Altivar Process

Variable Speed Drives ATV930, ATV950

Programming Manual

08/2015

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Schneider Electric

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Qualification Of Personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product. In addition, these persons must have received safety training to recognize and avoid hazards involved. These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical and electronic equipment of the entire system in which the product is used. All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work.

Intended Use

This product is a drive for three-phase synchronous and asynchronous motors and intended for industrial use according to this manual.The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements and the technical data.Prior to using the product, you must perform a risk assessment in view of the planned application. Based on the results, the appropriate safety measures must be implemented.Since the product is used as a component in an entire system, you must ensure the safety of persons by means of the design of this entire system (for example, machine design). Any use other than the use explicitly permitted is prohibited and can result in hazards. Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel.

Product Related Information

Read and understand these instructions before performing any procedure with this drive.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation and who have received safety training to recognize and avoid hazards involved are authorized to work on and with this drive system. Installation, adjustment, repair and maintenance must be performed by qualified personnel.
- The system integrator is responsible for compliance with all local and national electrical code requirements as well as all other applicable regulations with respect to grounding of all equipment.
- Many components of the product, including the printed circuit boards, operate with mains voltage. Do not touch. Use only electrically insulated tools.
- Do not touch unshielded components or terminals with voltage present.
- Motors can generate voltage when the shaft is rotated. Prior to performing any type of work on the drive system, block the motor shaft to prevent rotation.
- AC voltage can couple voltage to unused conductors in the motor cable. Insulate both ends of unused conductors of the motor cable.
- Do not short across the DC bus terminals or the DC bus capacitors or the braking resistor terminals.
- Before performing work on the drive system:
  - Disconnect all power, including external control power that may be present.
  - Place a **Do Not Turn On** label on all power switches.
  - Lock all power switches in the open position.
  - Wait 15 minutes to allow the DC bus capacitors to discharge. The DC bus LED is not an indicator of the absence of DC bus voltage that can exceed 800 Vdc.
    Measure the voltage on the DC bus between the DC bus terminals (PA/+, PC/-) using a properly rated voltmeter to verify that the voltage is <42 Vdc
  - If the DC bus capacitors do not discharge properly, contact your local Schneider Electric representative. Do not repair or operate the product.
- Install and close all covers before applying voltage.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNEXPECTED MOVEMENT

Drive systems may perform unexpected movements because of incorrect wiring, incorrect settings, incorrect data or other errors.

- Carefully install the wiring in accordance with the EMC requirements.
- Do not operate the product with unknown or unsuitable settings or data.
- Perform a comprehensive commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Damaged products or accessories may cause electric shock or unanticipated equipment operation.

⚠⚠ DANGER

ELECTRIC SHOCK OR UNANTICIPATED EQUIPMENT OPERATION

Do not use damaged products or accessories.

Failure to follow these instructions will result in death or serious injury.

Contact your local Schneider Electric sales office if you detect any damage whatsoever.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop, overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines (1).
- Each implementation of the product must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) For USA: Additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems.

NOTICE

DESTRUCTION DUE TO INCORRECT MAINS VOLTAGE

Before switching on and configuring the product, verify that it is approved for the mains voltage

Failure to follow these instructions can result in equipment damage.

The metal surfaces of the product may exceed 100 °C (212 °F) during operation.

⚠ WARNING

HOT SURFACES

- Ensure that any contact with hot surfaces is avoided.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

About the Book

At a Glance

Document Scope

The purpose of this document is to:

- help you to set up the drive,
- show you how to program the drive,
- show you the different menus, modes, and parameters,
- help you in maintenance and diagnostics.

Validity Note

This documentation is valid for the Altivar Process drives. For Drive System products, refer to the dedicated addendum which describes specific features of these products (for the reference number of the manual see the related documents section).

The technical characteristics of the devices described in this document also appear online. To access this information online:

Step	Action
1	Go to the Schneider Electric home page *www.schneider-electric.com*.
2	In the **Search** box type the reference of a product or the name of a product range. ● Do not include blank spaces in the reference or product range. ● To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the **Product Datasheets** search results and click on the reference that interests you. If you entered the name of a product range, go to the **Product Ranges** search results and click on the product range that interests you.
4	If more than one reference appears in the **Products** search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the data sheet.
6	To save or print a data sheet as a .pdf file, click **Download XXX product datasheet**.

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the manual and online information, use the online information as your reference.

Related Documents

Use your tablet or your PC to quickly access detailed and comprehensive information on all our products on www.schneider-electric.com

The internet site provides the information you need for products and solutions

- The whole catalog for detailed characteristics and selection guides
- The CAD files to help design your installation, available in over 20 different file formats
- All software and firmware to maintain your installation up to date
- A large quantity of White Papers, Environment documents, Application solutions, Specifications... to gain a better understanding of our electrical systems and equipment or automation
- And finally all the User Guides related to your drive, listed below:

Title of Documentation	Reference Number
Altivar Process ATV930, ATV950, ATV960 Getting Started	NHA61578 (English), NHA61579 (French), NHA61580 (German), NHA61581 (Spanish), EAV61724 (Italian), NHA61582 (Chinese)
Altivar Process ATV930, ATV950, ATV960 Getting Started Annex (SCCR)	NHA61583 (English)
Altivar Process ATV930, ATV950, ATV960 Installation Manual	NHA80932 (English), NHA80933 (French), NHA80934 (German), NHA80935 (Spanish), NHA80936 (Italian), NHA80937 (Chinese)
Altivar Process Drive Systems – Installation manual	NHA37118 (German), NHA37121 (French), NHA37122 (Spanish), NHA37123 (Italian), NHA37124 (Dutch), NHA37126 (Polish), NHA37127 (Portuguese), NHA37128 (Russian), NHA37129 (Turkish), NHA37130 (Chinese)
Altivar Process ATV930, ATV950 Programming Manual	NHA80757 (English), NHA80758 (French), NHA80759 (German), NHA80760 (Spanish), NHA80761 (Italian), NHA80762 (Chinese)
Altivar Process ATV930, ATV950, ATV960 Modbus Serial Link Manual (Embedded)	NHA80939 (English)
Altivar Process ATV930, ATV950, ATV960 Ethernet Manual (Embedded)	NHA80940 (English)
Altivar Process ATV930, ATV950, ATV960 PROFIBUS DP manual (VW3A3607)	NHA80941 (English)
Altivar Process ATV930, ATV950, ATV960 DeviceNet manual (VW3A3609)	NHA80942 (English)
Altivar Process ATV930, ATV950, ATV960 PROFINET manual (VW3A3627)	NHA80943 (English)
Altivar Process ATV930, ATV950, ATV960 CANopen Serial Link Manual (VW3A3608, 618, 628)	NHA80945 (English)
Altivar Process ATV930, ATV950, ATV960 EtherCAT manual - VW3A3601	NHA80946 (English)
Altivar Process ATV930, ATV950, ATV960 Communication Parameters	NHA80944 (English)
Altivar Process ATV930, ATV950, ATV960 Service Instructions	NHA80954 (English)
Altivar Process ATV930, ATV950, ATV960 Safety Function manual	NHA80947 (English), NHA80948 (French), NHA80949 (German), NHA80950 (Spanish), NHA80951 (Italian), NHA80953 (Chinese)

You can download these technical publications and other technical information from our website at http://download.schneider-electric.com

Terminology

The technical terms, terminology, and the corresponding descriptions in this manual normally use the terms or definitions in the relevant standards.

In the area of drive systems this includes, but is not limited to, terms such as **error, error message, failure, fault, fault reset, protection, safe state, safety function, warning, warning message**, and so on.

Among others, these standards include:

- IEC 61800 series: Adjustable speed electrical power drive systems
- IEC 61508 Ed.2 series: Functional safety of electrical/electronic/programmable electronic safety-related
- EN 954-1 Safety of machinery - Safety related parts of control systems
- EN ISO 13849-1 & 2 Safety of machinery - Safety related parts of control systems.
- IEC 61158 series: Industrial communication networks - Fieldbus specifications
- IEC 61784 series: Industrial communication networks - Profiles
- IEC 60204-1: Safety of machinery - Electrical equipment of machines – Part 1: General requirements

In addition, the term **zone of operation** is used in conjunction with the description of specific hazards, and is defined as it is for a **hazard zone** or **danger zone** in the EC Machinery Directive (2006/42/EC) and in ISO 12100-1.

Also see the glossary at the end of this manual.

Part I
Introduction

What Is in This Part?

This part contains the following chapters:

Chapter 1
Setup

What Is in This Chapter?

This chapter contains the following topics:

Preliminary Recommendations

Before Powering up the Drive

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

Before switching on the device, verify that no unintended signals can be applied to the digital inputs that could cause unintended movements.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If the drive was not connected to mains for an extended period of time, the capacitors must be restored to their full performance before the motor is started.

NOTICE

REDUCED CAPACITOR PERFORMANCE

- Apply mains voltage to the drive for one hour before starting the motor if the drive has not been connected to mains for the following periods of time:
  - 12 months at a maximum storage temperature of +50°C (+122°F)
  - 24 months at a maximum storage temperature of +45°C (+113°F)
  - 36 months at a maximum storage temperature of +40°C (+104°F)
- Verify that no Run command can be applied before the period of one hour has elapsed.
- Verify the date of manufacture if the drive is commissioned for the first time and run the specified procedure if the date of manufacture is more than 12 months in the past.

Failure to follow these instructions can result in equipment damage.

If the specified procedure cannot be performed without a Run command because of internal mains contactor control, perform this procedure with the power stage enabled, but the motor being at standstill so that there is no appreciable mains current in the capacitors.

Start-up

NOTE:
If a Run command such as Run forward, Run reverse, DC injection is still active during:

- A product reset to the factory settings,
- A manual "Fault Reset" using **[Fault Reset Assign]** rSF,
- A manual "Fault reset" by applying a product switched off and on again,
- A stop command given by a channel that is not the active channel command (such as Stop key of the display terminal in 2/3 wires control),

The drive is in a blocking state and displays **[Freewheel Stop]** nSt. It will be necessary to deactivate all active Run commands prior to authorizing a new Run command.

Mains Contactor

NOTICE

RISK OF DAMAGE TO THE DRIVE

Do not switch on the drive at intervals of less than 60 s.

Failure to follow these instructions can result in equipment damage.

Using a Motor with a Lower Rating or Dispensing with a Motor Altogether

In factory settings, the motor output phase loss detection is active: **[OutPhaseLoss Assign]** oPL is set to **[OPF Error Triggered]** YES. For details, refer to the parameter description *(see page 501)*. For commissioning tests or maintenance phase, the drive could be connected to a small motor power size and thus trigger an error **[Output Phase Loss]** oPL2 or **[Single output phase loss]** oPF1 when a Run command is applied.For that purpose, the function can be disabled by setting **[OutPhaseLossAssign]** oPL to **[Function Inactive]** nO.

Set also **[Motor control type]** CTT to **[U/F VC Standard]** Std in **[Motor parameters]** MPA-. For details, refer to the parameter description.

NOTICE

MOTOR OVERHEATING

Install external thermal monitoring equipment under the following conditions:

- If a motor with a nominal current of less than 20% of the nominal current of the drive is connected.
- If you use the function Motor Switching.

Failure to follow these instructions can result in equipment damage.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

If output phase monitoring is disabled, phase loss and, by implication, accidental disconnection of cables, are not detected.

- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

Steps for Setting-Up the Drive

⚠ WARNING

UNEXPECTED MOVEMENT

Drive systems may perform unexpected movements because of incorrect wiring, incorrect settings, incorrect data or other errors.

- Carefully install the wiring in accordance with the EMC requirements.
- Do not operate the product with unknown or unsuitable settings or data.
- Perform a comprehensive commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Tips

Use the **[Config. Source]** FCS1 parameter *(see page 551)* to restore the factory settings at any time.

NOTE: The following operations must be performed for optimum drive performance in terms of accuracy and response time:

- Enter the values indicated on the motor nameplate in the **[Motor parameters]** MPA- menu.
- Perform autotuning with the motor cold and connected using the **[Autotuning]** tUn parameter.

Chapter 2
Overview

What Is in This Chapter?

This chapter contains the following topics:

Factory Configuration

Factory Settings

The drive is factory-set for common operating conditions:

- Display: drive ready **[Ref Frequency]** LFr when motor is ready to run and motor frequency when motor is running.
- The DI3 and DI5 to DI8 digital inputs, AI2 and AI3 analog inputs, R2 and R3 relays are unassigned.
- Stop mode when error detected: freewheel.

This table presents the basic parameters of the drive and their factory setting values:

Code	Name	Factory setting values
bFr	**[Motor Standard]**	**[50Hz IEC]** 50
tCC	**[2/3-Wire Control]**	**[2-Wire Control]** 2C: 2-wire control
Ctt	**[Motor control type]**	**[SVC V]** VVC: voltage vector control
ACC	**[Acceleration]**	3.0 s
dEC	**[Deceleration]**	3.0 s
LSP	**[Low Speed]**	0.0 Hz
HSP	**[High Speed]**	50.0 Hz
ItH	**[Motor Th Current]**	Nominal motor current (value depending on drive rating)
Frd	**[Forward]**	**[DI1]** dI1: Digital input DI1
rrS	**[Reverse]**	**[DI2]** dI2: Digital input DI2
Fr1	**[Ref Freq 1 Config]**	**[AI1]** AI1: Analog input AI1
r1	**[R1 Assignment]**	**[Operating State Fault]** FLt: the contact opens when the drive has detected error or when the drive has been switched off
brA	**[Dec.Ramp Adapt]**	**[Yes]** YES: function active (automatic adaptation of deceleration ramp)
Atr	**[Auto Fault Reset]**	**[No]** no: function inactive
Stt	**[Type of stop]**	**[On Ramp]** rMP: on ramp
Ao1	**[AQ1 assignment]**	**[Motor Frequency]** oFr: Motor frequency
Ao2	**[AQ2 assignment]**	**[Motor Current]** oCr: Motor current
rSF	**[Fault Reset Assign]**	**[DI4]** dI4: Digital input DI4

NOTE: If you want to restore the drive presettings to their factory values, set **[Config. Source]** FCS1 to **[Macro Config]** In1.

Verify whether the above values are compatible with the application and modify them if required.

Application Functions

Introduction

The following tables show the combinations of functions and applications in order to guide your selection.

The functions in these tables relate to the following applications:

- Mining, Mineral and Metal (MMM):
  - Long belt conveyor
  - Long-distance heavy conveying
  - Crusher
  - Grinding mills
  - Vibro feeders
- Hoisting:
  - Special cranes (Gantry cranes - Grab cranes)
  - Ship loaders
- Food & Beverage:
  - Mixers
  - Centrifuges machines
  - Hot rotary dryers
- O&G:
  - PCP (Progressive Cavity Pump)
  - ESP (Electrically Submersible Pump)
  - Rod pump

Each application has its own special features, and the combinations listed here are not mandatory or exhaustive.

Some functions are designed specifically for a given application. In this case, the application is identified by a tab in the margin on the relevant programming pages.

Combinations of Functions and Applications

Application functions:

Function	MMM		O&G			F&B	Process
	Conveyor	Hoisting	Pump Jack or Road pump	PCP control	ESP control	High inertia	
ENA system			X				
Brake sequence	X	X					
Boost for conical motors	X	X					
Limit switch management	X						
Torque regulation	X						X
Positioning / Autostop on distance	X						
Process control							X
Positioning value for PLC	X	X					
Load sharing	X	X				X	X
Master/Slave management (1)	X	X				X	X
Master/Slave on rigid coupling (1)	X	X				X	
Master/Slave on elastic coupling (1)	X	X					
Backspin sequence for PCP pumps (1)				X	X		
Backspin control for PCP pumps (1)				X	X		
Braking balance		X				X	X
DC Bus charge option						X	X
High-speed hoisting		X					
Commutation high speed		X					

1 This feature is not supported by the current firmware version

Monitoring functions:

Function	MMM		O&G			F&B	Process
	Conveyor	Hoisting	Pump Jack or Road pump	PCP control	ESP control	High inertia	
External error	X	X	X	X	X	X	
Catch on the fly	X		X	X	X	X	
Motor Overspeed		X		X	X		X
Torque limitation	X						
Encoder check	X	X					X
Reverse disable			X	X	X	X	X
Thermal monitoring of the braking resistor	X	X				X	
Under load detection	X			X	X		
Fast stop	X	X				X	
Dynamic load detection	X					X	X
Mechanical resonance rejection		X					
Stall monitoring	X					X	X
Load slipping monitoring		X					
Rope slack and anti rope slack detection		X					

Configuration management:

Function	MMM		O&G			F&B	Process
	Conveyor	Hoisting	Pump Jack or Road pump	PCP control	ESP control	High inertia	
Motor switching	X	X					
Configuration switching	X	X					
Parameter switching	X						
Current threshold function	X	X	X	X	X	X	X
Torque threshold reached	X	X				X	X
Frequency threshold reached	X	X	X	X	X	X	X
Thermal state reached	X	X	X	X	X	X	X
Automatic fault reset	X						
High speed reached		X		X	X		
Surge voltage on motor				X	X		
Parameter customization	X		X	X	X		X
Pulse input configuration	X	X				X	
Dual rating			X				X

Basic Functions

Drive Ventilation

NOTICE
DAMAGE TO THE DRIVE If **[Fan Mode]** FFM is set to **[Never]** StP, the fan of the drive is disabled. Life time of Electronic component is reduced. The ambient temperature must be limited to 40°C (104°F). **Failure to follow these instructions can result in equipment damage.**

If **[Fan mode]** FFM is set to:
- **[Standard]** Std, the fan is activated during the all run time of the motor. According to drive rating, this could be the only available setting.
- **[Always]** run, the fan is always activated.
- **[Economy]** ECo, the fan is activated only if necessary, according to the internal thermal state of the drive.
- **[Never]** StP, the fan is stopped.

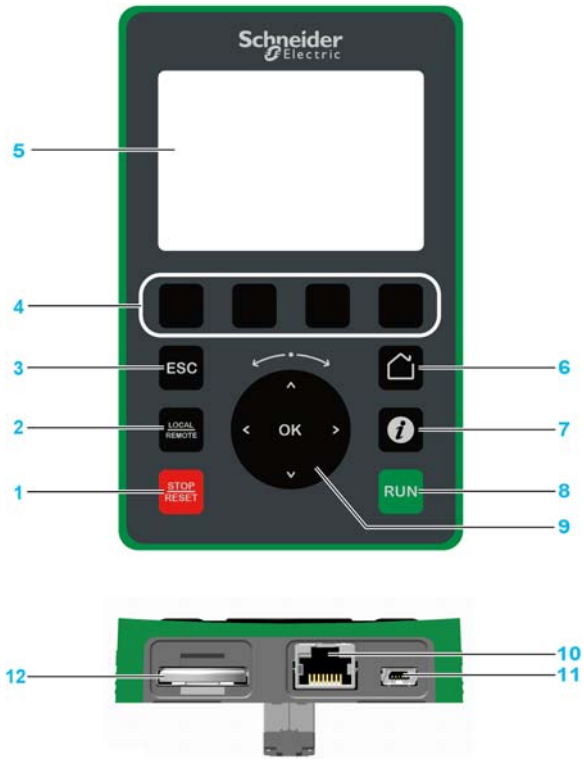
Fan speed and **[Fan Operation Time]** FPbt are monitored values:
- An abnormal low speed of the fan triggers a warning **[Fan Feedback Warning]** FFdA.
- As soon as **[Fan Operation Time]** FPbt reach the predefined value of 45,000 hours, a warning **[Fan Counter Warning]** FCtA is triggered.

[Fan Operation Time] FPbt counter can be set to 0 by using the **[Time Counter Reset]** rPr parameter.

Graphic Display Terminal

Description of the Graphic Display Terminal

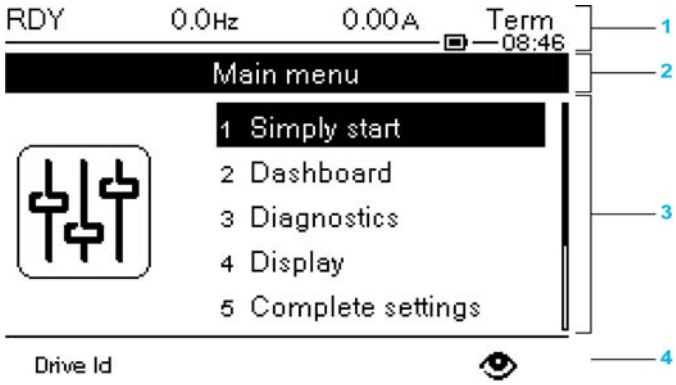
This Graphic Display Terminal is a local control unit which can be either plugged on the drive or mounted on the door of the wall-mounted or floor-standing enclosure. It has a cable with connectors, which is connected to the drive front Modbus serial link. The Graphic Display Terminal embeds a real time clock used for the time stamping of logged data and all other functions which require time information.



1 **STOP / RESET**: Stop command / apply a Fault Reset.
2 **LOCAL / REMOTE**: used to switch between local and remote control of the drive.
3 **ESC**: used to quit a menu/parameter or remove the currently displayed value in order to revert to the previous value retained in the memory
4 **F1 to F4**: function keys used to access drive id, QR code, quick view, and submenus. Simultaneous press of F1 and F4 keys generates a screenshot file in the Graphic Display Terminal internal memory.
5 **Graphic display**.
6 **Home**: used to access directly at the home page.
7 **Information**: used to have more information about menus, submenus, and parameters. The selected parameter or menu code is displayed on the first line of the information page.
8 **RUN**: executes the function assuming it has been configured.
9 **Touch wheel / OK**: used to save the current value or access the selected menu/parameter. The touch wheel is used to scroll fast into the menus. Up/down arrows are used for precise selections, right/left arrows are used to select digits when setting a numerical value of a parameter.
10 **RJ45 Modbus serial port**: used to connect the Graphic Display Terminal to the drive in remote control.
11 **MiniB USB port**: used to connect the Graphic Display Terminal to a computer.
12 **Battery** (10 years service life. Type: CR2032). The battery positive pole points to the front face of the Graphic Display Terminal.

NOTE: Keys 1, 8 and 9 can be used to control the drive if control via the Graphic Display Terminal is activated. To activate the keys on the Graphic Display Terminal, you first need to set **[Ref Freq 1 Config]** Fr1 to **[Ref.Freq-Rmt.Term]** LCC.

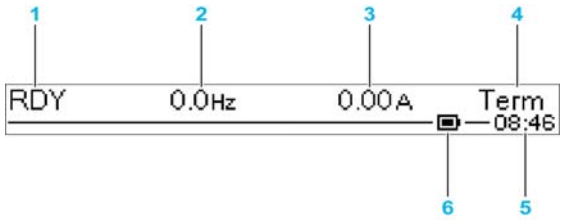
Description of the Graphic Display



1 Display line: its content can be configured
2 Menu line: indicates the name of the current menu or submenu
3 Menus, submenus, parameters, values, bar charts, and so on, are displayed in drop-down window format on a maximum of five lines. The line or value selected by the navigation button is displayed in reverse video
4 Section displaying tabs (1 to 4 by menu), these tabs can be accessed using F1 to F4 keys

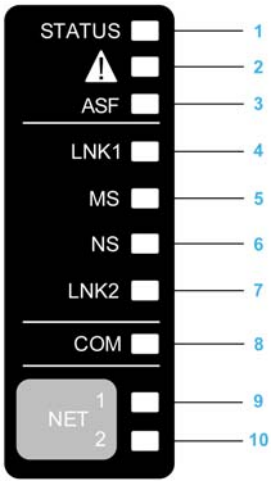
NOTE: The numbers in front of the menus and submenus in the graphic display terminal are different from chapters numbers in this programming manual.

Display line details:



Key	
1	Drive state
2	Customer defined
3	Customer defined
4	Active control channel ● TERM: terminals ● HMI: Graphic Display Terminal ● MDB: integrated Modbus serial ● CAN: CANopen® ● NET: fieldbus module ● ETH: integrated Ethernet ● PWS: DTM based commissioning software
5	Present time
6	Battery level

Description of the Product Front LEDs



Following table provides the details of the drive status LEDs:

Item	LED	Color & status	Description
1	**STATUS**	OFF	Indicates that the drive is powered off
		Green flashing	Indicates that the drive is not running, ready to start
		Green blinking	Indicates that the drive is in transitory status (acceleration, deceleration, and so on)
		Green on	Indicates that the drive is running
		Yellow on	Device Visual identification function when using SoMove or the device DTM
2	**Warning/Error**	Red flashing	Indicates that the drive detected warning
		Red on	Indicates that the drive detected error
3	**ASF**	Yellow on	Indicates that the safety function is activated

Following table provides the details of the embedded Ethernet LEDs:

Item	LED	Color & status	Description
4	**LNK1**	OFF	No link.
		Green/Yellow flashing	Power on testing.
		Green on	Link established at 100 Mbit/s.
		Green flashing	Link established at 10 Mbit/s.
		Yellow flashing	Fieldbus activity at 100 Mbit/s.
		Yellow on	Fieldbus activity at 10 Mbit/s.
5	**MS**	OFF	No power is supplied to the device.
		Green/Red flashing	Power up testing.
		Green on	The device is operating correctly.
		Green flashing	The device has not been configured.
		Red flashing	The device has detected a recoverable minor detected error.
		Red on	The device has detected a non-recoverable major detected error.
6	**NS**	OFF	The device does not have an IP address or powered off.
		Green/Red flashing	Power on testing.
		Green on	A connection is established to control the command word.
		Green flashing	Device has a valid IP, but no command word connection.
		Red flashing	Duplicated IP.
		Red on	An established connection to control the command word is closes or timed out.
7	**LNK2**	OFF	No link.
		Green/Yellow flashing	Power on testing.
		Green on	Link established at 100 Mbit/s.
		Green flashing	Link established at 10 Mbit/s.
		Yellow flashing	Fieldbus activity at 100 Mbit/s.
		Yellow on	Fieldbus activity at 10 Mbit/s.

Following table provides the details of the embedded Modbus serial LEDs:

Item	LED	Color & status	Description
8	**COM**	Yellow flashing	Indicates embedded Modbus serial activity

Following table provides the details of the fieldbus module LEDs:

Item	LED	Color & status	Description
9	**NET 1**	Green/Red	for details, refer to the fieldbus manual
10	**NET 2**	Green/Red	for details, refer to the fieldbus manual

Graphic Display Terminal Connected to a Computer

NOTICE
RISK OF DAMAGE TO THE COMPUTER Do not connect the Graphic Display Terminal to the drive via a Modbus RJ45 link and to the computer via a USB link at the same time. **Failure to follow these instructions can result in equipment damage.**

The Graphic Display Terminal is recognized as a USB storage device named SE_VW3A1111 while plugged on a computer.

This allows to access the saved drive configurations (DRVCONF menu) and the Graphic Display Terminal screenshots (PRTSCR menu).

Screenshots can be stored by a simultaneous press on F1 and F4 function keys

The Graphic Display Terminal language files can also be accessed and updated (LANG menu).

Language files are available on *www.schneider-electric.com*.

NOTE: Make a backup of the original language file prior to you replace it by another one.

Structure of the Parameter Table

General Legend

Pictogram	Description
★	These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.
	Setting of this parameter can be done during operation or when stopped. **NOTE:** It is recommended to stop the motor before modifying any of the settings.
	To change the assignment of the parameter, reinforced validation is required.

Parameter Presentation

Below is an example of a parameter presentation:

[Sample Menu] CodE – Menu

Access
Parameters described below can be accessed by:
[Path] → [Sub-path]

About this menu
Description of the menu or function

[Parameter1] CodE 1
Description of the parameter

Example of a table with a setting range:

Setting ( )	Description
0.0… 10,000.0	Setting range Factory setting: 50.0

[Parameter2] CodE 2
Description of the parameter

Example of a table with a list of choices:

Setting ( )	Code / Value	Description
[50 Hz IEC]	50	IEC **Factory setting**
[60 Hz NEMA]	60	NEMA

Finding a Parameter in This Document

With the Graphic Display Terminal

Select the required parameter and press  .

The parameter code is displayed at the top of the information window.

Example: **[Acceleration]** code is ACC.

With the Manual

It is possible to use either the parameter name or the parameter code to search in the manual the page giving details of the selected parameter.

Difference Between Menu and Parameter

A dash after menu and submenu codes is used to differentiate menu commands from parameter codes.

Example:

Level	Name	Code
Menu	**[Ramp]**	rAMP-
Parameter	**[Acceleration]**	ACC

Chapter 3
CyberSecurity

CyberSecurity

Introduction

Cyber security is a branch of network administration that addresses attacks on or by computer systems and through computer networks that can result in accidental or intentional disruptions.

The objective of cyber security is to help provide increased levels of protection for information and physical assets from theft, corruption, misuse, or accidents while maintaining access for their intended users.

No single cyber security approach is adequate. Schneider Electric recommends a defense-in-depth approach. Conceived by the **National Security Agency** (NSA), this approach layers the network with security features, appliances, and processes.

The basic components of this approach are:
- Risk assessment
- A security plan built on the results of the risk assessment
- A multi-phase training campaign
- Physical separation of the industrial networks from enterprise networks using a demilitarized zone (DMZ) and the use of firewalls and routing to establish other security zones
- System access control
- Device hardening
- Network monitoring and maintenance

This chapter defines the elements that help you configure a system that is less susceptible to cyber attacks.

For detailed information on the defense-in-depth approach, refer to the TVDA: **How Can I Reduce Vulnerability to Cyber Attacks in the Control Room** on the Schneider Electric website.

To submit a cyber security question, report security issues, or get the latest news from Schneider Electric, visit the Schneider Electric website.

Password Management

The system is secured thanks to several passwords:
- Drive password *(see page 561)* must contain six characters (blanks are allowed)
- Webserver password *(see page 574)* must contain:
  - A total of eight characters
  - At least one upper-case letter
  - At least one lower-case letter
  - At least one special character (for example, @, #, $)
  - No blank character

NOTE: After five unsuccessful login attempts, the access must be reactivated by the administrator.

Schneider Electric recommends to:
- Change the password every 90 days
- Use a dedicated password (not related to your personal password)

NOTE: No responsibility is assumed by Schneider Electric for any consequences if anyone hacks your product password and if you use the same password for personal usage.

Backing-up and Restoring the Software Configuration

To protect your data, Schneider Electric recommends backing-up the drive configuration and keeping your backup file in a safe place. The backup is available in the drive DTM, using "load from device" and "store to device" functions.

Remote Access to the Drive

When remote access is used between a device and the drive, please ensure your network is secure (VPN,Firewall…).

Data Flow Restriction

To secure the access to the drive and limit the data flow, the use of a firewall device is recommended.

ConneXium Tofino Firewall Product

The ConneXium TCSEFEA Tofino Firewall is a security appliance that provides levels of protection against cyber threats for industrial networks, automation systems, SCADA systems, and process control systems.

This Firewall is designed to permit or deny communications between devices connected to the external network connection of the Firewall and the protected devices connected to the internal network connection.

The Firewall can restrict network traffic based on user defined rules that would permit only authorized devices, communication types and services.

The Firewall includes built-in security modules and an off-line configuration tool for creating secure zones within an industrial automation environment.

Control Command Restriction

To prevent unauthorized use of the command of the drive, it is possible to grant access to a limited number of IP address using the IP master parameter.

The parameter IP Master defines which device can command with the drive. This parameter is available in the drive DTM.

Recommendations for unused functions

To avoid unauthorized access, we recommend deactivating unused functions.

Example: WebServer, Fast Device Replacement …

Part II
Programming

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
4	**[Simply start]** SYS -	45
5	**[Dashboard]** dSH -	55
6	**[Diagnostics]** d iA -	63
7	**[Display]** Mon -	87
8	**[Complete settings]** CSt -	157
9	**[Communication]** CoM -	537
10	**[File management]** FMt -	549
11	**[My preferences]** MYP -	559

Chapter 4
[Simply start] SYS-

Introduction

[Simply start] SYS- menu contains 3 tabs for quick access to mains features:

- Simply Start tab which gives a quick access to basic parameters to set.
- My Menu tab which is a user-defined menu for quick access to specific parameters.
- Modified Parameters tab which gives a quick access to the last modified parameters.

What Is in This Chapter?

This chapter contains the following topics:

[Simply start] SIM - Menu

Access

[Simply start] ➡ **[Simply start]**

About This Menu

⚠ WARNING

LOSS OF CONTROL

- Fully read and understand the manual of the connected motor.
- Verify that all motor parameters are correctly set by referring to the nameplate and the manual of the connected motor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This menu provides a quick access to the basic parameters to set.

[Motor Standard] bFr ★

Motor standard.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVC.

This parameter modifies the presets of the following parameters:

- **[High Speed]** HSP
- **[Motor Freq Thd]** Ftd
- **[Nom Motor Voltage]** unS
- **[Nominal Motor Freq]** FrS
- **[Max Frequency]** tFr

Setting	Code / Value	Description
[50 Hz IEC]	50	IEC **Factory setting**
[60 Hz NEMA]	60	NEMA

[Nominal motor power] nPr ★

Nominal motor power.

This parameter can be accessed if:

- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc, and
- **[Motor param choice]** MPC is set to **[Mot Power]** nPr.

Rated motor power given on the nameplate, in kW if **[Motor Standard]** bFr is set to **[50Hz IEC]** 50, in HP if **[Motor Standard]** bFr is set to **[60Hz NEMA]** 60.

Setting	Description
According to drive rating	– **Factory setting**: according to the drive rating

[Nom Motor Voltage] ★

Nominal motor voltage.

This parameter can be accessed if **[Motor control type]** is not set to:
- **[Sync. mot.]**, or
- **[Sync.CL.]**, or
- **[SYN_U VC]**, or
- **[Rel. Mot.]** .

Rated motor voltage given on the nameplate.

Setting	Description
100.0...690.0 Vac	Setting range **Factory setting**: according to drive rating and **[Motor Standard]**

[Nom Motor Current] ★

Rated motor current given on the nameplate.

This parameter can be accessed if **[Motor control type]** is not set to:
- **[Sync. mot.]**, or
- **[Sync.CL.]**, or
- **[SYN_U VC]**, or
- **[Rel. Mot.]** .

Setting	Description
0.25...1.5 In (1)	Setting range **Factory setting**: according to drive rating and **[Motor Standard]**
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Nominal Motor Freq] ★

Nominal motor frequency.

This parameter can be accessed if **[Motor control type]** is not set to:
- **[Sync. mot.]**, or
- **[Sync.CL.]**, or
- **[SYN_U VC]**, or
- **[Rel. Mot.]** .

The factory setting is 50 Hz, or preset to 60 Hz if **[Motor Standard]** is set to 60 Hz.

Setting	Description
10.0...599.0 Hz	Setting range **Factory setting**: 50.0 Hz

[Nominal Motor Speed] nSP ★

Nominal motor speed.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

If the nameplate indicates the synchronous speed and the slip in Hz or as a %, use one of the formulas to calculate the rated speed:

- Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$
- Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors)
- Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors).

Setting	Description
0...65,535 rpm	Setting range **Factory setting**: according to drive rating

[Motor 1 Cosinus Phi] Cos ★

Nominal motor cosinus Phi.

This parameter can be accessed if:

- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc, and
- **[Motor param choice]** MPC is set to **[Mot Cosinus]** Cos.

Setting	Description
0.50...1.00	Setting range **Factory setting**: according to the drive rating

[2/3-Wire Control] tCC

2-wire or 3-wire control.

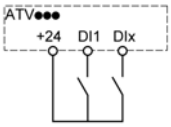
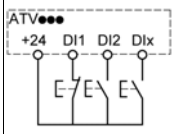
⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

If this parameter is changed, the parameters **[Reverse Assign]** rrS and **[2-wire type]** tCt and the assignments of the digital inputs are reset to the factory setting.

Verify that this change is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[2-Wire Control]	2C	**2-wire control (level commands):** This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping. Example of **source** wiring:  **DI1** Forward **DIx** Reverse **Factory setting**
[3-Wire Control]	3C	**3-wire control (pulse commands) [3 wire]:** A **forward** or **reverse** pulse is sufficient to command starting, a **stop** pulse is sufficient to command stopping. Example of **source** wiring:  **DI1** Stop **DI2** Forward **DIx** Reverse

[Max Frequency] tFr

Maximum output frequency.

The factory setting is 60 Hz, or preset to 72 Hz if **[Motor Standard]** bFr is set to 60 Hz.

Setting	Description
10.0...599.0 Hz	Setting range **Factory setting**: 60 Hz

[Autotuning] tun 

⚠ WARNING

UNEXPECTED MOVEMENT

Autotuning moves the motor in order to tune the control loops.
- Only start the system if there are no persons or obstructions in the zone of operation.
- During autotuning, the motor makes small movements. Noise development and mechanical oscillations of the system are normal.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

In any case, the motor has to be stopped before performing a tune operation. Verify that the application does not make the motor turn during the tune operation.

The tune operation optimizes:
- The motor performances at low speed.
- The estimation of the motor torque.

Autotuning is only performed if no stop command has been activated. If a “freewheel stop” or “fast stop” function has been assigned to a digital input, this input must be set to 1 (active at 0).

Autotuning takes priority over any run or prefluxing commands, which will be taken into account after the autotuning sequence.

If autotuning has detected error, the drive always displays **[No action]** nO and, depending on the configuration of **[Tuning Error Resp]** tnL , may switch to **[Autotuning]** tun detected error mode.

Autotuning may last for several seconds. Do not interrupt the process. Wait for the Graphic Display Terminal to change to **[No action]** nO.

NOTE: The motor thermal state has a significant influence on the tuning result. Always perform a motor tuning with the motor stopped and cold. Verify that the application does not have the motor operate during a tuning operation.

To redo a motor tuning, wait that it is stopped and cold. Set first **[Autotuning]** tun to **[Erase Autotuning]** CLr , then redo the motor tuning.

The use of the motor tuning without doing a **[Erase Autotuning]** CLr first is used to get the thermal state estimation of the motor.

The cable length has an influence on the tune result. If the wiring is modified, it is necessary to redo the tune operation.

Setting ❮❯	Code / Value	Description
[No action]	nO	Autotuning not in progress **Factory setting**
[Apply Autotuning]	YES	Autotuning is performed immediately if possible, then the parameter automatically changes to **[No action]** nO. If the drive state does not allow the tune operation immediately, the parameter changes to **[No]** nO and the operation must be done again.
[Erase Autotuning]	CLr	The motor parameters measured by the autotuning function are reset. The default motor parameter values are used to control the motor. **[Autotuning Status]** tuS is set to **[Not done]** tAb.

[Autotuning Status] tUS

Autotuning status.

(for information only, cannot be modified)

This parameter is not saved at drive power off. It shows the autotuning status since last power-on.

Setting	Code / Value	Description
[Not done]	tAb	Autotune is not done **Factory setting**
[Pending]	PEnd	Autotune has been requested but not yet performed
[In Progress]	PrOG	Autotune is in progress
[Error]	FAIL	Autotune has detected error
[Autotuning Done]	donE	The motor parameters measured by the autotuning function are used to control the motor

[Motor Th Current] ItH

Motor thermal monitoring current to be set to the rated current indicated on the nameplate.

Setting	Description
0.2...1.1 In(1)	Setting range **Factory setting**: According to drive rating
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Acceleration] ACC

Time to accelerate from 0 to the **[Nominal Motor Freq]** Frs. To have a repeatability in the ramps, the value of this parameter must be set according to the possibility of the application.

Setting	Description
0.0...6,000.0 s (1)	Setting range **Factory setting**: 3.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1...6,000 s according to **[Ramp increment]** Inr.	

[Deceleration] dEC

Time to decelerate from the **[Nominal Motor Freq]** Frs to 0. To have a repeatability in the ramps, the value of this parameter must be set according to the possibility of the application.

Setting	Description
0.0...6,000.0 s (1)	Setting range **Factory setting**: 3.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1...6,000 s according to **[Ramp increment]** Inr.	

[Low Speed] L S P

Low speed.

Motor frequency at minimum reference, can be set between 0 and **[High Speed]** H S P.

Setting	Description
0.0... **[High Speed]** H S P Hz	Setting range **Factory setting**: 0.0 Hz

[High Speed] H S P

High speed.

Motor frequency at maximum reference, can be set between **[Low Speed]** L S P and **[Max Frequency]** t F r. The factory setting changes to 60 Hz if **[Motor Standard]** b F r is set to **[60Hz NEMA]** 6 0.

Setting	Description
0.0...**[Max Frequency]** t F r Hz	Setting range **Factory setting**: 50.0 Hz

[My menu] MYMn - Menu

Access

[Simply start] ➡ **[My menu]**

About This Menu

This menu contains the parameters selected in the **[My menu config.]** MYC - Menu.

NOTE: This menu is empty by default.

[Modified parameters] LMd - Menu

Access

[Simply start] ➡ [Modified parameters]

About This Menu

This menu gives a quick access to the 10 last modified parameters

Chapter 5
[Dashboard] dSH-

Introduction

[Dashboard] dSH- menu contains tabs for quick access to system and display features:

- System tab to configure the main system parameters.
- Energy tab which provides a complete access for instantaneous power counters and energy reports by means of graphics on the Graphic Display Terminal.

What Is in This Chapter?

This chapter contains the following topics:

[System] dSt - Menu

Access

[Dashboard] ➡ [System]

[Pre-Ramp Ref Freq] FrH

Frequency reference before ramp (signed value).

Actual frequency reference lied to the motor regardless of which reference channel has been selected. This parameter is in read-only mode.

Setting	Description
-**[High Speed]** HSP...**[High Speed]** HSP Hz	Setting range **Factory setting: –**

[Drive State] HMIS

Drive state.

Setting	Code / Value	Description
[Autotuning]	tUn	Autotuning
[In DC inject.]	dCb	DC Injection
[Ready]	rdY	Drive ready
[Freewheel]	nSt	Freewheel stop control
[Running]	run	Motor in steady state or run command present and zero reference
[Accelerating]	ACC	Acceleration
[Decelerating]	dEC	Deceleration
[Current limitation]	CLI	In current limitation
[Fast stop]	FSt	Fast stop
[Mot. fluxing]	FLU	Fluxing function is activated
[No Mains Voltage]	nLP	Control is powered on but the DC bus is not loaded
[control.stop]	CtL	Controlled stop
[Dec. adapt.]	obr	Adapted deceleration
[Output cut]	SoC	Stand by output cut
[Undervoltage Warning]	USA	Undervoltage warning
[“Operating State "Fault"“]	FLt	Product has detected an error
[DCP Flashing Mode]	dCP	DCP flashing mode
[STO Active]	Sto	Safe Torque Off active
[Energy Saving]	IdLE	Idle stop and go mode
[Firmware Update]	FWuP	Firmeware update
[Angle test]	ASA	Angle setting

[Motor Current] LCr

Motor current.

Setting	Description
According to drive rating	Setting range **Factory setting: –**

[Motor speed] SPd

Motor speed in rpm.

Setting	Description
0...65,535 rrpm	Setting range **Factory setting: –**

[Motor Therm state] tHr

Motor thermal state.

The normal motor thermal state is 100%, the **[Motor Overload]** oLF threshold is set to 118%.

Setting	Description
0...200%	Setting range **Factory setting: –**

[Dashboard] dSH - Menu

Access

[Dashboard]

[Trq/Spd] tES

Displays the torque versus speed curve.

[kWh Counters] kWC - menu

Access

[Dashboard] ➡ **[kWh Counters]**

About This Menu

This menu presents many energy objects available for instantaneous data and kW consumption reports.

It offers the possibility to display logged data with graphics by pressing the F4 function key.

[Elc energy cons] oC4 ★

Electrical energy consumed by the motor in TWh.

This parameter can be accessed if **[Elc energy cons(TWh)]** oC4 is not set to 0.

Setting	Description
0...999 TWh	Setting range **Factory setting**: –

[Elc energy cons] oC3 ★

Electrical energy consumed by the motor in GWh.

Setting	Description
0...999 GWh	Setting range **Factory setting**: –

[Elc energy cons] oC2 ★

Electrical energy consumed by the motor in MWh.

Setting	Description
0...999 MWh	Setting range **Factory setting**: –

[Elc energy cons] oC1 ★

Electrical energy consumed by the motor in kWh.

Setting	Description
0...999 kWh	Setting range **Factory setting**: –

[Elc energy cons] oC0 ★

Electrical energy consumed by the motor in Wh.

Setting	Description
0...999 Wh	Setting range **Factory setting**: –

[Acv Elc out pwr estm] EPrW

Active electrical output power estimation.

Setting	Description
-32,767...32,767	Setting range Value in kW or HP according to **[Motor Standard]** bFr setting **Factory setting**: –

[Elc Egy Today] oCt

Electrical energy consumed today by the motor in kWh.

Setting	Description
0...4,294,967,295 kWh	Setting range **Factory setting**: –

[Elc Egy Yesterday] oCY

Electrical energy consumed yesterday by the motor in kWh.

Setting	Description
0...4,294,967,295 kWh	Setting range **Factory setting**: –

[Dashboard] dSH- Menu

Access

[Dashboard]

About This Menu

Using **F4** function key on the Graphic Display Terminal, it is possible to select one of the following view for the **[Energy]** tab.

[Instant kW Trend] CVI

Displays the instantaneous electrical energy curve at the drive output.

[Daily kWh Report] HSd

Displays the daily energy histogram.

[Weekly kWh Report] HSW

Displays the weekly energy histogram.

[Monthly kWh Report] HSM

Displays the monthly energy histogram.

[Yearly kWh Report] HSY

Displays the yearly energy histogram.

Chapter 6
[Diagnostics] d iA-

Introduction

 **[Diagnostics]** d iA- menu presents drive and application data useful when diagnostics is required.

What Is in This Chapter?

This chapter contains the following sections:

Section 6.1
[Diag. data]

What Is in This Section?

This section contains the following topics:

[Diag. data] ddt - Menu

Access

[Diagnostics] ➡ [Diag. data]

About This Menu

This menu presents the actual warning and detected error in addition to drive data.

[Last Warning] LALr

Last warning which occurred.

Setting	Code / Value	Description
[No Warning Stored]	noA	No warning stored
[Fallback speed]	FrF	Reaction on event / fallback speed
[Speed Maintained]	rLS	Reaction on event / maintain speed
[Type of Stop]	Stt	Reaction on event / stop on **[Type of stop]** Stt without tripping in error
[Ref Frequency Warning]	SrA	Frequency reference reached
[Life Cycle Warn 1]	LCA1	Life cycle warning 1
[Life Cycle Warn 2]	LCA2	Life cycle warning 2
[PumpCycle warning]	PCPA	Pumpcycle monitoring warning
[PID Error Warning]	PEE	Warning on PID error
[PID Feedback Warning]	PFA	Warning on PID feedback
[PID High Fdbck Warning]	PFAH	PID feedback high threshold reached
[PID Low Fdbck Warning]	PFAL	PID feedback low threshold reached
[Regulation Warning]	P1SH	PI feedback monitoring warning is raised
[Limit Switch Reached]	LSA	Limit switch reached
[Slack Rope Warning]	rSdA	Slack rope warning
[Dynamic Load Warning]	dLdA	Dynamic load warning
[AI1 Th Warning]	tP1A	Temperature monitoring AI1 warning
[AI3 Th Warning]	tP3A	Temperature monitoring AI3 warning
[AI4 Th Warning]	tP4A	Temperature monitoring AI4 warning
[AI5 Th Warning]	tP5A	Temperature monitoring AI5 warning
[AI1 4-20 Loss Warning]	AP1	AI1 4-20 loss warning on AI1
[AI3 4-20 Loss Warning]	AP3	AI3 4-20 loss warning on AI3
[AI4 4-20 Loss Warning]	AP4	AI4 4-20 loss warning on AI4
[AI5 4-20 Loss Warning]	AP5	AI5 4-20 loss warning on AI5
[Drive Thermal Warning]	tHA	Drive overheating warning is raised
[IGBT Thermal Warning]	tJA	Warning on IGBT thermal state
[Fan Counter Warning]	FCtA	Fan counter speed warning
[Fan Feedback Warning]	FFdA	Fan feedback warning is raised
[BR Temp Warning]	boA	Braking resistor temperature warning
[Ext. Error Warning]	EFA	External error warning
[Undervoltage Warning]	uSA	Undervoltage warning is raised
[Preventive UnderV Active]	uPA	Controlled stop on power loss threshold id reached
[Forced Run]	Ern	Drive in forced run
[Motor Freq High Thd]	FtA	Motor frequency high threshold 1 reached
[Motor Freq Low Thd]	FtAL	Motor frequency low threshold 1 reached
[Motor Freq High Thd 2]	F9AL	Motor frequency high threshold 2 reached
[Motor Freq Low Thd 2]	F2AL	Motor frequency low threshold 2 reached
[High Speed Reached]	FLA	High speed reached function result
1 This feature is not supported by the current firmware version		

Setting	Code / Value	Description
[Ref Freq High Thd Reached]	rtAH	Reference frequency high threshold reached
[Ref Freq High Thd Reached]	rtAL	Reference frequency low threshold reached
[2nd Freq Thd Reached]	F2A	Frequency level reached (frequency meter)
[Current Thd Reached]	CtA	Motor current high threshold reached
[Low I Thd Reached]	CtAL	Motor current low threshold reached
[High Torque Warning]	ttHA	High torque warning
[Low Torque Warning]	ttLA	Low torque warning
[Process Undld Warning]	uLA	Underload is detected
[Process Overload Warning]	oLA	Overload is detected
[Torque Limit Reached]	SSA	Timeout on current or torque limitation is reached
[Torque Control Warning]	rtA	Torque control warning
[Drv Therm Thd Reached]	tAd	Drive thermal threshold reached function result
[Motor Therm Thd Reached]	tSA	Motor thermal threshold reached function result (motor 1)
[Mot2 Therm Thd reached]	tS2	Motor 2 thermal threshold reached
[Mot3 Therm Thd reached]	tS3	Motor 3 thermal threshold reached
[Mot3 Therm Thd reached]	tS4	Motor 4 thermal threshold reached
[Power High Threshold]	PtHA	Power high threshold reached
[Power Low Threshold]	PtHL	Power low threshold reached
[Cust Warning 1]	CAS1	Customer warning 1 active
[Cust Warning 2]	CAS2	Customer warning 2 active
[Cust Warning 3]	CAS3	Customer warning 3 active
[Cust Warning 4]	CAS4	Customer warning 4 active
[Cust Warning 5]	CASS	Customer warning 5 active
[Power Cons Warning]	PoWd	Power consumption warning
[Sleeping Warn]	AnA	Sleeping warning
[Load Mvt Warn]	bSA	Load movement warning
[Brake Cont Warn]	bcA	Brake contact warning
[M/S Device Warn] (1)	MSdA	Master/Slave device warning
[Encoder Thermal Warn]	tPEA	Encoder Thermal warning
1 This feature is not supported by the current firmware version		

[Last Error] LFt

Last error which occurred.

Setting	Code / Value	Description
[No Error]	nOF	No error detected
[EEPROM Control]	EEF1	EEPROM control
[Incorrect Configuration]	CFF	Invalid configuration at power-on
[Invalid Configuration]	CFI	Incorrect parameter configuration
[Modbus Com Interruption]	SLF1	Modbus local serial communication error
[Internal Link Error]	ILF	Option internal link error
[Fieldbus Com Interrupt]	CnF	Communication interruption on fieldbus module
[External Error]	EPF1	External error from LI or local link
[Overcurrent]	OCF	Over current error
[Precharge Capacitor]	CrF	Load relay error
[Encoder Feedback Loss]	SPF	Encoder Feedback Loss
[Load Sleeping]	AnF	Load sleeping
[Drive Overheating]	OHF	Drive over heating error
[Motor Overload]	OLF	Motor overload error
[DC Bus Overvoltage]	ObF	DC bus overvoltage
[Supply Mains Overvoltage]	OSF	Over supply error
[Single Output Phase Loss]	OPF1	Motor 1-phase loss
[Input Phase Loss]	PHF	Main input 1-phase loss
[Supply Mains UnderV]	USF	Under voltage error
[Motor Short Circuit]	SCF1	Motor short circuit error (hard detection)
[Motor Overspeed]	SOF	Instability or driving load too high
[Autotuning Error]	tnF	Tune error
[Internal Error 1]	InF1	Unknown drive rating
[Internal Error 2]	InF2	Unknown or incompatible power board
[Internal Error 3]	InF3	Internal communication error
[Internal Error 4]	InF4	Internal data inconsistent
[EEprom Power]	EEF2	Internal memory error
[Ground Short Circuit]	SCF3	Direct ground short-circuit error (hard detection)
[Output Phase Loss]	OPF2	Motor 3-phases loss
[Brake Control]	bLF	Brake Control
[Internal Error 7]	InF7	CPLD communication error
[Fieldbus Error]	EPF2	External error from fieldbus module
[Internal Error 8]	InF8	Power switching supply error
[Brake Feedback Loss]	brF	Brake Feedback
[PC Com Interruption]	SLF2	PC software communication interruption
[Encoder Coupling]	EcF	Encoder coupling
[Torque Limitation Error]	SSF	Torque limitation error
[HMI Com Interruption]	SLF3	Graphic Display Terminal communication error
[Internal Error 9]	InF9	Current measurement circuit failure
[Internal Error 10]	InFA	Customer supply error
[Internal Error 11]	InFb	Thermal sensor error (OC or SC)
[IGBT Overheating]	tJF	IGBT over heating error
[IGBT Short Circuit]	SCF4	IGBT short-circuit error (hard detection)
[Motor Short Circuit]	SCF5	Load short-circuit error during long load sequence (hard detection)
[Torque Timeout]	SrF	Torque timeout
[Internal Error 12]	InFc	Internal error 12 (internal current supply)

1 This feature is not supported by the current firmware version

Setting	Code / Value	Description
[Encoder]	EnF	Encoder
[Input Contactor]	LCF	Line contactor failure
[Internal Error 6]	inF6	Unknown or incompatible option module
[Internal Error 14]	inFE	CPU error (ram, flash, task ...)
[Braking Resistor ovld]	boF	Braking resistor overload
[AI3 4-20 mA Loss]	LFF3	AI3 4-20 mA loss
[AI4 4-20 mA Loss]	LFF4	AI4 4-20 mA loss
[Boards Compatibility]	HCF	Hardware configuration error
[Dynamic Load Error]	dLF	Dynamic load detected error
[Conf Transfer Error]	CF i2	Configuration transfer error
[AI5 4-20 mA Loss]	LFF5	AI5 4-20 mA loss
[Channel Switch Error]	C5F	Channel switching error
[Process Underload]	uLF	Torque underload error
[Process Overload]	oLC	Torque overload error
[Angle Error]	A5F	Angle Setting error
[AI1 4-20 mA loss]	LFF1	AI1 4-20 mA loss
[AI3 Th Detected Error]	tH3F	AI3 thermal sensor detected error
[AI3 Thermal Sensor Error]	t3CF	Thermal sensor error on AI3
[PumpCycle Start Error]	PCPF	Pumpcycle detected error
[AI4 Th Detected Error]	tH4F	AI4 thermal sensor detected error
[AI4 Thermal Sensor Error]	t4CF	Thermal sensor error on AI4
[AI5 Th Detected Error]	tH5F	AI5 thermal sensor detected error
[AI5 Thermal Sensor Error]	t5CF	Thermal sensor error on AI5
[PID FeedBack Error]	PFnF	PID feedBack detected error
[Program Loading Error]	PGLF	Program loading detected error
[Program Running Error]	PGrF	Program running detected error
[Internal Error 16]	inFG	Internal error 16
[Internal Error 17]	inFH	Internal error 17
[Internal Error 0]	inF0	Internal error 0 (IPC)
[Internal Error 13]	inFd	Internal error 13 (different current)
[Motor Stall Error]	StF	Motor stall detected error
[Internal Error 21]	inFL	Internal error 21 (RTC)
[Internal Error 15]	inFF	Internal error 15 (flash)
[Firmware Update Error]	FWEr	Firmware Update Error
[Internal Error 25]	inFP	Internal error 25
[Internal Error 20]	inFK	Internal error 20
[Internal Error 19]	inFJ	Internal error 19 (encoder module)
[Internal Error 27]	inFr	Internal error 27
[Pre-settings Transfer Error]	cF i3	Pre-settings Transfer Error
[Drive Overload]	tLoF	Drive overload
[Multidrive Link Error] (1)	d2dF	Multidrive link error
[AI3 Th Detected Error]	tH IF	AI3 thermal sensor detected error
[AI3 Thermal Sensor Error]	t ICF	Thermal sensor error on AI3
[M/S Device Error] (1)	nSdF	Master/Slave device error
[Encoder Th Detected Error]	tHEF	Encoder thermal sensor detected error
[Encoder Th Sensor Error]	tECF	Encoder thermal sensor error on AI3
[Empty Configuration Error]	cF i4	Empty configuration error
[Internal Error 30]	inFW	Internal error 30 (firmware update)
1 This feature is not supported by the current firmware version		

[Identification Error] inF6 ★

Identification Error (inF6).

This parameter can be accessed if **[Last Error]** LFt is **[Identification Error]** inF6.

Setting	Description
0...12 (value in Hex.)	Value = 0x00 : No error detected Value = 0x01 : No response of the option module Value = 0x02 : Signature reception timeout Value = 0x03 : ACK reception timeout Value = 0x04 : Signature length Value = 0x05 : CheckSum Value = 0x06 : Unknown state Value = 0x07 : UART receive Value = 0x08 : Unknown protocol version Value = 0x09 : Unknown module type Value = 0x0A : More than 5 unsuccessful tries Value = 0x0B : Unknown module type Value = 0x0C : Option module not supported by the slot Value = 0x0D : Same option module in more than one slot Value = 0x0E : O1SV not received Value = 0x0F : O1SV option module software version not compatible Value = 0x10 : reserved Value = 0x11 : reserved Value = 0x12 : Control terminal module not present or not recognized **Factory setting**: –

[Internal Error 19] inFJ ★

Encoder module error code.

This parameter can be accessed if **[Last Error]** LFt is **[Internal Error 19]** inFJ.

Setting	Description
0...65,535	Setting Range **Factory setting**: –

[Encoder Fdbck Error] EnCE ★

Encoder feedback error code.

This parameter can be accessed if **[Last Error]** LFt is **[Encoder Feedback Loss]** SPF.

Setting	Description
0...65,535	Setting range Encoder error Id 1: Encoder power supply overcurrent 10: AB encoder: A-line disconnected 11: AB encoder: B-line disconnected 12: AB encoder: tracking error 13: AB encoder: spike error 50: Endat: communication error 51: Endat: encoder not connected 52...56: Endat: error reading EnDat21 paramameter 57: Endat: encoder does not support EnDat22 58: Endat: runtime compensation procedure 59: Endat: runtime compensation procedure 60: Endat: error in cyclic communication **Factory setting**: –

Setting	Description
0...65,535	

[Nb Of Start] nSt

Number of motor starts (resettable).

Setting	Description
0...4,294,967,295	Setting range **Factory setting**: 0

[Motor Run Time] rtH

Motor run time.

Run elapsed time display (resettable) in seconds (length of time the motor has been switched on).

Setting	Description
0...4,294,967,295 s	Setting range **Factory setting**: _

[Service message] SEr - Menu

Access

[Diagnostics] ➡ [Diag. data] ➡ [Service message]

About This Menu

This menu presents the service messages.

This is a user-defined service message configured in **[My preferences]** MYP **➡ [Customization]** CuS **➡ [Service messages]** SEr.

[Other State] SSt - Menu

Access

[Diagnostics] ➡ [Diag. data] ➡ [Other State]

About This Menu

List of secondary states.

List

[Sleep Active] SLn
[Sleep Boost active] SLPb
[Set 1 active] CFP 1
[Set 2 active] CFP2
[Set 3 active] CFP3
[PID Active] Auto
[DC Bus Charged] dbL
[Fast stop Active] FSt
[Fallback Frequency] FrF
[Speed Maintained] rLS
[Type of stop] Stt
[Encoder Config] iCC
[In braking] brS
[Frequency ref. att.] SrA
[Forward] nFrd
[Reverse] nrrS
[In motor fluxing] FLX
[Autotuning] tun

[Diagnostics] dAu - Menu

Access

[Diagnostics] ➡ [Diag. data] ➡ [Diagnostics]

About This Menu

This menu allows to make simple test sequences for diagnostics.

[FAN Diagnostics] Fnt

Diagnostics of internal fan(s).

This will start a test sequence.

[HMI LED Diagnostics] HLt

Diagnostics of product LED(s).

This will start a test sequence.

[IGBT Diag w motor] iWt

Diagnostics of product IGBT(s).

This will start a test sequence with the connected motor (open circuit/short-circuit).

[IGBT Diag w/o motor] iWot

Diagnostics of product IGBT(s).

This will start a test sequence without the motor (short-circuit).

[Identification] o id - Menu

Access

[Diagnostics] ➡ [Diag. data] ➡ [Identification]

About This Menu

This is a read-only menu that cannot be configured. It enables the following information to be displayed:

- Drive reference, power rating, and voltage
- Drive software version
- Drive serial number
- Type of option modules present, with their software version
- Graphic Display Terminal type and version

Section 6.2
[Error history]

[Error history] PFH - Menu

Access

[Diagnostics] ➡ **[Error history]**

About This Menu

This menu shows the 15 last detected errors (dP1 to dPF).

Pressing OK key on the selected error code in the Error history list displays the drive data recorded when the error has been detected.

NOTE: Same content for **[Last Error 1]** dP1 to **[Last Error F]** dPF.

[Last Error 1] dP1

Last error 1.

Identical to **[Last Error]** LFt *(see page 67)*.

[Drive State] HS1

HMI status.

Identical to **[Drive State]** HM1S *(see page 56)*.

[Last Error 1 Status] EP1

Status of last error 1.

DRIVECOM status register (same as **[ETA state word]** EtA).

[ETI state word] 1P1

ETI state word.

ETI status register (see the communication parameter file).

[Cmd word] CMP1

Cmd word.

Command register (same as **[Cmd word]** CMd).

[Motor current] LCP1

Motor current (same as **[Motor Current]** LCr).

Setting	Description
-3,276.7...3,276.7 A	Setting range **Factory setting**: _

[Output frequency] rFP1

Output frequency (same as **[Output frequency]** rFr).

Setting	Description
-3,276.7...3,276.7 Hz	Setting range **Factory setting**: _

[Elapsed Time] rtPI

Elapsed time.

Setting	Description
0...65,535 h	Setting range **Factory setting**: _

[DC bus voltage] ULPI

DC bus voltage (same as **[Mains Voltage]** ULn).

Setting	Description
1.0...860.0 Vac	Setting range: **[No meas.]** ---- is displayed if no value is measured. **Factory setting**: _

[Motor therm state] tHPI

Motor thermal state (same as **[Motor Therm state]** tHr).

Setting	Description
0...65,535%	Setting range **Factory setting**: _

[Command Channel] dCCI

Command channel (same as **[Command channel]** CMdC).

Setting	Code / Value	Description
[Terminals]	tErM	Terminal block
[HMI]	HMI	Graphic Display Terminal
[Modbus]	Mdb	Modbus serial
[CANopen]	CAn	CANopen
[Com. Module]	nEt	Fieldbus module
[Ethernet Module]	Eth	Embedded Ethernet
[PC TOOL]	PWS	DTM based commissioning software

[Ref Freq Channel] drCI

Channel for reference frequency (same as **[Ref Freq Channel]** rFCC).

Identical to **[Command channel]** dCCI *(see page 76)*.

[Motor Torque] otPI

Estimated motor torque value (same as **[Motor Torque]** otr).

Setting	Description
-3,276.7...3,276.7%	Setting range **Factory setting**: _

[Drive Thermal State] tdPI

Measured drive thermal state (same as **[Drive Therm State]** tHd).

Setting	Description
0...355%	Setting range **Factory setting**: _

[IGBT Junction Temp] tJP1

Estimated junction temperature value.

Setting	Description
0...255°C	Setting range **Factory setting**: _

[Switching Frequency] SFP1

Switching frequency applied (related to **[Switching Frequency]** SFr).

Setting	Description
0...65,535 Hz	Setting range **Factory setting**: _

[Last Error 2] dP2 to [Last Error F] dPF

Last error 2... Last error F

Identical to **[Last Error1]** dP1 *(see page 75)*.

Section 6.3
[Warnings]

What Is in This Section?

This section contains the following topics:

[Actual warnings] ALrd - Menu

Access

[Diagnostics] ➡ [Warnings] ➡ [Actual warnings]

About This Menu

List of current warnings.

If a warning is active, ✓ and ❗ appears on the Graphic Display Terminal.

List of Available Warnings

Identical to **[Last warning] LALr** *(see page 65)*.

[Warning group 1 definition] A 1C - Menu

Access

[Diagnostics] ➡ [Warnings] ➡ [Warning group 1 definition]

About This Menu

The following submenus group the warnings into 1 to 5 groups, each of which can be assigned to a relay or a digital output for remote signaling.

When one or a number of warnings selected in a group occurs, this warning group is activated.

List of Warnings

Identical to **[Last warning]** LALr *(see page 65)*.

[Warning group 2 definition] A2C - Menu

Access

[Diagnostics] ➡ [Warnings] ➡ [Warning group 2 definition]

About This Menu

Identical to **[Warning group 1 definition]** A1C *(see page 80)*

[Warning group 3 definition] A3C - Menu

Access

[Diagnostics] ➡ [Warnings] ➡ [Warning group 3 definition]

About This Menu

Identical to **[Warning group 1 definition]** A1C *(see page 80)*

[Warning group 4 definition] A4C - Menu

Access

[Diagnostics] ➡ [Warnings] ➡ [Warning group 4 definition]

About This Menu

Identical to **[Warning group 1 definition]** A1C *(see page 80)*

[Warning group 5 definition] A5C - Menu

Access

[Diagnostics] ➡ [Warnings] ➡ [Warning group 5 definition]

About This Menu

Identical to **[Warning group 1 definition]** A1C *(see page 80)*

[Warnings] AL r - Menu

Access

[Diagnostics] ➡ [Warnings]

About This Menu

This menu presents the warning history (30 past warnings).

[Warning History] AL H

Identical to **[Last warning]** L AL r *(see page 65)*.

Chapter 7
[Display] Mon -

Introduction

 **[Display]** Mon - menu shows monitoring data related to the drive and the application.

It offers an application-oriented display in terms of energy, cost, cycle, efficiency, ...

This is available with customized units and graphics view.

What Is in This Chapter?

This chapter contains the following sections:

Section 7.1
[Energy parameters]

What Is in This Section?

This section contains the following topics:

[Elec Ener Input Counter] E L , - Menu

Access

[Display] ➡ [Energy parameters] ➡ [Elec Ener Input Counter]

About This Menu

This menu presents the input electrical energy data.

[Active Input Power] , P r W

Active electrical input power estimation.

Setting	Description
According to the drive rating	Setting range in kW if **[Motor Standard]** b F r is set to **[50Hz IEC]** 5 0 or in HP if **[Motor Standard]** b F r is set to **[60Hz NEMA]** 6 0 **Factory setting**: _

[Real Input Energy(TWh)] , E 4 ★

Input electrical power consumed (TWh).

This parameter can be accessed if **[Real Input Energy(TWh)]** , E 4 is not set to 0.

Setting	Description
-999...999 TWh	Setting range **Factory setting**: _

[Real Input Energy(GWh)] , E 3 ★

Input electrical power consumed (GWh).

Setting	Description
-999...999 GWh	Setting range **Factory setting**: _

[Real Input Energy(MWh)] , E 2 ★

Input electrical power consumed (MWh).

Setting	Description
-999...999 MWh	Setting range **Factory setting**: _

[Real Input Energy(kWh)] , E 1 ★

Input electrical power consumed (kWh).

Setting	Description
-999...999 kWh	Setting range **Factory setting**: _

[Real Input Energy(Wh)] , E 0 ★

Input electrical power consumed (Wh).

Setting	Description
-999...999 Wh	Setting range **Factory setting**: _

[Elec Ener Output Counter] E L o - Menu

Access

[Display] ➡ [Energy parameters] ➡ [Elec Ener Output Counter]

About This Menu

This menu presents the output electrical energy data.

[Acv Elc out pwr estm] E P r W

Active electrical output power estimation.

Setting	Description
According to the drive rating	Setting range in kW if **[Motor Standard]** b F r is set to **[50Hz IEC]** 5 0 or in HP if **[Motor Standard]** b F r is set to **[60Hz NEMA]** 6 0 **Factory setting**: _

[Real Consumption(TWh)] o E 4 ★

Electrical energy consumed (TWh).

This parameter can be accessed if **[Real Consumption(TWh)]** o E 4 is not set to 0.

Setting	Description
-999...999 TWh	Setting range **Factory setting**: _

[Real Consumption(GWh)] o E 3

Electrical energy consumed (GWh).

Setting	Description
-999...999 GWh	Setting range **Factory setting**: _

[Real Consumption(MWh)] o E 2

Electrical energy consumed (MWh).

Setting	Description
-999...999 MWh	Setting range **Factory setting**: _

[Real Consumption(kWh)] o E 1

Electrical energy consumed (kWh).

Setting	Description
-999...999 kWh	Setting range **Factory setting**: _

[Real Consumption(Wh)] o E 0

Electrical energy consumed (Wh).

Setting	Description
-999...999 Wh	Setting range **Factory setting**: _

[Elc Egy Today] oCt

Electrical energy consumed today by the motor (kWh).

Setting	Description
0...4,294,967,295 kWh	Setting range **Factory setting**: _

[Elc Egy Yesterday] oCY

Electrical energy consumed yesterday by the motor (kWh).

Setting	Description
0...4,294,967,295 kWh	Setting range **Factory setting**: _

[Over-Consumption Thd] PCAH

Power level for over-consumption.

Setting	Description
[Under-Consumption Thd] PCAL ...200.0%	Setting range **Factory setting**: 0.0%

[Under-Consumption Thd] PCAL

Power level for under-consumption.

Maximum value = PCAH if PCAH ≤ 100%.

Setting	Description
0.0...100.0% or **[Over-Consumption Thd]** PCAH if PCAH ≤ 100%	Setting range **Factory setting**: 0.0%

[Over/Under-Cons Delay] PCAt

Over/under-consumption detection time.

Setting	Description
0...60 min	Setting range **Factory setting**: 1 min

[Peak Output Power] MoEP

Peak output power.

Setting	Description
According to the drive rating	Setting range **Factory setting**: _

[Mechanical energy] nEC - Menu

Access

[Display] ➡ [Energy parameters] ➡ [Mechanical energy]

About This Menu

This menu presents the output mechanical energy data.

[Power Estim Value] oPrW

Motor mechanical power estimation.

Setting	Description
According to the drive rating	Setting range in kW if **[Motor Standard]** bFr is set to **[50Hz IEC]** 50 or in HP if **[Motor Standard]** bFr is set to **[60Hz NEMA]** 60 **Factory setting**: _

[Motor Consumption(TWh)] nEH ★

Energy consumption (TWh).

This parameter can be accessed if **[Motor Consumption(TWh)]** nEH is not set to 0.

Setting	Description
0...999 TWh	Setting range **Factory setting**: _

[Motor Consumption(GWh)] nE3 ★

Energy consumption (GWh).

Setting	Description
0...999 GWh	Setting range **Factory setting**: _

[Motor Consumption(MWh)] nE2 ★

Energy consumption (MWh).

Setting	Description
0...999 MWh	Setting range **Factory setting**: _

[Motor Consumption(kWh)] nE 1 ★

Energy consumption (kWh).

Setting	Description
0...999 kWh	Setting range **Factory setting**: _

[Motor Consumption (Wh)] nE0 ★

Energy consumption (Wh).

Setting	Description
0...999 Wh	Setting range **Factory setting**: _

[Energy saving] E S A - Menu

Access

[Display] ➡ [Energy parameters] ➡ [Energy saving]

About This Menu

This menu presents the comparison in term of cost, energy, CO^2 between solutions with and without drive.

[Reference Power] P r E F

Reference electrical power for a solution without drive.

Setting	Description
0.00...655.35 kW	Setting range in kW if **[Motor Standard]** b F r is set to **[50Hz IEC]** 5 0 or in HP if **[Motor Standard]** b F r is set to **[60Hz NEMA]** 6 0. **Factory setting**: 0.00 kW

[kWh Cost] E C 5 t

Cost of the kWh.

Setting	Description
0.00...655.35 $	Setting range in € if **[Motor Standard]** b F r is set to [50 Hz IEC] (50) or in $ if **[Motor Standard]** b F r is set to **[60Hz NEMA]** 6 0. **Factory setting**: _

[CO2 Ratio] E C o 2

Quantity of CO^2 by kWh.

Setting	Description
0.000...65.535 kg/kWh	Setting range **Factory setting**: 0.000 kg/kWh

[Energy Saved] E S A V

Energy saved with the drive solution.

Setting	Description
0...4,294,967,295 kWh	Setting range **Factory setting**: _

[Money Saved] C A S H

Cost saved with the drive solution.

Setting	Description
0.00...42,949,672 $	Setting range in € if **[Motor Standard]** b F r is set to **[50 Hz IEC]** 5 0 or in $ if **[Motor Standard]** b F r is set to **[60 Hz NEMA]** 6 0. **Factory setting**: _

[Co2 Saved] C o 2 S

CO^2 saved with the drive solution.

Setting	Description
0.0...429,496,729.5 t	Setting range **Factory setting**: _

Section 7.2
[Application parameters]

[Application parameters] APr - Menu

Access

[Display] ➡ [Application parameters]

About This Menu

This menu displays information related to the application.

[Application State] APPS

Application state.

Setting	Code / Value	Description
[Running]	run	No application function in progress; the drive is running
[Stop]	StoP	No application function in progress; the drive is not running
[Local Mode Active]	LoCAL	Forced local mode activated
[Channel 2 Active]	oVEr	Override speed control mode activated
[Manual Mode Active]	MAnu	Motor running; manual PID mode is active
[PID Active]	Auto	Motor running; auto PID mode is active
[Boost In progress]	boo St	The boost is in progress
[Sleep Active]	SLEEP	The sleep is active

Section 7.3
[Pump parameters]

[Variable speed pump] ΠPP - Menu

Access

[Display] ➡ [Pump parameters] ➡ [Variable speed pump]

About This Menu

This menu shows the pump-related parameters.

[Motor Run Time] rtH

Motor run time.

Run elapsed time display (resettable) in seconds (length of time the motor has been switched on).

Setting	Description
0...4,294,967,295 s	Setting range **Factory setting**: _

[Motor Mechanical speed] SPdΠ

Motor mechanical speed.

Setting	Description
[Undefined] Und...32,767 rpm	Setting range **Factory setting**: _

[Nb Of Start] nSΠ

Number of motor starts (resettable).

Setting	Description
0...4,294,967,295	Setting range **Factory setting**: _

[Acv Elc out pwr estm] EPrW

Active electrical output power estimation.

Setting	Description
-327.67...327.67 kW	Setting range in kW if **[Motor Standard]** bFr is set to **[50 Hz IEC]** 50 or in HP if **[Motor Standard]** bFr is set to **[60 Hz NEMA]** 60 **Factory setting**: _

Section 7.4
[M/S parameters]

About this Menu

This menu can be accessed if **[M/S Comm Mode]** MSCM is not set to **[No]** no.

NOTE: This feature is not supported by the current firmware version.

What Is in This Section?

This section contains the following topics:

[M/S Local Display] MSo - Menu

Access

[Display] ➡ [M/S parameters] ➡ [M/S Local Display]

About This Menu

This menu present the master slave local display related parameters.

[M/S Device Status] MSS

M/S function status at device level.

Setting	Code / Value	Description
[None]	nonE	Not configured
[M/S Not Ready]	nrdY	M/S not ready
[M/S Ready]	rEAdY	M/S ready
[M/S Running]	run	M/S running
[M/S Warning]	ALArn	M/S warning
[M/S Error]	FAuLt	M/S error

[M/S Master Speed Ref] MSMS

M/S master speed reference.

Setting	Description
-599.0...599.0 Hz	Setting range **Factory setting**: _

[M/S Master Torque Ref] MSMt

M/S master torque reference.

Setting	Description
-32,767...32,767 Nm	Setting range **Factory setting**: _

[M/S Local Speed Ref] MSSr

M/S Local speed reference. This parameter can be accessed if **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE.

Setting	Description
-599.0...599 Hz	Setting range **Factory setting**: _

[M/S Local Torque Reference] MStr

M/S Local torque reference. This parameter can be accessed if **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE.

Setting	Description
-32,767...32,767 Nm	Setting range **Factory setting**: _

[M/S System Display] nSr - Menu

Access

[Display] ➡ **[M/S parameters]** ➡ **[M/S System Display]**

About This Menu

This menu present the master slave system related parameters.

This menu can be accessed if **[M/S Comm Mode]** nSCn is set to **[MultiDrive Link]** d2d.

[M/S Out Speed Reference] nSSr

M/S output speed reference. This parameter can be accessed if **[M/S Device ID]** nS id is set to **[Slave 1]** to **[Slave 10]**.

Setting	Description
-599.0...599 Hz	Setting range **Factory setting**: _

[M/S Out Torque Reference] nStr

M/S output torque reference. This parameter can be accessed if **[M/S Device ID]** nS id is set to **[Slave 1]** to **[Slave 10]**.

Setting	Description
-32,767...32,767 Nm	Setting range **Factory setting**: _

[M/S Device Selection] nSdn

M/S device selection.

Setting	Code / Value	Description
[Master]	nSter	Master **Factory setting**
[Slave 1]	SLV 1	Slave 1
[Slave 2]	SLV2	Slave 2
[Slave 3]	SLV3	Slave 3
[Slave 4]	SLV4	Slave 4
[Slave 5]	SLV5	Slave 5
[Slave 6]	SLV6	Slave 6
[Slave 7]	SLV7	Slave 7
[Slave 8]	SLV8	Slave 8
[Slave 9]	SLV9	Slave 9
[Slave 10]	SLV 10	Slave 10

[M/S Device Status] nSdS

M/S device status.

Setting	Code / Value	Description
[None]	nonE	Not configured
[M/S Not Ready]	nrdY	M/S not ready
[M/S Ready]	rEAdY	M/S ready
[M/S Running]	run	M/S running
[M/S Warning]	ALArn	M/S warning
[Error]	FAuLt	Error

[M/S Device Speed Ref] MSXS

M/S device speed reference.

Setting	Description
-599.0...599 Hz	Setting range **Factory setting**: _

[M/S Device Torque Ref] MSXt

M/S device speed reference.

Setting	Description
-32,767...32,767 Nm	Setting range **Factory setting**: _

Section 7.5
[Motor parameters]

[Motor parameters] MMo - Menu

Access

[Display] ➡ **[Motor parameters]**

About This Menu

This menu shows the motor-related parameters.

[Motor Speed] SPd

Motor speed.

Setting	Description
0...65,535 rpm	Setting range **Factory setting**:–

[Motor Mechanical speed] SPdM

Motor mechanical speed.

Setting	Description
[Undefined] Und...32,765 rpm	Setting range **Factory setting**:–

[Motor Voltage] UoP

Motor voltage.

Setting	Description
0...65,535 V	Setting range **Factory setting**:–

[Motor Power] oPr

Motor power.

Output power in % (100% = nominal motor power).

Setting	Description
-300...300%	Setting range **Factory setting**: –

[Nom Motor Torque] tqn

Computed nominal motor torque in Nm (+/- 2%).

Setting	Description
0.01...655.35 Nm Depend of the drive rating	Setting range **Factory setting**: ● 4.99 Nm if power product is below than 15 kW ● 49.9 Nm if power product is between 15 kW and 160 kW

[Motor Torque] ₒ t r

Motor torque.

Output torque value (100% = nominal motor torque).

Setting	Description
-300.0... 300.0	Setting range **Factory setting**: –

[Motor Torque (Nm)] ₒ t 9 n

Motor torque (Nm).

Output torque value.

Setting	Description
-32,767 Nm...32,767 Nm	Setting range: according to drive ratings **Factory setting**: –

[Motor Current] L C r

Motor current.

Setting	Description
0.00...655.35 A	Setting range **Factory setting**: –

[Motor Therm state] t H r

Motor thermal state.

The normal motor thermal state is 100%, the **[Motor Overload]** ₒ L F is set to 118%.

Setting	Description
0...200%	Setting range **Factory setting**: –

Section 7.6
[Drive parameters]

[Drive parameters] MP i - Menu

Access

[Display] ➡ **[Drive parameters]**

About This Menu

This menu shows the drive-related parameters.

[Image Input AIV1] AIV1

Virtual analog input value.

This parameter is read-only. It enables to display the speed reference applied to the motor via the fieldbus channel.

Setting	Description
-8,192...8,192	Setting range **Factory setting**: –

[Pre-Ramp Ref Freq] FrH

Frequency reference before ramp.

This parameter is read-only. It enables to display the speed reference applied to the motor, regardless of which reference channel has been selected.

Setting	Description
-599.0...599.0 Hz	Setting range **Factory setting**: 0 Hz

[Ref Frequency] LFr

Reference frequency.

This parameter only appears if the function has been enabled. It is used to change the speed reference from the remote control. OK does not have to be pressed to enable a change of reference.

Setting	Description
-599.0...599.0 Hz	Setting range **Factory setting**: –

[Torque reference] trr

Torque reference.

This parameter can be accessed if:
- **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE, **and**
- **[M/S Control Type]** MSCt is set to:
  - **[Torque Direct]** trFd, or
  - **[Torque Reverse]** trFr, or
  - **[Torque Custom]** trFC.

NOTE: This feature is not supported by the current firmware version.

Setting	Description
-32,767...32,767	Setting range **Factory setting**: –

[Stator Frequency] SFY

Stator frequency.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr

Setting	Description
[No Freq Applied] nO...599.0 Hz	Setting range **Factory setting**: –

[Rotor Frequency] rFY

Rotor frequency.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr

Setting	Description
[No Freq Applied] nO...599.0 Hz	Setting range **Factory setting**: –

[Measured output fr.] MMF

Measured output frequency.

This parameter can be accessed only if the encoder module has been inserted, and the available selections will depend on the type of encoder module used.

Setting	Description
-778.7...778.7 Hz	Setting range **Factory setting**: –

[Motor Frequency] rFr

Motor frequency.

Setting	Description
-3,276.7...3,276.7 Hz	Setting range **Factory setting**: 0.0 Hz

[Multiplying Coeff.] MFr ★

Multiplying coefficient.

This parameter can be accessed if **[Ref Freq - Multiply]** MA2,MA3 has been assigned.

Setting	Description
0...100%	Setting range **Factory setting**: –

[Measured Freq] FqS ★

Pulse input measured frequency.

This parameter can be accessed if **[Frequency meter]** FqF is not set to **[Not Configured]** nO.

Setting	Description
0...30 KHz	Setting range **Factory setting**: –

[Mains Voltage] uLn

Mains voltage based on AC bus measurement, motor running or stopped.

Setting	Description
1.0...860.0 Vac	Setting range: **[no meas.]** ---- is displayed if no value is measured. **Factory setting**: –

[Mains Voltage phase 1-2] uL1

Mains voltage phase 1-2 rms.

Setting	Description
-3,276.7...3,276.7 Vac	Setting range **Factory setting**: –

[Mains Voltage phase 2-3] uL2

Mains voltage phase 2-3 rms

Setting	Description
-3,276.7...3,276.7 Vac	Setting range **Factory setting**: –

[Mains Voltage phase 3-1] uL3

Mains voltage phase 3-1 rms

Setting	Description
-3,276.7...3,276.7 Vac	Setting range **Factory setting**: –

[DC Bus Voltage] Vbus

DC bus voltage.

Setting	Description
0...65,535 Vdc	Setting range **Factory setting**: –

[Drive Therm State] tHd

Drive thermal state.

The normal drive thermal state is 100%, the **[Motor Overload]** oLF is set to 118%.

Setting	Description
0...200%	Setting range **Factory setting**: –

[Used Param. Set] CFPS ★

Used parameter set.

Configuration parameter status (can be accessed if parameter switching function has been enabled).

Setting	Code / Value	Description
[None]	no	Not assigned
[Set N°1]	CFP1	Parameter set 1 active
[Set N°2]	CFP2	Parameter set 2 active
[Set N°3]	CFP3	Parameter set 3 active

[Config. active] CnF5

Active configuration.

Setting	Code / Value	Description
[In progress]	no	Transitory state
[Config. No.0]	CnF0	Configuration 0 active
[Config. No.1]	CnF1	Configuration 1 active
[Config. No.2]	CnF2	Configuration 2 active
[Config 3 active]	CnF3	Configuration 3 active

Section 7.7
[Thermal monitoring]

[Thermal Monitoring] tPM- Menu

Access

[Display] ➡ **[Thermal Monitoring]**

About This Menu

The content of this menu can be accessed if the thermal monitoring function has been activated.

Wiring

Refer to the wiring *(see page 181)* of the **[Thermal monitoring]** tPP- menu.

[AI1 Th Value] tHI1 ★

AI1 thermal value.

Setting	Description
-15...200°C	Setting range **Factory setting: –**

[AI3 Th Value] tHI3 ★

AI3 thermal value.

Identical to **[AI1 Th Value]** tHI1.

[AI4 Th Value] tHI4 ★

AI4 thermal value.

Identical to **[AI1 Th Value]** tHI1.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[AI5 Th Value] tHI5 ★

AI5 thermal value.

Identical to **[AI1 Th Value]** tHI1.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[Enc Th Value] tHEN

Encoder thermal sensor value

Setting	Description
-15...200°C	Setting range **Factory setting: –**

Section 7.8
[PID display]

[PID display] P iC - Menu

Access

[Display] ➡ **[PID display]**

About This Menu

NOTE: This function cannot be used with some other functions.

Following parameters can be accessed if **[PID feedback]** P iF is not set to **[Not Configured]** no.

[Internal PID ref] rP i ★

Internal PID reference.

Setting	Description
0...32,767	Setting range **Factory setting**: 150

[PID Reference] rPC ★

PID setpoint value.

Setting	Description
0...65,535	Setting range **Factory setting**: 0

[PID feedback] rPF ★

PID feedback value.

Setting	Description
0...65,535	Setting range **Factory setting**: 0

[PID Error] rPE ★

PID error value.

Setting	Description
-32,767...32,767	Setting range **Factory setting: –**

[PID Output] rPo ★

PID output value.

Setting	Description
[PID Min Output] PoL ...**[PID Max Output]** Poh	Setting range **Factory setting**: _

Section 7.9
[Counter management]

[Counter Management] E L t - Menu

Access

[Display] ➡ **[Counter Management]**

About This Menu

This menu shows the drive and motor-related counters.

[Motor Run Time] r t H

Motor run time.

Run elapsed time display (resettable) in seconds (length of time the motor has been switched on).

Setting	Description
0...4,294,967,295 s	Setting range **Factory setting**: _

[Power-on Time] P t H

Power-on time (resettable) or counter can be set to 0 by using the **[Time Counter Reset]** r P r parameter.

Setting	Description
0...4,294,967,295 s	Setting range **Factory setting**: _

[Fan Operation Time] F P b t

Fan operation time.

As soon as **[Fan Operation Time]** F P b t reach the predefined value of 45,000 hours, a warning **[Fan Counter Warning]** F C t A is triggered.

[Fan Operation Time] F P b t counter can be set to 0 by using the **[Time Counter Reset]** r P r parameter.

Setting	Description
0...500,000 h	Setting range **Factory setting**: _

[Nb Of Start] n S n

Number of motor starts (resettable) or counter can be set to 0 by using the **[Time Counter Reset]** r P r parameter.

Setting	Description
0...4,294,967,295	Setting range **Factory setting**: _

[Time Counter Reset] rPr

Time counter reset.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[Run Time Reset]	rtH	Run time reset
[Power ON Time Reset]	PtH	Power ON time reset
[Reset Fan Counter]	FtH	Reset fan counter
[Clear NSM]	nSM	Clear number of motor starts

Section 7.10
[Other state]

[Other state] SSt - Menu

Access

[Display] ➡ [Other state]

About This Menu

List of secondary states.

List

[Sleep Active] SLn
[Sleep Boost active] SLPb
[Set 1 active] CFP 1
[Set 2 active] CFP2
[Set 3 active] CFP3
[Automatic restart] Autо
[DC Bus Charged] dbL
[Fast stop Active] FSt
[Fallback Frequency] FrF
[Speed Maintained] rLS
[Type of stop] Stt
[Encoder Config] ,CC
[In braking] brS
[Ref Freq Warning] SrA
[Forward] nFrd
[Reverse] nrrS
[In motor fluxing] FLX
[Autotuning] tun

Section 7.11
[I/O map]

What Is in This Section?

This section contains the following topics:

[Digital Input Map] L iA - Menu

Access

[Display] ➡ [I/O map] ➡ [Digital Input Map]

About This Menu

This menu presents the state and assignment of digital inputs.

Read-only parameters, cannot be configured.

It is used to visualize the state of the digital inputs and Safe Torque Off inputs.

It displays all the functions that are assigned to the digital input in order to verify for multiple assignments.

If no functions have been assigned, **[No]** nO is displayed. Use the touch wheel to scroll through the functions.

[AI1] AI1C - Menu

Access

[Display] ➡ [I/O map] ➡ [Analog inputs image] ➡ [AI1]

[AI1] AI1C

Physical value AI1.

AI1 customer image: value of analog input 1.

Setting	Description
-32,767...32,767	Setting range **Factory setting: –**

NOTE: The parameters **[AI1 Assignment]** AI1A, **[AI1 min value]** UIL1, **[AI1 max value]** UIH1 and **[AI1 filter]** AI1F can be accessed on the Graphic Display Terminal by pressing the **OK** key on the **[AI1]** AI1C parameter.

[AI1 Assignment] AI1A

Analog input AI1 functions assignment.

Read-only parameter, cannot be configured. It displays all the functions associated with input AI1 in order to verify, for example, for compatibility problems.

If no functions have been assigned, **[No]** nO is displayed.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Torque Ref Offset]	tqO	Torque offset source
[Torque Ref Ratio]	tqr	Torque ratio source
[Ref Freq Channel 1]	Fr1	Reference frequency channel 1 **Factory Setting**
[Ref Freq Channel 2]	Fr2	Reference frequency channel 2
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Manual PID Ref.]	PIM	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FPI	PID reference frequency
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Ref Frequency 1B]	Fr1b	Reference frequency 1B
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier
[Torque reference]	tr1	Torque regulation: torque set point 1
[Torque reference 2]	tr2	Torque regulation: torque set point 2
[External Feed Forward]	tEFF	External feed-forward
[M/S Speed Ref In] (1)	MSS1	Master Slave: speed input
[M/S Trq Ref In] (1)	MSt1	Master Slave: torque input
1 This feature is not supported by the current firmware version.		

[AI1 min value] uIL1 ★

AI1 minimum value.

AI1 voltage scaling parameter of 0%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Voltage]** 10U.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 0.0 Vdc

[AI1 max value] uIH1 ★

AI1 maximum value.

AI1 voltage scaling parameter of 100%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Voltage]** 10U.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 10.0 Vdc

[AI1 min. value] CrL1 ★

AI1 minimum value.

AI1 current scaling parameter of 0%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 0.0 mA

[AI1 max. value] CrH1 ★

AI1 maximum value.

AI1 current scaling parameter of 100%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 20.0 mA

[AI1 filter] AI1F

AI1 filter.

Interference filtering.

Setting	Description
0.00...10.00 s	Setting range **Factory setting**: 0.00 s

[AI2] A I2C - Menu

Access

[Display] ➡ **[I/O map]** ➡ **[Analog inputs image]** ➡ **[AI2]**

[AI2] A I2C

Physical value AI2.

AI2 customer image: value of analog input 2.

Identical to **[AI1]** A I IC *(see page 113)*.

[AI2 Assignment] A I2A

Configuration of AI2.

Identical to **[AI1 Assignment]** A I IA *(see page 113)*.

[AI2 min value] U IL2 ★

AI2 minimum value.

AI2 voltage scaling parameter of 0%.

This parameter can be accessed if **[AI2 Type]** A I2E is set to **[Voltage]** I0U.

Identical to **[AI1 min value]** U IL I *(see page 114)*.

[AI2 max value] U IH2 ★

AI2 maximum value.

AI2 voltage scaling parameter of 100%.

This parameter can be accessed if **[AI2 Type]** A I2E is set to **[Voltage]** I0U.

Identical to **[AI1 max value]** U IH I *(see page 114)*.

[AI2 filter] A I2F

AI2 filter.

Interference filtering.

Identical to **[AI1 filter]** A I IF *(see page 114)*.

[AI3] AI3C - Menu

Access

[Display] ➡ **[I/O map]** ➡ **[Analog inputs image]** ➡ **[AI3]**

[AI3] AI3C

Physical value AI3.

AI3 customer image: value of analog input 3.

Identical to **[AI1]** AI1C *(see page 113)*.

[AI3 Assignment] AI3A

Configuration of AI3.

Identical to **[AI1 Assignment]** AI1A *(see page 113)*.

[AI3 min value] uL3 ★

AI3 voltage scaling parameter of 0%.

This parameter can be accessed if **[AI3 Type]** AI3t is set to **[Voltage]** 10u.

Identical to **[AI1 min value]** uL1 *(see page 114)*.

[AI3 max value] uH3 ★

AI3 voltage scaling parameter of 100%.

This parameter can be accessed if **[AI3 Type]** AI3t is set to **[Voltage]** 10u.

Identical to **[AI1 max value]** uH1 *(see page 114)*.

[AI3 min. value] CrL3 ★

Value for low speed AI3.

AI3 current scaling parameter of 0%.

This parameter can be accessed if **[AI3 Type]** AI3t is set to **[Current]** 0A.

Identical to **[AI1 min. value]** CrL1 *(see page 114)*.

[AI3 max. value] CrH3 ★

Value for high-speed AI3.

AI3 current scaling parameter of 100%.

This parameter can be accessed if **[AI3 Type]** AI3t is set to **[Current]** 0A.

Identical to **[AI1 max. value]** CrH1 *(see page 114)*.

[AI3 Filter] AI3F

AI3 filter.

Interference filtering.

Identical to **[AI1 filter]** AI1F *(see page 114)*.

[AI4] AI4C - Menu

Access

[Display] ➡ **[I/O map]** ➡ **[Analog inputs image]** ➡ **[AI4]**

[AI4] AI4C

Physical value AI4.

AI4 customer image: value of analog input 4.

Identical to **[AI1]** AI1C *(see page 113)*.

[AI4 Assignment] AI4A

AI4 functions assignment. If no functions have been assigned, **[No]** no is displayed.

Identical to **[AI1 Assignment]** AI1A *(see page 113)*.

[AI4 min value] uIL4★

AI4 minimum value.

AI4 voltage scaling parameter of 0%.

This parameter can be accessed if **[AI4 Type]** AI4E is set to **[Voltage]** 10u.

Identical to **[AI1 min value]** uIL1 *(see page 114)*.

[AI4 max value] uIH4★

AI4 maximum value.

AI3 voltage scaling parameter of 100%.

This parameter can be accessed if **[AI4 Type]** AI4E is set to **[Voltage]** 10u.

Identical to **[AI1 max value]** uIH1 *(see page 114)*.

[AI4 min. value] CrL4★

AI4 minimum value.

AI4 current scaling parameter of 0%.

This parameter can be accessed if **[AI4 Type]** AI4E is set to **[Current]** 0A.

Identical to **[AI1 min. value]** CrL1 *(see page 114)*.

[AI4 max. value] CrH4★

AI4 maximum value.

AI4 current scaling parameter of 100%.

This parameter can be accessed if **[AI4 Type]** AI4E is set to **[Current]** 0A.

Identical to **[AI1 max. value]** CrH1 *(see page 114)*.

[AI4 filter] AI4F

Interference filtering cut-off time of the low-filter.

Identical to **[AI1 filter]** AI1F *(see page 114)*.

[AI5] AI5C - Menu

Access

[Display] ➡ **[I/O map]** ➡ **[Analog inputs image]** ➡ **[AI5]**

[AI5] AI5C

AI5 customer image: value of analog input 5.

Identical to **[AI1]** AI1C *(see page 113)*.

[AI5 Assignment] AI5A

AI5 functions assignment. If no functions have been assigned, **[No]** no is displayed.

Identical to **[AI1 Assignment]** AI1A *(see page 113)*.

[AI5 min value] uIL5 ★

AI5 voltage scaling parameter of 0%.

This parameter can be accessed if **[AI5 Type]** AI5t is set to **[Voltage]** 10u.

Identical to **[AI1 min value]** uIL1 *(see page 114)*.

[AI5 max value] uIH5 ★

AI3 voltage scaling parameter of 100%.

This parameter can be accessed if **[AI5 Type]** AI5t is set to **[Voltage]** 10u.

Identical to **[AI1 max value]** uIH1 *(see page 114)*.

[AI5 min. value] CrL5 ★

AI5 current scaling parameter of 0%.

This parameter can be accessed if **[AI5 Type]** AI5t is set to **[Current]** 0A.

Identical to **[AI1 min. value]** CrL1 *(see page 114)*.

[AI5 max. value] CrH5 ★

AI5 current scaling parameter of 100%.

This parameter can be accessed if **[AI5 Type]** AI5t is set to **[Current]** 0A.

Identical to **[AI1 max. value]** CrH1 *(see page 114)*.

[AI5 filter] AI5F

Interference filtering cut-off time of the low filter.

Identical to **[AI1 filter]** AI1F *(see page 114)*.

[Digital output map] L o A - Menu

Access

[Display] ➡ [I/O map] ➡ [Digital output map]

About This Menu

DQ assignment.

R1, R2, R3 assignment.

R4, R5, R6 assignment if VW3A3204 relay output option module has been inserted.

DQ11, DQ12 assignment if VW3A3203 I/O extension module has been inserted.

On the Graphic Display Terminal, click the digital output to see the assignment.

Read-only parameters, cannot be configured.

It displays the function which is assigned to a digital output. If no function has been assigned, **[Not assigned]** n o is displayed.

It allows to verify the delay, active state, and holding time set for the digital output. Possible values are identical as those in the configuration menu.

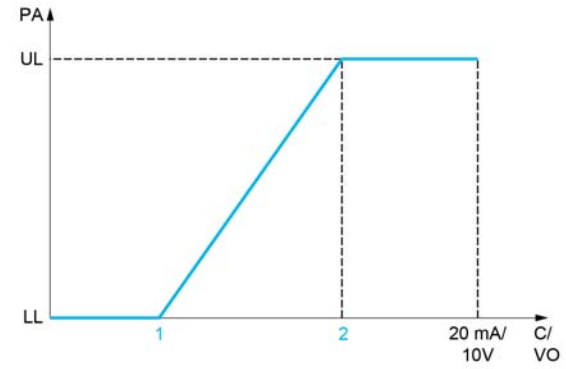
[AQ1] Ao IC - Menu

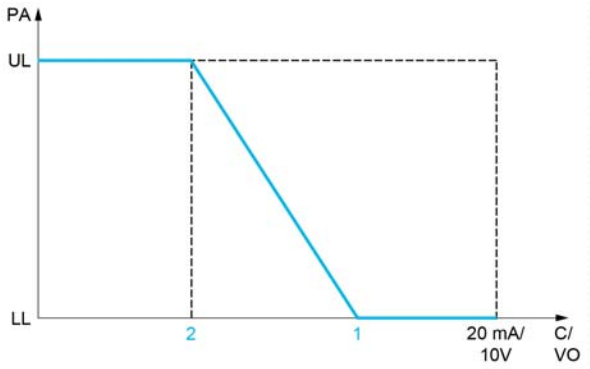
Access

[Display] ➡ [I/O map] ➡ [Analog outputs image] ➡ [AQ1]

Minimum and Maximum Output Values

The minimum output value, in volts, corresponds to the lower limit of the assigned parameter and the maximum value corresponds to its upper limit. The minimum value may be greater than the maximum value.





PA Parameter assigned
C / VO Current or voltage output
UL Upper limit
LL Low limit
1 **[Min Output]** AoLX or uoLX
2 **[Max Output]** AoHX or uoHX

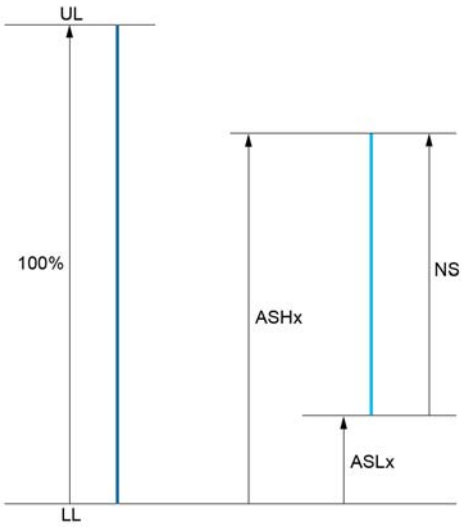
Scaling of the Assigned Parameter

The scale of the assigned parameter can be adapted in accordance with requirements by modifying the values of the lower and upper limits with two parameters for each analogic output.

These parameters are given in %. 100% corresponds to the total variation range of the configured parameter, so: 100% = upper limit - lower limit.

For example, **[Sign. torque]** StQ which varies between –3 and +3 times the rated torque, 100% corresponds to 6 times the rated torque.

- The **[Scaling AQx min]** ASLx parameter modifies the lower limit: new value = lower limit + (range x ASLx). The value 0% (factory setting) does not modify the lower limit.
- The **[Scaling AQx max]** ASHx parameter modifies the upper limit: new value = lower limit + (range x ASLx). The value 100% (factory setting) does not modify the upper limit.
- **[Scaling AQx min]** ASLx must always be lower than **[Scaling AQx max]** ASHx.



UL Upper limit of the assigned parameter
LL Lower limit of the assigned parameter
NS New scale
ASHx Scaling max
ASLx Scaling min

Application Example

The value of the motor current at the AQ1 output is to be transferred with 0...20 mA, range 2 in motor, in motor being the equivalent of a 0.8 In drive.

- The **[Motor Current]** oCr parameter varies from 0 to 2 times the rated drive current.
- **[Scaling AQ1 min]** ASL1 must not modify the lower limit, which therefore remains at its factory setting of 0%.
- **[Scaling AQ1 max]** ASH1 must modify the upper limit by 0.5x the rated motor torque, or 100 - 100/5 = 80% (new value = lower limit + (range x ASH1).

[AQ1] Ao1C

AQ1 customer image: value of analogic output 1.

Setting	Description
-32,767...32,767	Setting range **Factory setting**: _

[AQ1 assignment] AO1

AQ1 assignment.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[Motor Current]	OCr	Current in the motor, from 0 to 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate)
[Motor Frequency]	OFr	Output frequency, from 0 to **[Max Frequency]** tFr **Factory Setting**
[Ramp out.]	OrP	From 0 to **[Max Frequency]** tFr
[Motor torq.]	trq	Motor torque, from 0 to 3 times the rated motor torque
[Sign. torque]	Stq	Signed motor torque, between –3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the – sign to the generator mode (braking).
[sign ramp]	OrS	Signed ramp output, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[PID ref.]	OPS	PID controller reference between **[Min PID reference]** PIP1 and **[Max PID reference]** PIP2
[PID feedbk]	OPF	PID controller feedback between **[Min PID feedback]** PIF1 and **[Max PID feedback]** PIF2
[PID error]	OPE	PID controller detected error between –5% and +5% of **[Max PID feedback]** PIF2 – **[Min PID feedback]** PIF1
[PID output]	OPI	PID controller output between **[Low speed]** LSP and **[High speed]** HSP
[Drive power]	OPr	Motor power, between 0 and 2.5 times **[Nominal Motor Power]** nPr
[Mot thermal]	tHr	Motor thermal state, from 0 to 200% of the rated thermal state
[Drv thermal]	tHd	Drive thermal state, from 0 to 200% of the rated thermal state
[Measured Motor Freq]	OFrr	Measured motor frequency
[Sig. o/p frq.]	OFS	Signed output frequency, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[Mot therm2]	tHr2	Motor thermal 2 state
[Mot therm3]	tHr3	Motor thermal 3 state
[Mot therm4]	tHr4	Motor thermal 4 state
[Unsigned Trq Ref]	utr	Unsigned torque reference
[Signed Trq Ref]	Str	Signed torque reference
[Torque lim.]	tqL	Torque limit
[Motor volt.]	uoP	Voltage applied to the motor, between 0 and **[Nom Motor Voltage]** unS
[M/S Out Speed Reference] (1)	MSSo	Master / slave output speed reference
[M/S Out Torque Reference] (1)	MSto	Master / slave output torque reference
1 This feature is not supported by the current firmware version.		

[AQ1 Min Output] uoL1 ★

AQ1 minimum output.

This parameter can be accessed if **[AQ1 Type]** AO1t is set to **[Voltage]** 10u.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 0.0 Vdc

[AQ1 max Output] uoH I ★

AQ1 maximum output.

This parameter can be accessed if **[AQ1 Type]** Ao It is set to **[Voltage]** 10u.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 10.0 Vdc

[AQ1 min output] AoL I ★

AQ1 minimum output.

This parameter can be accessed if **[AQ1 Type]** Ao It is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 0.0 mA

[AQ1 max output] AoH I ★

AQ1 maximum output.

This parameter can be accessed if **[AQ1 Type]** Ao It is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 20.0 mA

[Scaling AQ2 min] ASL I

Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0...100.0%	Setting range **Factory setting**: 0.0%

[Scaling AQ1 max] ASH I

Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0...100.0%	Setting range **Factory setting**: 100.0%

[AQ1 Filter] Ao IF

Interference filtering.

Setting	Description
0.00...10.00 s	Setting range **Factory setting**: 0.00 s

[AQ2] AO2C - Menu

Access

[Display] ➡ [I/O Map] ➡ [Analog outputs image] ➡ [AQ2]

[AQ2] AO2C

AQ2 customer image: value of analog output 2.

Identical to **[AQ1]** AO1C *(see page 121)*.

[AQ2 Assignment] AO2

AQ2 assignment.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[Motor Current]	OCr	Current in the motor, from 0 to 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate) **Factory Setting**
[Motor Frequency]	OFr	Output frequency, from 0 to **[Max Frequency]** tFr
[Ramp out.]	OrP	From 0 to **[Max Frequency]** tFr
[Motor torq.]	tr9	Motor torque, from 0 to 3 times the rated motor torque
[Sign. torque]	St9	Signed motor torque, between –3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the – sign to the generator mode (braking).
[sign ramp]	Or5	Signed ramp output, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[PID ref.]	OP5	PID controller reference between **[Min PID reference]** P1P1 and **[Max PID reference]** P1P2
[PID feedbk]	OPF	PID controller feedback between **[Min PID feedback]** P1F1 and **[Max PID feedback]** P1F2
[PID error]	OPE	PID controller detected error between –5% and +5% of **[Max PID feedback]** P1F2 – **[Min PID feedback]** P1F1
[PID output]	OP1	PID controller output between **[Low speed]** LSP and **[High speed]** HSP
[Drive power]	OPr	Motor power, between 0 and 2.5 times **[Nominal Motor Power]** nPr
[Mot thermal]	tHr	Motor thermal state, from 0 to 200% of the rated thermal state
[Drv thermal]	tHd	Drive thermal state, from 0 to 200% of the rated thermal state
[Measured Motor Freq]	OFrr	Measured motor frequency
[Sig. o/p frq.]	OFS	Signed output frequency, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[Mot therm2]	tHr2	Motor thermal 2 state
[Mot therm3]	tHr3	Motor thermal 3 state
[Mot therm4]	tHr4	Motor thermal 4 state
[Unsigned Trq Ref]	utr	Unsigned torque reference
[Signed Trq Ref]	Str	Signed torque reference
[Torque lim.]	t9L	Torque limit
[Motor volt.]	uoP	Voltage applied to the motor, between 0 and **[Nom Motor Voltage]** unS
[M/S Out Speed Reference] (1)	MSSo	Master / slave output speed reference
[M/S Out Torque Reference] (1)	MSto	Master / slave output torque reference

1 This feature is not supported by the current firmware version.

[AQ2 Min Output] uoL2 ★

AQ2 minimum output.

This parameter can be accessed if **[AQ2 Type]** Ao2t is set to **[Voltage]** 10u.

Identical to **[AQ1 min Output]** uoL 1 *(see page 122)*.

[AQ2 Max Output] uoH2 ★

AQ2 maximum output.

This parameter can be accessed if **[AQ2 Type]** Ao2t is set to **[Voltage]** 10u.

Identical to **[AQ1 max Output]** uoH 1 *(see page 123)*.

[AQ2 Min Output] AoL2 ★

AQ2 minimum output.

This parameter can be accessed if **[AQ2 Type]** Ao2t is set to **[Current]** 0A.

Identical to **[AQ1 min Output]** uoL 1 *(see page 123)*.

[AQ2 Max Output] AoH2 ★

AQ2 maximum output.

This parameter can be accessed if **[AQ2 Type]** Ao2t is set to **[Current]** 0A.

Identical to **[AQ1 max Output]** uoH 1 *(see page 123)*.

[Scaling AQ2 min] ASL2

Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.

Identical to **[Scaling AQ2 min]** ASL 1 *(see page 123)*.

[Scaling AQ2 max] ASH2

Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.

Identical to **[Scaling AQ1 max]** ASH 1 *(see page 123)*.

[AQ2 Filter] Ao2F

Interference filtering.

Identical to **[AQ1 Filter]** Ao 1F *(see page 123)*.

[DI7 frequency measured] PFC 7 - Menu

Access

[Display] ➡ [I/O map] ➡ [Freq. signal image] ➡ [DI7 frequency measured]

About This Menu

Following parameters can be accessed on the Graphic Display Terminal by pressing the OK key on the **[DI7 Frequency Measured]** PFC 7 parameter.

[DI7 Frequency Measured] PFC 7

Filtered customer pulse input frequency reference.

Setting	Description
0...4,294,967,295	Setting range **Factory setting**: _

[DI7 Pulse Input Assign] PI7A

DI7 pulse input assignment.

It displays all the functions associated with the pulse input in order to verify, for example, for compatibility problems.

If no functions have been assigned, **[No]** no is displayed.

Setting	Code / Value	Description
[No]	no	Not assigned
[Torque Ref Offset]	tqo	Torque offset source
[Torque Ref Ratio]	tqr	Torque ratio source
[Ref Frequency 1]	Fr1	Reference frequency 1
[Ref Frequency 2]	Fr2	Reference frequency 2
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Manual PID Ref.]	PIM	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FPI	PID reference frequency
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Ref Frequency 1B]	Fr1b	Reference frequency 1B
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier
[Torque reference]	tr1	Torque regulation: torque set point 1
[Torque reference 2]	tr2	Torque regulation: torque set point 2
[Frequency Meter]	FqF	Frequency meter function activation
[External Feed Forward]	tEFF	External feed-forward

[DI7 PulseInput Low Freq] PIL 7

Di7 pulse input low frequency.

Pulse input scaling parameter of 0% in Hz x 10 unit.

Setting	Description
0.00...30000.00 Hz	Setting range **Factory setting**: 0 Hz

[DI7 PulseInput High Freq] P ,H 7

Di7 pulse input high frequency.

Pulse input scaling parameter of 100% in Hz x 10 unit.

Setting	Description
0.00...30.00 kHz	Setting range **Factory setting**: 30.00 kHz

[DI7 Frequency Filter] PF ,7

Interference filtering pulse input cut-off time of the low-filter.

Setting	Description
0...1,000 ms	Setting range **Factory setting**: 0 ms

[DI8 frequency measured] PFCB - Menu

Access

[Display] ➡ [I/O map] ➡ [Freq. signal image] ➡ [DI8 frequency measured]

About This Menu

Following parameters can be accessed on the Graphic Display Terminal by pressing the OK key on the **[DI8 Frequency Measured]** PFCB parameter.

[DI8 Frequency Measured] PFCB

Filtered customer pulse input frequency reference.

Identical to **[DI7 frequency measured]** PFC7 *(see page 126)*.

[DI8 Pulse Input Assign] P,BA

DI8 pulse input assignment.

Identical to **[DI7 Pulse Input Assign]** P,7A *(see page 126)*.

[DI8 PulseInput Low Freq] P,LB

DI8 pulse input low frequency.

Identical to **[DI7 PulseInput Low Freq]** P,L7 *(see page 126)*.

[DI8 PulseInput High Freq] P,HB

DI8 pulse input high frequency.

Identical to **[DI7 PulseInput High Freq]** P,H7 *(see page 127)*.

[DI8 Frequency Filter] PF,B

Interference filtering pulse input cut-off time of the low-filter.

Identical to **[DI7 Frequency Filter]** PF,7 *(see page 127)*.

Section 7.12
[Communication map]

What Is in This Section?

This section contains the following topics:

[Communication map] CMM - Menu

Access

[Display] ➡ [Communication map]

[Command Channel] CMdC

Command channel.

Setting	Code / Value	Description
[Terminals]	tEr	Terminal block source **Factory Setting**
[Ref. Freq- Rmt. Term]	LCC	Reference Frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	nEt	Reference frequency via fieldbus module if a fieldbus module has been inserted
[Embedded Ethernet]	EtH	Embedded Ethernet

[Cmd Register] CMd

Command register.

[Control Mode] CHCF is not set to **[I/O profile]** IO

Possible values in CiA402 profile, separate, or not separate mode:

Bit	Description, Value
0	Set to 1: "Switch on"/Contactor command
1	Set to 0: "Disable voltage"/Authorization to supply AC power
2	Set to 0: "Quick stop"
3	Set to 1: "Enable operation"/Run command
4 to 6	Reserved (= 0)
7	"Fault reset" acknowledgment active on 0 to 1 rising edge
8	Set to 1: Halt stop according to the **[Type Of Stop]** Stt parameter without leaving the operation enabled state
9 and 10	Reserved (= 0)
11 to 15	Can be assigned to commands

Possible values in the I/O profile. On state command **[2-Wire Control]** 2C:

Bit	Description, Value
0	Forward (on state) command: 0: No forward command 1: Forward command **NOTE:** The assignment of bit 0 cannot be modified. It corresponds to the assignment of the terminals. It can be switched. Bit 0 CdO0 is only active if the channel of this control word is active.
1 to 15	Can be assigned to commands

Possible values in the I/O profile. On edge command **[3-Wire Control]** 3C:

Bit	Description, Value
0	Stop (run authorization): 0: Stop 1: Run is authorized on a forward or reverse command
1	Forward (on 0 to 1 rising edge) command
2 to 15	Can be assigned to commands
NOTE: The assignment of bits 0 and 1 cannot be modified. It corresponds to the assignment of the terminals. It can be switched. Bits 0 CdO0 and 1 CdO1 are only active if the channel of this control word is active.	

[Ref Freq Channel] rFCC

Channel of reference frequency.

Identical to **[Command Channel]** CMdC *(see page 130)*

[Pre-Ramp Ref Freq] FrH

Frequency reference before ramp.

Setting	Description
-599.0...599.0 Hz	Setting range **Factory setting**: _

[CIA402 State Reg] EtA

CIA402 State Register.

Possible values in CiA402 profile, separate, or not separate mode:

Bit	Description, Value
0	"Ready to switch on", awaiting power section line supply
1	"Switched on", ready
2	"Operation enabled", running
3	Operating detected error state: 0: Inactive 1: Active
4	"Voltage enabled", power section line supply present: 0: Power section line supply absent 1: Power section line supply present **NOTE:** When the drive is powered by the power section only, this bit is always at 1.
5	Quick stop
6	"Switched on disabled", power section line supply locked
7	Warning: 0: No warning 1: Warning
8	Reserved (= 0)
9	Remote: command or reference via the network 0: Command or reference via the Graphic Display Terminal 1: Command or reference via the network
10	Targets reference reached: 0: The reference is not reached 1: The reference has been reached **NOTE:** When the drive is in speed mode, this is the speed reference.
11	"Internal limit active", reference outside limits: 0: The reference is within the limits 1: The reference is not within the limits **NOTE:** When the drive is in speed mode, the limits are defined by the **[Low speed]** LSP and **[High speed]** HSP parameters.
12	Reserved
13	Reserved
14	"Stop key", STOP via stop key: 0: STOP key not pressed 1: Stop triggered by the STOP key on the Graphic Display Terminal
15	"Direction", direction of rotation: 0: Forward rotation at output 1: Reverse rotation at output
NOTE: The combination of bits 0, 1, 2, 4, 5 and 6 defines the state in the DSP 402 state chart (see the communication manuals).	

Possible values in the I/O profile:

Bit	Description, Value
0	Reserved (= 0 or 1)
1	Ready: 0: Not ready 1: Ready
2	Running: 0: The drive does not start if a reference other than zero is applied 1: Running, if a reference other than zero is applied, the drive can start
3	Operating detected error state: 0: Inactive 1: Active
4	Power section line supply present: 0: Power section line supply absent 1: Power section line supply present
5	Reserved (= 1)
6	Reserved (= 0 or 1)
7	Warning 0: No warning 1: Warning
8	Reserved (= 0)
9	Command via a network: 0: Command via the terminals or the Graphic Display Terminal 1: Command via a network
10	Reference reached: 0: The reference is not reached 1: The reference has been reached
11	Reference outside limits: 0: The reference is within the limits 1: The reference is not within the limits **NOTE:** When the drive is in speed mode, the limits are defined by LSP and HSP parameters.
12	Reserved (= 0)
13	Reserved (= 0)
14	Stop via STOP key: 0: STOP key not pressed 1: Stop triggered by the STOP key on the Graphic Display Terminal
15	Direction of rotation: 0: Forward rotation at output 1: Reverse rotation at output
NOTE: The value is identical in the CiA402 profile and the I/O profile. In the I/O profile, the description of the values is simplified and does not refer to the CiA402 (Drivecom) state chart.	

[Modbus network diag] Mnd - Menu

Access

[Display] ➡ [Communication map] ➡ [Modbus network diag]

About This Menu

Used for the Modbus serial communication port at the bottom of the control block. Refer to the Modbus serial embedded communication manual for a complete description.

[COM LED] Mdb I

View of the Modbus communication LED.

[Mdb Frame Nb] M ICt

Modbus network frames counter: number of processed frames.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Mb NET CRC errors] M IEC

Modbus network CRC error countered: number of CRC errors

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Com. scanner input map] iSA - Menu

Access

[Display] ➡ [Communication map] ➡ [Modbus network diag] ➡ [Com. scanner input map]

About This Menu

Used for CANopen® and Modbus network.

[Com Scan In1 val.] nMI1

Com scanner input 1 value. Value of the first input word.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Com Scan In2 val.] nMI2

Com scanner input 2 value. Value of the second input word.

Identical to **[Com Scan In1 val.] nMI1** *(see page 134)*.

[Com Scan In3 val.] nMI3

Com scanner input 3 value. Value of the third input word.

Identical to **[Com Scan In1 val.] nMI1** *(see page 134)*.

[Com Scan In4 val.] nMI4

Com scanner input 4 value. Value of the fourth input word.

Identical to **[Com Scan In1 val.] nMI1** *(see page 134)*.

[Com Scan In5 val.] nMI5

Com scanner input 5 value. Value of the fifth input word.

Identical to **[Com Scan In1 val.] nMI1** *(see page 134)*.

[Com Scan In6 val.] nMI6

Com scanner input 6 value. Value of the sixth input word.

Identical to **[Com Scan In1 val.] nMI1** *(see page 134)*.

[Com Scan In7 val.] nMI7

Com scanner input 7 value. Value of the seventh input word.

Identical to **[Com Scan In1 val.] nMI1** *(see page 134)*.

[Com Scan In8 val.] nMI8

Com scanner input 8 value. Value of the eighth input word.

Identical to **[Com Scan In1 val.] nMI1** *(see page 134)*.

[Com scan output map] oSA - Menu

Access

[Display] ➡ [Communication map] ➡ [Com scan output map]

About This Menu

Used for CANopen® and Modbus networks.

[Com Scan Out1 val.] nC1

Com scanner output 1 value. Value of the first output word.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Com Scan Out2 val.] nC2

Com scanner output 2 value. Value of the second output word.

Identical to **[Com Scan Out1 val.] nC1** *(see page 135)*.

[Com Scan Out3 val.] nC3

Com scanner output 3 value. Value of the third output word.

Identical to **[Com Scan Out1 val.] nC1** *(see page 135)*.

[Com Scan Out4 val.] nC4

Com scanner output 4 value. Value of the fourth output word.

Identical to **[Com Scan Out1 val.] nC1** *(see page 135)*.

[Com Scan Out5 val.] nC5

Com scanner output 5 value. Value of the fifth output word.

Identical to **[Com Scan Out1 val.] nC1** *(see page 135)*.

[Com Scan Out6 val.] nC6

Com scanner output 6 value. Value of the sixth output word.

Identical to **[Com Scan Out1 val.] nC1** *(see page 135)*.

[Com Scan Out7 val.] nC7

Com scanner output 7 value. Value of the seventh output word.

Identical to **[Com Scan Out1 val.] nC1** *(see page 135)*.

[Com Scan Out8 val.] nC8

Com scanner output 8 value. Value of the eighth output word.

Identical to **[Com Scan Out1 val.] nC1** *(see page 135)*.

[Modbus HMI Diag] Π d H - Menu

Access

[Display] ➡ [Communication map] ➡ [Modbus HMI Diag]

About This Menu

Used for the Modbus serial communication port at the front of the control block (used by the Graphic Display Terminal)

[COM LED] Π d b 2

View of the Modbus HMI communication LED.

[Mdb NET frames] Π 2 C t

Terminal Modbus 2: number of processed frames.

Setting	Description
0...65,535	Setting range

[Mdb NET CRC errors] Π 2 E C

Terminal Modbus 2: number of CRC errors.

Setting	Description
0...65,535	Setting range

[Ethernet Emb Diag] nPE - Menu

Access

[Display] ➡ [Communication map] ➡ [Ethernet Emb Diag]

About This Menu

Refer to the Modbus TCP Ethernet-IP communication manual.

[MAC @] nACE

MAC address of the embedded Ethernet adapter.

Read-only parameter.

The address format is XX-XX-XX-XX-XX-XX.

[ETH emb Rx frames] ErXE

Ethernet embedded Rx frames counter.

Setting	Description
0...4,294,967,295	Setting range **Factory setting**: _

[ETH emb Tx frames] EtXE

Ethernet embedded Tx frames counter.

Setting	Description
0...4,294,967,295	Setting range **Factory setting**: _

[ETH emb error frames] EErE

Ethernet embedded error frames counter.

Setting	Description
0...4,294,967,295	Setting range **Factory setting**: _

[Ethernet Rate Data] ArdE ★

Actual data rate.

Setting	Code / Value	Description
[Auto]	Auto	Automatic
[10M. full]	10F	10 F
[10M. half]	10H	10 H
[100M. full]	100F	100 F
[100M. half]	100H	100 H

[DeviceNet Diag] dVn - Menu

Access

[Display] ➡ [Communication map] ➡ [DeviceNet Diag]

About This Menu

Following parameters can be accessed if DeviceNet module (VW3A3609) has been inserted.

[Data rate used] bdru ★

Data rate used by the fieldbus module.

Setting	Code / Value	Description
[Automatic]	Auto	Automatic detection **Factory setting**
[125 Kbps]	125K	125,000 Bauds
[250 Kbps]	250K	250,000 Bauds
[500 Kbps]	500K	500,000 Bauds

[Fieldbus Error] EPF2

External detected error from fieldbus module.

[Fieldbus Com Interrupt] CnF

Fieldbus module communication interruption. Refer to the related fieldbus manual.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Profibus Diag] PrB - Menu

Access

[Display] ➡ [Communication] ➡ [Profibus Diag]

About This Menu

Following parameters can be accessible if Profibus DP module VW3A3607 has been inserted.

[Data rate used] bdru ★

Data rate used by the fieldbus module.

Setting	Code / Value	Description
[Automatic]	Auto	Automatic detection **Factory setting**
[9.6 Kbps]	9K6	9,600 Bauds
[19.2 Kbps]	19K2	19,200 Bauds
[93.75 Kbps]	93K7	93,750 Bauds
[187.5 Kbps]	187K	187,500 Bauds
[500 Kbps]	500K	500,000 Bauds
[1.5 Mbps]	1M5	1.5 MBauds
[3 Mbps]	3M	3 MBauds
[6 Mbps]	6M	6 MBauds
[12 Mbps]	12M	12 MBauds

[PPO profile used] PrFL ★

PPO profile in use.

Setting	Code / Value	Description
[Not configured]	unCG	Not configured
[1]	1	PROFIdrive
[100]	100	Device specific
[101]	101	Device specific
[102]	102	Device specific
[106]	106	Device specific
[107]	107	Device specific

[DP Master Active] dPMA ★

Active master: 1 or 2.

Setting	Code / Value	Description
[MCL1]	1	Master 1 **Factory setting**
[MCL2]	2	Master 2

[Fieldbus Error] EPF2

External detected error from fieldbus module.

[Fieldbus Com Interrupt] CnF

Fieldbus module communication interruption. Refer to the related fieldbus manual.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[InternCom Error1] iLF1

Option module communication interruption. Refer to the related fieldbus manual.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[PROFINET Diag] PrN - Menu

Access

[Display] ➡ [Communication map] ➡ [PROFINET Diag]

About This Menu

Following parameters are accessible if PROFINET® module (VW3A3627) has been inserted.

[MAC @] MAC

MAC address of the PROFINET module.

read-only parameter.

The address format is XX-XX-XX-XX-XX-XX.

[PPO profile used] PrFL ★

PPO profile in use.

Setting	Code / Value	Description
[Not configured]	uncG	Not configured
[1]	1	PROFIdrive
[100]	100	Device specific
[101]	101	Device specific
[102]	102	Device specific
[106]	106	Device specific
[107]	107	Device specific

[Ethernet Error Code] Err ★

Ethernet specific error code.

Setting	Description
0...65,535	Setting range **Factory setting**: 0

[iPar Status] iPAE ★

PROFINET: IPAR service status.

Setting	Code / Value	Description
[Idle State]	idLE	Idle state
[Init]	init	Initialization
[Configuration]	Conf	Configuration
[Ready]	rdy	Ready
[Operational]	oPE	Operational
[Not Configured]	uCFG	Not configured
[Unrecoverable Error]	urEC	Unrecoverable detected error

[iPar Error Code] iPAd ★

IPar detected error code.

Setting	Description
0...5	Setting range **Factory setting**: 0

[DP Master Active] dPMA ★

Active master: 1 or 2.

Setting	Code / Value	Description
[MCL1]	1	Master 1 **Factory setting**
[MCL2]	2	Master 2

[Fieldbus Error] EPF2

External detected error from fieldbus module.

[Fieldbus Com Interrupt] CnF

Fieldbus module communication interruption.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[InternCom Error1] iLF1

Option module communication interruption.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[EtherCAT Module Diag] E t d - Menu

Access

[Display] ➡ [Communication map] ➡ [EtherCAT Module Diag]

About This Menu

Following parameters can be accessed if EtherCAT module (VW3A33601) has been inserted.

[External Error] E P F 2

External detected error from fieldbus module.

[Fieldbus Com Interrupt] C n F

Fieldbus module communication interruption.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[InternCom Error1] I L F 1

Internal communication interruption 1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Command word image] CWI - Menu

Access

[Display] ➡ [Communication map] ➡ [Command word image]

About This Menu

Command word image.

[Modbus Cmd] CMd1

Command word image built with Modbus port source.

Identical to **[CMD Value]** CMd *(see page 130)*.

[CANopen Cmd] CMd2

Command word image built with CANopen® port source.

Identical to **[CMD Value]** CMd *(see page 130)*.

[COM. Module Cmd.] CMd3

Command word image built with fieldbus module source.

Identical to **[CMD Value]** CMd *(see page 130)*.

[Ethernet Embd cmd.] CMd5

Command word image built with Ethernet embedded source).

Identical to **[CMD Value]** CMd *(see page 130)*.

[Freq. ref. word map] rW 1 - Menu

Access

[Display] ➡ [Communication map] ➡ [Freq. ref. word map]

About This Menu

Frequency reference image.

[Modbus Ref Freq] LFr 1

Frequency reference image built with Modbus port source (LFR_MDB).

Setting	Description
-32,767...32,767 Hz	Setting range **Factory setting**: 0.0 Hz

[CAN Ref Freq] LFr 2

Frequency reference image built with CANopen® port source (LFR_CAN).

Setting	Description
-32,767...32,767 Hz	Setting range **Factory setting**: 0.0 Hz

[Com Module Ref Freq] LFr 3

Frequency reference image built with fieldbus module source (LFR_COM).

Setting	Description
-32,767...32,767 Hz	Setting range **Factory setting**: 0.0 Hz

[Ethernet Embd Ref Freq] LFr 5

Embedded Ethernet reference frequency.

Setting	Description
-32,767...32,767 Hz	Setting range **Factory setting**: 0.0 Hz

[CANopen map] CAnM - Menu

Access

[Display] ➡ [Communication map] ➡ [CANopen map]

About This Menu

This menu is visible if a CANopen fieldbus module is present. Refer to the CANopen communication module manual.

[RUN LED] CAn

Bitfield: view of the CANopen® Run LED status.

[ERR LED] CAnE

Bitfield: view of the CANopen® error LED status.

[PDO1 image] PdO 1 - Menu

Access

[Display] ➡ [Communication map] ➡ [CANopen map] ➡ [PDO1 image]

About This Menu

View of the Receive PDO1 and Transmit PDO1.

[Receive PDO1-1] rP11★

First frame of the receive PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Receive PDO1-2] rP12★

Second frame of the receive PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Receive PDO1-3] rP13★

Third frame of the receive PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Receive PDO1-4] rP14★

Fourth frame of the receive PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Transmit PDO1-1] tP11★

First frame of the transmit PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Transmit PDO1-2] tP12★

Second frame of the transmit PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Transmit PDO1-3] tP 13 ★

Third frame of the transmit PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Transmit PDO1-4] tP 14 ★

Fourth frame of the transmit PDO1.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[PDO2 image] P o 2 - Menu

Access

[Display] ➡ [Communication map] ➡ [CANopen map] ➡ [PDO2 image]

About This Menu

View of the RPDO2 and TPDO2: same structure as **[PDO1 image] P o 1 -** *(see page 147)*.

[Receive PDO2-1] r P 2 1 ★

First frame of the receive PDO2.

[Receive PDO2-2] r P 2 2 ★

Second frame of the receive PDO2.

[Receive PDO2-3] r P 2 3 ★

Third frame of the receive PDO2.

[Receive PDO2-4] r P 2 4 ★

Fourth frame of the receive PDO2.

[Transmit PDO2-1] t P 2 1 ★

First frame of the transmit PDO2.

[Transmit PDO2-2] t P 2 2 ★

Second frame of the transmit PDO2.

[Transmit PDO2-3] t P 2 3 ★

Third frame of the transmit PDO2.

[Transmit PDO2-4] t P 2 4 ★

Fourth frame of the transmit PDO2.

[PDO3 image] P o 3 - Menu

Access

[Display] ➡ [Communication map] ➡ [CANopen map] ➡ [PDO3 image]

About This Menu

View of the RPDO3 and TPDO3.

[Receive PDO3-1] r P 3 1 ★

First frame of the receive PDO3.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Receive PDO3-2] r P 3 2 ★

Second frame of the receive PDO3.

Identical settings as in **[Receive PDO3-1]** r P 3 1.

[Receive PDO3-3] r P 3 3 ★

Third frame of the receive PDO3.

Identical settings as in **[Receive PDO3-1]** r P 3 1.

[Receive PDO3-4] r P 3 4 ★

Fourth frame of the receive PDO3.

Identical settings as in **[Receive PDO3-1]** r P 3 1.

[Transmit PDO3-1] t P 3 1 ★

First frame of the transmit PDO3.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Transmit PDO3-2] t P 3 2 ★

Second frame of the transmit PDO3.

Identical settings as in **[Transmit PDO3-1]** t P 3 1.

[Transmit PDO3-3] t P 3 3 ★

Third frame of the transmit PDO3.

Identical settings as in **[Transmit PDO3-1]** t P 3 1.

[Transmit PDO3-4] t P 3 4 ★

Fourth frame of the transmit PDO3.

Identical settings as in **[Transmit PDO3-1]** t P 3 1.

[CANopen map] CnM - Menu

Access

[Display] ➡ [Communication map] ➡ [CANopen map]

About This Menu

CANopen® image.

[Canopen NMT state] nMtS

Drive NMT state of the CANopen® slave.

Settings	Code / Value	Description
[Boot]	boot	Bootup
[Stopped]	StoP	Stopped
[Operation]	oPE	Operational
[Pre-op]	PoPE	Pre-Operational

[Number of TX PDO] nbtP

Number of transmit PDO.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Number of RX PDO] nbrP

Number of receive PDO.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[CANopen Error] ErCo

Error registry CANopen®.

Setting	Description
0...5	Setting range **Factory setting**: _

[RX Error Counter] rEC1

Number of receive error counter (not saved at power off).

Setting	Description
0...65,535	Setting range **Factory setting**: _

[TX Error Counter] tEC1

Number of transmit errors countered (not saved at power off).

Setting	Description
0...65,535	Setting range **Factory setting**: _

Section 7.13
[Data logging]

What Is in This Section?

This section contains the following topics:

[Distributed logging] dLo - Menu

Access

[Display] ➡ [Data logging] ➡ [Distributed logging]

About This Menu

This menu is used to store data following specific parameters.

The distributed logging function allows to log up to four parameter distributions at the same time. Each parameter storage is synchronized with the same sample time.

The result of this function gives the possibility to extract a bar graph with 10 bars (every 10% of the defined maximum value) to visualize the distribution for each of the four selected parameters.

NOTE: Any modification of the data logging function configuration will clear the data previously stored.

This function aims at extracting samples of data to store them. When available, these samples can be uploaded by other tools (SoMove and/or Webserver). Data logging meets the need to record and store data over time.

The drive can store the following data:

Type of [Data logging]	Description	[Data logging] storage: Automatic/Manual	Access
Drive identification	Drive identification data	Automatic, in **[Dashboard]** dSH- menu	SoMove Webserver
Even warning logging	Warning logging	Automatic, in **[Dashboard]** dSH- menu	SoMove Webserver
Even error logging	Error logging	Automatic, in **[Dashboard]** dSH- menu	SoMove Webserver
Distribution logging	4 Distribution data	Manual	Webserver
Energy logging	1 Energy logging data	Automatic, in **[Dashboard]** dSH- menu	SoMove Webserver

Activation

To activate **[Distributed logging]** dLo-:

- Select 1 to 4 data to store with **[Log dstrb prm select]** LdP-
- Set **[Log Distrib State]** LdEn to **[Start]** StArt

The logging starts as soon as the motor is running.

To stop logging, set **[Log Distrib State]** LdEn to **[Stop]** StoP.

[Log Distrib State] LdEn

Logging distribution state.

Setting ❮❯	Code / Value	Description
[Stop]	StoP	Distribution logging disabled **Factory setting**
[Start]	StArt	Distribution logs only when the motor is started
[Always]	ALWAYS	Distribution logs all the time
[Reset]	rESEt	Distribution logging reset (configuration, data)
[Clear]	CLEAr	Clear distribution data
[Error]	Error	An error has been detected during distribution logging

[Log dstrb prm select] LdP - Menu

Access

[Display] ➡ [Data logging] ➡ [Distributed logging] ➡ [Log dstrb prm select]

About This Menu

This menu allows you to select up to 4 parameters for data logging. The peak value for each parameter is also stored.

[Log Distrib. Data 1] Ldd1

Logging distribution data 1.

Setting	Code / Value	Description
[Distrib. Log. Disable]	no	Distribution logging disable **Factory setting**
[Motor Frequency]	rFr	Motor frequency
[Motor Current]	LCr	Motor current
[Motor Speed]	SPd	Motor speed
[Motor Voltage]	uoP	Motor voltage
[Motor Mech. Power]	oPrW	Motor mechanical power
[Input Elec. Power]	iPrW	Input electrical power
[Output Elec. Power]	EPrW	Output electrical power
[Motor Torque]	otr	Motor torque
[Mains Voltage]	uLn	Mains voltage
[DC BUS Voltage]	Vbus	DC BUS voltage
[PID Feedback]	rPF	PID feedback
[AI1 Th Value]	tH1V	Thermal sensor AI1
[AI3 Th Value]	tH3V	Thermal sensor AI3
[AI4 Th Value]	tH4V	Thermal sensor AI4
[AI5 Th Value]	tH5V	Thermal sensor AI5
[Drive Thermal State]	tHd	Drive thermal state
[Motor Therm State]	tHr	Motor thermal state
[Energy Consum. Ind.]	ECi	Energy consumption indicator
[Pump Efficiency]	EFY	Pump efficiency
[Energy Perf. Ind.]	EPi	Energy performance indicator

[Log Distrib. Data 2] Ldd2

Logging distribution data 2.

Identical to **[Log Distrib. Data 1]** Ldd1 *(see page 154)*.

[Log Distrib. Data 3] Ldd3

Logging distribution data 3.

Identical to **[Log Distrib. Data 1]** Ldd1 *(see page 154)*.

[Log Distrib. Data 4] Ldd4

Logging distribution data 4.

Identical to **[Log Distrib. Data 1]** Ldd1 *(see page 154)*.

[Distributed logging] dLo - Menu

Access

[Display] ➡ [Data logging] ➡ [Distributed logging]

About This Menu

NOTE: If a log data exceeds the user defined maximum values for log distribution data, this value will not be stored in the log distribution.

[Log Distrib Slp Time] LdSt

Logging distribution sample time.

Setting	Code / Value	Description
[200 ms]	200MS	200 ms
[1 second]	1S	1 s **Factory setting**
[2 second]	2S	2 s
[5 second]	5S	5 s

[Dist Max Val 1] LdM1

Maximum value of the log distribution data 1.

Setting	Description
10...65,535	Setting range **Factory setting**: _

[Dist Max Val 2] LdM2

Maximum value of the log distribution data 2.

Setting	Description
10...65,535	Setting range **Factory setting**: _

[Dist Max Val 3] LdM3

Maximum value of the log distribution data 3.

Setting	Description
10...65,535	Setting range **Factory setting**: _

[Dist Max Val 4] LdM4

Maximum value of the log distribution data 4.

Setting	Description
10...65,535	Setting range **Factory setting**: _

Chapter 8
[Complete settings] CSt -

Introduction

[Complete settings] CSt - menu presents all the settings related to drive functions for:

- Motor and drive configuration
- Application functions
- Monitoring functions

What Is in This Chapter?

This chapter contains the following sections:

Section 8.1
[Macro configuration]

[Macro configuration] MCr - Menu

Access

[Complete settings] ➡ [Macro configuration]

About This Menu

This menu allows to select an application type in order to display only the parameters and menus useful for the selected application.

The application type selection should be done prior to the application settings.

Menu	[Generic Pump Control] GPMP	[Hoisting] Hoist	[Conveyor] Conv	[All Applications] ALL
[Pump functions] PFt -	X			X
[Pump monitoring] PPt -	X			X
[Hoisting functions] HFt -		X		X
[Hoisting monitoring] HMn -		X		X
[Conveyor functions] CFt -			X	X

[Application Selection] APPt

Application selection.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

If this parameter is changed, the functions that are active with the current configuration are disabled and the assignments of the inputs used in these functions are reset to the factory setting.

Verify that this change is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[Generic Pump Control]	GPMP	Generic pump control application
[Hoisting]	Hoist	Hoisting control application
[Conveyor]	Conv	Conveyor control application
[All Applications]	ALL	All Applications **Factory setting**

Section 8.2
[Motor parameters]

What Is in This Section?

This section contains the following topics:

[Motor parameters] MPA - Menu

Access

[Complete settings] ➡ [Motor parameters]

About This Menu

For an application where less than 110% of overload is required
- Power rating of the drive could be equal to power rating of the motor
- Normal rating should be used

For an application where more that 110% of overload is required (up to 150%)
- Power rating of the drive should be greater than power rating of the motor
- High rating could be used to pre-adjust motor nameplate parameter

If high rating is selected, drive current limitation is extended to 1.5. In and maximum values of motor parameters linked to current and/or power are reduced. When switching from one to another selection, all the related parameters are set to their factory setting values.

In any case, the maximum current of the drive does not change. Setting the drive in high rating mode decrease the nominal values for the motor parameters. It means that for the same motor name plate, an oversized drive is required in high rating mode.

[Dual Rating] drt

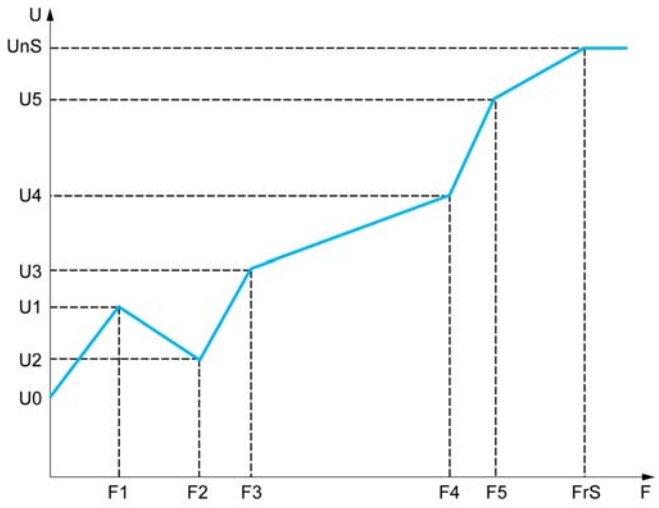
Dual rating state.

Setting	Code / Value	Description
[Normal rating]	norMAL	Normal rating, drive current limitation is 1.1 In **Factory setting**
[High rating]	HIGH	High rating, drive current limitation is 1.5 In

[Motor Control Type] Ctt

Motor control type.

NOTE: Select the motor control type before entering parameter values.

Setting	Code / Value	Description
[SVC V]	VVC	Voltage vector control: Open-loop voltage flux vector control with automatic slip compensation according to the load. It supports operation with a number of motors connected in parallel on the same drive (if motors are identical). **Factory setting**
[FVC]	FVC	Current vector control closed loop: Closed-loop current flux vector control for motors with incremental encoder type sensor; this option can be selected if an encoder module has been inserted. **NOTE:** Verify the encoder before selecting **[FVC]** FVC.
[U/F VC 5pts]	uF5	5–segment V/F profile: As **[U/F VC Standard]** Std profile but also supports the avoidance of resonance (saturation).  The profile is defined by the values of parameters un5, Fr5, u1 to u5 and F1 to F5. Fr5 > F5 > F4 > F3 > F2 > F1 **NOTE:** U0 is the result of an internal calculation based on motor parameters and multiplied by uFr (%). U0 can be adjusted by modifying uFr value.
[Sync. mot.]	SYn	Open-loop synchronous motors: Motor control type specific for permanent magnet synchronous motors.
[Energy Sav.]	nLd	Energy saving: For Applications that do not require high dynamics.
[Sync.CL]	FSY	Closed-loop synchronous motor: For permanent magnet synchronous motors with sinusoidal electromotive force (EMF) only, with encoder. This selection is only possible if an encoder module has been inserted. **NOTE:** Verify the encoder before selecting **[Sync.CL]** FSY.
[SYN_U VC]	SYnu	Motor control type specific for permanent magnet synchronous motors. **[Stall Monitoring]** StPC function helps to prevent a motor overload by monitoring the motor current and the speed rise time.
[Rel. Mot.]	SrVc	Synchronous Reluctant Motor: Opened loop synchronous motor without permanent magnet. This motor control type is used for variable torque applications. If the maximum output current of the drive is not equal or greater than the motor current, this will lead to a lake of torque performances. **[Stall Monitoring]** StPC function helps to prevent a motor overload by monitoring the motor current and the speed rise time.

[Data] Mtd - Menu

Access

[Complete settings] ➡ **[Motor parameters]** ➡ **[Motor data]** ➡ **[Data]**

About This Menu

For synchronous motor parameters. Dedicated parameters can be accessed if **[Motor control type]** Ctt is not set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnU, or
- **[Rel. Mot.]** SrVc.

⚠ WARNING

LOSS OF CONTROL

- Fully read and understand the manual of the connected motor.
- Verify that all motor parameters are correctly set by referring to the nameplate and the manual of the connected motor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This table presents the steps to follow to set and optimize the motor data:

Step	Action
1	Enter the motor nameplate
2	Perform the **[Autotuning]** tun operation

3	Adjust **[Syn. EMF constant]** PHS to optimize the behavior:
	● Start the motor at minimal stable frequency available on the machine (at minimum load).
	● Check and note the **[% error EMF sync]** rdAE value:
	  ● If the **[% error EMF sync]** rdAE value is lower than 0%, then **[Syn. EMF constant]** PHS may be increased.
	  ● If the **[% error EMF sync]** rdAE value is upper than 0%, then **[Syn. EMF constant]** PHS may be reduced. **[% error EMF sync]** rdAE value should be closed to 0%.
	● Stop the motor for modify **[Syn. EMF constant]** PHS in accordance with the value of the **[% error EMF sync]** rdAE (previously noted).

[Motor Standard] bFr ★

Motor standard.

This parameter modifies the presets of the following parameters:

- **[High Speed]** HSP
- **[Motor Freq Thd]** Ftd
- **[Nom Motor Voltage]** UnS
- **[Nominal Motor Freq]** FrS
- **[Max Frequency]** tFr

This parameter can be accessed if **[Motor control type]** Ctt is not set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnU, or
- **[Rel. Mot.]** SrVc.

Setting	Code / Value	Description
[50 Hz IEC]	50	IEC **Factory setting**
[60 Hz NEMA]	60	NEMA

[Nominal Motor Power] nPr ★

Nominal motor power.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Rated motor power given on the nameplate, in kW if **[Motor Standard]** bFr is set to **[50Hz IEC]** 50, in HP if **[Motor Standard]** bFr is set to **[60Hz NEMA]** 60.

Setting	Description
According to drive rating	– **Factory setting**: according to the drive rating

[Nom Motor Voltage] unS ★

Nominal motor voltage.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Rated motor voltage given on the nameplate.

Setting	Description
100...690 Vac	Setting range **Factory setting**: according to drive rating and **[Motor Standard]** bFr

[Nom Motor Current] nCr ★

Rated motor current given on the nameplate.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Setting	Description
0.25...1.5 In (1)	Setting range **Factory setting**: according to drive rating and **[Motor Standard]** bFr
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Nominal Motor Freq] FrS ★

Nominal motor frequency.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

The factory setting is 50 Hz, or preset to 60 Hz if **[Motor Standard]** bFr is set to 60 Hz.

Setting	Description
10.0...599.0 Hz	Setting range **Factory setting**: 50 Hz

[Nominal Motor Speed] nSP ★

Nominal motor speed.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

If the nameplate indicates the synchronous speed and the slip in Hz or as a %, use any 1 of the formulas to calculate the rated speed:

- Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$
- Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors)
- Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors).

Setting	Description
0...65,535 rpm	Setting range **Factory setting**: according to drive rating

[Motor Param Choice] MPC ★

Motor parameter choice.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Setting	Code / Value	Description
[Mot Power]	nPr	Motor power **Factory setting**
[Mot Cosinus]	CoS	Motor cosinus

[Motor 1 Cosinus Phi] CoS ★

Nominal motor cosinus Phi.

This parameter can be accessed if:
- **[Motor param choice]** MPC is set to **[Mot Cosinus]** CoS, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc.

Setting	Description
0.50...1.00	Setting range **Factory setting**: according to the drive rating

[AsyncMotor R Stator] rSA ★

Asynchronous motor stator resistance.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc.

The factory setting is replaced by the result of the autotuning operation if it has been performed.

Setting	Description
0...65,535 mOhm	Setting range **Factory setting**: 0 mOhm

[Magnetizing Current] idA ★

Magnetizing current.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc.

Setting	Description
0...6,553.5 A	Setting range **Factory setting**: 0 A

[AsyncMotor L Induct] LFA ★

Asynchronous motor leakage inductance.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc.

The factory setting is replaced by the result of the autotuning operation if it has been performed.

Setting	Description
0...655.35 mH	Setting range **Factory setting**: 0 mH

[Rotor Time Const] trA ★

Rotor time constant.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc.

Setting	Description
0...65,535 ms	Setting range **Factory setting**: 0 ms

[Sync Nominal I] nCrS ★

Sync motor nominal current.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Setting	Description
0.25...1.5 In (1)	Setting range **Factory setting**: according to the drive rating.
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Nom SyncMotor Speed] nSPS ★

Nominal synchronous motor speed.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Setting	Description
0...48,000 rpm	Setting range **Factory setting**: according to the drive rating.

[Nom Motor torque] tqS ★

Nominal motor torque

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Setting	Description
0.1...6,553.5 Nm	Setting range **Factory setting**: according to the drive rating.

[Pole pairs] PPnS ★

Pole pairs.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Setting	Description
1...50	Setting range **Factory setting**: according to the drive rating.

[Angle setting type] ASt ★

Automatic angle setting type.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

[PSI align] (PS i) and **[PSIO align]** (PS io) are working for all types of synchronous motors. **[SPM align]** (SPMA) and **[IPM align]** (iPMA) increase performances depending on the type of synchronous motor. **[Rotational Current Injection]** rCi may be used where **[PSI align]** (PS i) and **[PSIO align]** (PS io do not give expected performances.

Setting	Code / Value	Description
[IPM align]	iPMA	Alignment for IPM motor. Alignment mode for Interior-buried Permanent Magnet motor (usually, this kind of motor has a high saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[SPM align]	SPMA	Alignment for SPM motor. Mode for Surface-mounted Permanent Magnet motor (usually, this kind of motor has a medium or low saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[PSI align]	PS i	Pulse signal injection. Standard alignment mode by pulse signal injection.
[PSIO align]	PS io	Pulse signal injection – Optimized. Standard optimized alignment mode by pulse signal injection.The phase-shift angle measurement time is reduced after the first run order or tune operation, even if the drive has been turned off. **Factory setting**
[Rotational Current Injection]	rCi	Rotational current injection. Alignment mode with rotor motion. This alignment mode realizes the mechanical alignment of the rotor and the stator; it requires up to 4 s. The motor needs to be stopped and without resistive torque.
[No align]	no	No alignment

[Syn. EMF constant] PHS ★

Synchronous motor: permanent magnet flux with R/W access to the customer.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

PHS adjustment allows you to reduce the current in operation without load.

Setting	Description
0...6,553.5 mV/rpm	Setting range **Factory setting**: 0 mV/rpm

[SyncMotor Stator R] r S A S ★

Calculated synchronous motor stator R.

Cold state stator resistance (per winding). The factory setting is replaced by the result of the tuning operation if it has been performed.

This parameter can be accessed if:
- **[Access Level]** L A C is set to **[Expert]** E P r , and if
- **[Motor control type]** C t t is not set to:
  - **[Sync. mot.]** S Y n , or
  - **[Sync.CL.]** F S Y , or
  - **[SYN_U VC]** S Y n u , or
  - **[Rel. Mot.]** S r V c .

You can enter the value if you know it.

Setting	Description
0...65,535 mOhm	Setting range **Factory setting**: 0 mOhm

[Autotune L d-axis] L d S ★

Autotune L d-axis.

Axis "d" stator inductance in mH (per phase).

This parameter can be accessed if:
- **[Access Level]** L A C is set to **[Expert]** E P r , and if
- **[Motor control type]** C t t is not set to:
  - **[Sync. mot.]** S Y n , or
  - **[Sync.CL.]** F S Y , or
  - **[SYN_U VC]** S Y n u , or
  - **[Rel. Mot.]** S r V c .

On motors with smooth poles **[Autotune L d-axis]** L d S = **[Autotune L q-axis]** L 9 S = Stator inductance L.

The factory setting is replaced by the result of the autotuning operation if it has been performed.

Setting	Description
0...655.35 mH	Setting range **Factory setting**: 0

[Autotune L q-axis] L 9 S ★

Autotune L q-axis.

Axis "q" stator inductance in mH (per phase).

This parameter can be accessed if:
- **[Access Level]** L A C is set to **[Expert]** E P r , and if
- **[Motor control type]** C t t is not set to:
  - **[Sync. mot.]** S Y n , or
  - **[Sync.CL.]** F S Y , or
  - **[SYN_U VC]** S Y n u , or
  - **[Rel. Mot.]** S r V c .

On motors with smooth poles **[Autotune L d-axis]** L d S = **[Autotune L q-axis]** L 9 S = Stator inductance L.

The factory setting is replaced by the result of the autotuning operation if it has been performed.

Setting	Description
0...655.35 mH	Setting range **Factory setting**: 0

[Sync Nominal Freq] FrSS ★

Synchronous motor nominal frequency.

Nominal motor frequency for synchronous motor in Hz unit. Automatically updated according to **[Nom SyncMotor Speed]** nSPS and **[Pole pairs]** PPnS data.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc.

Setting	Description
10.0...500.0 Hz	Setting range **Factory setting**: nSPS x PPnS / 60

[PSI Align Curr Max] nCr ★

Maximum current of PSI alignment.

Current level in % of **[Sync Nominal I]** nCrS for **[PSI align]** PS1 and **[PSI Oalign]** PS1o angle shift measurement modes. This parameter has an impact on the inductor measurement.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnu, or
  - **[Rel. Mot.]** SrVc.

This current must be equal to or higher than the maximum current level of the application; otherwise an instability may occur.

If **[PSI Align Curr Max]** nCr is set to **[AUTO]** Auto, **[PSI Align Curr Max]** nCr is adapted by the drive according to the motor data settings.

Setting	Description
[AUTO] Auto...300%	Setting range **Factory setting**: **[AUTO]** Auto

NOTE: In case of instability, **[PSI Align Curr Max]** nCr should be increased by steps up to obtain the requested performances.

[Current Filter Time] CrtF ★

Filter time of the current.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Description
[AUTO] Auto...100.0 ms	Setting range **Factory setting**: **[AUTO]** Auto

[Currents Filter] CrFA ★

Internal currents filter time.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Description
0.0...100.0 ms	Setting range **Factory setting**: nSPS * PPnS / 60

[% error EMF sync] rdAE ★

Ratio D-axis current.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

Use **[% error EMF sync]** rdAE to adjust **[Syn. EMF constant]** PHS, **[% error EMF sync]** rdAE should be closed to 0%.

If the **[% error EMF sync]** rdAE value is:

- Lower than 0%:**[Syn. EMF constant]** PHS may be increased.
- Upper than 0%: **[Syn. EMF constant]** PHS may be reduced.

For the all steps to follow to optimize the synchronous motor settings *(see page 163)*.

Setting	**Description**
0.0...6,553.5 %	Setting range **Factory setting**: _

[Angle test setting] ASA - Menu

Access

[Complete settings] → **[Motor parameters]** → **[Motor data]** → **[Angle test setting]**

About This Menu

For synchronous motor parameters. Dedicated parameters can be accessed if **[Motor Control Type]** CTT is set to **[Sync.CL]** FSY.

[Angle setting type] ASt ★

Auto angle setting type.

This parameter can be accessed if **[Motor Control Type]** CTT is set to:

- **[Sync. mot.]** SYn , or
- **[Sync.CL]** FSY, or
- **[SYN_U VC]** SYnU, or
- **[Rel. Mot.]** SrVC.

[PSI align] PSI and **[PSIO align]** PSIo are working for all types of synchronous motors. **[SPM align]** SPMA and **[IPM align]** IPMA increase performances depending on the type of synchronous motor. **[Rotational Current Injection]** rCI may be used where **[PSI align]** PSI and **[PSIO align]** PSIo do not give expected performances.

Setting	Code / Value	Description
[IPM align]	IPMA	Alignment for IPM motor. Alignment mode for Interior-buried Permanent Magnet motor (usually, this kind of motor has a high saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[SPM align]	SPMA	Alignment for SPM motor. Mode for Surface-mounted Permanent Magnet motor (usually, this kind of motor has a medium or low saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[PSI align]	PSI	Pulse signal injection. Standard alignment mode by pulse signal injection.
[PSIO align]	PSIo	Pulse signal injection – Optimized. Standard optimized alignment mode by pulse signal injection.The phase-shift angle measurement time is reduced after the first run order or tune operation, even if the drive has been turned off. **Factory setting**
[Rotational Current Injection]	rCI	Rotational current injection. Alignment mode with rotor motion. This alignment mode realizes the mechanical alignment of the rotor and the stator; it requires up to 4 s. The motor needs to be stopped and without resistive torque.
[No align]	no	No alignment

[Angle auto-test] ASA

Angle setting activation

This parameter can be accessed if **[Motor Control Type]** CTT is set to **[Sync.CL]** FSY and if VW3A3420 Digital encoder option module has been inserted.

Setting	Code / Value	Description
[No]	no	Auto angle setting is not done **Factory setting**
[Yes]	YES	Auto angle setting is requested.
[Done]	donE	Auto angle setting is done.

[Angle Test Assign] ASL

Angle setting activation

This parameter can be accessed if **[Motor Control Type]** CTT is set to **[Sync.CL]** FSY and if VW3A3420 Digital encoder option module has been inserted.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

NOTE: If a **line contactor** or **output contactor** function has been configured, the contactor closes during measurement.

[Angle setting Mode] AtA

Angle setting activation mode

This parameter can be accessed if **[Motor Control Type]** CTT is set to **[Sync.CL]** FSY and if VW3A3420 Digital encoder option module has been inserted.

Setting	Code / Value	Description
[No]	nO	Automatic auto angle setting is not activated **Factory setting**
[Run Command]	AutO	Auto angle setting launched at run command if the drive is not aligned state. **[Angle setting Mode]** AStS is not equal to **[Done]** donE

[Angle offset value] ASV

Angle setting activation mode

This parameter can be accessed if **[Motor Control Type]** CTT is set to **[Sync.CL]** FSY and if VW3A3420 Digital encoder option module has been inserted.

Setting	Description
[No]...8192	Automatic auto angle setting value **Factory setting: [No]** nO

[Angle setting status] ASt S

Angle setting activation mode

This parameter can be accessed if **[Motor Control Type]** Ctt is set to **[Sync.CL]** FSY and if VW3A3420 Digital encoder option module has been inserted.

Setting	Code / Value	Description
[Not done]	tAb	Angle setting value is not defined **Factory setting**
[Pending]	PEnd	Angle setting is in waiting state
[In progress]	PrOG	Angle setting function is in progress.
[Error]	FAIL	Angle Setting function failed
[Done]	donE	Angle function is OK
[Custom Value]	CUS	The phase-shift angle value has been entered by the user via the display terminal or serial Link.

[Motor tune] nTU - Menu

Access

[Complete settings] ➡ **[Motor parameters]** ➡ **[Motor data]** ➡ **[Motor tune]**

[Autotuning] tUn

⚠ WARNING

UNEXPECTED MOVEMENT

Autotuning moves the motor in order to tune the control loops.

- Only start the system if there are no persons or obstructions in the zone of operation.
- During autotuning, the motor makes small movements. Noise development and mechanical oscillations of the system are normal.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

In any case, the motor has to be stopped before performing a tune operation. Verify that the application does not make the motor turn during the tune operation.

If **[Motor control type]** Ctt is set to **[Rel. Mot.]** SrVC, the drive operates the mechanical alignment of the motor (**[Angle setting type]** ASt set to **[Rotational Current Injection]** rCI) prior to start the autotuning.

The tune operation optimizes:

- The motor performances at low speed.
- The estimation of the motor torque.
- The accuracy of the estimation of the process values in sensorless operation and monitoring.

Autotuning is only performed if no stop command has been activated. If a “freewheel stop” or “fast stop” function has been assigned to a digital input, this input must be set to 1 (active at 0).

Autotuning takes priority over any run or prefluxing commands, which will be taken into account after the autotuning sequence.

If autotuning has detected an error, the drive always displays **[No action]** nO and, depending on the configuration of **[Tuning Error Resp]** tnL, may switch to **[Autotuning]** tUn detected error mode.

Autotuning may last for several seconds. Do not interrupt the process. Wait for the Graphic Display Terminal to change to **[No action]** nO.

NOTE: The motor thermal state has a significant influence on the tuning result. Always perform a motor tuning with the motor stopped and cold. Verify that the application does not have the motor operate during a tuning operation.

To redo a motor tuning, wait that it is stopped and cold. Set first **[Autotuning]** tUn to **[Erase Autotuning]** CLr, then redo the motor tuning.

The use of the motor autotuning without doing a **[Erase Autotuning]** CLr first is used to get the thermal state estimation of the motor.

The cable length has an influence on the tune result. If the wiring is modified, it is necessary to redo the tune operation.

Setting ❮❯	Code / Value	Description
[No action]	nO	Autotuning not in progress **Factory setting**
[Apply Autotuning]	YES	Autotuning is performed immediately if possible, then the parameter automatically changes to **[No action]** nO. If the drive state does not allow the tune operation immediately, the parameter changes to **[No]** nO and the operation must be done again.
[Erase Autotuning]	CLr	The motor parameters measured by the autotuning function are reset. The default motor parameter values are used to control the motor. **[Autotuning Status]** tUS is set to **[Not done]** tAb.

[Autotuning Status] tUS

Autotuning status.

This parameter is not saved at drive power-off. It shows the autotuning status since the last power-on (for information only, cannot be modified).

Setting	Code / Value	Description
[Not done]	tAb	The autotuning is not done **Factory setting**
[Pending]	PEnd	The autotuning has been requested but not yet performed
[In Progress]	PrOG	The autotuning is in progress
[Error]	FAIL	The autotuning has detected an error
[Done]	donE	The motor parameters measured by the autotuning function are used to control the motor

[Tuning Error Resp] tnL ★

Response to autotune error.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**

[Autotuning Assign] tUL ★

Autotuning input assignment.

The autotuning is performed when the assigned input or bit changes to 1.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

NOTE: The autotuning causes the motor to start up.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Automatic autotune] AUt ★

Automatic autotune.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK OR ARC FLASH

If this function is activated, autotuning is performed each time the drive is switched on.

- Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

The motor must be stopped when switching on the drive.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Code / Value	Description
[No]	nO	Function deactivated **Factory setting**
[Yes]	YES	A tuning is automatically done at each power-up

[Auto tuning usage] tUnU ★

Auto tune usage.

This parameter shows the way used to modify the motor parameters according to its estimated thermal state.

Setting	Code / Value	Description
[Therma Mot]	tM	Statoric thermal state estimation based on nominal current and current consumed by the motor. **Factory setting**
[No]	nO	No thermal state estimation

[Tune Selection] StUn ★

Tune selection.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

(for information only, cannot be modified)

Setting	Code / Value	Description
[Default]	tAb	The default motor parameter values are used to control the motor **Factory setting**
[Measure]	MEAS	The values measured by the autotuning function are used to control the motor
[Custom]	CUS	The values manually set are used to control the motor

[Autotuning Lvl Of Current] tCr

Tune current ratio.

This parameter shows the level of current applied to the motor during auto tuning, in percent of the drive nominal current.

Setting	Description
[Auto] AUtO...300%	**Factory setting: [Auto]** AUtO

[Angle setting type] AnGt ★

Automatic angle setting type.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnU, or
- **[Rel. Mot.]** SrVc.

[PSI align] (PSI) and **[PSIO align]** (PSIo) are working for all types of synchronous motors. **[SPM align]** (SPMA) and **[IPM align]** (IPMA) increase performances depending on the type of synchronous motor. **[Rotational Current Injection]** rCI may be used where **[PSI align]** (PSI) and **[PSIO align]** (PSIo do not give expected performances.

Setting	Code / Value	Description
[IPM align]	IPMA	Alignment for IPM motor. Alignment mode for Interior-buried Permanent Magnet motor (usually, this kind of motor has a high saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[SPM align]	SPMA	Alignment for SPM motor. Mode for Surface-mounted Permanent Magnet motor (usually, this kind of motor has a medium or low saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[PSI align]	PSI	Pulse signal injection. Standard alignment mode by pulse signal injection.
[PSIO align]	PSIo	Pulse signal injection – Optimized. Standard optimized alignment mode by pulse signal injection.The phase-shift angle measurement time is reduced after the first run order or tune operation, even if the drive has been turned off. **Factory setting**
[Rotational Current Injection]	rCI	Rotational current injection. Alignment mode with rotor motion. This alignment mode realizes the mechanical alignment of the rotor and the stator; it requires up to 4 s. The motor needs to be stopped and without resistive torque.
[No align]	no	No alignment

[PSI Align Curr Max] nCr ★

Maximum current of PSI alignment.

Current level in % of **[Sync Nominal I]** nCrS for **[PSI align]** PSI and **[PSI Oalign]** PSIo angle shift measurement modes. This parameter has an impact on the inductor measurement.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and if
- **[Motor control type]** Ctt is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnU, or
  - **[Rel. Mot.]** SrVc.

This current must be equal to or higher than the maximum current level of the application; otherwise an instability may occur.

If **[PSI Align Curr Max]** nCr is set to **[AUTO]** Auto, **[PSI Align Curr Max]** nCr is adapted by the drive according to the motor data settings.

Setting	Description
[AUTO] Auto...300%	Setting range **Factory setting**: **[AUTO]** Auto

[Rotational Current Level] rCL ★

Rotational current level.

This parameter can be accessed if **[Angle setting type]** ASt is set to **[Rotational Current Injection]** rCI. The current level should be set according to the torque required during the alignment operation.

Setting	Description
10...300%	Setting range, as a percentage of the nominal motor current **Factory setting**: 75%

[Motor monitoring] MOP - Menu

Access

[Complete settings] ➡ [Motor parameters] ➡ [Motor monitoring]

[Motor Th Current] ITH

Motor thermal monitoring current to be set to the rated current indicated on the nameplate.

Setting	Description
0.2...1.1 In(1)	Setting range **Factory setting**: According to drive rating
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Motor Thermal Mode] THE

Motor thermal monitoring mode.

NOTE: An error is detected when the thermal state reaches 118% of the rated state and reactivation occurs when the state falls back below 100%.

Setting	Code / Value	Description
[No]	nO	No thermal monitoring
[Self cooled]	ACL	Self ventilated motor **Factory setting**
[Force-cool]	FCL	Fan-cooled motor

[MotorTemp ErrorResp] OLL

Overload error response.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Free wheel **Factory setting**

[Thermal monitoring] tPP - Menu

Access

[Complete settings] ➡ [Motor parameters] ➡ [Motor monitoring] ➡ [Thermal monitoring]

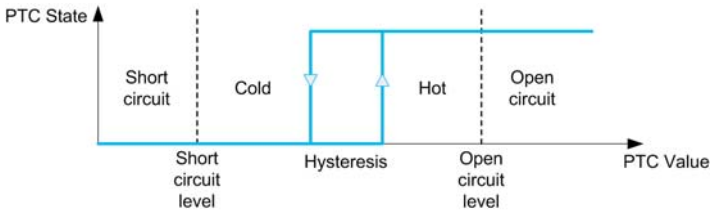
About This Menu

The thermal monitoring function helps to prevent against high temperature by monitoring the real temperature by the drive.

PTC, PT100, PT1000, and KTY84 thermal probes are supported by this function.

The function gives the possibility to manage 2 levels of monitoring:
- A Warning level: the drive triggers an event without stopping the application.
- An Error level: the drive triggers an event and stops the application.

The thermal probe is monitored for the following detected error:
- Overheating
- Probe break (loss of signal)
- Probe short-circuit



Activation

[AIx Th Monitoring] tHX5 allows you to activate the thermal monitoring on the related analog input:
- **[No]** no: the function is disabled
- **[Yes]** YES: the thermal monitoring is enabled on the related AIx.

Type of Thermal Probe Selection

[AIx Type] AIXt allows you to select the type of thermal sensor(s) connected on the related analog input:
- **[No]** no: no sensor
- **[PTC Management]** PTC: one to six PTC (in serial) is used
- **[KTY]** KTY: 1 KTY84 is used
- **[PT100]** 1PT2: 1 PT100 connected with two wires is used
- **[PT1000]** 1PT3: 1 PT1000 connected with two wires is used
- **[PT100 in 3 wires]** 1PT23: 1 PT100 connected with three wires is used (AI4 & AI5 only)
- **[PT1000 in 3 wires]** 1PT33: 1 PT1000 connected with three wires is used (AI4 & AI5 only)
- **[3PT100 in 3 wires]** 3PT23: 3 PT100 connected with three wires is used (AI4 & AI5 only)
- **[3PT1000 in 3 wires]** 3PT33: 3 PT1000 connected with three wires is used (AI4 & AI5 only)

2-wire thermal probes are supported on analog input 2 to analog input 5.

Wiring for PT100 and PT1000 Probes

For 2-wire probes, the following wirings are possible:

[AI1 Th Monitoring] tH I5

Activation of the thermal monitoring on AI1.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[YES]	YES	Yes

[AI1 Type] AI1t ★

AI1 assignment.

This parameter can be accessed if **[AI1 Th Monitoring]** tH I5 is not set to **[No]** nO.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc **Factory setting**
[Current]	0A	0-20 mA
[PTC Management]	PtC	1 to 6 PTC (in serial)
[KTY]	KtY	1 KTY84
[PT100]	1Pt2	1 PT100 connected with 2 wires
[PT1000]	1Pt3	1 PT1000 connected with 2 wires

[AI1 Th Error Resp] tH Ib ★

Thermal monitoring response to a detected error for AI1.

This parameter can be accessed if **[AI1 Type]** AI1t is not set to
- **[Voltage]** 10U, or
- **[Current]** 0A.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	Stt	Stop according to **[Type of stop]** Stt parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp **Factory setting**
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[AI1 Th Error Level] tH IF ★

Error detection level for AI1.

This parameter can be accessed if **[AI1 Type]** AI1t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: 110.0°C

[AI1 Th Warn Level] tHIA ★

Warning level for AI1.

This parameter can be accessed if **[AI1 Type]** AI1t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: 90.0°C

[AI1 Th Value] tHIV ★

AI1 thermal value.

This parameter can be accessed if **[AI1 Type]** AI1t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: _

[AI3 Th Monitoring] tHM3S

Activation of the thermal monitoring on AI3.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[YES]	YES	Yes

[AI3 Type] AI3t ★

AI3 assignment.

This parameter can be accessed if **[AI3 Th Monitoring]** tHM3S is not set to **[No]** nO.

Identical to **[AI1 Type]** AI1t *(see page 182)* with factory setting: **[Current]** 0A.

[AI3 Th Error Resp] tHM3b ★

Thermal monitoring response to a detected error for AI3.

This parameter can be accessed if **[AI3 Type]** AI3t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	Stt	Stop according to **[Type of stop]** Stt parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp **Factory setting**
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[AI3 Th Error Level] tH3F ★

Error detection level for AI3.

This parameter can be accessed if **[AI3 Type]** AI3t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PTC.

Setting ❮❯	Description
-15.0...200.0°C	Setting range **Factory setting**: 110.0°C

[AI3 Th Warn Level] tH3A ★

Warning level for AI3.

This parameter can be accessed if **[AI3 Type]** AI3t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PTC.

Setting ❮❯	Description
-15.0...200.0°C	Setting range **Factory setting**: 90.0°C

[AI3 Th Value] tH3V ★

AI3 thermal value.

This parameter can be accessed if **[AI3 Type]** AI3t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PTC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: _

[AI4 Th Monitoring] tH4S ★

Activation of the thermal monitoring on AI4.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[YES]	YES	Yes

[AI4 Type] A I4E ★

AI4 assignment.

This parameter can be accessed if **[AI4 Th Monitoring]** tHA5 is not set to **[No]** nO.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc
[Current]	0A	0-20 mA **Factory setting**
[Voltage +/-]	n 10U	-10/+10 Vdc
[PTC Management]	PTC	1 to 6 PTC (in serial)
[KTY]	KTY	1 KTY84
[PT1000]	1PT3	1 PT1000 connected with 2 wires
[PT100]	1PT2	1 PT100 connected with 2 wires
[3 PT1000]	3PT3	3 PT1000 connected with 2 wires
[3 PT100]	3PT2	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	1PT33	1 PT1000 connected with 3 wires (AI4 & AI5 only)
[PT100 in 3 wires]	1PT23	1 PT100 connected with 3 wires (AI4 & AI5 only)
[3 PT1000 in 3 wires]	3PT33	3 PT1000 connected with 3 wires (AI4 & AI5 only)
[3 PT100 in 3 wires]	3PT23	3 PT100 connected with 3 wires (AI4 & AI5 only)

[AI4 Th Error Resp] tHAb ★

Thermal monitoring response to a detected error for AI4.

This parameter can be accessed if **[AI4 Type]** A I4E is not set to
- **[Voltage]** 10U, or
- **[Current]** 0A.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	STT	Stop according to **[Type of stop]** STT parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp **Factory setting**
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[AI4 Th Error Level] tHAF ★

Error detection level for AI4.

This parameter can be accessed if **[AI4 Type]** A I4E is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PTC.

Setting ❮❯	Description
-15.0...200.0°C	Setting range **Factory setting**: 110.0°C

[AI4 Th Warn Level] tH4A ★

Warning level for AI4.

This parameter can be accessed if **[AI4 Type]** A1t4 is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting ( )	Description
-15.0...200.0°C	Setting range **Factory setting**: 90.0°C

[AI4 Th Value] tH4V ★

AI4 thermal value.

This parameter can be accessed if **[AI4 Type]** A1t4 is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: _

[AI5 Th Monitoring] tH5S ★

Activation of the thermal monitoring on AI5.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[YES]	YES	Yes

[AI5 Type] A1t5 ★

AI5 assignment.

This parameter can be accessed if **[AI5 Th Monitoring]** tH5S is not set to **[No]** nO.

Identical to **[AI4 Type]** A1t4 *(see page 185)*.

[AI5 Th Error Resp] tH5b ★

Thermal monitoring response to a detected error for AI5.

This parameter can be accessed if **[AI5 Type]** A1t5 is not set to
- **[Voltage]** 10U, or
- **[Current]** 0A.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	Stt	Stop according to **[Type of stop]** Stt parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp **Factory setting**
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[AI5 Th Error Level] tH5F ★

Error detection level for AI5.

This parameter can be accessed if **[AI5 Type]** AI5t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: 110.0°C

[AI5 Th Warn Level] tH5A ★

Warning level for AI5.

This parameter can be accessed if **[AI5 Type]** AI5t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: 90.0°C

[AI5 Th Value] tH5V

AI5 thermal value.

This parameter can be accessed if **[AI5 Type]** AI5t is not set to:
- **[Voltage]** 10U, or
- **[Current]** 0A, or
- **[PTC Management]** PtC.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: _

[Enc Therm Sensor Type] tHEt

Encoder thermal sensor type

This parameter can be accessed if VW3A3420 Digital encoder module has been inserted.

Settings	Code/Value	Description
[None]	nonE	None **Factory settings**
[PTC]	PtC	PTC
[PT100]	1Pt2	PT100
[PT1000]	1Pt3	PT1000
[KTY]	Kty	KTY
[Klixon]	KL1X	Klixon

[Enc Th ErrorResp] tHEb

Thermal monitoring response to a detected error for the encoder module input.

Setting	Code / Value	Description
[Ignore]	nO	External detected error ignored
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	STt	Stop according to configuration of **[Type of stop]** Stt *(see page 316)*, without tripping. In this case, the detected error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-wire control]** tCC and **[2-wire type]** tCt *(see page 224)*if control is via the terminals). Configuring a warning for this detected error is recommended (assigned to a digital output, for example) in order to indicate the cause of the stop.
[Fallback speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed(1)
[Speed maintained]	rLS	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed(1)
[Ramp stop]	rMP	Stop on ramp **Factory setting**
[Fast stop]	FSt	Fast stop
[DC Injection]	dCI	DC injection stop. This type of stop cannot be used with some other functions
(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.		

[Enc Th Error Level] tHEF

The following table provides the details of the thermal error level for encoder.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: 110.0°C

[Enc Th Warn Level] tHEA

The following table provides the details of the thermal warning level for encoder.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: 90.0°C

[Enc Th Value] tHEV

The following table provides the details of the encoder thermal value.

Setting	Description
-15.0...200.0°C	Setting range **Factory setting**: _

[Fallback Speed] LFF

Fallback speed.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Motor monitoring] MOP - Menu

Access

[Complete settings] ➡ [Motor parameters] ➡ [Motor monitoring]

About This Menu

The thermal monitoring function helps to prevent the motor from overheating by an estimation of the thermal state of the motor.

[Current Limitation] CL1 ★

Internal current limit.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR ● Verify that the motor is properly rated for the maximum current to be applied to the motor. ● Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit. **Failure to follow these instructions can result in equipment damage.**

NOTE: If the setting is less than 0.25. In, the drive may lock in **[OutPhaseLoss Assign]** OPL if this has been enabled. If it is less than the no-load motor current, the motor cannot run.

Setting ❮❯	Description
0...1.1 In(1)	Setting range **Factory setting**: 1.1 In(1)
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Attenuation Time] SOP ★

Attenuation time.

This parameter can be accessed if **[Motor surge limit.]** SVL is not set to **[No]** no.

The value of the **[Volt surge limit. opt]** SOP parameter corresponds to the attenuation time of the cable used. It is defined to help to prevent the superimposition of voltage wave reflections resulting from long cable lengths. It limits over-voltages to twice the DC bus rated voltage.

As surge voltage depends on many parameters such as types of cable, different motor powers in parallel, different cable lengths in parallel, and so on, it is recommend the use of an oscilloscope to check the over-voltage values obtained at the motor terminals.

For long cable lengths, an output of the filter or a dV/dt filter must be used.

To retain the overall drive performance, do not increase the SOP value unnecessarily.

Setting	Code / Value	Description
[6]	6	6 µs
[8]	8	8 µs **Factory setting**
[10]	10	10 µs

[Sinus Filter Activation] oFI ★

Sinus filter activation.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnU, or
- **[Rel. Mot.]** SrVC.

NOTICE
RISK OF DAMAGE TO THE SINUS FILTER On systems using a sinus filter, the maximum output frequency **[Max frequency]** tFr must not exceed 100 Hz. **Failure to follow these instructions can result in equipment damage.**

Setting	Code / Value	Description
[No]	nO	No sinus filter **Factory setting**
[Yes]	YES	Use of a sinus filter to limit over-voltages on the motor and reduce the ground detected error leakage current.

[Output Short Circuit Test] Stst

Output short circuit test configuration.

The drive outputs are tested on power-up and every time a run command is applied. These tests cause a slight delay (a few ms). In the event of an error, the drive locks.

The *drive output short-circuit (terminals U-V-W): SCF display* error can be detected.

Setting	Code / Value	Description
[No]	nO	No test
[Yes]	YES	Output short circuit test enabled **Factory setting**

[Motor Therm Thd] ttd

Motor thermal threshold.

Setting ( )	Description
0...118%	Setting range **Factory setting**: 100%

[Motor2 therm. level] ttd2

Motor 2 thermal level.

Setting ( )	Description
0...118%	Setting range **Factory setting**: 100%

[Motor3 therm. level] ttd3

Motor 3 thermal level.

Setting ( )	Description
0...118%	Setting range **Factory setting**: 100%

[Motor control] drC - Menu

Access

[Complete settings] ➡ **[Motor parameters]** ➡ **[Motor control]**

About This Menu

This menu shows the motor control related parameters.

[IR compensation] UFr

This parameter is used to optimize torque at low speed, or to adapt to special cases (for example: for motors connected in parallel, decrease **[IR compensation]** UFr). If there is insufficient torque at low speed, increase **[IR compensation]** UFr. A too high value can avoid the motor to start (locking) or change the current limiting mode.

Setting ❮❯	Description
0...200%	Setting range **Factory setting**: 100%

[Slip compensation] SLP ★

Slip compensation.

This parameter can be accessed if **[Motor control type]** CtT is not set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnU, or
- **[Rel. Mot.]** SrVC.

The speeds given on motor nameplates are not necessarily exact.

If the slip setting is lower than the actual slip, the motor is not rotating at the correct speed in steady state, but at a lower speed than the reference.

If the slip setting is higher than the actual slip, the motor is overcompensated and the speed is unstable.

Setting ❮❯	Description
0...300%	Setting range **Factory setting**: 100%

[U1] U 1 ★

Voltage point 1 on 5 points V/F.

This parameter can be accessed if **[Motor Control Type]** CtT is set to **[V/F 5pts]** UF5.

Setting ❮❯	Description
0...800 Vac	Setting range according to rating **Factory setting**: 0 Vac

[U2] U 2 ★

Voltage point 2 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** CtT is set to **[V/F 5pts]** UF5.

Setting ❮❯	Description
0...800 Vac	Setting range according to rating **Factory setting**: 0 Vac

[U3] u 3 ★

Voltage point 3 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0...800 Vac	Setting range according to rating **Factory setting**: 0 Vac

[U4] u 4 ★

Voltage point on 4 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0...800 Vac	Setting range according to rating **Factory setting**: 0 Vac

[U5] u 5 ★

Voltage point 5 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0...800 Vac	Setting range according to rating **Factory setting**: 0 Vac

[F1] F 1 ★

Frequency point 1 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[F2] F 2 ★

Frequency point 2 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[F3] F 3 ★

Frequency point 3 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0.0...599 Hz	Setting range **Factory setting**: 0.0 Hz

[F4] F 4 ★

Frequency point 4 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[F5] F 5 ★

Frequency point 5 on 5 points V/F.

V/F profile setting.

This parameter can be accessed if **[Motor Control Type]** C t t is set to **[V/F 5pts]** u F 5.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Output Ph Rotation] P H r

Output phase rotation.

Modifying this parameter operates as an inversion of 2 of the three motor phases. This results in changing the direction of rotation of the motor.

Setting	Code / Value	Description
[ABC]	A b C	Standard rotation **Factory setting**
[ACB]	A C b	Opposite rotation

[Inertia Factor] S P G u ★

Inertia factor

This parameter can be accessed if:

- **[Access Level]** L A C is set to **[Expert]** E P r, and
- **[Motor Control Type]** C t t is set to:
  - **[U/F VC 5pts]** u F 5, or
  - **[Sync. mot.]** S Y n, or
  - **[Sync.CL]** F S Y, or
  - **[Rel. Mot.]** S r V c, or
  - **[SYN_U VC]** S Y n u.

Setting ❮❯	Description
0...1,000%	Setting range **Factory setting**: 40%

[Boost Activation] bOA ★

Boost activation.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

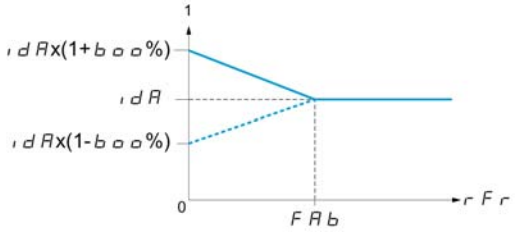
Setting	Code / Value	Description
[Inactive]	nO	No boost **Factory setting**
[Dynamic]	dYnA	Dynamic boost, the magnetizing current value is modified according to the motor load, can be accessed if **[Motor Control Type]** Ctt is not set to **[SYN_U VC]** SYnU
[Static]	StAt	Static boost, the magnetizing current value follows the profile whatever the motor load
[Constant]	CStE	Constant boost used for conical motors. The magnetizing current is maintained in case of change of direction of the motor. An additional parameter is available to handle the deceleration and stop phase. CStE can be accessed if **[Motor Control Type]** Ctt is set to **[SYN_U VC]** SYnU
[Conical Motor]	CnOt	Conical boost, can be accessed if **[Motor Control Type]** Ctt is not set to **[SYN_U VC]** SYnU

[Boost] boO ★

Value at 0 Hz: % of nominal magnetizing current (taken into account if different from 0).

A too high value of **[Boost]** boO can result in a magnetic saturation of the motor, which leads to a torque reduction.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Boost Activation]** bOA is not set to **[Inactive]** nO.



Setting	Description
-100...100%	Setting range If **[Boost Activation]** bOA is set to **[Dynamic]** dYnA, **[Boost]** boO is set to 25%. **Factory setting**: 0%

[Boost On Deceleration] bOO2 ★

Value in % of nominal magnetizing current (taken into account if different from 0).

This parameter is used during deceleration phase to quickly reduce the magnetizing current at stop phase.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Boost Activation]** bOA is set to **[Conical Motor]** CnOt.

Setting	Description
-100...0%	Setting range **Factory setting**: -25%

[Freq Boost] FAb ★

Value at 0 Hz: speed threshold to reach nominal magnetizing current.

This parameter can be accessed if:

- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Boost Activation]** boA is not set to **[NO]** no, and
- **[Boost Activation]** boA is not set to **[Constant]** CSTE.

Setting	Description
0.0...599.0 Hz	Setting range If **[Boost Activation]** boA is set to **[Dynamic]** dynA, **[Freq Boost]** FAb is set to 30.0 Hz. **Factory setting**: 0.0 Hz

[Braking level] Vbr

Braking transistor command level.

Setting	Description
335...1127 V	Setting range **Factory setting**: According to drive rating voltage

[Fluxing by DI] FLI- Menu

Access

[Complete settings] → **[Motor parameters]** → **[Motor control]** → **[Fluxing by DI]**

About This Menu

Configure the fluxing by digital input.

[Motor fluxing] FLU ★

Motor fluxing configure

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the parameter **[Motor fluxing]** FLU is set to **[Continuous]** FCT, fluxing is always active, even if the motor does not run.

- Verify that using this setting does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the flux current to be applied in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

In order to obtain rapid high torque on startup, magnetic flux needs to already have been established in the motor.

In **[Continuous]** FCT mode, the drive automatically builds up flux when it is powered up.

in **[Not continuous]** FNC mode, fluxing occurs when the motor starts up.

The flux current is greater than **[Nom Motor Current]** NCR (configured rated motor current) when the flux is established and is the adjusted to the motor magnetizing current.

If **[Motor control type]** CTT is set to **[Sync. mot.]** SYN, the **[Motor fluxing]** FLU parameter causes the alignment of the motor and not the fluxing.

If **[Brake assignment]** BLC is not **[No]** NO), the **[Motor fluxing]** FLU parameter has no effect.

Setting	Code / Value	Description
[Not continuous]	FNC	Non-continuous mode
[Continuous]	FCT	Continuous mode This option is not possible if **[Auto DC Injection]** ADC *(see page 322)* is **[Yes]** YES or if **[Type of stop]** STT *(see page 316)* is **[Freewheel]** NST
[No]	FNO	Function inactive **Factory setting**

[Fluxing assignment] FLI ★

Fluxing input assignment

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the flux current to be applied in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

Assignment is only possible if **[Motor fluxing]** FLU is set to **[Not continuous]** FnC.

If a DI or a bit is assigned to the motor fluxing command, flux is built up when the assigned input or bit is at 1.

If a DI or a bit has not been assigned, or if the assigned DI or bit is at 0 when a run command is sent, fluxing occurs when the motor starts.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Angle setting type] ASt ★

Automatic angle setting type.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnu, or
- **[Rel. Mot.]** SrVc.

[PSI align] (PSI) and **[PSIO align]** (PSIo) are working for all types of synchronous motors. **[SPM align]** (SPMA) and **[IPM align]** (IPMA) increase performances depending on the type of synchronous motor. **[Rotational Current Injection]** rCI may be used where **[PSI align]** (PSI) and **[PSIO align]** (PSIo do not give expected performances.

Setting	Code / Value	Description
[IPM align]	IPMA	Alignment for IPM motor. Alignment mode for Interior-buried Permanent Magnet motor (usually, this kind of motor has a high saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[SPM align]	SPMA	Alignment for SPM motor. Mode for Surface-mounted Permanent Magnet motor (usually, this kind of motor has a medium or low saliency level). It uses high frequency injection, which is less noisy than standard alignment mode.
[PSI align]	PSI	Pulse signal injection. Standard alignment mode by pulse signal injection.
[PSIO align]	PSIo	Pulse signal injection – Optimized. Standard optimized alignment mode by pulse signal injection.The phase-shift angle measurement time is reduced after the first run order or tune operation, even if the drive has been turned off. **Factory setting**
[Rotational Current Injection]	rCI	Rotational current injection. Alignment mode with rotor motion. This alignment mode realizes the mechanical alignment of the rotor and the stator; it requires up to 4 s. The motor needs to be stopped and without resistive torque.
[No align]	no	No alignment

[Spd Loop Optimization] nCL - Menu

Access

[Complete settings] → [Motor parameters] → [Motor control] → [Spd Loop Optimization]

About This Menu

Recommended Procedure for Setting the High-Performance Speed Loop

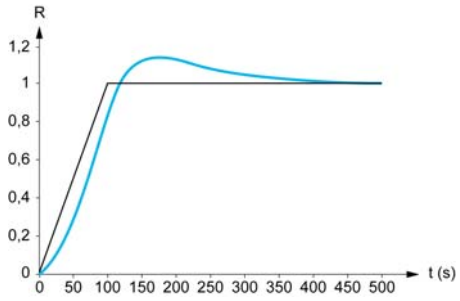
Step	Action
1	Enter the motor parameters. If you subsequently modify one of these, you have to perform this whole procedure again.
2	The value of the inertia being driven must be entered in the **[Application Inertia]** JAPL parameter. *(see page 204)* **NOTE:** If a motor parameter is modified, the estimated inertia is recalculated and updated (parameters **[Estim. app. inertia]** JES and **[Inertia Mult. Coef.]** JMUL. **[Application Inertia]** JAPL returnes to its default value according to the new value of **[Estim. app. inertia]** JES.
3	Check the speed loop response time by first setting **[Feed forward]** FFP to 0 (see graphs on next page).
4	If necessary, adjust the bandwidth and stability using parameters **[FreqLoop Stab]** SAT and **[FreqLoopGain]** FLG *(see page 201)*.
5	To optimize ramp following, increase the feedforward parameter [**[Feed forward]** FFP as indicated on the next page until the best result is obtained.
6	The feedforward term bandwidth can be adjusted if necessary (as shown on the next page) to further improve the ramp following or to filter the noise on the speed reference.

High-Performance speed Loop - Setting the [Feed forward] FFP Parameter

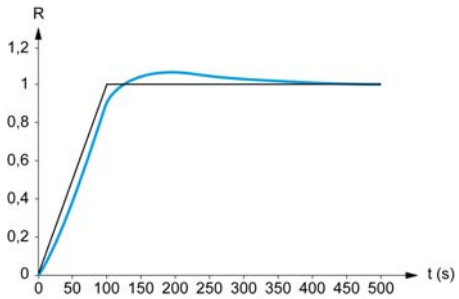
This is used to adjust the level of dynamic torque feedforward required for accelerating and decelerating the inertia. The effect of this parameter on ramp following is illustrated below. Increasing the value of FFP allows the ramp to be followed more closely. However, if the value is too high, overspeed occurs. The optimum setting is obtained when the speed follows the ramp precisely; this depends on the accuracy of the **[Application Inertia]** JAPL parameter, *(see page 204)* and the **[Encoder filter value]** FFr parameter setting *(see page 204)*

FFP settings

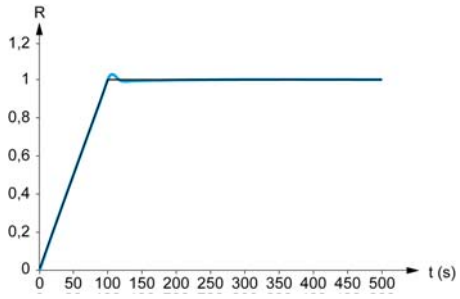
Initial response with FFP=0
R: Reference division



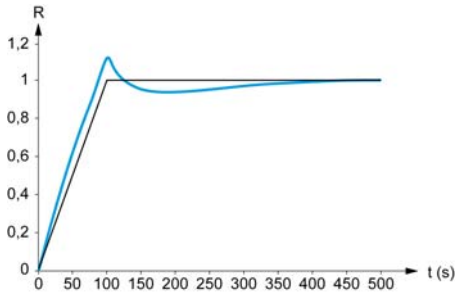
Increase in FFP ↗
R: Reference division



Increase in FFP ↗ ↗
R: Reference division



Increase in FFP ↗ ↗ ↗
R: Reference division

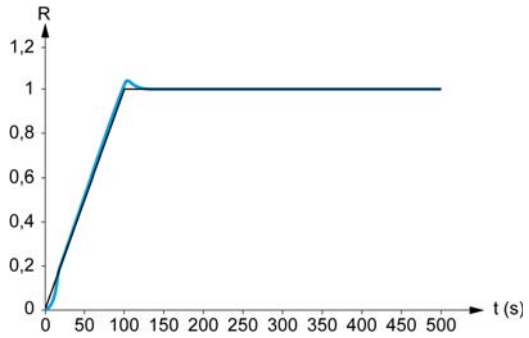


High-Performance Speed Loop - Setting the [FeedFwd Bandwidth] FFV Parameter

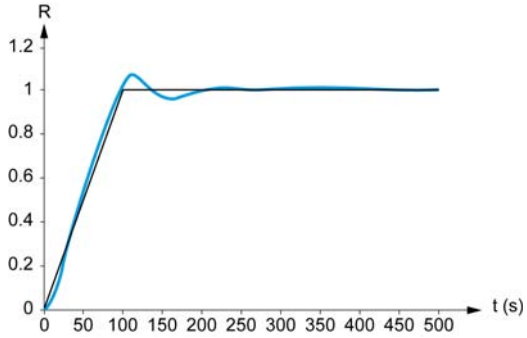
This is used to adjust the bandwidth of the dynamic torque feedforward term. The effect of this parameter on ramp following is illustrated below. Decreasing the value of FFV reduces the effect of noise on the speed reference (torque ripple). However, too great a decrease in relation to the ramp settings (on short ramps) causes a delay, and ramp following is adversely affected. Increasing the value of FFV allows the ramp to be followed more closely, but also heightens noise sensitivity. The optimum setting is obtained by reaching the best compromise between ramp following and the existing noise sensitivity.

FFV settings

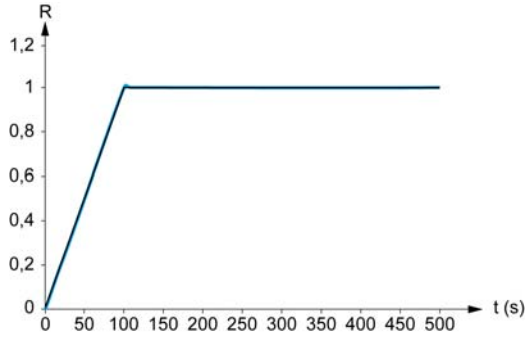
Initial response with FFV=100%
R: Reference division



Reduction in FFV
R: Reference division



Increase in FFV
R: Reference division



[Speed loop type] SSL ★

Speed loop type.

This parameter can be accessed if **[Motor control type]** CTT is not set to:

- **[U/F VC 5pts]** UF5, or
- **[SYN_U VC]** SYNU.

Setting	Code / Value	Description
[Standard]	STD	Standard speed loop **Factory setting**
[High Perf]	HPF	High-performance speed loop. It is advised to deactivate **[Dec.Ramp Adapt]** BRA = **[No]** NO *(see page 312)*

[Speed prop. gain] SPG ★

Speed loop proportional gain.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[Standard]** Std, and
- **[Motor control type]** Ctt is not set to:
  - **[U/F VC 5pts]** UF5, or
  - **[SYN_U VC]** SYnU.

Setting ❮❯	Description
0...1,000%	Setting range **Factory setting**: 40%

[Speed time integral] S_it ★

Speed loop integral time constant.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[Standard]** Std, and
- **[Motor control type]** Ctt is not set to:
  - **[U/F VC 5pts]** UF5, or
  - **[SYN_U VC]** SYnU.

Setting ❮❯	Description
1...65,535 ms	Setting range **Factory setting**: According to the drive rating.

[K speed loop filter] SFC

Speed filter coefficient (0(IP) to 1(PI)).

Setting ❮❯	Description
0...100	Setting range **Factory setting**: 65

[Spd est. filter time] FFH ★

Filter time of the estimated speed.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting ❮❯	Description
0.0...100.0 ms	Setting range **Factory setting**: According to the drive rating

[FreqLoop Stab] StA ★

Frequency loop stability (Speed loop damping factor).

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** Ctt is not set to:
  - **[U/F VC 5pts]** UF5, or
  - **[SYN_U VC]** SYnU.

Stability: Used to adapt the return to steady state after a speed transient, according to the dynamics of the machine. Gradually increase the stability to increase control loop attenuation and thus reduce any overspeed.

Setting ❮❯	Description
0...100%	Setting range **Factory setting**: 20%

[FreqLoopGain] FLG ★

Frequency loop gain (Speed loop bandwidth).

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** CTT is not set to:
  - **[U/F VC 5pts]** UF5, or
  - **[SYN_U VC]** SYNU.

Used to adapt the response of the machine speed transients according to the dynamics. For machines with high resistive torque, high inertia of fast cycles, increase the gain gradually.

Setting ❮❯	Description
0...100%	Setting range **Factory setting**: 20%

[Feed forward] FFP ★

Feed-Forward term activation and setting.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** CTT is not set to:
  - **[U/F VC 5pts]** UF5, or
  - **[SYN_U VC]** SYNU.

Percentages of the high-performance regulator feedforward term. 100% corresponds to the term calculated using the value of **[Application Inertia]** JAPL.

Setting ❮❯	Description
0...200%	Setting range **Factory setting**: 0%

[FeedFwd Bandwidth] FFV ★

Bandwidth of the filter of feed-forward term.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** CTT is not set to:
  - **[U/F VC 5pts]** UF5, or
  - **[SYN_U VC]** SYNU.

Bandwidths of the high-performance speed loop feedforward term, as a percentage of the predefined value.

Setting ❮❯	Description
20...500%	Setting range **Factory setting**: 100%

[External FeedFwd Assign] TEFF ★

External feed-forward mode

[Inertia Mult. Coef.] JMuL ★

Scaling factor for inertia displays.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** Ctt is not set to:
  - **[U/F VC 5pts]** uF5, or
  - **[SYN_U VC]** SYnu.

Increment for **[Application Inertia]** JAPL and **[Estim. app. inertia]** JES t parameters, calculated by the drive, in read-only mode: 0.1 gm², 1 gm², 10 gm², 100 gm², 1000 gm².

Setting	Description
0.0...6553.5 gm²	Setting range **Factory setting**: 0.0 gm²

[Estim. app. inertia] JES t ★

Estimated application inertia.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** Ctt is not set to:
  - **[U/F VC 5pts]** uF5, or
  - **[SYN_U VC]** SYnu.

The inertia being driven is estimated by the drive according to the motor parameters, in read-only mode. Speed loop default settings are determined by the drive from this inertia.

Increment given by **[Inertia Mult. Coef.]** JMuL : - 0.1 gm², 1 gm², 10 gm², 100 gm² or 1000 gm².

Setting	Description
1...9,999 kg.m²	Setting range **Factory setting**: –

[App. Inertia Coef.] JACo ★

Adjustable application inertia ratio.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** Ctt is not set to:
  - **[U/F VC 5pts]** uF5, or
  - **[SYN_U VC]** SYnu.

Coefficient which fixes the ratio between **[Estim. app. inertia]** JES t and **[Application Inertia]** JAPL parameters.

[Application Inertia] JAPL = **[Estim. app. inertia]** JES t x **[App. Inertia Coef.]** JACo.

Setting	Description
0.10...100.00	Setting range **Factory setting**: 1

[Application Inertia] JAPL ★

Adjustable application inertia.

This parameter can be accessed if:
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Motor control type]** CTT is not set to:
  - **[U/F VC 5pts]** UF5, or
  - **[SYN_U VC]** SYNU.

Adjustable application inertia used by the drive to optimize speed loop settings).

Increment given by **[Inertia Mult. Coef.]** JMUL : 0.1 gm², 1 gm², 10 gm², 100 gm² or 1000 gm².

NOTE: If a motor parameter is modified, the estimated inertia is recalculated and updated (parameters **[Estim. app. inertia]** JEST and **[Inertia Mult. Coef.]** JMUL). **[Application Inertia]** JAPL is also returned to its default value according to the new value of **[Estim. app. inertia]** JEST.

Setting	Description
0.00...655.35 kgm²	Setting range **Factory setting**: -

[Encoder filter activ.] FFA ★

Encoder feedback filter activation.

This parameter can be accessed if an encoder module is present.

This parameter can be accessed if **[Encoder usage]** ENU is set to **[No]** NO.

Setting	Code / Value	Description
[No]	NO	Filter deactivated **Factory setting**
[Yes]	YES	Filter activated

[Encoder filter value] FFr ★

Encoder feedback filter value.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Encoder filter activ.]** FFA is set to **[Yes]** YES.

Setting	Description
0.0...40.0 ms	Setting range **Factory setting**: according to encoder rating

[Notch Filter Activation] nFA ★

Notch filter activation.

This parameter activates the notch filter function. Two independent notch filters can be configured.

The notch filter central frequency should be set at or slightly higher than the mechanical resonance frequency. The main task is to identify as precise as possible the resonance frequency.

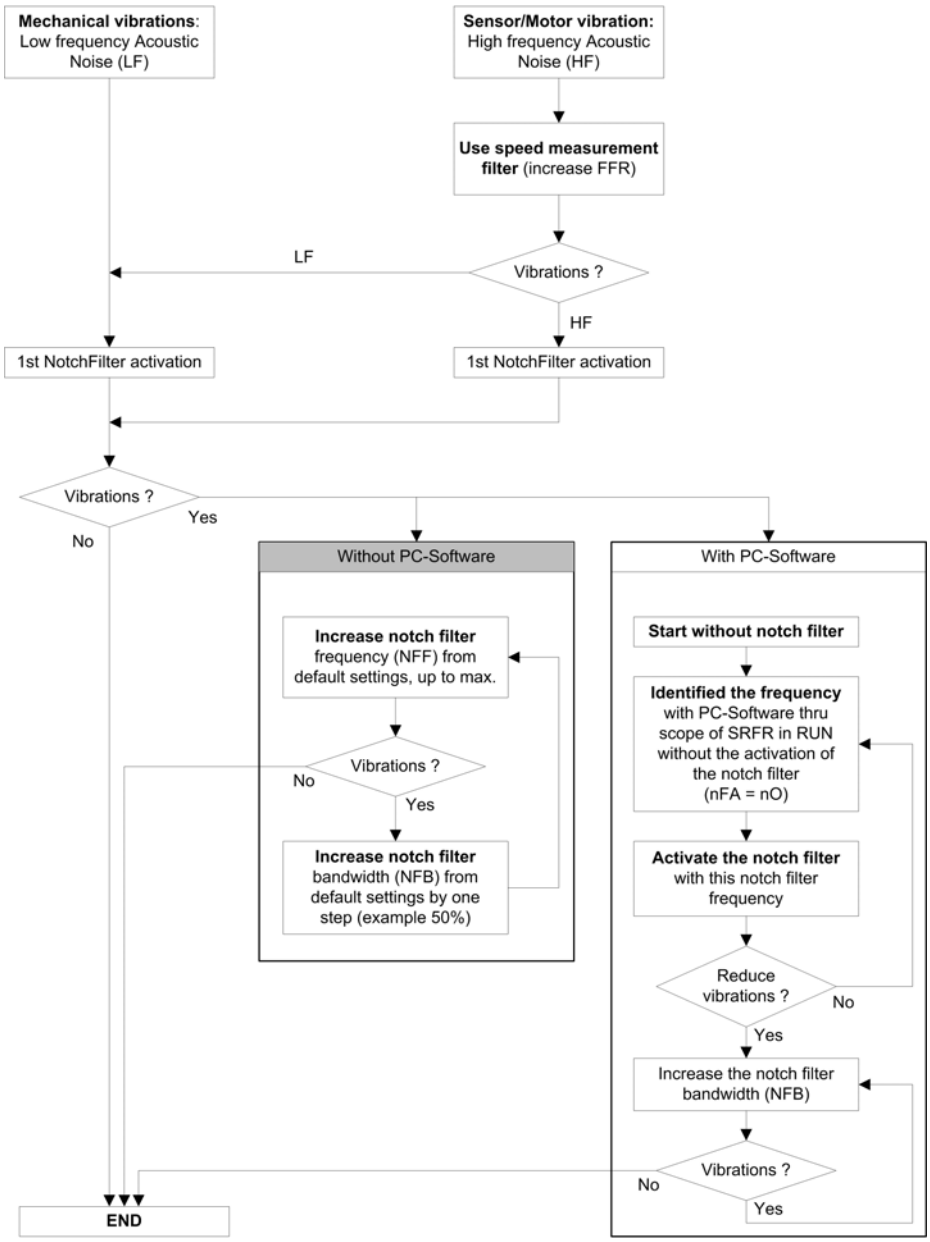
NOTE: Vibrations may occurs at frequencies higher than the mechanical resonance frequency, depending on the settings of the speed loop and motor parameters. It is important to identify the real mechanical resonance frequency.

Perform the following actions for the commissioning:
1. Set the motor data
2. Set the application data
3. Set the speed loop settings
4. In case of vibrations, set the Notch filter settings as described bellow
5. If the performances are not OK, restart from step 3

This parameter can be accessed if:
- an encoder module is present
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Speed loop type]** SSL is set to **[High Perf]** HPF.

Setting ❮❯	Code / Value	Description
[First]	1St	Notch filter 1 enabled
[2nd]	2nd	Notch filter 2 enabled
[All]	ALL	Notch filters 1 and 2 enabled
[No]	no	No notch filter enabled **Factory setting**

Notch filter settings



[Notch Filter Freq 1] nFF 1★

Notch filter 1 central frequency.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Notch Filter Activation]** nFA is set to:
  - **[First]** 1St, or
  - **[All]** ALL.

Setting	Description
10.0...150.0 Hz	Setting range **Factory setting**: 15.0 Hz

[Notch Filter Bdw 1] nFb 1★

Notch filter 1 bandwidth.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Notch Filter Activation]** nFA is set to:
  - **[First]** 1St, or
  - **[All]** ALL.

This parameter defines the bandwidth of the notch filter 1. Filter with higher bandwidth provides better stability margin when the load resonant frequency changes (with car position or load).

NOTE: Rising the bandwidth can interfere with the expect drive dynamic (reducing the dynamic of the speed loop).

Setting	Description
10...400%	Setting range **Factory setting**: 100%

[Notch Filter Depth 1] nFd 1★

Notch filter 1depth.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Notch Filter Activation]** nFA is set to:
  - **[First]** 1St, or
  - **[All]** ALL.

This parameter defines the gain of the notch filter 1 at the central frequency. When NFD1=100%, no filter is applied.

Setting	Description
0...99%	Setting range **Factory setting**: 10%

[Notch Filter Freq 2] nFF2★

Notch filter 2 central frequency.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Notch Filter Activation]** nFA is set to:
  - **[First]** 1St, or
  - **[All]** ALL.

Setting	Description
10.0...150.0 Hz	Setting range **Factory setting**: 85.0 Hz

[Notch Filter Bdw 2] nFb2 ★

Notch filter 2 bandwidth.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Notch Filter Activation]** nFA is set to:
  - **[First]** 1St, or
  - **[All]** ALL.

This parameter defines the bandwidth of the notch filter 2. Filter with higher bandwidth provides better stability margin when the load resonant frequency changes (with car position or load).

NOTE: Rising the bandwidth can interfere with the expect drive dynamic (reducing the dynamic of the speed loop).

Setting	Description
10...400%	Setting range **Factory setting**: 100%

[Notch Filter Depth 2] nFd2 ★

Notch filter 2 depth.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Speed loop type]** SSL is set to **[High Perf]** HPF, and
- **[Notch Filter Activation]** nFA is set to:
  - **[First]** 1St, or
  - **[All]** ALL.

This parameter defines the gain of the notch filter 2 at the central frequency. When nFd2 =100%, no filter is applied.

Setting	Description
0...99%	Setting range **Factory setting**: 25%

[Motor control] drC - Menu

Access

[Complete settings] → **[Motor parameters]** → **[Motor control]**

About This Menu

This menu shows the motor control related parameters.

[HF inj. activation] HFI

Activation of HF injection.

This parameter can be accessed if:

- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Motor control type]** CtT is not set to:
  - **[Sync. mot.]** SYn, or
  - **[Sync.CL.]** FSY, or
  - **[SYN_U VC]** SYnU, or
  - **[Rel. Mot.]** SrVC.

Setting	Code / Value	Description
[NO]	nO	HF injection inactive **Factory setting**
[YES]	YES	HF injection active

[HF injection freq.] FrI

Frequency of the HF injection signal.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Description
250...1000 Hz	Setting range **Factory setting**: 500 Hz

[HF pll bandwidth] SPb

Bandwidth of the HF PLL.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Description
0...400%	Setting range **Factory setting**: 100%

[Current Level Align] ILr

Current level of the HF alignment.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Description
0...200%	Setting range **Factory setting**: 50%

[Boost level align.] 5 ır

Boost level for IPMA alignment.

This parameter can be accessed if **[Access Level]** L AC is set to **[Expert]** E Pr .

Setting	Description
0...200%	Setting range **Factory setting**: 100%

[Angle error Comp.] P E C

Angle position error compensation.

This parameter can be accessed if **[Access Level]** L AC is set to **[Expert]** E Pr .

Setting	Description
0...500%	Setting range **Factory setting**: 0%

[Switching frequency] SWF - Menu

Access

[Complete settings] ➡ **[Motor parameters]** ➡ **[Switching frequency]**

[Switching frequency] SFr

Drive switching frequency.

Adjustment range: The maximum value is limited to 4 kHz if **[Motor surge limit.]** SVL parameter is configured.

If **[Sinus Filter Activation]** oF1 is set to **[Yes]** YES, the minimum value is 2 kHz and the maximum value is limited to 6 kHz or 8 kHz according to drive rating.

NOTE: In the event of excessive temperature rise, the drive automatically reduces the switching frequency and reset it once the temperature returns to normal.

In case of high-speed motor, it is advised to increase the PWM frequency **[Switching frequency]** SFr at 8, 12 kHz or 16 kHz

Setting ❮❯	Description
2...8 or 16 kHz according to drive rating	Setting range **Factory setting**: 4.0 kHz or 2.5 kHz according to the drive rating

[Noise Reduction] nrd

Motor noise reduction.

Random frequency modulation helps to prevent any resonance, which may occur at a fixed frequency.

Setting	Code / Value	Description
[No]	no	Fixed frequency **Factory setting**
[Yes]	YES	Frequency with random modulation

[Switch Freq Type] SFt ★

Switching frequency type.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

The motor switching frequency is modified (reduced) when the internal temperature of the drive is too high.

Setting ❮❯	Code / Value	Description
[SFR type 1]	HF1	Heating optimization Allows the system to adapt the switching frequency according to the motor frequency. This setting optimizes the heating loss of the drive in order to improve the drive efficiency. **Factory setting**
[SFR type 2]	HF2	Allows the system to keep a constant chosen switching frequency **[Switching frequency]** SFr whatever the motor frequency **[Output frequency]** rFr. With this setting, the motor noise is kept as low as possible for a high switching frequency. In the event of overheating, the drive automatically decreases the switching frequency. It is restored to its original value when the temperature returns to normal.

[Motor Surge Limit.] SVL

Surge voltage limitation.

This function limits motor over-voltages and is useful in the following applications:
- NEMA motors
- Old or poor quality motors
- Spindle motors
- Rewound motors

This parameter can remain set to **[No]** nO for 230/400 Vac motors used at 230 Vac, or if the length of cable between the drive and the motor does not exceed:
- 4 m with unshielded cables
- 10 m with shielded cables

NOTE: When **[Motor Surge Limit.]** SVL is set to **[Yes]** YES, the maximum switching frequency **[Switching freq.]** SFr is modified.

Setting	Code / Value	Description
[No]	nO	Function inactive **Factory setting**
[Yes]	YES	Function active

[Attenuation Time] SoP ★

Attenuation time.

This parameter can be accessed if **[Motor surge limit.]** SVL is not set to **[No]** nO. The value of the **[Attenuation Time]** SoP parameter corresponds to the attenuation time of the cable used. It is defined to help to prevent the superimposition of voltage wave reflections resulting from long cable lengths. It limits over-voltages to twice the DC bus rated voltage. As surge voltage depends on many parameters such as types of cable, different motor powers in parallel, different cable lengths in parallel, and so on, It is recommended to use an oscilloscope to check the over-voltage values obtained at the motor terminals. If the higher value of **[Attenuation Time]** SoP is not enough according to the cable lengths, an output filter or a dV/dt filter must be used.

To retain the overall drive performance, do not increase the SoP value unnecessarily.

Setting	Code / Value	Description
[6]	6	6 µs
[8]	8	8 µs **Factory setting**
[10]	10	10 µs

Section 8.3
[Define system units]

[Define system units] SUC - Menu

Access

[Complete settings] ➡ [Define system units]

About This Menu

In order to be easy to configure, commission, operate, and maintain, the drive uses the application units.

The physicals that are concerned by application units are:
- Temperature values
- Currency values

NOTE: Some other default system units are automatically deduced from configurable system units or from other parameters.

System unit applies by default to all communication parameters and HMI (Graphic Display Terminal, Web server, DTM-based software).

When a system unit is changed, there is no rescaling of values. Numerical values are kept, but the meaning of these values is not the same:
- After a change, the behavior of the product will not change (the system stays numerically the same).
- If new values are written through communication or through HMI in new unit, then the behavior is impacted. In that case, all parameters should be reconfigured according to the new selected unit.
- In order to avoid issues due to a modification of system unit parameters, system units should be modified only during the installation of the product and before the commissioning of the functions.

The precision of the physical values is selected at the same time as the unit.

By default, values are signed.

Default range of values are:

16 bits values	32 bits values
-32,768...32,767	-2,147,483,648...2,147,483,648

[Temperature unit] SUEP

Default system application unit used for temperature.

Available temperature units:

Unit	Symbol	Conversion
Celsius Degree	°C	–
Fahrenheit Degree	°F	TF = 9/5*Tc+32

Setting	Code / Value	Description
[0.1°C]	0.1°C	0.1 °C **Factory setting**
[0.1°F]	0.1°F	0.1 °F

[Currency unit list] SUCU

Default system application unit used for currency.

Setting	Code / Value	Description
[EURO]	Euro	Euro **Factory setting**
[$]	doLLAr	Dollar
[£]	Pound	Pound
[Krone]	Kr	Krone
[Renminbi]	rMb	Renminbi
[Other]	otHEr	Other

Section 8.4
[Command and Reference]

[Command and Reference] CrP- Menu

Access

[Complete settings] ➡ **[Command and Reference]**

Command and Reference Channels Parameter Can Be Accessed

Run commands (forward, reverse, stop, and so on) and references can be sent using the following channels:

Command	Reference
Terminals: Digital inputs DI	Terminals: Analog inputs AI, pulse input
Graphic Display Terminal	Graphic Display Terminal
Integrated Modbus	Integrated Modbus
CANopen®	CANopen
Fieldbus module	Fieldbus module
–	+/– speed via the Graphic Display Terminal
Integrated Ethernet	Integrated Ethernet

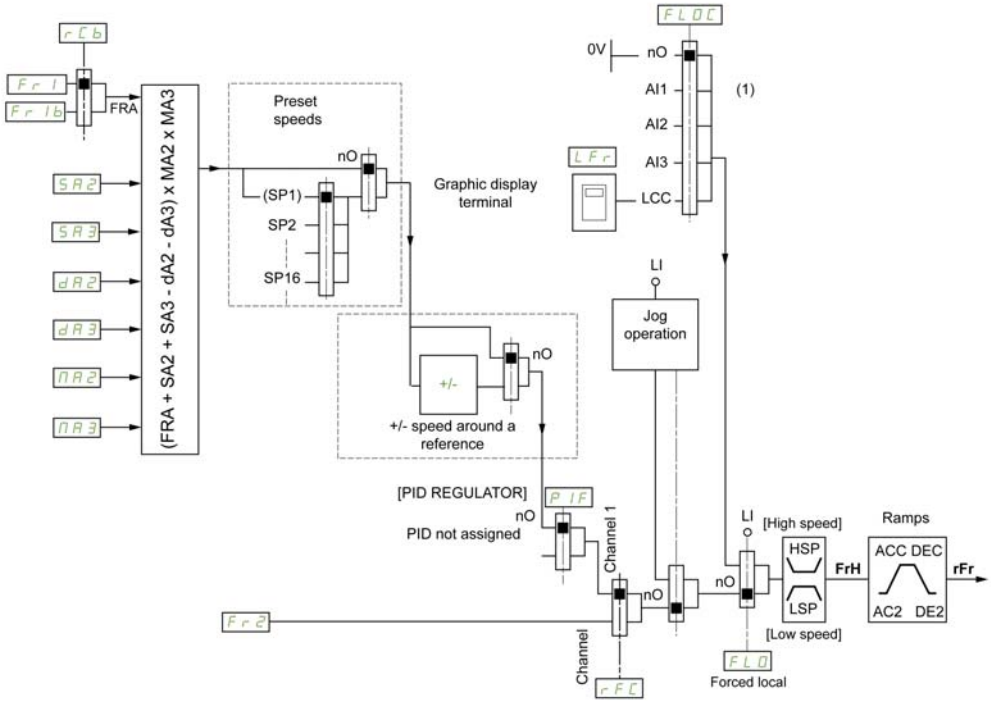
NOTE: The stop keys on the Graphic Display Terminal can be programmed as non-priority keys. A stop key can only have priority if the **[Stop Key Enable]** PSt parameter menu is set to **[Yes]** YES.

The behavior of the drive can be adapted according to requirements:

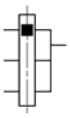
- **[Not separ.]** Sim: Command and reference are sent via the same channel.
- **[Separate]** SEP: Command and reference may be sent via different channels.In these configurations, control via the communication bus is performed in accordance with the DRIVECOM standard with only 5 freely assignable bits (see communication parameter manual). The application functions cannot be accessed via the communication interface.
- **[I/O profile]** io: The command and the reference can come from different channels. This configuration both simplify and extends use via the communication interface. Commands may be sent via the digital inputs on the terminals or via the communication bus. When commands are sent via a bus, they are available on a word, which acts as virtual terminals containing only digital inputs. Application functions can be assigned to the bits in this word. More than one function can be assigned to the same bit.

NOTE: Stop commands from the Graphic Display Terminal remain active even if the terminals are not the active command channel.

Reference Channel for [Not separ.] SIM, [Separate] SEP and [I/O profile] IO Configurations, PID Not Configured



(1) Note: Forced local is not active in **[I/O]**.



The black square represents the factory setting assignment.

Fr1: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, communication card, embedded Ethernet, DI7 PulseInput, DI8 PulseInput.

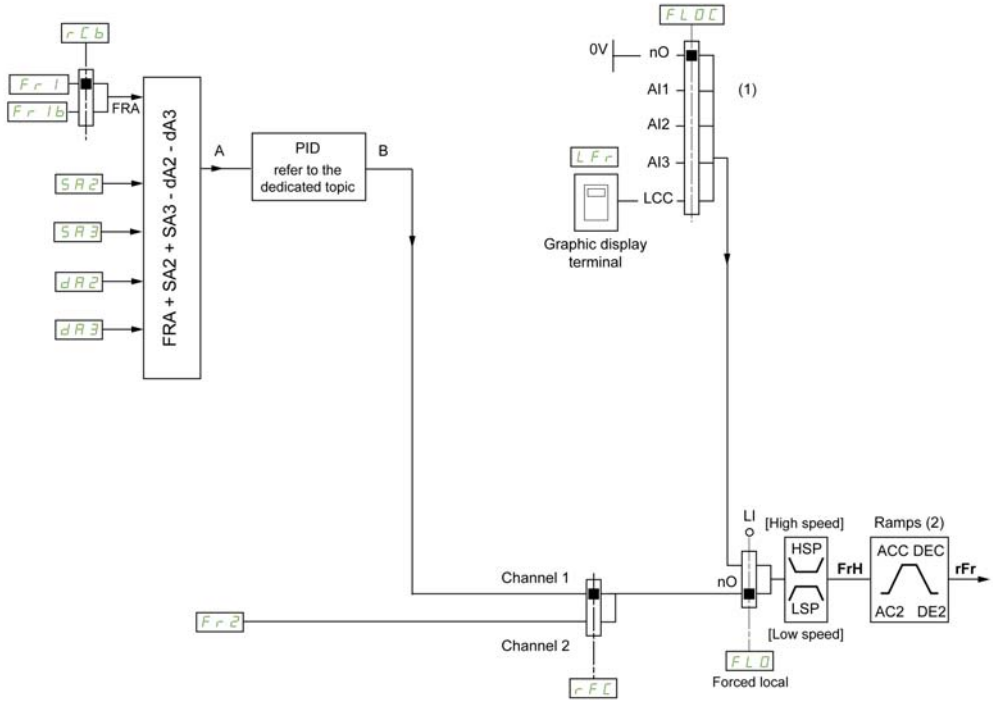
Fr1b, for SEP and IO: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, embedded Ethernet, DI7 PulseInput, DI8 PulseInput.

Fr1b, for SIM: terminals (including I/O extension module), DI7 PulseInput, DI8 PulseInput.

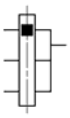
SA2, SA3, dA2, dA3, MA2, MA3: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, communication card, embedded Ethernet, DI7 PulseInput, DI8 PulseInput, and AI Virtual 1.

Fr2: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, embedded Ethernet communication card, and Ref Freq via DI..

Reference Channel for [Not separ.] SIM, [Separate] SEP and [I/O profile] IO Configurations, PID Configured with PID References at the Terminals



(1) **Note**: Forced local is not active in **[I/O profile]**.
(2) Ramps not active if the PID function is active in automatic mode.



The black square represents the factory setting assignment.

Fr1: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, communication card, embedded Ethernet, DI7 PulseInput, DI8 PulseInput.

Fr1b, for SEP and IO: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, embedded Ethernet, DI7 PulseInput, DI8 PulseInput.

Fr1b, for SIM: terminals (including I/O extension module), DI7 PulseInput, DI8 PulseInput.

SA2, SA3, dA2, dA3: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, communication card, embedded Ethernet, DI7 PulseInput, DI8 PulseInput.

Fr2: terminals (including I/O extension module), Graphic Display Terminal, integrated Modbus, CANopen®, embedded Ethernet communication card, and Ref Freq via DI..

[Ref Freq 1 Config] FrI

Configuration reference frequency 1.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[AI1]	AI1	Analog input AI1 **Factory Setting**
[AI2]...**[AI3]**	AI2...AI3	Analog input AI2...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	UPdt	Up/Down function is assigned by DIx
[Ref. Freq- Rmt. Term]	LCC	Reference Frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	nEt	Reference frequency via fieldbus module if a fieldbus module has been inserted
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Ref.1B channel] FrIb

Configuration reference frequency 1B.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Ref 1B switching] rCb

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example an inversion of the direction of the rotation of the motor, a sudden acceleration or a stop.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Select switching (1 to 1B).

- If the assigned input or bit is at 0, **[Ref Freq 1 Config]** FrI is active.
- If the assigned input or bit is at 1, **[Ref.1B channel]** FrIb is active.

[Ref 1B switching] rCb is forced to **[Ref Freq Channel 1]** FrI if **[Control Mode]** CHCF is set to **[Not separ.]** SIM with **[Ref Freq 1 Config]** FrI assigned via the terminals (analog inputs, pulse input).

Setting	Code / Value	Description
[Ref Freq Channel 1]	FrI	Reference channel = channel 1 (for RFC)
[Ref.1B channel]	FrIb	Reference channel = channel 2 (for RFC)
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8

Setting	Code / Value	Description
[DI11]...**[DI16]**	L I 1 1...L I 16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	C d 0 0...C d 1 0	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** I O configuration
[CD11]...**[CD15]**	C d 1 1...C d 1 5	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C 1 0 1...C 1 1 0	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** I O configuration
[C111]...**[C115]**	C 1 1 1...C 1 1 5	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C 2 0 1...C 2 1 0	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** I O configuration
[C211]...**[C215]**	C 2 1 1...C 2 1 5	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C 3 0 1...C 3 1 0	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** I O configuration
[C311]...**[C315]**	C 3 1 1...C 3 1 5	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C 5 0 1...C 5 1 0	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** I O configuration
[C511]...**[C515]**	C 5 1 1...C 5 1 5	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Reverse Disable] r I n

Reverse directions disable.

Lock of movement in reverse direction does not apply to direction requests sent by digital inputs.

Reverse direction requests sent by digital inputs are taken into account.

Reverse direction requests sent by the Graphic Display Terminal or sent by the line are not taken into account.

Any reverse speed reference originating from the PID, summing input, and so on, is interpreted as a zero reference (0 Hz).

Setting	Code / Value	Description
[No]	n o	No
[Yes]	Y E S	Yes **Factory Setting**

[Control Mode] C H C F

Mixed mode configuration.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

Disabling **[I/O profile]** I O resets the drive to the factory settings.

- Verify that restoring the factory settings is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[Not separ.]	S I M	Reference and command, not separate **Factory Setting**
[Separate]	S E P	Separate reference and command. This assignment cannot be accessed in **[I/O profile]** I O
[I/O profile]	I O	I/O profile

[Command Switching] CCS ★

Control channel switch.

This parameter can be accessed if **[Control Mode]** CHCF is set to **[Separate]** SEP or to **[I/O profile]** IO.

If the assigned input or bit is at 0, channel **[Cmd channel 1]** Cd1 is active.If the assigned input or bit is at 1, channel **[Cmd channel 2]** Cd2 is active.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example an inversion of the direction of the rotation of the motor, a sudden acceleration or a stop.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[Command channel 1]	Cd1	Command channel = channel 1 (for CCS) **Factory setting**
[Command channel 2]	Cd2	Command channel = channel 2 (for CCS)
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Cmd channel 1] Cd1 ★

Command channel 1 assignment.

This parameter can be accessed if **[Control Mode]** CHCF is set to **[Separate]** SEP or **[I/O profile]** IO.

Setting	Code / Value	Description
[Terminals]	tEr	Terminal block source **Factory Setting**
[Ref. Freq- Rmt. Term]	LCC	Reference Frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	nEt	Reference frequency via fieldbus module if a fieldbus module has been inserted
[Embedded Ethernet]	EtH	Embedded Ethernet

[Cmd channel 2] CD2 ★

Command channel 2 assignment.

This parameter can be accessed if **[Control Mode]** CHCF is set to **[Separate]** SEP or **[I/O profile]** IO.

Identical to **[Cmd channel 1]** CD1 with factory setting **[Ref. Freq- Modbus]** MDB.

[Freq Switch Assign] RFC

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example an inversion of the direction of the rotation of the motor, a sudden acceleration or a stop.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

frequency switching assignment.

If the assigned input or bit is at 0, channel **[Ref Freq Channel 1]** FR1 is active.

If the assigned input or bit is at 1, channel **[Ref Freq Channel 2]** FR2 is active.

Setting	Code / Value	Description
[Ref Freq Channel 1]	FR1	Reference channel = channel 1 (for RFC)
[Ref Freq Channel 2]	FR2	Reference channel = channel 2 (for RFC)
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Ref Freq 2 Config] F r 2

Configuration reference frequency 2.

Setting	Code / Value	Description
[Not Configured]	n o	Not assigned. If **[Control Mode]** C H C F is set to**[Not separ.]** S i M, the command is at the terminals with a zero reference. If **[Control Mode]** C H C F is set to **[Separate]** S E P or **[I/O profile]** i o, the reference is zero. **Factory Setting**
[AI1]...**[AI3]**	A i 1...A i 3	Analog input AI1...AI3
[AI4]...**[AI5]**	A i 4...A i 5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	u P d t	+/– speed command assigned to DIx
[Ref.Freq-Rmt.Term]	L C C	Display terminal source
[Ref. Freq-Modbus]	M d b	Reference frequency via Modbus
[Ref. Freq-CANopen]	C A n	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	n E t	Reference frequency via fieldbus module if a fieldbus module has been inserted
[Embedded Ethernet]	E t h	Integrated Ethernet
[DI7 PulseInput]...**[DI8 PulseInput]**	P i 7...P i 8	Digital input DI7...DI8 used as pulse input

[Copy Ch1-Ch2] C o P

Copy channel 1 reference frequency to channel 2.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

This parameter can cause unintended movements, for example an inversion of the direction of the rotation of the motor, a sudden acceleration or a stop.

- Verify that the setting of this parameter does not cause unintended movements.
- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Can be used to copy the current reference and/or the command with switching in order to avoid speed surges, for example.

If **[Control Mode]** C H C F *(see page 218)* is set to **[Not separ.]** S i M or **[Separate]** S E P, copying is possible only from channel 1 to channel 2.

If **[Control Mode]** C H C F is set to **[I/O profile]** i o, copying is possible in both directions.A reference or a command cannot be copied to a channel on the terminals.The reference copied is **[Pre-Ramp Ref Freq]** F r H (before ramp) unless the destination channel reference is set via +/– speed. In this case, the reference copied is **[Output frequency]** r F r (after ramp).

Setting	Code / Value	Description
[No]	n o	No copy **Factory Setting**
[Reference Frequency]	S P	Copy reference
[Command]	C d	Copy command
[Cmd + Ref Frequency]	A L L	Copy reference and command

As the Graphic Display Terminal may be selected as the command and/or reference channel, its action modes can be configured.

Comments:

- The Graphic Display Terminal command/reference is only active if the command and/or reference channels from the terminal are active except for BMP with Local/ Remote key (command via the Graphic Display Terminal), which takes priority over these channels. Press Local/ Remote key again to revert control to the selected channel.
- Command and reference via the Graphic Display Terminal are impossible if the latter is connected to more than one drive.
- The preset PID reference functions can only be accessed if **[Control Mode]** CHCF is set to **[Not separ.]** SIM or **[Separate]** SEP.
- The command via the Graphic Display Terminal can be accessed regardless of the **[Control Mode]** CHCF.

[Forced Local Freq] FLOC

Forced local reference source assignment.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned (control via the terminals with zero reference) **Factory Setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref.Freq-Rmt.Term]	LCC	Display terminal source
[DI7 PulseInput]...**[DI8 PulseInput]**	P17...P18	Digital input DI7...DI8 used as pulse input

[Time-out Forc. Local] FLOT ★

Time for channel confirmation after forced local.

This parameter can be accessed if **[Forced Local Assign]** FLO is not set to **[No]** nO.

Setting	Description
0.1...30.0 s	Setting range **Factory setting**: 10.0 s

[Forced Local Assign] FLO

Forced local assignment.

Forced local mode is active when the input is at state 1.

[Forced Local Assign] FLO is forced to **[No]** nO if **[Control Mode]** CHCF is set to **[I/O profile]** IO.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted

[Reverse Assign] rrS

Reverse assignment.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[2/3-wire control] tCC

2-wire or 3-wire control.

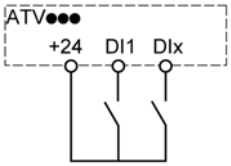
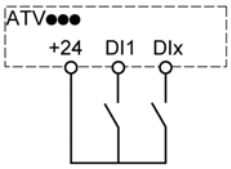
⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

If this parameter is changed, the parameters **[Reverse Assign]** rrS and **[2-wire type]** tCt and the assignments of the digital inputs are reset to the factory setting.

Verify that this change is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[2-Wire Control]	2C	**2-wire control (level commands):** This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping. Example of **source** wiring:  **DI1** Forward **DIx** Reverse **Factory setting**
[3-Wire Control]	3C	**3-wire control (pulse commands) [3 wire]:** A **forward** or **reverse** pulse is sufficient to command starting, a **stop** pulse is sufficient to command stopping. Example of **source** wiring:  **DI1** Stop **DI2** Forward **DIx** Reverse

[2-wire type] tCt ★

Type of 2-wire control.

This parameter can be accessed if **[2/3-wire control]** tCC is set to **[2-Wire Control]** 2C.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that the parameter setting is compatible with the type of wiring used.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Setting	Code / Value	Description
[Level]	LEL	State 0 or 1 is taken into account for run (1) or stop (0)
[Transition]	trn	A change of state (transition or edge) is necessary to initiate operation in order to avoid accidental restarts after a break in the supply mains **Factory setting**
[Level With Fwd Priority]	PFo	State 0 or 1 is taken into account for run or stop, but the “forward” input takes priority over the “reverse” input

[Stop Key Enable] PSt 

Stop key enable.

⚠ WARNING

LOSS OF CONTROL

This function disables the Stop key of the Display Terminal if the setting of the parameter **[Command Channel]** CMdC is not HMI.

Only set this parameter to no if you have implemented appropriate alternative stop functions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This is a freewheel stop. If the active command channel is the Graphic Display Terminal, the stop is performed according to the **[Type of stop]** Stt irrespective of the configuration of **[Stop Key Enable]** PSt.

Setting	Code / Value	Description
[No]	no	–
[Yes]	YES	Gives priority to the STOP key on the Graphic Display Terminal when the Graphic Display Terminal is not enabled as the command channel **Factory Setting**

[HMI cmd.] bMP

HMI command.

Setting	Code / Value	Description
[Stop]	StoP	Stops the drive (although the controlled direction of operation and reference of the previous channel are copied (to be taken into account on the next RUN command))
[Bumpless]	buMP	Does not stop the drive (the controlled direction of operation and the reference of the previous channel are copied)
[Disabled]	dIS	Disabled **Factory Setting**

Section 8.5
[Pump functions] - [PID controller]

What Is in This Section?

This section contains the following topics:

[PID controller] PId - Overview

About This Menu

NOTE: This function cannot be used with some other functions.

Block Diagram

The function is activated by assigning an analog input to the PID feedback (measurement).

The PID feedback needs to be assigned to one of the analog inputs AI1 to AI5 or a pulse input, according to whether any I/O extension module has been inserted.

The PID reference needs to be assigned to the following parameters:

- Preset references via digital inputs (**[Ref PID Preset 2]** rP2, **[Ref PID Preset 3]** rP3, **[Ref PID Preset 4]** rP4).
- In accordance with the configuration of **[Intern PID Ref]** PII:
  - **[Internal PID ref]** rP1, or
  - Reference A **[Ref Freq 1 Config]** FrI or **[Ref.1B channel]** FrIb.

Combination Table for Preset PID References:

DI (Pr4)	DI (Pr2)	Pr2 = no	Reference
			rP1 or FrI(b)
0	0		rP1 or FrI(b)
0	1		rP2
1	0		rP3
1	1		rP4

A predictive speed reference can be used to initialize the speed on restarting the process.

Scaling of feedback and references:

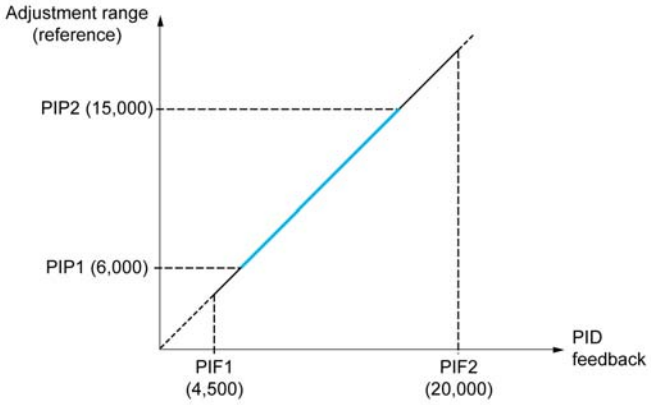
- **[Min PID feedback]** PIF1, **[Max PID feedback]** PIF2 parameters can be used to scale the PID feedback (sensor range). This scale must be maintained for all other parameters.
- **[Min PID Process]** PIP1, **[Max PID Process]** PIP2 parameters can be used to scale the adjustment range, for example the reference. **Check that the adjustment range remains within the sensor range.**

The maximum value of the scaling parameters is 32,767. To facilitate the installation, it is recommended to use values as close as possible to this maximum level, while retaining powers of 10 in relation to the actual values. The scaling is without unit if **[Type of control]** toCt is set to **[NA]** nA, in % if set to **[OTHER]** otHEr.

Example

Adjustment of the volume in a tank, 6...15 m3.

- Probe used 4-20 mA, 4.5 m^3 for 4 mA and 20 m^3 for 20 mA, with the result that **[PID Feedback 1]** PIF1 = 4,500 and **[PID Feedback 2]** PIF2 = 20,000.
- Adjustment range 6 to 15 m^3, with the result that **[PID Ref.1 Channel]** PIP1 = 6,000 (min. reference) and **[PID Ref.2 Channel]** PIP2 = 15,000 (max. reference).
- Example references:
  - **[Internal PID ref.]** rPI (internal reference) = 9,500
  - **[PID Preset Ref. 2]** rP2 (preset reference) = 6,500
  - **[PID Preset Ref. 3]** rP3 (preset reference) = 8,000
  - **[PID Preset Ref. 4]** rP4 (preset reference) = 11,200



Other parameters:

- Reversal of the direction of correction **[PID Inversion]** PIC. If **[PID Inversion]** PIC is set to **[No]** nO, the speed of the motor increases when the detected error is positive (for example pressure control with a compressor). If **[PID Inversion]** PIC is set to **[Yes]** YES, the speed of the motor decreases when the detected error is positive (for example temperature control using a cooling fan).
- The integral gain may be short-circuited by a digital input.
- A warning on the **[PID feedback]** PIF may be configured.
- A warning on the **[PID error]** rPE may be configured.

"Manual - Automatic" Operation with PID

This function combines the PID controller, the preset speeds, and a manual reference. Depending on the state of the digital input, the speed reference is given by the preset speeds or by a manual reference input via the PID function.

Manual PID reference **[Manual PID reference]** PIM:

- Analog inputs AI1 to AI5
- Pulse inputs

Predictive speed reference **[Predictive Speed Ref]** FPI:

- **[AI1]** AI1: analog input
- **[AI2]** AI2: analog input
- **[AI3]** AI3: analog input
- **[AI4]** AI4: analog input if VW3A3203 I/O extension module has been inserted
- **[AI5]** AI5: analog input if VW3A3203 I/O extension module has been inserted
- **[DI7 PulseInput]** PI7: pulse input
- **[DI8 PulseInput]** PI8: pulse input
- **[Ref.Freq-Rmt.Term]** LCC: Graphic Display Terminal
- **[Modbus]** Mdb: integrated Modbus
- **[CANopen]** CAn: CANopen® (if inserted)
- **[Com. Module]** nEt: fieldbus option module (if inserted)
- **[Embedded Ethernet]** EtH: integrated Ethernet

Setting Up the PID Controller

1. Configuration in PID mode.

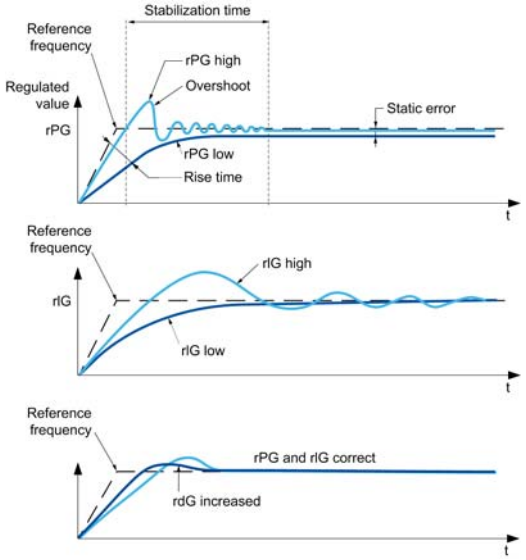
Refer to the Block Diagram *(see page 227)*.

2. Perform a test in factory settings mode.

To optimize the drive, adjust **[PID Prop.Gain]** rPG or **[PID Intgl.Gain]** rIG gradually and independently, and observe the effect on the PID feedback in relation to the reference.

3. If the factory settings are unstable or the reference is incorrect.

Step	Action
1	Perform a test with a speed reference in Manual mode (without PID controller) and with the drive on load for the speed range of the system: ● In steady state, the speed must be stable and comply with the reference, and the PID feedback signal must be stable. ● In transient state, the speed must follow the ramp and stabilize quickly, and the PID feedback must follow the speed. If not, see the settings for the drive and/or sensor signal and wiring.
2	Switch to PID mode.
3	Set **[PID ramp]** PrP to the minimum permitted by the mechanism without triggering an **[DC Bus Overvoltage]** obF.
4	Set the integral gain **[PID Intgl.Gain]** rIG to minimum.
5	Leave the derivative gain **[PID derivative gain]** rdG at 0.
6	Observe the PID feedback and the reference.
7	Switch the drive ON/OFF a number of times or vary the load or reference rapidly a number of times.
8	Set the proportional gain **[PID Prop.Gain]** rPG in order to ascertain the compromise between response time and stability in transient phases (slight overshoot and 1 to 2 oscillations before stabilizing).
9	If the reference varies from the preset value in steady state, gradually increase the integral gain **[PID Intgl.Gain]** rIG, reduce the proportional gain **[PID Prop.Gain]** rPG in the event of instability (pump applications), find a compromise between response time and static precision (see diagram).
10	Lastly, the derivative gain may permit the overshoot to be reduced and the response time to be improved, although this is more difficult to obtain a compromise in terms of stability, as it depends on 3 gains.
11	Perform in-production tests over the whole reference range.



The oscillation frequency depends on the system kinematics:

Parameter	Rise time	Overshoot	Stabilization time	Static error
rPG +	- -	+	=	-
rIG +	-	+ +	+	- -
rdG +	=	-	-	=

[Feedback] F d b - Menu

Access

[Complete settings] ➡ [Pump functions] ➡ [PID controller] ➡ [Feedback]

About This Menu

NOTE: This function cannot be used with some other functions.

[Type of Control] t o C t

Type of control for the PID = unit choice.

Setting	Code / Value	Description
[nA]	n A	(without unit) **Factory setting**
[Other]	o t H E r	Other control and unit (%)

[PID Feedback] P , F

PID controller feedback.

Setting	Code / Value	Description
[No]	n o	Not assigned **Factory setting**
[AI1]...**[AI3]**	A , 1...A , 3	Analog input AI1...AI3
[AI4]...**[AI5]**	A , 4...A , 5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[AI Virtual 1]	A , V 1	Virtual analogic input 1
[DI7 PulseInput]...**[DI8 PulseInput]**	P , 7...P , 8	Digital input DI7...DI8 used as pulse input

[AI1 Type] A , 1 t ★

Configuration of analog input AI1.

This parameter can be accessed if **[PID Feedback]** P , F is set to **[AI1]** A , 1.

Setting	Code / Value	Description
[Voltage]	1 0 u	0-10 Vdc **Factory setting**
[Current]	0 A	0-20 mA
[PTC Management]	P t C	1 to 6 PTC (in serial)
[KTY]	K t Y	1 KTY84
[PT100]	1 P t 2	1 PT100 connected with 2 wires
[PT1000]	1 P t 3	1 PT1000 connected with 2 wires

[AI1 min value] u , L 1 ★

AI1 voltage scaling parameter of 0%.

This parameter can be accessed if:

- **[PID Feedback]** P , F is set to **[AI1]** A , 1, and
- **[AI1 Type]** A , 1 t is not set to **[Voltage]** 1 0 u.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 0.0 Vdc

[AI1 max value] uH1 ★

AI1 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI1]** AI1, and
- **[AI1 Type]** AI1t is not set to **[Voltage]** 10U.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 10.0 Vdc

[AI1 min. value] CrL1 ★

AI1 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI1]** AI1, and
- **[AI1 Type]** AI1t is not set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 0.0 mA

[AI1 max. value] CrH1 ★

AI1 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI1]** AI1, and
- **[AI1 Type]** AI1t is not set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 20.0 mA

[AI2 Type] AI2t ★

Configuration of analog input AI2.

This parameter can be accessed if **[PID Feedback]** PIF is set to **[AI2]** AI2.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc
[Voltage +/-]	n10U	-10/+10 Vdc **Factory setting**

[AI2 min value] uL2 ★

AI2 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI2]** AI2, and
- **[AI2 Type]** AI2t is not set to **[Voltage]** 10U.

Identical to **[AI1 min value]** uL1 *(see page 230)*.

[AI2 max value] uH2 ★

AI2 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI2]** AI2, and
- **[AI2 Type]** AI2t is not set to **[Voltage]** 10U.

Identical to **[AI1 max value]** uH1 *(see page 231)*.

[AI3 Type] A I 3 t ★

Configuration of analog input AI3.

This parameter can be accessed if **[PID Feedback]** P I F is set to **[AI3]** A I 3.

Identical to **[AI1 Type]** A I 1 t with factory setting: **[Current]** 0 A *(see page 231)*.

[AI3 min value] u I L 3 ★

AI3 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Voltage]** 1 0 u.

Identical to **[AI1 min value]** u I L 1 *(see page 230)*.

[AI3 max value] u I H 3 ★

AI3 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Voltage]** 1 0 u.

Identical to **[AI1 max value]** u I H 1 *(see page 231)*.

[AI3 min. value] C r L 3 ★

AI3 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Current]** 0 A.

Identical to **[AI1 min. value]** C r L 1 *(see page 231)*.

[AI3 max. value] C r H 3 ★

AI3 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Current]** 0 A.

Identical to **[AI1 max. value]** C r H 1 *(see page 231)*.

[AI4 Type] A I 4 t ★

Configuration of analog input AI4.

This parameter can be accessed if:
- VW3A3203 I/O extension module has been inserted, and
- **[PID Feedback]** P I F is set to **[AI4]** A I 4.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc
[Current]	0A	0-20 mA **Factory setting**
[Voltage +/-]	n10U	-10/+10 Vdc
[PTC Management]	PTC	1 to 6 PTC (in serial)
[KTY]	KTY	1 KTY84
[PT1000]	1PT3	1 PT1000 connected with 2 wires
[PT100]	1PT2	1 PT100 connected with 2 wires
[3 PT1000]	3PT3	3 PT1000 connected with 2 wires
[3 PT100]	3PT2	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	1PT33	1 PT1000 connected with 3 wires (AI4 & AI5 only)
[PT100 in 3 wires]	1PT23	1 PT100 connected with 3 wires (AI4 & AI5 only)
[3 PT1000 in 3 wires]	3PT33	3 PT1000 connected with 3 wires (AI4 & AI5 only)
[3 PT100 in 3 wires]	3PT23	3 PT100 connected with 3 wires (AI4 & AI5 only)

[AI4 min value] U I L 4 ★

AI4 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4 t is not set to **[Voltage]** 10U.

Identical to **[AI1 min value]** U I L 1 *(see page 230)*.

[AI4 max value] U I H 4 ★

AI4 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4 t is not set to **[Voltage]** 10U.

Identical to **[AI1 max value]** U I H 1 *(see page 231)*.

[AI4 min. value] C r L 4 ★

AI4 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4 t is not set to **[Current]** 0A.

Identical to **[AI1 min. value]** C r L 1 *(see page 231)*.

[AI4 max. value] C r H 4 ★

AI4 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4 t is not set to **[Current]** 0A.

Identical to **[AI1 max. value]** C r H 1 *(see page 231)*.

[AI5 Type] A I 5 t ★

Configuration of analog input AI5.

This parameter can be accessed if:
- VW3A3203 I/O extension module has been inserted, and
- **[PID Feedback]** P I F is set to **[AI5]** A I 5.

Identical to **[AI4 Type]** A I 4 t *(see page 233)*.

[AI5 min value] u I L 5 ★

AI5 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I 5, and
- **[AI5 Type]** A I 5 t is not set to **[Voltage]** I O u.

Identical to **[AI1 min value]** u I L 1 *(see page 230)*.

[AI5 max value] u I H 5 ★

AI5 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I 5, and
- **[AI5 Type]** A I 5 t is not set to **[Voltage]** I O u.

Identical to **[AI1 max value]** u I H 1 *(see page 231)*.

[AI5 min. value] C r L 5 ★

AI5 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I 5, and
- **[AI5 Type]** A I 5 t is not set to **[Current]** O A.

Identical to **[AI1 min. value]** C r L 1 *(see page 231)*.

[AI5 max. value] C r H 5 ★

AI5 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I 5, and
- **[AI5 Type]** A I 5 t is not set to **[Current]** O A.

Identical to **[AI1 max. value]** C r H 1 *(see page 231)*.

[Min PID feedback] P I F 1 ★

Minimum PID feedback.

This parameter can be accessed if **[PID Feedback]** P I F is not set to **[No]** n o.

Setting	Description
0...**[Max PID feedback]** P I F 2	Setting range **Factory setting**: 100

[Max PID feedback] P I F 2 ★

Maximum PID feedback.

This parameter can be accessed if **[PID Feedback]** P I F is not set to **[No]** n o.

Setting	Description
[Min PID feedback] P I F 1...32,767	Setting range **Factory setting**: 1,000

[PID feedback] rPF ★

Value for PID feedback, display only.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[No]** nO.

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Min Fbk Warning] PAL ★

Minimum feedback level warning.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[No]** nO.

Setting	Description
0...65,535	Setting range **Factory setting**: 100

[Max Fbk Warning] PAH ★

Maximum feedback level warning.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[No]** nO.

Setting	Description
0...65,535	Setting range **Factory setting**: 1,000

[Reference frequency] rF - Menu

Access

[Complete settings] ➡ [Pump functions] ➡ [PID controller] ➡ [Reference frequency]

About This Menu

NOTE: This function cannot be used with some other functions.

[Intern PID Ref] Pii ★

Internal PID controller reference.

This parameter can be accessed if **[PID Feedback]** PiF is not set to **[Not Configured]** nO.

Setting	Code / Value	Description
[No]	nO	The PID controller reference is given by **[Ref Freq 1 Config]** Fr1 or **[Ref.1B channel]** Fr1b with summing/subtraction/multiplication functions. Refer to the block diagram *(see page 227)*. **Factory setting**
[Yes]	YES	The PID controller reference is internal via **[Internal PID ref]** rPi.

[Ref Freq 1 Config] Fr1 ★

Configuration reference frequency 1.

This parameter can be accessed if:

- **[PID Feedback]** PiF is not set to **[Not Configured]** nO, and
- **[Intern PID Ref]** Pii is set to **[No]** nO.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[AI1]	AI1	Analog input AI1 **Factory Setting**
[AI2]...**[AI3]**	AI2...AI3	Analog input AI2...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	UPdt	Up/Down function is assigned by DIx
[Ref. Freq- Rmt. Term]	LCC	Reference Frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	nEt	Reference frequency via fieldbus module if a fieldbus module has been inserted
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Min PID reference] PiP1 ★

Minimum PID reference.

This parameter can be accessed if **[PID Feedback]** PiF is not set to **[Not Configured]** nO.

Setting ❮❯	Description
[Min PID feedback] PiF1...**[Max PID reference]** PiP2	Setting range **Factory setting**: 150

[Max PID reference] PIP2 ★

Maximum PID reference.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[Not Configured]** nO.

Setting	Description
[Min PID reference] PIP1...**[Max PID feedback]** PIF2	Setting range **Factory setting**: 900

[Internal PID ref] rPI ★

Internal PID controller reference.

This parameter can be accessed if:

- **[PID Feedback]** PIF is not set to **[Not Configured]** nO, and
- **[Intern PID Ref]** PII is set to **[Yes]** YES.

Setting	Description
[Min PID reference] PIP1...**[Max PID reference]** PIP2	Setting range **Factory setting**: 150

[Auto/Manual assign.] PAU ★

Auto/Manual select input.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[Not Configured]** nO.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Manual PID Reference] PIM ★

Manual PID reference.

Reference input in manual mode.

This parameter can be accessed if:
- **[PID Feedback]** PIF is not set to **[Not Configured]** nO, and
- **[Auto/Manual assign.]** PAU is not set to **[No]** nO.

The preset speeds are active on the manual reference if they have been configured.

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[PID preset references] PrI - Menu

Access

[Complete settings] ➡ [Pump functions] ➡ [PID controller] ➡ [Reference frequency] ➡ [PID preset references]

About This Menu

The function can be accessed if **[PID feedback ass.]** PIF is assigned.

[2 PID Preset Assign] Pr2

2 PID preset assignment.

If the assigned input or bit is at 0, the function is inactive.

If the assigned input or bit is at 1, the function is active.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[4 PID Preset Assign] Pr4

4 PID preset assignment.

Identical to **[2 PID Preset Assign]** Pr2 *(see page 239)*.

Verify that **[2 PID Preset Assign]** Pr2 has been assigned before assigning this function.

[Ref PID Preset 2] rP2 ★

Second PID preset reference.

This parameter can be accessed only if **[2 PID Preset Assign]** Pr2 is assigned.

Setting ❮❯	Description
[Min PID reference] PIP1...**[Max PID reference]** PIP2	Setting range **Factory setting**: 300

[Ref PID Preset 3] rP3 ★

Third PID preset reference.

This parameter can be accessed only if **[4 preset PID ref.]** Pr4 is assigned.

Setting ❮❯	Description
[Min PID reference] P1P1...**[Max PID reference]** P1P2	Setting range **Factory setting**: 600

[Ref PID Preset 4] rP4 ★

Fourth PID preset reference.

This parameter can be accessed only if **[2 preset PID ref.]** Pr2 and **[4 preset PID ref.]** Pr4 are assigned.

Setting ❮❯	Description
[Min PID reference] P1P1...**[Max PID reference]** P1P2	Setting range **Factory setting**: 900

[Reference frequency] rF - Menu

Access

[Complete settings] ➡ **[Pump functions]** ➡ **[PID controller]** ➡ **[Reference frequency]**

[Predictive Speed Ref] FPI ★

Predictive speed reference.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr.
- **[PID feedback]** PIF is not set to **[No]** nO

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref. Freq- Rmt.Term]	LCC	Reference frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen
[Ref. Freq-Com. Module]	nEt	Reference frequency via communication module
[Embedded Ethernet]	EtH	Embedded Ethernet
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Speed Input %] PSr ★

PID speed input % reference.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Description
1...100%	Setting range **Factory setting**: 100%

[Settings] 5t - Menu

Access

[Complete settings] ➡ **[Pump functions]** ➡ **[PID controller]** ➡ **[Settings]**

About This Menu

Following parameters can be accessed if **[PID Feedback]** PiF is not set to **[Not Configured]** no.

NOTE: This function cannot be used with some other functions.

[PID Prop.Gain] rPG ★

Proportional gain.

Setting ❮❯	Description
0.01...100.00	Setting range **Factory setting**: 1.00

[PI Intgl.Gain] rIG ★

Integral gain.

Setting ❮❯	Description
0.01...100.00	Setting range **Factory setting**: 1.00

[PID derivative gain] rdG ★

Derivative gain.

Setting ❮❯	Description
0.00...100.00	Setting range **Factory setting**: 0.00

[PID ramp] PrP ★

PID acceleration/deceleration ramp, defined to go from **[Min PID reference]** PiPI to **[Max PID reference]** PiP2 and conversely.

Setting ❮❯	Description
0.0...99.9 s	Setting range **Factory setting**: 0.0 s

[PID Inversion] PIC ★

PID inversion.

Setting	Code / Value	Description
[No]	no	No **Factory setting**
[Yes]	YES	Yes

[PID Min Output] PoL ★

PID controller minimum output in Hz.

Setting ❮❯	Description
-599.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[PID Max Output] PoH ★

PID controller maximum output in Hz.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 60.0 Hz

[PID Error Warning] PEr ★

PID error warning.

Setting ❮❯	Description
0...65,535	Setting range **Factory setting**: 100

[PID Integral OFF] PI5 ★

Integral shunt.

If the assigned input or bit is at 0, the function is inactive (the PID integral is enabled).

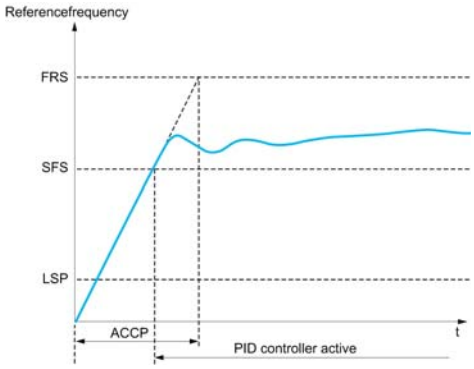
If the assigned input or bit is at 1, the function is active (the PID integral is disabled).

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** Io configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** Io configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** Io configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** Io configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** Io configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[PID acceleration time] ACCP ★

PID: acceleration during start-up.

PID start ramp can be applied before starting the PID controller to allow reaching quickly the PID reference without increasing PID gains. If configured, the **[Start Accel Ramp]** ACC S is applied up to **[Low Speed]** LSP instead of **[PID acceleration time]** ACCP.



Setting ❮❯	Description
0.01...99,99 s (1)	Setting range **Factory setting**: 0.50 s
1 Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1...6,000 s according to **[Ramp increment]** INR.	

[PID Start Ref Freq] SFS ★

PID: speed reference for start-up.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range If **[PID Start Ref Freq]** SFS is lower than **[Low speed]** LSP, this function has no effect. **Factory setting**: 0.0 Hz

Section 8.6
[Pump functions] - [Sleep/wakeup]

What Is in This Section?

This section contains the following topics:

[Sleep/Wakeup] SPW - Overview

About This Menu

Following parameters can be accessed if **[PID feedback ass.]** PIF is not set to **[Not Configured]** nO.

⚠ WARNING
UNANTICIPATED EQUIPMENT OPERATION
Verify that activating this function does not result in unsafe conditions.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

The purpose of the "Sleep / Wake-Up" function is to stop the motor in process standstill situations.

It allows you to save energy and helps to prevent premature aging of some equipment that cannot run for a long time at low speed because the greasing or cooling depends on the machine speed.

Depending on user-defined wakeup conditions, the motor is restarted automatically.

Sleep/Wake-Up in PID Control Mode

When the drive is used in PID control, one of the following conditions is used to switch the application to the sleep state:

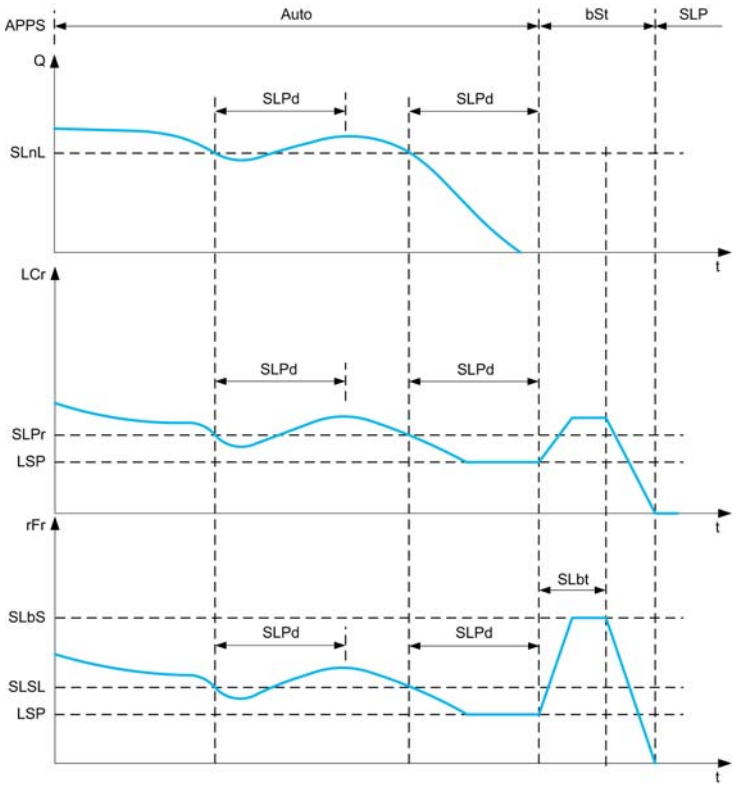
- Sleep on low speed.
- Sleep on low motor power.
- Sleep on external condition (using drive input).

The drive is in "PID control mode" when PID is active. Typically when:

- PID is configured, and
- Channel 1 is selected, and
- PID is in automatic mode.

When the drive is in a sleep state, a wake-up condition is used to restart the application:

- Wake-up on PID Feedback level
- Wake-up on PID Error level



Sleep Conditions in PID Control Mode

If there is no valid wake-up condition, then the system switches to the sleep mode after one of the configured sleep conditions remains longer than **[Sleep Delay]** SLPd.

The sleep detection mode is selected by configuring **[Sleep Detect Mode]** SLPM. Then the system switches to sleep mode if the selected condition is met:

Configuration	Condition
SW sleep on switch or external condition	The switch input becomes active
SPd sleep on speed	The output frequency is below the sleep speed
PWr sleep on power level	The output power is below the sleep power
or multiple conditions	At least 1 of the configured condition to enter in sleep mode is met

Wake-Up Conditions in PID Control Mode

The system wakes up according to **[Wake Up Mode]** WuPM configuration:
- On PID Feedback level
- On PID Error level.

If **[Feedback]** FbK is selected, then the system wakes up and goes back in PID control mode:
- When PID feedback drops below configured **[Wake Up Process Level]** WuPF if PID is configured in Direct mode, (**[PID Inversion]** PIC is set to no).
- When PID feedback raises above configured **[Wake Up Process Level]** WuPF, if PID is configured in Reverse mode (**[PID Inversion]** PIC is set to YES).

If **[Error]** Err is selected, then the system wakes up and goes back in PID control mode:
- When PID feedback drops below (**[PID reference]** rPC - **[Wake Up Process Error]** WuPE), if PID is configured in Direct mode (**[PID Inversion]** PIC is set to no).
- When PID feedback raises above (**[PID reference]** rPC + **[Wake Up Process Error]** WuPE), if PID is configured in Reverse mode (**[PID Inversion]** PIC is set to YES).

Boosting Phase in PID Control Mode

When entering the sleep mode, the motor accelerates to **[Sleep Boost Speed]** SLbS during **[Sleep Boost Time]** SLbt and then stops.

If **[Sleep Boost Time]** SLbt is set to 0, then the boost phase is ignored.

Initial State in PID Control Mode

Just after the system starts in automatic mode (a run order appears while in automatic mode - channel 1 already selected and PID auto):
- If a wake-up condition is met, the drive goes in PID control mode (PID started).
- If a wake-up condition is not met, the drive goes in sleep mode (PID stays stopped and motor is kept halted), and Boosting phase is ignored.

When the control is switched to automatic mode while the motor is running (switch to channel 1 or switch to PID auto mode for example), the drive stays in running state and switches to PID automatic mode.

Configuration of Sleep External Condition (Usage of a No Flow Switch for Example)

Sleep switch allows you to select the source of sleep external condition:
- no: no input selected for the sleep external condition.
- dIX: the sleep external condition (switch for example) is connected to DIx (the assignment is also possible on a control bit in I/O profile).

[Sleep menu] SLP - Menu

Access

[Complete settings] ➡ [Pump functions] ➡ [Sleep/Wakeup] ➡ [Sleep menu]

[Sleep Detect Mode] SLPM

Sleep detection mode.

Setting	Code / Value	Description
[No]	nO	Not configured **Factory setting**
[Switch]	SW	System enters in sleep mode on switch condition
[Speed]	SPd	System enters in sleep mode on speed condition
[Power]	PWr	System enters in sleep mode on power condition
[Multiple]	or	System enters in sleep mode on multiple-OR condition

[Sleep Switch Assign] SLPW

Sleep switch assignment.

This parameter can be accessed if **[Sleep Detect Mode]** SLPM is set to:

- **[Switch]** SW, or
- **[Multiple]** or.

Select an external condition to enter in sleep mode.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LI1L...LI8L	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LI11L...LI16L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Sleep Min Speed] SLSL ★

Sleep speed level.

Speed level under which the system should enter the sleep mode.

This parameter can be accessed if **[Sleep Detect Mode]** SLPM is set to:
- **[Speed]** SPd, or
- **[Multiple]** mr.

Setting ❮❯	Description
0...599.0 Hz	Setting range **Factory setting**: **[No]** nO

[Sleep Power Level] SLPr ★

Sleep power level.

Power level under which the system should enter the sleep mode.

This parameter can be accessed if **[Sleep Detect Mode]** SLPM is set to:
- **[Power]** PWr, or
- **[Multiple]** mr.

Setting ❮❯	Description
0...**[Nominal Motor Power]** nPr	Setting range **Factory setting**: **[No]** nO

[Sleep Delay] SLPd ★

Sleep delay.

This parameter can be accessed if **[Sleep Detect Mode]** SLPM is not set to **[Not Configured]** nO.

Setting ❮❯	Description
0...3,600 s	Setting range **Factory setting**: 20 s

[Boost] SbE - Menu

Access

[Complete settings] ➡ **[Pump functions]** ➡ **[Sleep/wakeup]** ➡ **[Sleep menu]** ➡ **[Boost]**

About This Menu

Following parameters can be accessed if **[Sleep Detect Mode]** SLPM is not set to **[No]** no.

[Sleep Boost Speed] SLbS ★

Sleep boost speed.

Setting ❮❯	Description
0...599.0 Hz	Setting range **Factory setting**: no

[Sleep Boost Time] SLbE ★

Sleep boost time.

This parameter can be accessed if **[Sleep Boost Speed]** SLbS is not set to 0.

Setting ❮❯	Description
0...3,600 s	Setting range **Factory setting**: no

[Wake up menu] WKP - Menu

Access

[Complete settings] ➡ **[Pump functions]** ➡ **[Sleep/wakeup]** ➡ **[Wake up menu]**

About This Menu

This menu can be accessed if **[Sleep Detect Mode]** SLPM is not set to **[Not Configured]** no.

[Wake Up Mode] WUPM ★

Wake-up mode.

Setting	Code / Value	Description
[Feedback]	FbK	Wake-up on PID feedback level **Factory setting**
[Error]	Err	Wake-up on PID error level

[Wake Up Process Level] WUPF ★

Wake-up process value level.

This parameter can be accessed if **[Wake Up Mode]** WUPM is set to **[FeedBack]** FbK.

Setting ❮❯	Description
[Min PID feedback] PIF1...**[Max PID feedback]** PIF2	Setting range **Factory setting**: 0

[Wake Up Process Error] WUPE ★

Wake-up process value error level.

This parameter can be accessed if **[Wake Up Mode]** WUPM is set to **[Error]** Err.

Setting ❮❯	Description
0...**[Max PID feedback]** PIF2	Setting range **Factory setting: 0,0 Hz**

Section 8.7
[Pump functions] - [Feedback monitoring]

[Feedback monitoring] FKП - Menu

Access

[Complete settings] ➡ [Pump functions] ➡ [Feedback monitoring]

About This Menu

The function is typically used to detect cases where the installation capability is exceeded or where the installation is not operating properly:

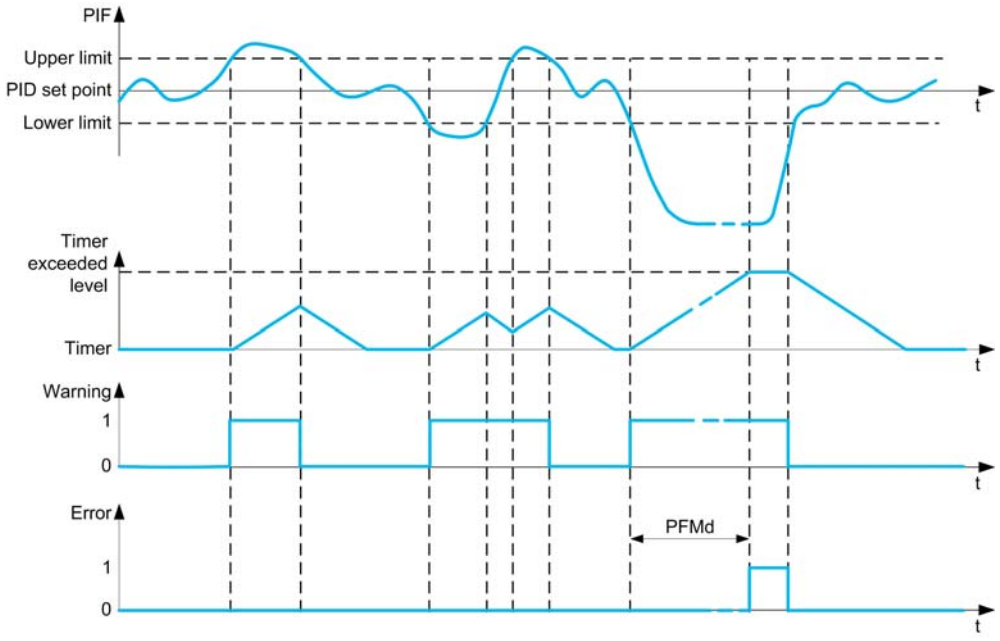
- Fire hydrant opened.
- Pump start-up with open discharge valve.
- Mechanical breakdown of pipes.
- Water leakage.

When the drive is running at high speed, this function monitors the PID feedback in order to detect if it is out of a given range around the setpoint during a configurable time.

By using a warning or a detected error, this function also indicates that:

- The capability of the installation is exceeded
- The proper control could not be ensured
- Something is wrong on the installation.

This graphic presents the PID feedback monitoring:



[PID Fdbk Monitoring] PFПП

PID feedback monitoring mode.

Parameter used to activate the function.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[Yes]	YES	Yes

[PID Fdbk Range] PFnr ★

PID feedback monitoring range.

Range within which the PID feedback value is supposed to stay in normal situation.

This parameter can be accessed if **[PID Fdbk Monitoring]** PFnn is not set to **[No]** nO.

Setting	Description
0...100%	Setting range **Factory setting**: 3%

[PID Fdbk Error Delay] PFnd ★

PID feedback monitoring delay.

Delay to trig an error after detection of an anomaly.

This parameter can be accessed if **[PID Fdbk Monitoring]** PFnn is not set to **[No]** nO.

Setting	Description
0...3,600 s	Setting range **Factory setting**: 10 s

[PID Fdbk Error Resp] PFnb ★

PID feedback monitoring response to a detected error.

Define how the drive reacts when a feedback monitoring error occurs.

This parameter can be accessed if **[PID Fdbk Monitoring]** PFnn is not set to **[No]** nO.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	StT	Stop according to **[Type of stop]** StT parameter but without an error triggered after stop
[Ramp stop]	rMP	Stop on ramp **Factory setting**

Section 8.8
[Pump functions] - [Pump start stop]

[Pump start stop] PSt - Menu

Access

[Complete settings] ➡ **[Pump functions]** ➡ **[Pump start stop]**

About This Menu

This function defines how the acceleration and deceleration are controlled during start and stop of the pump.

[Low Speed] LSP

Motor frequency at low speed.

Setting	Description
0...**[High Speed]** HSP	Setting range **Factory setting**: 0 Hz

[High Speed] HSP

Motor frequency at high speed.

Setting	Description
[Low Speed] LSP...**[Max Frequency]** tFr	Setting range **Factory setting**: 50.0 Hz

[Acceleration] ACC

Time to accelerate from 0 to the **[Nominal Motor Freq]** Fr S.

To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

Setting	Description
0.00...6,000.00 s (1)	Setting range **Factory setting**: 3.00 s
(1) Range 0.00 to 99.99 s or 0.0 to 999.9 s or 0 to 6,000 according to **[Ramp increment]** Inr	

[Deceleration] dEC

Time to decelerate from the **[Nominal Motor Freq]** Fr S to 0.

To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

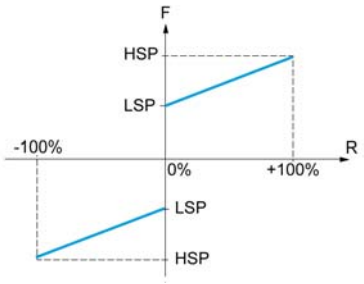
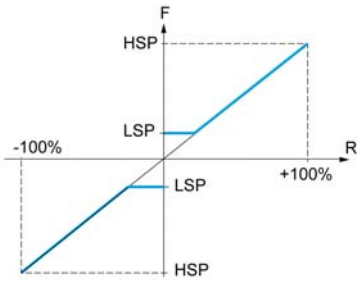
Setting	Description
0.00...6,000.00 s (1)	Setting range **Factory setting**: 3.00 s
(1) Range 0.00 to 99.99 s or 0.0 to 999.9 s or 0 to 6,000 according to **[Ramp increment]** Inr	

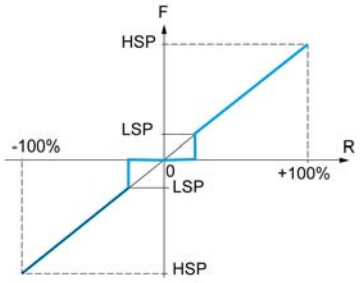
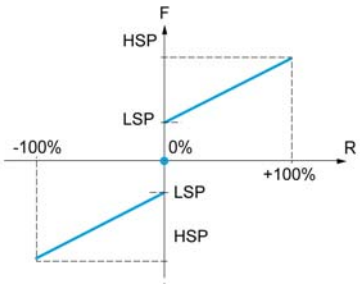
[Ref Freq Template] b S P

Reference frequency template selection.

This parameter defines how the speed reference is taken into account, for analog inputs and pulse input. In the case of the PID controller, this is the PID output reference.

The limits are set by the **[Low speed]** L S P and **[High speed]** H S P parameters

Setting ❮❯	Code / Value	Description
[Standard]	b S d	 **F** Frequency **R** Reference At zero reference the frequency = LSP **Factory setting**
[Pedestal]	b L S	 **F** Frequency **R** Reference At reference = 0 to LSP the frequency = LSP

Setting	Code / Value	Description
[Deadband]	bnS	 **F** Frequency **R** Reference At reference = 0 to LSP the frequency = 0
[Deadband 0]	bnS0	 **F** Frequency **R** Reference This operation is the same as **[Standard]** bSd, except that in the following cases at zero reference, the frequency = 0: The signal is less than **[Min nvalue]**, which is greater than 0 (example: 1 Vdc on a 2–10 Vdc input) The signal is greater than **[Min nvalue]**, which is greater than **[Max value]** (example: 11 Vdc on a 10–0 Vdc input). If the input range is configured as “bidirectional”, operation remains identical to **[Standard]** bSd.

Section 8.9
[Pump functions] - [ENA System]

[ENA System] E n A - Menu

Access

[Complete settings] ➡ **[Pump functions]** ➡ **[ENA System]**

About This Menu

ENA System is a control profile designed for rotating machines with unbalanced load. It is used primarily for oil pumps.

The operating principle applied:
- Allows operation without a braking resistor.
- Reduces mechanical stress on the rod.
- Reduces line current fluctuations.
- Reduces energy consumption by improving the electric power/current ratio.

[ENA activation] E n A ★

ENA function activation.

This parameter can be accessed if **[Motor control type]** C t t is set to **[SVC V]** U U C.

Setting ( )	Code / Value	Description
[No]	n o	Not activated **Factory setting**
[Yes]	Y E S	Activated

[ENA prop gain] G P E ★

ENA proportional gain.

This parameter can be accessed if **[ENA activation]** E n A is not set to **[No]** n o.

This setting is used to achieve a compromise between the reduced energy consumption (and/or line current fluctuations) and the mechanical stress to which the rod is subject. Energy is saved by reducing current fluctuations and increasing the current while retaining the same average speed.

Setting ( )	Description
1...9999	Setting range **Factory setting**: 250

[ENA integral gain] G iE ★

ENA integral gain.

This parameter can be accessed if **[ENA activation]** EnA is not set to **[No]** no.

This setting is used to smooth the DC bus voltage.

Start up the machine with a low integral and proportional gain (proportional 25% and integral 10%) in order to avoid an overvoltage trip in the absence of a braking resistor. See if these settings are suitable.

Recommended adjustments to be made during operation:

- To eliminate the braking resistor and, therefore, the increase in the DC bus voltage:
  Display the machine speed on the Graphic Display Terminal.
  Reduce the integral gain value until the machine speed drops
  When this point is reached, increase the integral gain until the machine speed stabilizes.
  Use the Graphic Display Terminal or an oscilloscope to check that the DC bus voltage is stable.
- To save energy:
  Reduce the proportional gain (gradually) may increase energy savings by reducing the maximum value of the line current, but it will increase speed variations and, therefore, mechanical stress.
  The aim is to identify settings that will enable energy to be saved and minimize mechanical stress.
  When reducing the proportional gain, it may be necessary to readjust the integral gain in order to avoid an overvoltage trip.

NOTE: Once the adjustments are complete, check that the pump starts up correctly. If the ENA integral gain setting is too low, this may lead to insufficient torque on startup.

Setting ❮❯	Description
0...9999	Setting range **Factory setting**: 100

[Reduction ratio] rAP ★

Reduction ratio in ENA system.

This parameter can be accessed if **[ENA activation]** EnA is not set to **[No]** no.

This setting corresponds to the motor speed ahead of gearbox/speed after gearbox ratio.

This parameter is used to display the average speed in Hz and the machine speed in customer units (e.g., in strokes per minute) on the Graphic Display Terminal.

In order to be displayed on the Graphic Display Terminal, these values must be selected in the **[Display]** Mon - menu.

Adjustment recommendations for prevention of tripping on an **[Motor Overspeed]** SoF error, **[ENA System]** authorizes overspeed, which can trigger an **[Motor Overspeed]** SoF error.

To avoid this occurring, it is advisable to increase the value of the following parameters slightly:

- **[Max Frequency]** tFr
- **[Overspd. pulse thd.]** F9A, if the "frequency meter" function is configured

Setting ❮❯	Description
10.0...999.9	Setting range **Factory setting**: 10.0

Section 8.10
[Pump monitoring] - [Pumpcycle monitoring]

[Pumpcycle monitoring] CSP - Menu

Access

[Complete settings] ➡ **[Pump monitoring]** ➡ **[Pumpcycle monitoring]**

About This Menu

The purpose of this function is to monitor the number of start sequences during a configured time window in order to prevent from an unwanted aging of the system and to detect any abnormal operation.

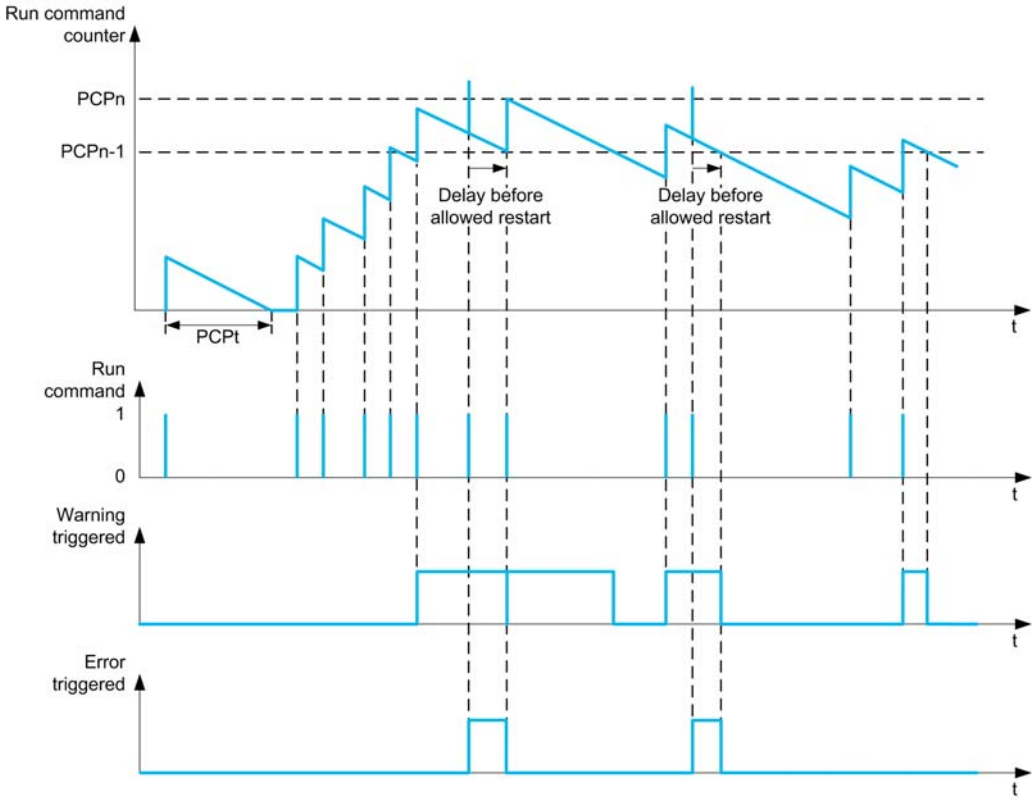
An internal counter counts the number of pump start sequences. Each time the pump is started, the counter is incremented. It is decreased by one every time window corresponding to one start.

If the counter reaches the maximum number allowed **[PumpCycle MaxStarts]** PCPn, a warning **[Pump Cycle warning]** PCPA is triggered.

If a start command occurs while the detected warning is active, an error **[PumpCycle Start Error]** PCPF is triggered. The application follows the **[PumpCycleError Resp]** PCPb defined behavior.

Restarting the pump is allowed as soon as the counter decreases under the maximum number of starts allowed, if the detected error has been cleared.

The function is based on the sliding time window in which the pump start commands are counted.



If **[PumpCycle Monitoring]** PCPM is set to **[Mode 1]** nor M, the function is activated without power Off time management.

If **[PumpCycle Monitoring]** PCPM is set to **[Mode 2]** rtC, the function is activated with power Off time management. This requires a time clock source such as the Graphic Display Terminal plugged at power On of the drive, or a Time server configured over Ethernet.

[PumpCycle Monitoring] PCPM

Pumpcycle monitoring mode.

Setting	Code / Value	Description
[No]	nO	Cyclic monitoring disabled **Factory setting**
[Mode 1]	nOrM	Cyclic monitoring without power off time management
[Mode 2]	rtC	Cyclic monitoring with power off time management

[PumpCycle MaxStarts] PCPn ★

Maximum number of events to trip.

This parameter can be accessed if **[PumpCycle Monitoring]** PCPM is not set to **[No]** nO.

Setting ❮❯	Description
1...99	Setting range **Factory setting**: 6

[PumpCycle Timeframe] PCPt ★

Window time.

This parameter can be accessed if PCPM is not set to **[Inactive]** nO.

Setting ❮❯	Description
0...3,600 min	Setting range **Factory setting**: 60 min

[PumpCycleError Resp] PCPb ★

Pumpcycle monitoring response to a detected error.

This parameter can be accessed if PCPM is not set to **[Inactive]** nO.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**

Section 8.11
[Pump monitoring] - [Thermal monitoring]

[Thermal monitoring] tPP- Menu

Access

[Complete settings] ➡ **[Pump monitoring]** ➡ **[Thermal monitoring]**

About This Menu

Identical to **[Thermal monitoring]** tPP- Menu *(see page 181)*.

Section 8.12
[Master/Slave]

About This Menu

NOTE: This feature is not supported by the current firmware version.

What Is in This Section?

This section contains the following topics:

[M/S System Architecture] MSA - Menu

Access

[Complete settings] ➜ [Master/Slave] ➜ [M/S System Architecture]

About This Menu

The purpose of this menu is to manage the sharing of data between the drives involved in Master/Slave architecture. This menu is associated to Master/Slave control functions related to the mechanical coupling type.

Master/Slave Management

The **Master/Slave management** has different functionalities, which are:

- **Master/Slave architecture configuration**: allows configuring which drive is the master and which ones are slaves and specific configurations like the type of mechanical coupling.
- **Master/Slave architecture alarms and faults**: provides alarms in case of bad configuration (no master in the system for example) or impossibility to work properly (communication link loss).
- **Master/Slave System Monitoring**: gives information on slave data to the master for monitoring purposes.

[M/S Comm Mode] MSCM ★

Master / Slave communication mode.

Activate Master Slave and select communication mode to exchange data between drives involved in the Master Slave architecture.

Setting	Code / Value	Description
[No]	nO	Master/Slave is not configured. **Factory setting**
[MultiDrive Link]	d2d	Master/Slave is configured using a multi-drive link
[Analog]	AnA	Master/Slave is configured using Analog I/Os. It is recommended to wire a digital output of the slave assigned to **[Operating State Fault]** FLt to a digital input of the master set to **[Ext Error assign]** EtF, with this setting, an error on the slave drive generates a stop to the master.

[M/S Device ID] MS id ★

Master / Slave ID selection.

This parameter selects the Drive identification number for the Master Slave application.

This parameter can be accessed if **[M/S Comm Mode]** MSCM is set to **[MultiDrive Link]** d2d

Setting	Code / Value	Description
[Master]	MStEr	Master **Factory setting**
[Slave1]...**[Slave10]**	SLV 1...SLV 10	Slave ID

[M/S Device Role] MSdt ★

Master / Slave selection.

Select if the drive is the master or a slave.

This parameter can be accessed if **[M/S Comm Mode]** MSCM is set to **[Analog]** AnA

Setting	Code / Value	Description
[Master]	MStEr	The Drive is configured as the Master Drive. (it provides the speed and torque reference value to Slaves).
[Slave]	SLAVE	The Drive is configured as a Slave Drive. (it uses the speed and torque reference value from the Master). **Factory setting**

[M/S Number of Slaves] nSSn ★

Master / Slave number of slaves.

Total number of slaves in the Master Slave architecture. The maximum number of slaves is 10 in multi-drive link architecture. In Analog architecture the maximum number of slaves depends on Analog I/O capabilities.This parameter can be accessed if **[M/S Comm Mode]** nSCM is set to **[MultiDrive Link]** d2d and if **[M/S Device ID]** nS id is set to **[Master]** nSter.

Setting	Description
0...10	Setting range **Factory setting**: 1

[M/S Speed Ref In Assign] nSS i ★

Master / Slave speed reference input assignment.

This parameter can be accessed if **[M/S Comm Mode]** nSCM is set to **[Analog]** AnA and if **[M/S Device Role]** nSdt is set to **[Slave]** SLAVE.

Setting	Code / Value	Description
[No]	no	Analog input is not configured **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted

[M/S Trq Ref In Assign] nSt i ★

Master / Slave torque reference input assignment.

This parameter can be accessed if

- **[M/S Control Type]** nSCt is set to **[Torque Direct]** trqd, **[Torque Reverse]** trqr or **[Torque Custom]** trqC.
- **[M/S Device Role]** nSdt is set to **[Slave]** SLAVE
- **[M/S Comm Mode]** nSCM is set to **[Analog]** AnA

Setting	Code / Value	Description
[No]	no	Analog input is not configured **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted

[M/S Speed Ref Out Assign] nSSo ★

Master / Slave output speed reference.

Analog output selected for speed reference for the Master Drive.

This parameter can be accessed if **[M/S Comm Mode]** nSCM is not set to **[No]** no.

Setting	Code / Value	Description
[No]	no	Analog output for speed reference is not configured. **Factory setting**
[AQ1 assignment]	AO1	Analog Output for speed reference is configured to AO1.
[AQ2 assignment]	AO2	Analog Output for speed reference is configured to AO2.
1 In order to monitor the loss of signal, it is recommended to use a 4-20mA link between the master and the slave and to configure the monitoring function in the **[4-20 mA loss]** LFL- menu.		

[M/S Trq Ref Out Assign] MSto ★

Master / Slave output torque reference.

Analog output selected for torque reference for the Master Drive.

Setting	Code / Value	Description
[No]	nO	Analog output for torque reference is not configured. **Factory setting**
[AQ1 assignment]	AO1	Analog Output for speed reference is configured to AO1.
[AQ2 assignment]	AO2	Analog Output for speed reference is configured to AO2.

[M/S Disable Input Assign] MSdI ★

Master / Slave disable input assignment.

Digital input selected to disable Master-Slave operation and return local control mode (for example in maintenance mode).

This parameter can be accessed if **[M/S Comm Mode]** MSCM is not set to **[No]** nO.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[M/S Comm ErrorResp] nSCb ★

Master / Slave response to a communication error.

Define how will react the drive when a multi-drive link communication error is detected.

This parameter can be accessed if **[M/S Comm Mode]** nSCn is set to **[MultiDrive Link]** d2d.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored **Factory setting**
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	Stt	Stop according to **[Type of stop]** Stt parameter but without an error triggered after stop
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop

NOTE: If the master is in **[Ramp stop]** rMP the slave has to be set to **[Freewheel Stop]** YES, **[Ignore]** no is not available for slave drives.

[M/S Device ErrorResp] nSdb ★

Master / Slave response to device error.

Define how will react the Drive when a device is lost

This parameter can be accessed if **[M/S Comm Mode]** nSCn set to **[MultiDrive Link]** d2d.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored **Factory setting**
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	Stt	Stop according to **[Type of stop]** Stt parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

NOTE: If the master is in **[Ramp stop]** rMP the slave has to be set to **[Freewheel Stop]** YES, **[Ignore]** no, **[Speed maintained]** rLS and **[Fallback Speed]** LFF are not available for slave drives.

[M/S Device Error Delay] nSdd ★

Master / Slave device error delay.

This parameter can be accessed if **[M/S Comm Mode]** nSCn is set to **[MultiDrive Link]** d2d.

Setting	Description
0...60 s	Setting range **Factory setting**: no wait infinite time

[Fallback Speed] LFF ★

Fallback speed.

This parameter can be accessed if **[M/S Device ErrorResp]** MSdb is set to **[Fallback Speed]** LFF

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[M/S Control] MSE - Menu

Access

[Complete settings] ➜ [Master/Slave] ➜ [M/S Control]

About This Menu

This function can be accessed if **[M/S Comm Mode]** MSCM is not set to **[No]** no.

[M/S Coupling Type] MSMC

Master / Slave mechanical coupling type.

Setting	Code / Value	Description
[Rigid]	rIGid	Torque direct control **Factory setting**
[Elastic]	ELASt	Elastic coupling

[M/S Control Type] MSCt ★

Master / Slave control type.

This parameter can be accessed if **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE or **[M/S Device ID]** MS id is set to **[Slave 1]**to**[Slave 10]**.

Setting	Code / Value	Description
[Torque Direct]	trqd	Torque direct control **Factory setting**
[Torque Reverse]	trqr	Torque reverse control
[Torque Custom]	trqC	Torque custom control Allow to apply a torque ratio a torque ramp in case of different motors
[Speed Direct]	SPdd	Speed direct control Is not a available if **[M/S Coupling Type]** MSMC is set to **[Rigid]** rIGid
[Speed Reverse]	SPdr	Speed reverse control Is not a available if **[M/S Coupling Type]** MSMC is set to **[Rigid]** rIGid

[M/S Torque Control] MS9- Menu

Access

[Complete settings] → **[Master/Slave]** → **[M/S Control]** → **[M/S Torque Control]**

About This Menu

This menu can be accessed if:

- **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE or **[M/S Device ID]** MS id is set to **[Slave1]** to **[Slave10]**, and
- **[M/S Control Type]** MSCt is set to:
  - **[Torque Direct]** tr9d, or
  - **[Torque Reverse]** tr9r, or
  - **[Torque Custom]** tr9C.

[Speed Ref Direction] SSd ★

Speed reference direction.

This parameter can be accessed if:

- **[M/S Comm Mode]** MSCM is not set to **[No]** no, and
- **[M/S Control Type]** MSCt is set to **[Torque Custom]** tr9c.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[Yes]	YES	Yes
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Torque ref. sign] tSd ★

Assignment for the inversion of the sign of the reference for the torque regulation function.

This parameter can be accessed if:

- **[M/S Comm Mode]** MSCM is not set to **[No]** no, and
- **[M/S Control Type]** MSCt is set to **[Torque Custom]** tr9c.

Identical to **[Speed Ref Direction]** SSd.

[Torque ratio] tRt ★

Torque ratio, This parameter is used in case of using a slave motor with a different nominal torque than the master motor.

This parameter applies a factor in % on the torque reference received from the master.

This parameter can be accessed if:
- **[M/S Comm Mode]** MSCM is not set to **[No]** no, and
- **[M/S Control Type]** MSCt is set to **[Torque Custom]** trqC.

Setting ❮❯	Description
0.0...1000.0%	Coefficient applied to **[Torque ref. channel]** tr1 or **[Torque ref. 2 channel]** tr2 **Factory setting:** 100.0%

[Torque Ref Offset] trqOP ★

Torques reference offset.

This parameter is used to scale the torque reference value.

This parameter applies an offset in % on the torque reference.

This parameter can be accessed if:
- **[M/S Comm Mode]** MSCM is not set to **[No]** no, and
- **[M/S Control Type]** MSCt is set to **[Torque Custom]** trqC.

Setting ❮❯	Description
-1000.0...1000.0%	Setting range **Factory setting:** 0.0%

[Torque ramp time] trP ★

Torque ramp time.

This parameter can be accessed if:
- **[M/S Comm Mode]** MSCM is not set to **[No]** no, and
- **[M/S Control Type]** MSCt is set to **[Torque Custom]** trqC.

Setting ❮❯	Description
0.0...99.99 s	Rise and fall time for a variation of 100% of the rated torque **Factory setting:** 3.00 s

[Torque control stop] tSt

Torque control stop type.

Setting	Code / Value	Description
[Speed]	SPd	Speed regulation stop, in accordance with the type of stop configuration
[Freewheel Stop]	nSt	**Factory setting:** Freewheel stop
[Spin]	SPn	Zero torque stop, but maintaining the flux in the motor (only in close loop)

[Spin time] SPt

Torque regulation: spin time.

Spin time following stop in order to remain ready to restart quickly.

Setting ❮❯	Description
0.0...3600.0 s	Setting range **Factory setting:** 1.0 s

[Positive deadband] dbP

Torque regulation positive dead band.

Value added algebraically to the speed reference.

Example for **[Negative deadband]** dbn = 10:
- If reference = + 50 Hz: + 50 + 10 = 60 Hz
- If reference = + 50 Hz: - 50 + 10 = - 40 Hz

Setting	Description
0.0...2 x **[Max Frequency]** tFr	Setting range **Factory setting:** 10.0 Hz

[Negative deadband] dbn

Torque regulation negative dead band.

Value subtracted algebraically from the speed reference.

Example for **[Negative deadband]** dbn = 10:
- If reference = + 50 Hz: + 50 - 10 = 40 Hz
- If reference = - 50 Hz: - 50 - 10 = - 60 Hz

Setting	Description
0.0...2 x **[Max Frequency]** tFr	Setting range **Factory setting:** 10.0 Hz

[Torque ctrl time out] rto

Torque control time-out.

Time following automatic exit of torque control mode in the event of an error or a warning has been triggered.

Setting	Description
0.0...999.9 s	Setting range **Factory setting:** 60 s

[Torque Ctrl ErrorResp] tob

Response to torque control error.

Response of drive once time **[Torque ctrl time out]** rto has elapsed.

Setting	Code / Value	Description
[Warning]	ALrn	An error is triggered **Factory setting**
[Error]	FLt	An error is triggered with freewheel stop

[Low Torque] LtQ

Low torque threshold.

This parameter cannot be higher than **[High Torque]** HtQ .

Setting	Description
-300.0...**[High Torque]** HtQ	Setting range **Factory setting:** -100.0%

[High Torque] HtH

High torque threshold.

This parameter cannot be lower than **[Low Torque]** LtH.

Setting	Description
[Low Torque] LtH...300.0%	Setting range **Factory setting:** 100.0%

[Master/Slave Type] MSt - Menu

Access

[Complete settings] ➜ **[Master/Slave]** ➜ **[Master/Slave Type]**

About This Menu

This menu can be accessed if **[M/S Comm Mode]** MSCM is not set to **[No]** no.

[Torque Filter] trF ★

This function provides a filter on the torque reference for Slaves Drives to deal with dynamic control constraints (such as a communication delays). Select if the filtering on the input torque reference is present or not.

This parameter can be accessed if:

- **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE or **[M/S Device ID]** MS id is set to **[Slave1]** to **[Slave10]**, and
- **[M/S Control Type]** MSCt is set to:
  - **[Torque Direct]** tr9d, or
  - **[Torque Reverse]** tr9r, or
  - **[Torque Custom]** tr9C.

Setting	Code / Value	Description
[No]	no	Input torque reference filtering is disabled **Factory setting**
[Yes]	YES	Input torque reference filtering is enabled

[Torque Filter Bandwidth] trW ★

Defines the bandwidth of the filter in Hertz.

This parameter can be accessed if:

- **[Torque Filter]** trF ★ is set to **[Yes]** YES, and
- **[M/S Control Type]** MSCt is set to:
  - **[Torque Direct]** tr9d, or
  - **[Torque Reverse]** tr9r, or
  - **[Torque Custom]** tr9C.

Setting	Description
1...1000 Hz	Setting range **Factory setting**: 20 Hz.

[M/S Filters] MSF - Menu

Access

[Complete settings] ➜ [Master/Slave] ➜ [Master/Slave Type] ➜ [M/S Filters]

About This Menu

The Master Slave on elastic coupling has different functionalities which are:

- **Advanced filtering feature:** Master is speed controlled and Slave is torque controlled. This feature allows configuring the transfer function between Master Drive and Slave Drive according to the dynamic of the coupling (elastic).
- **Balancing feature:** Master and Slave are speed controlled. This feature allows sharing the load between Master and Slave in case of elastic coupling or slip.
- **Reference routing feature:** The function will allow selecting the routing point for the speed and torque references in the control scheme.

This menu can be accessed if:

- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[M/S Coupling Type]** MSMC is set to **[Elastic]** ELAST.

[M/S Advanced Filter] MSFE

Master / Slave advanced filter activation.

Setting	Code / Value	Description
[No]	no	Advanced filtering disable **Factory setting**
[Yes]	YES	Advanced filtering enable

[M/S Advanced Filter Freq] MSFF ★

Defines the frequency of the filter in Hz.

This parameter can be accessed if **[M/S Advanced Filter]** MSFE is not set to **[No]** no.

Setting	Description
10.0...150 Hz	Setting range **Factory setting**: 15.0 Hz

[M/S Advanced Filter Bdw] MSFb ★

Defines the bandwidth. Means the width of the stop-band of the filter in % of the filter frequency.

This parameter can be accessed if **[M/S Advanced Filter]** MSFE is not set to **[No]** no.

Setting	Description
10...400%	Setting range **Factory setting**: 100%

[M/S Advanced Filter Depth] MSFd ★

Defines the attenuation level at the filter frequency.

This parameter can be accessed if **[M/S Advanced Filter]** MSFE is not set to **[No]** no.

Setting	Description
0...99%	Setting range **Factory setting**: 10%

[M/S Advanced Filter Gain] MSFG ★

Defines the gain of the filter. 100% means a unitary gain.

This parameter can be accessed if **[M/S Advanced Filter]** MSFE is not set to **[No]** no.

Setting	Description
0...1000%	Setting range **Factory setting**: 100%

[M/S Advanced Filter Coeff] MSFC ★

Master / Slave advanced filter coefficient.

This parameter can be accessed if **[M/S Advanced Filter]** MSFE is not set to **[No]** no.

Setting	Description
0...1000%	Setting range **Factory setting**: 100%

[Load Sharing M/S] MS6 - Menu

Access

[Complete settings] → **[Master/Slave]** → **[Master/Slave Type]** → **[Load Sharing M/S]**

About This Menu

This menu can be accessed if:

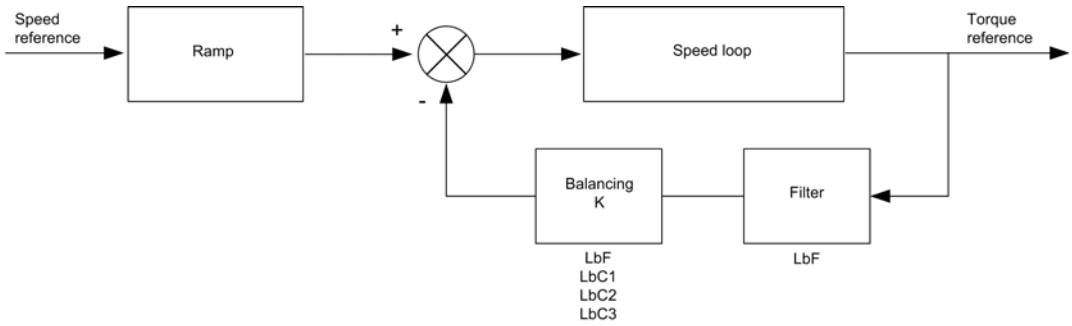
- **[M/S Coupling Type]** MSMC is set to **[Elastic]** ELAST, and
- **[M/S Device Role]** MSdt or **[M/S Device ID]** MS id is set to **[Master]** MSter.

Or if:

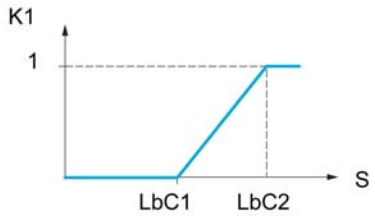
- **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE or **[M/S Device ID]** MS id is set to **[Slave1]** to **[Slave10]**, and
- **[M/S Control Type]** MSCt is set to:
  - **[Speed Direct]** SPdd, or
  - **[Speed Reverse]** SPdr.

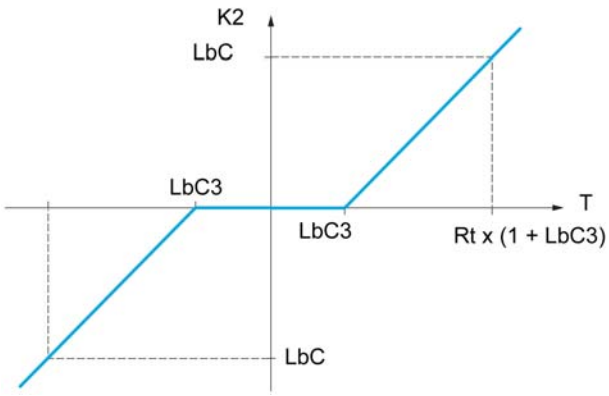
Load sharing, Parameters That can be Accessed at Expert Level

Principle:



The load sharing factor K is determined by the torque and speed, with two factors K1 and K2 (K = K1 x K2).





S Speed
T Torque
Rt Rated torque

[Load sharing] LbA

Load balancing configuration.

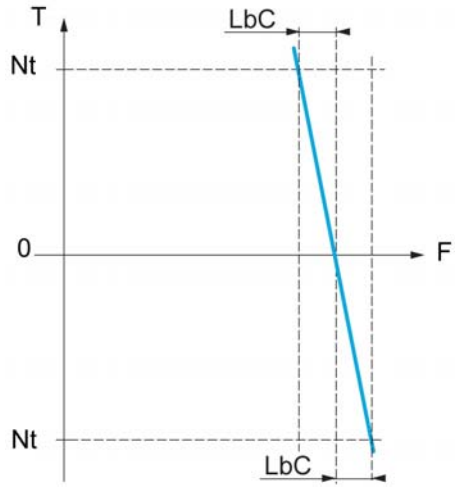
When 2 motors are connected mechanically and therefore at the same speed, and each is controlled by a drive, this function can be used to improve torque distribution between the two motors. To do this, it varies the speed based on the torque.

Setting	Code / Value	Description
[No]	nO	Function inactive **Factory setting**
[Yes]	YES	Function active

[Load correction] LbC ★

Nominal speed load balance correction.

This parameter can be accessed if **[Load sharing]** LbA is not set to **[No]** nO.



T Torque
Nt Nominal torque
F Frequency

Setting	Description
0.0...1000.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Correction min spd] LbC I ★

Low Speed for torque decreasing function speed reference.

Minimum speed for load correction in Hz. Below this threshold, no corrections are made. Used to prevent correction at very low speed if this would hamper rotation of the motor.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Description
0.0...999.9 Hz	Setting range **Factory setting**: 0.0 Hz

[Correction max spd] LbC2 ★

High speed for torque decreasing function speed reference.

Speed threshold in Hz above which maximum load correction is applied.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Description
LbC1...1000.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Torque offset] LbC3 ★

Torque offset for torque correction.

Minimum torque for load correction as a % of the rated torque. Below this threshold, no corrections are made. Used to avoid torque instabilities when the torque direction is not constant.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Description
0...300%	Setting range **Factory setting**: 0%

[Sharing filter] LbF ★

Time constant filter.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Description
100...20,000 ms	Setting range **Factory setting**: 100 ms

[M/S Balance Trq Ref Sel] MS1b ★

Master / Slave load balancing torque reference selection.

This parameter can be accessed if **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Code / Value	Description
[Not Applied]	nO	Not applied
[Before Advanced Filter]	bFiLt	Before advanced filter **Factory setting**
[After Advanced Filter]	AFiLt	After filter

[Master/Slave Type] MSt - Menu

Access

[Complete settings] ➡ **[Master/Slave]** ➡ **[Master/Slave Type]**

About This Menu

This function can be accessed if **[M/S Comm Mode]** MSCM is not set to **[No]** no.

[M/S Torque Ref Entry] MS tE ★

Master / Slave torque reference entry in control chain.

This parameter can be accessed if:
- **[M/S Advanced Filter]** MSFE is not set to **[No]** no.
- **[M/S Coupling Type]** MSMC is set to **[Elastic]** ELAST, and
- **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE or**[M/S Device ID]** MS id is set to **[Slave 1]** to **[Slave 10]**.

Setting	Code / Value	Description
[Not Applied]	no	Not applied
[Before Advanced Filter]	bF iLt	Before advanced filter **Factory setting**
[After Advanced Filter]	AF iLt	After advanced filter

[M/S Out Torque Ref Select] MSot ★

Master / Slave output torque reference selection.

Select the input routing of balancing feature.

This parameter can be accessed if:
- **[M/S Coupling Type]** MSMC is set to **[Elastic]** ELAST, and
- **[M/S Advanced Filter]** MSFE is not set to **[No]** no.

Identical to **[M/S Torque Ref Entry]** MS tE.

[M/S Speed Ref Entry] MS iS ★

Master / Slave speed reference entry in control chain.

Select the routing of the new speed reference input.

This parameter can be accessed if **[M/S Device Role]** MSdt is set to **[Slave]** SLAVE or **[M/S Device ID]** MS id is set to **[Slave 1]** to **[Slave 10]**.

Setting	Code / Value	Description
[Not Applied]	no	Not applied
[Before Ramp]	brMP	The input speed reference is before the ramp input in the control scheme **Factory setting**
[After Ramp]	ArMP	The input speed reference is after the ramp input in the control scheme
[Before Control Loop]	bCtrL	The input speed reference is before the control input in the control scheme

[M/S Out Speed Ref Select] MSoS

Master / Slave output speed reference selection.

Identical to **[M/S Speed Ref Entry]** MS iS.

Section 8.13
[Hoisting Functions]

What Is in This Section?

This section contains the following topics:

[Brake logic control] bLC - Menu

Access

[Complete settings] → [Hoisting Functions] → [Brake logic control]

About This Menu

NOTE: This function cannot be used with some other functions.

Used to control an electromagnetic brake by the drive, for horizontal and vertical hoisting applications, and for unbalanced machines.

Principle of the hoisting movements:

- Vertical movement: maintain motor torque in the driving load holding direction during brake opening and closing, in order to hold the load. Start smoothly when the brake is released and stop smoothly when the brake is engaged.
- Horizontal movement: synchronize brake release with the build-up of torque during startup and brake engage at zero speed on stopping, to prevent jolting.

Instructions for Brake Logic Control for a Vertical Hoisting Application

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Check that the selected settings and configurations will not result in the dropping or loss of control of the load being lifed.

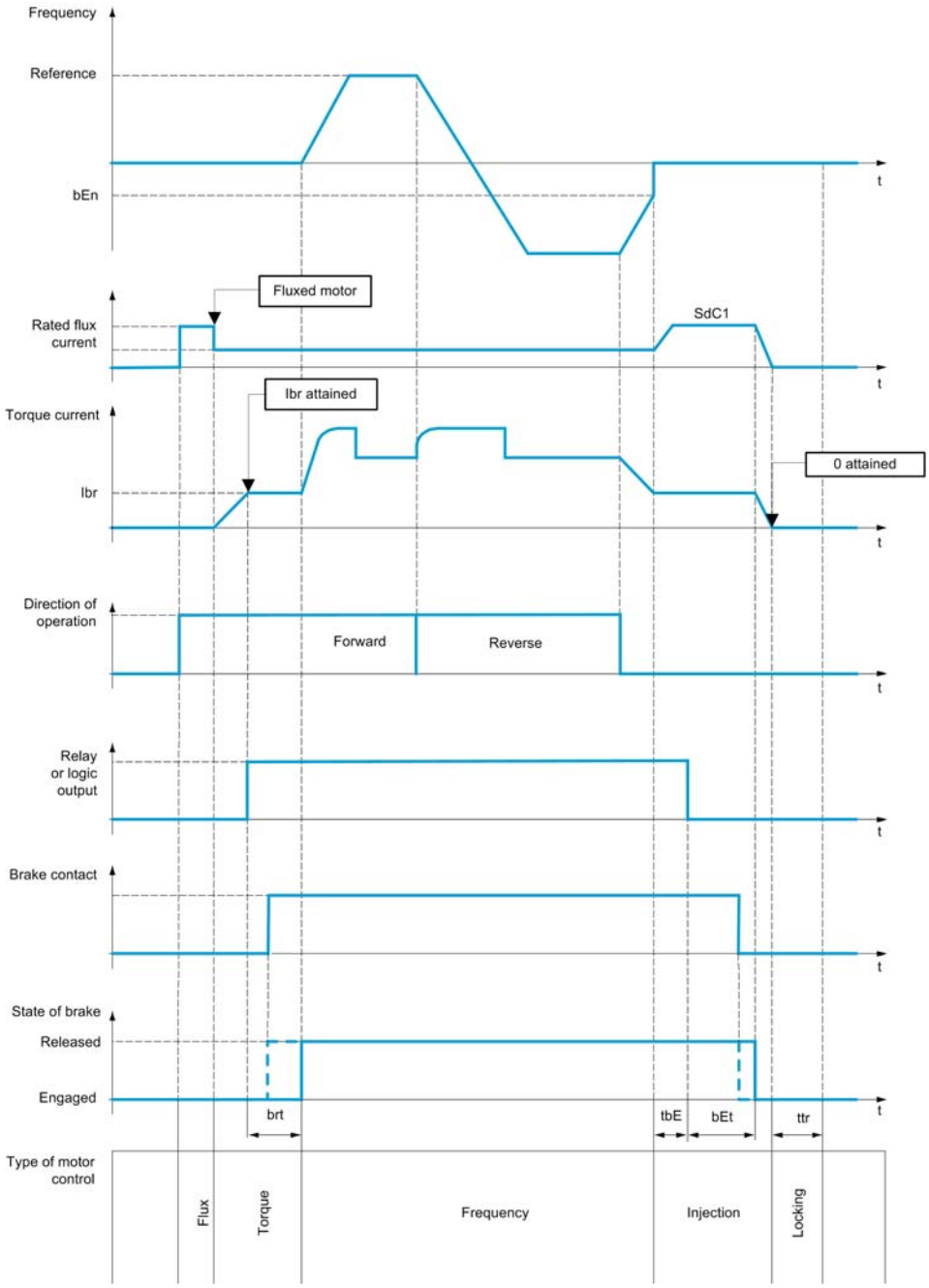
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Step	Action
1	**[Brake Release Pulse]** bIP: YES. Ensure that the direction of rotation FW corresponds to lifting the load. For applications in which the load being lowered is very different from the load being lifted, set **[Brake Release Pulse]** bIP = **[2 IBR]** 2IbR (e.g., ascent always with a load and descent always without a load).
2	Brake release current **[Brk Release Current]** IbR and **[Brake release I Rev]** IrD if **[Brake Release Pulse]** bIP = **[2 IBR]** 2IbR: adjust the brake release current to the rated current indicated on the motor. During testing, adjust the brake release current in order to hold the load smoothly.
3	Acceleration time: for hoisting applications it is advisable to set the acceleration ramps to more than 0.5 seconds. Ensure that the drive does not exceed the current limit. The same recommendation applies for deceleration. Reminder: for a hoisting movement, a braking resistor should be used.
4	**[Brake Release time]** brt: set according to the type of brake. It is the time required for the mechanical brake to release.
5	**[Brake release freq]** bIr, in open-loop mode only: Leave in **[Auto]** AUto, adjust if necessary.
6	**[Brake engage freq]** bEn: leave in [Auto], adjust if necessary.
7	**[Brake engage time]** bEt: set according to the type of brake. It is the time required for the mechanical brake to engage.

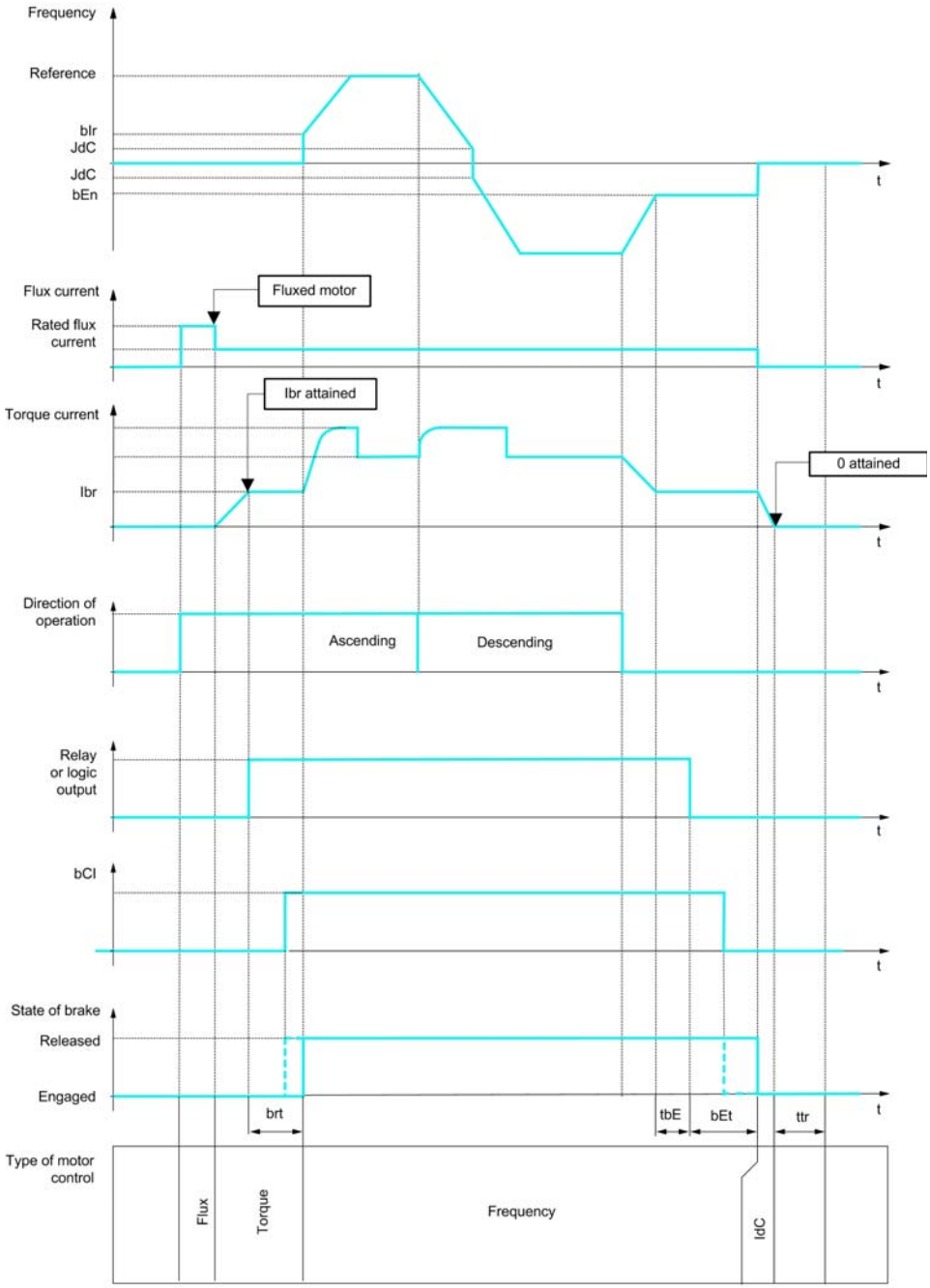
Instructions for Brake Logic Control for an Horizontal Hoisting Application

Step	Action
1	**[Brake Release Pulse]** bIP: no
2	**[Brk Release Current]** IbR: set to 0.
3	**[Brake Release time]** brt: set according to the type of brake. It is the time required for the mechanical brake to release.
4	**[Brake engage freq]** bEn, in open-loop mode only: leave in **[Auto]** AUto, adjust if necessary.
5	**[Brake engage time]** bEt: set according to the type of brake. It is the time required for the mechanical brake to engage.

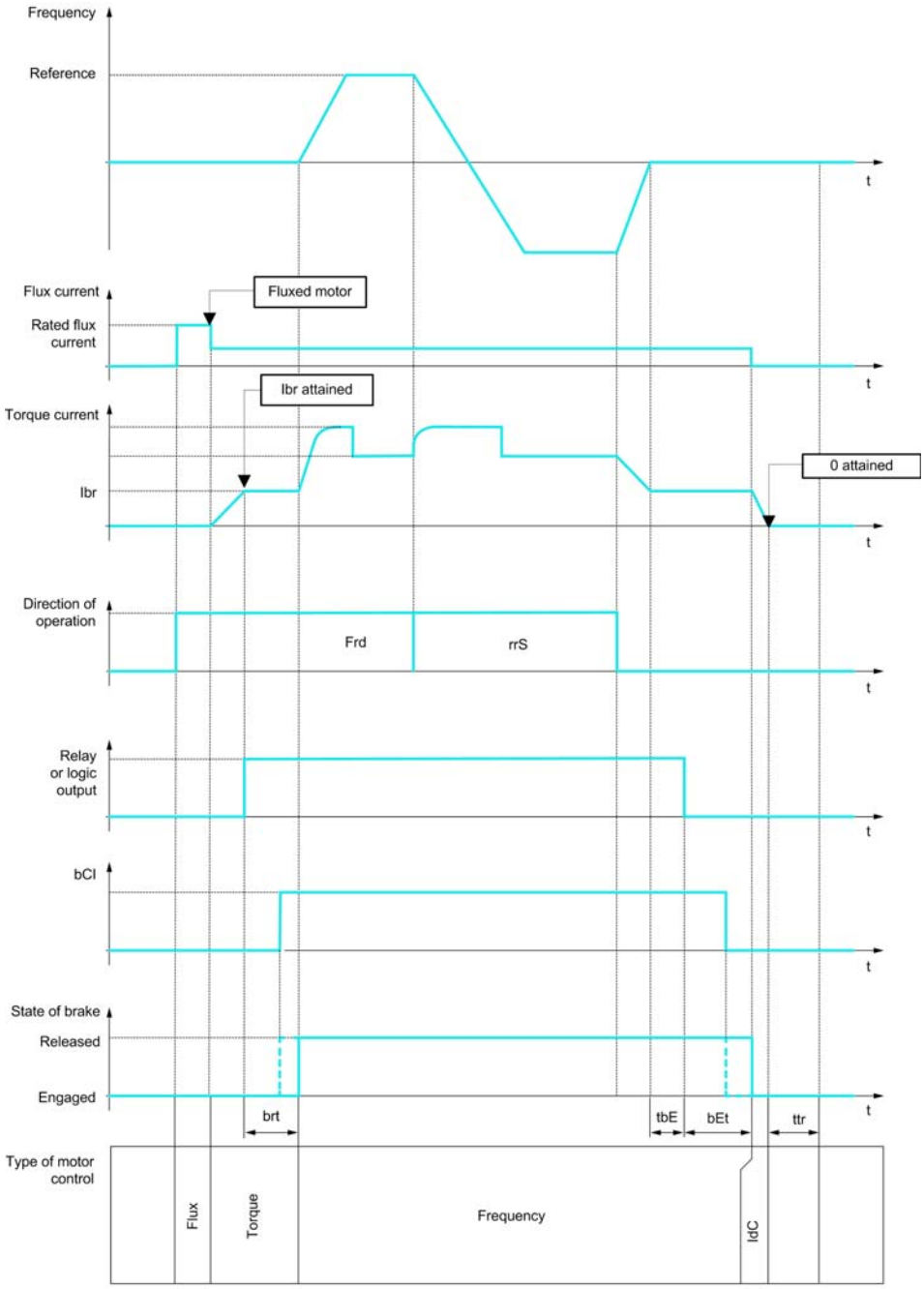
Horizontal Movement in Open-Loop Mode



Vertical Movement in Open-Loop Mode



Vertical or Horizontal Movement in Closed-Loop Mode



Vertical movment
Frd = Up
rrS = Down

[Brake assignment] bLC

Brake function assignment.

[Brake assignment] bLC is forced to **[No]** nO if :

- **[Motor control type]** Ctt is set to **[U/F VC 5pts]** UF5, **[SYN_U VC]** SYnU, **[Sync. mot.]** SYn, **[Rel. Mot.]** SrVC.
- **[DC Injection Assign]** dC1 is not set to **[Not Assigned]** nO
- **[Catch On Fly]** FLr is not set to **[No]** nO
- **[Jog Assign]** JOG is not set to **[Not Assigned]** nO
- **[PID feedback]** PIF is not set to **[Not Configured]** nO
- **[OutPhaseLoss Assign]** OPL is set to **[No Error Triggered]** OAC
- **[M/S Comm Mode]** MSCM is not set to **[No]** nO

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[R2]...**[R3]**	r2...r3	Relay output R2...R3
[R4]...**[R6]**	r4...r6	Relay output R4...R6 if VW3A3204 relay output option module has been inserted
[DQ1 Digital Output]	dO1	Digital output DQ1
[DQ11 Digital Output]...**[DQ12 Digital Output]**	dO11...dO12	Digital output DQ11...DQ12 if VW3A3203 I/O extension module has been inserted

[Movement type] bSt ★

Brake sequence type.

This parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** nO.

Setting	Code / Value	Description
[Traveling]	HOr	Resistive-load movement (translational motion of overhead crane, for example).
[Hoisting]	VEr	Driving-load movement (hoisting winch, for example). **Factory setting**

[Brake sequence type] bC 1 ★

Brake contact input.

This parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** nO.

If the brake has a monitoring contact (closed for released brake).

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Brake Fdbk Filter] FbC 1 ★

Brake feedback filter.

The parameter can be accessed if **[Brake sequence type]** bC 1 is not set to **[No]** nO.

Setting ❮❯	Description
0...1000 ms	Setting range **Factory setting**: 0 ms

[Brake Release Pulse] b 1P ★

Brake release pulse.

This parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** nO.

Setting ❮❯	Code / Value	Description
[No]	nO	The motor torque is given in the required operating direction, at current **[Brk Release Current]** Ibr. **Factory setting:** if **[Movement type]** bSt = **[Traveling]** Hor
[Yes]	YES	The motor torque is always Forward (check that this direction corresponds to ascending), at current **[Brk Release Current]** Ibr. **Factory setting:** if **[Movement type]** bSt = **[Hoisting]** VEr
[2 IBR]	2 Ibr	The torque is in required direction, at current **[Brk Release Current]** Ibr Forward and **[Brake release I Rev]** Ird for Reverse, for certain specific applications.

[Brk Release Current] ibr ★

Brake release current level.

This parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** no.

Setting ❮❯	Description
0...1.1 In (1)	Setting range **Factory setting**: **[Nom Motor Current]** nCr
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[Brake release I Rev] ird

Brake release current level for going down.

Setting ❮❯	Description
0...1.1 In (1)	Setting range **Factory setting**: 0
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[Brake Release time] brt ★

Brake release time.

The parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** no

Setting ❮❯	Description
0.0...5.00 s	Setting range **Factory setting**: 0.50 s

[Brake release freq] b ir ★

Brake release frequency.

The parameter can be accessed if **[Motor control type]** Ctt is not **[FVC]** FVC and if **[Movement type]** bSt is set to **[Hoisting]** VEr.

Setting ❮❯	Code / Value	Description
[Auto]	Auto	The drive takes a value based on the rated slip of the motor, calculated using the drive parameters
0.0...10.0 Hz		Manual control **Factory setting**: ● 0 If **[Movement type]** bSt is set to **[Traveling]** Hor or **[Hoisting]** VEr and in closed loop. ● **[Auto]** Auto if **[Movement type]** bSt is set to **[Hoisting]** VEr and in open loop

[Brake release frequency] bEn ★

Brake engage frequency threshold.

The parameter can be accessed if **[Motor control type]** Ctt is not set to **[FVC]** FVC.

Setting ❮❯	Code / Value	Description
[Auto]	Auto	The drive takes a value based on the rated slip of the motor, calculated using the drive parameters
0.0...10.0 Hz		Manual control **Factory setting**: ● 0 If **[Movement type]** bSt is set to **[Traveling]** Hor or **[Hoisting]** VEr and in closed loop. ● **[Auto]** Auto if **[Movement type]** bSt is set to **[Hoisting]** VEr and in open loop

[Brake engage at 0] bECd ★

Brake: brake engage delay when 0 speed on close loop.

This parameter can be accessed if **[Motor control type]** Ctt is not set to:

- **[FVC]** FVC, or
- **[Sync.CL]** FSY.

This parameter can be used to adjust the brake engage delay once zero speed has been reached.

If a speed other than zero is then required, the command to release the brake is sent following torque application.

Setting	Code / Value	Description
[No]	no	Brake does not engage at regulated zero speed. **Factory setting**
0.0...30.0 s		Brake engage delay once zero speed is reached.

[Brake engage delay] bEE ★

Temporization at brake engage frequency.

The parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** no.

Time delay before request to engage brake. To delay brake engagement, if you wish the brake to be engaged when the drive comes to a complete stop.

Setting ❮❯	Description
0.00...5.00 s	**Factory setting:** 0.00 s

[Brake engage time] bEt ★

Brake engage time.

The parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** no.

Setting ❮❯	Description
0.00...5.00 s	**Factory setting:** 0.50 s

[Auto DC inj Level 1] SdC I ★

Auto DC injection level 1.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

Level of standstill DC injection current **[Auto DC Injection]** AdC is not **[No]** no.

Setting ❮❯	Description
0...1.1 In (1)	Setting range **Factory setting**: 0.7 In (1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[Engage at reversal] bEd ★

Brake engage at speed inversion.

Can be used to select whether or not the brake engages on transition to zero speed when the operating direction is reversed.

The parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** nO.

Setting	Code / Value	Description
[No]	nO	The brake does not engage **Factory setting**
Yes	YES	The brake engages

[Jump at reversal] JdC ★

Brake: Jump frequency at direction change.

This parameter can be accessed if

- **[Motor control type]** Ctt is not set to:
  - **[FVC]** FVC, or
  - **[Sync.CL]** FSY, and
- **[Movement type]** bSt is set to **[Hoisting]** VEr.

When the reference direction is reversed, this parameter can be used to avoid loss of torque (and consequential release of load) on transition to zero speed. Parameter is not applicable if **[Engage at reversal]** bEd is set to **[Yes]** YES.

Setting	Code / Value	Description
[Auto]	Auto	The drive takes a value based on the rated slip of the motor, calculated using the drive parameters
0.0...10.0Hz		Manual control **Factory setting**: ● 0 If **[Movement type]** bSt is set to **[Traveling]** Hor or **[Hoisting]** VEr and in closed loop. ● **[Auto]** Aut if **[Movement type]** bSt is set to **[Hoisting]** VEr and in open loop

[Time to restart] tbr ★

Brake time to restart.

Time between the end of a brake sequence and the start brake release sequence.

The parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** nO.

Setting	Description
0.00...15.00 s	**Factory setting:** 0.00 s

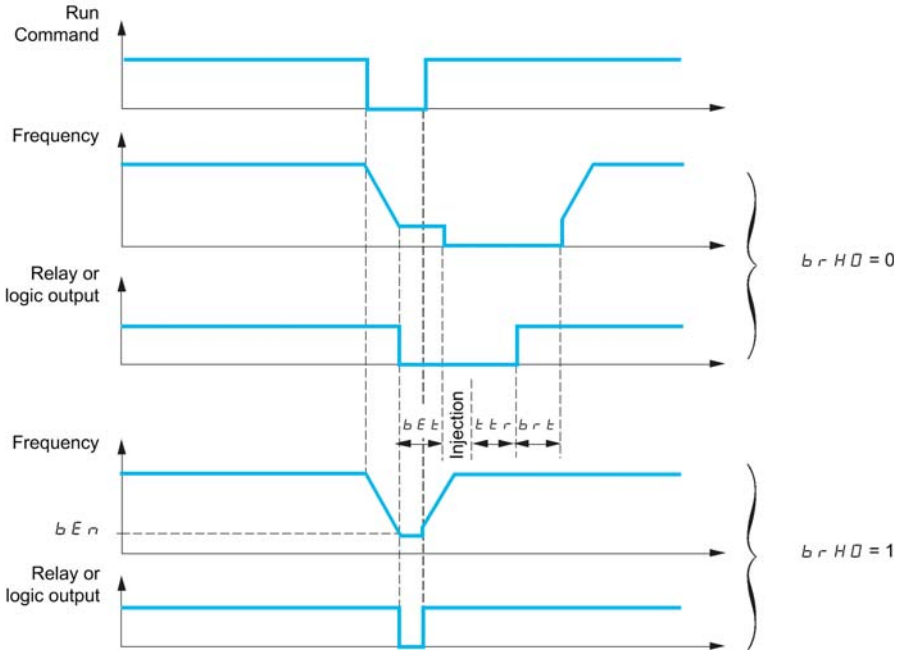
[BRH b0] brH0 ★

Selection of the brake restart sequence if a run command is repeated while the brake is engaging.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Use in open-loop and closed-loop mode

A run command may be requested during the brake engagement phase. Whether or not the brake release sequence is executed depends on the value selected for **[BRH b0]** brH0.



NOTE: if a run command is requested during the **[Time to restart]** Ett phase, the complete brake control sequence is initialized.

Setting	Code / Value	Description
[0]	0	The engage/release sequence is executed in full. **Factory setting**
[1]	1	The brake is released immediately.

[BRH b1] brH1 ★

Deactivation of the brake contact in steady state error.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Code / Value	Description
[0]	0	The brake contact in steady state error is active (error is triggered if the contact is open during operation). **[Brake Feedback]** brF is monitored in all operating phases **Factory setting**
[1]	1	The brake contact in steady state error is inactive. **[Brake Feedback]** brF is only monitored during the brake release and engage phases.

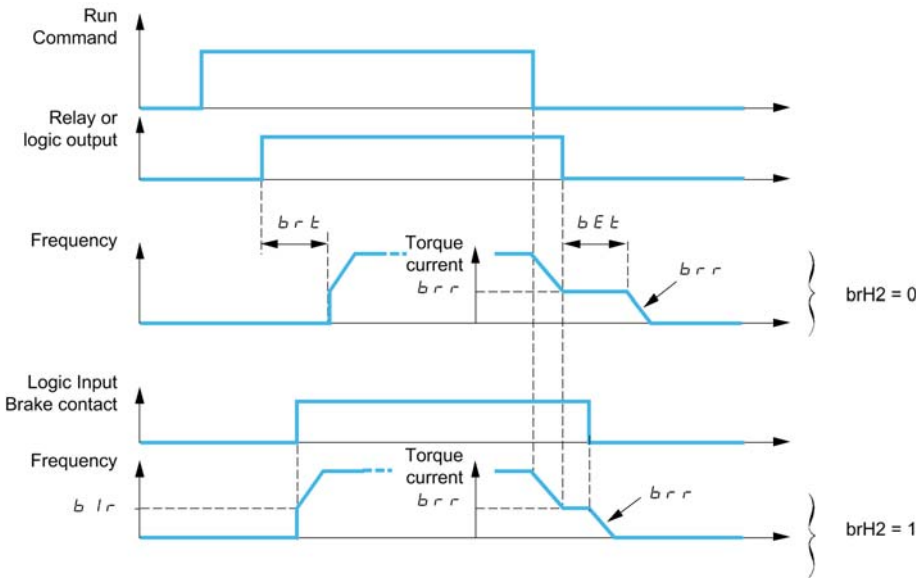
[BRH b2] brH2 ★

Taking the brake contact into account for the brake control sequence.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

If a logic input is assigned to the brake contact.

- **[BRH b2]** brH2 = **[0]** 0: During the brake release sequence, the reference is enabled at the end of the time **[Brake Release time]** brt. During the brake engage sequence, the current changes to **[0]** 0 according to the ramp **[Current ramp time]** brr at the end of the **[Brake engage time]** bEt.
- **[BRH b2]** brH2 = **[1]** 1: When the brake is released, the reference is enabled when the logic input changes to 1. When the brake is engaged, the current changes to 0 according to the ramp **[Current ramp time]** brr when the logic input changes to 0.



Setting	Code / Value	Description
[0]	0	The engage/release sequence is executed in full. **Factory setting**
[1]	1	The brake is released immediately.

[BRH b3] brH3 ★

In closed-loop mode only. Management of the absence of brake contact response, if it is assigned.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Code / Value	Description
[0]	0	During the brake engage sequence, the brake contact must be open before the end of **[Brake engage time]** bEt, otherwise the drive locks in a **[Brake Feedback]** brF brake contact error. **Factory setting**
[1]	1	During the brake engage sequence, the brake contact must be open before the end of **[Brake engage time]** bEt, otherwise a **[Brake Contact Warn]** bCA is triggered and zero speed is maintained.

[Current ramp time] brr ★

Brake current ramp.

The parameter can be accessed if **[Brake assignment]** bLC is not set to **[No]** no.

Torque current ramp time (increase and decrease) for a current variation equal to **[Brk Release Current]** Ibr.

Setting ❮❯	Description
0.00...5.00 s	**Factory setting:** 0.00 s

[High speed hoisting] HSH - Menu

Access

[Complete settings] ➡ [Hoisting Functions] ➡ [High speed hoisting]

About This Menu

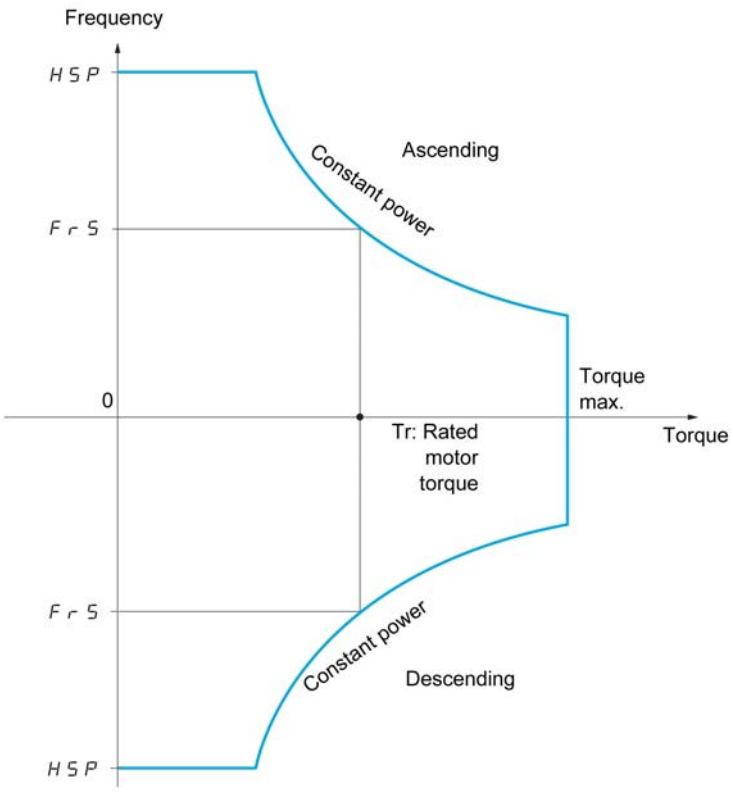
NOTE: This function cannot be used with some other functions.

This function can be used to optimize the cycle times for hoisting movements for zero or lightweight loads. It authorizes operation at "constant power" in order to reach a speed greater than the rated speed without exceeding the rated motor current.

The speed remains limited by the **[High speed]** HSP.

The function acts on the speed reference pedestal and not on the reference itself.

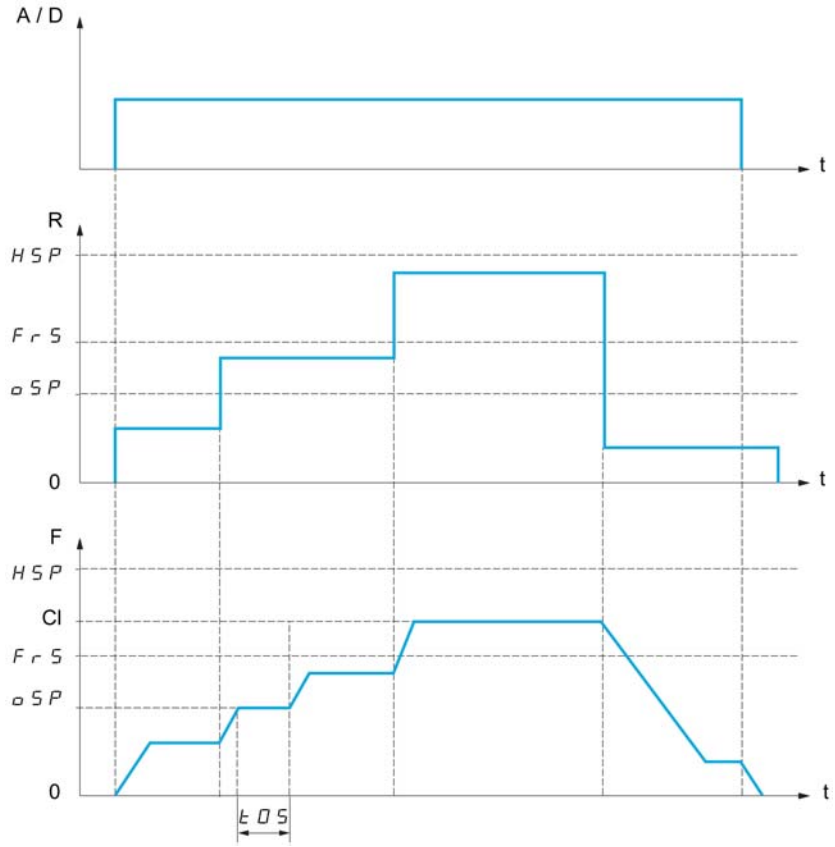
Principle



There are two possible operating modes:

- Speed reference mode: the maximum permissible speed is calculated by the drive during a speed step that is set so that the drive can measure the load.
- Current limitation mode: the maximum permissible speed is the speed that supports current limitation in motor mode, in the "ascending" direction only. For the "descending" direction, operation is in Speed reference mode.

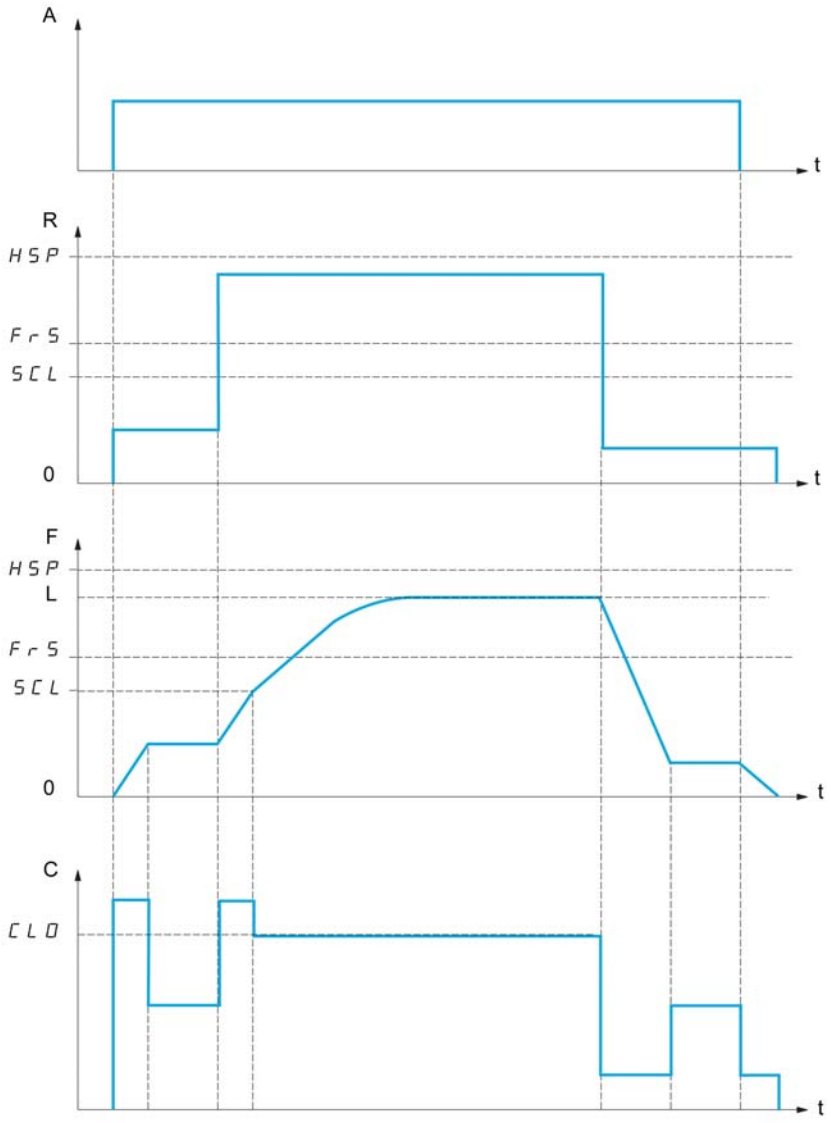
Speed Reference Mode



A / D Ascend or descend command
R Reference
F Frequency
CI Calculated limit
oSP Adjustable speed step for load measurement
t0S Load measuring time

2 parameters are used to reduce the speed calculated by the drive, for ascending and descending.

Current Limiting Mode

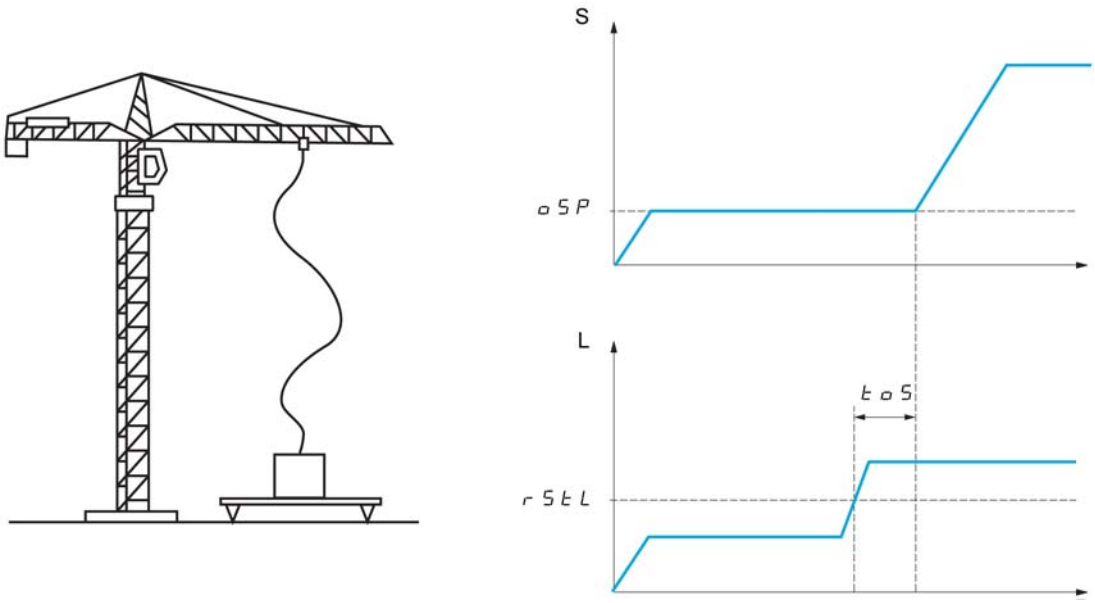


A Ascend command
R Reference
F Frequency
L Limit imposed by current limitation
C Current
SCL Adjustable speed threshold, above which current limitation is active
CLO Current limitation for high-speed function

NOTE: The speed reached for a specific current will be lower in case of network undervoltage in comparison with nominal network voltage.

Rope Slack

The Rope slack function can be used to help to prevent starting up at high speed when a load has been set down ready for lifting but the rope is still slack (as illustrated below).



S Speed
L Load

The speed step (OSP parameters) is used to measure the load. The effective measurement cycle will not be triggered until the load reaches the adjustable threshold **[Rope slack trq level]** rSTL , which corresponds to the weight of the hook.

A digital output or a relay can be assigned to the indication of the Rope slack state in the**[Input/Output]** I-O - menu.

NOTE: The speed reached for a specific current will be lower in case of network undervoltage in comparison with nominal network voltage.

[High speed hoisting] HSo

High Speed Optimized activation function.

Setting	Code / Value	Description
[No]	nO	Function inactive **Factory setting**
[Reference Frequency]	SSo	Speed reference mode
[Current Limit]	CSo	Current limitation mode

[Motor speed coeff.] CoF ★

Coefficient Optimize Forward (motor quadrant).

This parameter can be accessed if **[High speed hoisting]** HSo is set to **[Speed ref]** SSo.

Setting ❮❯	Description
0...100%	Setting range **Factory setting**: 100%

[Gen. speed coeff] CorR ★

Coefficient Optimize Reverse (generator quadrant).

This parameter can be accessed if **[High speed hoisting]** HSo is not set to **[No]** no.

Setting ❮❯	Description
0...100%	Setting range **Factory setting**: 50%

[Load measuring tm.] tos ★

Torque measuring time.

This parameter can be accessed if **[High speed hoisting]** HSo is not set to **[No]** no.

Setting ❮❯	Description
0.10...65.00 s	Setting range **Factory setting**: 0.50 s

[Measurement spd] oSP ★

Optimize Speed.

This parameter can be accessed if **[High speed hoisting]** HSo is not set to **[No]** no.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 40 Hz

[High speed I Limit] CLo ★

Current Limitation Optimize.

This parameter can be accessed if **[High speed hoisting]** HSo is set to **[I Limit]** CSo.

NOTE: If the setting is less than 0.25 In, the drive may lock in **[Output Phase Loss]** oPL error if this has been enabled.

Setting ❮❯	Description
0...1.1 In (1)	Setting range **Factory setting**: In(1)
(1) in corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[I Limit. frequency] SCL ★

Frequency threshold, above which the high-speed limitation current is active.

This parameter can be accessed if **[High speed hoisting]** HSo is set to **[I Limit]** CSo.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 40.0 Hz

[Rope slack config.] rSd ★

Load measurement feedback.

This parameter can be accessed if **[High speed hoisting]** HSo is not set to **[No]** no.

Setting	Code / Value	Description
[No]	no	Function inactive **Factory setting**
[Weight Estimation]	dri	Measurement of the load by estimating the torque generated by the drive

[Rope slack trq level] rSLL ★

Adjustment threshold corresponding to a load weighing slightly less than the hook when off-load, as a % of the rated load.

This parameter can be accessed if **[Rope slack config.]** rSd has been assigned.

Setting ❮❯	Description
0...100%	Setting range **Factory setting**: 0%

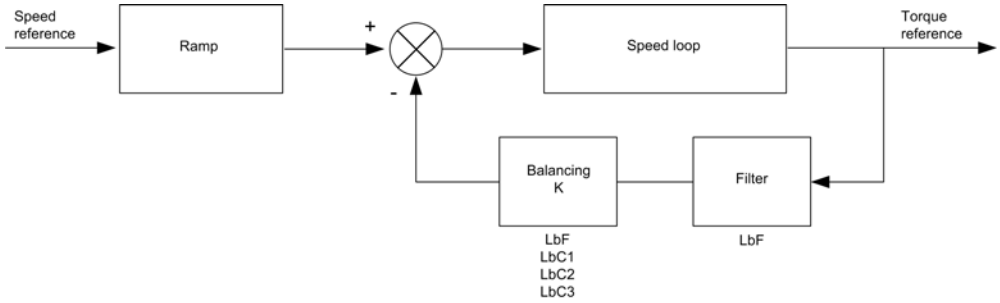
[Load Sharing] LdS - Menu

Access

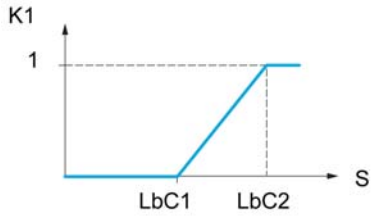
[Complete settings] ➡ [Hoisting Functions] ➡ [Load Sharing]

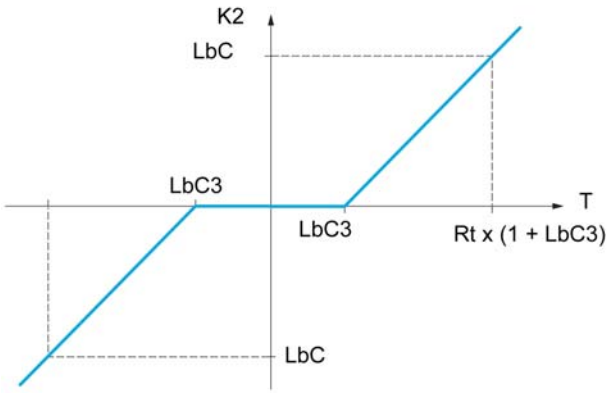
About This Menu

Principle:



The load sharing factor K is determined by the torque and speed, with two factors K1 and K2 (K = K1 x K2).





S Speed
T Torque
Rt Rated torque

[Load sharing] LbA

Load balancing configuration

When 2 motors are connected mechanically and therefore at the same speed, and each is controlled by a drive, this function can be used to improve torque distribution between the two motors. To do this, it varies the speed based on the torque.

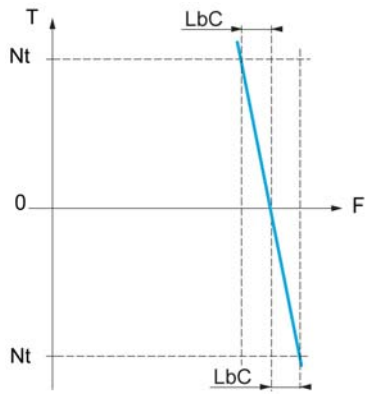
This parameter can only be accessed if **[Motor control type]** CtT is set to **[SVC V]** UUC or **[FVC]** FUC.

Setting	Code / Value	Description
[No]	nO	Function inactive **Factory setting**
[Yes]	YES	Function active

[Load correction] L b C

Nominal speed load balance correction.

This parameter can be accessed if **[Load sharing]** L b A is set to **[Yes]** Y E S.



T Torque
t Nominal torque
F Frequency

Setting	Description
0...1000.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Correction min spd] L b C 1

Low Speed for torque decreasing function speed reference

Minimum speed for load correction in Hz. Below this threshold, no corrections are made. Used to prevent correction at very low speed ifthis would hamper rotation of the motor.

This parameter can be accessed if **[Access Level]** L A C is set to **[Expert]** E P r and if **[Load sharing]** L b A = **[Yes]** Y E S

Setting	Description
0...999.9 Hz	Setting range **Factory setting**: 0.0 Hz

[Correction max spd] L b C 2

High speed for torque decreasing function speed reference.

Speed threshold in Hz above which maximum load correction is applied.

This parameter can be accessed if **[Access Level]** L A C is set to **[Expert]** E P r and if **[Load sharing]** L b A = **[Yes]** Y E S

Setting	Description
L b C 1 +0.1 Hz at 1000.0 Hz	Setting range **Factory setting**: 0.1 Hz

[Torque offset] L b C 3

Torque offset for torque correction.

Minimum torque for load correction as a % of the rated torque. Below this threshold, no corrections are made. Used to avoid torque instabilities when the torque direction is not constant.

This parameter can be accessed if **[Access Level]** L A C is set to **[Expert]** E P r and if **[Load sharing]** L b A = **[Yes]** Y E S

Setting	Description
0...300%	Setting range **Factory setting**: 0%

[Sharing filter] L b F

Time constant filter.

This parameter can be accessed if **[Load sharing]** L b A = **[Yes]** Y E S. Used in the event of flexible mechanical coupling in order to avoid instabilities.

Setting	Description
100...20000 ms	Setting range **Factory setting**: 100 ms

[Rope Slack Handling] SdR - Menu

Access

[Complete settings] ➜ **[Hoisting Functions]** ➜ **[Rope Slack Handling]**

About This Menu

This parameter can be accessed if **[High speed hoisting]** HSo is not set to **[No]** no.

[Rope slack config.] rSd ★

Load measurement feedback.

Setting	Code / Value	Description
[No]	no	Function not active **Factory setting**
[Weight Estimation]	dr1	Drive motor torque estimation

[Rope slack trq level] rSEL ★

Torque level for rope slack detection.

This parameter can be accessed if **[Rope slack config.]** rSd is not set to **[No]** no.

Setting	Description
0...100%	Setting range **Factory setting**: 0%

Section 8.14
[Hoisting monitoring]

[Dynamic load detect.] dLd - Menu

Access

[Complete settings] ➜ [Hoisting monitoring] ➜ [Dynamic load detect.]

About This Menu

This detection is only possible with the high-speed hoisting function. It can be used to detect if an obstacle has been reached, triggering a sudden (upward) increase or (downward) decrease in the load.

Load variation detection triggers a **[Dynamic Load Error]** dLF. The **[Dyn. load Mgt.]** dLb parameter can be used to configure the response of the drive in the event of this detected error.

Load variation detection can also be assigned to a relay or a digital output.

There are two possible detection modes, depending on the configuration of high-speed hoisting:

- Speed reference mode
  [High speed hoisting] HSo is set to **[Speed ref]** SSo.
  Torque variation detection.
  During high-speed operation, the load is compared to that measured during the speed step. The permissible load variation and its duration can be configured. If exceeded, an error is triggered.
- Current limitation mode
  [High speed hoisting] HSo is set to **[Current Limit]** CSo. On ascend, during high-speed operation, an increase in load will result in a drop in speed. Even if high-speed operation has been activated, if the motor frequency drops below the **[I Limit Frequency]** SCL threshold, an error is triggered. The detection is realized only for a positive variation of the load and only in the high-speed area (area upper to **[I Limit Frequency]** SCL).On descend, operation takes the form of speed reference mode.

[Dynamic load time] tLd

Activation of load variation detection and adjustment of time delay for taking load variation detected an error **[Dynamic Load Error]** dLF into account.

Setting	Code / Value	Description
[No]	nO	No load variation detection **Factory setting**
0.00...10.00 s		Adjustment of the time delay for taking detected an error into account.

[Dyn. load threshold] dLd

Adjustment of the trip threshold for load variation detection, as a % of the load measured during the speed step.

Setting ( )	Description
1...100%	Setting range **Factory setting**: 100%

[Dyn. load Mgt.] dLb

Drive response in the event of a load varation dected error.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**
[Per STT]	StT	Stop according to **[Type of stop]** StT parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
[DC injection]	dCI	DC injection
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

Section 8.15
[Conveyor Functions]

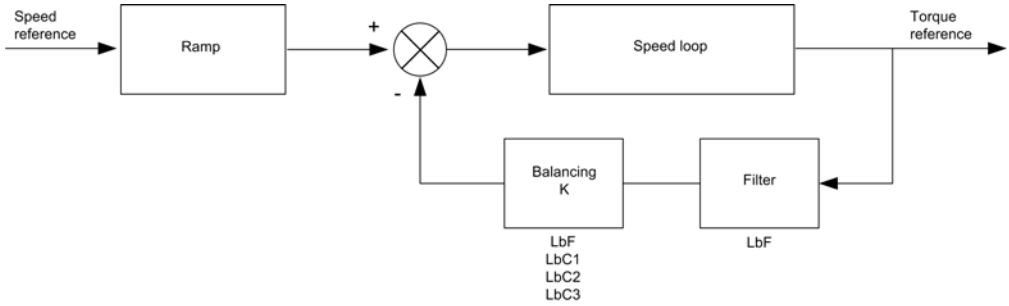
[Load Sharing] LdS - Menu

Access

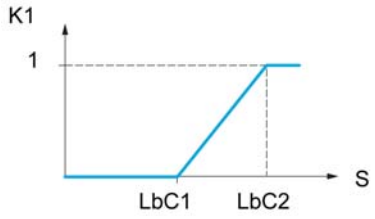
[Complete settings] ➡ [Conveyor Functions] ➡ [Load Sharing]

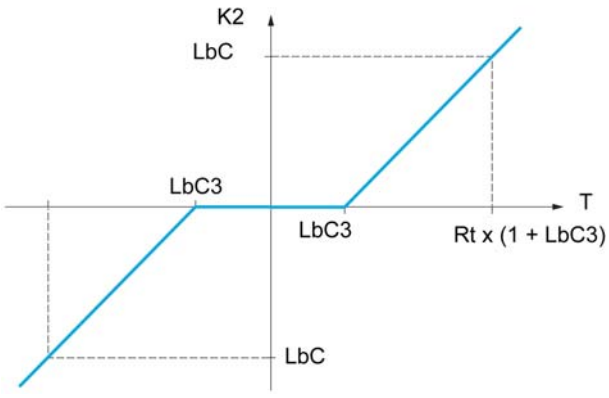
About This Menu

Principle:



The load sharing factor K is determined by the torque and speed, with two factors K1 and K2 (K = K1 x K2).





S Speed
T Torque
Rt Rated torque

[Load sharing] LbA ★

Load balancing configuration.

When 2 motors are connected mechanically and therefore at the same speed, and each is controlled by a drive, this function can be used to improve torque distribution between the two motors. To do this, it varies the speed based on the torque.

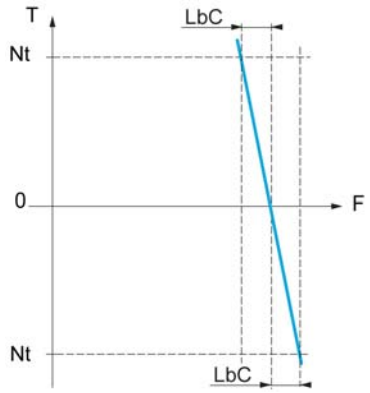
This parameters can be accessed if **[Motor control type]** CtE is set to:
- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SVC V]** VVC, or
- **[FVC]** FVC.

Setting	Code / Value	Description
[No]	no	Function inactive **Factory setting**
[Yes]	YES	Function active

[Load correction] LbC ★

Nominal speed load balance correction.

This parameter can be accessed if **[Load sharing]** LbA is not set to **[No]** no.



T Torque
Nt Nonimal torque
F Frequency

Setting	Description
0...1000.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Correction min spd] LbC I ★

Low Speed for torque decreasing function speed reference.

Minimum speed for load correction in Hz. Below this threshold, no corrections are made. Used to prevent correction at very low speed if this would hamper rotation of the motor.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** no.

Setting	Description
0...999.9 Hz	Setting range **Factory setting**: 0.0 Hz

[Correction max spd] LbC2 ★

High speed for torque decreasing function speed reference.

Speed threshold in Hz above which maximum load correction is applied.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Description
LbC1 +0.1 Hz at 1000.0 Hz	Setting range **Factory setting**: 0.1 Hz

[Torque offset] LbC3 ★

Torque offset for torque correction.

Minimum torque for load correction as a % of the rated torque. Below this threshold, no corrections are made. Used to avoid torque instabilities when the torque direction is not constant.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Description
0...300%	Setting range **Factory setting**: 0%

[Sharing filter] LbF ★

Time constant filter.

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Load sharing]** LbA is not set to **[No]** nO.

Setting	Description
100...20,000 ms	Setting range **Factory setting**: 100 ms

Section 8.16
[Generic functions] - [Speed limits]

[Speed limits] SLM - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [Speed limits]

[Low Speed] LSP

Motor frequency at low speed.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0 Hz

[High Speed] HSP

Motor frequency at high speed.

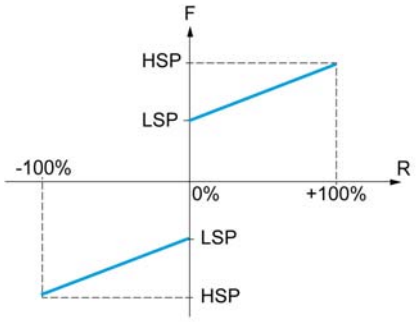
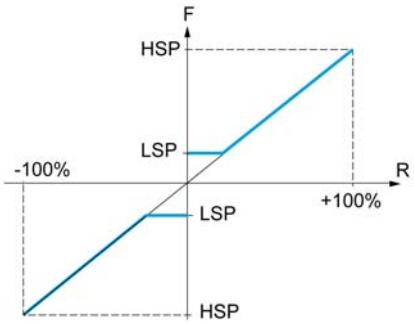
Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 50.0 Hz

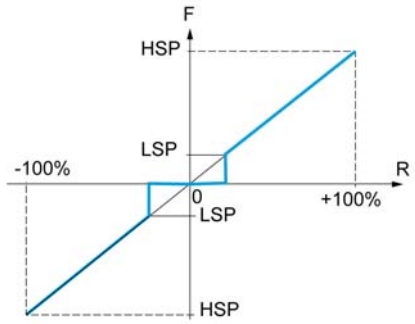
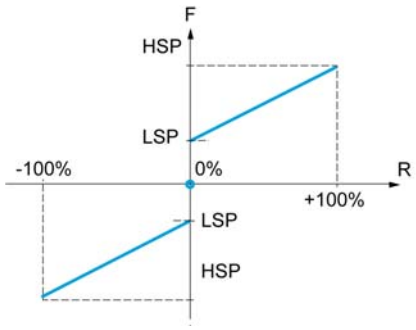
[Ref Freq Template] b S P

Low speed management (template).

This parameter defines how the speed reference is taken into account, for analog inputs and pulse input only. In the case of the PID controller, this is the PID output reference.

The limits are set by the **[Low speed]** L S P and **[High speed]** H S P parameters.

Setting	Code / Value	Description
[Standard]	b S d	 **F** Frequency **R** Reference At reference = 0, the frequency = **[Low speed]** L S P **Factory setting**
[Pedestal]	b L S	 **F** Frequency **R** Reference At reference = 0 to **[Low speed]** L S P, the frequency = **[Low speed]** L S P

Setting	Code / Value	Description
[Deadband]	bnS	 **F** Frequency **R** Reference At reference = 0 to LSP the frequency = 0
[Deadband 0]	bnS0	 **F** Frequency **R** Reference This operation is the same as **[Standard]** bSd, except that in the following cases at zero reference, the frequency = 0: The signal is less than **[Min value]**, which is greater than 0 (example: 1 Vdc on a 2–10 Vdc input). The signal is greater than **[Min value]**, which is greater than **[Max value]** (example: 11 Vdc on a 10–0 Vdc input). If the input range is configured as “bidirectional”, the operation remains identical to **[Standard]** bSd.

Section 8.17
[Generic functions] - [Ramp]

[Ramp] r A M P - Menu

Access

[Complete settings] → **[Generic functions]** → **[Ramp]**

[Ramp Type] r P t

Type of ramp.

Setting	Code / Value	Description
[Linear]	L I n	Linear ramp **Factory setting**
[S-Ramp]	S	S ramp
[U-Ramp]	U	U ramp
[Customized]	C U S	Customer ramp

[Ramp increment] I n r

This parameter is valid for **[Acceleration]** A C C, **[Deceleration]** d E C, **[Acceleration 2]** A C 2 and **[Deceleration 2]** d E 2.

Setting ( )	Code / Value	Description
[0.01]	0.0 1	Ramp up to 99.99 seconds
[0.1]	0. 1	Ramp up to 999.9 seconds **Factory setting**
[1]	1	Ramp up to 6,000 seconds

[Acceleration] A C C

Time to accelerate from 0 to the **[Nominal Motor Freq]** F r S.

To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

Setting ( )	Description
0.00...6,000.00 s (1)	Setting range **Factory setting**: 3.00 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 according to **[Ramp increment]** I n r	

[Deceleration] d E C

Time to decelerate from the **[Nominal Motor Freq]** F r S to 0.

To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

Setting ( )	Description
0.00...6,000.00 s (1)	Setting range **Factory setting**: 3.00 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 according to **[Ramp increment]** I n r	

[Begin Acc round] tA1 ★

Rounding of start of acceleration ramp as a % of the **[Acceleration]** ACC or **[Acceleration 2]** AC2 ramp time.

Can be set from 0 to 100%.

This parameter can be accessed if the **[Ramp type]** rPt is set to **[Customized]** CUS.

Setting	Description
0...100%	Setting range **Factory setting**: 10%

[End Acc round] tA2 ★

Rounding of end of acceleration ramp as a % of the **[Acceleration]** ACC or **[Acceleration 2]** AC2 ramp time.

Can be set between 0 and (100% - **[Begin Acc round]** tA1).

This parameter can be accessed if the **[Ramp type]** rPt is set to **[Customized]** CUS.

Setting	Description
0...100%	Setting range **Factory setting**: 10%

[Begin Dec round] tA3 ★

Rounding of start of deceleration ramp as a % of the **[Deceleration]** dEC or **[Deceleration 2]** dE2 ramp time.

Can be set from 0 to 100%.

This parameter can be accessed if the **[Ramp type]** rPt is set to **[Customized]** CUS.

Setting	Description
0...100%	Setting range **Factory setting**: 10%

[End Dec round] tA4 ★

Rounding of end of deceleration ramp as a % of the **[Deceleration]** dEC or **[Deceleration 2]** dE2 ramp time.

Can be set between 0 and (100% - **[Begin Dec round]** tA3).

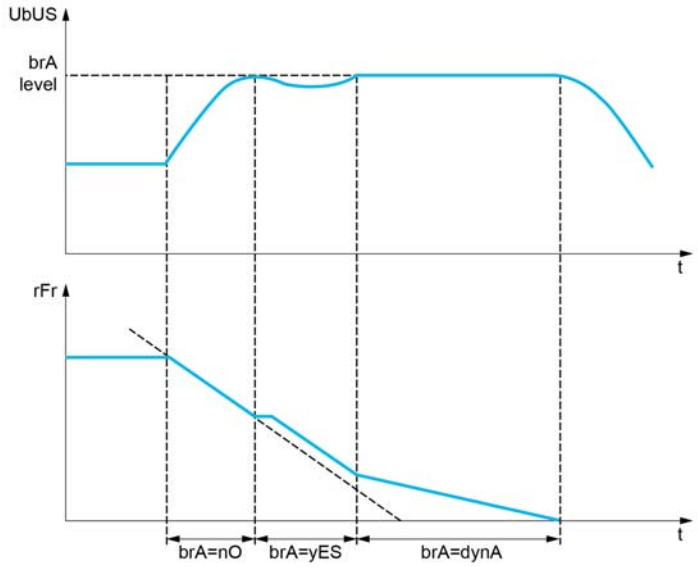
This parameter can be accessed if the **[Ramp type]** rPt is **[Customized]** CUS.

Setting	Description
0...100%	Setting range **Factory setting**: 10%

[Dec.Ramp Adapt] brA

Deceleration ramp adaptation.

NOTICE
DAMAGE TO THE MOTOR Only set this parameter to YES or nO if the connected motor is a permanent magnet synchronous motor. Other settings demagnetize permanent magnet synchronous motors. **Failure to follow these instructions can result in equipment damage.**



Activating this function automatically adapts the deceleration ramp, if this has been set at a too low value according to the inertia of the load, which can cause an overvoltage detected error.

The function is incompatible with applications requiring:

- Positioning on a ramp
- The use of a braking resistor (the resistor would not operate correctly).

Setting	Code / Value	Description
[No]	nO	Function inactive, this setting is available if **[Braking Resistor]** brC is not set to **[No]** nO **Factory setting**
[Yes]	YES	Function active, for applications that do not require strong deceleration **[Dec.Ramp Adapt]** brA is set to **[Yes]** YES if **[Braking Resistor]** brC is set to **[No]** nO
[High Torque]	dYnA	Addition of a constant current flow component. The **[High torq. A]** dYnA selection appears depending on the rating of the drive and **[Motor control type]** Ctt. It enables stronger deceleration to be obtained than with **[Yes]** YES. Use comparative testing to determine your selection When **[Dec.Ramp Adapt]** brA is configured on **[High torq. x]** dYnX, the dynamic performances for braking are improved by the addition of a current flow component. The aim is to increase the iron loss and magnetic energy stored in the motor.

[Braking Resistor] brC

Setting	Code / Value	Description
[No]	nO	Function inactive **Factory setting**
[Yes]	YES	Function active **[Braking Resistor]** brC is forced to **[Yes]** YES if **[Dec.Ramp Adapt]** brA is set to **[No]** nO or if **[Brake assignment]** bLC is not set to **[No]** nO. *(see page 312)*

Section 8.18
[Generic functions] - [Ramp switching]

[Ramp switching] rPt - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Ramp switching]**

[Ramp 2 Thd] Frt

Ramp 2 frequency threshold

The second ramp is switched if the value of **[Ramp 2 Thd]** Frt is not 0 (0 deactivates the function) and the output frequency is greater than **[Ramp 2 Thd]** Frt.

Threshold ramp switching can be combined with **[Ramp Switch Assign]** rPS switching as follows:

DI or Bit	Frequency	Ramp
0	< Frt	ACC, dEC
0	> Frt	AC2, dE2
1	< Frt	AC2, dE2
1	> Frt	AC2, dE2

Setting ( )	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Ramp Switch Assign] rPS

Ramp switching.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** io configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** io configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** io configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** io configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** io configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Acceleration 2] AC2 ★

Acceleration 2 ramp time.

Time to accelerate from 0 to the **[Nominal Motor Freq]** FrS. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

This parameter can be accessed if **[Ramp 2 Thd]** FrtH is greater than 0 or if **[Ramp Switch Assign]** rPS is assigned.

Setting	Description
0.0...6,000 s (1)	Setting range **Factory setting**: 5.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1...6,000 s according to **[Ramp increment]** Inr.	

[Deceleration 2] dE2 ★

Time to decelerate from the **[Nominal Motor Freq]** FrS to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

This parameter can be accessed if:
- **[Ramp 2 Thd]** FrtH is greater than 0, or
- **[Ramp Switch Assign]** rPS is assigned.

Setting	Description
0.0...6,000 s (1)	Setting range **Factory setting**: 5.0 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1...6,000 s according to **[Ramp increment]** Inr.	

Section 8.19
[Generic functions] - [Stop configuration]

[Stop configuration] StE - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Stop configuration]**

About This Menu

NOTE: This function cannot be used with some other functions.

[Type of stop] StE

Normal stop mode.

Stop mode on disappearance of the run command or appearance of a stop command.

Setting	Code / Value	Description
[On Ramp]	rMP	Stop on ramp, f **[Brake assignment]** bLC or **[Low speed time out]** tLS are configured, only a **[On Ramp]** rMP is possible. **Factory setting**
[Fast stop]	FSt	Fast stop Available if **[Motor fluxing]** FLu is set to **[Continuous]** FCt,
[Freewheel]	nSt	Freewheel stop
[DC injection]	dC I	DC injection stop. Available if **[Motor control type]** Ctt is not set to: ● **[Sync. mot.]** SYn, or ● **[Sync.CL.]** FSY, or ● **[SYN_U VC]** SYnu, or ● **[Rel. Mot]** SrVC

[Freewheel stop ass.] nSt

Freewheel stop.

The stop is activated when the input or the bit changes to 0. If the input returns to state 1 and the run command is still active, the motor will only restart if **[2/3-wire control]** tCC is set to **[2-Wire Control]** 2C and if **[2-wire type]** tCt is set to **[Level]** LEL or **[Fwd priority]** PFo. If not, a new run command must be sent.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LIL...LBL	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LI1L...LI6L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Freewheel stop Thd] FFt ★

Freewheel stop threshold.

Speed threshold below which the motor switches to freewheel stop.

This parameter supports switching from a ramp stop or a fast stop to a freewheel stop below a low speed threshold.

This parameter can be accessed if:

- **[Type of stop]** Stt is set to **[Fast stop]** FSt or **[Ramp stop]** rMP, and
- **[Auto DC Injection]** AdC is configured.

Setting ❮❯	Description
0.2...599.0 Hz	Setting range **Factory setting**: 0.2 Hz

[Fast stop ass.] FSt

Fast stop.

The stop is activated when the input changes to 0 or the bit changes to 1 (bit in **[I/O profile]** IO at 0).

If the input returns to state 1 and the run command is still active, the motor will only restart if **[2/3-wire control]** tCC is set to **[2-Wire Control]** 2C and if **[2-wire type]** tCt is set to **[Level]** LEL or **[Fwd priority]** PFo.

If not, a new run command must be sent.

NOTE: This function cannot be used with some other functions.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LIL...LBL	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LIIL...LI6L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Ramp Divider] dCF ★

Fast Stop deceleration ramp reduction coefficient.

This parameter can be accessed if:

- **[Type of stop]** Stt is set to **[Fast stop]** FSt, and
- **[Fast stop assign.]** FSt is not set to **[No]** nO, and
- **[Stop type]** PAS is set to **[Fast stop]** FSt.

The ramp that is enabled (**[Deceleration]** dEC or **[Deceleration 2]** dE2) is then divided by this coefficient when stop requests are sent.

Value 0 corresponds to a minimum ramp time.

Setting ❮❯	Description
0...10	Setting range **Factory setting**: 4

[DC Injection Assign] dC I

DC injection brake assignment.

⚠ WARNING

UNINTENDED MOVEMENT

- Do not use DC injection to generate holding torque when the motor is at a standstill.
- Use a holding brake to keep the motor in the standstill position.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

DC injection braking is initiated when the assigned input or bit changes to state 1.

If the input returns to state 0 and the run command is still active, the motor will only restart if **[2/3-wire control]** tCC is set to **[2-Wire Control]** 2C and if **[2-wire type]** tCt is set to **[Level]** LEL or **[Fwd priority]** PFo. If not, a new run command must be sent.

NOTE: This function cannot be used with some other functions.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[DC inject. level 1] IdC ★

DC injection current.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

Level of DC injection braking current activated via digital input or selected as stop mode.

This parameter can be accessed if:
- **[Type of stop]** Stt is set to **[DC injection]** dC 1, or
- **[DC.Brake DI]** dC 1 is not set to **[No]** no.

Setting ❮❯	Description
0.1...1.41 In (1)	Setting range This setting is independent of the **[Auto DC Injection]** AdC - function. **Factory setting**: 0.7 In (1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[DC injection time 1] tdI ★

DC injection time 1.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

Maximum current injection time **[DC inject. level 1]** IdC. After this time, the injection current becomes **[DC inject. level 2]** IdC2.

This parameter can be accessed if:
- **[Type of stop]** Stt is set to **[DC injection]** dC 1, or
- **[DC.Brake DI]** dC 1 is not set to **[No]** no.

Setting ❮❯	Description
0.1...30 s	Setting range This setting is independent of the **[Auto DC Injection]** AdC - function. **Factory setting**: 0.5 s

[DC inject. level 2] IdC2 ★

DC injection current 2.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Injection current activated by digital input or selected as stop mode once period **[DC injection time 1]** tdI has elapsed.

This parameter can be accessed if:

- **[Type of stop]** Stt is set to **[DC injection]** dC1, or
- **[DC.Brake DI]** dC1 is not set to **[No]** no.

Setting ❮❯	Description
0.1 In (1)...**[DC inject. level 1]** IdC	Setting range This setting is independent of the **[Auto DC Injection]** AdC- function. **Factory setting**: 0.5 In (1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[DC Inj Time 2] tdC ★

2nd DC injection time.

NOTICE

OVERHEATING AND DAMAGE TO THE MOTOR

Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor.

Failure to follow these instructions can result in equipment damage.

Maximum injection time **[DC inject. level 2]** IdC2 for injection, selected as stop mode only.

This parameter can be accessed if **[Type of stop]** Stt is set to **[DC injection]** dC1.

Setting ❮❯	Description
0.1...30 s	Setting range This setting is independent of the **[Auto DC Injection]** AdC- function. **Factory setting**: 0.5 s

[SwitchOnDisable Stp] dOtd

Disable operation stop mode.

Setting	Code / Value	Description
[Freewheel Stop]	nSt	Disable drive function
[Ramp Stop]	rMP	Ramp stop then disable drive function **Factory setting**

Section 8.20
[Generic functions] - [Auto DC injection]

[Auto DC injection] AdC - Menu

Access

[Complete settings] → **[Generic functions]** → **[Auto DC injection]**

About This Menu

This menu presents the automatic injection of motor current function. This is used to hold the rotor of the motor at the end of the deceleration ramp.

[Auto DC Injection] AdC

Automatic DC Injection.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the parameter **[Auto DC Injection]** AdC is set to **[Continuous]** Ct, DC injection is always active, even if the motor does not run.

- Verify that using this setting does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED MOVEMENT

- Do not use DC injection to generate holding torque when the motor is at a standstill.
- Use a holding brake to keep the motor in the standstill position.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Automatic current injection on stopping (at the end of the ramp).

NOTE: There is an interlock between this function and **[Motor fluxing]** FLu. If **[Motor fluxing]** FLu is set to **[Continuous]** FCt, **[Auto DC Injection]** AdC must be **[No]** no.

[Auto DC Injection] AdC is forced to **[No]** no when **[Brake assignment]** bLC is not set to **[No]** no. This parameter gives rise to the injection of current even if a run command has not been sent.

Setting	Code / Value	Description
[No]	no	No injection **Factory setting**
[Yes]	YES	Adjustable injection time
[Continuous]	Ct	Continuous standstill injection

[Auto DC inj Level 1] SdC 1 ★

Auto DC injection level 1.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

Level of standstill DC injection current **[Auto DC Injection]** AdC is not **[No]** nO.

Setting ❮❯	Description
0...1.1 In (1)	Setting range **Factory setting**: 0.7 In (1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[Auto DC Inj Time 1] tdC 1 ★

Auto DC injection time 1.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

This parameter can be accessed if **[Auto DC Injection]** AdC is not set to **[No]** nO.

This time corresponds to the zero speed maintenance time, if **[Motor control type]** Ctt is set to:

- **[Sync. mot.]** SYn, or
- **[Sync.CL.]** FSY, or
- **[SYN_U VC]** SYnU, or
- **[Rel. Mot]** SrVC

Setting ❮❯	Description
0.1...30.0 s	Setting range **Factory setting**: 0.5 s

[Auto DC inj Level 2] SdC 2 ★

Auto DC injection level 2.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

Second level of standstill DC injection current.

This parameter can be accessed if **[Auto DC Injection]** AdC is not set to **[No]** nO.

Setting ❮❯	Description
0...1.1 In (1)	Setting range **Factory setting**: 0.5 In (1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

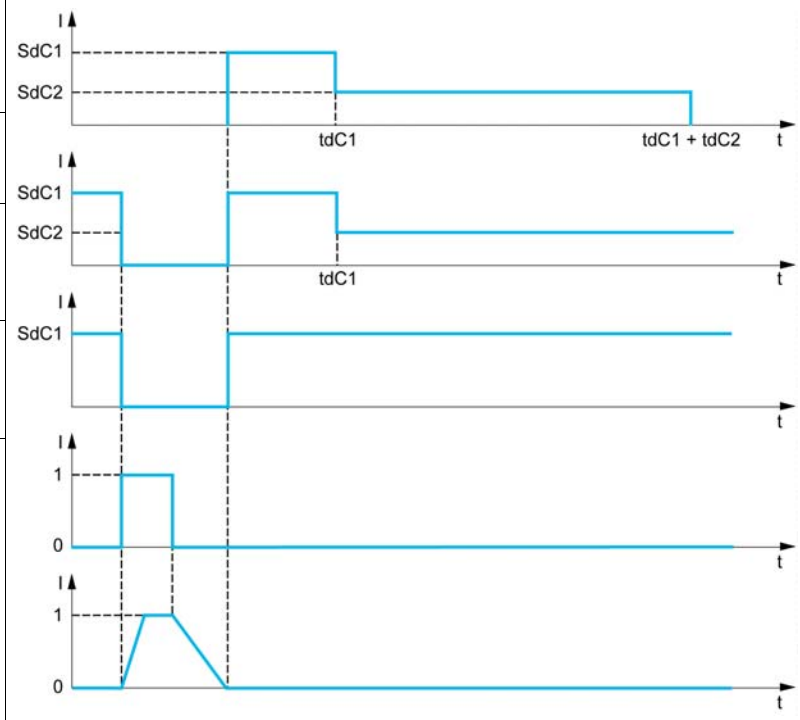
[Auto DC Inj Time 2] tdC2 ★

Auto DC injection time 2.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR Verify that the connected motor is properly rated for the DC injection current to be applied in terms of amount and time in order to avoid overheating and damage to the motor. **Failure to follow these instructions can result in equipment damage.**

Second standstill injection time.

This parameter can be accessed if **[Auto DC Injection]** AdC is set to **[YES]** YES.

AdC	SdC2	Operation
YES	x	
Ct	≠ 0	
Ct	= 0	
Run command		
Speed		

Setting ❮❯	Description
0.0...30.0 s	Setting range **Factory setting**: 0.0 s

Section 8.21
[Generic functions] - [Ref. operations]

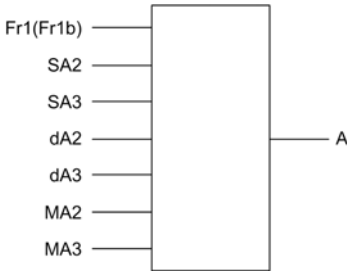
[Ref. operations] oA1 - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Ref. operations]**

About This Menu

Summing input / subtraction input / multiplier



A (Fr1 or Fr1b + SA2 + SA3 - dA2 - dA3) x MA2 x MA3

NOTE:
- If SA2, SA3, dA2, dA3 are not assigned, they are set to 0.
- If MA2, MA3 are not assigned, they are set to 1.
- A is limited by the minimum LSP and maximum HSP parameters.
- For a multiplication, the signal on MA2 or MA3 is interpreted as a %. 100% corresponds to the maximum value of the corresponding input. If MA2 or MA3 is sent via the communication bus or Graphic Display Terminal, an MFr multiplication variable must be sent via the bus or Graphic Display Terminal.
- Reversal of the direction of operation in the event of a negative result can be blocked (see **[Reverse Disable]** rIn).

[Summing Input 2] SA2

Summing input 2.

Selection of a reference to be added to **[Ref Freq 1 Config]** Fr1 or **[Ref.1B channel]** Fr1b.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[AI1]	AI1	Analog input AI1 **Factory Setting**
[AI2]...**[AI3]**	AI2...AI3	Analog input AI2...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	uPdt	Up/Down function is assigned by DIx
[Ref. Freq- Rmt. Term]	LCC	Reference Frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	nEt	Reference frequency via fieldbus module if a fieldbus module has been inserted
[Embedded Ethernet]	EtH	Embedded Ethernet
[AI Virtual 1]	AIV1	Virtual analogic input 1
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Summing Input 3] *SA3*

Summing input 3.

Selection of a reference to be added to **[Ref Freq 1 Config]** *Fr1* or **[Ref.1B channel]** *Fr1b*.

Identical to **[Summing Input 2]** *SA2*

[Subtract Ref Freq 2] *dA2*

Subtract reference frequency 2.

Selection of a reference to be subtracted from **[Ref Freq 1 Config]** *Fr1* or **[Ref.1B channel]** *Fr1b*.

Identical to **[Summing Input 2]** *SA2*

[Subtract Ref Freq 3] *dA3*

Subtract reference frequency 3.

Selection of a reference to be subtracted from **[Ref Freq 1 Config]** *Fr1* or **[Ref.1B channel]** *Fr1b*.

Identical to **[Summing Input 2]** *SA2*.

[Ref Freq 2 Multiply] *MA2*

Reference frequency 2 multiply (in % of the source range).

Selection of a multiplier reference **[Ref Freq 1 Config]** *Fr1* or **[Ref.1B channel]** *Fr1b*.

Identical to **[Summing Input 2]** *SA2*.

[Ref Freq 3 Multiply] *MA3*

Reference frequency 3 multiply (in % of the source range).

Selection of a multiplier reference **[Ref Freq 1 Config]** *Fr1* or **[Ref.1B channel]** *Fr1b*.

Identical to **[Summing Input 2]** *SA2*.

Section 8.22
[Generic functions] - [Preset speeds]

[Preset speeds] PSS - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [Preset speeds]

About This Menu

NOTE: This function cannot be used with some other functions.

Combination Table for Preset Speed Inputs

2, 4, 8 or 16 speeds can be preset, requiring 1, 2, 3 or 4 digital inputs respectively.

It is necessary to configure:
- 2 and 4 speeds in order to obtain 4 speeds.
- 2, 4 and 8 speeds in order to obtain 8 speeds.
- 2, 4, 8 and 16 speeds in order to obtain 16 speeds.

16 Preset Freq (PS16)	8 Preset Freq (PS8)	4 Preset Freq (PS4)	2 Preset Freq (PS2)	Speed Reference
0	0	0	0	Reference 1 (1)
0	0	0	1	SP2
0	0	1	0	SP3
0	0	1	1	SP4
0	1	0	0	SP5
0	1	0	1	SP6
0	1	1	0	SP7
0	1	1	1	SP8
1	0	0	0	SP9
1	0	0	1	SP10
1	0	1	0	SP11
1	0	1	1	SP12
1	1	0	0	SP13
1	1	0	1	SP14
1	1	1	0	SP15
1	1	1	1	SP16

(1) Reference 1 = SP1, refer to diagram *(see page 214)*

[2 Preset Freq] P S 2

2 preset freq assignment.

Setting	Code / Value	Description
[Not Assigned]	n o	Not assigned **Factory setting**
[DI1]...**[DI8]**	L I 1...L I 8	Digital input DI1...DI8
[DI11]...**[DI16]**	L I 1 1...L I 16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	C d 0 0...C d 1 0	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** I o configuration
[CD11]...**[CD15]**	C d 1 1...C d 1 5	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C 1 0 1...C 1 1 0	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** I o configuration
[C111]...**[C115]**	C 1 1 1...C 1 1 5	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C 2 0 1...C 2 1 0	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** I o configuration
[C211]...**[C215]**	C 2 1 1...C 2 1 5	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C 3 0 1...C 3 1 0	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** I o configuration
[C311]...**[C315]**	C 3 1 1...C 3 1 5	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C 5 0 1...C 5 1 0	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** I o configuration
[C511]...**[C515]**	C 5 1 1...C 5 1 5	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[4 Preset Freq] P S 4

4 preset freq assignment.

Identical to **[2 Preset Freq]** P S 2

To obtain 4 speeds, you must also configure 2 speeds.

[8 Preset Freq] P S 8

8 preset freq assignment.

Identical to **[2 Preset Freq]** P S 2

To obtain 8 speeds, you must also configure 2 and 4 speeds.

[16 Preset Freq] P S 1 6

16 preset freq assignment.

Identical to **[2 Preset Freq]** P S 2

To obtain 16 speeds, you must also configure 2, 4 and 8 speeds.

[Preset speed 2] S P 2 ★

Preset speed 2. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 10.0 Hz

[Preset speed 3] 5P3 ★

Preset speed 3. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 15.0 Hz

[Preset speed 4] 5P4 ★

Preset speed 4. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 20.0 Hz

[Preset speed 5] 5P5 ★

Preset speed 5. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 25.0 Hz

[Preset speed 6] 5P6 ★

Preset speed 6. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 30.0 Hz

[Preset speed 7] 5P7 ★

Preset speed 7. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 35.0 Hz

[Preset speed 8] 5P8 ★

Preset speed 8. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 40.0 Hz

[Preset speed 9] 5P9 ★

Preset speed 9. See the combination table for preset speed inputs *(see page 327)*.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 45.0 Hz

[Preset speed 10] SP 10 ★

Preset speed 10. See the combination table for preset speed inputs *(see page 327)*.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 50.0 Hz

[Preset speed 11] SP 11 ★

Preset speed 11. See the combination table for preset speed inputs *(see page 327)*.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 55.0 Hz

[Preset speed 12] SP 12 ★

Preset speed 12. See the combination table for preset speed inputs *(see page 327)*.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 60.0 Hz

[Preset speed 13] SP 13 ★

Preset speed 13. See the combination table for preset speed inputs *(see page 327)*.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 70.0 Hz

[Preset speed 14] SP 14 ★

Preset speed 14. See the combination table for preset speed inputs *(see page 327)*.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 80.0 Hz

[Preset speed 15] SP 15 ★

Preset speed 15 See the combination table for preset speed inputs *(see page 327)*.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 90.0 Hz

[Preset speed 16] SP 16 ★

Preset speed 16. See the combination table for preset speed inputs *(see page 327)*.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 100.0 Hz

Section 8.23
[Generic functions] - [+/- speed]

[+/- speed] uPd - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[+/- speed]**

About This Menu

This function can be accessed if reference channel **[Ref Freq 2 Config]** Fr2 is set to **[Ref Frequency via DI]** uPdt

NOTE: This function cannot be used with some other functions.

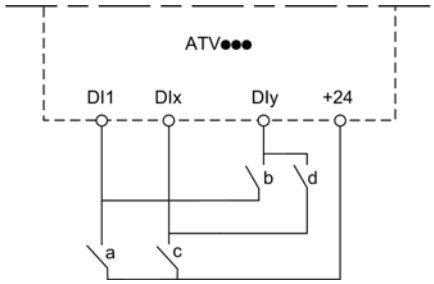
2 types of operations are available:

- **Use of single action keys:** 2 digital inputs are required in addition to the operating directions. The input assigned to the “+ speed” command increases the speed, the input assigned to the “– speed” command decreases the speed.
- **Use of double action keys:** Only one digital input assigned to “+ speed” is required.

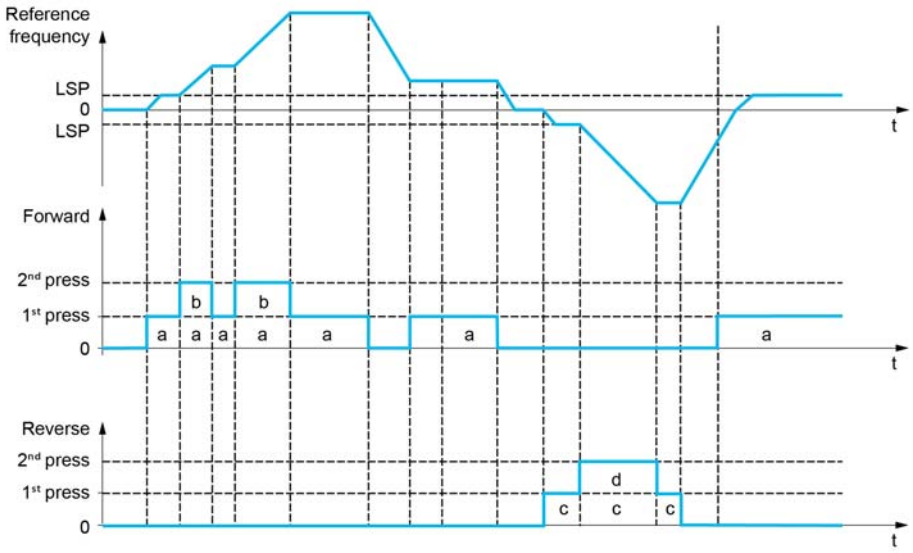
+/– speed with double-press buttons:

Description: 1 button pressed twice (2 steps) for each direction of rotation. A contact closes each time the button is pressed.

Setting	Released (– Speed)	First Press (Speed Maintained)	Second Press (Faster)
Forward button	–	a	a and b
Reverse button	–	c	c and d



DI1 Forward
DIx Reverse
DIy + speed



Do not use this +/– speed type with a 3-wire control.

Whichever type of operation is selected, the max. speed is set by **[High speed]** *HSP*.

NOTE: If the reference is switched via **[Freq Switch Assign]** *rFC* from any reference channel to another reference channel with "+/– speed", the value of reference **[Motor Frequency]** *rFr* (after ramp) may be copied at the same time in accordance with the **[Copy Ch1-Ch2]** *CoP* parameter.
If the reference is switched via **[Freq Switch Assign]** *rFC* from one reference channel to any other reference channel with "+/– speed", the value of reference **[Motor Frequency]** *rFr* (after ramp) is copied at the same time.
This helps to prevent the speed from being incorrectly reset to zero when switching takes place.

[+ Speed Assign] *USP*

Increase speed input assignment.

Function active if the assigned input or bit is at 1.

Setting	Code / Value	Description
[Not Assigned]	*nO*	Not assigned **Factory setting**
[DI1]...**[DI8]**	*LI1*...*LI8*	Digital input DI1...DI8
[DI11]...**[DI16]**	*LI11*...*LI16*	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	*Cd00*...*Cd10*	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** *IO* configuration
[CD11]...**[CD15]**	*Cd11*...*Cd15*	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	*C101*...*C110*	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** *IO* configuration
[C111]...**[C115]**	*C111*...*C115*	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	*C201*...*C210*	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** *IO* configuration
[C211]...**[C215]**	*C211*...*C215*	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	*C301*...*C310*	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** *IO* configuration
[C311]...**[C315]**	*C311*...*C315*	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	*C501*...*C510*	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** *IO* configuration
[C511]...**[C515]**	*C511*...*C515*	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[- Speed Assign] dSP

Down speed input assignment. See the assignment conditions.

Parameter settings identical to **[+ Speed Assign] uSP**.

Function active if the assigned input or bit is at 1.

[Ref Frequency Save] SEr ★

Reference frequency saves. This parameter can be accessed if **[+ Speed Assign] uSP** is not set to **[Not Assigned] nO**.

Associated with the "+/– speed" function, this parameter can be used to save the reference:

- When the run commands disappear (saved to RAM).
- When the supply mains or the run commands disappear (saved to EEPROM).

Therefore, next time the drive starts up, the speed reference is the last reference frequency saved.

Setting	Code / Value	Description
[No save]	nO	Not saved **Factory setting**
[Save to RAM]	rAM	+/- speed with saving of the reference frequency in RAM
[Save to EEprom]	EEP	+/- speed with saving of the reference frequency in EEPROM

Section 8.24
[Generic functions] - [+/- speed around ref]

[+/- speed around ref] SrE - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[+/- speed around ref]**

About This Menu

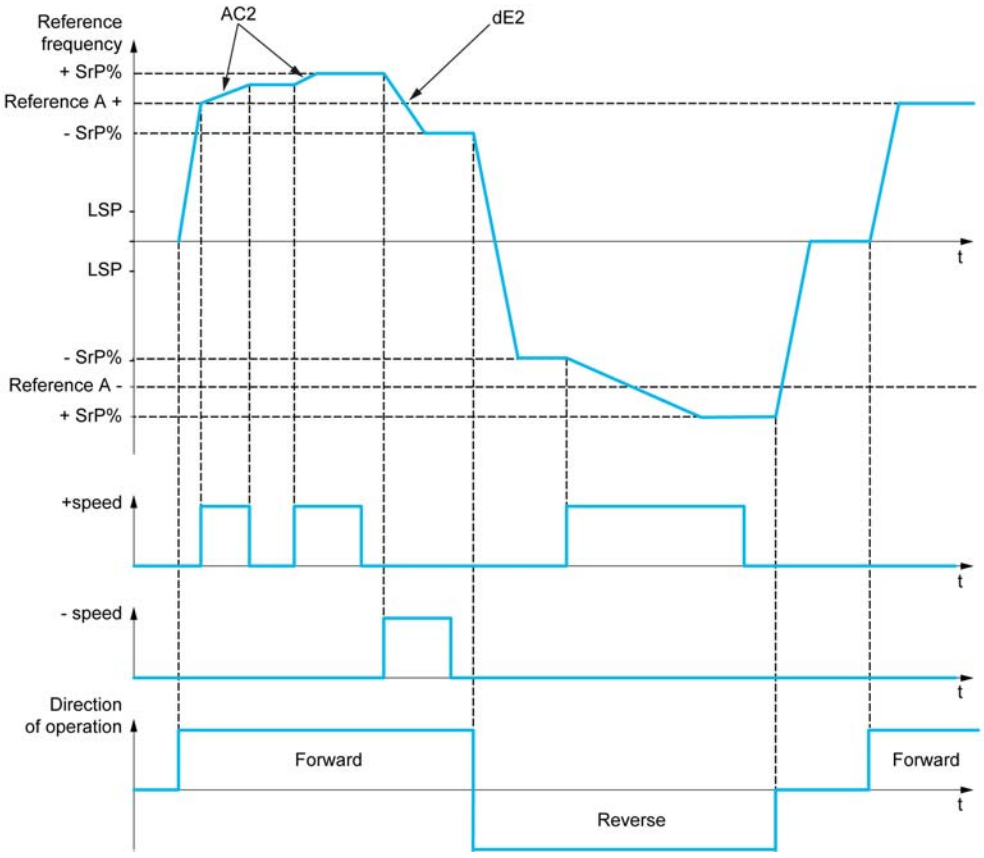
The function can be accessed for reference channel **[Ref Freq 1 Config]** Fr 1.

NOTE: This function cannot be used with some other functions.

The reference is given by **[Ref Freq 1 Config]]** Fr 1 or **[Ref.1B channel]** Fr 1b with summing/subtraction/multiplication functions and preset speeds if relevant (see the diagram below).

For improved clarity, it calls this reference A. The action of the +speed and –speed keys can be set as a % of this reference A. On stopping, the reference (A +/– speed) is not saved, so the drive restarts with reference A+ only.

The maximum total reference is limited by **[High Speed]** HSP and the minimum reference by **[Low Speed]** LSP.



[+ Speed Assign] uS1

Upper speed assignment.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[- Speed Assign] dS1

Down speed assignment. See the assignment conditions.

Function active if the assigned input or bit is at 1.

Setting	Code / Value	Description
[No]	nO	**Factory setting**

[+/-Speed limitation] SrP ★

Up/Down speed limit.

This parameter limits the variation range with +/– speed as a % of the reference. The ramps used in this function are **[Acceleration 2]** AC2 and **[Deceleration 2]** dE2.

This parameter can be accessed if **[+ Speed Assign]** uS1 or **[- Speed Assign]** dS1 is not set to **[No]** nO.

Setting ❮❯	Description
0...50%	Setting range **Factory setting**: 10%

[Acceleration 2] AC2 ★

Acceleration 2 ramp time.

Time to accelerate from 0 to the **[Nominal Motor Freq]** FrS. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

This parameter can be accessed if **[+ Speed Assign]** US1 or **[- Speed Assign]** dS1 is not set to **[No]** nO.

Setting ❮❯	Description
0.00...6,000 s(1)	Setting range **Factory setting**: 5.00 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1...6,000 s according to **[Ramp increment]** Inr.	

[Deceleration 2] dE2 ★

Deceleration 2.

Time to decelerate from the **[Nominal Motor Freq]** FrS to 0. To have repeatability in ramps, the value of this parameter must be set according to the possibility of the application.

This parameter can be accessed if **[+ Speed Assign]** US1 or **[- Speed Assign]** dS1 is not set to **[No]** nO.

Setting ❮❯	Description
0.00...6,000 s(1)	Setting range **Factory setting**: 5.00 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1...6,000 s according to **[Ramp increment]** Inr.	

Section 8.25
[Generic functions] - [Jump frequency]

[Jump frequency] JUF - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [Jump frequency]

About This Menu

This function helps to prevent prolonged operation within an adjustable range around the regulated frequency.

This function can be used to help to prevent a speed, which could cause resonance, being reached. Setting the function to 0 renders it inactive.

[Skip Frequency] JPF

Jump frequency.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Skip Frequency 2] JF2

Jump frequency 2.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[3rd Skip Frequency] JF3

Jump frequency 3.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Skip.Freq.Hysteresis] JFH ★

Jump frequency bandwidth.

This parameter can be accessed if at least one skip frequency JPF, JF2, or JF3 is different from 0.

Skip frequency range: between JPF – JFH and JPF + JFH for example.

This adjustment is common to the 3 frequencies JPF, JF2, JF3.

Setting	Description
0.1...10.0 Hz	Setting range **Factory setting**: 1.0 Hz

Section 8.26
[Generic functions] - [PID controller]

What Is in This Section?

This section contains the following topics:

[PID controller] PId - Overview

About This Menu

NOTE: This function cannot be used with some other functions.

Block Diagram

The function is activated by assigning an analog input to the PID feedback (measurement).

The PID feedback needs to be assigned to one of the analog inputs AI1 to AI5 or a pulse input, according to whether any I/O extension module has been inserted.

The PID reference needs to be assigned to the following parameters:

- Preset references via digital inputs (**[Ref PID Preset 2]** rP2, **[Ref PID Preset 3]** rP3, **[Ref PID Preset 4]** rP4).
- In accordance with the configuration of **[Intern PID Ref]** PII:
  - **[Internal PID ref]** rPI, or
  - Reference A **[Ref Freq 1 Config]** FrI or **[Ref.1B channel]** FrIb.

Combination Table for Preset PID References:

DI (Pr4)	DI (Pr2)	Pr2 = no	Reference
			rPI or FrI(b)
0	0		rPI or FrI(b)
0	1		rP2
1	0		rP3
1	1		rP4

A predictive speed reference can be used to initialize the speed on restarting the process.

Scaling of feedback and references:

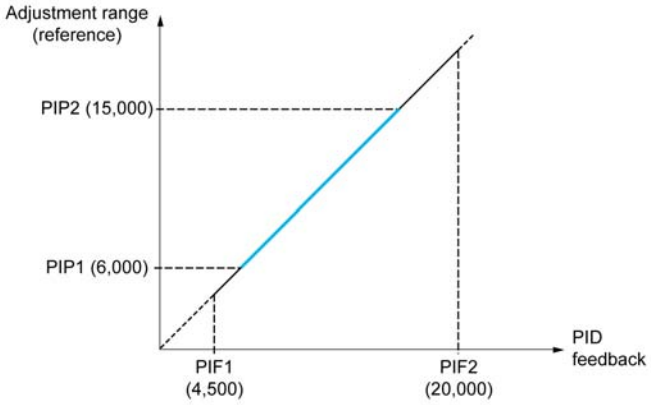
- **[Min PID feedback]** PIF1, **[Max PID feedback]** PIF2 parameters can be used to scale the PID feedback (sensor range). **This scale MUST be maintained for all other parameters.**
- **[Min PID Process]** PIP1, **[Max PID Process]** PIP2 parameters can be used to scale the adjustment range, for example the reference. **Check that the adjustment range remains within the sensor range.**

The maximum value of the scaling parameters is 32,767. To facilitate the installation, it is recommended to use values as close as possible to this maximum level, while retaining powers of 10 in relation to the actual values. The scaling is without unit if **[Type of control]** toCt is set to **[NA]** nA, in % if set to **[OTHER]** otHEr.

Example

Adjustment of the volume in a tank, 6...15 m3.

- Probe used 4-20 mA, 4.5 m^3 for 4 mA and 20 m^3 for 20 mA, with the result that **[PIF1]** PIF1 = 4,500 and **[PIF2]** PIF2 = 20,000.
- Adjustment range 6 to 15 m^3, with the result that **[PIP1]** PIP1 = 6,000 (min. reference) and **[PIP2]** PIP2 = 15,000 (max. reference).
- Example references:
  - **[rP1]** rP1 (internal reference) = 9,500
  - **[rP2]** rP2 (preset reference) = 6,500
  - **[rP3]** rP3 (preset reference) = 8,000
  - **[rP4]** rP4 (preset reference) = 11,200



Other parameters:

- Reversal of the direction of correction **[PID Inversion]** PIC. If **[PID Inversion]** PIC is set to **[No]** nO, the speed of the motor increases when the detected error is positive (for example pressure control with a compressor). If **[PID Inversion]** PIC is set to **[Yes]** YES, the speed of the motor decreases when the detected error is positive (for example temperature control using a cooling fan).
- The integral gain may be short-circuited by a digital input.
- A warning on the **[PID feedback]** PIF may be configured.
- A warning on the **[PID error]** rPE may be configured.

"Manual - Automatic" Operation with PID

This function combines the PID controller, the preset speeds, and a manual reference. Depending on the state of the digital input, the speed reference is given by the preset speeds or by a manual reference input via the PID function.

Manual PID reference **[Manual PID reference]** PIM:

- Analog inputs AI1 to AI5
- Pulse inputs

Predictive speed reference **[Predictive Speed Ref]** FPI:

- **[AI1]** AI1: analog input
- **[AI2]** AI2: analog input
- **[AI3]** AI3: analog input
- **[AI4]** AI4: analog input if VW3A3203 I/O extension module has been inserted
- **[AI5]** AI5: analog input if VW3A3203 I/O extension module has been inserted
- **[DI7 PulseInput]** PI7: pulse input
- **[DI8 PulseInput]** PI8: pulse input
- **[Ref.Freq-Rmt.Term]** LCC: Graphic Display Terminal
- **[Modbus]** Mdb: integrated Modbus
- **[CANopen]** CAn: CANopen® (if inserted)
- **[Com. Module]** nEt: fieldbus option module (if inserted)
- **[Embedded Ethernet]** EtH: integrated Ethernet

Setting Up the PID Controller

1. Configuration in PID mode.

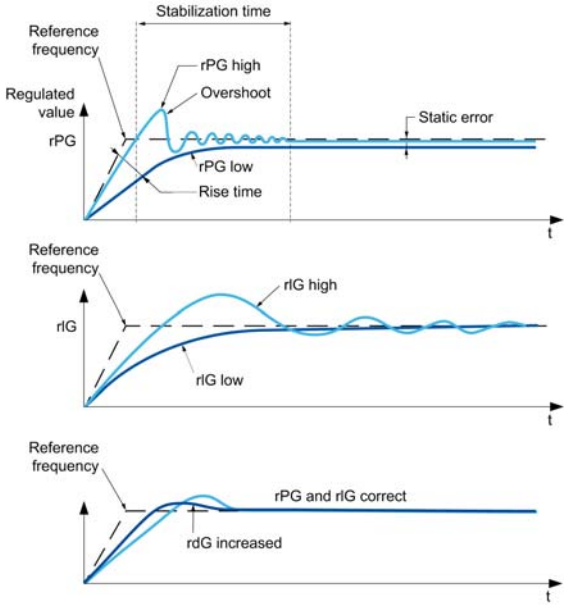
Refer to the Block Diagram *(see page 339)*.

2. Perform a test in factory settings mode.

To optimize the drive, adjust **[PID Prop.Gain]** rPG or **[PID Intgl.Gain]** rIG gradually and independently, and observe the effect on the PID feedback in relation to the reference.

3. If the factory settings are unstable or the reference is incorrect.

Step	Action
1	Perform a test with a speed reference in manual mode (without PID controller) and with the drive on load for the speed range of the system: ● In steady state, the speed must be stable and comply with the reference, and the PID feedback signal must be stable. ● In transient state, the speed must follow the ramp and stabilize quickly, and the PID feedback must follow the speed. If not, see the settings for the drive and/or sensor signal and wiring.
2	Switch to PID mode.
3	Set **[PID ramp]** PrP to the minimum permitted by the mechanism without triggering an **[DC Bus Overvoltage]** obF.
4	Set the integral gain **[PID Intgl.Gain]** rIG to minimum.
5	Leave the derivative gain **[PID derivative gain]** rdG at 0.
6	Observe the PID feedback and the reference.
7	Switch the drive ON/OFF a number of times or vary the load or reference rapidly a number of times.
8	Set the proportional gain **[PID Prop.Gain]** rPG in order to ascertain the compromise between response time and stability in transient phases (slight overshoot and 1 to 2 oscillations before stabilizing).
9	If the reference varies from the preset value in steady state, gradually increase the integral gain **[PID Intgl.Gain]** rIG, reduce the proportional gain **[PID Prop.Gain]** rPG in the event of instability (pump applications), find a compromise between response time and static precision (see diagram).
10	Lastly, the derivative gain may permit the overshoot to be reduced and the response time to be improved, although this is more difficult to obtain a compromise in terms of stability, as it depends on 3 gains.
11	Perform in-production tests over the whole reference range.



The oscillation frequency depends on the system kinematics:

Parameter	Rise time	Overshoot	Stabilization time	Static error
rPG +	- -	+	=	-
rIG +	-	+ +	+	- -
rdG +	=	-	-	=

[Feedback] F d b - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [PID controller] ➡ [Feedback]

About This Menu

NOTE: This function cannot be used with some other functions.

[Type of Control] t o C t

Type of control for the PID = unit choice.

Setting	Code / Value	Description
[nA]	n A	Nothing special **Factory setting**
[Other]	o t h E r	Other control and unit

[PID Feedback] P I F

PID controller feedback.

Setting	Code / Value	Description
[No]	n o	Not assigned **Factory setting**
[AI1]...**[AI3]**	A I 1...A I 3	Analog input AI1...AI3
[AI4]...**[AI5]**	A I 4...A I 5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[AI Virtual 1]	A I V 1	Virtual analogic input 1
[DI7 PulseInput]...**[DI8 PulseInput]**	P I 7...P I 8	Digital input DI7...DI8 used as pulse input

[AI1 Type] A I 1 t ★

Configuration of analog input AI1.

This parameter can be accessed if **[PID Feedback]** P I F is set to **[AI1]** A I 1.

Setting	Code / Value	Description
[Voltage]	10u	0-10 Vdc **Factory setting**
[Current]	0A	0-20 mA
[PTC Management]	P t C	1 to 6 PTC (in serial)
[KTY]	K t Y	1 KTY84
[PT100]	1 P t 2	1 PT100 connected with 2 wires
[PT1000]	1 P t 3	1 PT1000 connected with 2 wires

[AI1 min value] u I 1 L ★

AI1 voltage scaling parameter of 0%.

This parameter can be accessed if:

- **[PID Feedback]** P I F is set to **[AI1]** A I 1, and
- **[AI1 Type]** A I 1 t is not set to **[Voltage]** 10u.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 0.0 Vdc

[AI1 max value] uH1 ★

AI1 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI1]** AI1, and
- **[AI1 Type]** AI1t is not set to **[Voltage]** 10u.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 10.0 Vdc

[AI1 min. value] CrL1 ★

AI1 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI1]** AI1, and
- **[AI1 Type]** AI1t is not set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 0.0 mA

[AI1 max. value] CrH1 ★

AI1 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI1]** AI1, and
- **[AI Type]** AI1t is not set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 20.0 mA

[AI2 Type] AI2t ★

Configuration of analog input AI2.

This parameter can be accessed if **[PID Feedback]** PIF is set to **[AI2]** AI2

Setting	Code / Value	Description
[Voltage]	10u	0-10 Vdc
[Voltage +/-]	n10u	-10/+10 Vdc **Factory setting**

[AI2 min value] uL2 ★

AI2 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI2]** AI2, and
- **[AI2 Type]** AI2t is not set to **[Voltage]** 10u.

Identical to **[AI1 min value]** uL1 *(see page 342)*.

[AI2 max value] uH2 ★

AI2 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** PIF is set to **[AI2]** AI2, and
- **[AI2 Type]** AI2t is not set to **[Voltage]** 10u.

Identical to **[AI1 max value]** uH1 *(see page 343)*.

[AI3 Type] A I 3 t ★

Configuration of analog input AI3.

This parameter can be accessed if **[PID Feedback]** P I F is set to **[AI3]** A I 3.

Identical to **[AI2 Type]** A I 2 t *(see page 343)* with factory setting: **[Current]** 0 A.

[AI3 min value] u I L 3 ★

AI3 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Voltage]** I 0 u.

Identical to **[AI1 min value]** u I L I *(see page 342)*.

[AI3 max value] u I H 3 ★

AI3 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Voltage]** I 0 u.

Identical to **[AI1 max value]** u I H I *(see page 343)*.

[AI3 min. value] C r L 3 ★

AI3 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Current]** 0 A.

Identical to **[AI1 min. value]** C r L I *(see page 343)*.

[AI3 max. value] C r H 3 ★

AI3 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI3]** A I 3, and
- **[AI3 Type]** A I 3 t is not set to **[Current]** 0 A.

Identical to **[AI1 max. value]** C r H I *(see page 343)*.

[AI4 Type] A I 4 t ★

Configuration of analog input AI4.

This parameter can be accessed if:
- VW3A3203 I/O extension module has been inserted, and
- **[PID Feedback]** P I F is set to **[AI4]** A I 4.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc
[Current]	0A	0-20 mA **Factory setting**
[Voltage +/-]	n 10U	-10/+10 Vdc
[PTC Management]	PtC	1 to 6 PTC (in serial)
[KTY]	Kty	1 KTY84
[PT1000]	1Pt3	1 PT1000 connected with 2 wires
[PT100]	1Pt2	1 PT100 connected with 2 wires
[3 PT1000]	3Pt3	3 PT1000 connected with 2 wires
[3 PT100]	3Pt2	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	1Pt33	1 PT1000 connected with 3 wires (AI4 & AI5 only)
[PT100 in 3 wires]	1Pt23	1 PT100 connected with 3 wires (AI4 & AI5 only)
[3 PT1000 in 3 wires]	3Pt33	3 PT1000 connected with 3 wires (AI4 & AI5 only)
[3 PT100 in 3 wires]	3Pt23	3 PT100 connected with 3 wires (AI4 & AI5 only)

[AI4 min value] U I L 4 ★

AI4 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4t is not set to **[Voltage]** 10U.

Identical to **[AI1 min value]** U I L 1 *(see page 342)*.

[AI4 max value] U I H 4 ★

AI4 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4t is not set to **[Voltage]** 10U.

Identical to **[AI1 max value]** U I H 1 *(see page 343)*.

[AI4 min. value] C r L 4 ★

AI4 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4t is not set to **[Current]** 0A.

Identical to **[AI1 min. value]** C r L 1 *(see page 343)*.

[AI4 max. value] C r H 4 ★

AI4 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI4]** A I 4, and
- **[AI4 Type]** A I 4t is not set to **[Current]** 0A.

Identical to **[AI1 max. value]** C r H 1 *(see page 343)*.

[AI5 Type] A I5t ★

Configuration of analog input AI5.

This parameter can be accessed if:
- VW3A3203 I/O extension module has been inserted, and
- **[PID Feedback]** P I F is set to **[AI5]** A I5.

Identical to **[AI4 Type]** A I4t.

[AI5 min value] u IL5 ★

AI5 voltage scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I5, and
- **[AI4 Type]** A I5t is not set to **[Voltage]** I0u.

Identical to **[AI1 min value]** u IL1 *(see page 342)*.

[AI5 max value] u IH5 ★

AI5 voltage scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I5, and
- **[AI4 Type]** A I5t is not set to **[Voltage]** I0u.

Identical to **[AI1 max value]** u IH1 *(see page 343)*.

[AI5 min. value] CrL5 ★

AI5 current scaling parameter of 0%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I5, and
- **[AI5 Type]** A I5t is not set to **[Current]** 0A.

Identical to **[AI1 min. value]** CrL1 *(see page 343)*.

[AI5 max. value] CrH5 ★

AI5 current scaling parameter of 100%.

This parameter can be accessed if:
- **[PID Feedback]** P I F is set to **[AI5]** A I5, and
- **[AI5 Type]** A I5t is not set to **[Current]** 0A.

Identical to **[AI1 max. value]** CrH1 *(see page 343)*.

[Min PID feedback] P IF1 ★

Minimum PID feedback.

This parameter can be accessed if **[PID Feedback]** P I F is not set to **[Not Configured]** nO.

Setting ❮❯	Description
0...**[Max PID feedback]** P IF2	Setting range **Factory setting**: 100

[Max PID feedback] P IF2 ★

Maximum PID feedback.

This parameter can be accessed if **[PID Feedback]** P I F is not set to **[Not Configured]** nO.

Setting ❮❯	Description
[Min PID feedback] P IF1...32,767	Setting range **Factory setting**: 1,000

[PID feedback] rPF ★

Value for PID feedback, display only.

This parameter can be accessed if **[PID Feedback]** PiF is not set to **[Not Configured]** nO.

Setting	Description
0...65,535	Setting range **Factory setting**: 0

[Min Fbk Warning] PAL ★

Minimum feedback level warning.

This parameter can be accessed if **[PID Feedback]** PiF is not set to **[Not Configured]** nO.

Setting ❮❯	Description
0...65,535	Setting range **Factory setting**: 100

[Max Fbk Warning] PAH ★

Maximum feedback level warning.

This parameter can be accessed if **[PID Feedback]** PiF is not set to **[Not Configured]** nO.

Setting ❮❯	Description
0...65,535	Setting range **Factory setting**: 1,000

[Reference frequency] rF - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [PID controller] ➡ [Reference frequency]

About This Menu

NOTE: This function cannot be used with some other functions.

[Intern PID Ref] PI★

Internal PID reference.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[Not Configured]** nO.

Setting	Code / Value	Description
[No]	nO	The PID controller reference is given by **[Ref Freq 1 Config]** Fr1 or **[Ref.1B channel]** Fr1b with summing/subtraction/multiplication functions. Refer to the block diagram *(see page 227)*. **Factory setting**
[Yes]	YES	The PID controller reference is internal via **[Internal PID ref]** rPI.

[Ref Freq 1 Config] Fr1★

Configuration reference frequency 1.

This parameter can be accessed if:

- **[PID Feedback]** PIF is not set to **[Not Configured]** nO, and
- **[Intern PID Ref]** PII is set to **[No]** nO.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[AI1]	AI1	Analog input AI1 **Factory Setting**
[AI2]...**[AI3]**	AI2...AI3	Analog input AI2...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref Frequency via DI]	UPdt	Up/Down function is assigned by DIx
[Ref. Freq- Rmt. Term]	LCC	Reference Frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	nEt	Reference frequency via fieldbus module if a fieldbus module has been inserted
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Min PID reference] PIP1★

Minimum PID reference.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[Not Configured]** nO.

Setting ❮❯	Description
[Min PID feedback] PIF1...**[Max PID reference]** PIP2	Setting range **Factory setting**: 150

[Max PID reference] PIP2 ★

Maximum PID reference.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[Not Configured]** nO.

Setting ❮❯	Description
[Min PID reference] PIP1...**[Max PID feedback]** PIF2	Setting range **Factory setting**: 900

[Internal PID ref] rPI ★

Internal PID reference.

This parameter can be accessed if:
- **[PID Feedback]** PIF is not set to **[Not Configured]** nO, and
- **[Intern PID Ref]** PII is set to **[Yes]** YES.

Setting ❮❯	Description
[Min PID reference] PIP1...**[Max PID reference]** PIP2	Setting range **Factory setting**: 150

[Auto/Manual assign.] PAU ★

Auto/Manual select input.

This parameter can be accessed if **[PID Feedback]** PIF is not set to **[Not Configured]** nO.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Manual PID Reference] PIM ★

Manual PID reference.

Reference input in manual mode.

This parameter can be accessed if:
- **[PID Feedback]** PIF is not set to **[Not Configured]** nO, and
- **[Auto/Manual assign.]** PAU is not set to **[No]** nO.

The preset speeds are active on the manual reference if they have been configured.

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref.Freq-Rmt.Term]	LCC	Display terminal source
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq- CANopen]	CAn	Reference frequency via CANopen
[Ref. Freq-Com. Module]	nEt	Reference frequency via Com Module
[Embedded Ethernet]	EtH	Embedded Ethernet source
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[PID preset references] PrI - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[PID controller]** ➡ **[Reference frequency]** ➡ **[PID preset references]**

About This Menu

The function can be accessed if **[PID feedback ass.]** PIF is assigned.

[2 PID Preset Assign] Pr2

2 PID Preset assignment.

If the assigned input or bit is at 0, the function is inactive.

If the assigned input or bit is at 1, the function is active.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[4 PID Preset Assign] Pr4

4 PID Preset assignment.

Identical to **[2 PID Preset Assign]** Pr2 *(see page 351)*.

Verify that **[2 PID Preset Assign]** Pr2 has been assigned before assigning this function.

[Ref PID Preset 2] rP2 ★

Second PID preset reference.

This parameter can be accessed only if **[2 PID Preset Assign]** Pr2 is assigned.

Setting ❮❯	Description
[Min PID reference] PIP1...**[Max PID reference]** PIP2	Setting range **Factory setting**: 300

[Ref PID Preset 3] rP3 ★

Third PID preset reference.

This parameter can be accessed only if **[4 PID Preset Assign]** Pr4 is assigned.

Setting	Description
[Min PID reference] P1P1...**[Max PID reference]** P1P2	Setting range **Factory setting**: 600

[Ref PID Preset 4] rP4 ★

Fourth PID preset reference.

This parameter can be accessed only if **[4 PID Preset Assign]** Pr4 and **[2 PID Preset Assign]** Pr2 are assigned.

Setting	Description
[Min PID reference] P1P1...**[Max PID reference]** P1P2	Setting range **Factory setting**: 900

[Reference frequency] rF - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[PID controller]** ➡ **[Reference frequency]**

[Predictive Speed Ref] FP1 ★

Predictive speed reference.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref.Freq-Rmt.Term]	LCC	Reference frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq- CANopen]	CAn	Reference frequency via CANopen
[Ref. Freq-Com. Module]	nEt	Reference frequency via communication module
[Embedded Ethernet]	EtH	Embedded Ethernet
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Speed Input %] PSr ★

PID speed input % reference.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting ❮❯	Description
1...100%	Setting range **Factory setting**: 100%

[Settings] 5t - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[PID controller]** ➡ **[Settings]**

About This Menu

Following parameters can be accessed if **[PID Feedback]** PIF is not set to **[Not Configured]** nO.

NOTE: This function cannot be used with some other functions.

[PID Prop.Gain] rPG ★

PID proportional gain.

Setting ❮❯	Description
0.01...100.00	Setting range **Factory setting**: 1.00

[PI Intgl.Gain] rIG ★

Integral gain.

Setting ❮❯	Description
0.01...100.00	Setting range **Factory setting**: 1.00

[PID derivative gain] rdG ★

Derivative gain.

Setting ❮❯	Description
0.00...100.00	Setting range **Factory setting**: 0.00

[PID ramp] PrP ★

PID acceleration/deceleration ramp, defined to go from **[Min PID reference]** PIP1 to **[Max PID reference]** PIP2 and conversely.

Setting ❮❯	Description
0.0...99.9 s	Setting range **Factory setting**: 0.0 s

[PID Inversion] PIC ★

PID inversion.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[Yes]	YES	Yes

[PID Min Output] PoL ★

PID controller minimum output in Hz.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[PID Max Output] PoH ★

PID controller maximum output in Hz.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 60.0 Hz

[PID Error Warning] PEr ★

PID error warning.

Setting ❮❯	Description
0...65,535	Setting range **Factory setting**: 100

[PID Integral OFF] PIS ★

Integral shunt.

If the assigned input or bit is at 0, the function is inactive (the PID integral is enabled).

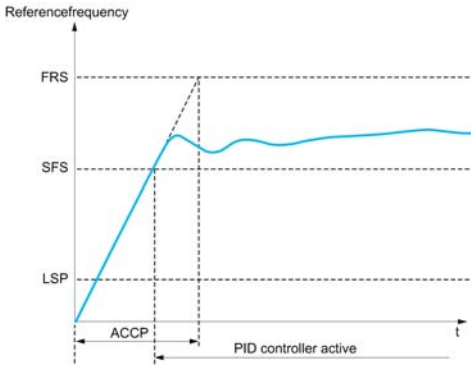
If the assigned input or bit is at 1, the function is active (the PID integral is disabled).

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** Io configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** Io configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** Io configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** Io configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** Io configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[PID acceleration time] ACCP ★

PID: acceleration during start-up.

PID start ramp can be applied before starting the PID controller to allow reaching quickly the PID reference without increasing PID gains. If configured, the **[Start Accel Ramp]** ACC S is applied up to **[Low Speed]** LSP instead of **[PID acceleration time]** ACCP.



Setting ❮❯	Description
0.01...99,99 s	Setting range **Factory setting**: 0.50 s
(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6,000 according to **[Ramp increment]** INR	

[PID Start Ref Freq] SFS ★

PID start reference frequency.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range If **[PID Start Ref Freq]** SFS is lower than **[Low speed]** LSP, this function has no effect. **Factory setting**: 0.0 Hz

Section 8.27
[Generic functions] - [Feedback mon.]

[Feedback monitoring] FKP- Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Feedback monitoring]**

About This Menu

Identical to **[Feedback monitoring]** FKP- Menu *(see page 252)*.

Section 8.28
[Generic functions] - [Threshold reached]

[Threshold reached] tHrE - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [Threshold reached]

[Low I Threshold] CtdL

Current low threshold value.

Setting	Description
0...65,535 A	Setting range **Factory setting**: 0 A

[High Current Thd] Ctd

Current high threshold value.

Setting	Description
0...65,535 A	Setting range **Factory setting**: Drive nominal current

[Low Freq. Threshold] FtdL

Motor low frequency threshold.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Motor Freq Thd] Ftd

Motor frequency threshold.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 50.0 Hz

[2 Freq. Threshold] F2dL

Motor low frequency second threshold.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Freq. threshold 2] F2d

Motor frequency threshold 2.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 50.0 Hz

[Motor Thermal Thd] ttd

Motor thermal state threshold.

Setting	Description
0...118%	Setting range **Factory setting**: 100%

[Motor2 therm. level] ttd2

Motor 2 thermal state threshold.

Setting	Description
0...118%	Setting range **Factory setting**: 100%

[Motor3 therm. level] ttd3

Motor 3 thermal state threshold.

Setting	Description
0...118%	Setting range **Factory setting**: 100%

[Reference high Thd] rtd

Reference frequency high threshold.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Reference low Thd] rtdL

Reference low threshold.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[High torque thd.] ttH

High torque threshold.

Setting	Description
-300...300%	Setting range **Factory setting**: 100%

[Low torque thd.] ttL

Low torque threshold.

Setting	Description
-300...300%	Setting range **Factory setting**: 50%

Section 8.29
[Generic functions] - [Mains contactor command]

[Mains contactor command] LLC - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Mains contactor command]**

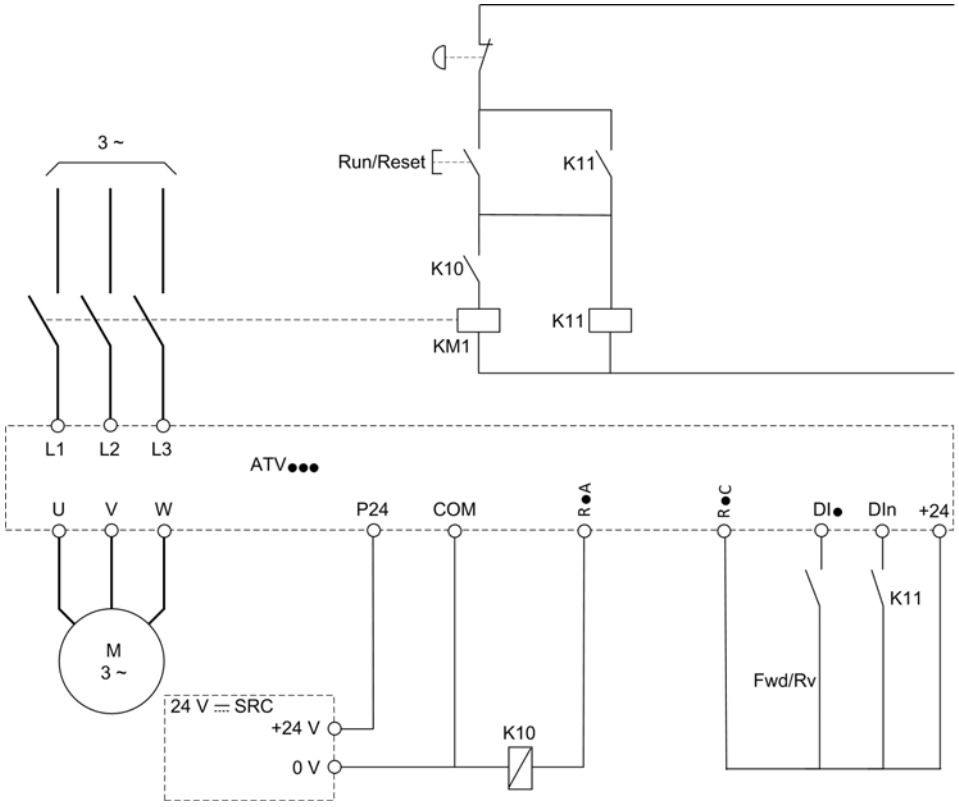
About This Menu

The line contactor closes every time a run command (forward or reverse) is sent and opens after every stop, as soon as the drive is locked. For example, if the stop mode is stop on ramp, the contactor opens when the motor reaches zero speed.

NOTE: The drive control power supply must be provided via an external 24 Vdc source.

NOTICE
DAMAGE TO THE DRIVE
Do not use this function at intervals of less than 60 s.
Failure to follow these instructions can result in equipment damage.

Example circuit (24 Vdc power supply):



DIï = Run command **[Forward]** Frd or **[Reverse]** rrS

RïA/RïC = **[Mains Contactor]** LLC

DIn = **[Drive Lock]** LES

NOTE: The Run/Reset key must be pressed once the emergency stop key has been released.

[Mains Contactor] LLC

Mains contactor control.

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[R2]...**[R3]**	r2...r3	Relay output R2...R3
[R4]...**[R6]**	r4...r6	Relay output R4...R6 if VW3A3204 relay output option module has been inserted
[DQ1 Digital Output]	do1	Digital output DQ1
[DQ11 Digital Output]...**[DQ12 Digital Output]**	do11...do12	Digital output DQ11...DQ12 if VW3A3203 I/O extension module has been inserted

[Drive Lock] LES ★

Drive lock assignment.

This parameter can be accessed if **[Mains Contactor]** LLC is not set to **[No]** nO.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LI1L...LI8L	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LI11L...LI16L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Mains V. time out] LCt ★

Monitoring time for closing of line contactor.

Setting	Description
1...999 s	Setting range **Factory setting**: 5 s

Section 8.30
[Generic functions] - [Reverse disable]

[Reverse disable] rEin - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [Reverse disable]

[Reverse Disable] rin

Reverse direction disable.

Reverse direction requests sent by digital inputs are taken into account.

Reverse direction requests sent by the Graphic Display Terminal or sent by the line are not taken into account.

Any reverse speed reference originating from the PID, summing input, and so on, is interpreted as a zero reference (0 Hz).

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[Yes]	YES	Yes

Section 8.31
[Generic functions] - [Torque limitation]

[Torque limitation] tOL - Menu

Access

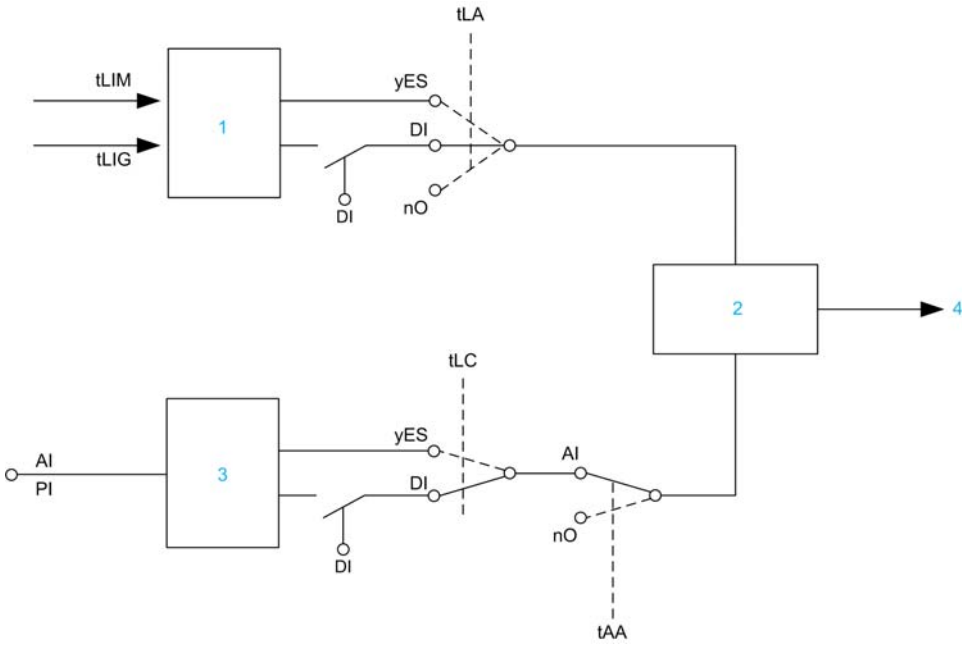
[Complete settings] ➡ [Generic functions] ➡ [Torque limitation]

About This Menu

There are 2 types of torque limitation:
- With a value that is fixed by a parameter.
- With a value that is set by an analog input (AI or pulse).

If both types are enabled, the lowest value is taken into account.

These 2 types can be configured or switched remotely using a digital input or via the communication bus:



1 Torque limitation via parameter
2 Lowest value taken into account
3 Torque limitation via analog input, RP
4 Limitation value

[Torque limit activ.] tLA

Activation of the permanent torque limitation.

If the assigned input or bit is at 0, the function is inactive.

If the assigned input or bit is at 1, the function is active.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[Yes]	YES	Yes
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Pmax Motor] tPMM ★

Maximum power in motor mode.

This parameter can be accessed if **[Torque limit activ.]** tLA is not set to **[Not Assigned]** nO.

Setting ❮❯	Description
10...300%	Setting range **Factory setting**: 300%

[Pmax Generator] tPMG ★

Maximum power in generator mode.

This parameter can be accessed if **[Torque limit activ.]** tLA is not set to **[Not Assigned]** nO.

Setting ❮❯	Description
10...300%	Setting range **Factory setting**: 300%

[Torque increment] inCr ★

Torque limitation increment.

This parameter can be accessed if **[Torque limit activ.]** tLA is not set to **[No]** no.

Selection of units for the **[Motoring torque lim]** tLIM and **[Gen. torque limit]** tLIG parameters.

Setting	Code / Value	Description
0.1%	0.1	Unit 0.1% **Factory setting**
1%	1	Unit 1%

[Motoring torque lim] tLIM ★

Motor torque limitation.

This parameter can be accessed if **[Torque limit activ.]** tLA is no set to **[No]** no.

Torque limitation in motor mode, as a % or in 0.1% increments of the rated torque in accordance with the **[Torque increment]** inCr parameter.

Setting ❮❯	Description
0...300%	Setting range **Factory setting**: 100%

[Gen. torque limit] tLIG ★

Generative torque limitation.

This parameter can be accessed if **[Torque limit activ.]** tLA is not set to **[No]** no.

Torque limitation in generator mode, as a % or in 0.1% increments of the rated torque in accordance with the **[Torque increment]** inCr parameter.

Setting ❮❯	Description
0...300%	Setting range **Factory setting**: 100%

[Analog limit activ.] tLC ★

Activation (analog input) by a logic input.

This parameter cannot be accessed if **[Torque limit activ.]** tLA is set to **[No]** no.

Identical to **[Torque limit activ.]** tLA.

If the assigned input or bit is at 0:

- The limitation is specified by the **[Motor torque limit]** tLIM and **[Gen. torque limit]** tLIG parameters if **[Torque limit activ.]** tLA is not set to **[No]** no.
- No limitation if **[Torque limit activ.]** tLA is set to **[No]** no.

If the assigned input or bit is at: the limitation depends on the input assigned by **[Ref Torque Assign]** tAA.

NOTE: If **[Torque limitation]** tLA and **[Ref Torque Assign]** tAA are enabled at the same time, the lowest value is taken into account.

[Ref Torque Assign] tAA

Activation by an analog value.

If the function is assigned, the limitation varies between 0% and 300% of the rated torque based on the 0% to 100% signal applied to the assigned input.

Examples:12 mA on a 4-20 mA input results in a limitation to 150% of the rated torque 2.5 Vdc on a 10 Vdc input results in 75% of the rated torque.

Setting	Code / Value	Description
[No]	nO	Analog input is not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[AI Virtual 1]	AIV1	Virtual analogic input 1
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Ref Torque Switch Assign] tASu

Reference torque switch assignment.

This parameter can be accessed if **[Ref Torque Assign]** tAA or **[Ref Torque 2 Assign]** tAA2 are not set to **[No]** nO.

Identical to **[Torque limit activ.]** tLA.

[Ref Torque 2 Assign] tAA2

Activation by another analog value.

Identical to **[Ref Torque Assign]** tAA.

[Trq/I limit. stop] (SSb)

Torque current limitation: behavior configuration.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored **Factory setting**
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	StT	Stop according to **[Type of stop]** StT parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
[DC injection]	dCI	DC injection
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[Trq/I limit. time out] (Sto)

Torque current limitation: **[Torque Limitation Error]** SSF error delay and **[Torque Limit Reached]** SSA warning delay.

Setting ( )	Description
0...9,999 ms	Setting range **Factory setting**: 1,000 ms

Section 8.32
[Generic functions] - [2nd current limit.]

[2nd current limit.] CL1 - Menu

Access

[Complete settings] ➜ [Generic functions] ➜ [2nd current limit.]

[Current Limitation2] LC2

Current limitation switching assignment

If the assigned input or bit is at 0, the first current limitation is active.

If the assigned input or bit is at 1, the second current limitation is active.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Current Limitation2] CL2 ★

Second current limitation value

This parameter can be accessed if **[Current Limit Assign]** (LC2) is not set to **[No]** (no).

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR ● Verify that the motor is properly rated for the maximum current to be applied to the motor. ● Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit. **Failure to follow these instructions can result in equipment damage.**

The adjustment range is limited to 1.5 In.

NOTE: If the setting is less than 0.25 In, the drive may lock in **[Output Phase Loss]** OPL if this has been enabled. If it is less than the no-load motor current, the motor cannot run.

Setting ❮❯	Description
0...1.5 In (1)	Setting range **Factory setting**: 1.2 In(1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

[Current limitation] CL1 ★

First current limitation value

This parameter can be accessed if **[Current Limit Assign]** LC2 is not set to **[No]** no.

NOTICE
OVERHEATING AND DAMAGE TO THE MOTOR ● Verify that the motor is properly rated for the maximum current to be applied to the motor. ● Consider the duty cycle of the motor and all factors of your application including derating requirements in determining the current limit. **Failure to follow these instructions can result in equipment damage.**

The adjustment range is limited to 1.5 In.

NOTE: If the setting is less than 0.25 In, the drive may lock in **[Output Phase Loss]** OPL if this has been enabled. If it is less than the no-load motor current, the motor cannot run.

Setting ❮❯	Description
0...1.5 In (1)	Setting range **Factory setting**: 1.2 In(1)
(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.	

Section 8.33
[Generic functions] - [Jog]

[Jog] JOG - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Jog]**

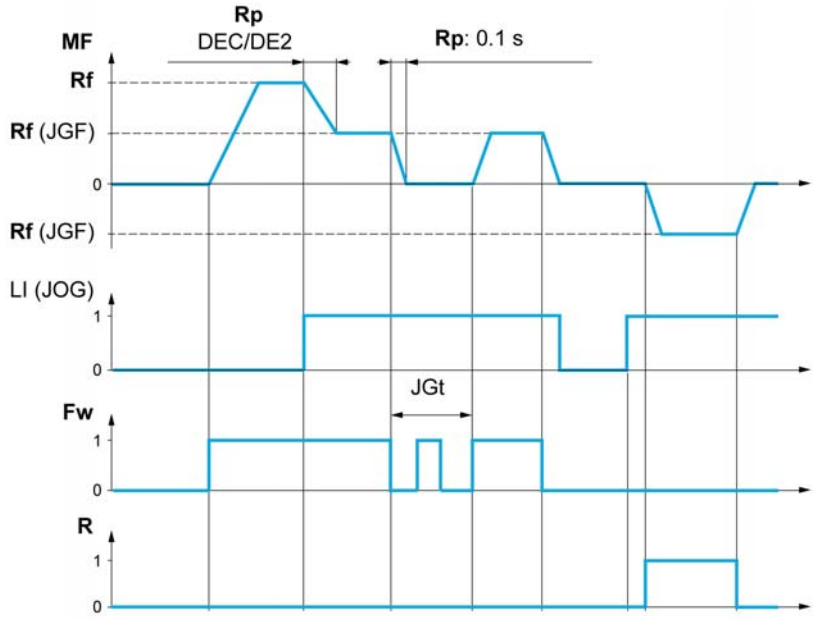
[Jog Assign] JOG

Jog assignment.

The JOG function is only active if the command channel and the reference channels are on the terminals.

The function is active when the assigned input or bit is at 1.

Example: 2-wire control operation (**[2/3-Wire Control]** 2C = **[2-Wire Control]** 2C.



MF Motor frequency
Rf Reference
Rp Ramp
Rp: 0.1 s Ramp forced to 0.1 S
Fw Forward
R Reverse

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted

[Jog frequency] (JGF) ★

This parameter can be accessed if **[Jog Assign]** (JOG) is not set to **[No]** (nO).

Setting ❮❯	Description
0.0...10.0 Hz	Setting range **Factory setting**: 10.0 Hz

[Jog Delay] (JGt) ★

This parameter can be accessed if **[Jog Assign]** (JoG) is not set to **[No]** (no).

Setting ❮❯	Description
0.0...2.0 s	Setting range **Factory setting**: 0.5 s

Section 8.34
[Generic functions] - [High Speed Switching]

[High Speed Switching] CHS - Menu

Access

[Complete settings] → **[Generic functions]** → **[High Speed Switching]**

[2 High speed] SH2

2 High speed assign.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[Mot Freq High Thd]	FtA	Motor frequency high threshold reached
[2nd Freq Thd Reached]	F2A	Second frequency threshold reached
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[4 High speed] SH4

4 High speed assign.

NOTE: In order to obtain 4 High speed, **[2 High speed]** SH2 must also be configured.

Identical to **[2 High speed]** SH2.

[High speed] HSP

Motor frequency at maximum reference, can be set between **[Low speed]** LSP and **[Max frequency]** tFr.

The factory setting changes to 60 Hz if **[Standard mot. freq]** bFr is set to **[60Hz NEMA]** 60.

Setting	Description
0...599 Hz	Setting range **Factory setting**: 50 Hz

[High speed 2] HSP2 ★

Visible if **[2 High speed]** SH2 is not set to **[No]** no.

Identical to **[High speed]** HSP.

[High speed 3] HSP3 ★

Visible if **[4 High speed]** SH4 is not set to **[No]** no.

Identical to **[High speed]** HSP.

[High speed 4] HSP4 ★

Visible if **[4 High speed]** SH4 is not set to **[No]** no.

Identical to **[High speed]** HSP.

Section 8.35
[Generic functions] - [Memo reference frequency]

[Memo reference frequency] SPM - Menu

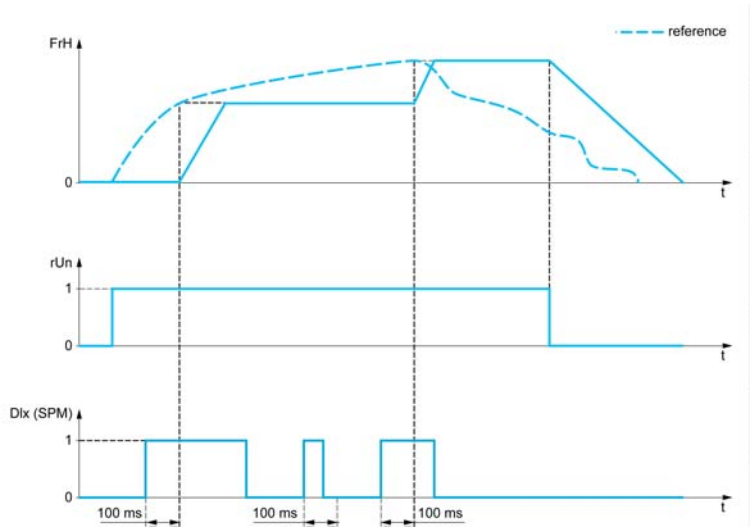
Access

[Complete settings] → **[Generic functions]** → **[Memo reference frequency]**

About This Menu

Saving a speed reference value using a digital input command lasting longer than 0.1 s.

- This function is used to control the speed of several drives alternately via a single analog reference and one digital input for each drive.
- It is also used to confirm a line reference (communication bus or network) on several drives via a digital input. This allows movements to be synchronized by getting rid of variations when the reference is set.
- The reference is acquired 100 ms after the rising edge of the request. A new reference is not then acquired until a new request is made.



rFr Motor frequency
FrH Reference frequency before ramp
rUn Run command
DIx (SPM) [Ref Freq Memo assign] SPM

[Ref Freq Memo assign] SPM

Reference frequency memory assignment

Function active if the assigned input is at active state.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted

Section 8.36
[Generic functions] - [Brake logic control]

[Brake logic control] bLC - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Brake logic control]**

About This Menu

Identical to **[Brake logic control]** bLC - menu *(see page 281)*.

Section 8.37
[Generic functions] - [Limit switches]

[Limit switches] L S E - Menu

Access

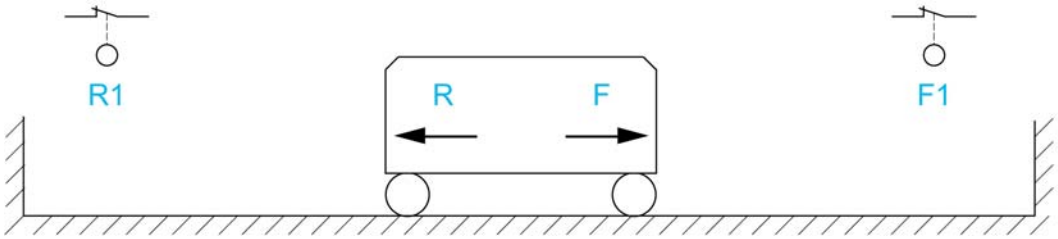
[Complete settings] → [Generic functions] → [Limit switches]

About This Menu

This function can be used to manage trajectory limits using limit switches

The stop mode is configurable.When the stop contact is activated, startup in the other direction is authorized.

Example:



R Reverse
R1 Reverse stop
F Forward
F1 Forward stop

The stop is activated when the input is at 0 (contact open).

[Stop FW assign] LAF

Stop forward limit assignment.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LI1L...LI8L	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LI11L...LI16L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Stop RV assign] LAr

Stop reverse limit assignment.

Identical to **[Stop FW assign]** LAF.

[Stop type] LAS

Stop type on limit switch.

The parameter can be accessed if **[Stop FW assign]** LAF or **[Stop RV assign]** LAr is assigned.

When the assigned input changes to 0, the stop is controlled in accordance with the selected type.Restarting is only authorized for the other operating direction once the motor has stopped. If the two inputs **[Stop FW assign]** LAF and **[Stop RV assign]** LAr are assigned and at state 0, restarting will be impossible.The parameter can be accessed if **[Stop FW assign]** LAF or **[Stop RV assign]** LAr) is assigned.

Setting	Code / Value	Description
[On Ramp]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
[Freewheel Stop]	nSt	Freewheel stop **Factory setting**

Section 8.38
[Generic functions] - [Positioning by sensors]

[Positioning by sensors] LPo

Access

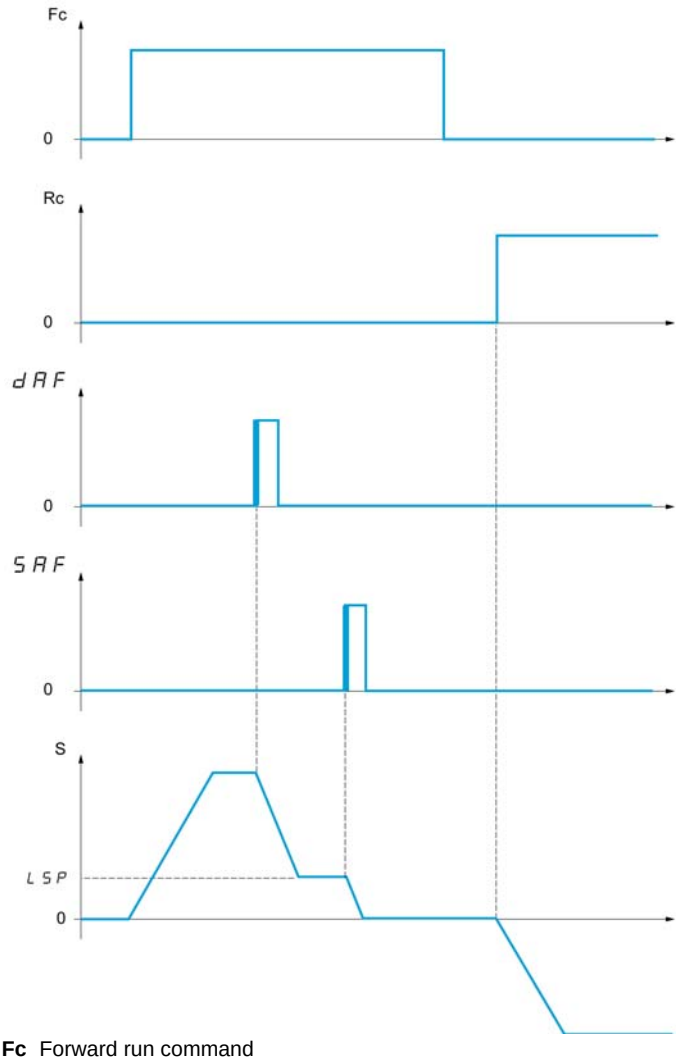
[Complete settings] ➡ [Generic functions] ➡ [Positioning by sensors]

About This Menu

This function is used for managing positioning using position sensors or limit switches linked to logic inputs or using control word bits:

- Slowing down
- Stopping

The action logic for the inputs and bits can be configured on a rising edge (change from 0 to 1) or a falling edge (change from 1 to 0). The example below has been configured on a rising edge:



Fc Forward run command
Rc Reverse run command
S Speed

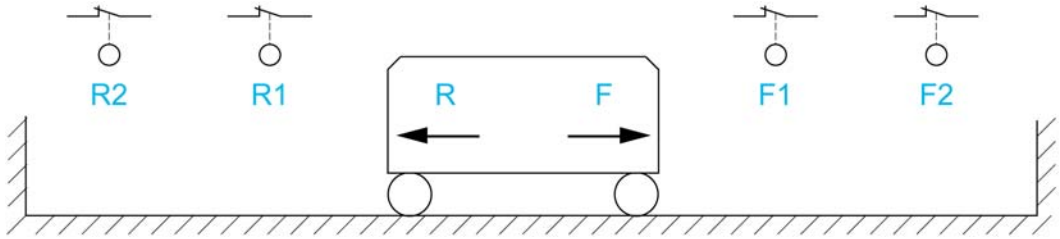
The slowdown mode and stop mode can be configured.

The operation is identical for both directions of operation. Slowdown and stopping operate according to the same logic, described below.

Example: Forward slowdown, on rising edge

- Forward slowdown takes place on a rising edge (change from 0 to 1) of the input or bit assigned to forward slowdown if this rising edge occurs in forward operation. The slowdown command is then memorized, even in the event of a power outage. Operation in the opposite direction is authorized at high speed. The slowdown command is deleted on a falling edge (change from 1 to 0) of the input or bit assigned to forward slowdown if this falling edge occurs in reverse operation.
- A bit or a logic input can be assigned to disable this function.
- Although forward slowdown is disabled while the disable input or bit is at 1, sensor changes continue to be monitored and saved.

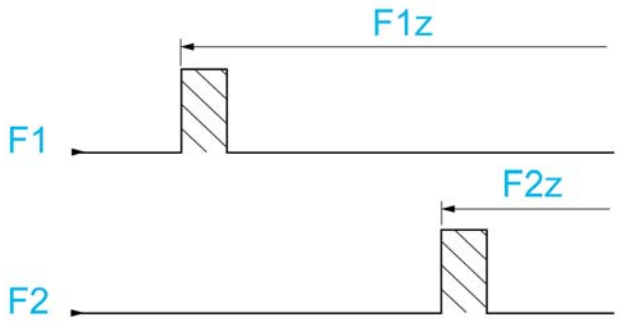
Example: Positioning on a limit switch, on rising edge



R Reverse
R1 Reverse slowdown
R2 Reverse stop
F Forward
F1 Forward slowdown
F2 Forward stop

Operation with short cams:

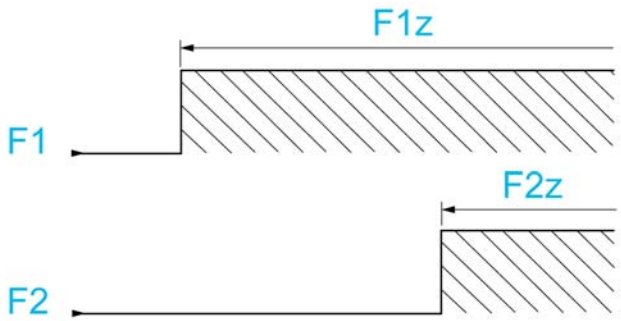
In this instance, when operating for the first time or after restoring the factory settings, the drive must initially be started outside the slowdown and stop zones in order to initialize the function.



F1 Forward slowdown
F1z Forward slowdown zone
F2 Forward stop
F2z Forward stop zone

Operation with long cams:

In this instance, there is no restriction, which means that the function is initialized across the whole trajectory.

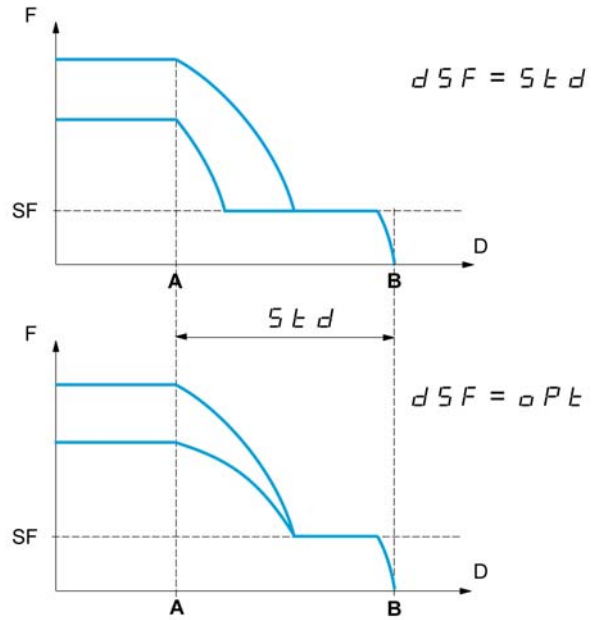


F1 Forward slowdown
F1z Forward slowdown zone
F2 Forward stop
F2z Forward stop zone

Stop at distance calculated after deceleration limit switch

This function can be used to control the stopping of the moving part automatically once a preset distance has been traveled after the slowdown limit switch. On the basis of the rated linear speed and the speed estimated by the drive when the slowdown limit switch is tripped, the drive will induce the stop at the configured distance. This function is useful in applications where one manual-reset overtravel limit switch is common to both directions. It will then only respond to help management if the distance is exceeded. The stop limit switch retains priority in respect of the function.

The **[Deceleration type]** *dSF* parameter can be configured to obtain either of the functions described below:



A Slowdown limit switch reached
B Automatic stop at a distance
D Distance
F Frequency
SF Slowdown frequency

Note:

- If the deceleration ramp is modified while stopping at a distance is in progress, this distance will not be observed.
- If the direction is modified while stopping at a distance is in progress, this distance will not be observed.

[Stop FW limit sw.] SAF

Stop switch forward

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LIL...LBL	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LILL...LILL	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Stop RV limit sw.] SAr

Stop switch reverse

Identical to **[Stop FW limit sw.]** SAF.

[Forward Slowdown] dAF

Slowdown attained forward.

Identical to **[Stop FW limit sw.]** SAF.

[Reverse Slowdown] dAr

Slowdown attained reverse

Identical to **[Stop FW limit sw.]** SAF.

[Disable limit sw.] CLS

Limits switches clearing

The action of the limit switches is disabled when the assigned bit or input is at 1. If, at this time, the drive is stopped or being slowed down by limit switches, it will restart up to its speed reference.

This parameter can be accessed if at least one limit switch or one sensor has been assigned.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LI1L...LI8L	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LI11L...LI16L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Stop type] PAS

Stop type on limit switch activation

This parameter can be accessed if at least one limit switch or one sensor has been assigned.

Setting	Code / Value	Description
[On Ramp]	rMP	Follow ramp **Factory setting**
[Fast stop]	FSt	Fast stop (ramp time reduced by **[Ramp Divider]** dCF
[Freewheel Stop]	nSt	Freewheel stop

[Deceleration type] dSF

Limit switch deceleration adaptation

This parameter can be accessed if at least one limit switch or one sensor has been assigned.

Setting	Code / Value	Description
[Standard]	Std	Uses the **[Deceleration]** dEC or **[Deceleration 2]** dE2 ramp (depending on which has been enabled) **Factory setting**
[Optimized]	oPt	The ramp time is calculated on the basis of the actual speed when the slowdown contact switches, in order to limit the operating time at low speed (optimization of the cycle time: the slowdown time is constant regardless of the initial speed).

[Stop distance] Std

Stop distance

This parameter can be accessed if at least one limit switch or one sensor has been assigned. Activation and adjustment of the "Stop at distance calculated after the slowdown limit switch" function.

Setting	Code / Value	Description
[No]	no	Function inactive **Factory setting**
[0.01...10.00]	0.01... 10.00	Stop distance range in meters

[Nom linear speed] nLS

Rated linear speed

This parameter can be accessed if at least one limit switch or one sensor has been assigned and **[Stop distance]** Std is not set to **[No]** no.

Setting	Description
0.20...5.00 m/s	**Factory setting:** 1.00 m/s

[Stop corrector] SFd

Scaling factor applied to the stop distance to compensate, for example, a non-linear ramp.

This parameter can be accessed if at least one limit switch or one sensor has been assigned and **[Stop distance]** Std is not set to **[No]** no.

Setting	Description
50...200%	**Factory setting:** 100%

Section 8.39
[Generic functions] - [Torque control]

[Torque control] tor - Menu

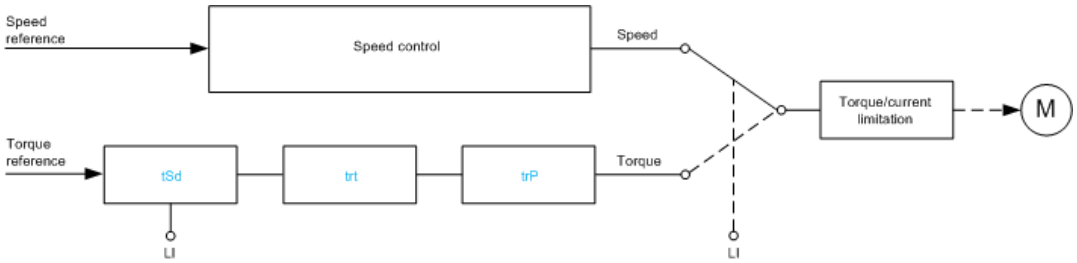
Access

[Complete settings] → **[Generic functions]** → **[Torque control]**

About This Menu

NOTE: This function cannot be used with some other functions.

NOTE: This function is not compatible with the handling of the **[Load slipping]** AnF error.



The function can be used to switch between operation in speed regulation mode and operation in torque control mode.

In torque control mode, the speed may vary within a configurable "deadband". When it reaches a lower or upper limit, the drive automatically reverts to speed regulation mode and remains at this limit speed. The regulated torque is therefore no longer maintained and two scenarios may occur.

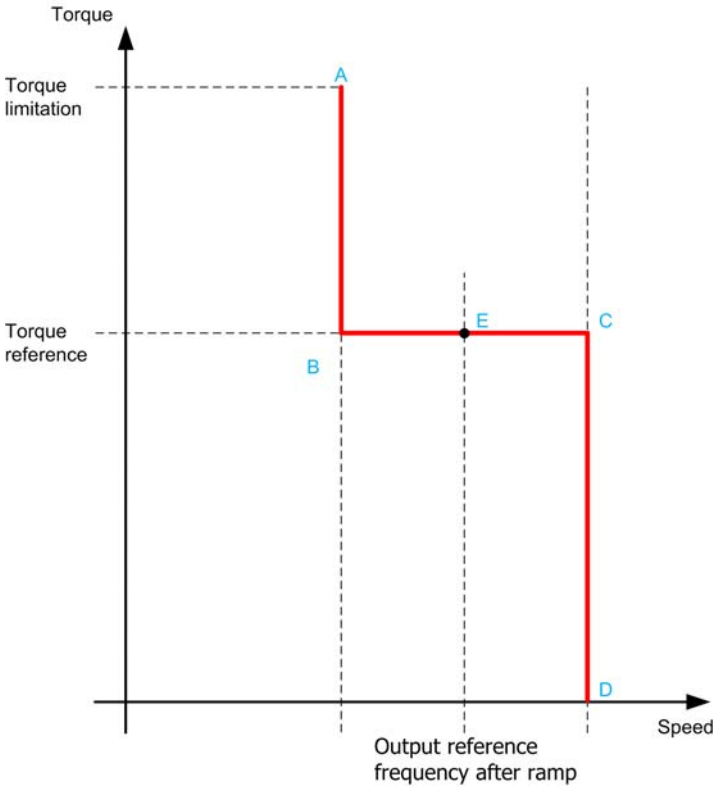
- If the torque returns to the required value, the drive returns to torque control mode.
- If the torque does not return to the required value at the end of a configurable period, the drive switches to **[Torque Reg Warning]** rtA or **[Torque timeout]** Srf.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



AB, CD Fallback" to speed regulation
BC Torque control zone
E Ideal operating point

The torque sign and value can be transmitted via a logic output and an analog output.

[Trq/spd switching] tSS

Torque / speed regulation switching by a logic input.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[Yes]	YES	Yes
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Torque ref. channel] tr1 ★

Channel for torque reference.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Setting	Code / Value	Description
[Not Configured]	no	Not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[Ref. Freq-Rmt.Term]	LCC	Reference frequency via remote terminal
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen
[Ref. Freq-Com. Module]	nEt	Reference frequency via communication module
[Embedded Ethernet]	EtH	Embedded Ethernet
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Torque Ref Assign] tr1 ★

Torque reference channel assignment.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Setting	Code / Value	Description
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[Torque ref. channel]	tr1	Torque reference channel 1
[Torque ref. 2 channel]	tr2	Torque reference channel 2

[Torque ref. 2 channel] tr2 ★

Torque reference channel 2.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Identical to **[Torque ref. channel]** tr1 *(see page 385)*.

[Torque ref. sign] tSd ★

Assignment for the inversion of the sign of the reference for the torque regulation function.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Identical to **[Trq/spd switching]** tSS *(see page 384)*.

[Torque ratio] trt ★

Torque regulation: torque ratio.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Setting ❮❯	Description
0.0...1000.0%	Coefficient applied to **[Torque ref. channel]** tr1 or **[Torque ref. 2 channel]** tr2 **Factory setting:** 100.0%

[Torque Ratio Assign] tPr ★

Torque regulation: torque ratio value selection.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Setting	Code / Value	Description
[No]	no	Analog input is not assigned **Factory setting**
[AI1]...**[AI3]**	AI1...AI3	Analog input AI1...AI3
[AI4]...**[AI5]**	AI4...AI5	Analog input AI4...AI5 if VW3A3203 I/O extension module has been inserted
[AI Virtual 1]	AIV1	Virtual analogic input 1
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Torque Ref Offset] tPoP ★

Torque reference offset.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Setting ❮❯	Description
-1000.0...1000.0%	Setting range **Factory setting:** 0.0%

[Torque Offset Assign] tPo ★

Torque regulation: Torque offset value selection

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** no.

Identical to **[Torque Ratio Assign]** tPr *(see page 386)*.

[Low Torque] LtQ ★

Low torque threshold.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

This parameter cannot be higher than **[High Torque]** HtQ .

Setting	Description
-300.0...**[High Torque]** HtQ	Setting range **Factory setting:** -100.0%

[High Torque] HtQ ★

High torque threshold.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

This parameter cannot be lower than **[Low Torque]** LtQ.

Setting	Description
[Low Torque] LtQ...300.0%	Setting range **Factory setting:** 100.0%

[Torque ramp time] trP ★

Torque ramp time.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

Setting	Description
0.00...99.99 s	Rise and fall time for a variation of 100% of the rated torque **Factory setting:** 3.00 s

[Torque Filter] trF ★

Torque filter activation.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

Setting	Code / Value	Description
[No]	nO	Not activated. **Factory setting**
[Yes]	YES	Activated

[Torque Filter Bandwidth] trW ★

Torque filter bandwidth.

This parameter can be accessed if **[Torque Filter]** trF is set to **[Yes]** YES.

Setting	Description
1...1000 Hz	Setting range **Factory setting:** 20 Hz

[Torque control stop] tSt ★

Torque regulation: stop command type.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

Setting	Code / Value	Description
[Speed]	SPd	Speed regulation stop, in accordance with the type of stop configuration **Factory setting**
[Freewheel Stop]	nSt	Freewheel stop
[Spin]	SPn	Zero torque stop, but maintaining the flux in the motor (only in close loop)

[Spin time] SPt ★

Torque regulation: spin time.

Spin time following stop, in order to remain ready to restart quickly.

This parameter can be accessed if:
- **[Trq/spd switching]** tSS is not set to **[No]** nO, and
- **[Torque control stop]** tSt is set to **[Spin]** SPn.

Setting ❮❯	Description
0.0...3600.0 s	Setting range **Factory setting:** 1.0 s

[Positive deadband] dbP ★

Torque regulation positive deadband.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

Value added algebraically to the speed reference.

Example for dbP = 10:
- If reference = +50 Hz : +50 + 10 = 60 Hz
- If reference = -50 Hz : -50 + 10 = -40 Hz

Setting ❮❯	Description
0...2 x **[Max Frequency]** tFr	Setting range **Factory setting:** 10 Hz

[Negative deadband] dbn ★

Torque regulation negative deadband.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

Value subtracted algebraically from the speed reference.

Example for dbn = 10:
- If reference = +50 Hz: + 50 - 10 = 40 Hz
- If reference = -50 Hz: -50 - 10 = -60 Hz

Setting ❮❯	Description
0...2 x **[Max Frequency]** tFr	Setting range **Factory setting:** 10 Hz

[Torque ctrl time out] rtO ★

Torque control time-out.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

Time following automatic exit of torque control mode in the event of an error or a warning has been triggered.

Setting	Description
0.0...999.9 s	Setting range **Factory setting:** 60 s

[Torque Ctrl ErrorResp] tOb ★

Response to torque control error.

This parameter can be accessed if **[Trq/spd switching]** tSS is not set to **[No]** nO.

Response of drive once time **[Torque ctrl time out]** rtO has elapsed.

Setting	Code / Value	Description
[Warning]	ALrN	Warning is triggered on time-out **Factory setting**
[Error]	FLt	An error is triggered with freewheel stop

Section 8.40
[Generic functions] - [Parameters switching]

What Is in This Section?

This section contains the following topics:

[Parameters switching] MLP- Menu

Access

[Complete settings] → [Generic functions] → [Parameters switching]

About This Menu

A set of 1 to 15 parameters from the **[Parameter Selection]** SPS list can be selected and 2 or 3 different values assigned. These 2 or 3 sets of values can then be switched using 1 or 2 digital inputs or control word bits. This switching can be performed during operation (motor running). It can also be controlled based on 1 or 2 frequency thresholds, whereby each threshold acts as a digital input (0 = threshold not reached, 1 = threshold reached).

	Values 1	Values 2	Values 3
Parameter 1 ... Parameter 15	Parameter 1 ... Parameter 15	Parameter 1 ... Parameter 15	Parameter 1 ... Parameter 15
Input DI or bit or frequency threshold 2 values	0	1	0 or 1
Input DI or bit or frequency threshold 3 values	0	0	1

NOTE: Do not modify the parameters in **[Parameter Selection]** SPS, because any modifications made in this menu will be lost on the next power-up. The parameters can be adjusted during operation in the **[Parameters switching]** MLP- menu, on the active configuration.

[2 Parameter sets] CHA1

Parameter switching assignment 1.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[Mot Freq High Thd]	FtA	Motor frequency high threshold reached
[2nd Freq Thd Reached]	F2A	Second frequency threshold reached
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
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[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[3 Parameter sets] CHA2

Parameter switching assignment 2.

Identical to **[2 Parameter sets]** CHA 1.

Switching 3 parameter sets.

NOTE: In order to obtain 3 parameter sets, it is necessary to configure first **[2 Parameter sets]** CHA 1.

[Parameter Selection] SPS

This parameter can be accessed if **[2 Parameter sets]** CHA 1 is not set to **[No]** no.

Making an entry in this parameter opens a window containing all the adjustment parameters that can be accessed. Select 1 to 15 parameters using **OK** key. Parameter(s) can also be deselected using **OK** key.

Available parameters for parameters switching function are:

Parameter	Code
[Ramp increment]	inr
[Acceleration]	ACC
[Deceleration]	dEC
[Acceleration 2]	AC2
[Deceleration 2]	dE2
[Begin Acc round]	tA1
[End Acc round]	tA2
[Begin Dec round]	tA3
[End Dec round]	tA4
[Low Speed]	LSP
[High Speed]	HSP
[High Speed 2]	HSP2
[High Speed 3]	HSP3
[High Speed 4]	HSP4
[Motor Th Current]	ItH
[IR compensation]	UFr
[Slip compensation]	SLP
[K speed loop filter]	SFC
[Speed time integral]	S it
[Speed prop. gain]	SPG
[Inertia Factor]	SPGu
[Ramp Divider]	dCF
[DC Inj Level 1]	idC
[DC Inj Time 1]	td 1
[DC Inj Level 2]	idC2
[DC Inj Time 2]	tdC
[Auto DC inj Level 1]	SdC1
[Auto DC Inj Time 1]	tdC1
[Auto DC inj Level 2]	SdC2
[Auto DC Inj Time 2]	tdC2
[Switching frequency]	SFr
[Current Limitation]	CL 1
[Current Limitation2]	CL2
[Motor fluxing]	FLu
[Low Speed Timeout]	tLS
[Sleep Offset Thres.]	SLE
[Jog frequency]	JGF
[Jog Delay]	JGt
[Preset speed 2]...**[Preset speed 16]**	SP2... SP 16

Parameter	Code
[+/- Speed limitation]	SrP
[Multiplying coeff.]	MFr
[ENA prop gain]	GPE
[ENA integral gain]	G iE
[Brk Release Current]	ibr
[Brake release I Rev]	ird
[Brake Release time]	brt
[Brake release freq]	b ir
[Brake engage freq]	bEn
[Brake engage delay]	tbE
[Brake engage time]	bEt
[Jump at reversal]	JdC
[Time to restart]	ttr
[Motor torque limit]	tL iM
[Gen. torque limit]	tL iG
[Torque ratio]	trt
[Low Torque]	Ltq
[High Torque]	Htq
[Low Freq.Threshold]	JGt
[High Current Thd]	Ctd
[Low I Threshold]	CtdL
[High torque thd.]	ttH
[Low torque thd.]	ttL
[Motor Freq Thd]	Ftd
[Low Freq.Threshold]	FtdL
[Freq. threshold 2]	F2d
[2 Freq. Threshold]	F2dL
[Freewheel stop Thd]	FFt
[Motor Therm Thd]	ttd
[Reference high Thd]	rtd
[Reference low Thd]	rtdL
[Skip Frequency]	JPF
[Skip Frequency 2]	JF2
[3rd Skip Frequency]	JF3
[Skip Freq.Hysteresis]	JFH
[Unld.Thr.Nom.Speed]	Lun
[Unld.Thr.0.Speed]	LuL
[Unld. FreqThr. Det.]	rMud
[Hysteresis Freq]	Srb
[Underload T.B.Rest.]	Ftu
[Ovld Detection Thr.]	LoC
[Overload T.B.Rest.]	Fto
[Fan mode]	FFM
[Pmax Motor]	tPMM
[Pmax Generator]	tPMG
[Stall Max Time]	StP1
[Stall Current]	StP2
[Stall Frequency]	StP3
[AI1 Th Warn Level]	tH1A
[AI3 Th Warn Level]	tH3A

Parameter	Code
[AI4 Th Warn Level]	tH4A
[AI5 Th Warn Level]	tH5A
[AI1 Th Error Level]	tH 1F
[AI3 Th Error Level]	tH3F
[AI4 Th Error Level]	tH4F
[AI5 Th Error Level]	tH5F
[Sleep Min Speed]	SLSL
[Sleep Power Level]	SLPr
[Sleep Delay]	SLPd
[SLeep Boost Speed]	SLbS
[Sleep Boost Time]	SLbt
[Wake Up Process level]	WuPF
[Wake Up Process Error]	WuPE
[Load correction]	LbC
[AFE Generator Mode]	CL iG

[Set 1] P S 1 - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [Parameters switching] ➡ [Set 1]

About This Menu

Making an entry in this menu opens a settings window containing the selected parameters in the order in which they were selected.

[Set 2] P S 2 - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Parameters switching]** ➡ **[Set 2]**

About This Menu

Identical to **[Set 1]** P S 1 - *(see page 396)*.

[Set 3] P S 3 - Menu

Access

[Complete settings] ➡ [Generic functions] ➡ [Parameters switching] ➡ [Set 3]

About This Menu

Identical to **[Set 1]** P S 1 - *(see page 396)*.

Section 8.41
[Generic functions] - [Stop after speed timeout]

[Stop after speed timeout] PrSP - Menu

Access

[Complete settings] ➡ **[Generic functions]** ➡ **[Stop after speed timeout]**

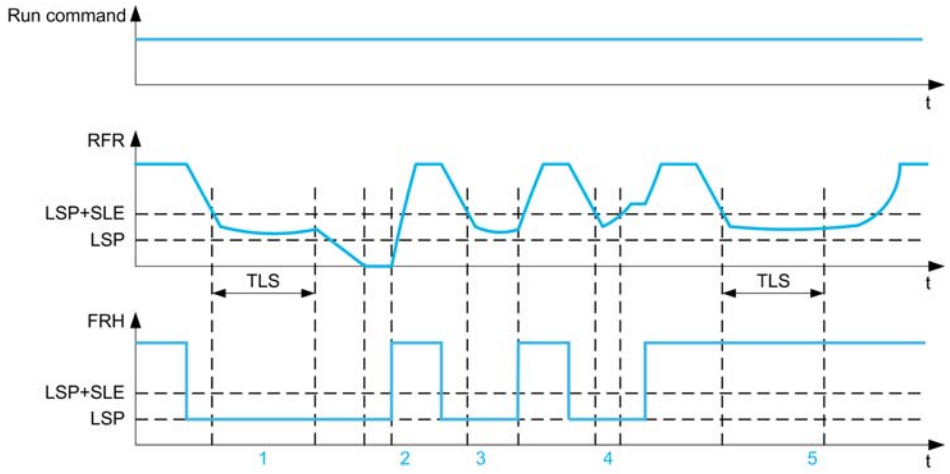
Sleep/Wake-Up in Speed Control Mode

The drive is in Speed control mode, when PID is not active, typically when:
- PID is not configured (the motor speed setpoint is controlled by an external PLC, for example).
- PID is in manual mode (manual application mode, for example).
- PID is not active because Channel 1 is not selected (forced local mode enabled, for example).

When the drive is used in Speed Control (PID not used or not active), a speed condition is used to switch the application to the sleep state. When the drive is in sleep state, the motor is restarted if the sleep condition disappears.

This function avoids prolonged operation at low speeds when neither useful nor compliant with the system constraints. It stops the motor after a period of operation at reduced speed. This time and speed can be adjusted.

In Speed control mode, Sleep/Wake-up is managed according to the following rules:
- The motor is stopped when **[Pre-Ramp Ref Freq]** FrH and **[Output frequency]** rFr become and stay lower than **[Low speed]** LSP + **[Sleep Offset Thres.]** SLE during **[Low Speed Timeout]** tLS.
- The motor is restarted when **[Pre-Ramp Ref Freq]** FrH > **[Low speed]** LSP + **[Sleep Offset Thres.]** SLE.



1 Nominal **[Low Speed Timeout]** tLS function action: after **[Low Speed Timeout]** tLS time, the motor is stopped according to the current deceleration ramp
2 **[Pre-Ramp Ref Freq]** FrH becomes greater than **[Low speed]** LSP + **[Sleep Offset Thres.]** SLE and run order still present **[Low Speed Timeout]** tLS function is deactivated
3 **[Low Speed Timeout]** tLS function is not activated because **[Pre-Ramp Ref Freq]** FrH becomes greater than **[Low speed]** LSP + **[Sleep Offset Thres.]** SLE before **[Low Speed Timeout]** tLS has expired
4 **[Low Speed Timeout]** tLS function is not activated because **[Output frequency]** rFr becomes greater than **[Low speed]** LSP + **[Sleep Offset Thres.]** SLE before **[Low Speed Timeout]** tLS has expired
5 **[Low Speed Timeout]** tLS function is not activated because **[Pre-Ramp Ref Freq]** FrH stays greater than **[Low speed]** LSP + **[Sleep Offset Thres.]** SLE

[Low Speed Timeout] tLS

Time limited speed.

Setting	Description
0.0...999.9 s	Setting range **Factory setting**: 0.0 s

[Sleep Offset Thres.] SLE

Sleep offset threshold.

This parameter can be accessed if **[Low Speed Timeout]** tLS is not set to 0

Adjustable restart threshold (offset) following a stop after prolonged operation at **[Low speed]** LSP + **[Sleep Offset Thres.]** SLE, in Hz. The motor restarts if the reference rises above (LSP + SLE) and if a run command is still present.

Setting	Description
1.0...**[Max Frequency]** tFr	Setting range **Factory setting**: 1.0 Hz

Section 8.42
[Generic functions] - [DC bus supply]

[DC bus supply] dCb - Menu

Access

[Complete settings] → [Generic functions] → [Multimotors config]

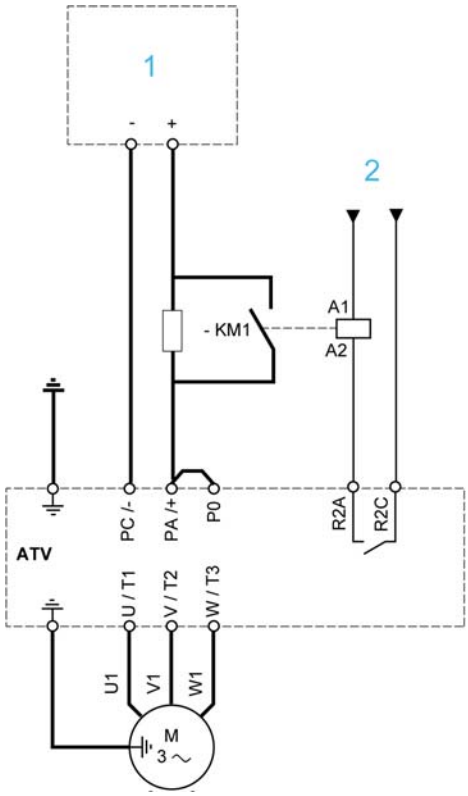
About This Menu

This menu can be accessed for 220T Drive up to 15kW or 480T Drive up to 30kW.

Direct power supply via the DC bus requires a protected direct current source with adequate power and voltage as well as a suitably dimensioned resistor and capacitor precharging contactor. Consult Schneider Electric for information about specifying these components.

The **Direct Power Supply via Dc Bus** function can be used to control the precharging contactor via a relay or a logic input on the drive.

Example circuit using R2 relay:



1 DC power supply
2 +24 Vdc

[DC Charging Assign] dCo ★

DC Bus charge assignment.

Setting	Code / Value	Description
[No]	nO	Not assigned **Factory setting**
[R2]...**[R3]**	r2...r3	Relay output R2...R3
[R4]...**[R6]**	r4...r6	Relay output R4...R6 if VW3A3204 relay output option module has been inserted
[DQ1 Digital Output]	do1	Digital output DQ1
[DQ11 Digital Output]...**[DQ12 Digital Output]**	do11...do12	Digital output DQ11...DQ12 if VW3A3203 I/O extension module has been inserted

[DC Bus Charge Time] dCt ★

DC Bus charge option time.

This parameter can be accessed if **[DC Charging Assign]** dCo is not set to **[Not Assigned]** nO.

Setting	Description
0.00...10.00 s	**Factory setting:** 0.00 s

Section 8.43
[Generic functions] - [Multimotors config]

[Multimotors config] MMC - Menu

Access

[Complete settings] → **[Generic functions]** → **[Multimotors config]**

Motor or Configuration Switching

The drive may contain up to 4 configurations, which can be saved using the **[Factory settings]** FCS - menu.

Each of these configurations can be activated remotely, enabling adaptation to:
- 2 to 4 different motors or mechanisms (multi-motors mode).
- 2 to 4 different configurations for a single motor (multi-configurations mode).

The two switching modes cannot be combined.

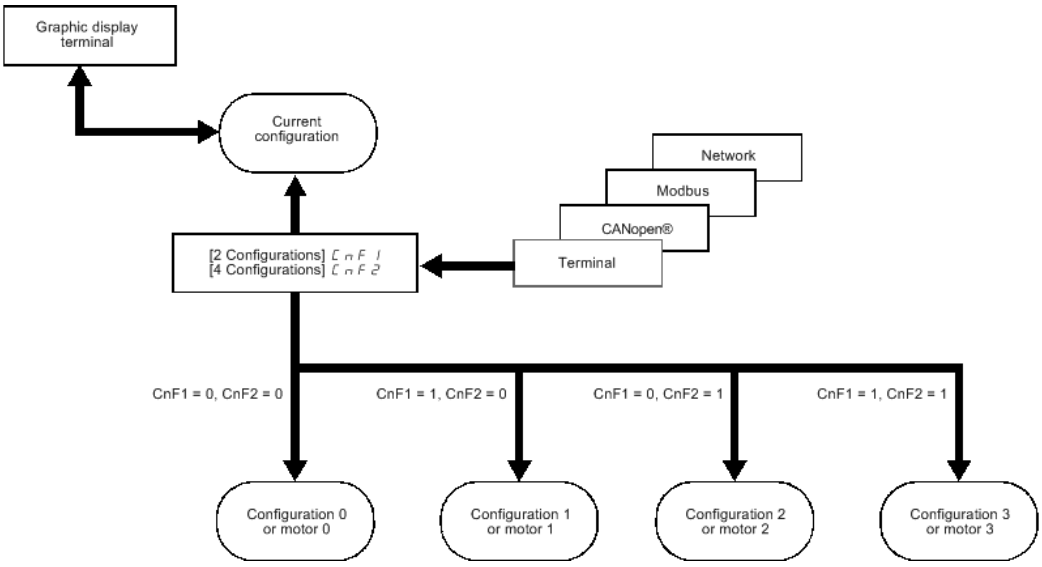
Note: Observe the following conditions:
- Switching may take place when stopped (drive locked). If a switching request is sent during operation, it will be executed at next stop.
- When switching between motors, the concerned power and control terminals must be switched as appropriate.
- All configurations must share the same hardware configuration; otherwise the drive locks in **[Incorrect Configuration]** CFF.
- Switching to a configuration that does not exist causes the drive to lock in **[Empty Configuration]** CF i4.

Menus and Parameters Switched in Multi-Motor Mode

In multi-configurations mode, communication parameters are not switched.

- **[Motor control]** drC - menu.
- **[Input/Output]** io - menu.
- **[Application function]** Fun - menu except for the **[Multimotors config]** MMC - function (to be configured once only).
- **[Monitoring]** FLt - menu.
- **[My menu]** MYMn - menu.

Transfer of a Drive Configuration to Another one, With Graphic Display Terminal, When the Drive Uses [Multimotors config] MMC - Function

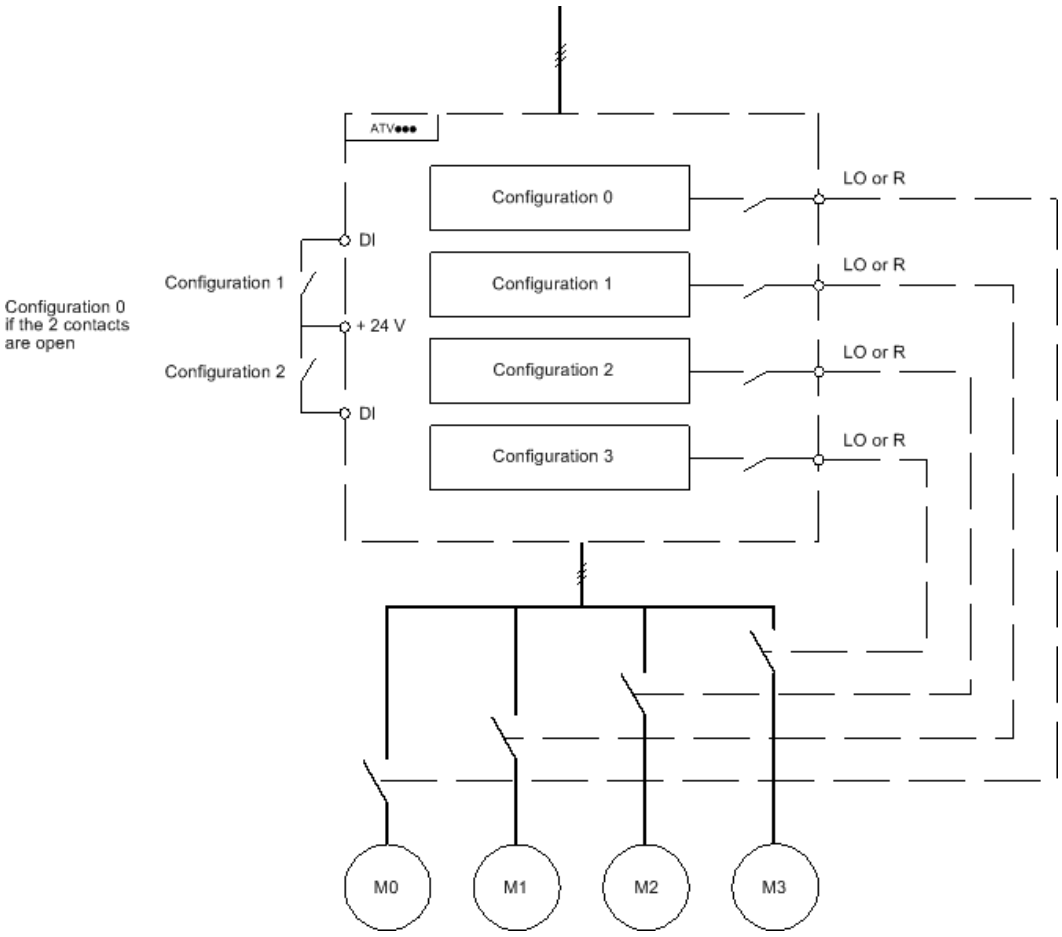


Switching Command

Depending on the number of motors or selected configurations (2 to 4), the switching command is sent using one or two logic inputs. The table below lists the possible combinations.

DI (CnF1) 2 motors or configurations	DI (CnF2) 3 motors or configurations	Number of configurations or active motors
0	0	0
1	0	1
0	1	2
1	1	3

Schematic Diagram for Multi-Motor Mode



Auto-Tuning in Multi-Motor Mode

This auto-tuning can be performed:

- Manually using a logic input when the motor changes.
- Automatically each time the motor is activated for the first time after switching on the drive if the **[Automatic autotune]** AUt parameter is set to **[Yes]** YES.

Motor thermal states in multimotor mode:

The drive helps to protect the three motors individually. Each thermal state takes into account all stop times if the drive power is not switched off.

Configuration Information Output

In the **[Input/Output]** IO- menu, a logic output can be assigned to each configuration or motor (2 to 4) for remote information transmission.

NOTE: As the **[Input/Output]** IO- menu is switched, these outputs must be assigned in all configurations in which information is required.

[Multimotors] CHM

Multimotors selection.

NOTICE

MOTOR OVERHEATING

When the drive is switched off, the thermal states of the connected motors are not saved. When the drive is switched on again, the drive is not aware of the thermal states of the connected motors.

- Use separate temperature sensors for each connected motor for thermal monitoring.

Failure to follow these instructions can result in equipment damage.

Setting	Code / Value	Description
[No]	no	Multiconfiguration possible **Factory setting**
[Yes]	YES	Multimotor possible

[2 Configurations] CnF1

Switching of two motors or 2 configurations.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** io configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** io configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** io configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** io configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[3 Configurations] CnF2

Switching of three motors or 3 configurations.

NOTE: In order to obtain four motors or 4 configurations, **[2 Configurations]** CnF1 must also be configured.

Identical to **[2 Configurations]** CnF1

Section 8.44
[Generic monitoring]

What Is in This Section?

This section contains the following topics:

[Process underload] uLd - Menu

Access

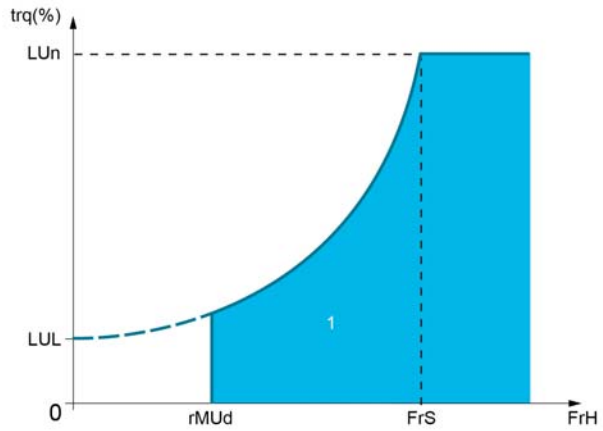
[Complete settings] ➜ [Generic monitoring] ➜ [Process underload]

Process Underload Detected Error

A process underload is detected when the next event occurs and remains pending for a minimum time **[Unld T. Del. Detect]** uLt, which is configurable:

- The motor is in steady state and the torque is below the set underload limit (**[Unld.Thr.0.Speed]** LuL, **[Unld.Thr.Nom.Speed]** Lun, **[Unld. FreqThr. Det.]** rMud parameters).
- The motor is in steady state when the offset between the frequency reference and motor frequency falls below the configurable threshold **[Hysteresis Freq]** Srb.

Between zero frequency and the rated frequency, the curve reflects the following equation: torque = LuL + (Lun - LuL) x (frequency)^2 / (rated frequency)^{2}The underload function is not active for frequencies below rMud.



1 Underload zone.

A relay or a digital output can be assigned to the signaling of this detected error in the **[Input/Output]** IO -, **[I/O assignment]** IOAS - menus.

[Unld T. Del. Detect] uLt

Underload detection time delay.

A value of 0 deactivates the function and makes the other parameters inaccessible.

Setting	Description
0...100 s	Setting range **Factory setting**: 0 s

[Unld.Thr.Nom.Speed] Lun ★

Underload threshold at nominal motor speed **[Nominal Motor Freq]** Fr S, as a % of the rated motor torque.

This parameter can be accessed if **[Unld T. Del. Detect]** uLt is not set to 0.

Setting ❮❯	Description
20...100%	Setting range **Factory setting**: 60%

[Unld.Thr.0.Speed] ULL ★

Underload threshold at zero frequency as a % of the rated motor torque.

This parameter can be accessed if **[Unld T. Del. Detect]** ULt is not set to 0.

Setting ❮❯	Description
0...**[Unld.Thr.Nom.Speed]** LUn	Setting range **Factory setting**: 0%

[Unld. FreqThr. Det.] rMUd ★

Minimum frequency underload detection threshold.

This parameter can be accessed if **[Unld T. Del. Detect]** ULt is not set to 0

.

Setting ❮❯	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Hysteresis Freq] SrB ★

Maximum deviation between the frequency reference and the motor frequency, which defines a steady state operation.

This parameter can be accessed if **[Unld T. Del. Detect]** ULt or **[Ovld Time Detect.]** toL is not set to 0.

Setting ❮❯	Description
0.3...599.0 Hz	Setting range **Factory setting**: 0.3 Hz

[Underload Mangmt.] UdL ★

Underload management.

Behavior on switching to underload detection.

This parameter can be accessed if **[Unld T. Del. Detect]** ULt is not set to 0.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel stop]	YES	Freewheel stop **Factory setting**
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop

[Underload T.B.Rest.] Ftu ★

Minimum time permitted between an underload being detected and any automatic restart.

To allow an automatic restart, the value of **[Fault Reset Time]** tAr must exceed this parameter by at least 1 minute.

This parameter can be accessed if **[Underload Mangmt.]** UdL is not set to **[Ignore]** nO.

Setting ❮❯	Description
0...6 min	Setting range **Factory setting**: 0 min

[Process overload] oLd - Menu

Access

[Complete settings] ➡ **[Generic monitoring]** ➡ **[Process overload]**

About This Menu

A process overload error is detected when the next event occurs and remains pending for a minimum time **[Ovld Time Detect.]** tOL , which is configurable:

- The drive is in current limitation mode.
- The motor is in steady state and the current is above the set overload threshold **[Ovld Detection Thr.]** LoC .

The motor is in steady state when the offset between the frequency reference and motor frequency falls below the configurable threshold **[Hysteresis Freq]** Srb .

A relay or a digital output can be assigned to the signaling of this detected error.

[Ovld Time Detect.] tOL

Overload reaction time.

A value of 0 deactivates the function and makes the other parameters inaccessible.

Setting	Description
0...100 s	Setting range **Factory setting**: 0 s

[Ovld Detection Thr.] LoC ★

Overload threshold.

Overload detection threshold, as a % of the rated motor current **[Nom Motor Current]** nCr . This value must be less than the limit current in order for the function to work.

This parameter can be accessed if **[Ovld Time Detect.]** tOL is not set to 0.

Setting ❮❯	Description
70...150%	Setting range **Factory setting**: 110%

[Hysteresis Freq] Srb ★

Hysteresis for steady state.

Maximum deviation between the frequency reference and the motor frequency, which defines a steady state operation.

This parameter can be accessed if **[Ovld Time Detect.]** tOL or **[Unld T. Del. Detect.]** ULt is not set to 0.

Setting ❮❯	Description
0.3...599.0 Hz	Setting range **Factory setting**: 0.3 Hz

[Ovld.Proces.Mngmt] odL ★

Behavior on switching to overload detection.

This parameter can be accessed if **[Ovld Time Detect.]** tOL is not set to 0.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel stop]	YES	Freewheel stop **Factory setting**
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop

[Overload T.B.Rest.] FtO ★

Minimum time permitted between an overload being detected and any automatic restart.

In order to allow an automatic restart, the value of **[Fault Reset Time]** tAr must exceed this parameter by at least 1 minute.

This parameter can be accessed if **[Ovld Time Detect.]** tOL or **[Ovld.Process.Mngmt]** odL is not set to 0.

Setting ❮❯	**Description**
0...6 min	Setting range **Factory setting**: 0 min

[Stall monitoring] StPr - Menu

Access

[Complete settings] ➡ **[Generic monitoring]** ➡ **[Stall monitoring]**

About This Menu

This function helps to prevent a motor overload by monitoring the motor current and the speed rise time.

A stalling condition is when:

- An output frequency is smaller than the stalling frequency **[Stall Frequency]** StP3
- And an output current is higher than the stalling current **[Stall Current]** StP2
- During a time longer than the stalling time **[Stall Max Time]** StP1

When a stalling condition occurs, an **[Motor Stall Error]** StF error is triggered.

[Stall Monitoring] StPC

Stall monitoring activation.

Setting	Code / Value	Description
[No]	no	Function disabled **Factory setting**
[Yes]	YES	Function enabled

[Stall Max Time] StP1 ★

Motor stall maximum time.

This parameter can be accessed if **[Stall Monitoring]** StPC is not set to **[No]** no.

Setting	Description
0.0...200 s	Setting range **Factory setting**: 60.0 s

[Stall Current] StP2 ★

Stall monitoring current level.

This parameter can be accessed if **[Stall Monitoring]** StPC is not set to **[No]** no.

Setting	Description
0.0...150.0%	Setting range **Factory setting**: 150.0%

[Stall Frequency] StP3 ★

Stall monitoring frequency level.

This parameter can be accessed if **[Stall Monitoring]** StPC is not set to **[No]** no.

Setting	Description
0.0...**[Max Frequency]** tFr	Setting range **Factory setting**: 2.0 Hz

[Thermal monitoring] tPP- Menu

Access

[Complete settings] ➡ **[Generic monitoring]** ➡ **[Thermal monitoring]**

About This Menu

Identical to **[Thermal monitoring] tPP-** Menu *(see page 181)*.

[Frequency meter] F9F - Menu

Access

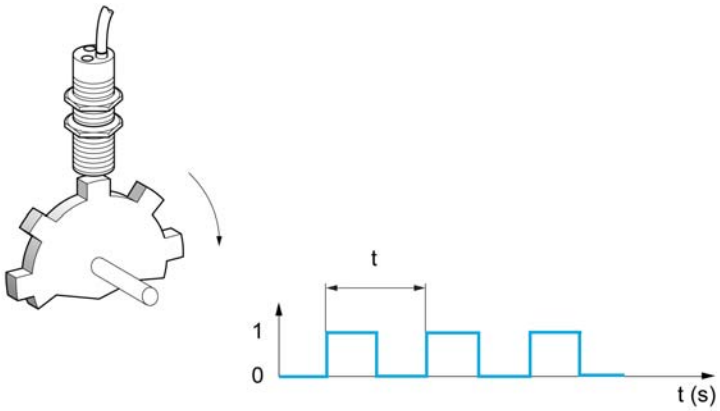
[Complete settings] → [Generic monitoring] → [Frequency meter]

About This Menu

This function uses the "Pulse input" input and can only be used if the "Pulse input" input is not being used for another function.

Example of Use

An indexed disk driven by the motor and connected to a proximity sensor can be used to generate a frequency signal that is proportional to the speed of rotation of the motor.



When applied to the "Pulse input" input, this signal supports:

- Measurement and display of the motor speed: signal frequency = 1/T. This frequency is displayed with the **[Measured Freq]** F95.
- Overspeed detection (if the measured speed exceeds a preset threshold, the drive trips).
- Brake failure detection if brake logic control has been configured: If the speed does not drop sufficiently quickly following a command to engage the brake, the drive trips. This function can be used to detect worn brake linings.
- Detection of a speed threshold that can be adjusted using **[Pulse warning thd.]** F9L *(see page 413)* and is assignable to a relay or digital output.

[Frequency meter] F9F

Frequency Meter function activation.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned **Factory Setting**
[DI7 PulseInput]...**[DI8 PulseInput]**	PI7...PI8	Digital input DI7...DI8 used as pulse input

[Pulse scal. divider] F9C

Coefficient for measure.

The frequency measured is displayed with the **[Measured Freq]** F95 parameter.

Setting	Description
1.0...100.0	Setting range **Factory setting**: 1.0

[Overspd. pulse thd.] F 9 A

Maximum frequency authorized.

Activation and adjustment of overspeed monitoring: **[Motor Overspeed]** S o F.

Setting	Code / Value	Description
[No]	n o	No motor overspeed monitoring **Factory setting**
0...30 kHz		Adjustment of the frequency tripping threshold on the "Pulse input" input divided by **[Pulse scal. divider]** F 9 C.

[Pulse overspd delay] t d S

Time before trip in over-speed.

Setting	Description
0.0...10.0 s	Setting range **Factory setting**: 0.0 s

[Level fr. pulse ctrl] F d t

Feedback detection threshold.

Activation and adjustment of monitoring for the pulse input (speed feedback): **[Encoder Feedback Loss]** S P F.

Setting	Code / Value	Description
[No]	n o	No monitoring of speed feedback **Factory setting**
0.0...599 Hz		Adjustment of the motor frequency threshold for tripping a speed feedback detection. (difference between the estimated frequency and the measured speed).

[Pulse thd. wo Run] F 9 t

Frequency threshold wear brake.

Activation and adjustment of brake feedback monitoring: **[Brake Feedback]** b r F. If brake logic control **[Brake assignment]** b L C is not configured, this parameter is forced to **[No]** n o.

Setting	Code / Value	Description
[No]	n o	No brake monitoring **Factory setting**
1...1,000 Hz		Adjustment of the motor frequency threshold to trigger a **[Brake Feedback]** b r F error (detection of speeds other than 0).

[Pulse wo Run delay] t 9 b

Time before trip in wear brake.

Setting	Description
0.0...10.0 s	Setting range **Factory setting**: 0.0 s

[Pulse warning thd.] F 9 L

Frequency level.

Setting	Description
0...30,000 Hz	Setting range **Factory setting**: 0 Hz

Section 8.45
[Input/Output] - [I/O assignment]

What Is in This Section?

This section contains the following topics:

[DI1 assignment] L I A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI1 assignment]

[DI1 Low Assignment] L I L

DI1 low assignment.

Setting	Code / Value	Description
[No]	n o	Not assigned
[Fast stop]	F S t	Fast stop
[External Error]	E t F	External error
[Drive Lock]	L E S	Drive lock assignment
[Stop FW]	L A F	Stop forward limit assignment
[Stop RV]	L A r	Stop reverse limit assignment
[Stop FW limit sw.]	S A F	Fwd stop limit input assig
[Stop RV limit sw.]	S A r	RV stop limit input assign
[Forward Slowdown]	d A F	Forward slowdown limit
[Reverse Slowdown]	d A r	Reverse slowdown limit
[Disable limit sw.]	C L S	Disable limit switch
[Switch Source]	S L P W	Select an external condition to enter in sleep mode (for example. Flow switch)

[DI1 High Assignment] L I H

DI1 high assignment.

Setting	Code / Value	Description
[No]	n o	Not assigned
[Run]	r u n	Run enable
[Forward]	F r d	Forward operation
[Reverse]	r r S	Reverse operation
[Ramp switching]	r P S	Ramp switching
[Jog]	J o G	Jog
[+Speed]	u S P	+ speed
[- speed]	d S P	- Speed
[2 preset speeds]	P S 2	2 preset speeds
[4 preset speeds]	P S 4	4 preset speeds
[8 preset speeds]	P S 8	8 preset speeds
[Ref. 2 switching]	r F C	Reference switching
[DC injection]	d C I	Injection DC stop
[Forced local]	F L o	Forced local mode
[Fault reset]	r S F	Fault reset
[Autotuning Assign]	t u L	Autotuning assignment
[Ref Frequency stored]	S P M	Reference frequency stored
[Pre Fluxing]	F L I	Pre fluxing
[Auto / manual]	P A u	PID auto-manu
[PID integral reset]	P I S	Integral shunting PID
[2 preset PID ref].	P r 2	2 preset PID references
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

Setting	Code / Value	Description
[4 preset PID ref.]	PrH	4 preset PID references
[Torque limitation]	tLA	Permanent torque limitation
[External Error]	EtF	External error
[2 config. switching]	CnF1	2 configuration switching
[3 config. switching]	CnF2	3 configuration switching
[2 parameter sets]	CHA1	Parameter switching 1
[3 parameter sets]	CHA2	Parameter switching 2
[Analog torque limitation]	tLC	Analog torque limitation
[Trq/spd switching]	tSS	Torque/Speed switching
[Torque ref. sign]	tSd	Torque reference sign switching
[Cmd switching]	CCS	Command channel switching
[ErrorDetect Disable]	inH	Error detection disable
[16 preset speeds]	PS16	16 preset speeds
[Current limit 2]	LC2	Current limit 2 switching
[Ref 1B switching]	rCb	Reference channel switching (1 to 1B)
[Brake contact]	bC1	Brake contact
[Stop FW limit sw.]	SAF	Fwd stop limit input assig
[Stop RV limit sw.]	SAr	RV stop limit input assign
[Forward Slowdown]	dAF	Forward slowdown limit
[Reverse Slowdown]	dAr	Reverse slowdown limit
[Disable limit sw.]	CLS	Disable limit switch
[Drive Lock]	LES	Drive lock assignment
[ProductRestart Assign]	rPA	Restart product
[Angle test]	ASL	Angle setting test
[Stop on top Z]	toSt	Stop on next top Z detection
[2 HSP]	Sh2	2 High Speed assignment
[4 HSP]	Sh4	4 High Speed assignment
[Idle]	idLS	Stop and go : idle mode enable condition
[TrqLimit Switch Assign]	tASu	Torque limitation switch assignment
[+speed around Ref Freq]	uS1	Increase speed around reference frequency
[-speed around Ref Freq]	dS1	Decrease speed around reference frequency
[Trq Ref Switch Assign]	tr1	Torque control reference switch assignment
[Switch Source]	SLPW	Select an external condition to enter in sleep mode (for example. Flow switch)
[Disable M/S]	nSd1	Disable Master/Slave (1)
[Speed Ref Direction]	SSd	Speed reference direction (1)
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[DI2 assignment] L 2 A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI2 assignment]

About This Menu

Identical to **[DI1 assignment]** L IA - menu *(see page 415)*.

[DI2 Low Assignment] L 2 L

DI2 low assignment.

[DI2 High Assignment] L 2 H

DI2 high assignment.

[DI3 assignment] L 3 A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI3 assignment]

About This Menu

Identical to **[DI1 assignment]** L IA - menu *(see page 415)*.

[DI3 Low Assignment] L 3 L

DI3 low assignment.

[DI3 High Assignment] L 3 H

DI3 high assignment.

[DI4 assignment] L 4A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI4 assignment]

About This Menu

Identical to **[DI1 assignment] L IA -** menu *(see page 415)*.

[DI4 Low Assignment] L 4L

DI4 low assignment.

[DI4 High Assignment] L 4H

DI4 high assignment.

[DI5 assignment] L 5 A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI5 assignment]

About This Menu

Identical to **[DI1 assignment]** L IA - menu *(see page 415)*.

[DI5 Low Assignment] L 5 L

DI5 low assignment.

[DI5 High Assignment] L 5 H

DI5 high assignment.

[DI6 assignment] L 6 A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI6 assignment]

About This Menu

Identical to **[DI1 assignment]** L IA - menu *(see page 415)*.

[DI6 Low Assignment] L 6 L

DI6 low assignment.

[DI6 High Assignment] L 6 H

DI6 high assignment.

[DI7 assignment] L 7A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI7 assignment]

About This Menu

Identical to **[DI1 assignment] L IA -** menu *(see page 415)*.

[DI7 Low Assignment] L 7L

DI7 low assignment.

[DI7 High Assignment] L 7H

DI7 high assignment.

[DI8 assignment] L 8 A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI8 assignment]

About This Menu

Identical to **[DI1 assignment] L I A -** menu *(see page 415)*.

[DI8 Low Assignment] L 8 L

DI8 low assignment.

[DI8 High Assignment] L 8 H

DI8 high assignment.

[DI11 assignment] L I IA - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI11 assignment]

About This Menu

Identical to **[DI1 assignment] L I IA -** menu *(see page 415)*.

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DI11 Low Assignment] L I IL ★

DI11 low assignment.

[DI11 High Assignment] L I IH ★

DI11 high assignment.

[DI12 assignment] L I2A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI12 assignment]

About This Menu

Identical to **[DI1 assignment]** L I1A - menu *(see page 415)*.

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DI12 Low Assignment] L I2L ★

DI12 low assignment.

[DI12 High Assignment] L I2H ★

DI12 high assignment.

[DI13 assignment] L I 3 A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI13 assignment]

About This Menu

Identical to **[DI1 assignment]** L I A - menu *(see page 415)*.

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DI13 Low Assignment] L I 3 L ★

DI13 low assignment.

[DI13 High Assignment] L I 3 H ★

DI13 high assignment.

[DI14 assignment] L I4A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI14 assignment]

About This Menu

Identical to **[DI1 assignment]** L I1A - menu *(see page 415)*.

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DI14 Low Assignment] L I4L ★

DI14 low assignment.

[DI14 High Assignment] L I4H ★

DI14 high assignment.

[DI15 assignment] L I5A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI15 assignment]

About This Menu

Identical to **[DI1 assignment]** L I1A - menu *(see page 415)*.

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DI15 Low Assignment] L I5L ★

DI15 low assignment.

[DI15 High Assignment] L I5H ★

DI15 high assignment.

[DI16 assignment] L I6A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI16 assignment]

About This Menu

Identical to **[DI1 assignment]** L I1A - menu *(see page 415)*.

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DI16 Low Assignment] L I6L ★

DI16 low assignment.

[DI16 High Assignment] L I6H ★

DI16 high assignment.

[DI7 Pulse Input Assign] P I 7A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [DI7 Pulse Input Assign]

About This Menu

Following parameters can be accessed on the Graphic Display Terminal by pressing the OK key on the **[DI7 Frequency Measured]** PFC 7 parameter.

[DI7 Pulse Input Assign] P I 7A

DI7 pulse input assignment.

It displays all the functions associated with the pulse input in order to verify, for example, for compatibility problems.

If no functions have been assigned, **[No]** no is displayed.

Setting	Code / Value	Description
[No]	no	Not assigned
[Torque Ref Offset]	tqo	Torque offset source
[Torque Ref Ratio]	tqr	Torque ratio source
[Ref Frequency 1]	Fr 1	Reference frequency 1
[Ref Frequency 2]	Fr 2	Reference frequency 2
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Manual PID Ref.]	PIM	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FPI	PID reference frequency
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Ref Frequency 1B]	Fr 1b	Reference frequency 1B
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier
[Torque reference]	tr 1	Torque regulation: torque set point 1
[Torque reference 2]	tr 2	Torque regulation: torque set point 2
[Frequency Meter]	FqF	Frequency meter function activation
[External Feed Forward]	tEFF	External feed-forward

[DI8 Pulse Input Assign] P ,8A - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[I/O assignment]** ➡ **[Pulse Input DI8 Assign]**

About This Menu

Identical to **[DI7 Pulse Input Assign]** P ,7A -.

Following parameters can be accessed on the Graphic Display Terminal by pressing the OK key on the **[DI8 Frequency Measured]** PFC8 parameter.

[Pulse Input DI8 Assign] P ,8A

Pulse Input DI8 Assignment.

[AI1 assignment] AI1A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [AI1 assignment]

[AI1 Assignment] AI1A

Analog input AI1 functions assignment.

Read-only parameter, cannot be configured. It displays all the functions associated with input AI1 in order to verify, for example, for compatibility problems.

If no functions have been assigned, **[No]** nO is displayed.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Torque Ref Offset]	tqO	Torque offset source
[Torque Ref Ratio]	tqr	Torque ratio source
[Ref Freq Channel 1]	Fr1	Reference frequency channel 1 **Factory Setting**
[Ref Freq Channel 2]	Fr2	Reference frequency channel 2
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Manual PID Ref.]	PIM	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FPI	PID reference frequency
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Ref Frequency 1B]	Fr1b	Reference frequency 1B
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier
[Torque reference]	tr1	Torque regulation: torque set point 1
[Torque reference 2]	tr2	Torque regulation: torque set point 2
[External Feed Forward]	tEFF	External feed-forward
[M/S Speed Ref In] (1)	MSSI	Master Slave: speed input
[M/S Trq Ref In] (1)	MSTI	Master Slave: torque input

1 This feature is not supported by the current firmware version.

[AI2 assignment] A I2A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [AI2 assignment]

About This Menu

Identical to **[AI1 assignment]** A I1A - menu *(see page 432)*.

[AI2 Assignment] A I2A

AI2 assignment.

[AI3 assignment] AI3A - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [AI3 assignment]

About This Menu

Identical to **[AI1 assignment] AI1A -** menu *(see page 432)*.

[AI3 assignment] AI3A

AI3 assignment.

[AI4 assignment] AI4A- Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[I/O assignment]** ➡ **[AI4 assignment]**

About This Menu

Identical to **[AI1 assignment]** AI1A- menu *(see page 432)*.

[AI4 Assignment] AI4A★

AI4 assignment.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[AI5 assignment] AI5A - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[I/O assignment]** ➡ **[AI5 assignment]**

About This Menu

Identical to **[AI1 assignment]** AI1A - menu *(see page 432)*.

[AI5 Assignment] AI5A ★

AI5 assignment.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[AU1A assignment] AV IA - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [I/O assignment] ➡ [AU1A assignment]

[AIV1 Assignment] AV IA

Virtual analog input 1 function assignment.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Torque Ref Offset]	tqO	Torque offset source
[Torque Ref Ratio]	tqr	Torque ratio source
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier

Section 8.46
[Input/Output] - [DI/DQ]

What Is in This Section?

This section contains the following topics:

[DI1 Configuration] d I 1 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI1 Configuration]

[DI1 Low Assignment] L I1L

DI1 low assignment.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Fast stop]	FSt	Fast stop
[External Error]	EtF	External error
[Drive Lock]	LES	Drive lock assignment
[Stop FW]	LAF	Stop forward limit assignment
[Stop RV]	LAr	Stop reverse limit assignment
[Stop FW limit sw.]	SAF	Fwd stop limit input assig
[Stop RV limit sw.]	SAr	RV stop limit input assign
[Forward Slowdown]	dAF	Forward slowdown limit
[Reverse Slowdown]	dAr	Reverse slowdown limit
[Disable limit sw.]	CLS	Disable limit switch
[Switch Source]	SLPW	Select an external condition to enter in sleep mode (for example. Flow switch)

[DI1 High Assignment] L I1H

DI1 high assignment.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Run]	run	Run enable
[Forward]	Frd	Forward operation
[Reverse]	rrS	Reverse operation
[Ramp switching]	rPS	Ramp switching
[Jog]	JoG	Jog
[+Speed]	uSP	+ speed
[- speed]	dSP	- Speed
[2 preset speeds]	PS2	2 preset speeds
[4 preset speeds]	PS4	4 preset speeds
[8 preset speeds]	PS8	8 preset speeds
[Ref. 2 switching]	rFC	Reference switching
[DC injection]	dC I	Injection DC stop
[Forced local]	FLo	Forced local mode
[Fault reset]	rSF	Fault reset
[Autotuning Assign]	tuL	Autotuning assignment
[Ref Frequency stored]	SPM	Reference frequency stored
[Pre Fluxing]	FL I	Pre fluxing
[Auto / manual]	PAu	PID auto-manu
[PID integral reset]	PIS	Integral shunting PID
[2 preset PID ref].	Pr2	2 preset PID references
[4 preset PID ref.]	Pr4	4 preset PID references
[Torque limitation]	tLA	Permanent torque limitation
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

Setting	Code / Value	Description
[External Error]	EtF	External error
[2 config. switching]	CnF1	2 configuration switching
[3 config. switching]	CnF2	3 configuration switching
[2 parameter sets]	CHA1	Parameter switching 1
[3 parameter sets]	CHA2	Parameter switching 2
[Analog torque limitation]	tLC	Analog torque limitation
[Trq/spd switching]	tSS	Torque/Speed switching
[Torque ref. sign]	tSd	Torque reference sign switching
[Cmd switching]	CCS	Command channel switching
[ErrorDetect Disable]	inH	Error detection disable
[16 preset speeds]	PS16	16 preset speeds
[Current limit 2]	LC2	Current limit 2 switching
[Ref 1B switching]	rCb	Reference channel switching (1 to 1B)
[Brake contact]	bCi	Brake contact
[Stop FW limit sw.]	SAF	Fwd stop limit input assig
[Stop RV limit sw.]	SAr	RV stop limit input assign
[Forward Slowdown]	dAF	Forward slowdown limit
[Reverse Slowdown]	dAr	Reverse slowdown limit
[Disable limit sw.]	CLS	Disable limit switch
[Drive Lock]	LES	Drive lock assignment
[ProductRestart Assign]	rPA	Restart product
[Angle test]	ASL	Angle setting test
[Stop on top Z]	toSt	Stop on next top Z detection
[2 HSP]	Sh2	2 High Speed assignment
[4 HSP]	Sh4	4 High Speed assignment
[Idle]	idLS	Stop and go : idle mode enable condition
[TrqLimit Switch Assign]	tASu	Torque limitation switch assignment
[+speed around Ref Freq]	uSi	Increase speed around reference frequency
[-speed around Ref Freq]	dSi	Decrease speed around reference frequency
[Trq Ref Switch Assign]	tri	Torque control reference switch assignment
[Switch Source]	SLPW	Select an external condition to enter in sleep mode (for example. Flow switch)
[Disable M/S]	MSdi	Disable Master/Slave (1)
[Speed Ref Direction]	SSd	Speed reference direction (1)
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[D1 Delay] Ld1

DI1 delay.

NOTE: Commands received via this digital input are processed once the delay time set via this parameter has elapsed.

Setting	Description
0...200 ms	Setting range **Factory setting**: 0 ms

[DI2 Configuration] d I2 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI2 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI2 Low Assignment] L 2L

DI2 low assignment.

[DI2 High Assignment] L 2H

DI2 high assignment.

[DI2 Delay] L 2d

DI2 delay.

[DI3 Configuration] d I 3 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI3 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI3 Low Assignment] L 3 L

DI3 low assignment.

[DI3 High Assignment] L 3 H

DI3 high assignment.

[DI3 Delay] L 3 d

DI3 delay.

[DI4 Configuration] d I 4 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI4 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI4 Low Assignment] L 4 L

DI4 low assignment.

[DI4 High Assignment] L 4 H

DI4 high assignment.

[DI4 Delay] L 4 d

DI4 delay.

[DI5 Configuration] d I 5 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI5 Configuration]

About This Menu

Identical to **[DI1 Configuration]** d I 1 - menu *(see page 439)*.

[DI5 Low Assignment] L 5 L

DI5 low assignment.

[DI5 High Assignment] L 5 H

DI5 high assignment.

[DI5 Delay] L 5 d

DI5 delay.

[DI6 Configuration] d I6 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI6 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI6 Low Assignment] L 6 L

DI6 low assignment.

[DI6 High Assignment] L 6 H

DI6 high assignment.

[DI6 Delay] L 6 d

DI6 delay.

[DI7 Configuration] d I 7 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI7 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI7 Low Assignment] L 7L

DI7 low assignment.

[DI7 High Assignment] L 7H

DI7 high assignment.

[DI7 Delay] L 7d

DI7 delay.

[DI8 Configuration] d I8 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI8 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI8 Low Assignment] L I8L

DI8 low assignment.

[DI8 High Assignment] L I8H

DI8 high assignment.

[DI8 Delay] L I8d

DI8 delay.

[DI11 Configuration] d I I - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI11 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI11 Low Assignment] L I IL ★

DI11 low assignment.

[DI11 High Assignment] L I IH ★

DI11 high assignment.

[DI11 Delay] L I Id ★

DI11 delay.

[DI12 Configuration] d I 2 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI12 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I -** menu *(see page 439)*.

[DI12 Low Assignment] L I 2 L ★

DI12 low assignment.

[DI12 High Assignment] L I 2 H ★

DI12 high assignment.

[DI12 Delay] L I 2 d ★

DI12 delay.

[DI13 Configuration] d I I 3 - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[DI/DQ]** ➡ **[DI13 Configuration]**

About This Menu

Identical to **[DI1 Configuration]** d I I - menu *(see page 439)*.

[DI13 Low Assignment] L I 3 L ★

DI13 low assignment.

[DI13 High Assignment] L I 3 H ★

DI13 high assignment.

[DI13 Delay] L I 3 d ★

DI13 delay.

[DI14 Configuration] d I 14 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI14 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI14 Low Assignment] L I4L ★

DI14 low assignment.

[DI14 High Assignment] L I4H ★

DI14 high assignment.

[DI14 Delay] L I4d ★

DI14 delay.

[DI15 Configuration] d I 15 - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[DI/DQ]** ➡ **[DI15 Configuration]**

About This Menu

Identical to **[DI1 Configuration]** d I 1 - menu *(see page 439)*.

[DI15 Low Assignment] L I5L ★

DI15 low assignment.

[DI15 High Assignment] L I5H ★

DI15 high assignment.

[DI15 Delay] L I5d ★

DI15 delay.

[DI16 Configuration] d I 16 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI16 Configuration]

About This Menu

Identical to **[DI1 Configuration] d I 1 -** menu *(see page 439)*.

[DI16 Low Assignment] L I16L ★

DI16 low assignment.

[DI16 High Assignment] L I16H ★

DI16 high assignment.

[DI16 Delay] L I16d ★

DI16 delay.

[DI7 Pulse Config] PA i7 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI7 Pulse Config]

About This Menu

Following parameters can be accessed on the Graphic Display Terminal by pressing the **OK** key on the **[DI7 Frequency Measured]** PFC 7 parameter.

[DI7 Pulse Input Assign] P i7A

DI7 pulse input assignment.

It displays all the functions associated with the pulse input in order to verify, for example, for compatibility problems.

If no functions have been assigned, **[No]** no is displayed.

Setting	Code / Value	Description
[No]	no	Not assigned
[Torque Ref Offset]	tqo	Torque offset source
[Torque Ref Ratio]	tqr	Torque ratio source
[Ref Frequency 1]	Fr 1	Reference frequency 1
[Ref Frequency 2]	Fr 2	Reference frequency 2
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PiF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Manual PID Ref.]	PiM	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FPi	PID reference frequency
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Ref Frequency 1B]	Fr 1b	Reference frequency 1B
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier
[Torque reference]	tr 1	Torque regulation: torque set point 1
[Torque reference 2]	tr 2	Torque regulation: torque set point 2
[Frequency Meter]	FqF	Frequency meter function activation
[External Feed Forward]	tEFF	External feed-forward

[DI7 PulseInput Low Freq] P I L 7

DI7 pulse input low frequency.

Pulse input scaling parameter of 0% in Hz x 10 unit.

Setting	Description
0.00...30,000.00 Hz	Setting range **Factory setting**: 0.00 Hz

[DI7 PulseInput High Freq] P I H 7

DI7 pulse input high frequency.

Pulse input scaling parameter of 100% in Hz x 10 unit.

Setting	Description
0.00...30.00 kHz	Setting range **Factory setting**: 30.00 kHz

[DI7 Frequency Filter] P F I 7

Interference filtering pulse input cut-off time of the low-filter.

Setting	Description
0...1,000 ms	Setting range **Factory setting**: 0 ms

[DI8 Pulse Config] PA i8 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DI8 Pulse Config]

About This Menu

Following parameters can be accessed on the Graphic Display Terminal by pressing the **OK** key on the **[DI8 Frequency Measured]** PFC8 parameter.

[DI8 Pulse Input Assign] P i8A

Filtered customer pulse input frequency reference.

Identical to **[DI7 Pulse Input Assign]** P i7A *(see page 454)*.

[DI8 PulseInput Low Freq] P iL8

DI6 pulse input low frequency.

Identical to **[DI7 PulseInput Low Freq]** P iL7 *(see page 454)*.

[DI8 PulseInput High Freq] P iH8

DI6 pulse input high frequency.

Identical to **[DI7 PulseInput High Freq]** P iH7 *(see page 455)*.

[DI8 Frequency Filter] PF i8

Interference filtering pulse input cut-off time of the low-filter.

Identical to **[DI7 Frequency Filter]** PF i7 *(see page 455)*.

[DQ1 Configuration] dO 1- Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DQ1 Configuration]

[DQ1 Assignment] dO 1★

Digital output 1 assignment.

Identical to **[R2 Assignment]** r2 *(see page 481)*.

[DQ1 Delay time] dO 1d★

DQ1 activation delay time

Setting	Description
0...60,000 ms	Setting range 0...9,999 ms then 10.00...60.00 s on the Graphic Display Terminal **Factory setting**: 0 ms

[DQ1 Active at] dO 1S★

DQ1 status (output active level)

Setting	Code / Value	Description
[1]	POS	State 1 when the information is true **Factory Setting**
[0]	nEG	State 0 when the information is true

[DQ1 Holding time] dO 1H★

DQ1 holding delay time.

Setting	Description
0...9,999 ms	Setting range **Factory setting**: 0 ms

[DQ11 Configuration] dO 11 - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[DI/DQ]** ➡ **[DQ11 Configuration]**

About This Menu

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DQ11 Assignment] dO 11 ★

Digital output 11 assignment.

Identical to **[R2 Assignment]** r2 *(see page 481)*

[DQ11 actv delay] d 11d ★

DQ11 activation delay time.

The delay cannot be set for the **[Operating State "Fault"]** FLt and **[Mains Contactor]** LLC assignments, and remains at 0.

The change in state only takes effect once the configured time has elapsed when the information becomes true.

Setting	Description
0...60,000 ms	Setting range 0...9,999 ms then 10.00...60.00 s on the Graphic Display Terminal **Factory setting**: 0 ms

[DQ11 status] d 11S ★

DQ11 status (output active level).

Setting	Code / Value	Description
[1]	PoS	State 1 when the information is true **Factory Setting**
[0]	nEG	State 0 when the information is true

The configuration **[1]** PoS cannot be modified for the **[Operating State "Fault"]** FLt, **[Brake Sequence]** bLC, and **[Mains Contactor]** LLC assignments.

[DQ11 hold delay] d 11H ★

DQ11 holding delay time.

The holding time cannot be set for the **[Operating State "Fault"]** FLt, **[Brake Sequence]** bLC, and **[Mains Contactor]** LLC assignments, and remains at 0.

The change in state only takes effect once the configured time has elapsed when the information becomes false.

Setting	Description
0...9,999 ms	Setting range **Factory setting**: 0 ms

[DQ12 Configuration] dO 12 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [DI/DQ] ➡ [DQ12 Configuration]

About This Menu

Identical to **[DQ11 Configuration]** dO 11 - Menu *(see page 458)*.

Following parameters can be accessed if VW3A3203 I/O extension module has been inserted.

[DQ12 Assignment] dO 12 ★

Digital output 12 assignment.

[DQ12 actv delay] d 12d ★

DQ12 activation delay time.

[DQ12 status] d 12S ★

DQ12 status (output active level).

[DQ12 hold delay] d 12H ★

DQ12 holding delay time.

Section 8.47
[Input/Output] - [Analog I/O]

What Is in This Section?

This section contains the following topics:

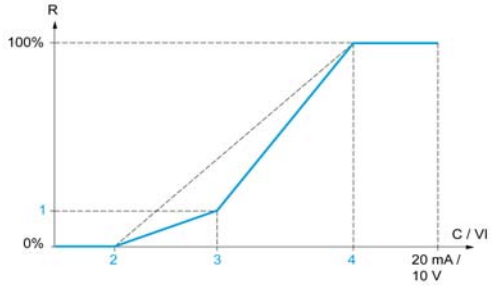
[AI1 configuration] *A I 1* - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[AI/AQ]** ➡ **[AI1 configuration]**

About This Menu

The input can be delinearized by configuring an intermediate point on the input/output curve of this input:



R Reference
C / VI Current or Voltage Input
1 **[Y Interm. point]**
2 **[Min value]** (0%)
3 **[X Interm. point]**
4 **[Max value]** (100%)

NOTE: For **[X Interm. point]**, 0% corresponds to **[Min value]** and 100% to **[Max value]**.

[AI1 Assignment] A I1A

Analog input AI1 functions assignment.

Read-only parameter, cannot be configured. It displays all the functions associated with input AI1 in order to verify, for example, for compatibility problems.

If no functions have been assigned, **[No]** nO is displayed.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Torque Ref Offset]	tAO	Torque offset source
[Torque Ref Ratio]	tAr	Torque ratio source
[Ref Freq Channel 1]	Fr1	Reference frequency channel 1 **Factory Setting**
[Ref Freq Channel 2]	Fr2	Reference frequency channel 2
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Manual PID Ref.]	PIM	Manual speed reference of the PID controller (auto-man)
[PID Ref Frequency]	FPI	PID reference frequency
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Ref Frequency 1B]	Fr1b	Reference frequency 1B
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Forced local]	FLoC	Forced local reference source1
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier
[Torque reference]	tr1	Torque regulation: torque set point 1
[Torque reference 2]	tr2	Torque regulation: torque set point 2
[External Feed Forward]	tEFF	External feed-forward
[M/S Speed Ref In] (1)	MSSI	Master Slave: speed input
[M/S Trq Ref In] (1)	MSTI	Master Slave: torque input
1 This feature is not supported by the current firmware version.		

[AI1 Type] A I1t

Configuration of analog input AI1.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc **Factory setting**
[Current]	0A	0-20 mA
[PTC Management]	PtC	1 to 6 PTC (in serial)
[KTY]	Kty	1 KTY84
[PT100]	1Pt2	1 PT100 connected with 2 wires
[PT1000]	1Pt3	1 PT1000 connected with 2 wires

[AI1 min value] uIL1 ★

AI1 voltage scaling parameter of 0%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Voltage]** 10U.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 0.0 Vdc

[AI1 max value] uIH1 ★

AI1 voltage scaling parameter of 100%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Voltage]** 10U.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 10.0 Vdc

[AI1 min. value] CrL1 ★

AI1 current scaling parameter of 0%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 0.0 mA

[AI1 max. value] CrH1 ★

AI1 current scaling parameter of 100%.

This parameter can be accessed if **[AI1 Type]** AI1t is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 20.0 mA

[AI1 filter] AI1F

AI1 cutoff time of the low filter.

Setting	Description
0.00...10.00 s	Setting range **Factory setting**: 0.00 s

[AI1 X Interm. point] AI1E

Input delinearization point coordinate. Percentage of the physical input signal.

0% corresponds to **[AI1 min value]** (uIL1)

100% corresponds to **[AI1 max value]** (uIH1)

Setting	Description
0...100%	Setting range **Factory setting**: 0%

[AI1 Y Interm. point] A I 5

Input delinearization point coordinate (frequency reference).

Percentage of the internal frequency reference corresponding to the **[AI1 X Interm. point]** (A I E) percentage of physical input signal.

Setting	Description
0...100%	Setting range **Factory setting**: 0%

[AI2 configuration] AI2 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [AI/AQ] ➡ [AI2 configuration]

[AI2 Assignment] AI2A

AI2 functions assignment.

Identical to **[AI1 Assignment] AI1A** *(see page 462)*.

[AI2 Type] AI2t

Configuration of analog input AI2.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc
[Voltage +/-]	n10U	-10/+10 Vdc **Factory setting**

[AI2 min value] UIL2 ★

AI2 voltage scaling parameter of 0%.

This parameter can be accessed if **[AI2 Type] AI2t** is set to **[Voltage] 10U**.

Identical to **[AI1 min value] UIL1** *(see page 463)*.

[AI2 max value] UIH2 ★

AI2 voltage scaling parameter of 100%.

This parameter can be accessed if **[AI2 Type] AI2t** is set to **[Voltage] 10U**.

Identical to **[AI1 max value] UIH1** *(see page 463)*.

[AI2 filter] AI2F

AI2 filter.

Identical to **[AI1 filter] AI1F** *(see page 463)*.

[AI2 X Interm. point] AI2E

AI2 delinearization input level.

Identical to **[AI1 X Interm. point] AI1E** *(see page 463)*.

[AI2 Y Interm. point] AI2S

AI2 delinearization output level.

Identical to **[AI1 Y Interm. point] AI1S** *(see page 464)*.

[AI3 configuration] A I 3 - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[AI/AQ]** ➡ **[AI3 configuration]**

[AI3 Assignment] A I 3 A

AI3 functions assignment.

Identical to **[AI1 Assignment]** A I I A *(see page 462)*.

[AI3 Type] A I 3 t

Configuration of analog input AI3.

Identical to **[AI2 Type]** A I 2 t *(see page 465)* with factory setting: **[Current]** O A.

[AI3 min value] u I L 3 ★

AI3 voltage scaling parameter of 0%.

Identical to **[AI1 min value]** u I L I *(see page 463)*.

This parameter can be accessed if **[AI3 Type]** A I 3 t is set to **[Voltage]** I O u.

[AI3 max value] u I H 3 ★

AI3 voltage scaling parameter of 100%.

Identical to **[AI1 max value]** u I H I *(see page 463)*.

This parameter can be accessed if **[AI3 Type]** A I 3 t is set to **[Voltage]** I O u.

[AI3 min. value] C r L 3 ★

AI3 current scaling parameter of 0%.

Identical to **[AI1 min. value]** C r L I *(see page 463)*.

This parameter can be accessed if **[AI3 Type]** A I 3 t is set to **[Current]** O A.

[AI3 max. value] C r H 3 ★

AI3 current scaling parameter of 100%.

Identical to **[AI1 max. value]** C r H I *(see page 463)*.

This parameter can be accessed if **[AI3 Type]** A I 3 t is set to **[Current]** O A.

[AI3 filter] A I 3 F

AI3 cutoff time of the low filter.

Identical to **[AI1 filter]** A I I F *(see page 463)*.

[AI3 X Interm. point] A I 3 E

AI3 delinearization input level.

Identical to **[AI1 X Interm. point]** A I I E *(see page 463)*.

[AI3 Y Interm. point] A I 3 S

AI3 delinearization output level.

Identical to **[AI1 Y Interm. point]** A I I S *(see page 464)*.

[AI4 configuration] AI4- Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [AI/AQ] ➡ [AI4 configuration]

[AI4 Assignment] AI4A ★

AI4 functions assignment.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 Assignment]** AI1A *(see page 462)*.

[AI4 Type] AI4t ★

Configuration of analog input AI4.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc
[Current]	0A	0-20 mA **Factory setting**
[Voltage +/-]	n10U	-10/+10 Vdc
[PTC Management]	PtC	1 to 6 PTC (in serial)
[KTY]	Kty	1 KTY84
[PT1000]	1Pt3	1 PT1000 connected with 2 wires
[PT100]	1Pt2	1 PT100 connected with 2 wires
[3 PT1000]	3Pt3	3 PT1000 connected with 2 wires
[3 PT100]	3Pt2	3 PT100 connected with 2 wires
[PT1000 in 3 wires]	1Pt33	1 PT1000 connected with 3 wires (AI4 & AI5 only)
[PT100 in 3 wires]	1Pt23	1 PT100 connected with 3 wires (AI4 & AI5 only)
[3 PT1000 in 3 wires]	3Pt33	3 PT1000 connected with 3 wires (AI4 & AI5 only)
[3 PT100 in 3 wires]	3Pt23	3 PT100 connected with 3 wires (AI4 & AI5 only)

[AI4 min value] UIL4 ★

AI4 voltage scaling parameter of 0%.

Identical to **[AI1 min value]** UIL1 *(see page 463)*.

[AI4 max value] UIH4 ★

AI4 voltage scaling parameter of 100%.

Identical to **[AI1 max value]** UIH1 *(see page 463)*.

[AI4 min. value] CrL4 ★

AI4 current scaling parameter of 0%.

Identical to **[AI1 min. value]** CrL1 *(see page 463)*.

[AI4 max. value] CrH4 ★

AI4 current scaling parameter of 100%.

Identical to **[AI1 max. value]** CrH1 *(see page 463)*.

[AI4 filter] AI4F ★

AI4 cutoff time of the low filter.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 filter]** AI1F *(see page 463)*.

[AI4 X Interm. point] AI4E ★

AI4 delinearization input level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 X Interm. point]** AI1E *(see page 463)*.

[AI4 Y Interm. point] AI4S ★

AI4 delinearization output level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 Y Interm. point]** AI1S *(see page 464)*.

[AI5 configuration] AI5 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [AI/AQ] ➡ [AI5 configuration]

[AI5 Assignment] AI5A ★

AI5 functions assignment.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 Assignment] AI1A** *(see page 462)*.

[AI5 Type] AI5t ★

Configuration of analog input AI5.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI4 Type] AI4t** . *(see page 467)*

[AI5 min value] uiL5 ★

AI5 voltage scaling parameter of 0%.

Identical to **[AI1 min value] uiL1** *(see page 463)*.

[AI5 max value] uiH5 ★

AI5 voltage scaling parameter of 100%.

Identical to **[AI1 max value] uiH1** *(see page 463)*.

[AI5 min. value] CrL5 ★

AI5 current scaling parameter of 0%.

Identical to **[AI1 min. value] CrL1** *(see page 463)*.

[AI5 max. value] CrH5 ★

AI5 current scaling parameter of 100%.

Identical to **[AI1 max. value] CrH1** *(see page 463)*.

[AI5 filter] AI5F ★

AI5 cutoff time of the low filter.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 filter] AI1F** *(see page 463)*.

[AI5 X Interm. point] AI5E ★

AI5 delinearization input level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 X Interm. point] AI1E** *(see page 463)*.

[AI5 Y Interm. point] AI5S ★

AI5 delinearization output level.

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

Identical to **[AI1 Y Interm. point] AI1S** *(see page 464)*.

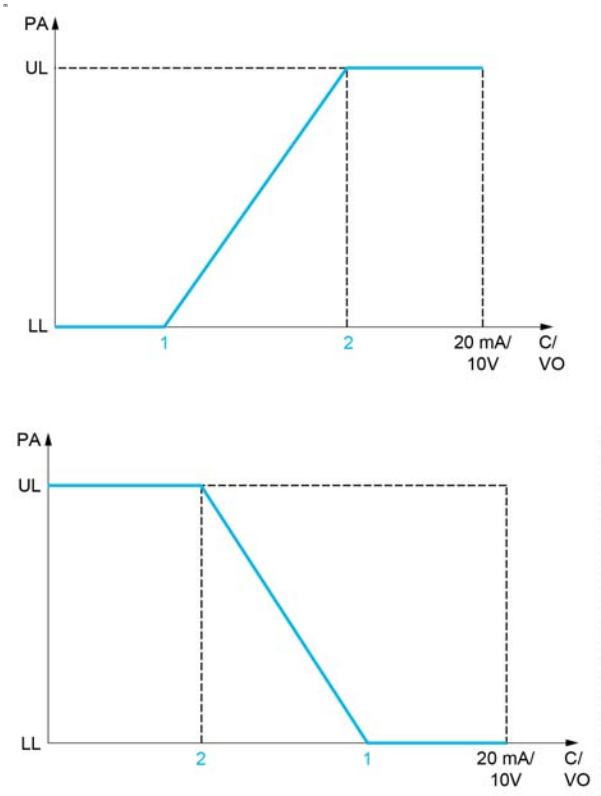
[AQ1 configuration] AO1- Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [AI/AQ] ➡ [AQ1 configuration]

Minimum and Maximum Output Values

The minimum output value, in volts, corresponds to the lower limit of the assigned parameter and the maximum value corresponds to its upper limit. The minimum value may be greater than the maximum value.



PA Parameter assigned
C / VO Current or voltage output
UL Upper limit
LL Lower limit
1 **[Min Output]** AOLX or UOLX
2 **[Max Output]** AOHX or UOHX

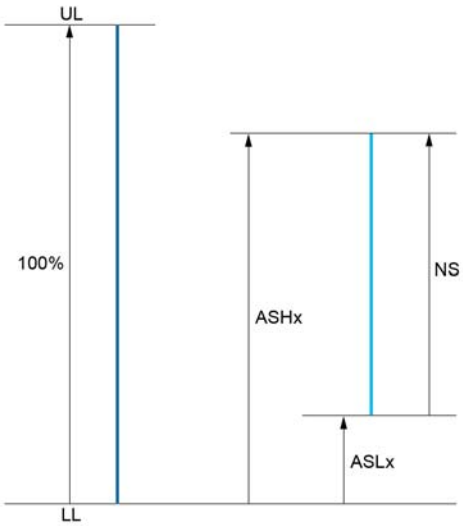
Scaling of the Assigned Parameter

The scale of the assigned parameter can be adapted in accordance with the requirements by modifying the values of the lower and upper limits with two parameters for each analog output.

These parameters are given in %. 100% corresponds to the total variation range of the configured parameter, so: 100% = upper limit - lower limit.

For example, **[Sign. torque]** StQ which varies between –3 and +3 times the rated torque, 100% corresponds to 6 times the rated torque.

- The **[Scaling AQx min]** ASLX parameter modifies the lower limit: new value = lower limit + (range x ASLX). The value 0% (factory setting) does not modify the lower limit.
- The **[Scaling AQx max]** ASHX) parameter modifies the upper limit: new value = lower limit + (range x ASLX). The value 100% (factory setting) does not modify the upper limit.
- **[Scaling AQx min]** ASLX must always be lower than **[Scaling AQx max]** ASHX.



UL Upper limit of the assigned parameter
LL Lower limit of the assigned parameter
NS New scale
1 ASHX
2 ASLX

Application Example

The value of the motor current at the AQ1 output is to be transferred with 0...20 mA, range 2 in motor, In motor being the equivalent of a 0.8 In drive.

- The **[Motor Current]** oCr parameter varies from 0 to 2 times the rated drive current, or a range of 2.5 times the rated drive current.
- **[Scaling AQ1 min]** ASL1 must not modify the lower limit, which therefore remains at its factory setting of 0%.
- **[Scaling AQ1 max]** ASH1 must modify the upper limit by 0.5x the rated motor torque, or 100 - 100/5 = 80% (new value = lower limit + (range x **[Scaling AQ1 max]** ASH1).

[AQ1 Assignment] AO1

AQ1 assignment.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[Motor Current]	OCr	Current in the motor, from 0 to 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate)
[Motor Frequency]	OFr	Output frequency, from 0 to **[Max Frequency]** tFr **Factory Setting**
[Ramp out.]	OrP	From 0 to **[Max Frequency]** tFr
[Motor torq.]	trq	Motor torque, from 0 to 3 times the rated motor torque
[Sign. torque]	Stq	Signed motor torque, between –3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the – sign to the generator mode (braking).
[sign ramp]	Ors	Signed ramp output, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[PID ref.]	OPS	PID controller reference between **[Min PID reference]** PIP1 and **[Max PID reference]** PIP2
[PID feedbk]	OPF	PID controller feedback between **[Min PID feedback]** PIF1 and **[Max PID feedback]** PIF2
[PID error]	OPE	PID controller detected error between –5% and +5% of **[Max PID feedback]** PIF2 – **[Min PID feedback]** PIF1
[PID output]	OPI	PID controller output between **[Low speed]** LSP and **[High speed]** HSP
[Drive power]	OPr	Motor power, between 0 and 2.5 times **[Nominal Motor Power]** nPr
[Mot thermal]	tHr	Motor thermal state, from 0 to 200% of the rated thermal state
[Drv thermal]	tHd	Drive thermal state, from 0 to 200% of the rated thermal state
[Measured Motor Freq]	OFrr	Measured motor frequency
[Sig. o/p frq.]	OFS	Signed output frequency, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[Mot therm2]	tHr2	Motor thermal 2 state
[Mot therm3]	tHr3	Motor thermal 3 state
[Mot therm4]	tHr4	Motor thermal 4 state
[Unsigned Trq Ref]	utr	Unsigned torque reference
[Signed Trq Ref]	Str	Signed torque reference
[Torque lim.]	tqL	Torque limit
[Motor volt.]	uoP	Voltage applied to the motor, between 0 and **[Nom Motor Voltage]** unS
[M/S Out Speed Reference] (1)	MSSo	Master / slave output speed reference
[M/S Out Torque Reference] (1)	MSto	Master / slave output torque reference
1 This feature is not supported by the current firmware version.		

[AQ1 Type] AO1t

AQ1 type.

Setting	Code / Value	Description
[Voltage]	10u	0-10 Vdc **Factory setting**
[Current]	0A	0-20 mA

[AQ1 min output] AOL 1 ★

AQ1 current scaling parameter of 0%.

This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 0.0 mA

[AQ1 max output] AOH 1 ★

AQ1 current scaling parameter of 100%.

This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Current]** 0A.

Setting	Description
0.0...20.0 mA	Setting range **Factory setting**: 20.0 mA

[AQ1 min Output] UOL 1 ★

AQ1 voltage scaling parameter of 0%.

This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Voltage]** 10U.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 0.0 Vdc

[AQ1 max Output] UOH 1 ★

AQ1 voltage scaling parameter of 100%.

This parameter can be accessed if **[AQ1 Type]** AO 1t is set to **[Voltage]** 10U.

Setting	Description
0.0...10.0 Vdc	Setting range **Factory setting**: 10.0 Vdc

[Scaling AQ1 min] ASL 1

AQ1 scaling parameter of 0%.

Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0...100.0%	Setting range **Factory setting**: 0.0%

[Scaling AQ1 max] ASH 1

AQ1 scaling parameter of 100%.

Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.

Setting	Description
0.0...100.0%	Setting range **Factory setting**: 100.0%

[AQ1 Filter] AO 1F

AQ1 cutoff time of the low-filter.

Setting	Description
0.00...10.00 s	Setting range **Factory setting**: 0.00 s

[AQ2 configuration] AO2 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [AI/AQ] ➡ [AQ2 configuration]

[AQ2 assignment] AO2

AQ2 assignment.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned
[Motor Current]	OCr	Current in the motor, from 0 to 2 In (In = rated drive current indicated in the Installation manual and on the drive nameplate) **Factory Setting**
[Motor Frequency]	OFr	Output frequency, from 0 to **[Max Frequency]** tFr
[Ramp out.]	OrP	From 0 to **[Max Frequency]** tFr
[Motor torq.]	trq	Motor torque, from 0 to 3 times the rated motor torque
[Sign. torque]	Stq	Signed motor torque, between –3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the – sign to the generator mode (braking).
[sign ramp]	OrS	Signed ramp output, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[PID ref.]	OPS	PID controller reference between **[Min PID reference]** PIP1 and **[Max PID reference]** PIP2
[PID feedbk]	OPF	PID controller feedback between **[Min PID feedback]** PIF1 and **[Max PID feedback]** PIF2
[PID error]	OPE	PID controller detected error between –5% and +5% of **[Max PID feedback]** PIF2 – **[Min PID feedback]** PIF1
[PID output]	OP1	PID controller output between **[Low speed]** LSP and **[High speed]** HSP
[Drive power]	OPr	Motor power, between 0 and 2.5 times **[Nominal Motor Power]** nPr
[Mot thermal]	tHr	Motor thermal state, from 0 to 200% of the rated thermal state
[Drv thermal]	tHd	Drive thermal state, from 0 to 200% of the rated thermal state
[Measured Motor Freq]	OFrr	Measured motor frequency
[Sig. o/p frq.]	OFS	Signed output frequency, between –**[Max Frequency]** tFr and +**[Max Frequency]** tFr
[Mot therm2]	tHr2	Motor thermal 2 state
[Mot therm3]	tHr3	Motor thermal 3 state
[Mot therm4]	tHr4	Motor thermal 4 state
[Unsigned Trq Ref]	utr	Unsigned torque reference
[Signed Trq Ref]	Str	Signed torque reference
[Torque lim.]	tqL	Torque limit
[Motor volt.]	uoP	Voltage applied to the motor, between 0 and **[Nom Motor Voltage]** unS
[M/S Out Speed Reference] (1)	MSSo	Master / slave output speed reference
[M/S Out Torque Reference] (1)	MSto	Master / slave output torque reference

1 This feature is not supported by the current firmware version.

[AQ2 Type] AO2t

AQ2 type.

Setting	Code / Value	Description
[Voltage]	10U	0-10 Vdc
[Current]	0A	0-20 mA **Factory setting**

[AQ2 min output] AOL2 ★

AQ2 current scaling parameter of 0%.

This parameter can be accessed if **[AQ2 Type]** AO2t is set to **[Current]** 0A.

Identical to **[AQ1 min output]** AOL1 *(see page 473)*.

[AQ2 max output] AOH2 ★

AQ2 current scaling parameter of 100%.

This parameter can be accessed if **[AQ2 Type]** AO2t is set to **[Current]** 0A.

Identical to **[AQ1 max output]** AOH1 *(see page 473)*.

[AQ2 min Output] UOL2 ★

AQ2 voltage scaling parameter of 0%.

This parameter can be accessed if **[AQ2 Type]** AO2t is set to **[Voltage]** 10U.

Identical to **[AQ1 min Output]** UOL1 *(see page 473)*.

[AQ2 max Output] UOH2 ★

AQ2 voltage scaling parameter of 100%.

This parameter can be accessed if **[AQ2 Type]** AO2t is set to **[Voltage]** 10U.

Identical to **[AQ1 max Output]** UOH1 *(see page 473)*.

[Scaling AQ2 min] AS2L

AQ2 scaling parameter of 0%.

Identical to **[Scaling AQ1 min]** AS1L *(see page 473)*.

[Scaling AQ2 max] AS2H

AQ2 scaling parameter of 100%.

Identical to **[Scaling AQ1 max]** AS1H *(see page 473)*.

[AQ2 Filter] AO2F

AQ2 cutoff time of the low-filter.

Identical to **[AQ1 Filter]** AO1F *(see page 473)*.

[Virtual AI1] AU1 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [AI/AQ] ➡ [Virtual AI1]

[AIV1 Assignment] AV1A

Virtual AI1 function assignment.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Torque Ref Offset]	tqO	Torque offset source
[Torque Ref Ratio]	tqr	Torque ratio source
[Ref Frequency 2 Summing]	SA2	Reference frequency 2 summing
[PID Feedback]	PIF	PI controller feedback
[Torque limitation]	tAA	Torque limitation: activation by an analog value
[Torque limitation 2]	tAA2	Torque limitation: activation by an analog value
[Subtract Ref Freq 2]	dA2	Subtract reference frequency 2
[Ref Frequency 3 Summing]	SA3	Reference frequency 3 summing
[Subtract Ref Freq 3]	dA3	Subtract reference frequency 3
[Ref Frequency 2 multiplier]	MA2	Reference frequency 2 multiplier
[Ref Frequency 3 multiplier]	MA3	Reference frequency 3 multiplier

[AIV1 Channel Assignment] AIC1

Channel assignment for virtual analog input AIV1.

Setting	Code / Value	Description
[Not Configured]	nO	Not assigned **Factory setting**
[Ref. Freq-Modbus]	Mdb	Reference frequency via Modbus
[Ref. Freq-CANopen]	CAn	Reference frequency via CANopen if a CANopen module has been inserted
[Ref. Freq-Com. Module]	nEt	Reference frequency via fieldbus module if a fieldbus module has been inserted
[Embedded Ethernet]	EtH	Embedded Ethernet

Section 8.48
[Input/Output] - [Relay]

What Is in This Section?

This section contains the following topics:

[R1 configuration] r 1 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [Relay] ➡ [R1 configuration]

[R1 Assignment] r 1

R1 assignment.

Setting	Code / Value	Description
[No]	nO	Not assigned
[Operating State Fault]	FLt	Operating state fault **Factory setting**
[Drive Running]	run	Drive running
[Mot Freq High Thd]	FtA	Motor frequency threshold (**[Motor Freq Thd]** Ftd) reached
[High Speed Reached]	FLA	High speed reached
[Current Thd Reached]	CtA	Motor current threshold (**[High Current Thd]** Ctd) reached
[Ref Freq Reached]	SrA	Frequency reference reached
[Motor Therm Thd Reached]	tSA	Motor thermal threshold (**[Motor Therm Thd]** ttd) reached
[PID Error Warning]	PEE	PID error warning
[PID Feedback Warning]	PFA	PID feedback warning
[Mot Freq High Thd 2]	F2A	Second frequency threshold (**[Freq. threshold 2]** F2d) reached
[Drv Therm Thd Reached]	tAd	Drive thermal threshold reached
[Ref Freq High Thd Reached]	rtAH	Frequency reference high threshold reached
[Ref Freq Low Thd Reached]	rtAL	Frequency reference low threshold reached
[Mot Freq Low Thd]	FtAL	Frequency low threshold (**[Low Freq.Threshold]** FtdL) reached
[Motor Freq Low Thd 2]	F2AL	Second frequency low threshold (**[2 Freq. Threshold]** F2dL) reached
[Low Current Reached]	CtAL	Current low threshold (**[Low I Threshold]** CtdL) reached
[Process Undld Warning]	uLA	Underload warning
[Process Overload Warning]	oLA	Overload warning
[PID High Fdbck Warning]	PFAH	PID feedback high threshold (PAH) reached
[PID Low Fdbck Warning]	PFAL	PID feedback low threshold (PAL) reached
[Regulation Warning]	PiSH	PID regulation unabled to reach the set point
[Forced Run]	Ern	Emergency Run
[Slack Rope Warning]	rSdA	Rope Slack
[High Torque Warning]	ttHA	High torque threshold
[Low Torque Warning]	ttLA	Low torque threshold
[Forward]	MFrd	Run forward
[Reverse]	MrrS	Run reverse
[Ramp switching]	rP2	Ramp switching state
[Mot2 Therm Thd reached]	tS2	Motor 2 thermal threshold (TTD2) reached
[Mot3 Therm Thd reached]	tS3	Motor 3 thermal threshold (TTD3) reached
[Mot4 Therm Thd reached]	tS4	Motor 4 thermal threshold (TTD4) reached
[Neg Torque]	AtS	Actual torque sign
[Cnfg.0 act.]	CnF0	Configuration 0 active
[Cnfg.1 act.]	CnF1	Configuration 1 active
[Cnfg.2 act.]	CnF2	Configuration 2 active
[Configuration 3 Active]	CnF3	Configuration 3 active
[set 1 active]	CFP1	Parameter set 1 active
[set 2 active]	CFP2	Parameter set 2 active

Setting	Code / Value	Description
[set 3 active]	CFP3	Parameter set 3 active
[DC Bus Charged]	dbL	DC bus charged
[In braking]	brS	In braking sequence
[Power removal state]	PrM	Power removal state
[Pulse Warn Thd Reached]	F9LA	Pulse warning threshold reached
[I present]	MCP	Motor current present
[Limit Switch Reached]	LSA	Limit switch function activated
[Dynamic Load Warning]	dLdA	Dynamic load detection
[Warning Grp 1]	AG 1	Warning group 1
[Warning Grp 2]	AG2	Warning group 2
[Warning Grp 3]	AG3	Warning group 3
[Warning Grp 4]	AG4	Warning group 4
[Warning Grp 5]	AG5	Warning group 5
[External Error Warning]	EFA	External error warning
[Undervoltage Warning]	uSA	Undervoltage warning
[Preventive UnderV Active]	uPA	Undervoltage prevention warning
[Slipping warn]	AnA	Anti-veering warning
[Drive Thermal Warning]	tHA	Drive thermal state warning
[Load Mvt Warn]	bSA	Brake speed warning
[Brake Contact Warn]	bCA	Brake contact warning
[Lim T/I Reached]	SSA	Torque current limitation warning
[Trq ctrl Warning]	rtA	Torque control time-out warning
[IGBT Thermal Warning]	tJA	Thermal junction warning
[BR Temp Warning]	boA	Braking resistor temperature warning
[AI3 4-20 Loss Warning]	AP3	AI3 4-20 mA loss warning
[AI4 4-20 Loss Warning]	AP4	AI4 4-20 mA loss warning
[Ready]	rdY	Ready to start
[AI1 4-20 Loss Warning]	AP 1	AI1 4-20 mA loss warning
[AI1 Th Warning]	tP 1A	Thermal 1 alarm
[Fallback speed]	FrF	Reaction on event / fallback speed
[Speed Maintained]	rLS	Reaction on event / maintain speed
[Per Type of Stop]	Stt	Reaction on event / stop on STT without an error triggered after stop.
[AI3 Th Warning]	tP3A	Thermal 3 warning
[AI4 Th Warning]	tP4A	Thermal 4 warning
[AI5 Th Warning]	tP5A	Thermal 5 warning
[AI5 4-20 Loss Warning]	AP5	AI5 4-20 mA loss warning

[R1 Delay time] r 1d

R1 activation delay time.

The change in state takes effect once the configured time has elapsed when the information becomes true.

The delay cannot be set for the **[Operating State Fault]** FLt assignment; and remains at 0.

Setting	Description
0...60,000 ms	Setting range **Factory setting**: 0 ms

[R1 Active at] r 1S

R1 status (output active level).

Setting	Code / Value	Description
1	POS	State 1 when the information is true **Factory setting**
0	nEG	State 0 when the information is true

Configuration **[1]** POS cannot be modified for the **[Operating State "Fault"]** FLt assignment.

[R1 Holding time] r 1H

R1 holding delay time.

The change in state takes effect once the configured time has elapsed when the information becomes false.

The holding time cannot be set for the **[Operating State "Fault"]** FLt assignment, and remains at 0.

Setting	Description
0...9,999 ms	Setting range **Factory setting**: 0 ms

[R2 configuration] r 2 - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[Relay]** ➡ **[R2 configuration]**

About This Menu

Identical to **[R1 configuration]** r 1 - Menu *(see page 478)*.

[R2 Assignment] r 2

R2 assignment.

Identical to **[R1 Assignment]** r 1 *(see page 478)* in addition to:

Setting	Code / Value	Description
[No]	n o	Not assigned Factory setting
[Brake Sequence]	b L C	Brake sequence
[Mains Contactor]	L L C	Mains contactor control
[DC charging]	d C o	DC charging
[M/S Device Warn]	M S d A	M/S device warning[1]
1 This feature is not supported by the current firmware version		

[R2 Delay time] r 2 d

R2 activation delay time.

[R2 Active at] r 2 S

R2 status (output active level).

[R2 Holding time] r 2 H

R2 holding delay time.

[R3 configuration] r 3 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [Relay] ➡ [R3 configuration]

About This Menu

Identical to **[R1 configuration]** r 1 - Menu *(see page 478)*.

[R3 Assignment] r 3

R3 assignment.

Identical to **[R2 Assignment]** r 2 *(see page 481)*.

[R3 Delay time] r 3d

R3 activation delay time.

[R3 Active at] r 3S

R3 status (output active level).

[R3 Holding time] r 3H

R3 holding delay time.

[R4 configuration] r 4 - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[Relay]** ➡ **[R4 configuration]**

About This Menu

Identical to **[R1 configuration]** r 1 - Menu *(see page 478)*.

Following parameters can be accessed if VW3A3204 relay output option module has been inserted.

[R4 Assignment] r 4 ★

R4 assignment.

Identical to **[R2 Assignment]** r 2 *(see page 481)*.

[R4 Delay time] r 4 d ★

R4 activation delay time.

[R4 Active at] r 4 S ★

R4 status (output active level).

[R4 Holding time] r 4 H ★

R4 holding delay time.

[R5 configuration] r 5 - Menu

Access

[Complete settings] ➡ [Input/Output] ➡ [Relay] ➡ [R5 configuration]

About This Menu

Identical to **[R1 configuration]** r 1 - Menu *(see page 478)*.

Following parameters can be accessed if VW3A3204 relay output option module has been inserted.

[R5 Assignment] r 5 ★

R5 assignment.

Identical to **[R2 Assignment]** r 2 *(see page 481)*.

[R5 Delay time] r 5 d ★

R5 activation delay time.

[R5 Active at] r 5 S ★

R5 status (output active level).

[R5 Holding time] r 5 H ★

R5 holding delay time.

[R6 configuration] r 6 - Menu

Access

[Complete settings] ➡ **[Input/Output]** ➡ **[Relay]** ➡ **[R6 configuration]**

About This Menu

Identical to **[R1 configuration]** r 1 - Menu *(see page 478)*.

Following parameters can be accessed if VW3A3204 relay output option module has been inserted.

[R6 Assignment] r 6 ★

R6 assignment.

Identical to **[R2 Assignment]** r 2 *(see page 481)*.

[R6 Delay time] r 6 d ★

R6 activation delay time.

[R6 Active at] r 6 S ★

R6 status (output active level).

[R6 Holding time] r 6 H ★

R6 holding delay time.

[Relay] r E L A - Menu

Access

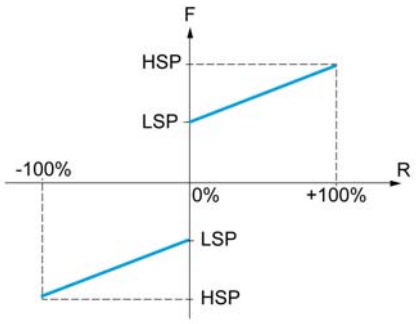
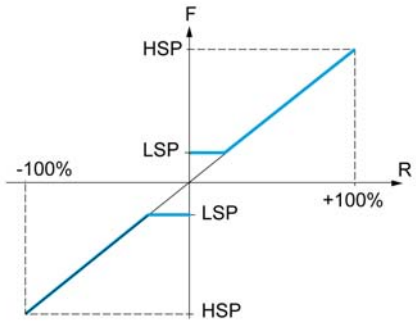
[Complete settings] ➡ [Input/Output] ➡ [Relay]

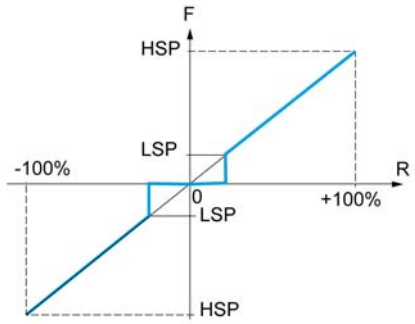
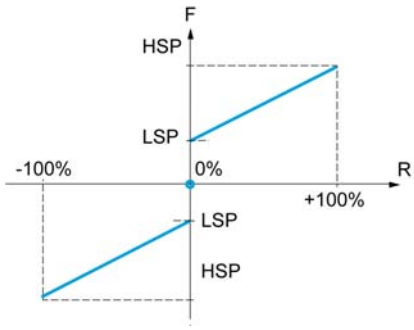
[Ref Freq Template] b S P

Reference frequency template selection.

This parameter defines how the speed reference is taken into account, for analog inputs and pulse input. In the case of the PID controller, this is the PID output reference.

The limits are set by the **[Low speed]** L S P and **[High speed]** H S P parameters

Setting ❮❯	Code / Value	Description
[Standard]	b S d	 **F** Frequency **R** Reference At zero reference the frequency = LSP **Factory setting**
[Pedestal]	b L S	 **F** Frequency **R** Reference At reference = 0 to LSP the frequency = LSP

Setting	Code / Value	Description
[Deadband]	bnS	 **F** Frequency **R** Reference At reference = 0 to LSP the frequency = 0
[Deadband 0]	bnS0	 **F** Frequency **R** Reference This operation is the same as **[Standard]** bSd, except that in the following cases at zero reference, the frequency = 0: The signal is less than **[Min nvalue]**, which is greater than 0 (example: 1 Vdc on a 2–10 Vdc input) The signal is greater than **[Min nvalue]**, which is greater than **[Max value]** (example: 11 Vdc on a 10–0 Vdc input). If the input range is configured as “bidirectional”, operation remains identical to **[Standard]** bSd.

Section 8.49
[Encoder configuration]

[Encoder configuration] iEn - Menu

Access

[Complete settings] → **[Encoder configuration]**

About This Menu

This menu can be accessed if an encoder module WV3A3420 has been inserted, and the available selections depend on the type of encoder module used.

Encoder Check Procedure

This procedure applies to all types of encoder.

Step	Action
1	Configure the parameters of the encoder used
2	Set **[Motor control type]** Ctt to a value other than **[FVC]** FVC even if it is the required configuration. For example, use **[SVC V]** VVC for an asynchronous motor and **[Sync. mot.]** SYn for a synchronous motor.
3	Configure the motor parameters in accordance with the specifications on the rating plate. ● Asynchronous motor: **[Nominal motor power]** nPr, **[Nom Motor Voltage]** unS, **[Nom Motor Current]** nCr, **[Nominal Motor Freq]** FrS, **[Nominal Motor Speed]** nSP. ● Synchronous motor: **[Sync Nominal I]** nCrS, **[Nom SyncMotor Speed]** nSPS, **[Pole pairs]** PPnS, **[Syn. EMF constant]** PHS, **[Autotune L d-axis]** LdS, **[Autotune L q-axis]** LqS, **[SyncMotor Stator R]** rSAS. **[Current Limitation]** CLI must not exceed the maximum motor current, otherwise demagnetization may occur.
4	Set **[Encoder usage]** EnU to **[No]** nO.
5	Perform auto-tuning
6	In the case of an incremental encoder, set **[AB Encoder type]** EnS and **[Number of pulses]** PGI according to the encoder used.
7	Set **[Number of pulses]**EnC to **[Yes]** YES
8	Set the motor rotating at stabilized speed around 15% of the rated speed for at least 3 seconds, and use the **[Display]** MOn menu to monitor its behavior
9	If it trips on an **[Encoder]** EnF, **[Encoder check]** EnC returns to **[No]** nO. ● Check the parameter settings (see steps 1 to 5 above). ● Check that the mechanical and electrical operation of the encoder, its power supply, and connections are all OK. ● Reverse the direction of rotation of the motor (**[Output Ph Rotation]** PHr parameter) or the encoder signals
10	Repeat the operations from step 6 onwards until **[Encoder check]** EnC changes to **[Done]** donE
11	If necessary, change**[Motor control type]** Ctt to **[FVC]** FVC or **[Sync.CL]** FSY. In the case of **[Sync.CL]** FSY, go on to perform the "Procedure for measuring the phase-shift angle between the motor and the encoder"

[Encoder Type] UECP

Encoder type.

The list of choice depends on the encoder module inserted.

Setting	Code / Value	Description
[Undefined]	und	Unknow / No encoder type selected **Factory setting**
[RS422]	Ab	AB encoder
[EnDat 2.2]	EndAt22	Endat 2.2 encoder

[Encoder supply volt.] uECV ★

Encoder supply voltage.

Rated voltage of encoder used.

This parameter can be accessed if **[Encoder Type]** uECP is not set to **[Undefined]** und.

Setting	Code / Value	Description
[Undefined]	und	Not defined **Factory setting**
[5 Vdc]	5V	5 Volts
[12 Vdc]	12V	12 Volts
[24 Vdc]	24V	24 Volts

[Number of pulses] PG ★

Number of pulses per encoder revolution.

The parameter can be accessed if an encoder module WV3A3420 has been inserted and if **[Encoder Type]** uECP is set to **[RS422]** Ab

Setting	Description
100...10,000	**Factory setting:** 1024

[Encoder check] EnC

Encoder check activation.

Setting	Code / Value	Description
[Not done]	no	Check not performed
[Yes]	YES	Activates monitoring of the encoder.
[Done]	donE	Check performed successfully. The check procedure checks: ● The direction of rotation of the encoder/motor ● The presence of signals (wiring continuity) ● The number of pulses/revolution. If an error is detected, the drive locks in **[Encoder]** EnF .
The encoder parameters can only be accessed if the encoder module WV3A3420 has been inserted, and the available selections depend on the type of encoder module used.		

[Encoder usage] Enu

Setting	Code / Value	Description
[No]	no	Function inactive
[Speed Monitoring]	SEC	The encoder provides speed feedback for monitoring only.
[Speed Regulation]	rEG	The encoder provides speed feedback for regulation and monitoring. This configuration is automatic if the drive is configured for closed-loop operation (**[Motor control type]** Ctt = **[FVC]** FVC. If **[Motor control type]** Ctt = **[SVC V]** VVC the encoder operates in speed feedback mode and enables static correction of the speed to be performed. This configuration is not accessible for other **[Motor control type]** Ctt values.
The encoder parameters can only be accessed if the encoder module WV3A3420 has been inserted, and the available selections depend on the type of encoder module used.		

[Encoder rotation inv.] EnrI

Inversion of encoder rotation direction.

Setting	Code / Value	Description
[No]	nO	Inversion of the encoder deactivated **Factory setting**
[Yes]	YES	Inversion of the encoder activated

[Encoder filter activ.] FFA ★

Encoder feedback filter activation

This parameter can be accessed if **[Encoder usage]** EnU is not set to **[No]** nO.

Setting	Code / Value	Description
[No]	nO	Filter deactivated **Factory setting**
[Yes]	YES	Filter activated

[Encoder filter value] FFr ★

Encoder feedback filter value

This parameter can be accessed if:
- **[Access Level]** LAC is set to **[Expert]** EPr, and
- **[Encoder filter activ.]** FFA is set to **[Yes]** YES.

Setting	Description
0.0...40.0 ms	Setting range **Factory setting**: according to encoder rating

[Stop on top Z] tOSt ★

Stop on next top Z detection.

This parameter can be used for homing. If the approach speed is set to high an **[DC Bus Overvoltage]** obF error will be triggered.

This parameter can be accessed if:
- A VW3A3420 Digital encoder module has been inserted, and
- **[Encoder type]** uECP is set to **[RS422]** Ab.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

Section 8.50
[Error/Warning handling]

What Is in This Section?

This section contains the following topics:

[Auto fault reset] AtR - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Auto fault reset]

[Auto Fault Reset] AtR

Automatic fault reset.

This function can be used to automatically perform individual or multiple Fault Resets. If the cause of the error that has triggered the transition to the operating state Fault disappears within while this function is active, the drive resumes normal operation. While the Fault Reset attempts are performed automatically, the output signal **[Operating state Fault]** is not available. If the attempts to perform the Fault Reset are not successful, the drive remains in the operating state Fault and the output signal **[Operating state Fault]** becomes active.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Verify that activating this function does not result in unsafe conditions.
- Verify that the fact that the output signal "Operating state Fault" is not available while this function is active does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The drive fault relay remains activated if this function is active. The speed reference and the operating direction must be maintained.

It is recommended to use 2-wire control (**[2/3-wire control]** tCC is set to **[2 wire]** 2C and **[2-wire type]** tCt is set to **[Level]** LEL , refer to **[2/3-wire control]** tCC .

If the restart has not taken place once the configurable time **[Fault Reset Time]** tAr has elapsed, the procedure is aborted and the drive remains locked until it is turned off and then on again.

The detected error codes, which permit this function, are listed in the Diagnostics part of the manual.

Setting	Code / Value	Description
[No]	no	Function inactive **Factory setting**
[Yes]	YES	Automatic restart, after locking in error state, if the detected error has disappeared and the other operating conditions permit the restart. The restart is performed by a series of automatic attempts separated by increasingly longer waiting periods: 1 s, 5 s, 10 s, then 1 minute for the following attempts.

[Fault Reset Time] tAr ★

Maximum time for automatic restart function.

This parameter appears if **[Auto Fault Reset]** AtR is set to **[Yes]** YES. It can be used to limit the number of consecutive restarts on a recurrent detected error.

Setting	Code / Value	Description
[5 minutes]	5	5 minutes **Factory setting**
[10 minutes]	10	10 minutes
[30 minutes]	30	30 minutes
[1 hour]	1h	1 hour
[2 hours]	2h	2 hours
[3 hours]	3h	3 hours
[Unlimited]	Ct	Continuous

[Fault reset] rSt - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Fault reset]

[Fault Reset Assign] rSF

Fault reset input assignment.

Detected errors are cleared manually when the assigned input or bit changes to 1 if the cause of the detected error has disappeared.

The **STOP/RESET** key on the Graphic Display Terminal performs the same function.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8 **Factory setting**: **[DI4]** LI4
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted

[Product Restart] rP ★

The Restart function performs a Fault Reset and then restarts the drive. During this Restart procedure, the drive goes through the same steps as if it had been switched off and on again. Depending on the wiring and the configuration of the drive, this may result in immediate and unanticipated operation.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

The Restart function performs a Fault Reset and restarts the drive.

- Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Product restart.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr mode.

This parameter can be used to reset all detected errors without having to disconnect the drive from the supply mains.

Setting	Code / Value	Description
[No]	nO	Function inactive **Factory setting**
[Yes]	YES	Reinitialization. Press and hold down the OK key for 2 s. The parameter changes back to **[No]** nO automatically as soon as the operation is complete. The drive can only be reinitialized when locked.

[Prod Restart Assign] rPA ★

Product restart assignment.

The Restart function performs a Fault Reset and then restarts the drive. During this Restart procedure, the drive goes through the same steps as if it had been switched off and on again. Depending on the wiring and the configuration of the drive, this may result in immediate and unanticipated operation. The Restart function can be assigned to a digital input

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

The Restart function performs a Fault Reset and restarts the drive.

- Verify that activating this function does not result in unsafe conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr mode.

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted

[Catch on the fly] FLr - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Catch on the fly]

[Catch On Fly] FLr

Catch on the fly.

Used to enable a smooth restart if the run command is maintained after the following events:
- Loss of line supply or disconnection.
- Clearance of current detected error or automatic restart.
- Freewheel stop.

The speed given by the drive resumes from the estimated or measured speed of the motor at the time of the restart, then follows the ramp to the reference speed.

This function requires 2-wire level control.

When the function is operational, it activates at each run command, resulting in a slight delay of the current (0.5 s max).

[Catch On Fly] FLr is forced to **[No]** nO if **[Auto DC Injection]** AdC is set to **[Continuous]** Ct.

Setting	Code / Value	Description
[No]	nO	Function inactive **Factory setting**
[Yes]	YES	Function active

[Catch on Fly Sensitivity] VCb ★

Catch on fly sensitivity.

This parameter can only be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Description
0.10...100.00 V	Setting range **Factory setting**: 0.20 V

[Catch On Fly Mode] CoFM

Velocity detection method for the Catch on Fly function.

[Catch On Fly Mode] CoFM is forced to **[Measured]** HWCoF for synchronous motors.

Setting	Code / Value	Description
[Measured]	HWCoF	Hardware catch on the fly The motor voltage signal should be greater than **[Catch on Fly Sensitivity]** VCb to be able to estimate the speed **Factory setting**
[Computed]	SWCoF	Software catch on the fly A signal is injected to estimate the speed and the position of the rotor. **[Comuted]** SWcoF method is effective for a motor velocity range included in -1.1*HSP to 1.1*HSP.

[Error detection disable] inH - Menu

Access

[Complete settings] ➜ [Error/Warning handling] ➜ [Error detection disable]

[ErrorDetect Disabled] inH ★

Disable error detection.

In rare cases, the monitoring functions of the drive may be unwanted because they impede the purpose of the application. A typical example is a smoke extractor fan operating as a part of a fire protection system. If a fire occurs, the smoke extractor fan should operate as long as possible, even if, for example, the permissible ambient temperature of the drive is exceeded. In such applications, damage to or destruction of the device may be acceptable as collateral damage, for example, to keep other damage from occurring whose hazard potential is assessed to be more severe.

A parameter is provided to disable certain monitoring functions in such applications so that automatic error detection and automatic error responses of the device are no longer active. You must implement alternative monitoring functions for disabled monitoring functions that allow operators and/or master control systems to adequately respond to conditions which correspond to detected errors. For example, if overtemperature monitoring of the drive is disabled, the drive of a smoke extractor fan may itself cause a fire if errors go undetected. An overtemperature condition can be, for example, signaled in a control room without the drive being stopped immediately and automatically by its internal monitoring functions.

⚠ DANGER

MONITORING FUNCTIONS DISABLED, NO ERROR DETECTION

- Only use this parameter after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Implement alternative monitoring functions for disabled monitoring functions that do not trigger automatic error responses of the drive, but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment.
- Commission and test the system with the monitoring functions enabled.
- During commissioning, verify that the drive and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions.

Failure to follow these instructions will result in death or serious injury.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

If the assigned input or bit state is:
- 0: error detection is enabled.
- 1: error detection is disabled.

Current errors are cleared on a rising edge (change from 0 to 1) of the assigned input or bit.

Detection of following errors can be disabled: AnF, bOF, CnF, COF, dLF, EnF, EPF1, EPF2, FCF2, ETHF, InFA, InFB, InFV, LFF1, LFF3, ObF, OHF, OLC, OLF, OPF1, OPF2, OSF, PHF, SLF1, SLF2, SLF3, SOF, SPF, SSF, TFd, TJF, TnF, ULF, USF.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** io configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** io configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** io configuration

Setting	Code / Value	Description
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

[Forced Run] InHS ★

Disable error detection on run order.

In rare cases, the monitoring functions of the drive may be unwanted because they impede the purpose of the application. A typical example is a smoke extractor fan operating as a part of a fire protection system. If a fire occurs, the smoke extractor fan should operate as long as possible, even if, for example, the permissible ambient temperature of the drive is exceeded. In such applications, damage to or destruction of the device may be acceptable as collateral damage, for example, to keep other damage from occurring whose hazard potential is assessed to be more severe.

A parameter is provided to disable certain monitoring functions in such applications so that automatic error detection and automatic error responses of the device are no longer active. You must implement alternative monitoring functions for disabled monitoring functions that allow operators and/or master control systems to adequately respond to conditions which correspond to detected errors. For example, if overtemperature monitoring of the drive is disabled, the drive of a smoke extractor fan may itself cause a fire if errors go undetected. An overtemperature condition can be, for example, signaled in a control room without the drive being stopped immediately and automatically by its internal monitoring functions.

⚠ DANGER

MONITORING FUNCTIONS DISABLED, NO ERROR DETECTION

- Only use this parameter after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Implement alternative monitoring functions for disabled monitoring functions that do not trigger automatic error responses of the drive, but allow for adequate, equivalent responses by other means in compliance with all applicable regulations and standards as well as the risk assessment.
- Commission and test the system with the monitoring functions enabled.
- During commissioning, verify that the drive and the system operate as intended by performing tests and simulations in a controlled environment under controlled conditions.

Failure to follow these instructions will result in death or serious injury.

Setting	Code / Value	Description
[Disabled]	nO	Function inactive **Factory setting**
[Forced Run FW]	Frd	Forced forward run.
[Forced Run RV]	rrS	Forced reverse run.

[Forced Run Ref] InHr ★

Forced Run Reference Frequency.

This parameter can be accessed if **[Forced Run]** InHS is not set to **[Disabled]** nO.

This parameter causes the reference to be forced to the configured value when the input or bit for error detection disabled is at 1, with priority over all other references. Value 0 = function inactive. The factory setting changes to 60 Hz if **[Motor Standard]** bFr = **[60 Hz NEMA]** 60.

Setting	Description
0...6553,5 Hz	**Factory setting:** 50 Hz

[External error] EtF - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [External error]

[Ext Error Assign] EtF

External error assignment.

If the assigned bit state is:
- 0: there is no external error.
- 1: there is an external error

Setting	Code / Value	Description
[Not Assigned]	nO	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	CD00...CD10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** IO configuration
[CD11]...**[CD15]**	CD11...CD15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** IO configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** IO configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** IO configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** IO configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration
[DI1 (Low level)]...**[DI8 (Low level)]**	LIL...LIL	Digital input DI1...DI8 used at low level
[DI11 (Low level)]...**[DI16 (Low level)]**	LI1L...LI6L	Digital input DI11...DI16 used at low level if VW3A3203 I/O extension module has been inserted

[Ext Error Resp] EPL

Drive response to external error.

Type of stop in the event of an external detected error.

Setting	Code / Value	Description
[Ignore]	nO	External detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**
[Per STT]	STT	Stop according to configuration of **[Type of stop]** STT *(see page 316)*, without tripping. In this case, the detected error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-wire control]** tCC and **[2-wire type]** tCt *(see page 224)*if control is via the terminals). Configuring a warning for this detected error is recommended (assigned to a digital output, for example) in order to indicate the cause of the stop.
[Fallback speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed(1)
[Speed maintained]	rLS	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed(1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FST	Fast stop
[DC Injection]	dCI	DC injection stop. This type of stop cannot be used with some other functions.
(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.		

[Fallback Speed] LFF ★

Fall back speed.

This parameter can be accessed if the error response parameter is set to **[Fallback Speed]** LFF.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting:** 0.0 Hz

[Output phase loss] oPL - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Output phase loss]

[OutPhaseLoss Assign] oPL

Output phase loss assignment.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

If output phase monitoring is disabled, phase loss and, by implication, accidental disconnection of cables, are not detected.

- Verify that the setting of this parameter does not result in unsafe conditions.

Failure to follow these instructions will result in death or serious injury.

NOTE: [OutPhaseLoss Assign] oPL is set to **[Function Inactive]** nO when **[Motor control type]** Ctt is set to **[SYN_U VC]** SYnU.

Setting	Code / Value	Description
[Function Inactive]	nO	Function inactive
[OPF Error Triggered]	YES	Tripping on **[OutPhaseLoss Assign]** oPL with freewheel stop **Factory setting**
[No Error Triggered]	oAC	No detected error triggered, but management of the output voltage in order to avoid an overcurrent when the link with the motor is re-established and catch on the fly performed (even if this function has not been configured).The drive switches to **[Output cut]** SoC state after **[OutPhL Time]** odt time. Catch on fly is possible as soon as the drive is in stand by output cut **[Output cut]** SoC state.

[OutPhaseLoss Delay] odt

Output (motor) phase loss detection time.

Time delay for taking the **[OutPhaseLoss Assign]** oPL detected error into account.

Setting ❮❯	Description
0.5...10 s	Setting range **Factory setting**: 0.5 s

[Input phase loss] iPL - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Input phase loss]

[InPhaseLoss Assign] iPL 

Loss of input phase error response.

If one supply mains phase is missing and if this leads to performance decrease, an **[Input phase loss]** PHF error is triggered.

If 2 or 3 supply mains phases are missing, the drive operate until an **[Supply Mains UnderV]** USF error is triggered.

Setting	Code / Value	Description
[Ignore]	nO	The input phase loss monitoring function is disabled to be used when the drive is supplied via a single-phase supply or by the DC bus
[Freewheel]	YES	The drive stops in freewheel in case of a supply mains phase loss has been detected

[4-20mA loss] LFL - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [4-20mA loss]

[AI1 4-20mA Loss] LFL1

Response to 4-20mA loss on AI1.

Drive behavior on AI1 4-20 event.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored. This is the only possible configuration if **[AI1 min. value]** CrL1 is not greater than 3 mA **Factory setting**
[Freewheel]	YES	Freewheel stop
[Per STT]	STT	Stop according to configuration of **[Type of stop]** STT, without tripping. In this case, the error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-wire control]** tCC and **[2-wire type]** tCt if control is via the terminals). Configuring a warning for this detected error is recommended (assigned to a digital output, for example) in order to indicate the cause of the stop
[fallback spd]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maint.]	rLS	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FST	Fast stop
[DC injection]	dCI	DC injection stop. This type of stop cannot be used with some other functions
(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.		

[AI3 4-20mA loss] LFL3

Response to 4-20mA loss on AI3.

Drive behavior on AI3 4-20 event.

Identical to **[AI1 4-20mA Loss]** LFL1

[AI4 4-20mA loss] LFL4 ★

Response to 4-20mA loss on AI4.

Drive behavior on AI4 4-20 event.

Identical to **[AI1 4-20mA Loss]** LFL1

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[AI5 4-20mA loss] LFL5 ★

Response to 4-20mA loss on AI5.

Drive behavior on AI5 4-20 event.

Identical to **[AI1 4-20mA Loss]** LFL1

This parameter can be accessed if VW3A3203 I/O extension module has been inserted.

[Fallback Speed] L F F ★

Fall back speed.

This parameter can be accessed if the error response parameter is set to **[Fallback Speed]** L F F.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting:** 0.0 Hz

[Fallback speed] L F F - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Fallback speed]

[Fallback Speed] L F F

Fall back speed.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting**: 0.0 Hz

[Fieldbus monitoring] CLL - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Fieldbus monitoring]

[Modbus Error Resp] SLL

Stop mode at Modbus SLF.

⚠ WARNING

LOSS OF CONTROL

If this parameter is set to no, Modbus communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Behavior of the drive in the event of a communication interruption with integrated Modbus.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel]	YES	Freewheel stop **Factory setting**
[Per STT]	Stt	Stop according to configuration of **[Type of stop]** Stt, without tripping. In this case, the error relay does not open and the drive is ready to restart as soon as the detected error disappears, according to the restart conditions of the active command channel (for example, according to **[2/3-wire control]** tCC and **[2-wire type]** tCt if control is via the terminals)(1)
[fallback spd]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed(1)
[Spd maint.]	rLS	The drive maintains the speed being applied when the detected error occurred, as long as the detected error is active and the run command has not been removed(1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
[DC injection]	dCI	DC injection stop. This type of stop cannot be used with some other functions
(1) Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or digital output to its indication.		

[Fallback Speed] LFF ★

Fall back speed.

This parameter can be accessed if the error response parameter is set to **[Fallback Speed]** LFF.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting:** 0.0 Hz

[Embedded Modbus TCP] E M b C - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Embedded Modbus TCP]

[Eth Error Response] E t H L

Ethernet error response.

⚠ WARNING

LOSS OF CONTROL

If this parameter is set to n o, Ethernet communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The error response to a communication interruption is effective if the communication channel is involved in the active command channel.

Setting	Code / Value	Description
[Ignore]	n o	Detected error ignored
[Freewheel Stop]	y E S	Freewheel stop **Factory setting**
[Per STT]	S t t	Stop according to **[Type of stop]** S t t parameter but without an error triggered after stop
[Fallback Speed]	L F F	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	r L S	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	r M P	Stop on ramp
[Fast stop]	F S t	Fast stop
[DC injection]	d C I	DC injection

1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

[Fallback Speed] L F F ★

Fall back speed.

This parameter can be accessed if the error response parameter is set to **[Fallback Speed]** L F F.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting:** 0.0 Hz

[Communication module] CoMo - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Communication module]

[Fieldbus Interrupt Resp] CLL

⚠ WARNING

LOSS OF CONTROL

If this parameter is set to no, fieldbus communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Response to fieldbus module communication interruption.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**
[Per STT]	STT	Stop according to **[Type of stop]** STT parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FST	Fast stop
[DC injection]	dCI	DC injection

1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

[CANopen Error Resp] CoL

⚠ WARNING

LOSS OF CONTROL

If this parameter is set to no, CANopen communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Response to CANopen error.

Behavior of the drive in the event of a communication interruption with CANopen®.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**
[Per STT]	Stt	Stop according to **[Type of stop]** Stt parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
[DC injection]	dCI	DC injection

1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

[Eth Error Response] ETHL

⚠ WARNING

LOSS OF CONTROL

If this parameter is set to no, Ethernet communication monitoring is disabled.

- Only use this setting after a thorough risk assessment in compliance with all regulations and standards that apply to the device and to the application.
- Only use this setting for tests during commissioning.
- Verify that communication monitoring has been re-enabled before completing the commissioning procedure and performing the final commissioning test.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Response to Ethernet error.

Setting	Code / Value	Description
[Ignore]	no	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**
[Per STT]	STT	Stop according to **[Type of stop]** STT parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FST	Fast stop
[DC injection]	dCI	DC injection

1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

[Fallback Speed] LFF ★

Fall back speed.

This parameter can be accessed if the error response parameter is set to **[Fallback Speed]** LFF.

Setting	Description
0.0...599.0 Hz	Setting range **Factory setting:** 0.0 Hz

[Undervoltage handling] uSb - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Undervoltage handling]

[Undervoltage Resp] uSb

Response to undervoltage.

Setting	Code / Value	Description
[Error Triggered]	0	The drive trips and the external detected error signal are triggered (the detected error relay assigned to **[Operating State Fault]** FLt will be opened) **Factory setting**
[Error Triggered w/o Relay]	1	The drive trips but the external detected error signal is not triggered (the detected error relay assigned to **[Operating State Fault]** FLt remains closed)
[Warning Triggered]	2	The warning and detected error relay remain closed. The warning can be assigned to a digital output or a relay

[Mains Voltage] urES

Rated voltage of the mains supply in Vac.

Settings	Code / Value	Description
[200 Vac]	200	200 Vac
[220 Vac]	220	220 Vac
[230 Vac]	230	230 Vac
[240 Vac]	240	240 Vac
[380 Vac]	380	380 Vac
[400 Vac]	400	400 Vac
[415 Vac]	415	415 Vac
[440 Vac]	440	440 Vac
[460 Vac]	460	460 Vac
[480 Vac]	480	480 Vac
[525 Vac]	525	525 Vac
[575 Vac]	575	575 Vac
[600 Vac]	600	600 Vac
[690 Vac]	690	690 Vac **Factory setting**

[Undervoltage Level] uSL

Undervoltage level.

The factory setting is determined by the drive voltage rating.

Setting	Description
100...345 V	Setting range,according to drive rating **Factory setting**: According to drive rating

[UnderVolt Timeout] uSt

Undervoltage timeout.

Setting	Description
0.2...999.9 s	Setting range **Factory setting**: 0.2 s

[CtrlStopPLoss] StP

Controlled stop on power loss.

Behavior in the event of the undervoltage prevention level being reached.

Setting	Code / Value	Description
[No]	nO	No action **Factory setting**
[DC Maintain]	dCS	This stop mode uses the inertia of the application to maintain the control block powered, and thus to keep operational I/O state and fieldbus link as long as possible.
[Ramp stop]	rMP	Stop following an adjustable deceleration ramp **[Max stop time]** StM in order to help to prevent from uncontrolled stop of the application.
[Freewheel Stop]	LnF	Lock (freewheel stop) without triggering an error

[UnderV. Restart Tm] tSM ★

Undervoltage restart time.

This parameter can be accessed if **[CtrlStopPLoss]** StP is set to **[Ramp stop]** rMP.

The time delay before authorizing the restart after a complete stop for **[CtrlStopPLoss]** StP is set to **[Ramp stop]** rMP if the voltage has returned to normal.

Setting ❮❯	Description
1.0...999.9 s	Setting range **Factory setting**: 1.0 s

[Prevention Level] uPL ★

Undervoltage prevention level.

This parameter can be accessed if **[CtrlStopPLoss]** StP is set to **[No]** nO.

The adjustment range and factory setting are determined by the drive voltage rating and the **[Mains Voltage]** urES value.

Setting	Description
141...414 V	Setting range **Factory setting**: According to drive rating

[Max Stop Time] StM ★

Maximum stop time.

This parameter can be accessed if **[CtrlStopPLoss]** StP is set to **[Ramp stop]** rMP.

This parameter defines the deceleration ramp time in case of mains loss. During this controlled stop, the drive is powered thanks to the inertia of the application, the motor is in generator mode. It is recommended to verify that the deceleration set is compatible with the application inertia.

Setting ❮❯	Description
0.01...60.00 s	Setting range **Factory setting**: 1.00 s

[DC Bus Maintain Time] tbS ★

DC bus maintain time.

This parameter can be accessed if **[CtrlStopPLoss]** StP is set to **[DC Maintain]** dCS.

Setting ❮❯	Description
1...9999 s	Setting range **Factory setting**: 9999 s

[Ground Fault] GrFL - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Ground Fault]

About This Menu

[Ground Fault Activation] GrFL

Ground fault error response.

Setting	Code / Value	Description
[ErrorDetect Disable]	inH	Disables error detection
[Yes]	YES	Use product internal value **Factory setting**
0.0...100.0%	_	Setting range, in % of the drive nominal current

[Motor thermal monit] ΕΗΕ - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Motor thermal monit]

[Motor Th Current] ιΕΗ

Motor thermal monitoring current to be set to the rated current indicated on the nameplate.

Setting	Description
0.2...1.1_In(1)	Setting range **Factory setting**: According to drive rating
(1) Corresponding to the rated drive current indicated in the installation manual and on the drive nameplate.	

[Motor Thermal Mode] ΕΗΕ

Motor thermal monitoring mode.

NOTE: An error is detected when the thermal state reaches 118% of the rated state and reactivation occurs when the state falls back below 100%.

Setting	Code / Value	Description
[No]	nO	No thermal monitoring
[Self cooled]	ACL	Self ventilated motor **Factory setting**
[Force-cool]	FCL	Fan-cooled motor

[Encoder monitoring] Sdd - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Encoder monitoring]

[Load slip detection] Sdd

Load slipping monitoring function.

Setting	Code / Value	Description
[No]	nO	No error triggered. The warning may be assigned to a digital output or a relay **Factory setting**
[Yes]	YES	Error triggered. **[Load slip detection]** Sdd is forced to **[Yes]** YES if **[Motor control type]** Ctt is set to **[FVC]** FVC. The **[Load slipping]** AnF error is triggered by compairing the ramp output and the speed feedback, and is effective for speeds greater than 10% of the **[Nominal Motor Freq]** Fr S. In the event of an error is triggered, the drive will stop in freewheel, and if the break logic control function has been configured, the break command will be set to 0.

[Encoder Coupling Monit] ECC ★

Encoder coupling monitoring.

This parameter can be accessed if **[Encoder usage]** EnU is not set to **[No]** nO.

Setting	Code / Value	Description
[No]	nO	Error not monitored **Factory setting**
[Yes]	YES	Error monitored. If the brake logic control function has been configured, the factory setting changes to **[Yes]** YES. **[Encoder Coupling Monit]** ECC set to **[Yes]** YES is only possible if: ● **[Load slip detection]** Sdd is set to **[Yes]** YES, and ● **[Motor control type]** Ctt is set to **[FVC]** FVC, and ● **[Brake assignment]** bLC is not set to **[No]** nO The error monitored is the break in the mechanical coupling of the encoder. In the event of an error, the drive will switch to a freewheel stop, and if the break logic control function has been configured, the break command will be set to 0.

[Encoder check time] ECt ★

Encoder check time.

This parameter can be accessed if:
- **[Encoder usage]** EnU is not set to **[No]** nO, and
- **[Encoder Coupling Monit]** ECC is not set to **[No]** nO.

Setting	Description
2.0...10.0 s	Setting range **Factory setting**: 2.0 s

[Braking Resistor monit] brP - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Braking Resistor monit]

About This Menu

This menu can be accessed if the drive embeds a breaking transistor (size 1 to size 5).

[Braking Resistor Monit] brO

Braking resistor monitoring.

Setting	Code / Value	Description
[Ignore]	nO	No braking resistor monitoring (thereby preventing access to the other function parameters). **Factory setting**
[Warning]	YES	The warning may be assigned to a logic output or a relay.
[Error]	FLt	Triggering a **[Braking Resistor ovld]** boF with locking of drive (freewheel stop).

[Braking Resistor Power] brP ★

Rated power of the resistor used.

This parameter can be accessed if **[Braking Resistor Monit]** brO is not set to **[No]** nO.

Setting	Description
0.1...1000.0 kW	Setting range **Factory setting**: 0.1 kW

[Braking Resistor Value] brV ★

Rated value of the braking resistor in ohms.

This parameter can be accessed if **[Braking Resistor Monit]** brO is not set to **[No]** nO.

Setting	Description
0.1...200.0 Ohm	Setting range **Factory setting**: 0.1 Ohm

[Braking Resist T Constant] brtC ★

Braking resistor time constant.

This parameter can be accessed if **[Braking Resistor Monit]** brO is not set to **[No]** nO.

Setting	Description
0...200 s	Setting range **Factory setting**: 45 s

[DBR thermal state] tHb

DBR thermal state.

Setting	Description
0...118%	Setting range **Factory setting**: _

[Torque or i lim. detect] tId - Menu

Access

[Complete settings] → **[Error/Warning handling]** → **[Torque or I limit detect]**

[Trq/I limit. stop] SSb

Torque current limitation: behaviour configuration.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored **Factory setting**
[Freewheel Stop]	YES	Freewheel stop
[Per STT]	StT	Stop according to **[Type of stop]** StT parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
[DC injection]	dCI	DC injection

1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.

[Trq/I limit. time out] Sto

Torque current limitation: **[Torque Limitation Error]** SSF error delay and **[Torque Limit Reached]** SSA warning delay.

Setting ⟲	Description
1...9,999 ms	Setting range **Factory setting**: 1,000 ms

[Drive overload monit] obr - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Drive overload monit]

[DriveTemp ErrorResp] oHL

Drive overtemperature error response.

Setting	Code / Value	Description
[Ignore]	nO	Detected error ignored
[Freewheel Stop]	YES	Freewheel stop **Factory setting**
[Per STT]	STt	Stop according to **[Type of stop]** Stt parameter but without an error triggered after stop
[Fallback Speed]	LFF	Change to fallback speed, maintained as long as the detected error persists and the run command has not been removed (1)
[Spd maintained]	rLS	Speed maintained as long as the detected error persists and the run command has not been removed (1)
[Ramp stop]	rMP	Stop on ramp
[Fast stop]	FSt	Fast stop
[DC injection]	dCI	DC injection
1 Because, in this case, the detected error does not trigger a stop, it is recommended to assign a relay or logic output to its indication.		

[Drv Thermal Warning] tHA

Drive thermal state warning.

Setting	Description
0...118%	Setting range **Factory setting**: 100%

[Drive Overload Monit] tLoL

Drive overload monitoring activation.

Setting	Code / Value	Description
[Disabled]	diS	Disabled **Factory setting**
[Error Triggered]	trIP	Error triggered
[Reduce to I Nom Drive]	LIM	Reduce to drive nominal current

[Warn grp 1 definition] A 1C - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Warning groups config] ➡ [Warn grp 1 definition]

About This Menu

The following submenus group the warnings into 1 to 5 groups, each of which can be assigned to a relay or a digital output for remote signaling.

When one or a number of warnings selected in a group occur, this warning group is activated.

List of Warnings

Setting	Code / Value	Description
[Fallback Frequency]	FrF	Fallback frequency
[Speed Maintained]	rLS	Speed maintained
[Type of stop]	StE	Type of stop
[Ref Frequency Warning]	SrA	Reference frequency warning
[Life Cycle Warn 1]	LCA1	Life cycle warning 1
[Life Cycle Warn 2]	LCA2	Life cycle warning 2
[Pump Cycle warning]	PCPA	Pumpcycle warning
[PID Error Warning]	PEE	PID error warning
[PID Feedback Warning]	PFA	PID feedback warning
[PID High Fdbck Warning]	PFAH	PID high warning
[PID Low Fdbck Warning]	PFAL	PID low warning
[Regulation Warning]	P.SH	Regulation warning
[Limit Switch Reached]	LSA	Limit switch reached
[Slack Rope Warning]	rSdA	Slack rope warning
[Dynamic Load Warning]	dLdA	Dynamic load warning
[AI3 Th Warning]	tP3A	AI3 thermal sensor warning
[AI4 Th Warning]	tP4A	AI4 thermal sensor warning
[AI5 Th Warning]	tP5A	AI5 thermal sensor warning
[AI1 4-20 Loss Warning]	AP1	AI1 4-20 loss warning
[AI3 4-20 Loss Warning]	AP3	AI3 4-20 loss warning
[AI4 4-20 Loss Warning]	AP4	AI4 4-20 loss warning
[AI5 4-20 Loss Warning]	AP5	AI5 4-20 loss warning
[Drive Thermal Warning]	tHA	Drive thermal state warning
[IGBT Thermal Warning]	tJA	IGBT thermal warning
[Fan Counter Warning]	FCtA	Fan counter warning
[Fan Feedback Warning]	FFdA	Fan feedback warning
[BR Thermal Warning]	boA	Braking resistor thermal warning
[Ext. Error Warning]	EFA	External error warning
[Undervoltage Warning]	uSA	Undervoltage warning
[Preventive UnderV Active]	uPA	Preventive undervoltage active
[Forced Run]	Frn	Drive in forced run
[Mot Freq High Thd]	FtA	Motor frequency high threshold reached
[Mot Freq Low Thd]	FtAL	Motor frequency low threshold reached
[Mot Freq High Thd 2]	F2LA	Motor frequency high threshold 2 reached
[Mot Freq Low Thd 2]	F2AL	Motor frequency low threshold 2 reached
[High speed reached]	FLA	High speed reached
[Ref Freq High Thd reached]	rtAH	Reference frequency high threshold reached
[Ref Freq Low Thd reached]	rtAL	Reference frequency low threshold reached

Setting	Code / Value	Description
[2nd Frequency Thd Reached]	F2A	Second frequency threshold reached
[Current Thd Reached]	CtA	Current threshold reached
[Low Current Reached]	CtAL	Low Current Reached
[High Torque Warning]	ttHA	High torque warning
[Low Torque Warning]	ttLA	Low torque warning
[Process Undld Warning]	uLA	Process underload warning
[Process Overload Warning]	oLA	Process overload warning
[Torque Limit Reached]	SSA	Torque limit reached
[Torque Control Warning]	rtA	Torque control warning
[Drv Therm Thd reached]	tAd	Drive thermal threshold reached
[Motor Therm Thd Reached]	tSA	Motor thermal threshold reached
[Mot2 Therm Thd Reached]	tS2	Motor 2 thermal threshold reached
[Mot3 Therm Thd Reached]	tS3	Motor 3 thermal threshold reached
[Mot4 Therm Thd Reached]	tS4	Motor 4 thermal threshold reached
[Power High Threshold]	PtHA	Power High Threshold
[Power Low Threshold]	PtHL	Power Low Threshold
[Cust Warning 1]	CAS1	Customer Warning 1
[Cust Warning 2]	CAS2	Customer Warning 2
[Cust Warning 3]	CAS3	Customer Warning 3
[Cust Warning 4]	CAS4	Customer Warning 4
[Cust Warning 5]	CASS	Customer Warning 5
[Power Cons Warning]	PoWd	Power consumption warning
[Auto Backup Not Plugged]	drAP	Automatic backup display terminal not plugged
[Auto Backup Warning]	drtF	Automatic backup transfer warning
[Slipping warn]	AnA	Slipping warning
[Load Mvt Warn]	bSA	Load movement warning
[Brake Cont Warn]	bCA	Brake contact warning
[AI1 Th Warning]	tP1A	AI1 thermal sensor warning
[M/S Device Warn]	MSdA	Master / Slave device warning
[Encoder Thermal Warn]	tPEA	Encoder module thermal warning

[Warn grp 2 definition] A2C - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Warning groups config] ➡ [Warn grp 2 definition]

About This Menu

Identical to **[Warn grp 1 definition]** A1C *(see page 519)*

[Warn grp 3 definition] A 3 C - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Warning groups config] ➡ [Warn grp 3 definition]

About This Menu

Identical to **[Warn grp 1 definition]** A 1 C *(see page 519)*

[Warn grp 4 definition] A4C - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Warning groups config] ➡ [Warn grp 4 definition]

About This Menu

Identical to **[Warn grp 1 definition]** A1C *(see page 519)*

[Warn grp 5 definition] A5C - Menu

Access

[Complete settings] ➡ [Error/Warning handling] ➡ [Warning groups config] ➡ [Warn grp 5 definition]

About This Menu

Identical to **[Warn grp 1 definition]** A1C *(see page 519)*

Section 8.51
[Maintenance]

What Is in This Section?

This section contains the following topics:

[Diagnostics] dAU - Menu

Access

[Complete settings] ➡ [Maintenance] ➡ [Diagnostics]

About This Menu

This menu allows you to make simple test sequences for diagnostics.

[FAN Diagnostics] Fnt

Diagnostics of internal fan(s).

This starts a test sequence.

[LED Diagnostics] HLt

Diagnostics of product LED(s).

This starts a test sequence.

[IGBT Diag w motor] tWt

Diagnostics of internal fan(s).

This starts a test sequence with the motor (open circuit/short-circuit).

[IGBT Diag w/o motor] tWot

Diagnostics of product IGBT(s).

This starts a test sequence without the motor (short-circuit).

[Drive warranty mgnt] dWnA - Menu

Access

[Complete settings] ➡ [Maintenance] ➡ [Drive warranty mgnt]

About This Menu

The product life cycle date is initialized during product manufacturing.

A **[Life Cycle Warn 1]** LCA1 is triggered 2 months before the end of the warranty period. At the end of the warranty period a **[Life Cycle Warn 2]** LCA2 is triggered. This function requires date and time data coming from Graphic Display Terminal or a time server configured trough Ethernet.

[LifeCycle Warning] LCAC

Life cycle warning configuration.

Setting	Code / Value	Description
[No]	no	No
[YES]	YES	Yes **Factory setting**

[Warranty Expired] LCAd

Life cycle date.

End of warranty date (YYYY/MM/DD).

Setting	Description
YYYY/MM/DD	Setting range **Factory setting**: _

[Customer event 1] CE1 - Menu

Access

[Complete settings] → [Maintenance] → [Customer events] → [Customer event 1]

About This Menu

This menu allows you to define customized customer events based on the time.

[Config Warning 1] CCA1

Configuration of customer warning 1.

Setting	Code / Value	Description
[Not Configured]	no	Not configured **Factory setting**
[Counter]	CPt	Counter
[Date And Time]	dt	Date and time

[Counter Limit 1] CCL1

Configuration counter limit 1.

Setting	Description
0...4294967295 s	Setting range **Factory setting**: 0 s

[Counter Source 1] CCS1

Configuration counter source 1.

Setting	Code / Value	Description
[Mains/Control ON]	0	Mains or control supply on
[Mains Supply ON]	1	Mains supply on
[Drv In Run State]	2	Drive in running state **Factory setting**

[Current Counter 1] CC1

Current counter 1.

Setting	Description
0...4294967295 s	Setting range **Factory setting**: 0 s

[Date Time Warn 1] Cdt1 ★

Date time warning 1.

This parameter can be accessed with the Graphic Display Terminal only.

Setting ❮❯	Description
hh:mm DD/MM/YYYY	Setting range **Factory setting**: 00:00 01/01/2000

[Customer event 2] CE2- Menu

Access

[Complete settings] ➡ **[Maintenance]** ➡ **[Customer events]** ➡ **[Customer event 2]**

About This Menu

Identical to **[Customer event 1]** CE1- menu *(see page 528)*.

[Config Warning 2] CCA2

Configuration of customer warning 2.

[Counter Limit 2] CCL2

Configuration counter limit 2.

[Counter Source 2] CCS2

Configuration counter source 2.

[Current Counter 2] CC2

Current counter 2.

[Date Time Warn 2] CdT2 ★

Date time warning 2.

This parameter can be accessed with the Graphic Display Terminal only.

[Customer event 3] CE3- Menu

Access

[Complete settings] ➡ **[Maintenance]** ➡ **[Customer events]** ➡ **[Customer event 3]**

About This Menu

Identical to **[Customer event 1]** CE1- menu *(see page 528)*.

[Config Warning 3] CCA3

Configuration of customer warning 3.

[Counter Limit 3] CCL3

Configuration counter limit 3.

[Counter Source 3] CCS3

Configuration counter source 3.

[Current Counter 3] CC3

Current counter 3.

[Date Time Warn 3] CdE3 ★

Date time warning 3.

This parameter can be accessed with the Graphic Display TerminalGraphic display terminal only.

[Customer event 4] CE4- Menu

Access

[Complete settings] ➡ **[Maintenance]** ➡ **[Customer events]** ➡ **[Customer event 4]**

About This Menu

Identical to **[Customer event 1]** CE1- menu *(see page 528)*.

[Config Warning 4] CCA4

Configuration of customer warning 4.

[Counter Limit 4] CCL4

Configuration counter limit 4.

[Counter Source 4] CCS4

Configuration counter source 4.

[Current Counter 4] CC4

Current counter 4.

[Date Time Warn 4] CdE4★

Date time warning 4.

This parameter can be accessed with the Graphic Display TerminalGraphic display terminal only.

[Customer event 5] CE5 - Menu

Access

[Complete settings] ➡ **[Maintenance]** ➡ **[Customer events]** ➡ **[Customer event 5]**

About This Menu

Identical to **[Customer event 1]** CE1- menu *(see page 528)*.

[Config Warning 5] CCA5

Configuration of customer warning 5.

[Counter Limit 5] CCL5

Configuration counter limit 5.

[Counter Source 5] CCS5

Configuration counter source 5.

[Current Counter 5] CC5

Current counter 5.

[Date Time Warn 5] CdT5 ★

Date time warning 5.

This parameter can be accessed with the Graphic Display Terminal only.

[Customer events] CUEV - Menu

Access

[Complete settings] ➡ [Maintenance] ➡ [Customer events]

[Warning Clearing] CAr

Customer warning clearing.

Setting ❮❯	Code / Value	Description
[No Warning Clearing]	no	No warning clearing **Factory setting**
[Clear Event 1 Warning]	rA 1	Clear event 1 warning
[Clear Event 2 Warning]	rA2	Clear event 2 warning
[Clear Event 3 Warning]	rA3	Clear event 3 warning
[Clear Event 4 Warning]	rA4	Clear event 4 warning
[Clear Event 5 Warning]	rA5	Clear event 5 warning

[Fan management] FAMA - Menu

Access

[Complete settings] ➡ **[Maintenance]** ➡ **[Fan management]**

About This Menu

⚠ CAUTION
RISK OF EQUIPEMENT DAMAGE If **[Fan Mode]** FFM is set to **[Never]** StP, the fan of the drive is disabled. Life time of electronic component is reduced. The ambient temperature must be limited to 40°C (104°F). **Failure to follow these instructions can result in injury or equipment damage.**

Fan speed and **[Fan Operation Time]** FPbt are monitored values.

An abnormal low speed or the fan trigger a warning **[Fan Feedback Warning]** FFdA. As soon as **[Fan Operation Time]** FPbt reach the predefined value of 45,000 hours, a warning **[Fan Counter Warning]** FCtA is triggered.

[Fan Operation Time] FPbt counter can be set to 0 by using the **[Counter Reset]** rPr parameter.

[Fan Mode] FFM

Fan activation mode.

Setting ❮❯	Code / Value	Description
[Standard]	Std	The fan is activated during the all run time of the motor. According to the drive rating, this could be the only available setting **Factory setting**
[Always]	run	The fan is always activated
[Never]	StP	The fan is stopped
[Economy]	Eco	The fan is activated only if necessary, according to the internal thermal state of the drive

[Maintenance] CSMA - Menu

Access

[Complete settings] ➡ [Maintenance]

[Time Counter Reset] rPr

Time counter reset.

NOTE: The list of possible values depends on the product size.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[Run Time Reset]	rtH	Run time reset
[Power ON Time Reset]	PtH	Power ON time reset
[Reset Fan Counter]	FtH	Reset fan counter
[Clear NSM]	nSM	Clear number of motor starts

Chapter 9
[Communication] COM -

Introduction

 **[Communication]** COM - menu presents the fieldbus submenus.

What Is in This Chapter?

This chapter contains the following topics:

[Modbus Fieldbus] Md I - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [Modbus SL] ➡ [Modbus Fieldbus]

About This Menu

This menu is related to the Modbus serial communication port on the bottom of the control block.

Refer to the Modbus serial manual.

[Modbus Address] Add

Drive Modbus address.

Setting	Description
[OFF] oFF ...247	Setting range **Factory setting**: **[OFF]** oFF

[Modbus add Com.C.] AMoC

Modbus adress of COM option board

Setting	Description
[OFF] oFF ...247	Setting range **Factory setting**: **[OFF]** oFF

[Bd.RateModbus] tbr

Baud rate Modbus.

Setting	Code / Value	Description
[4800 bps]	4K8	4,800 Bauds
[9600 bps]	9K6	9,600 Bauds
[19200 bps]	19K2	19,200 Bauds **Factory setting**
[38.4 Kbps]	38K4	38,400 Bauds

[Term Word Order] tWo ★

Terminal Modbus: word order.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Code / Value	Description
[OFF]	oFF	Low word first
[ON]	on	High word first **Factory setting**

[Modbus Format] tFo

Modbus communication format.

Setting	Code / Value	Description
[8-O-1]	8o1	8 bits odd parity 1 stop bit
[8-E-1]	8E1	8 bits even parity 1 stop bit **Factory setting**
[8-N-1]	8n1	8 bits no parity 1 stop bit
[8-N-2]	8n2	8 bits no parity 2 stop bits

[Modbus Timeout] tto

Modbus timeout.

Setting	Description
0.1 ...30.0 s	Setting range **Factory setting**: 10.s

[Mdb Com Stat] Com I

Modbus communication status.

Setting	Code / Value	Description
[r0t0]	r0t0	Modbus no reception, no transmission
[r0t1]	r0t1	Modbus no reception, transmission
[r1t0]	r1t0	Modbus reception, no transmission
[r1t1]	r1t1	Modbus reception and transmission

[Com. scanner input] iCS - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [Modbus SL] ➡ [Modbus Fieldbus] ➡ [Com. scanner input]

[Scan. IN1 address] nMA1

Address of the first input word.

Setting	Description
0...65535	Setting range **Factory setting**: 3201 (EtA)

[Scan. IN2 address] nMA2

Address of the second input word.

Setting	Description
0...65535	Setting range **Factory setting**: 8604 (rFrd)

[Scan. IN3 address] nMA3

Address of the third input word.

Setting	Description
0...65535	Setting range **Factory setting**: 0

[Scan. IN4 address] nMA4

Address of the fourth input word.

Identical to **[Scan. IN3 address]** nMA3.

[Scan. IN5 address] nMA5

Address of the fifth input word.

Identical to **[Scan. IN3 address]** nMA3.

[Scan. IN6 address] nMA6

Address of the sixth input word.

Identical to **[Scan. IN3 address]** nMA3.

[Scan. IN7 address] nMA7

Address of the seventh input word.

Identical to **[Scan. IN3 address]** nMA3.

[Scan. IN8 address] nMA8

Address of the eighth input word.

Identical to **[Scan. IN3 address]** nMA3.

[Com. scanner output] oCS - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [Modbus SL] ➡ [Modbus Fieldbus] ➡ [Com. scanner output]

[Scan.Out1 address] nCA1

Address of the first output word.

Setting	Description
0...65535	Setting range **Factory setting**: 8501(CMd)

[Scan.Out2 address] nCA2

Address of the second output word.

Setting	Description
0...65535	Setting range **Factory setting**: 8602(LFrd)

[Scan.Out3 address] nCA3

Address of the third output word.

Setting	Description
0...65535	Setting range **Factory setting**: 0

[Scan.Out4 address] nCA4

Address of the fourth output word.

Identical to **[Scan.Out3 address]** nCA3.

[Scan.Out5 address] nCA5

Address of the fifth output word.

Identical to **[Scan.Out3 address]** nCA3.

[Scan.Out6 address] nCA6

Address of the sixth output word.

Identical to **[Scan.Out3 address]** nCA3.

[Scan.Out7 address] nCA7

Address of the seventh output word.

Identical to **[Scan.Out3 address]** nCA3.

[Scan.Out8 address] nCA8

Address of the eighth output word.

Identical to **[Scan.Out3 address]** nCA3.

[Modbus HMI] Md2 - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [Modbus SL] ➡ [Modbus HMI]

About This Menu

This menu is related to the Modbus serial communication port on the front of the control block. It is used by default for the Graphic Display Terminal. The Graphic Display Terminal is compliant with baud rate equal to or lower than 19,200 bps.

[HMI Baud Rate] tbr2

Baud rate Modbus.

Setting	Code / Value	Description
[4800 bps]	4K8	4,800 Bauds
[9600 bps]	9K6	9,600 Bauds
[19200 bps]	19K2	19,200 Bauds **Factory setting**
[38.4 Kbps]	38K4	38,400 Bauds

[Term 2 word order] tWo2 ★

Terminal Modbus 2: Word order.

This parameter can be accessed if **[Access Level]** LAC is set to **[Expert]** EPr.

Setting	Code / Value	Description
[LOW]	oFF	Low word first
[HIGH]	on	High word first **Factory setting**

[HMI Format] tFo2

HMI format.

Setting	Code / Value	Description
[8-O-1]	8o1	8.o.1.
[8-E-1]	8E1	8.E.1. **Factory setting**
[8-N-1]	8n1	8.n.1.
[8-N-2]	8n2	8.n.2.

[Mdb com start] Com2

Modbus communication status.

Setting	Code / Value	Description
[r0t0]	r0t0	Modbus no reception, no transmission
[r0t1]	r0t1	Modbus no reception, transmission
[r1t0]	r1t0	Modbus reception, no transmission
[r1t1]	r1t1	Modbus reception and transmission

[Embd Eth Config] EtE - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [Embd Eth Config]

About This Menu

Refer to the Ethernet embedded manual.

[Device Name] PAn

The FDR (Fast Device Replacement) service is based on identification of the device by a “Device Name”. In the case of the Altivar drive, this is represented by the **[Device Name]** PAn parameter. Check that all the network devices have different “Device Names”.

[IP Mode Ether. Embd] IMOD

IP mode Ethernet embedded.

Setting	Code / Value	Description
[Fixed]	MAnu	Fixed address
[BOOTP]	bootP	BOOTP
[DHCP]	dHCP	DHCP **Factory setting**

[IP address] IC0

IP Address (IC01, IC02, IC03, IC04).

Setting	Description
0...255	Setting range **Factory setting**: 0.0.0.0

[Mask] IM0

Subnet mask (IM01, IM02, IM03, IM04).

Setting	Description
0...255	Setting range **Factory setting**: 0.0.0.0

[Gateway] IG0

Gateway address (IG01, IG02, IG03, IG04).

Setting	Description
0...255	Setting range **Factory setting**: 0.0.0.0

[CANopen] CAn - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [CANopen]

About This Menu

Refer to the CANopen fieldbus module manual.

[DeviceNet] dnC - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [DeviceNet]

About This Menu

Refer to the DeviceNet fieldbus module manual.

[Profibus] PbC - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [Profibus]

About This Menu

Refer to the Profibus DP fieldbus module manual.

[Profinet] PnC - Menu

Access

[Communication] ➡ [Comm parameters] ➡ [Profinet]

About This Menu

Refer to the PROFINET fieldbus module manual.

[EtherCAT Module] E E C - Menu

Access

[Communication] ➡ [EtherCAT Module]

About This Menu

Following parameters can be accessed if EtherCAT module has been inserted.

Refer to the EtherCAT manual.

[EthCat slave status] E C S S ★

EtherCAT slave status

Setting	Code / Value	Description
[Inlt]	i n i t	Init
[PrOP]	P r o P	Pre-operational
[bOOt]	b o o t	Pre-operational
[SFOP]	S F o P	Safe operational
[OP]	o P	Operational

[EthCat 2nd addr] E C S A ★

EtherCAT second address

Setting	Description
0...65,535	Setting range **Factory setting**: 0

[EthCat addr] E C A A ★

EtherCAT second address actual value

Setting	Description
0...65,535	Setting range **Factory setting**: 0

Chapter 10
[File management] FILE -

Introduction

[File management] FILE - menu presents the management of drive configuration files.

What Is in This Chapter?

This chapter contains the following topics:

[Transfer config file] tCF - Menu

Access

[File management] ➡ [Transfer config file]

[Copy to the drive] oPF

This allows to select a previously saved drive configuration from the Graphic Display Terminal memory and transfer it to the drive.

The drive needs to be restarted after a configuration file transfer.

[Copy from the drive] SAF

This allows to save the actual drive configuration into the Graphic Display Terminal memory.

[Factory settings] FCS - Menu

Access

[File management] ➡ [Factory settings]

About This Menu

This parameter allows to select the configuration to restore in case of factory setting operation.

[Config. Source] FCS ★

Setting	Code / Value	Description
[Macro-Conf]	ini	Factory setting parameter set **Factory setting**
[Config 1]	CFG1	Customer parameter set 1
[Config 2]	CFG2	Customer parameter set 2
[Config 3]	CFG3	Customer parameter set 3

[Parameter group list] FrY - Menu

Access

[File management] ➡ **[Factory settings]** ➡ **[Parameter group list]**

About This Menu

Selection of menus to be loaded.

NOTE: In factory configuration and after a return to "factory settings", **[Parameter group list]** FrY will be empty.

[All] ALL

All parameters in all menus.

[Drive Configuration] drM

Load **[Complete settings]** CSt - menu.

[Motor Param] Mot

Load **[Motor parameters]** MPA - menu.

[Comm. Menu] CoM ★

Load **[Communication]** CoM - menu.

This parameter can be accessed if **[Config. Source]** FCS 1 is set to **[Macro-Conf]** 1n 1.

[Display Config.] d1S ★

Load **[Display screen type]** MSC - menu.

This parameter can be accessed if **[Config. Source]** FCS 1 is set to **[Macro-Conf]** 1n 1.

[Factory settings] FCS - Menu

Access

[File management] ➡ [Factory settings]

[Go to Factory settings] GFS

⚠ WARNING
UNANTICIPATED EQUIPMENT OPERATION Verify that restoring the factory settings is compatible with the type of wiring used. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

It is only possible to revert to the factory settings if at least one group of parameters has previously been selected.

[Save Configuration] SCS ★

Save configuration.

The active configuration to be saved does not appear for selection. For example, if it is **[Config 0]** Str0, only **[Save Config 1]** Str1, **[Config 2]** Str2 and **[Save Config 3]** Str3, **[Config 3]**appear. The parameter changes back to**[No]** no as soon as the operation is complete.

Setting	Code / Value	Description
[No]	no	No **Factory setting**
[Config 0]	Str0	Store customer parameter set 0
[Save Config 1]	Str1	Store customer parameter set 1
[Config 2]	Str2	Store customer parameter set 2
[Config 3]	Str3	Store customer parameter set 3

[Pre-settings] FWud - Menu

Access

[File management] → [Firmware update] → [Firmware update diag]

About This Menu

This menu can be accessed in expert mode.

[Firmware Update Status] FWSt

Setting	Code / Value	Description
[Inactive]	CHECK	Firmware update inactive
[PwrUpd in progress]	PoWEr	Power update in progress
[PwrUpd Pending]	PEnd	Power update pending
[Ready]	rdY	Firmware update ready
[Inactive]	no	Firmware update inactive
[Succeeded]	SuCCd	Firmware update succeeded
[Update Error]	FAILEd	Update error
[In Progress]	PrOG	Firmware update in progress
[Requested]	r9Std	Firmware update requested
[Transfer In Progress]	trLd	Transfer in progress
[Transfer Done]	troK	Transfer done
[Package cleared]	CLEAr	Package cleared
[Warning]	SuCWr	Firmware update succeeded with warnings
[Drive State Error]	FLStA	Drive state error
[Package Error]	FLPKG	Package error
[Saving conf]	SAVE	Firmware update is saving the current configuration
[Post Script]	PoSt	Firmware update is doing the post FWUPD

[Firmware Update Error] FWEr

Setting	Code / Value	Description
[No Error]	no	No error
[Lock Error]	LoCK	Lock error
[Package Error]	PdS	Package error
[Package compatibility error]	CoMP	Package compatibility error
[Ask error]	ASK	Ask error
[Reset Drive Error]	rESEt	Reset drive error
[Conf Saving Warning]	SAVE	Configuration saving warning
[Conf Loading Warning]	LoAd	Configuration loading warning
[Post Script Warning]	SCP	Post script warning
[Package Description Error]	dES	Package description error
[Package not found]	PKG	Package not found
[Power Supply error]	SPWr	Power supply issue
[Boot M3 error]	btM3	Boot M3 error
[Boot C28 error]	btC28	Boot C28 error
[M3 Error]	M3	M3 error
[C28 error]	C28	C28 error
[CPLD error]	CPLd	CPLD error
[Boot Power Error]	PWr	Boot power error
[Emb. Eth Boot Error]	EMbt	Embedded ethernet boot error
[Emb. Eth Error]	EM iL	Embedded ethernet error
[Emb. Eth Web Error]	EMWb	Embedded ethernet WebServer error
[Module Eth Boot Error]	oPtbt	Module ethernet boot error
[Module Eth Error]	oPt iL	Module ethernet error
[Module Eth Web Error]	oPtWb	Module ethernet WebServer error
[Password enabled]	PSWd	Password enabled
[Flash Error]	MEM	Flash error
[Package error]	iFo	Package information error

[Identification] o id - Menu

Access

[File management] ➡ [Firmware update] ➡ [Identification]

About This Menu

This is a read-only menu that cannot be configured. It enables the following information to be displayed:

- Drive reference, power rating, and voltage
- Drive software version
- Drive serial number
- Type of option modules present, with their software version
- Graphic Display Terminal type and version

[Package version] PFV - Menu

Access

[File management] ➡ [Firmware update] ➡ [Package version]

About This Menu

This menu can be accessed in expert mode.

[Package Type] PKtP

Firmware Update Package Type

Setting	Code / Value	Description
[Product]	Prd	Firware update product package
[Module]	oPt	Firware update option package
[Spare part]	SPr	Firware update spare parts package
[Customized]	Cus	Firware update customized package
[Indus]	ind	Firware update industrialization package

[Package Version] PKVS

Firmware Update Package Version

Setting	Description
0...65,535	Setting range **Factory setting**: _

[Firmware update] FWuP - Menu

Access

[File management] → [Firmware update]

About This Menu

This menu can be accessed in expert mode.

[Update Firmware] FWAP

Firmware Update Application.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[Yes]	YES	Yes

[Abort Firmware Update] FWCL

Firmware Update Clear.

Setting	Code / Value	Description
[No]	nO	No **Factory setting**
[Yes]	YES	Yes

Chapter 11
[My preferences] MYP -

Introduction

[My preferences] MYP - menu presents the possible settings for the user-defined HMI and parameter access.

What Is in This Chapter?

This chapter contains the following sections:

Section 11.1
[Language]

[Language] LnG - Menu

Access

[My preferences] ➡ [Language]

About This Menu

This menu allows to select the Graphic Display Terminal language.

Section 11.2
[Password]

[Password] CodE - Menu

Access

[My preferences] ➡ **[Password]**

About This Menu

Enables the configuration to be protected with an access code or a password to be entered in order to access a protected configuration:

- The drive is unlocked when the password is set to **[No password defined]** nO or when the correct password has been entered. All menus can be accessed.
- Before protecting the configuration with a password, you must:
  - Define the **[Upload rights]** uLr and **[Download rights]** dLr.
  - Make a careful note of the password and keep it in a place where you are able to find it.

[Password status] PSSt

Password status.

Setting	Code / Value	Description
[No password defined]	nO	No password defined **Factory setting**
[Password is unlocked]	uL	Password is unlocked
[Password is locked]	LoC	Password is locked

[Password] PWd

6-digits password. The password must be entered in order to unlock the drive. Once the correct code has been entered, the drive is unlocked until the next time the supply mains is disconnected.

[Upload rights] uLr

Upload rights.

Setting	Code / Value	Description
[Permitted]	uLr0	Commissioning tools or the Graphic Display Terminal can save the whole configuration (password, monitoring, configuration) **Factory setting**
[Not allowed]	uLr1	Commissioning tools or the Graphic Display Terminal cannot save the configuration

[Download rights] dLr

Download rights.

Setting	Code / Value	Description
[Locked drv]	dLr0	Lock drive: the configuration can be downloaded only in a locked drive which configuration has the same password
[Unlock. drv]	dLr1	Unlock drive: the configuration can be downloaded only in a drive without active password **Factory setting**
[Not allowed]	dLr2	The configuration can never be downloaded
[Lock/unlock]	dLr3	Download is permitted according to case 0 or case 1

Section 11.3
[Parameter access]

What Is in This Section?

This section contains the following topics:

[Restricted channels] PCd - Menu

Access

[My preferences] ➡ [Parameter access] ➡ [Restricted access] ➡ [Restricted channels]

About This Menu

Following channels can be selected to disable the accessibility to the related parameters.

[HMI] Con

Graphic Display Terminal.

[PC Tool] PWS

DTM-based commissioning software.

[Modbus] Mdb

Embedded Modbus serial.

[CANopen] CAn

CANopen fieldbus module.

[Com. Module] nEt

Fieldbus option module.

[Restricted param] PPA - Menu

Access

[My preferences] ➡ [Parameter access] ➡ [Restricted access] ➡ [Restricted param]

About This Menu

In these screens, all parameters in the **[Complete settings]** CSt - menu can be protected and are displayed for selection, except for the Expert parameters.

Press the **All** key to select all the parameters. Press the **All** key again to deselect all the parameters.

Content of the **[Complete settings]** CSt - menu. No selections can be made in this screen if there are no parameters.

[Visibility] VI,S- Menu

Access

[My preferences] ➡ [Parameter access] ➡ [Visibility]

About This Menu

Selection to display all parameters or only the active parameters.

[Parameters] PVI,S

Parameters.

Setting	Code / Value	Description
[Active]	ACt	Only active parameters can be accessed **Factory setting**
[All]	ALL	All parameters can be accessed

Section 11.4
[Customization]

What Is in This Section?

This section contains the following topics:

[My menu config.] MYC - Menu

Access

[My preferences] ➡ **[Customization]** ➡ **[My menu config.]**

About This Menu

This menu allows to customize the **[My Menu]** MYMn - menu *(see page 53)*.

[Parameter Selection] uPP

Content of the **[Complete settings]** CSt - menu.

No selection can be made in this screen if there are no parameters.

[Selected List] uPL

This menu allows to sort the selected parameters.

[My Menu] MYMn

Used to define the name of the customized menu.

[Display screen type] Π S C - Menu

Access

[My preferences] ➡ [Customization] ➡ [Display screen type]

About This Menu

This parameter allows to select the type of display for the default screen.

[Display value type] Π d t

Type of screen display.

Setting	Code / Value	Description
[Digital]	d E C	Digital values **Factory setting**
[Bar graph]	b A r	Bar graph
[List]	L i S t	List of values
[Vu Meter]	V u Π E t	Vu meter

[Parameter Selection] Π P C

Customized selection.

This view allows to select the parameters to display on the default screen.

[Param. Bar Select] PbS - Menu

Access

[My preferences] ➡ [Customization] ➡ [Param. Bar Select]

About This Menu

This view allows to select the parameters to display on the top line of the Graphic Display Terminal screen.

[Customer parameters] CYP - Menu

Access

[My preferences] ➡ [Customization] ➡ [Customer parameters]

About This Menu

This menu allows to rename up to 15 parameters.

[Parameter Selection] SCP

Parameter selection.

This view allows to select up to 15 parameters.

[Custom Selection] CPN

Customized selection.

This view allows to set for each selected parameter:

- The name
- The unit if relevant (a custom unit is available)
- A multiplier (1...1000) if relevant
- A divisor (1...1000) if relevant
- An offset (-99.00...99.00) if relevant

[Service message] SEr - Menu

Access

[My preferences] ➡ **[Customization]** ➡ **[Service message]**

About This Menu

This menu allows to define a user-defined service message (5 lines, 23 digits per line).

This message can be displayed in **[theDiagnostics]** diAG, **[Diag. data]** ddt - menu and **[Service message]** SEr - submenus.

[LINE 1] SnL01

Line 1.

[LINE 2] SnL02

Line 2.

[LINE 3] SnL03

Line 3.

[LINE 4] SnL04

Line 4.

[LINE 5] SnL05

Line 5.

Section 11.5
[Date & Time settings]

[Date/time settings] rtC - Menu

Access

[My preferences] ➡ [Date/time settings]

About This Menu

This view allows to set date and time. This information is used for the time stamping of all logged data.

If a time server is connected over Ethernet and configured in the webserver, date and time data are updated automatically according to the configuration.

Date and time information shall be available (time server available and configured, or Graphic Display Terminal plugged) at drive power up to enable the time stamping of the logged data.

Modifying these settings will modify previously logged data value in case of average data based on time.

Section 11.6
[Access level]

[Access level] LAC - Menu

Access

[My preferences] ➡ **[Access level]**

About This Menu

[Access Level] LAC

Level of access control.

Setting	Code / Value	Description
[Basic]	bAS	Access to the **[Simply start]** SYS -, **[Dashboard]** dSH -, **[Diagnostics]** d iA - and **[My preferences]** MYP - menus only.
[Standard]	Std	Access to all menus. **Factory setting**
[Expert]	EPr	Access to all menus and to additional parameters.

Section 11.7
[Webserver]

[Webserver] W b S - Menu

Access

[My preferences] ➡ [Webserver]

About This Menu

This menu allows to manage Web services.

[EnableWebserver] E W E E

Enable Web services for the embedded Ethernet adapter.

Setting	Code / Value	Description
[No]	n o	Webserver disabled
[Yes]	Y E S	Webserver enabled **Factory setting**

[Reset EmbWeb] r W P E

Reset the embedded Ethernet webserver to its default configuration.

Setting ❮❯	Code / Value	Description
[No]	n o	No **Factory setting**
[Yes]	Y E S	Yes

[Webserver default password] W d P

8-digits password. A unique password is provided and must be entered at the first connection of the webserver in order to have access to the administrator accout (username = `ADMIN`).

Section 11.8
[Functions key mgnt]

[Functions key mgnt] FKG - Menu

Access

[My preferences] ➡ **[Functions key mgnt]**

About This Menu

This menu allows to assign functions to the Graphic Display Terminal function keys.

[F1 key assignment] Fn1

Function key 1. Following possible assignments cannot be accessed in **[I/O profile]** IO configuration.

Setting	Code / Value	Description
[Not assigned]	nO	Not assigned **Factory setting**
[Jog]	FJOG	Function key jog affectation
[Preset Speed 1]	FPS1	Function key preset speed 1 assignment
[Preset Speed 2]	FPS2	Function key preset speed 2 assignment
[PID Ref Frequency 1]	FPr1	Function key preset PID 1 assignment
[PID Ref Frequency 2]	FPr2	Function key preset PID 2 assignment
[+Speed]	FUSP	Function key faster assignment
[-Speed]	FdSP	Function key slower assignment

[F2 key assignment] Fn2

Function key 2.

Identical to **[F1 key assignment]** Fn1.

[F3 key assignment] Fn3

Function key 3.

Identical to **[F1 key assignment]** Fn1.

[F4 key assignment] Fn4

Function key 4.

Identical to **[F1 key assignment]** Fn1.

Section 11.9
[LCD settings]

[LCD settings] LCL - Menu

Access

[My preferences] ➡ [LCD settings]

About This Menu

This menu allows to set the Graphic Display Terminal related parameters.

[Screen Contrast] LCE

Screen contrast setting.

Setting	Description
0...100%	Setting range **Factory setting**: 50%

[Standby] SBY

Stand-by delay.

NOTE: Disabling the automatic standby function of the display terminal backlight will reduce the backlight service time.

Setting	Description
no...10 min	Automatic backlight OFF time **Factory setting**: 10 min

[Display Terminal locked] KLCK

Graphic Display Terminal key locked. Press **ESC** and **Home** keys to Lock manually & unlock the Graphic Display Terminal keys. The **Stop** key remains active when the Graphic Display Terminal is locked.

Setting	Description
no...10 min	Setting range **Factory setting**: 5 min

[Red Backlight] BCKL ★

Graphic Display Terminal red backlight function disabeled in case or an error triggered.

Setting	Code / Value	Description
[No]	no	Red backlight disabled
[Yes]	YES	Red backlight enabled **Factory setting**

Section 11.10
[Stop and go]

[Stop and go] StG - Menu

Access

[My preferences] ➡ **[Stop and go]**

About This Menu

This function is available for drives from frame size 4 to 7. When the function is active, the DC bus voltage is no longer maintained at operational level in order to save energy. When the drive is in energy saving state, the next run command shall be delayed up to 1 second during the DC bus charge.

[Energy Saving Delay] idLn

Wait time before going to **[Energy Saved]** ESAV mode after motor is stopped.

The value **[No]** no deactivate the function.

Setting	Description
[No] no...32,400 s	Setting range **Factory setting**: no

[Energy Saving Assign] idLS

Energy saving mode digital input assignment.

At active state rising edge, the drive switches to energy saving state if the motor is stopped without a run command active. A falling edge switch the drive to normal operation.

Setting	Code / Value	Description
[Not Assigned]	no	Not assigned **Factory setting**
[DI1]...**[DI8]**	LI1...LI8	Digital input DI1...DI8
[DI11]...**[DI16]**	LI11...LI16	Digital input DI11...DI16 if VW3A3203 I/O extension module has been inserted
[CD00]...**[CD10]**	Cd00...Cd10	Virtual digital input CMD.0...CMD.10 in **[I/O profile]** io configuration
[CD11]...**[CD15]**	Cd11...Cd15	Virtual digital input CMD.11...CMD.15 regardless of configuration
[C101]...**[C110]**	C101...C110	Virtual digital input CMD1.01...CMD1.10 with integrated Modbus Serial in **[I/O profile]** io configuration
[C111]...**[C115]**	C111...C115	Virtual digital input CMD1.11...CMD1.15 with integrated Modbus Serial regardless of configuration
[C201]...**[C210]**	C201...C210	Virtual digital input CMD2.01...CMD2.10 with CANopen® fieldbus module in **[I/O profile]** io configuration
[C211]...**[C215]**	C211...C215	Virtual digital input CMD2.11...CMD2.15 with CANopen® fieldbus module regardless of configuration
[C301]...**[C310]**	C301...C310	Virtual digital input CMD3.01...CMD3.10 with a fieldbus module in **[I/O profile]** io configuration
[C311]...**[C315]**	C311...C315	Virtual digital input CMD3.11...CMD3.15 with a fieldbus module regardless of configuration
[C501]...**[C510]**	C501...C510	Virtual digital input CMD5.01...CMD5.10 with integrated Ethernet in **[I/O profile]** io configuration
[C511]...**[C515]**	C511...C515	Virtual digital input CMD5.11...CMD5.15 with integrated Ethernet regardless of configuration

Section 11.11
[QR code]

[QR code] qrC - Menu

Access

[My preferences] ➡ [QR code]

About This Menu

This menu gives access to a QR Codes on the Graphic Display Terminal.

[QR Code] qCC

Scan of this QR code brings to a landing page on Internet with the information on:
- Technical product datasheet,
- Link for Schneider Electric App available for services.

Section 11.12
[QR code] - [My link 1]

[My link 1] ΠYL 1 - Menu

Access

[My preferences] ➡ [QR code] ➡ [My link 1]

About This Menu

This menu gives access to a QR Code customized with the commissioning software.

[MyLink 1] YL 1

Section 11.13
[QR code] - [My link 2]

[My link 2] MYL2 - Menu

Access

[My preferences] ➡ [QR code] ➡ [My link 2]

About This Menu

This menu gives access to a QR Code customized with the commissioning software.

[MyLink 2] ML2

Section 11.14
[QR code] - [My link 3]

[My link 3] Π Ч L Э - Menu

Access

[My preferences] ➡ [QR code] ➡ [My link 3]

About This Menu

This menu gives access to a QR Code customized with the commissioning software.

[MyLink 3] Ч L Э

Section 11.15
[QR code] - [My link 4]

[My link 4] MYL 4 - Menu

Access

[My preferences] ➡ [QR code] ➡ [My link 4]

About This Menu

This menu gives access to a QR Code customized with the commissioning software.

[MyLink 4] QL 4

Section 11.16
[Pairing password]

[Pairing password] PP I

Access

[My preferences] ➡ [Pairing password]

About This Menu

This function can only be accessed in Expert mode.This function is used to detect whenever an option module has been replaced or the software has been modified in any way. When a pairing password is entered, the parameters of the option modules currently inserted are stored. On every subsequent power-up, these parameters are verified and, in the event of a discrepancy, the drive locks in **[Boards Compatibility]** HCF. Before the drive can be restarted, it is necessary to revert to the original situation or reenter the pairing password.

The following parameters are verified:
- The type of option modules.
- The software version of the drive and the option modules.
- The serial number for the control block boards.

[Pairing password] PP I

Operation as a pair password.

Setting	Description
[OFF] oFF ...9,999	Setting range **Factory setting**: oFF

The **[OFF]** oFF value signifies that the pairing password function is inactive.

The **[ON]** on value signifies that the pairing password function is active and that a password is required to start the drive in the event of a **[Boards Compatibility]** HCF detected error.

As soon as the password has been entered, the drive is unlocked and the code changes to **[ON]** on.

Part III
Maintenance and diagnostics

What Is in This Part?

This part contains the following chapters:

Chapter 12
Maintenance

Maintenance

Limitation of Warranty

The warranty does not apply if the product has been opened, except by Schneider Electric services.

Servicing

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand the instructions in **Safety Information** chapter before performing any procedure in this chapter.

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF DAMAGE TO THE DRIVE

Perform the following activities.

Failure to follow these instructions can result in equipment damage.

Environment	Part concerned	Action	Periodicity
Mechanical impact on the product	Housing - control block (led - display)	Verify the drive visual aspect	At least each year
Corrosion	Terminals - connector - screws - EMC plate	Inspect and clean if required	
Dust	Terminals - fans blowholes		
Temperature	Around the product	Verify and correct if required	
Cooling	Fan	Verify the fan operation	
		Replace the fan	After 3 to 5 years, depending on the operating conditions
Vibration	Terminal connections	Verify tightening at recommended torque	At least each year

Spares and Repairs

Serviceable product. Please contact your Schneider Electric representative.

Long Time Storage

If the drive was not connected to mains for an extended period of time, the capacitors must be restored to their full performance before the motor is started.

NOTICE

REDUCED CAPACITOR PERFORMANCE
● Apply mains voltage to the drive for one hour before starting the motor if the drive has not been connected to mains for the following periods of time:
  ● 12 months at a maximum storage temperature of +50°C (+122°F)
  ● 24 months at a maximum storage temperature of +45°C (+113°F)
  ● 36 months at a maximum storage temperature of +40°C (+104°F)
● Verify that no Run command can be applied before the period of one hour has elapsed.
● Verify the date of manufacture if the drive is commissioned for the first time and run the specified procedure if the date of manufacture is more than 12 months in the past.
Failure to follow these instructions can result in equipment damage.

If the specified procedure cannot be performed without a Run command because of internal mains contactor control, perform this procedure with the power stage enabled, but the motor being at standstill so that there is no appreciable mains current in the capacitors.

Fan Replacement

It is possible to order a new fan for the drive maintenance, see the catalog numbers on *www.schneider-electric.com*.

Chapter 13
Diagnostics and Troubleshooting

Overview

This chapter describes the various types of diagnostics and provides troubleshooting assistance.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand the instructions in **Safety Information** chapter before performing any procedure in this chapter.

Failure to follow these instructions will result in death or serious injury.

What Is in This Chapter?

This chapter contains the following sections:

Section 13.1
Warning Codes

Warning Codes

List of Available Warnings

Setting	Code / Value	Description
[AI1 4-20 Loss Warning]	AP 1	4-20 loss warning on analog input AI1
[AI3 4-20 Loss Warning]	AP3	4-20 loss warning on analog input AI3
[AI4 4-20 Loss Warning]	AP4	4-20 loss warning on analog input AI4
[AI5 4-20 Loss Warning]	AP5	4-20 loss warning on analog input AI5
[Cust Warning 1]	CAS 1	Customer warning 1
[Cust Warning 2]	CAS2	Customer warning 2
[Cust Warning 3]	CAS3	Customer warning 3
[Cust Warning 4]	CAS4	Customer warning 4
[Cust Warning 5]	CAS5	Customer warning 5
[Current Thd Reached]	CtA	Motor current high threshold reached
[Low Current Reached]	CtAL	Motor current low threshold reached
[Ext. Error Warning]	EFA	External error warning
[2nd Frequency Thd Reached]	F2A	Second frequency threshold reached
[Motor Freq Low Thd 2]	F2AL	Motor frequency low threshold 2 reached
[Fan Counter Warning]	FCtA	Fan counter warning
[Fan Feedback Warning]	FFdA	Fan feedback warning
[High Speed Reached]	FLA	High speed reached
[Fallback Frequency]	FrF	Fallback frequency reaction
[Motor Freq High Thd]	FtA	Motor frequency high threshold reached
[Motor Freq Low Thd]	FtAL	Motor frequency low threshold reached
[Life Cycle Warn 1]	LCA 1	Life cycle warning 1
[Life Cycle Warn 2]	LCA2	Life cycle warning 2
[No Warning stored]	noA	No warning stored
[Process Overload Warning]	oLA	Process overload warning
[PumpCycle warning]	PCPA	Pumpcycle warning
[PID Error Warning]	PEE	PID error warning
[PID Feedback Warning]	PFA	PID feedback warning
[PID High Fdbck Warning]	PFAH	PID feedback high threshold warning
[PID Low Fdbck Warning]	PFAL	PID feedback low threshold warning
[Regulation Warning]	P 1SH	PID feedback regulation warning
[Power Cons Warning]	PoWd	Power consumption warning
[Power High Threshold]	PtHA	Power high threshold reached
[Power Low Threshold]	PtHL	Power low threshold reached
[Speed Maintained]	rLS	Speed maintained function is active
[Ref Freq High Thd reached]	rtAH	Reference frequency high threshold reached
[Ref Freq Low Thd reached]	rtAL	Reference frequency low threshold reached
[Ref Frequency Warning]	SrA	Reference frequency reached
[Type of stop]	Stt	Detected error without stop according to **[Type of stop]** Stt
[Drv Therm Thd Reached]	tAd	Drive thermal threshold reached
[Drive Thermal Warning]	tHA	Drive thermal state warning

Setting	Code / Value	Description
[IGBT Thermal Warning]	tJA	IGBT thermal state warning
[AI3 Th Warning]	tP3A	Thermal sensor warning on analog input AI3
[AI4 Th Warning]	tP4A	Thermal sensor warning on analog input AI4
[AI5 Th Warning]	tP5A	Thermal sensor warning on analog input AI5
[Motor Therm Thd Reached]	t5A	Motor thermal threshold reached
[Process Undld Warning]	uLA	Process underload warning
[Preventive UnderV Active]	uPA	Preventive undervoltage active
[Undervoltage Warning]	u5A	Undervoltage warning

Section 13.2
Error Codes

What Is in This Section?

This section contains the following topics:

Overview

Clearing the Detected Error

This table presents the steps to follow if intervention on the drive system is required:

Step	Action
1	Disconnect all power, including external control power that may be present.
2	Lock that all power disconnects in the open position.
3	Wait 15 minutes to allow the DC bus capacitors to discharge (the drive LEDs are not indicators of the absence of DC bus voltage).
4	Measure the voltage of the DC bus between the PA/+ and PC/- terminals to ensure that the voltage is less than 42 Vdc.
5	If the DC bus capacitors do not discharge completely, contact your local Schneider Electric representative. Do not repair or operate the drive.
6	Find and correct the cause of the detected error.
7	Restore power to the drive to confirm that the detected error has been rectified.

After the cause has been removed, the detected error can be cleared by:

- Switching off the drive.
- Using the **[Product Restart]** rP parameter.
- Using the **[Auto Fault Reset]** Atr - function.
- A digital input or control bit set to the **[Fault reset]** rSt - function.
- Pressing the **STOP/RESET** key on the Graphic Display Terminal if the active command channel is set to **[Ref. Freq-Rmt.Term]** LCC.

[AFE Modulation Rate Error] ACF 1

Probable Cause

Low mains voltage for long time.

Remedy

- Verify mains voltage.
- Verify parameter setting for mains voltage.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AFE Current Control Error] ACF2

Probable Cause

Mains voltage interruption.

Remedy

- Verify mains voltage.
- Reduce number of voltage drop-downs.

Clearing the Error Code

This detected error requires a power reset.

[Load slipping] AnF

Probable Cause

The difference between the output frequency and the speed feedback is not correct.

Remedy

- Confirm the drive rating according to the application (motor, load, and so on.)
- Verify the motor, gain, and stability parameters.
- Add a braking resistor.
- Verify the mechanical coupling and wiring of the encoder.
- If the torque control function is used and if the encoder is assigned to speed feedback,
  - Set **[Load slip detection]** Sdd = **[No]** no.
  - Set both **[Positive deadband]** dbP and **[Negative deadband]** dbn to a value less than 10% of the nominal motor frequency.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Angle error] AnF

Probable Cause

For the motor control type **[Sync. mot.]** SYnC, wrong setting of the speed loop when the reference goes through 0.

Remedy

- Verify the speed loop parameters.
- Verify the motor phases and the maximum current allowed by the drive.

Clearing the Error Code

This detected error can be cleared manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Brake Control] bLF

Probable Cause

- Brake release current not reached.
- Brake engages frequency threshold **[Brake engage freq]** bEn only regulated when brake logic control is assigned.

Remedy

- Verify the drive/motor connection.
- Verify the motor windings.
- Verify the **[Brk Release Current]** Ibr and **[Brake release I Rev]** Ird settings.
- Apply the recommended settings for **[Brake engage freq]** bEn.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Brake Resistor ovid] bOF

Probable Cause

The braking resistor is overloaded

Remedy

- Wait for the braking resistor to cool down.
- Check the nominal power of the braking resistor.
- Check the **[Braking Resistor Power]** brP and **[Braking Resistor Value]** brV parameters.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Brake Feedback] bRF

Probable Cause

- The status of the brake feedback contact is not correct compared to the brake logic control.
- The brake does not stop the motor quickly enough (detected by measuring the speed on the "Pulse input" input).

Remedy

- Verify the brake feedback circuit.
- Verify the brake logic control circuit.
- Verify the brake behavior.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[DB unit sh. circuit] bUF

Probable Cause

- Short-circuit from braking unit.
- Braking unit not connected (not applicable for drive system braking unit option).

Remedy

- Verify the wiring of the braking unit.
- Verify that the braking unit value is not too low.

Clearing the Error Code

This detected error requires a power reset.

[DB unit op. circuit] bUFo

Probable Cause

- Open-circuit from braking unit.
- Low current from braking unit.
- Braking unit not connected.

Remedy

- Verify the wiring of the braking unit.
- Verify that the braking unit value is not too high.

Clearing the Error Code

This detected error requires a power reset.

[Circuit Breaker Error] CbF

Probable Cause

The DC bus voltage level is not correct compared to the circuit breaker logic control (start or stop pulse) after the configured timeout **[Mains V. time out]** LCE.

Remedy

- Verify the circuit breaker logic control (pulse time for start and stop).
- Verify the mechanical state of the circuit breaker.

Clearing the Error Code

This detected error requires a power reset.

[CabinetCircuit A Error] CFA

Probable Cause

The monitoring function has detected an error. The digital input assigned to **[CabinetCircuit A Assign]** CFAA is active for duration longer than **[CabinetCircuit A Delay]** FdA.

Remedy

- Identify the cause of detection..
- Check the connected device (door switch, thermal switch,…) and its wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[CabinetCircuit B Error] CFb

Probable Cause

The monitoring function has detected an error. The digital input assigned to **[CabinetCircuit B Assign]** CFAb is active for duration longer than **[CabinetCircuit B Delay]** Fdb.

Remedy

- Identify the cause of detection..
- Check the connected device (door switch, thermal switch,…) and its wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[CabinetCircuit C Error] CFC

Probable Cause

The monitoring function has detected an error. The digital input assigned to **[CabinetCircuit C Assign]** CFAC is active for duration longer than **[CabinetCircuit C Delay]** FdC.

Remedy

- Identify the cause of detection..
- Check the connected device (door switch, thermal switch,…) and its wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Incorrect Configuration] CFF

Probable Cause

- Option module changed or removed.
- Control block replaced by a control block configured on a drive with a different rating.
- The current configuration is inconsistent.

Remedy

- Verify that there is no detected error on the option module.
- In the event of the control block being changed deliberately, see the remarks below.
- Return to factory settings or retrieve the backup configuration if it is valid.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Invalid Configuration] CF 1

Probable Cause

Invalid configuration. The configuration loaded in the drive via the commissioning tool or fieldbus is inconsistent.

Remedy

- Verify the previously loaded configuration.
- Load a compatible configuration.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Conf Transfer Error] CF 12

Probable Cause

- The configuration has not been transferred properly.
- The configuration loaded is not compatible with the drive.

Remedy

- Check the configuration loaded previously.
- Load a compatible configuration.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Pre-settings Transfer Error] CF13

Probable Cause

The preset configuration has not been transferred properly.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Empty Configuration] CF 14

Probable Cause

The selected configuration for the **[Multimotors config]** MMC - function has not been created previously.

Remedy

- Verify the configurations saved.
- Switch to a compatible configuration.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Cabinet Overheat Error] CHF

Probable Cause

The cabinet thermal switch is at active state, the fan cabinet has been switched on but there is no fan feedback.

Remedy

Verify fan cabinet and its wiring.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Fieldbus Com Interrupt] CnF

Probable Cause

Communication interruption on fieldbus module.

Remedy

- Verify the environment (electromagnetic compatibility).
- Verify the wiring.
- Verify the timeout.
- Replace the option module.
- Contact your local Schneider Electric representative

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[CANopen Com Interrupt] CoF

Probable Cause

Communication interruption on the CANopen® fieldbus

Remedy

- Verify the communication fieldbus.
- Verify the timeout.
- Refer to the CANopen® user manual.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Precharge Capacitor] CrF

Probable Cause

Charging circuit control detected error or charging resistor damaged.

Remedy

- Turn off the drive and then turn on again.
- Verify the internal connections.
- Contact your local Schneider Electric representative

Clearing the Error Code

This detected error requires a power reset.

[AFE contactor fdbk error] CrF3

Probable Cause

- The mains contactor feedback is inactive during DC Bus charging phase.
- The mains contactor feedback becomes inactive without mains phase loss detection while the drive is in operation (Ready or Run state).

Remedy

- Check the feedback circuit.
- Check the mechanical state of the mains contactor.

Clearing the Error Code

This detected error requires a power reset.

[Channel Switch Error] C S F

Probable Cause

Switch to a not valid channel.

Remedy

Verify the function parameters.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[MultiDrive Link Error] d2dF

Probable Cause

- The communication has been interrupted while running.
- The function has detected an inconsistency in the system configuration.

Remedy

- Check the communication network.
- Check the configuration of the multi-drive link function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrE or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Dynamic Load Error] dLF

Probable Cause

Abnormal load variation.

Remedy

Check for a mechanical cause of load instability.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrY or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Encoder Coupling] ECF

Probable Cause

The mechanical coupling of the encoder is broken.

Remedy

Verify the mechanical coupling of the encoder.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[EEPROM Control] *E E F I*

Probable Cause

An error of the internal memory of the control block has been detected.

Remedy

- Verify the environment (electromagnetic compatibility).
- Switch off the product.
- Return to factory settings.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[EEPROM Power] E E F 2

Probable Cause

An error of the internal memory of the power board has been detected.

Remedy

- Verify the environment (electromagnetic compatibility).
- Switch off the product.
- Return to factory settings.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Encoder] E n F

Probable Cause

Encoder feedback error.

Remedy

- Verify the configuration parameters for the encoder used.
- Verify the mechanical and electrical operation of the encoder.
- Check the consistency between the encoder signals and the direction of rotation of the motor.
- If necessary, reverse the direction of rotation of the motor (**[Output Ph rotation]** P H r parameter)

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** A t r or manually with the **[Fault Reset Assign]** r S F parameter after the cause has disappeared.

[External Error] EPF 1

Probable Cause

- Event triggered by an external device, depending on user.
- An external error has been triggered via Embedded Ethernet.

Remedy

Remove the cause of the external error.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Fieldbus Error] E P F 2

Probable Cause

An external error has been triggered via fieldbus.

Remedy

Remove the cause of the external error.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** A t r or manually with the **[Fault Reset Assign]** r S F parameter after the cause has disappeared.

[Embd Eth Com Interrupt] E E H F

Probable Cause

Communication interruption on the Ethernet IP ModbusTCP bus.

Remedy

- Check the communication bus.
- Refer to the Ethernet user manual.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** A E r or manually with the **[Fault Reset Assign]** r S F parameter after the cause has disappeared.

[Firmware Update Error] FWEr

Probable Cause

Firmware update function has detected an error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Boards Compatibility] HCF

Probable Cause

The **[Pairing password]** PP , parameter has been enabled and an option module has been changed.

Remedy

- Refit the original option module.
- Confirm the configuration by entering the **[Pairing password]** PP , if the module was changed deliberately.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[MonitorCircuit A Error] iFA

Probable Cause

The digital input assigned to **[MonitorCircuit A Assign]** iFAA is active for longer than **[MonitorCircuit A Delay]** iFdA.

Remedy

Check the connected device and its wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[MonitorCircuit B Error] iFb

Probable Cause

The digital input assigned to **[MonitorCircuit B Assign]** iFAb is active for longer than **[MonitorCircuit B Delay]** iFdb.

Remedy

Check the connected device and its wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[MonitorCircuit C Error] iFC

Probable Cause

The digital input assigned to **[MonitorCircuit C Assign]** iFAC is active for longer than **[MonitorCircuit C Delay]** iFdC.

Remedy

Check the connected device and its wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrY or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[MonitorCircuit D Error] iFd

Probable Cause

The digital input assigned to **[MonitorCircuit D Assign]** iFAd is active for longer than **[MonitorCircuit D Delay]** iFdd.

Remedy

Check the connected device and its wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Input Overheating] ıHF

Probable Cause

The AFE brick temperature is too high.

Remedy

Verify the drive ventilation and the ambient temperature. Wait for the drive to cool down before restarting.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrS or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Internal Link Error] ,LF

Probable Cause

Communication interruption between option module and the drive.

Remedy

- Verify the environment (electromagnetic compatibility).
- Verify the connections.
- Replace the option module.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 0] inF0

Probable Cause

Communication interruption between microprocessors of the control board.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 1] inF 1

Probable Cause

The power board rating is not valid.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 2] inF2

Probable Cause

The power board is incompatible with the control block software.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 3] inF3

Probable Cause

Internal communication detected error.

Remedy

- Verify the wiring on drive control terminals (internal 10V supply for analog inputs overloaded).
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 4] inF4

Probable Cause

Internal data inconsistent.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 6] inF6

Probable Cause

- The option module installed in the drive is not recognized.
- The removable control terminal modules (if existing) are not present or not recognized.
- The embedded Ethernet adapter is not recognized.

Remedy

- Verify the catalog number and compatibility of the option module.
- Plug the removable control terminal modules after the drive has been switched off.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 7] inF 7

Probable Cause

Communication interruption with CPLD component of Control board.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 8] inF8

Probable Cause

The internal power switching supply is not correct.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 9] inF9

Probable Cause

An error on the current circuit measurement has been detected.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Internal Error 10] inFA

Probable Cause

The input stage is not operating correctly.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 11] inFb

Probable Cause

The internal drive thermal sensor is not operating correctly.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Internal Error 12] inFC

Probable Cause

Internal current supply error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 13] inFd

Probable Cause

Differential current deviation.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 14] inFE

Probable Cause

Internal microprocessor detected error.

Remedy

- Verify that the error code can be cleared.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 15] inFF

Probable Cause

Serial memory flash format error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 16] inFG

Probable Cause

Communication interruption with the Extension module of output relays module or internal error of the Extension module of output relays

Remedy

- Replace the option module.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 17] inFh

Probable Cause

Communication interruption with the Extension module of digital & analog I/O or internal error of the Extension module of digital & analog I/O.

Remedy

- Replace the option module.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 18] inF

Probable Cause

Communication interruption with Safety function module or internal error of the Safety function module.

Remedy

- Replace the option module.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 19] inFJ

Probable Cause

An error on the encoder module has been detected.

Remedy

- Verify the compatibility of the encoder.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 20] InFK

Probable Cause

Option module interface board error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 21] inFL

Probable Cause

Internal Real Time Clock error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 22] ıոFՈ

Probable Cause

An error on the embedded Ethernet adapter has been detected.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 23] inFn

Probable Cause

A communication interruption between the control block and AFE or BU bricks has been detected.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 25] InFP

Probable Cause

Incompatibility between Control Board hardware version and firmware version.

Remedy

- Update the firmware package.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 27] inFr

Probable Cause

Diagnostics in CPLD have detected an error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 28] inF5

Probable Cause

An error on the AFE brick has been detected.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 29] inFt

Probable Cause

An error on the inverter brick has been detected.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 30] ıոFu

Probable Cause

An error on the rectifier brick has been detected.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 31] inFV

Probable Cause

An error on the brick architecture has been detected (brick missing).

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Internal Error 32] inFW

Probable Cause

Firmware update function has detected an error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Input Contactor] LCF

Probable Cause

The drive is not switched on even though **[Mains V. time out]** LCt timeout has elapsed.

Remedy

- Verify the input contactor and its wiring.
- Verify the **[Mains V. time out]** LCt timeout.
- Verify the supply mains/contactor/drive wiring.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI1 4-20mA loss] LFFI

Probable Cause

Loss of the 4-20 mA on analog input AI1.

Remedy

Verify the connection on the analog inputs.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrY or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI3 4-20mA loss] LFF3

Probable Cause

Loss of the 4-20 mA on analog input AI3.

Remedy

Verify the connection on the analog inputs.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI4 4-20mA loss] LFF4

Probable Cause

Loss of the 4-20 mA on analog input AI4.

Remedy

Verify the connection on the analog inputs.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI5 4-20mA loss] LFF5

Probable Cause

Loss of the 4-20 mA on analog input AI5.

Remedy

Verify the connection on the analog inputs.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtEr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Mains Freq Out Of Range] ΠFF

Probable Cause

[Mains Frequency] FAC on the AFE brick is out of range.

Remedy

Verify the mains frequency.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrY or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[M/S Device Error] nSdF

Probable Cause

- For a master, one or more slaves are not present or not ready.
- For a slave, the master is not present.

Remedy

- Verify the drive status.
- Verify the settings of the master/slave architecture.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrS or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[DC Bus Overvoltage] obF

Probable Cause

- Deceleration time too short or driving load.
- Supply mains voltage too high.

Remedy

- Increase the deceleration time.
- Configure the **[Dec ramp adapt.]** brA function if it is compatible with the application.
- Verify the supply mains voltage.
- Verify the braking resistor capability if present.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AFE Bus unbalancing] oBF2

Probable Cause

AFE DC bus unbalancing.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Overcurrent] oCF

Probable Cause

- Parameters in the **[Motor data]** MOA- menu are not correct.
- Inertia or load too high.
- Mechanical locking.

Remedy

- Verify the parameters.
- Verify the size of the motor/drive/load.
- Verify the state of the mechanism.
- Decrease **[Current limitation]** CLI.
- Increase the switching frequency.

Clearing the Error Code

This detected error requires a power reset.

[Drive Overheating] oHF

Probable Cause

Drive temperature too high.

Remedy

Verify the motor load, the drive ventilation, and the ambient temperature. Wait for the drive to cool down before restarting.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Process Overload] oLC

Probable Cause

Process overload.

Remedy

- Verify and remove the cause of the overload.
- Verify the parameters of the **[Process overload]** oLd- function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Motor Overload] oLF

Probable Cause

Triggered by excessive motor current.

Remedy

Verify the setting of the motor thermal monitoring,verify the motor load. Wait for the motor to cool down before restarting.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Single Output Phase Loss] oPF I

Probable Cause

Loss of one phase at drive output.

Remedy

Verify the wiring from the drive to the motor.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrE or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Output Phase Loss] oPF2

Probable Cause

- Motor not connected or motor power too low.
- Output contactor opened.
- Instantaneous instability in the motor current.

Remedy

- Verify the wiring from the drive to the motor.
- If an output contactor is being used, set **[OutPhaseLoss Assign]** oPL to **[No Error Triggered]** oAC.
- If the drive is connected to a low-power motor or not connected to a motor: In factory settings mode, motor phase loss detection is active **[Output Phase Loss]** oPL = **[OPF Error Triggered]** YES. Deactivate motor phase loss detection **[Output Phase Loss]** oPL = **[Function Inactive]** no.
- Verify and optimize the following parameters: **[IR compensation]** UFr, **[Nom Motor Voltage]** UnS and **[Rated mot. current]** nCr and perform **[Autotuning]** tUn.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Supply Mains Overvoltage] oSF

Probable Cause

- Supply mains voltage too high.
- Disturbed supply mains.

Remedy

Verify the supply mains voltage.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrY or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[PumpCycle Start Error] PCPF

Probable Cause

The Pumpcycle monitoring function has exceeded the maximum number of start sequences allowed in the time window.

Remedy

- Search for a possible cause of repetitive start of system.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrF or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[PID Feedback Error] PFDF

Probable Cause

The PID feedback error was out of the allowed range around the set point during the time window.

Remedy

- Check for mechanical breakdown of pipes.
- Check for water leakage.
- Check for open discharge valve.
- Check for fire hydrant opened.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Program Loading Error] PGLF

Probable Cause

Verify that the error code can be cleared.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Program Running Error] PGrF

Probable Cause

Verify that the error code can be cleared.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Input phase loss] PHF

Probable Cause

- Drive incorrectly supplied or a tripped fused.
- One phase missing.
- 3-phase drive used on a single-phase supply mains.
- Unbalanced load.

Remedy

- Check the power connection and the fuses.
- Use a 3-phase supply mains.
- Disable the detected error by **[Input phase loss]** IPL = **[No]** no if single phase supply mains or DC bus supply is used.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Safety Function Error] SAFF

Probable Cause

- Debounce time exceeded.
- Internal hardware error.

Remedy

- Verify the wiring of the digital inputs STOA and STOB.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Motor short circuit] SCF I

Probable Cause

Short-circuit or grounding at the drive output.

Remedy

- Verify the cables connecting the drive to the motor, and the motor insulation.
- Reduce the switching frequency.
- Connect chokes in series with the motor.
- Verify the adjustment of speed loop and brake.
- Increase the **[Time to restart]** tAr

Clearing the Error Code

This detected error requires a power reset.

[Ground Short Circuit] SCF3

Probable Cause

Significant ground leakage current at the drive output if several motors are connected in parallel.

Remedy

- Verify the cables connecting the drive to the motor, and the motor insulation.
- Reduce the switching frequency.
- Connect chokes in series with the motor.
- Verify the adjustment of speed loop and brake.
- Increase the **[Time to restart]** tAr
- Increase the switching frequency.

Clearing the Error Code

This detected error requires a power reset.

[IGBT Short Circuit] 5CF4

Probable Cause

Power component detected error.

Remedy

Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrS or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Motor Short Circuit] SCFS

Probable Cause

Short-circuit at drive output.

Remedy

- Verify the cables connecting the drive to the motor, and the motor's insulation.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrS or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AFE ShortCircuit error] 5CF6

Probable Cause

AFE rectifier IGBT short-circuit.

Remedy

- Verify the cables connecting the AFE brick to the mains.
- Contact your local Schneider Electric representative.

Clearing the Error Code

This detected error requires a power reset.

[Modbus Com Interruption] SLF 1

Probable Cause

Communication interruption on the Modbus port.

Remedy

- Verify the communication bus.
- Verify the timeout.
- Refer to the Modbus user manual.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[PC Com Interruption] SLF2

Probable Cause

Communication interruption with the commissioning software.

Remedy

- Verify the commissioning software connecting cable.
- Verify the timeout.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrE or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[HMI Com Interruption] SLF3

Probable Cause

Communication interruption with the Display Terminal.

Remedy

- Verify the Display Terminal connection.
- Verify the timeout.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrA or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Motor Overspeed] SoF

Probable Cause

- Instability or driving load too high.
- If a downstream contactor is used, the contacts between the motor and the drive have not been closed before applying a Run command.

Remedy

- Verify the motor parameter settings.
- Verify the size of the motor/drive/load.
- Verify and close the contacts between the motor and the drive before applying a Run command.

Clearing the Error Code

This detected error requires a power reset.

[Encoder Feedback Loss] SPF

Probable Cause

- Encoder feedback signal missing.
- No top Z signal after two rotations has been done.
- No signal on the pulse input, if the input is used for speed measurement.

Remedy

- Check the error code value **[Encoder Fdbck Error]** EnCE.
- Verify the wiring between the encoder and the drive.
- Verify the encoder.
- Verify the encoder settings.
- Check the wiring of the pulse input and the sensor used.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Torque timeout] SrF

Probable Cause

The torque control function is not able to regulate the torque within the configured dead band. The drive has switched to speed control for longer than **[Torque ctrl time out]** rtO.

Remedy

- Verify the settings of the **[Torque control]** tOr - function..
- Verify that there are no mechanical constraints.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Torque Limitation Error] SSF

Probable Cause

The drive was in torque limitation or current limitation state during **[Trq/I Limit Timeout]** StO.

Remedy

- Verify the settings of the **[Torque limitation]** toL - function.
- Verify that there are no mechanical constraints.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Motor Stall Error] SEF

Probable Cause

The stall monitoring function has detected an error.

Remedy

- Search for a mechanical blocking of the motor.
- Search for a possible cause of motor overload.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AEr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI1 Thermal Sensor Error] E ICF

Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input AI1:

- Open circuit, or
- Short circuit

Remedy

- Verify the sensor and its wiring.
- Replace the sensor.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI3 Thermal Sensor Error] E 3 C F

Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input AI3:

- Open circuit, or
- Short circuit.

Remedy

- Verify the sensor and its wiring.
- Replace the sensor.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** A t r or manually with the **[Fault Reset Assign]** r S F parameter after the cause has disappeared.

[AI4 Thermal Sensor Error] tH4F

Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input AI4:

- Open circuit, or
- Short circuit.

Remedy

- Verify the sensor and its wiring.
- Replace the sensor.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI5 Thermal Sensor Error] E 5 C F

Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on analog input AI5:

- Open circuit, or
- Short circuit.

Remedy

- Verify the sensor and its wiring.
- Replace the sensor.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** A t r or manually with the **[Fault Reset Assign]** r 5 F parameter after the cause has disappeared.

[Encoder Th Sensor Error] tECF

Probable Cause

The thermal sensor monitoring function has detected a thermal sensor error on the encoder module analog input:

- Open circuit, or
- Short circuit.

Remedy

- Verify the sensor and its wiring.
- Replace the sensor.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrS or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[MotorWinding A Error] ELFA

Probable Cause

The digital input assigned to **[MotorWinding A Assign]** ELFAA is active for longer than **[MotorWinding A Delay]** ELFdA.

Remedy

- Check the connected device (motor winding thermal switch) and its wiring.
- Verify the motor load and the ambient temperature. Wait for the motor to cool down before restarting.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrP or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[MotorWinding B Error] tFb

Probable Cause

The digital input assigned to **[MotorWinding B Assign]** tFAb is active for longer than **[MotorWinding B Delay]** tFdb.

Remedy

- Check the connected device (motor winding thermal switch) and its wiring.
- Verify the motor load and the ambient temperature. Wait for the motor to cool down before restarting.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[MotorWinding C Error] ᴇ F C

Probable Cause

The digital input assigned to **[MotorWinding C Assign]** ᴇ F A C is active for longer than **[MotorWinding C Delay]** ᴇ F d C .

Remedy

- Check the connected device (motor winding thermal switch) and its wiring.
- Verify the motor load and the ambient temperature. Wait for the motor to cool down before restarting.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** A ᴇ r or manually with the **[Fault Reset Assign]** r S F parameter after the cause has disappeared.

[MotorWinding D Error] tFd

Probable Cause

The digital input assigned to **[MotorWinding D Assign]** tFAd is active for longer than **[MotorWinding D Delay]** tFdd.

Remedy

- Check the connected device (motor winding thermal switch) and its wiring.
- Verify the motor load and the ambient temperature. Wait for the motor to cool down before restarting.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI1 Th Detected Error] ΕΗ IF

Probable Cause

The thermal sensor monitoring function has detected a high temperature error on analog input AI1.

Remedy

- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** ΑΕr or manually with the **[Fault Reset Assign]** r SF parameter after the cause has disappeared.

[AI3 Th Detected Error] $tH3F$

Probable Cause

The thermal sensor monitoring function has detected a high temperature error on analog input AI3.

Remedy

- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** $AtrE$ or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI4 Th Detected Error] tHAF

Probable Cause

The thermal sensor monitoring function has detected a high temperature error on analog input AI4.

Remedy

- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrF or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AI5 Th Detected Error] E H 5 F

Probable Cause

The thermal sensor monitoring function has detected a high temperature error on analog input AI5.

Remedy

- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** A t r or manually with the **[Fault Reset Assign]** r 5 F parameter after the cause has disappeared.

[Encoder Th Detected Error] ᴇ H E F

Probable Cause

The thermal sensor monitoring function has detected a high temperature error on encoder module analog input.

Remedy

- Search for a possible cause of overheating.
- Verify the settings of the monitoring function.

Clearing the Error Code

This detected error requires a power reset.

[IGBT Overheating] ELF

Probable Cause

Drive power stage overheating.

Remedy

- Verify the size of the load/motor/drive according to environment conditions.
- Reduce the switching frequency.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtrE or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AFE IGBT over-heat error] E JF2

Probable Cause

Rectifier IGBT power stage overheating.

Remedy

- Verify the size of the load/motor/drive according to environment conditions.
- Reduce the switching frequency.

Clearing the Error Code

This detected error requires a power reset.

[Drive Overload] tLoF

Probable Cause

The **[Drive overload monit]** obr - function has detected an error.

Remedy

- Verify the size of the load/motor/drive according to environment conditions.
- Verify the settings of the **[Drive Overload Monit]** tLoL parameter.

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** Atr or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Autotuning Error] tnF

Probable Cause

- Special motor or motor whose power is not suitable for the drive.
- Motor not connected to the drive.
- Motor not stopped.

Remedy

- Verify that the motor/drive are compatible.
- Verify that the motor is connected to the drive during autotuning.
- If an output contactor is being used, verify that it is closed during autotuning.
- Verify that the motor is stopped during autotuning.
- In case of reluctant motor, reduce **[PSI Align Curr Max]** nCr.

Clearing the Error Code

This detected error can be cleared manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[Process Underload] uLF

Probable Cause

Process underload.

Remedy

- Verify and remove the cause of the underload.
- Verify the parameters of the **[PROCESS UNDERLOAD]** uLd- function

Clearing the Error Code

This detected error can be cleared with the **[Auto Fault Reset]** AtR or manually with the **[Fault Reset Assign]** rSF parameter after the cause has disappeared.

[AFE Mains Undervoltage] ⊔ r F

Probable Cause

- Too low DC-Bus voltage due to mains undervoltage.
- AFE overload.

Remedy

- Verify mains voltage.
- Verify the size of the load/motor/drive according to environment conditions.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

[Supply Mains UnderV] ␣ 5 F

Probable Cause

- supply mains too low.
- Transient voltage dips.

Remedy

Verify the voltage and the parameters of **[Undervoltage handling]** ␣ 5 b.

Clearing the Error Code

This detected error is cleared as soon as its cause disappears.

Section 13.3
FAQ

FAQ

Introduction

If the display does not light up, verify the supply mains to the drive.

The assignment of the fast stop or freewheel functions help to prevent the drive starting if the corresponding digital inputs are not switched on. The drive then displays **[Freewheel]** nSt in freewheel stop and **[Fast stop]** FSt in fast stop. This is a normal behavior since these functions are active at zero so that the drive is stopped if there is a wire break.

Verify that the run command input is activated in accordance with the selected control mode (**[2/3-wire control]** tCC and **[2-wire type]** tCt parameters).

If the reference channel or command channel is assigned to a fieldbus, when the supply mains is connected, the drive displays **[Freewheel]** nSt. It remains in stop mode until the fieldbus gives a command.

Option Module Changed or Removed

When an option module is removed or replaced by another, the drive locks in **[Incorrect configuration]** CFF error mode at power-on. If the option module has been deliberately changed or removed, the detected error can be cleared by pressing the **OK** key twice, which causes the factory settings to be restored for the parameter groups affected by the option module.

Control Block Changed

When a control block is replaced by a control block configured on a drive with a different rating, the drive locks in **[Incorrect configuration]** CFF fault mode at power-on. If the control block has been deliberately changed, the detected error can be cleared by pressing the **OK** key twice, which **causes all the factory settings to be restored.**

Glossary

D

Display terminal

The display terminal menus are shown in square brackets.

For example: **[Communication]**

The codes are shown in round brackets.

For example: COM-

Parameter names are displayed on the display terminal in square brackets.

For example: **[Fallback Speed]**

Parameter codes are displayed in round brackets.

For example: LFF

E

Error

Discrepancy between a detected (computed, measured, or signaled) value or condition and the specified or theoretically correct value or condition.

F

Factory setting

Factory settings when the product is shipped

Fault

Fault is an operating state. If the monitoring functions detect an error, a transition to this operating state is triggered, depending on the error class. A "Fault reset" is required to exit this operating state after the cause of the detected error has been removed. Further information can be found in the pertinent standards such as IEC 61800-7, ODVA Common Industrial Protocol (CIP).

Fault Reset

A function used to restore the drive to an operational state after a detected error is cleared by removing the cause of the error so that the error is no longer active.

M

Monitoring function

Monitoring functions acquire a value continuously or cyclically (for example, by measuring) in order to check whether it is within permissible limits. Monitoring functions are used for error detection.

P

Parameter

Device data and values that can be read and set (to a certain extent) by the user.

PELV

Protective Extra Low Voltage, low voltage with isolation. For more information: IEC 60364-4-41

PLC

Programmable logic controller

Power stage

The power stage controls the motor. The power stage generates current for controlling the motor.

W

Warning

If the term is used outside the context of safety instructions, a warning alerts to a potential problem that was detected by a monitoring function. A warning does not cause a transition of the operating state.