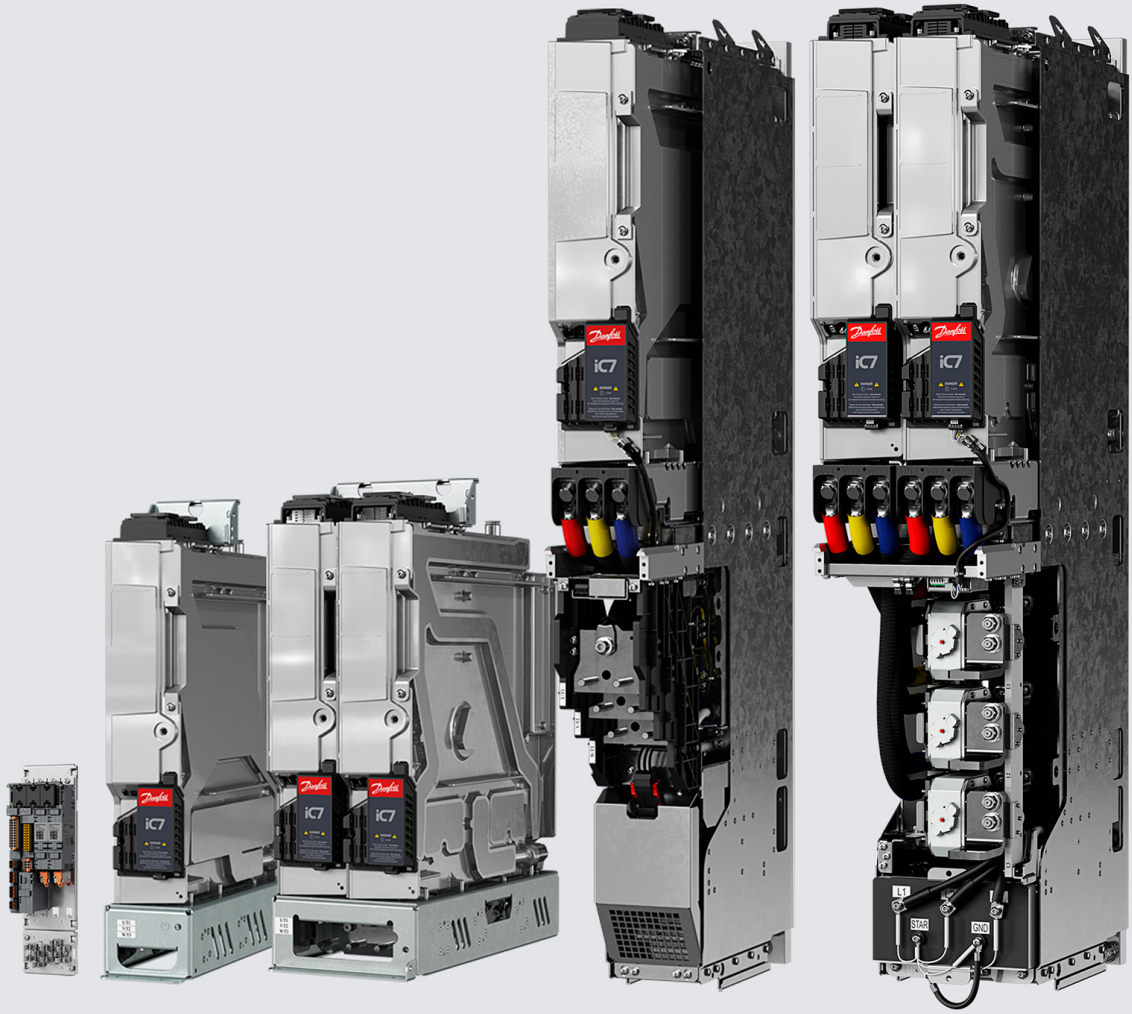
Application Guide

iC7 Series Brake Chopper Unit

iC7-Marine



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1 Introduction to Application Guide

1.1 Version History

Version	Remarks	Software Version
AB556325399770en-000101	First version	Application software version: 1.0.0 Firmware version: 5.36.2

1.2 Purpose of this Application Guide

This application guide provides information on operating the Brake Chopper Unit application of the iC7 Series. The application guide provides an overview of parameters and value ranges for operating the power converter. In addition to converter parameters, information on the various user interfaces to configure parameters, configuration examples with recommended parameter settings and troubleshooting steps are included in the application guide.

Intended Audience

The intended audience of the application guide is trained personnel, automation engineers, and configurators with experience in operating with parameters and with basic knowledge of Danfoss AC power converters.

1.3 Additional Resources

Additional resources are available with related information.

The design guide provides information about the capability and functionality to design power converter systems with the iC7 series.

The operating guide provides detailed specification, requirements, and installation instructions of the iC7 series power converters.

Protocol specific fieldbus Operating Guides provide details on how to configure and use a specific fieldbus protocol with iC7 series power converters.

The control panel user guide provides detailed specifications and operations to use the various control panel portfolios of the iC7 series.

1.4 Safety Symbols

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

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

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

NOTICE
Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

2 Application Software Overview

2.1 Introduction to the Application Software

The brake chopper unit (BCU) is a unidirectional power converter which is used to supply excessive energy from a common DC bus to the external resistors where the energy is dissipated as heat.

BCU use cases:

Brake chopper units are typically used in applications where dynamic braking is needed and motors need to be stopped or slowed down quickly and frequently. For example:

- **Cranes, hoists, and winches:** These applications involve lifting and lowering heavy loads, which requires controlled braking.
- **Conveyors:** Especially ones that are long or carry heavy loads must be able to stop quickly and safely.
- **Other industrial machinery:** Any application with a high-inertia load that must be decelerated rapidly.

In motoring applications, by dissipating the regenerative energy the brake chopper allows the drive to maintain a braking torque on the motor, enabling controlled and rapid deceleration or lowering of the load (in hoisting applications).

Brake chopper units can also be used as protective devices to protect the entire drive system from the harmful effects of excessive voltage, if the system contains synchronous motors or generators where the back-EMF voltage can increase to excessively high levels.

BCU behavior in motoring applications:

When a motor is slowing down or braking it acts like a generator, sending electrical energy back to the DC link of the drive. This can cause the voltage in the DC link to rise to a dangerous level. The brake chopper unit acts as a switch that monitors the DC voltage. When the voltage exceeds a set limit, the chopper diverts the excess energy to a braking resistor, which converts the electrical energy into heat and dissipates it.

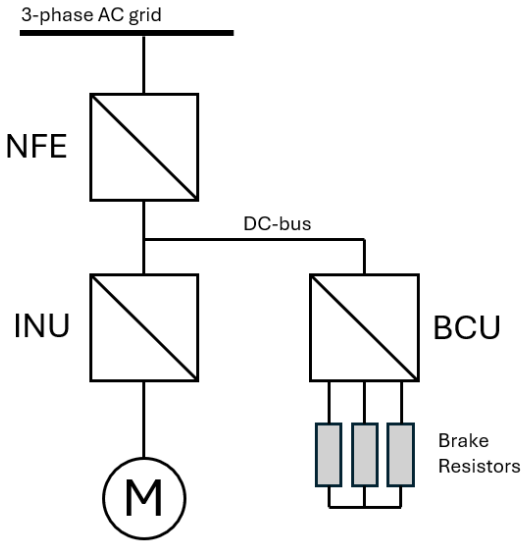


Figure 1: BCU Unit in a Typical Common DC Bus Drive System

2.1.1 General Features

The application software provides a wide range of built-in features for converter control, security, services, and protections.

DC-Link Voltage Limit Control

This feature enables the defining of a DC-link voltage limit which the converter maintains.

Event Handling and Customization

Events indicate undesirable conditions for the converter to operate. Fault, warning, and info are the three types of events.

Faults are critical events which require the operator to take immediate action so that the converter is not damaged and converter operations are not stopped.

Warnings are events which indicate that the recommended mitigating actions must be performed. When warnings occur in the system, the converter continues to operate.

Info events are mainly information of a situation, or to log events into the event history. These events do not typically require any actions, and they do not stop the operation of the converter.

With the application software, conditions and responses to fault and warning events can be configured. Configuring events and responses alerts operators, so that they can perform necessary actions for the safe operation of the module, converter, and application.

Logging and Storage of Data

Both converter and process related signals are logged and stored. The process-related signals which are to be stored can be selected. Converter and process data are exported to a format which can be easily understood. The data can be exported from MyDrive® Insight.

The converter records important events which help in understanding how the converter or module is used. Apart from standard events logged automatically by the converter, other recordable events can be selected.

Auto-detection of I/O

The converter has built-in terminals and installation space for options. The converter can automatically detect the installed options and connected terminals.

Paralleling BCUs

For applications requiring increased braking capacity, multiple Brake Chopper Units (BCUs) can be connected in parallel to a common DC bus. As illustrated in Figure 2, this configuration involves multiple BCUs, each equipped with its own control unit, working in unison.

Paralleling does not require any communication between the BCUs, but the DC voltage drooping feature must be used to guarantee equal load sharing of the parallel BCUs.

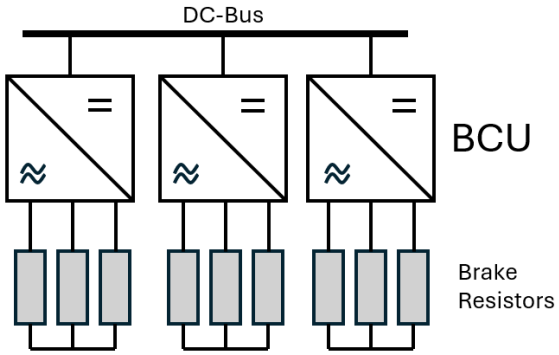


Figure 2: Paralleled BCUs Connected to a Common DC Bus.

2.1.2 Protection Features

The Brake Chopper Unit application software includes multiple protection features. The following is a short summary of the most relevant protections.

Overtemperature Protection

When the Temperature Measurement OC7T0 option is installed, the drive can measure the temperature from 10 external temperature sensors.

Cooling Supervision

Cooling supervision is only available for liquid-cooled BCU units.

Enables the protection of the BCU converter by monitoring the status of the cooling module through digital inputs.

Cooling supervision can be configured with the digital input ***No. 2400 Cooling Monitor Input***. The response can be configured either as a warning or a fault, or both. Different responses can be configured based on the run/stop state of the converter using ***No. 2402 Cooling Monitor Response***. A delay in seconds can be added for the triggering of the protection using ***No. 2401 Cooling Monitor Fault Delay***.

Quick Stop

Quick stop stops the converter regardless of the operation condition. Quick stop allows the converter to make a controlled stop, for example when the emergency stop is pressed. Usually there are a few

seconds to make a controlled stop before the emergency stop forces all breakers to open and makes the system electrically safe. In a quick stop modulation is stopped immediately.

The quick stop function can be initiated from the fieldbus or using digital inputs.

2.2 Fieldbus Profile Description

The iC7 Series products provide a flexible fieldbus profile which can be mapped according to customer needs. The standard bit configuration is described in this chapter.

Note! Fieldbus process data (Control Word, for example) is applicable only when the Control Word bit10 (data valid) is true and fieldbus is the active control place

2.2.1 Fieldbus Control Word and Bit Description

Bit	Name	Description	Further Information
0–1	-	Reserved	
2	Quick Stop Inverse	0: Initiate Quick Stop. 1: Do not initiate Quick Stop.	
3	Start	0: Stop the unit if it is running 1: Start running	Use the fieldbus start mode (parameter ***No. 5114***) to configure whether a new start command is required after the unit has been stopped, or whether the unit starts running immediately after all stopping conditions (quick stop, faults, and so on) are cleared.
4–6	-	Reserved	
7	Event Reset	0: Do not reset events 1: Reset active events	A rising edge (a transition from false to true) on this bit issues an event reset request.
8–9	-	Reserved	
10	Data Valid	0: Ignore the current incoming process data values, instead use the last processed value when the 'Data Valid' bit was true. 1: Use the current incoming process data values.	For Modbus® TCP protocol, the validity check applies for all the registers that are sent in the same message as the control word.
11	Watchdog	Incoming watchdog bit from the customer. Used for monitoring the fieldbus connection.	
12	Vendor Specific Bit 1	Select the value "Control word 1 - bit 12" for any Input parameter to utilize this signal for the activation of a desired function.	
13	Vendor Specific Bit 2	Select the value "Control word 1 - bit 13" for any Input parameter to utilize this signal for the activation of a desired function.	
14	Vendor Specific Bit 3	Select the value "Control word 1 - bit 14" for any Input parameter to utilize this signal for the activation of a desired function.	
15	Vendor Specific Bit 4	Select the value "Control word 1 - bit 15" for any Input parameter to utilize this signal for the activation of a desired function.	

2.2.2 Fieldbus Status Word and Bit Description

Bit	Name	Description	Further Information

0	Ready to Switch On	0: Unit is not ready to run 1: Unit is ready to run	This bit indicates that the unit is ready to start the startup sequence (pre-charging and/or MCB closure, if controlled by the application). There are no active faults and the Switch On Enabled bit is active.
1	Ready to Run	0: Unit is not ready to run 1: Unit is ready to run	When this bit is true, it indicates that the unit can be successfully started with bit 3 of the control word.
2	Running	0: Unit is not running (run is not requested) 1: Unit is running (run is requested)	When this bit is true, it indicates that the start command has been given and the unit is ready to feed excessive energy from the DC link to the braking resistor when the DC-link voltage exceeds the given voltage level.
3	Fault	0: No active faults 1: One or more faults are active	This bit indicates the presence of one or more active fault level events.
4	-	Reserved	
5	Quick Stop Inverse	0: Quick stop is active 1: Quick Stop is not active	This bit indicates whether the quick stop command is active or not
6	-	Reserved	
7	Warning	0: No active warnings 1: One or more warnings are active	This bit indicates the presence of one or more active warning level events.
8	Braking Active	0: Unit is not braking (not modulating) 1: Unit is braking (modulating)	This bit indicates whether the unit is in running state (modulating) and actively feeding excessive energy into the braking resistor.
9	Controlled by PLC	0: Fieldbus is not the active control place 1: Fieldbus is the active control place	This bit indicates whether the unit is controlled from the fieldbus or not.
10	-	Reserved	
11	Run Enabled	0: Run enable signal from the dedicated input is missing 1: Run enable signal from the dedicated input is present	This bit indicates the state of the parameter ***Run Enable Input (No. 103)***
12	Run Requested	0: Start command is not active 1: Start command is active	This bit indicates whether the final start command is active or not.
13–14	-	Reserved	
15	Watchdog	Bit used for the fieldbus watchdog.	Mirroring control word bit 11

3 User Interfaces and How to Configure

3.1 Overview of User Interfaces

To interact with a Danfoss iC7 Series converter, use either the control panel as a simple and direct interface, or the software tool MyDrive® Insight for more advanced interaction with the converter. The control panel can be mounted directly on the converter, or close to the converter by using a control panel mounting kit.

With MyDrive® Insight, the converter can be accessed from a remote place if the infrastructure is in place and the network provides the required access rights.

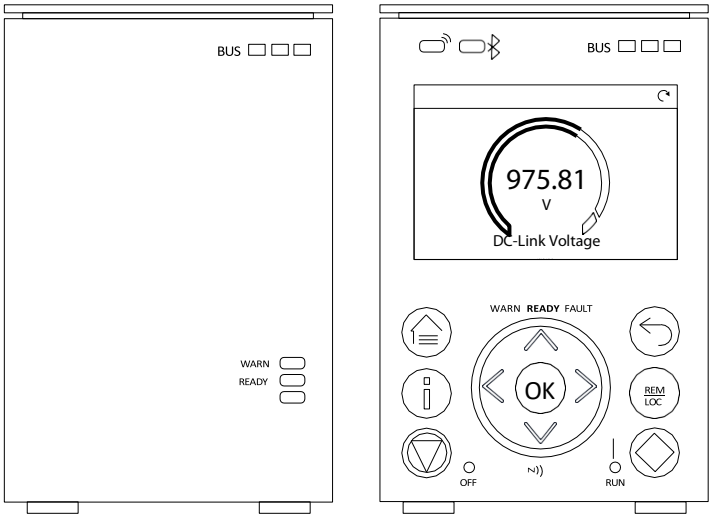
3.2 Control Panel

The chapter provides an overview about the different control panel options, the related elements, important features and functionalities, and quick guidance on how to use the control panel.

3.2.1 iC7 Control Panel Options

The iC7 series offers a broad range of interfaces which suit different connectivity requirements to support wireless regulations.

The iC7 Series offers the following 2 different control panel options. Refer to the relevant Design Guide for information on which control panels are available to your product.



Blind Panel Control Panel 2.8

Figure 3: Control Panel Options.

- **Blind Panel OPX00:** This panel shows the basic status of the converter and fieldbus indicators. The panel is typically used when only limited interaction with the converter is required after installation and commissioning, or when the converters are controlled by fieldbus.
- **Control Panel 2.8 OPX20:** This panel is the standard user interface, and used when frequent interaction with the converter is required. The panel enables easy setup of the converter via parameters, monitoring the converter status, and shows event notifications.

Control Panel 2.8 0PX20 has the following features:

- 2.8" monochromatic user interface with a display resolution of 240 x 160 pixels.
- Visual LEDs to illustrate converter status and fieldbus communication.
- Halo indicator with 3 colors to illustrate converter status at a glance.
- A display which can be customized to show required or essential information.
- Buttons to control the converter locally, including a toggle button to easily switch between local and remote control.
- Parameter widgets which support alphanumeric and special characters, integers, floating points, date time formats, choice lists, and commands to configure application data.
- Help texts to support in operating the system.

3.2.2 Control Panel Elements

The control panel provides an interface for configuring and controlling the converter easily. The section describes the elements for all control panel options.

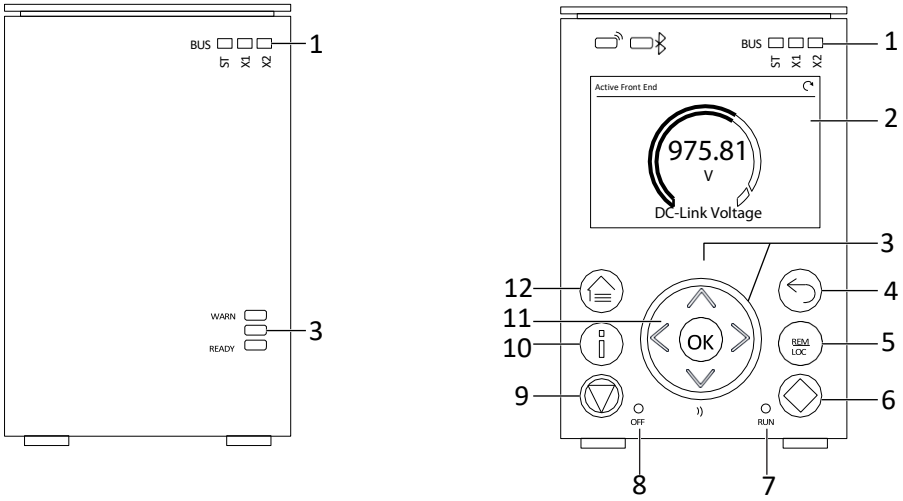


Figure 4: Control Panel Elements.

Legend	Name of Element	Description

1	Fieldbus Indicators	The LEDs indicate the status of the communication interface X1 and X2.
		• **[ST]**
		  ○ Green blinking LED indicates that the communication interfaces are in normal operating state.
		  ○ Red blinking LED indicates that an error has occurred, and communication is not possible.
		• **[X1]**
		  ○ Green blinking LED indicates data exchange on communication interface X1.
		  ○ Red blinking LED indicates an error during data exchange on communication interface X1.
		• **[X2]**
		  ○ Green blinking LED indicates data exchange on communication interface X2.
		  ○ Red blinking LED indicates an error during data exchange on communication interface X2.

2	Display	Enables access to content and settings. The display provides detailed information about the status of the converter.

3	Converter Status Indicators	The LEDs indicate the status of the converter.
		• **[WARN]**
		  ○ When this text is lit in yellow, it indicates a warning-level event.
		• **[READY]**
		  ○ When this text is lit in white, it indicates that the converter is ready for operation.
		  ○ When this text is blinking white (1 Hz), it indicates that the converter is powered on but is not ready.
		• **[FAULT]**
		  ○ When this text is lit in red, it indicates a fault.
		The status of the converter is also indicated by the Halo, which has the same color indicators as the converter status texts on the control panel.

4	Back button	Navigates to the previously viewed screen or a menu level above the current menu.
5	REM/LOC	Toggles the converter between remote and local operation.
6	Run button	Starts the operation of the converter.
7	RUN LED	The indicator has the following states: • **On:** Start command is applied and the converter is modulating. • **Off:** The converter has stopped, and the start command is not applied.

Legend	Name of Element	Description

8	OFF LED	The indicator has the following states:
		• **Steadily on:** The indicator is in this state because of either of the following two reasons:
		  ○ The converter is not modulating and is coasted.
		  ○ The stop signal is applied, output is active, and the converter is ramping down until coast or restart. Ramp times, protections, and stopping functions prolong this state.
		• **Flashes for 3 seconds**: Indicates that the start command is initiated, but the converter is not able to start.
		• **Off:** The converter is in operation, a start signal is applied, and the output is active. This also includes ramping, running on reference, and AMA.
		Note: When a fault has occurred in the converter, the LED is on though the start command is available. If there is a fault event, and the start command is disabled and reinitiated again, the Off LED blinks.

10	Info button	Provides more detailed information about an event that has occurred in the converter. Pressing Info also shows a context sensitive help for parameters.
11	Arrow buttons	• **Arrow buttons:** Used to navigate within the different screens and menus. • **[OK]:** Primarily used to confirm selections and data in the control panel display.
12	Home/Menu button	Toggles between Home screen and the current parameter menu, to allow quick access to key status information during parameter setup.

3.2.3 Control Panel Basic Configurations

The basic configurations of the control panel include:

- A readout of the status of the motor and the converter, including warnings and faults.
- Navigable menus, where the parameter settings of the converter can be viewed and changed.

3.2.3.1 Starting the Converter and Control Panel Display

While the converter is powering up until it is ready to operate, the control panel display shows the following:

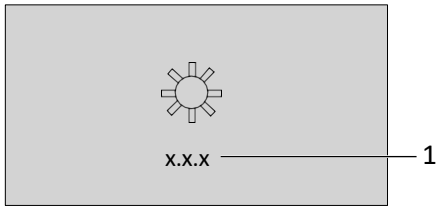


Figure 5: Control Panel Display on Startup.

Legend	Description
1	The panel software version

NOTICE

When the converter is started, it takes 25–30 s for the converter to be in ready state and for the control panel display to change to the Home screen (default).

3.2.3.2 Understanding Readout Screens

When the converter is in ready state, the control panel display shows the Home screen. By default, the Home screen is shown as follows, however the Home screen can be customized.

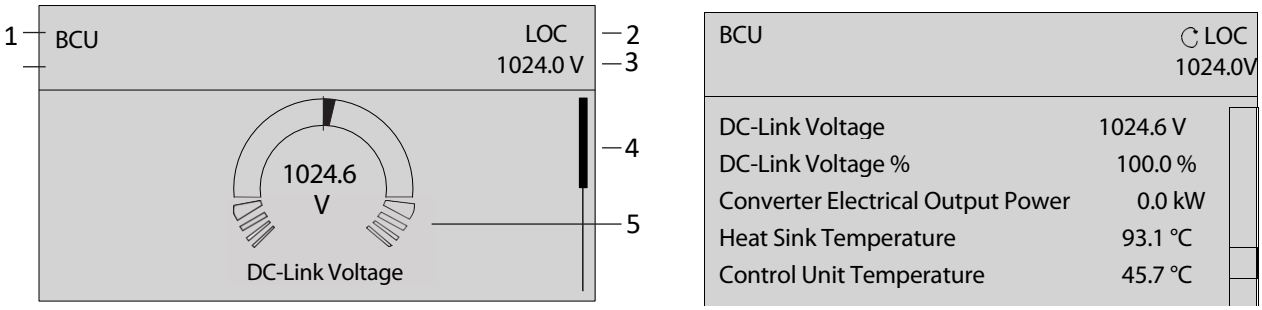


Figure 6: Home Screen (Donut View vs. Line View)

Legend	Description
1	The name of the application software
2	The current control place of the converter. REM indicates remote control and LOC indicates local control. The visible arrow indicates that the converter is in running state.
3	Actual DC-link voltage limit
4	The scroll bar. The scroll bar indicates whether the screen is in the upper Readout Screen 1 or lower Readout Screen 2 position, when in the menu structure or parameters
5	The readout value as a donut infographic view. It is possible to show only a single readout in a donut view. When more than 1 readout is configured, the screen changes to a line view. A minimum of 2 and a maximum of 5 readouts are shown in the line view.

Press the down arrow on the control panel when in Readout Screen 1, and the control panel screen navigates to Readout Screen 2. As a factory default setting, the control panel shows 5 readout values, as shown in the preceding image.

3.2.3.3 Changing the Content of the Readout Screens

This chapter outlines an example procedure for changing or customizing the content of Readout Screen 1. The same procedure is applicable for Readout Screen 2.

1. To start the screen content editing mode, press [OK] for a minimum of 5 seconds. The screen changes as shown in the following image.

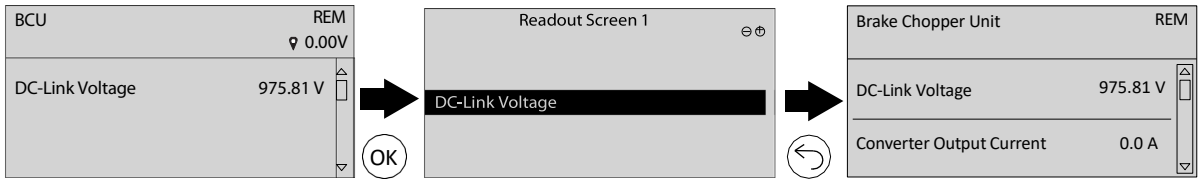


Figure 7: Typical Readout Screen

2. Remove an existing readout by pressing the up-arrow button on the control panel and navigating to the Remove readout button (-) on the UI and pressing it.

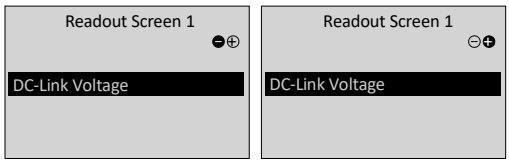


Figure 8: Add and Remove Readout Buttons

NOTICE

When the remove readout button is pressed, the last readout on the list is removed.

3. Add a readout to the screen by navigating to the Add readout button (+) on the UI and pressing it. To move between the Add readout and Remove readout buttons, press the left or right arrow buttons on the control panel.
4. After pressing the Add readout button, select the readout to be added.

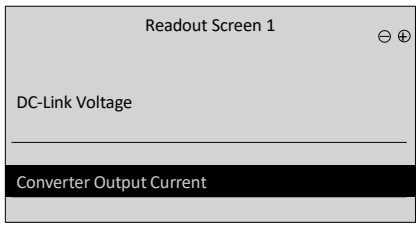


Figure 9: Updating the Readout Screen

5. Add more readouts by pressing the Add readout button and selecting a readout.
6. After selecting the readouts to be added or removed from the list, press [OK].
7. To exit the screen content editing mode, press the [Home] or [Back] button.

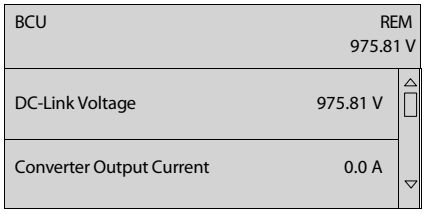


Figure 10: Updated Readout Screen

NOTICE

The readout screens can also be adjusted using parameter group ***5.2 Control Panel***. For more information, see *Device Settings (Menu Index 5)*.

3.2.3.4 Adjusting Display Backlight and Contrast

When in Readout Screen 1 or Readout Screen 2, it is possible to adjust the backlight intensity and contrast of the display.

To adjust the display backlight and contrast settings, press the [Info] button and any of the arrow buttons of the control panel. The settings are shown on the screen:

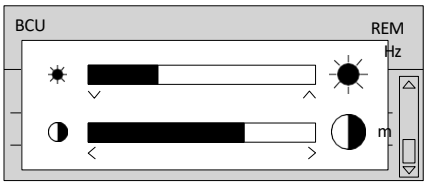


Figure 11: Changing the Backlight and Contrast

- To change the intensity of the backlight, keep pressing the [Info] button along with either the up or down arrow buttons of the control panel.
- To change the contrast, keep pressing the [Info] button along with either the left or right arrow buttons of the control panel.

3.2.3.5 Parameter Group Screen and Overall Navigation

Pressing the [Home/Menu] button toggles between the readout screens and the parameter group screen. The content of the parameter group screen can vary depending on the current level of the parameter group. A typical parameter group screen is shown in the following image.

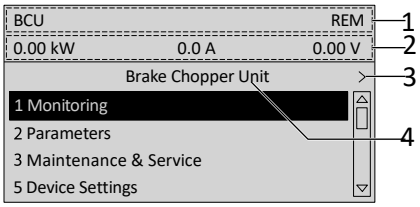


Figure 12: Parameter Group Screen

Legend	Description
1	Name and control state of the converter.
2	The menu readout header. It shows the Output Electrical Power, Output Current, and DC-link voltage
3	Previous and Next arrow icons. Press the icons to navigate 1 level above or below in the parameter group structure. When the Previous or Next arrow is not shown, it indicates that the view is at the top or bottom of the menu structure, respectively.
4	Name of the application software that is active in the converter.

Basic navigation techniques

To navigate through and within the different parameter groups, use the navigation buttons of the control panel.

- To navigate to different parameter groups, press the up or down arrows of the control panel.
- To navigate to parameter subgroups or parameters within a parameter group, press the left or right arrows of the control panel.
- To navigate to a higher level in the parameter/parameter group screens press the Back button, and to navigate to a lower level press the OK button.

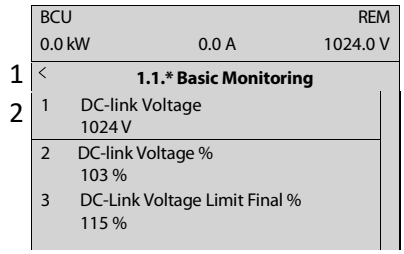


Figure 13: Parameter Navigation

Legend	Description
1	Previous button when in a parameter group.
2	When parameters are defined as readout only, the current value is shown below the parameter name. A black outline around the parameter without any highlighting indicates that the value of the parameter cannot be changed.

3.2.3.6 Changing the Selections of a Parameter

When a parameter has selections, the parameter index and name are highlighted in black. The example parameter in this procedure is **P2.1.6 Unit Voltage Class**.

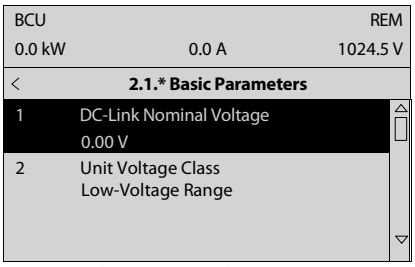


Figure 14: Changing a Selection in a Parameter

1. To view the selections of the parameter, press the right arrow button or [OK] on the control panel. The selections available for the parameter are shown on the screen.

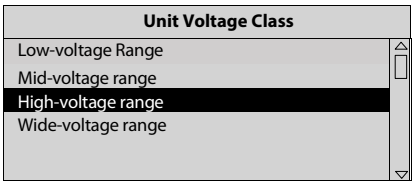


Figure 15: Selections for a Parameter

2. To browse through the selections, press the up or down arrow buttons.
3. To select a selection, press [OK].

3.2.3.7 Changing a Parameter Value

The example parameter in this procedure is **P2.1.1 DC-Link Nominal Voltage**.

1. Go to parameter **P2.1.1 DC-Link Nominal Voltage** and press [OK].
2. To go to the values before or after the decimals, use the left and right arrow buttons. A black highlight on the digit indicates the location where the cursor is active.

3. To increase or decrease the value, press the up and down arrow buttons.
4. Confirm the changes by pressing [OK].

The following illustration shows the process of changing the value of a parameter.

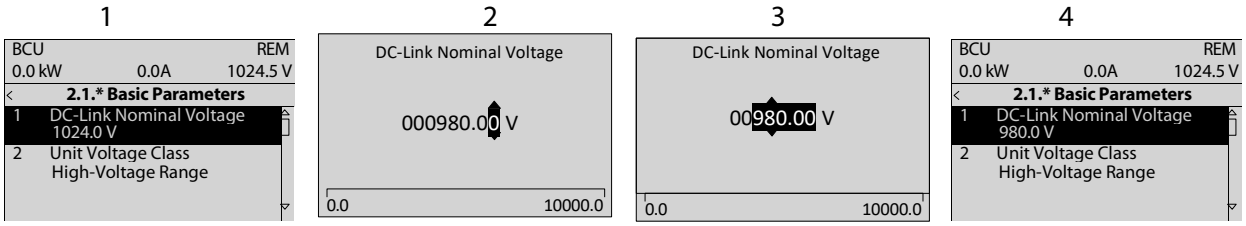


Figure 16: Changing the Value of a Parameter

3.2.3.8 Locking the Control Panel Display

To avoid unintended interaction via the control panel, the control panel display can be locked.

To lock the control panel, press the [Back] button for 3 s. After 3 s, the following screen is shown.

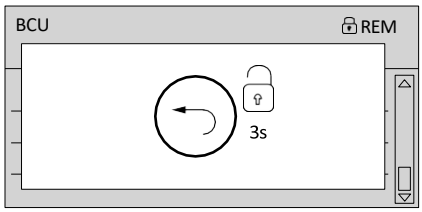


Figure 17: Control Panel Lock Screen

When the control panel is locked, pressing the control panel buttons has no effect.
To unlock the control panel, press the [Back] button for 3 s.

3.2.4 Control Panel Shortcuts

The following table lists shortcuts in navigating in the control panel.

Action	Precondition	Buttons	Activation Time
Fast scroll	When in a menu or list of choices	Up and down arrows	1 s to activate
Factory reset		Home + Back + down arrow	3 s to activate
Keypad lock		Back	3 s to activate or deactivate
Accessing DC-Link Voltage Limit (setpoint) editor	Local Control Active Home screen active	[OK]	<1 s to activate
Editing Home screen readouts	Home screen active	[OK]	5 s to activate
Editing the Menu Readout header	Any menu is active	[OK]	5 s to activate
Show active events	Home screen is active	Info	Single press
Adjusting screen contrast and brightness	Home screen is active	Info + arrows	Continuous simultaneous press

3.3 MyDrive® Insight

MyDrive® Insight is a platform-independent software tool that supports the commissioning, engineering, and monitoring of the iC7 series. Some of the key features include:

- Fast and easy configuration and commissioning.
- Monitor the converters as part of daily operations or any others.
- Collect data and information for troubleshooting, maintenance, and service.
- Discovery and access to multiple converters in a network.
- Intuitive user interface.
- Notifications and visualizations on real-time information and events about the converter.
- PC control to perform operations such as starting or stopping the converter, set references, set direction, reset, and coast of the converter.
- Perform updates on single or multiple converters.
- Backup and restore of parameter settings.
- Data logging and analyzing for troubleshooting.

NOTICE

The section is documented for MyDrive® Insight version 2.8.0 or above. Uninstall earlier versions of MyDrive® Insight from the workstation to utilize the latest MyDrive® Insight functions.

NOTICE

The section MyDrive® Insight in the application guide covers basic information such as getting started with MyDrive® Insight, accessing and viewing or changing the parameters, and PC control to operate the converter using MyDrive® Insight. For further information on the different MyDrive® screens, integrated help within MyDrive® Insight will be available in future releases.

NOTICE

The following figures and examples are from the iC7-Automation product. Thus, there are mentions of “iC7 Industry” and parameter and index references that do not apply in this application. However, all the principles do apply.

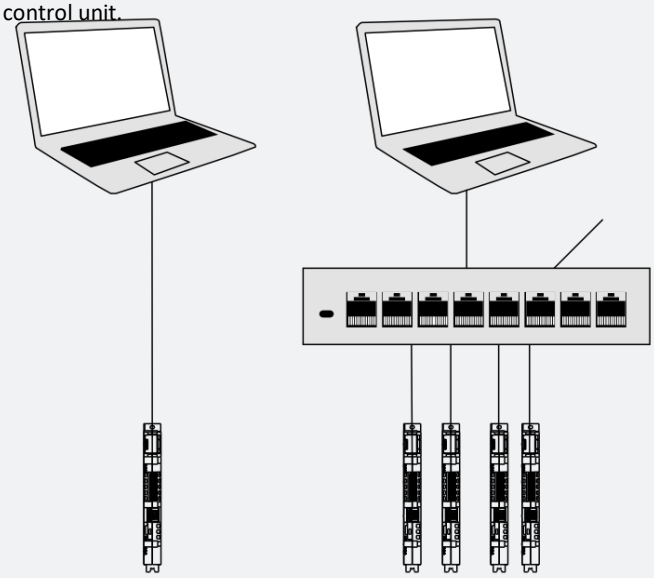
3.3.1 Getting Started with MyDrive® Insight

As a prerequisite, ensure that MyDrive® Insight is installed on the device (PC or laptop). MyDrive® Insight can be downloaded and installed from MyDrive® Suite, available here: https://suite.mydrive.danfoss.com/.

Procedure:

1. To establish a point-to-point connection between the converter and the device, use the communication interface X0 and the RJ45 Ethernet port on the device by using a standard Ethernet cable.

If the device does not have an RJ45 Ethernet port or it is already in use, then a conventional adapter from USB-C to RJ45 can be used. To connect several drives at the same time, use an Ethernet switch between the PC and the control unit.



A	Ethernet switch

Figure 18: Connection Between PC and Power Converter.

2. When the converter is powered up and in Ready state, open MyDrive® Insight on the device and the converter is recognized.

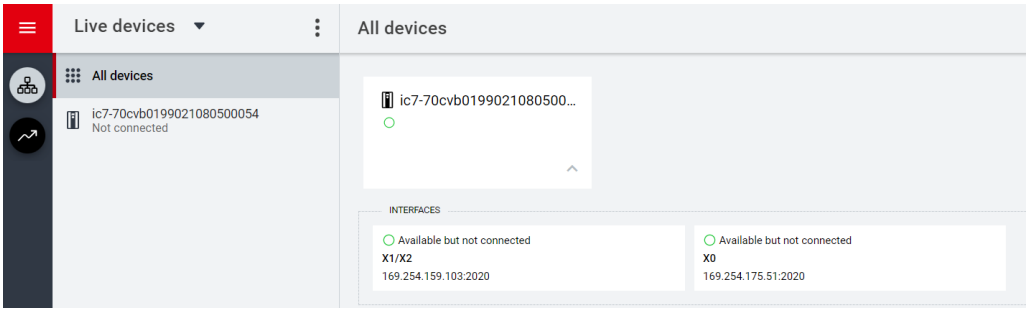


Figure 19: Confirm Connection in MyDrive® Insight.

3. To establish or confirm the connection, click the recognized converters.

☐ Once the connection is established, the drive is marked with a connection symbol (green color) in MyDrive® Insight, as shown.

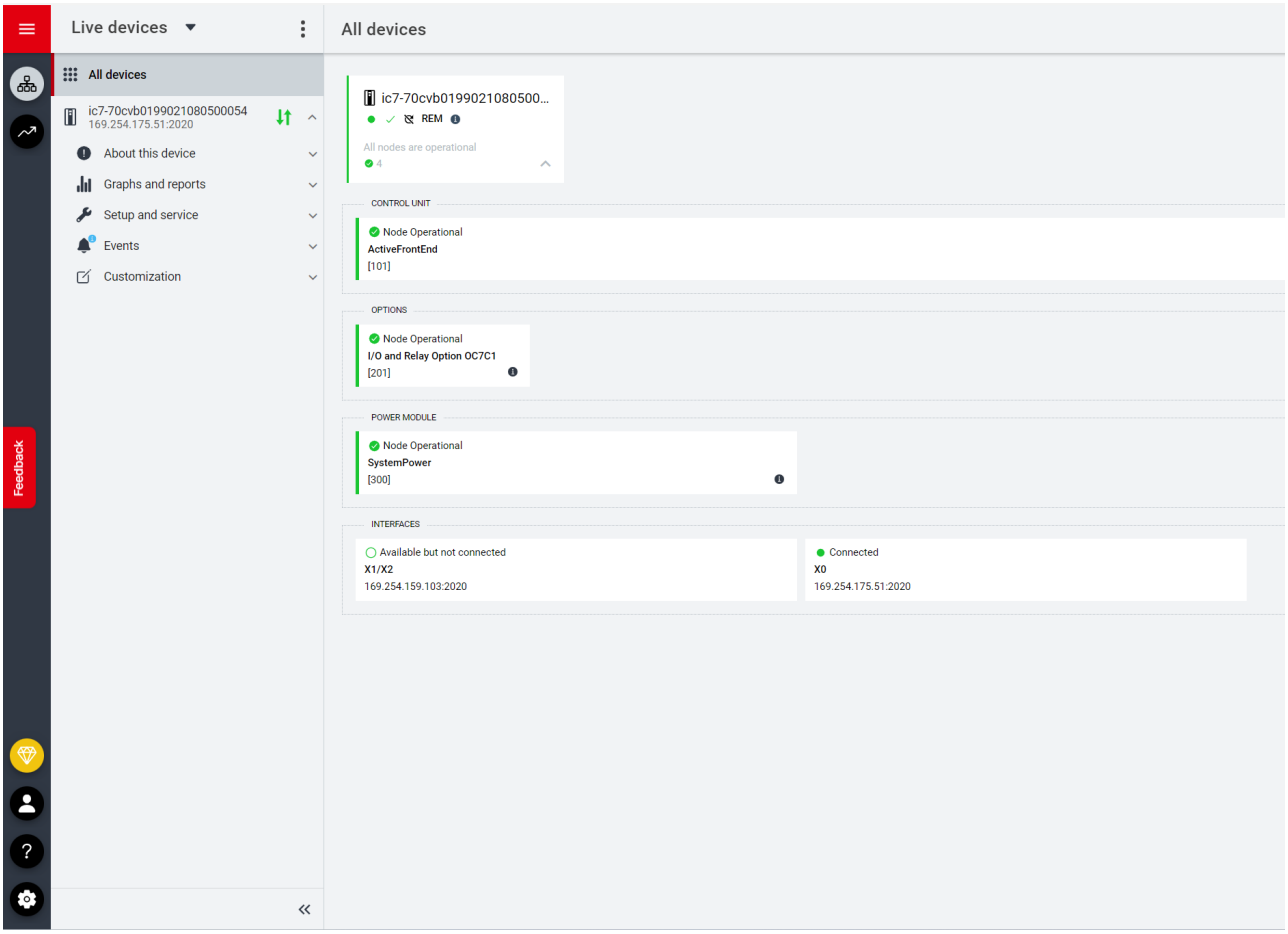


Figure 20: Establish Connection in MyDrive® Insight.

4. Select the required interaction for the converter. In this example, the Device Info (About this device) screen is shown.

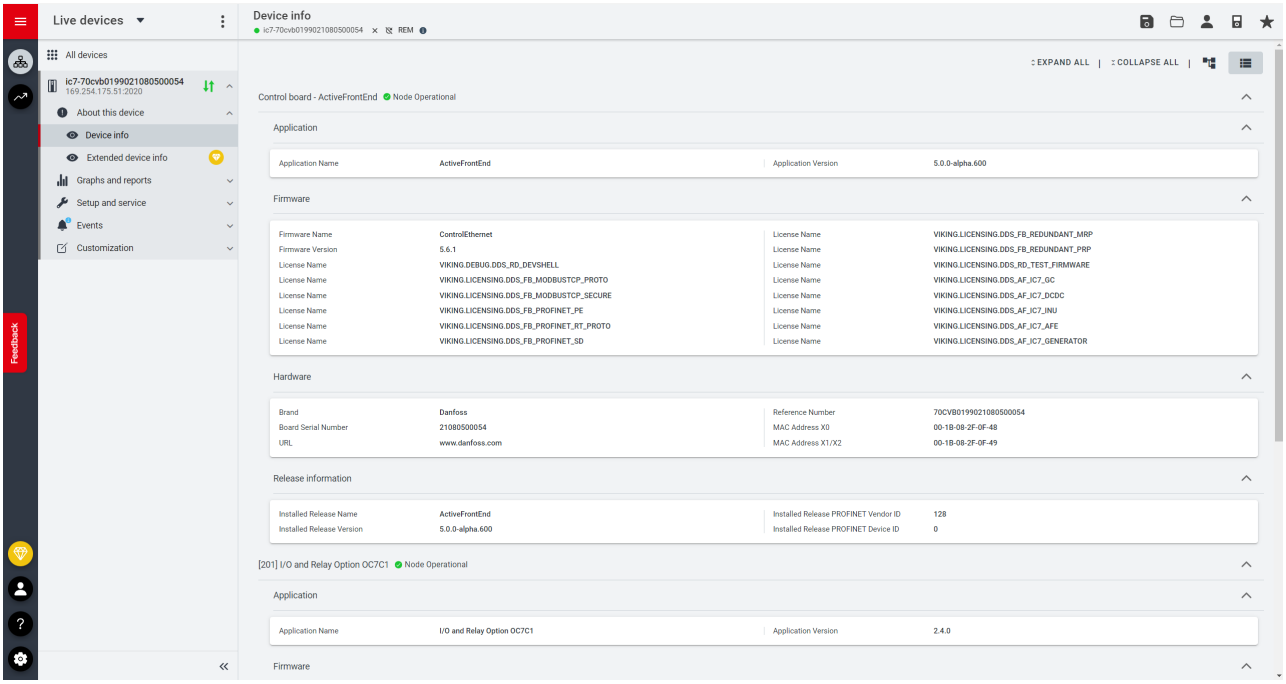


Figure 21: Device Info Screen in MyDrive® Insight.

NOTICE

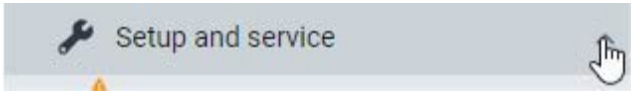
The application guide covers basic information such as accessing parameters and using the PC control in MyDrive® Insight.

3.3.2 Accessing Parameters and Understanding Parameter Screens in MyDrive® Insight

Viewing and Changing Parameters

1. To access the parameters of the connected converter, click Setup and Service.
2. Click Parameters → Live, as shown.

1



2

Figure 22: Setup and Service Tab in MyDrive® Insight.

Parameter Screen Overview

The following is an overview of the Parameters (Live) screen in MyDrive® Insight. The parameters and groups from the following examples are from the iC7 Industry application and they do not exist in the Active Front End application.

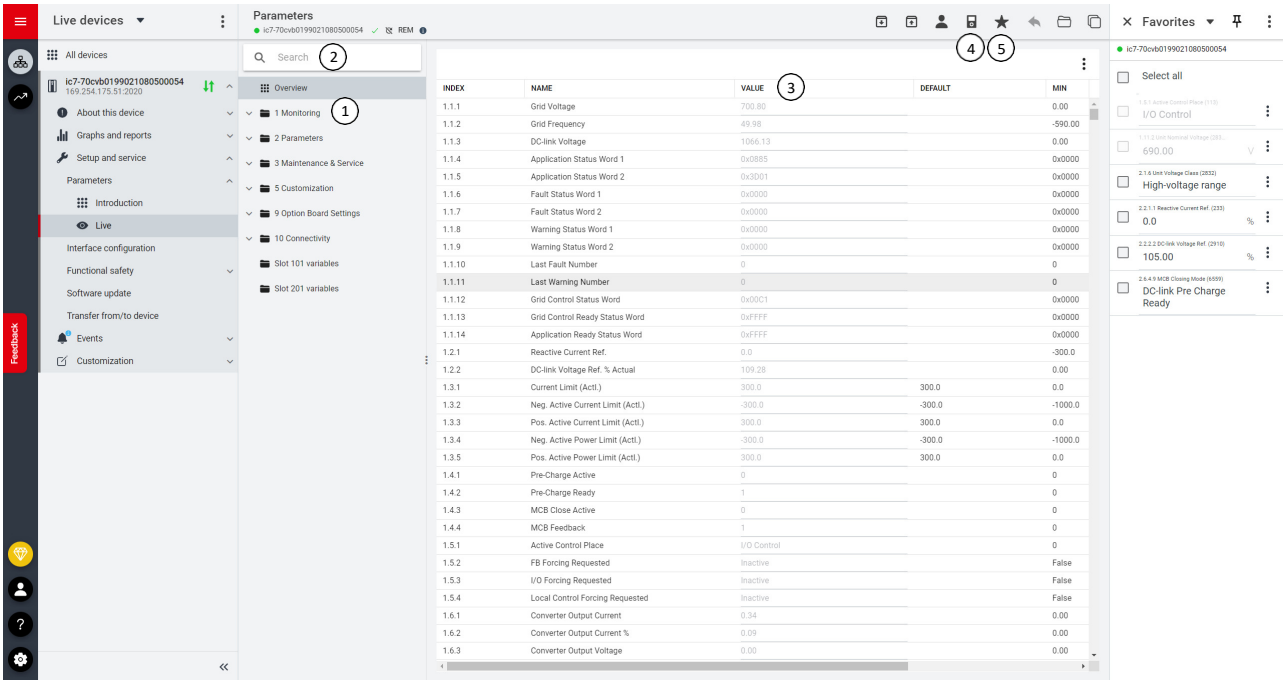


Figure 23: Parameters in the Live View in MyDrive® Insight.

Legend	Name	Description
1	Parameter group	Navigate through the different parameter groups in the converter.
2	Search field	Use the search function to find a specific parameter.
3	Value field	View and change a parameter value or selection. All the parameters for the converter are shown on the Live screen.
4	PC Control button	Switch to PC control to start or stop the converter using MyDrive® Insight.
5	Favorites	Select a parameter as a favorite by clicking the star in its row.

Navigate through different parameter groups

In the following figure, navigating to parameter subgroup 2.2.2 DC-Link Voltage Reference is shown as an example.

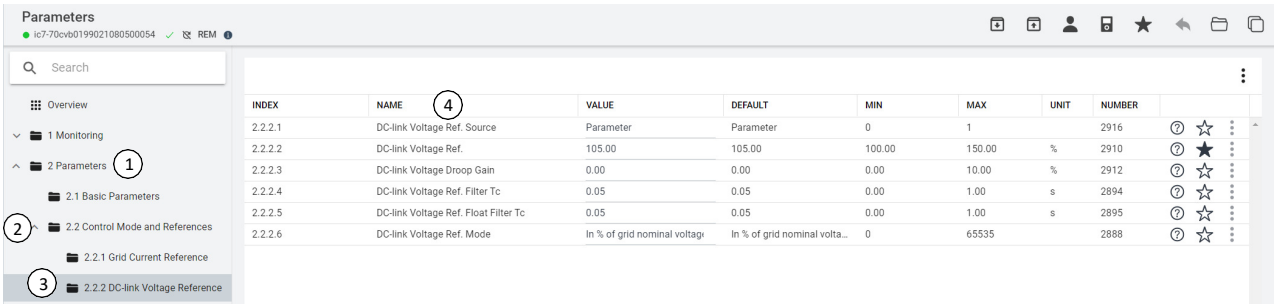


Figure 24: Parameter Group Navigation in MyDrive® Insight.

1. Click the parameter group (1) from the Live panel.
2. Click the parameter subgroup (2).

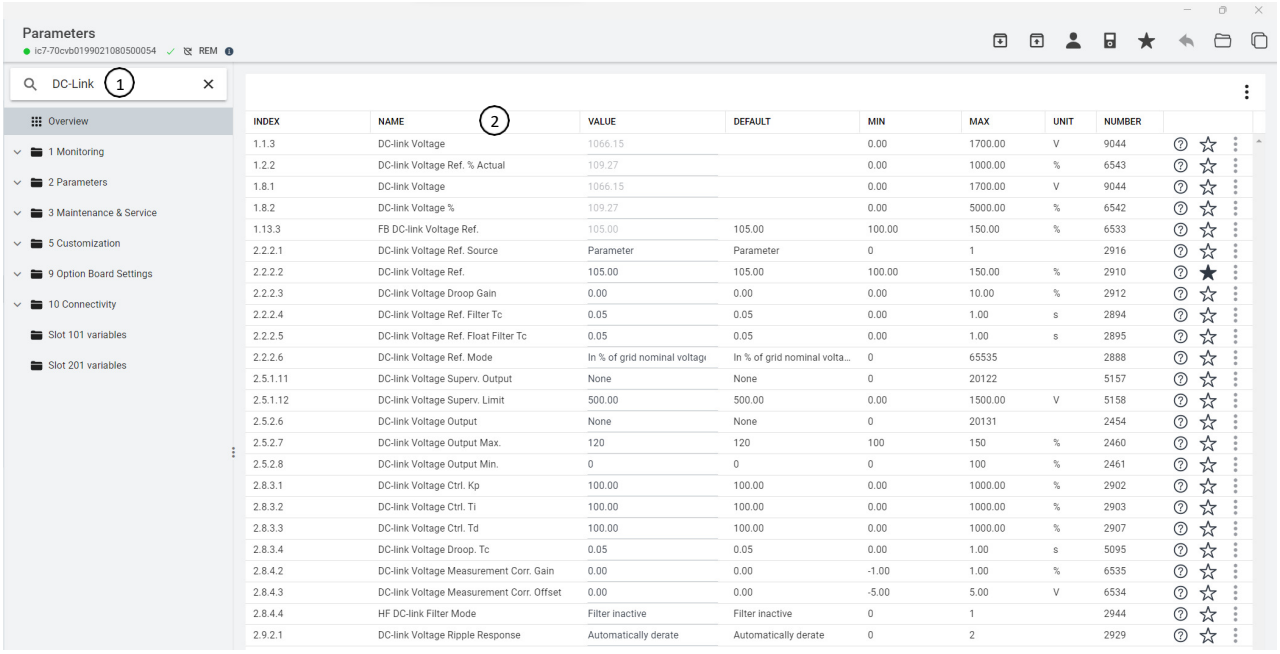
3. Repeat step 2, until the right level of parameter subgroup (3) is reached to find the specific parameters (4).

NOTICE

When in a specific parameter subgroup, only parameters relevant to the parameter subgroup can be accessed.

Searching for a specific parameter

In the Search field, type the search term. The search returns all parameters that have the search term in the name, index, or number. In the following example, all parameters with DC-Link (1) in the name are listed in the search results (2). In the example the Overview tab is activated, which leads the search to be conducted within all parameter groups. The search can also be conducted inside a specific group or subgroup by activating the wanted group.



INDEX	NAME	VALUE	DEFAULT	MIN	MAX	UNIT	NUMBER
1.1.3	DC-link Voltage	1066.15		0.00	1700.00	V	9044
1.2.2	DC-link Voltage Ref. % Actual	109.27		0.00	1000.00	%	6543
1.8.1	DC-link Voltage	1066.15		0.00	1700.00	V	9044
1.8.2	DC-link Voltage %	109.27		0.00	5000.00	%	6542
1.13.3	FB DC-link Voltage Ref.	105.00	105.00	100.00	150.00	%	6533
2.2.2.1	DC-link Voltage Ref. Source	Parameter	Parameter	0	1		2916
2.2.2.2	DC-link Voltage Ref.	105.00	105.00	100.00	150.00	%	2910
2.2.2.3	DC-link Voltage Droop Gain	0.00	0.00	0.00	10.00	%	2912
2.2.2.4	DC-link Voltage Ref. Filter Tc	0.05	0.05	0.00	1.00	s	2894
2.2.2.5	DC-link Voltage Ref. Float Filter Tc	0.05	0.05	0.00	1.00	s	2895
2.2.2.6	DC-link Voltage Ref. Mode	In % of grid nominal voltag	In % of grid nominal volta...	0	65535		2888
2.5.1.11	DC-link Voltage Superv. Output	None	None	0	20122		5157
2.5.1.12	DC-link Voltage Superv. Limit	500.00	500.00	0.00	1500.00	V	5158
2.5.2.6	DC-link Voltage Output	None	None	0	20131		2454
2.5.2.7	DC-link Voltage Output Max.	120	120	100	150	%	2460
2.5.2.8	DC-link Voltage Output Min.	0	0	0	100	%	2461
2.8.3.1	DC-link Voltage Ctrl. Kp	100.00	100.00	0.00	1000.00	%	2902
2.8.3.2	DC-link Voltage Ctrl. Ti	100.00	100.00	0.00	1000.00	%	2903
2.8.3.3	DC-link Voltage Ctrl. Td	100.00	100.00	0.00	1000.00	%	2907
2.8.3.4	DC-link Voltage Droop. Tc	0.05	0.05	0.00	1.00	s	5095
2.8.4.2	DC-link Voltage Measurement Corr. Gain	0.00	0.00	-1.00	1.00	%	6535
2.8.4.3	DC-link Voltage Measurement Corr. Offset	0.00	0.00	-5.00	5.00	V	6534
2.8.4.4	HF DC-link Filter Mode	Filter inactive	Filter inactive	0	1		2944
2.9.2.1	DC-link Voltage Ripple Response	Automatically derate	Automatically derate	0	2		2929

Figure 25: Parameter Search in MyDrive® Insight.

Viewing and Changing Parameter Settings

When in a specific parameter group, all parameters related to the parameter group are shown. Depending on the access type of the parameter, there is a possibility to view the parameter setting or change the current selection or value of the parameter.
In the following picture, parameter group 4 Motor is shown as an example.

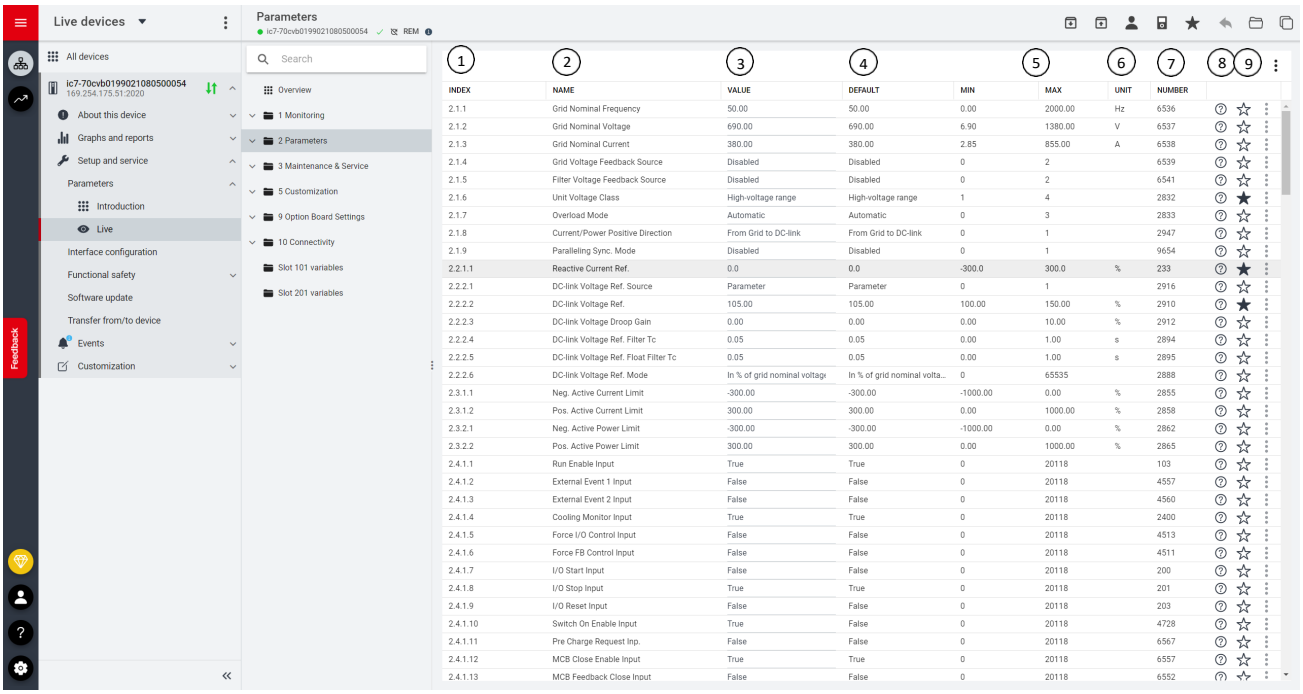


Figure 26: Parameter Overview in MyDrive® Insight.

Legend	Name	Description
1	Index	Based on the parameter group structure, the index defines the location of the parameter. The index is not used as a unique identifier of a parameter.
2	Name	Name of the parameter.
3	Value	The current values of the parameters. The values can be edited by clicking the values in the value field.
4	Default	The factory setting (default value) of the parameter.
5	Min and Max	When applicable, the minimum and maximum values of the parameter are shown in the Min and Max fields.
6	Unit	When applicable, the unit of the parameter is shown in the Unit field.
7	Number	The unique identifier for each parameter. The identifier is independent and decoupled from the parameter index values.
8	Help	Click the "?" button to see a description about the parameter. For more detailed descriptions, see chapter 7 Parameter Descriptions of this guide.
9	Favorites (star)	Clicking the Favorites icon adds the parameter to the Favorites tab.

3.3.3 PC Control to Operate the Converter Using MyDrive® Insight

To operate the converter using PC control, click the Control Panel button in MyDrive® Insight. The following illustration shows the different screens to operate the converter via MyDrive® Insight.

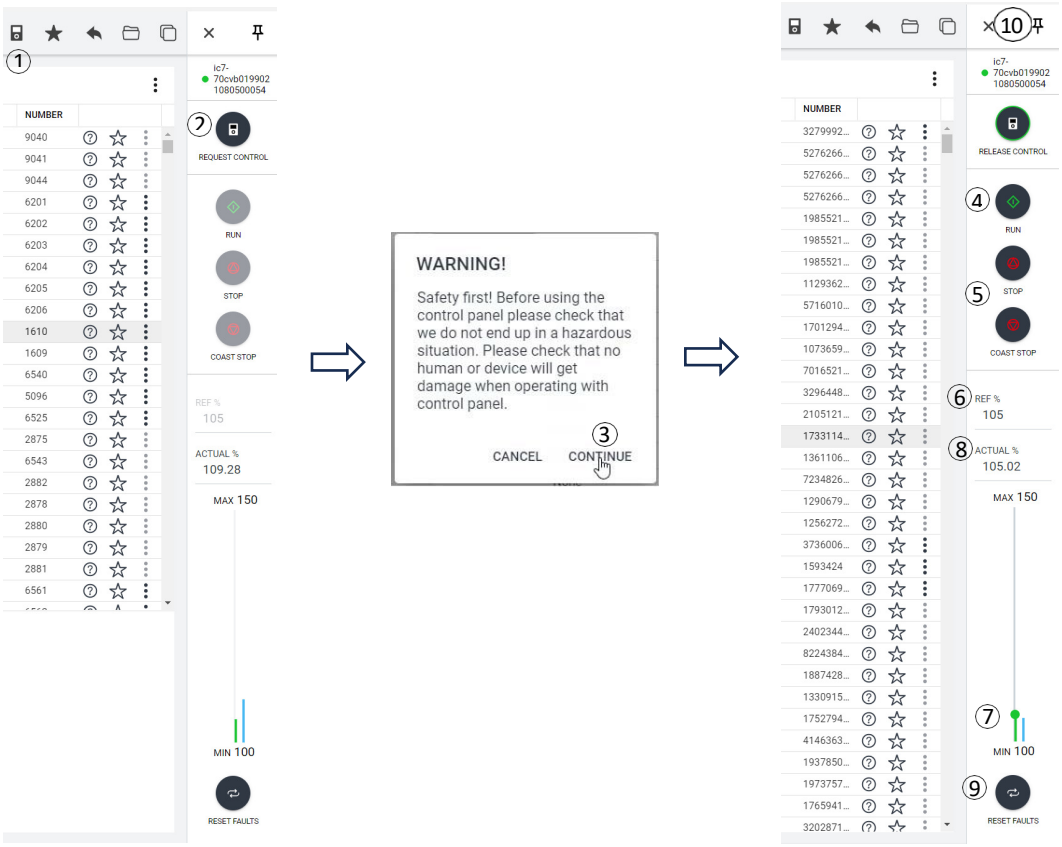


Figure 27: Operating the Converter with MyDrive® Insight.

To access PC Control in MyDrive® Insight and operate the converter, perform the following:

1. Activate the PC control window by pressing the icon in the task bar (1).
2. Click REQUEST CONTROL button (2).
3. Click Continue (3) to confirm secure operational conditions while controlling the converter using MyDrive® Insight.
4. Use the RUN button (4) to request a converter start. Use the STOP or COAST STOP buttons (5) to request the converter to stop. Note! If COAST STOP is performed, PC control must be released, or the main circuit breaker must be opened, to restart the converter in PC control.
5. Use the REF field (6) or the reference slider (7) to adjust the DC-Link Voltage reference. The actual value of the DC-Link Voltage can be monitored from the ACTUAL field (8) or from the blue indicator bar next to the reference slider.
6. To perform a fault reset, click RESET FAULTS (9).
7. For ease of access, click the Pin button (10) to make the control panel be constantly visible on the screen.

3.3.4 Datalogger

The datalogger in MyDrive® Insight enables the monitoring of signals and related information for the selected signals. To access the Datalogger feature, select the converter (1), then go to Graphs and Reports (2) → Datalogger (3).

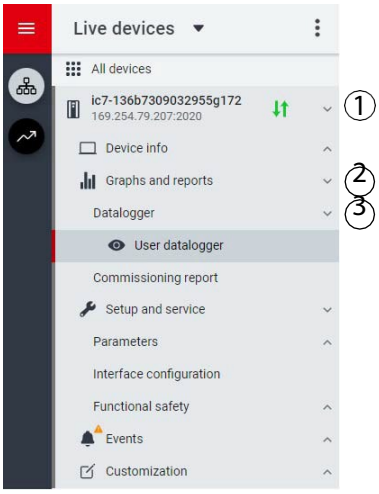


Figure 28: Navigation to the Datalogger in MyDrive® Insight.

The following figure shows the Datalogger main controls.

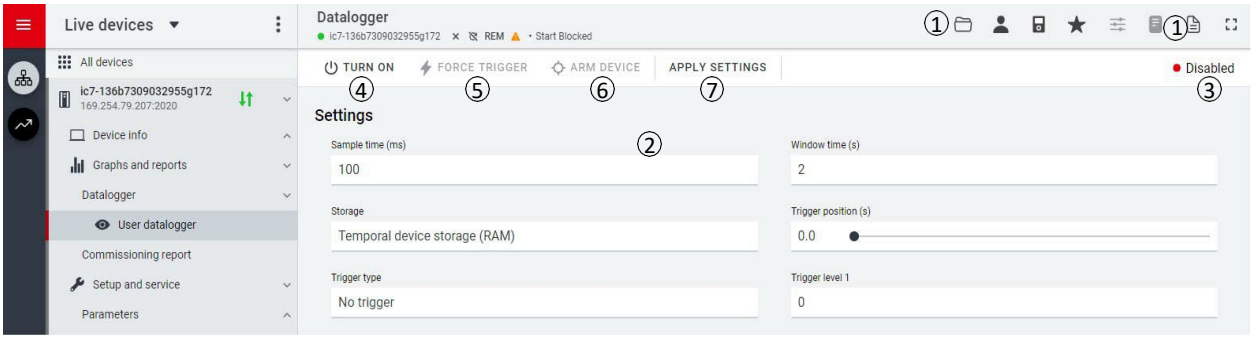


Figure 29: Datalogger Screen in MyDrive® Insight.

Legend	Description
1	Opens the window to select available Datalogger files for viewing.
2	Shows the list of Datalogger settings.
3	Shows the Datalogger status.
4	Enables or disables Datalogger. When disabled, all Datalogger configuration settings are inactive. When enabled, Datalogger is active and operates based on the configuration settings.
5	Activates the force trigger. The 0 – 1 transition (rising edge) triggers Datalogger manually. This function is typically used with automatic triggers.
6	Arms Datalogger. The 0 – 1 transition (rising edge) readies Datalogger for triggering.
7	Applies any changed settings.

3.3.4.1 Configuring Datalogger

To configure the datalogger, the following are the 2 main steps:

- Configure the signals to be recorded using the datalogger.
- Configure the datalogger settings.

Procedure:

1. Open Datalogger.

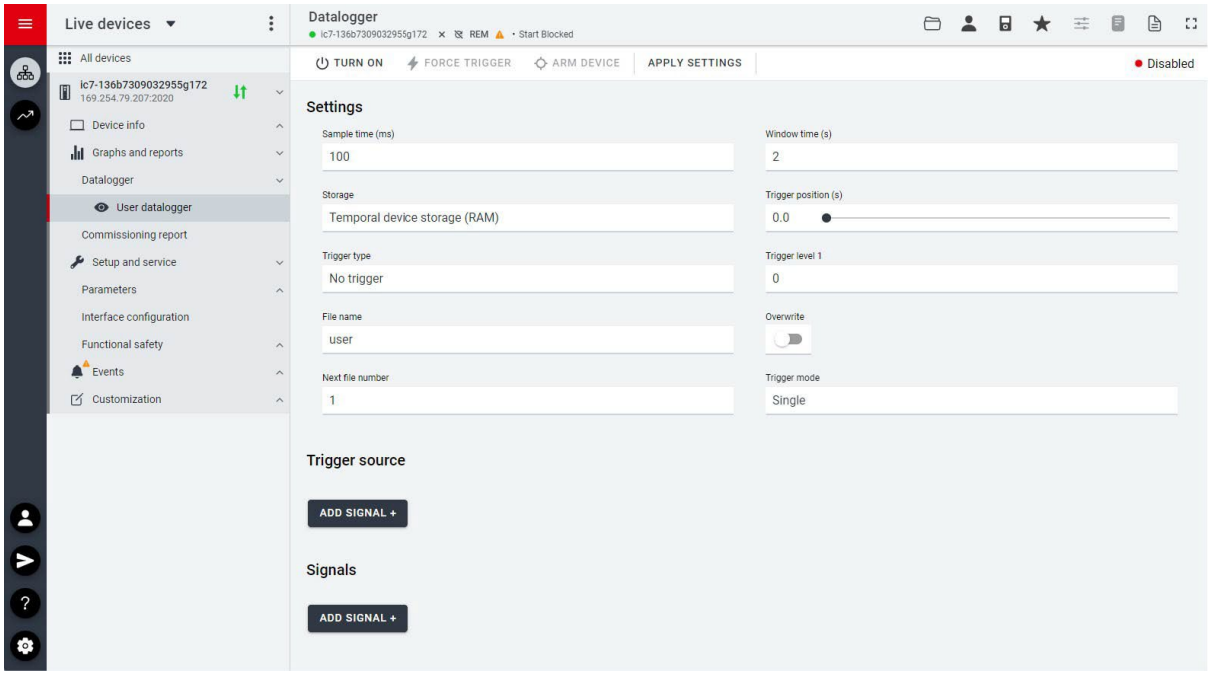
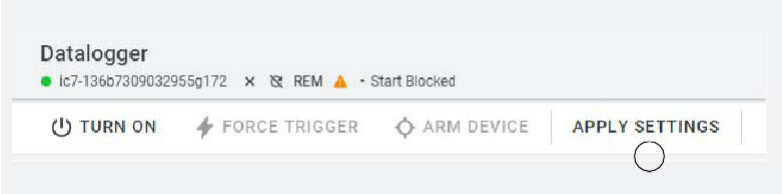


Figure 30: Datalogger Settings.

Field name	Field Description
Sample time (ms)	Enter a sample time in ms. The actual sample time depends on the switching frequency. Fast sample rate settings result in data changing slowly in the resulting log.
Window time (s)	Defines the size of the capture window. Enter the window time in seconds. High sample rates and large capture times that result in large capture files may be rejected when the configuration is applied.
Storage	Select the location to which datalogger files are stored. The selections are: • RAM: Settings are stored to the RAM of the converter. • Flash: Settings are stored to the flash of the converter. • SD card: Data is stored on the (optional) microSD card. The microSD cards supported are SD, SDHC, or SDXC which must be formatted for the FAT32 file system. SDHC is the recommended type, as they are delivered preformatted to FAT32.
Trigger position (s)	Adjust the slider to position the trigger. Setting the trigger position to 0 indicates the datalogger recording starts at the time of the trigger. Setting a negative value indicates that the datalogger recording starts after the trigger has occurred. Setting a positive value indicates that the datalogger recording starts before the trigger has occurred.

Field name	Field Description
Trigger type	Following are the trigger types: • No trigger (manual trigger only) • Equal triggers when the value of the trigger source variable is equal to trigger level 1. • Not equal triggers when the value of the trigger source variable is not equal to trigger level 1. • Greater than triggers when the value of the trigger source variable is greater than trigger level 1. • Greater than or equal to triggers when the value of the trigger source variable is greater than or equal to trigger level 1. • Less than triggers when the value of the trigger source variable is less than trigger level 1. • Less than or equal to triggers when the value of the trigger source variable is less than or equal to trigger level 1. • Rising edge triggers when the value of the trigger source variable rises above trigger level 1. If the trigger source is already above trigger level 1, the trigger must first drop below the trigger level. • Falling edge triggers when the value of the trigger source variable falls below trigger level 1. If the trigger source is already below trigger level 1, the trigger must first rise above the trigger level.
Trigger level 1	Defines the trigger level associated with the defined trigger type. This level is used for all single-level trigger types. The entry in the field defines the lower trigger level for window trigger types, such as bounds and out of bounds.
File name	Name of the file for datalogger recording.
Overwrite	Click the toggle button to turn the overwrite function on or off. • On: Overwrite is enabled. A file number is not appended to the data log file. The datalogger overwrites a previous datalog file. • Off: Overwrite is disabled. A file number is appended to the log file. For each datalog, the datalog file is Incremented and the previous datalog file is not overwritten.
Next file number	The number entered in this field is appended to the initial datalog file. Entry in the field is useful when data- logs are previously available in the converter. The number is auto incremented with each datalog recording when the entry in Next file number is enabled.
Trigger mode	Select 1 of the following trigger modes. • Single trigger mode: After a datalog recording, the datalogger must be rearmed before another trigger is allowed. • Auto trigger mode: After a datalog recording, the datalogger automatically rearms and starts to accept triggers.
Trigger source	Click the Add signal button under the Trigger source heading. A Trigger source field appears. Click the Trigger source field to select the signal source which is used for triggering the datalogger recording. The trigger source list opens in a new window:
Signals	Click the Add signal button under the Signals heading. A Signal field appears. Click the Signal field to select the signals that are logged. The signal list opens in a new window. Add more signals as necessary by clicking the *Add signal* button again.

2. Click Apply Settings.



After the signal selection and the datalogger settings, the datalogger is ready to record the logs. To view a recorded datalog file, click either one of the icons shown in the figure. The file can be selected from the Captures tab or from the selected file system.

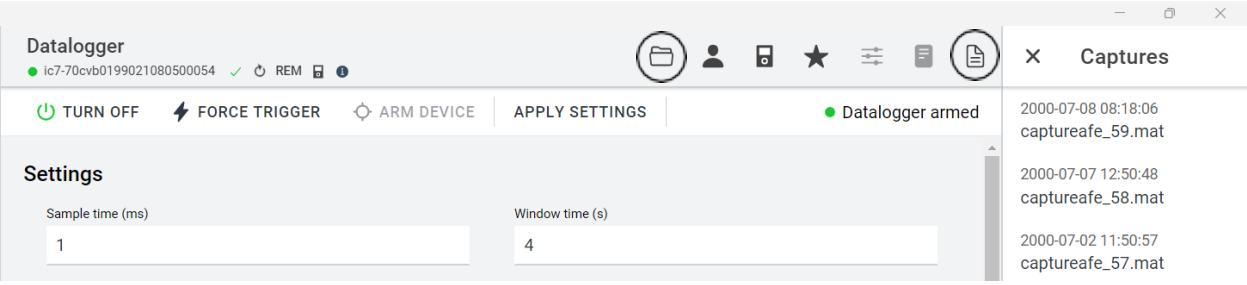


Figure 31: Datalogger Log File Viewing Possibilities.

3.3.5 Backup and Restore

The Backup feature in MyDrive® Insight enables the storing of the parameter settings of the converter into a new or existing project file, RAM, or Flash memory of the converter, or to an optional microSD card.

To use the microSD card as a storage device, the microSD card must be inserted in the slot on the interface module located behind the control panel, as shown in the following image.

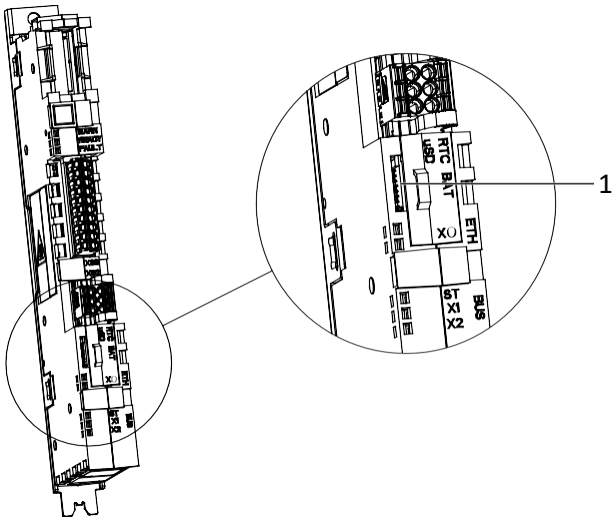


Figure 32: MicroSD Card Slot.

Legend	Description
1	The microSD card slot

Following are the types of microSD card supported by the interface module, which must be formatted for the file system FAT32.

- Secure Digital (SD) card
- Secure Digital High Capacity (SDHC)
- Secure Digital Extended Capacity (SDXC)

NOTICE

SDHC cards are recommended, as they are delivered preformatted to FAT32.

3.3.5.1 Backing up the Converter

Procedure

1. To back up the converter, select a converter, go to Setup & Services → Parameters → Live.
2. Click the icon as shown in the figure.

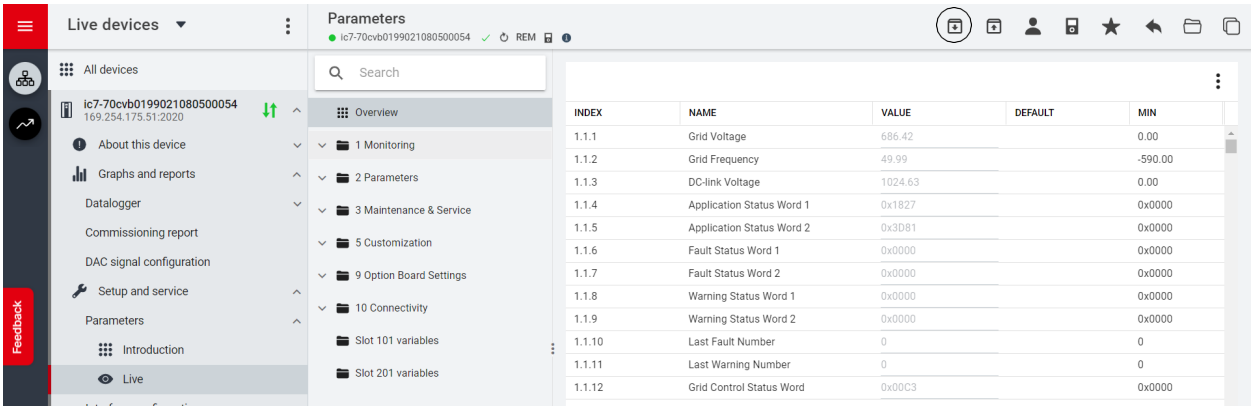


Figure 33: Backup Icon.

☐ This opens a screen to select the backup destination. The destinations to back up are:

- **Project:** The user can back up an existing project or a new project.
- **Device file system:** The user can back up to 1 of the available memory devices of the drive.

3. Click Next.
4. If Project was selected, give the backup file a name and description.
   If Device file system was selected, select where to save the backup. The selections are flash, RAM, or an (optional) microSD card. It is possible to specify a name for the backup file as well.
5. Click Backup to begin backup.

☐ Once backup is completed, a notification screen about it appears. If a project file was created, the backup is shown in the device menu under Parameters.

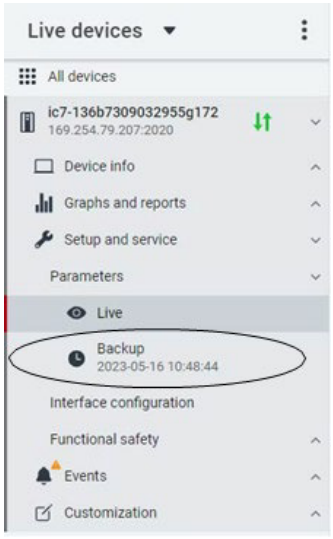


Figure 34: Backup File.

3.3.5.2 Restoring the data into the Converter

Procedure

1. To restore data to the converter, select a converter, go to Setup & Service → Parameters → Live.
2. Click the icon as shown in the following figure.

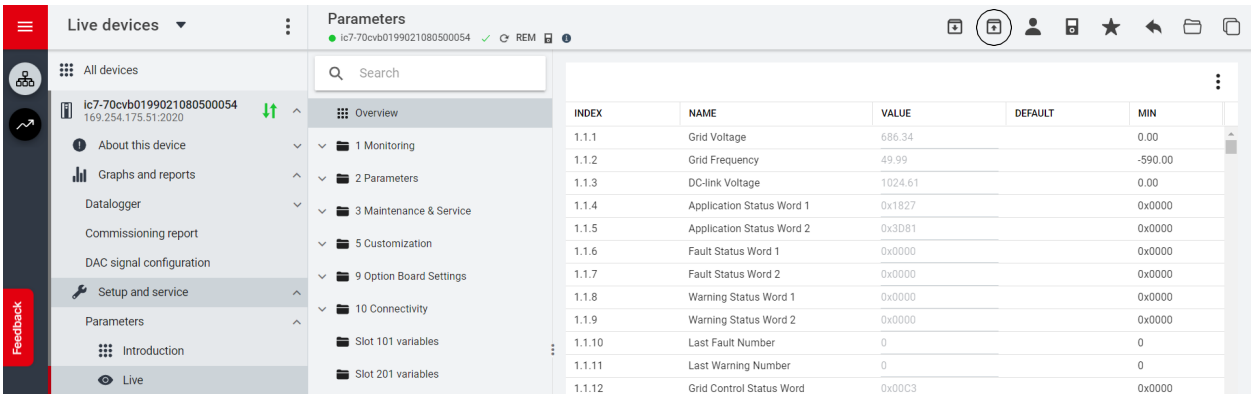


Figure 35: Restore Data Icon.

3. Select the source of the data which must be restored to the converter.

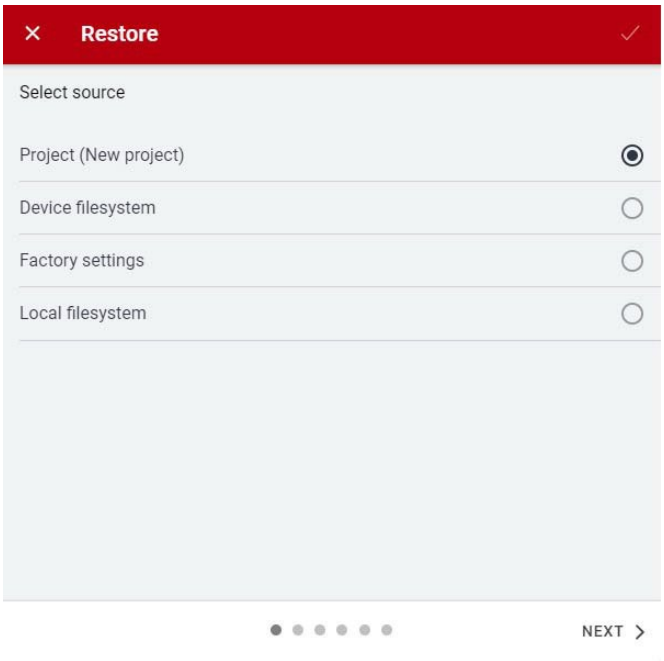


Figure 36: Source of the Data to be Restored.

4. Click Next to select the backup source device and view the available backup files.
5. If Project is the restore source, select the correct backup to restore. Click Next.

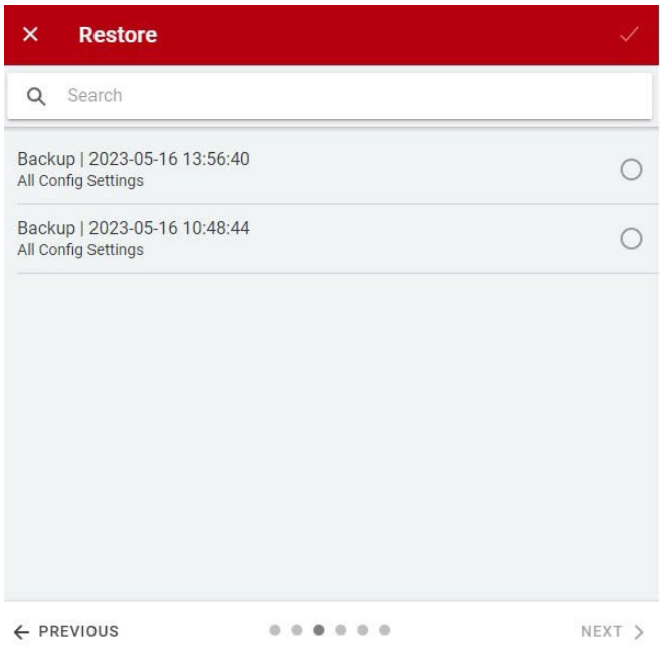


Figure 37: Backup File Selection.

6. Select the files for restoring data into the converter, as shown in the following figure, and click Next.

NOTICE

It is possible to exclude Ethernet port settings when restoring data.

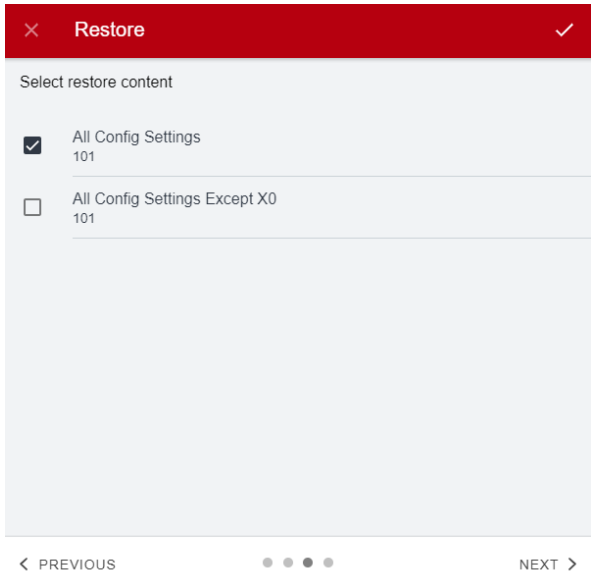


Figure 38: Restore Content Selection.

7. The system asks for confirmation of the restore action. Click Restore.

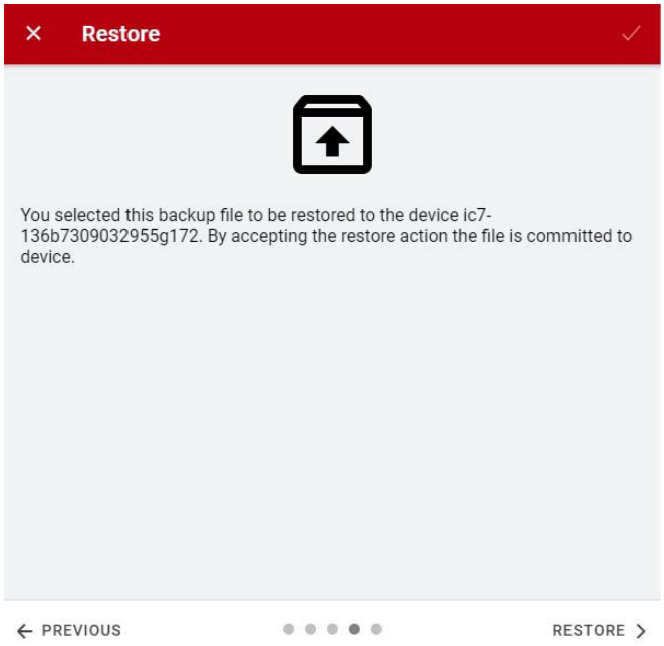


Figure 39: Restore Confirmation.

☐ On successful restore of data, a message is displayed.

4 Application Software Structure and Overview

4.1 Parameter Groups, Related Content, and Settings

The detailed structure and hierarchy within the parameter groups can vary, depending on the purpose of the parameter group and the total number of parameters. However, the design principle of the structure is to keep the overall sequence while commissioning or setting up the converter, within a logical structure.

- All readouts for monitoring the converter and the application behavior are in group ***1 Monitoring***.
- Most of the converter configuration, application-specific parameters, and the configuration of external control signals are accessed via parameter group ***2 Parameters***.
- Features and functions such as Maintenance & Service, Functional Safety, and Device Settings are in parameter groups ***3***, ***4***, and ***5***.
- The hardware setup for I/O interface, Options, and communication interfaces is done in parameter groups ***9*** and ***10***.
- The features and related parameters are grouped in individual parameter groups. Each feature has a parameter group of its own.
- The visibility of some parameters and parameter groups depend on the converter hardware used.

The following table provides information about the parameter groups.

Index	Parameter group name	Description
1	Monitoring	Contains readout values for monitoring converter and application functions.
2	Parameters	Contains parameters for configuring most of the functions of the converter.
3	Maintenance & Service	Contains parameters exclusively related to software information, events, counters, and backup & restore and expert tools.
4	Device Settings	Contains parameters to customize and adapt the behavior of the converter and user interface design.
9	Option Board Settings	Contains hardware-related parameters to configure option board related settings.
10	Connectivity	Parameters to configure the built-in and optional communication of the converter system.

Parameter Group 1st level	Parameter Group 2nd level	Parameter Group 1st level	Parameter Group 2nd level	Parameter Group 1st level	Parameter Group 2nd level
1. Monitoring	1.1 Basic Monitoring	2. Parameters	2.1 Basic Parameters	3. Maintenance & Service	3.1 Software Information
	1.2 Control Place Monitoring		2.2 DC-Link Voltage Limit Settings		3.2 Events
	1.3 Converter Output Monitoring		2.3 Digital and Analog Inputs		3.3 Operational Counters
	1.4 Converter Control Monitoring		2.4 Digital and Analog Outputs		3.4 Backup and Restore
	1.5 Protection Monitoring		2.5 Start and Stop Settings		3.5 Expert Tools
	1.6 Power Unit Monitoring		2.6 Control Places	4 Device Settings	4.1 Control Panel
	1.7 Cooling Fan Monitoring		2.7 Converter Control		4.2 Date & Time
	1.8 Fieldbus Process Data Monitoring		2.8 Protections and Responses		
	* System-specific option board monitoring			9. Option Board Settings	*System Specific Menu Content
				10. Connectivity	Integrated Communication

5 Configuration Examples

5.1 Introduction and Prerequisites

This section covers the basic configuration steps of a Brake Chopper Unit (BCU) converter. The specific application may require more steps such as protection settings. Use the following topics as reference during the converter configuration/commissioning process:

- For control panel related configurations, see chapter *3.2.3 Control Panel Basic Configurations*.
- For information on using MyDrive® Insight, see chapter 3.3.1 *Getting Started with MyDrive® Insight*.
- For detailed information about the parameters, see chapter *6 Parameter Lists and 7 Parameter Descriptions*.

The following examples assume that the BCU unit is connected to a drive system where the nominal DC-link voltage is 980 V DC.

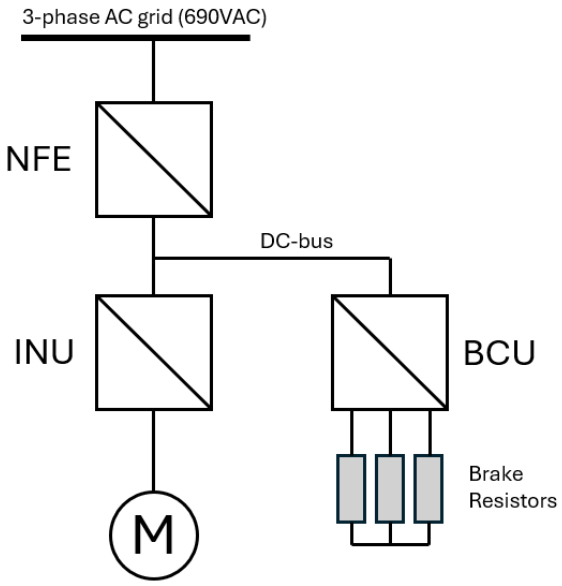


Figure 40: Principal Example of a Drive System, Including the BCU Unit.

Prerequisite:

NOTICE
Ensure that the converter is mounted safely as described in the relevant Operating Guide.

5.2 Basic Setup of the Converter

The basic setup of the converter consists of the following configuration steps.

1. Configuring the power unit settings.
2. Configuring the I/O control place and its command inputs.
3. Configuring readouts in the control panel.

Procedure:

1. Configure the power unit settings using the following parameters.

Index	Parameter Name	Example Setting	Parameter Number
2.1.2	Unit Voltage Class*	High Voltage Range	2832
2.1.1	DC-Link Nominal Voltage	980.0 V	2834

***Note:** The recommended voltage values for the selections depend on the converter type, size, and other such considerations. For example, for T7 units (525–690 V AC):

- Low Voltage Range: 525–550 V
- Medium Voltage Range: 550–600 V
- High Voltage Range: 600–690 V
- Wide Voltage Range: 525–690 V

2. Configure the control place and command inputs.

Index	Parameter Name	Example Setting	Parameter Number
2.6.1.1	Control Place Selection	I/O Control	114
2.6.3.1	I/O Start Input	I/O and Relay T13 Digital Input	200
2.6.3.4	I/O Start Mode	State High Start	213

3. Configure the readouts in the control panel. See chapter *3.2.3.3 Changing the Content of the Readout Screens*.

5.3 Set Up the DC-link Voltage Limit

The DC-Link Voltage Limit defines the DC-link voltage level where the Brake Chopper Unit (BCU) starts to feed excessive energy from the DC link to the brake resistor.

Procedure:

1. Set a DC-link voltage level.

Index	Parameter Name	Example Setting	Parameter Number
2.2.1	DC-link Voltage Limit Source	Parameter	2916
2.2.2	DC-link Voltage Limit %	112.0%	2910

5.4 Set Up Brake Resistor Monitoring

Brake Chopper Unit (BCU) can be configured to monitor the state and the presence of the brake resistor. If the brake resistor is disconnected or damaged during operation, the drive issues a fault.

Procedure:

1. Activate the Brake Resistor Test Pulse functionality

Index	Parameter Name	Example Setting	Parameter Number
2.8.7.1	Brake Resistor Test Pulse Mode	Periodically When Running	4202

6 Parameter Lists

6.1 How to Read Parameter Lists

The following chapters contain tables presenting the basic attributes of each parameter available in the application software. Each subchapter represents a single subgroup within the menu structure.

The tables have the following format:

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.2.3.4.5	Parameter Name	1234	-10.0[1]	10.0[1]	0.0	Hz	0.01	Config	REAL
6.7.8	Array Parameter Name	5678	0	5	[1,2]		1	Config	UINT

[1]: Value depends on the power unit specification.

- Index: shows the location of the parameter within the menu structure.
- Name: shows the parameter name.
- Num: shows the parameter number.
- Min: shows the minimum value that the parameter can have. For arrays, the single given value applies to all array elements.
- Max: shows the maximum value that the parameter can have. For arrays, the single given value applies to all array elements.
- Default: shows the value that the parameter has with factory default settings. For arrays, each element value is shown comma-separated within square brackets.
- Unit: shows the unit symbol of the parameter. Nothing is shown if the parameter is unitless.
- Reso: shows the resolution or display/edit precision of the parameter.
- Handling Type: shows whether the converter handles the parameter as a constantly changing *process* value or an infrequently changed *config(uration)* value. Use this field as a guide for evaluating how often to write to parameters when creating custom fieldbus configurations.
- Data type: shows the IEC 61131 elementary data type of the parameter.
- Possible references within any field signify special conditions that are explained after the table.

6.1.1 Understanding Data Types

The following is an overview of the data types used in the iC7 application software. They are IEC 61131 elementary data types.

Data type	Description	Size (Bits)	Range
BOOL	Boolean	1	0…1
INT	Integer	16	-32,768...32,767
DINT	Double Integer	32	-2,147,483,648 up to 2,147,483,647
USINT	Unsigned short integer	8	0 up to 255
UINT	Unsigned integer	16	0 up to 65,535
UDINT	Unsigned double integer	32	0 up to 4,294,967,295

Data type	Description	Size (Bits)	Range
REAL	Real numbers	32	-3.402823466 E+38 (approximately 7 digits) up to -1.175494351E-38 (approximately 7 digits) and +1.175494351 E-38 (approximately7 digits) up to +3.402823466 E+38 (approximately 7 digits)
WORD	Bit string of length 16	16	0...65,535 (16#00...16#FFFF)
STRING	Sequence of characters	N/A	1 Byte per character
ULINT	Unsigned long integer	64	0–18446744073709551615
DATE_AND_TIME	Date and time information	64	N/A

6.2 Monitoring

6.2.1 Basic Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.1.1	DC-link Voltage	9044	0.00	3.4e+38	0.0	V	0.01	Process	REAL
1.1.2	DC-link Voltage %	6542	0.00	5000.00	0.0	%	0.01	Process	REAL
1.1.3	DC-link Voltage Limit Final %	2955	100.00	150.00	0.0	%	0.01	Process	REAL
1.1.4	DC-link Power	5117	-3.4e+38	3.4e+38	0.0	kW	0.01	Process	REAL
1.1.5	Application Status Word	6201	0x0	0xffff	0x0		1	Process	WORD
1.1.6	Fault Status Word 1	6203	0x0	0xffffffff	0x0		1	Process	DWORD
1.1.7	Fault Status Word 2	6204	0x0	0xffffffff	0x0		1	Process	DWORD
1.1.8	Warning Status Word 1	6205	0x0	0xffffffff	0x0		1	Process	DWORD
1.1.9	Warning Status Word 2	6206	0x0	0xffffffff	0x0		1	Process	DWORD
1.1.10	Last Fault Number	1610	0	65535	0		1	Process	UINT
1.1.11	Last Warning Number	1609	0	65535	0		1	Process	UINT
1.1.12	BCU Status Word	4200	0x0	0xffff	0x0		1	Process	WORD
1.1.13	BCU Ready Status Word	4201	0x0	0xffff	0x0		1	Process	WORD

6.2.2 Control Place Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.2.1	Active Control Place	113	0	3	0		1	Process	UINT
1.2.2	FB Forcing Requested	116	0	1	0		1	Process	BOOL
1.2.3	I/O Forcing Requested	117	0	1	0		1	Process	BOOL
1.2.4	Local Control Forcing Requested	124	0	1	0		1	Process	BOOL

6.2.3 Converter Output Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.3.1	Converter Output Current	9000	0.0	3.4e+38	0.0	A	0.01	Process	REAL
1.3.2	Converter Output Current %	9001	0.0	200.0	0.0	%	0.01	Process	REAL
1.3.3	U-phase RMS Current	9020	0.0	3.4e+38	0.0	A	0.01	Process	REAL
1.3.4	V-phase RMS Current	9021	0.0	3.4e+38	0.0	A	0.01	Process	REAL
1.3.5	W-phase RMS Current	9022	0.0	3.4e+38	0.0	A	0.01	Process	REAL
1.3.6	Converter Output Voltage	9005	0.0	3.4e+38	0.0	V	0.01	Process	REAL
1.3.7	Converter Output Voltage %	9006	0.0	200.0	0.0	%	0.01	Process	REAL
1.3.8	Converter Output Electrical Power	9043	0.00	3.4e+38	0.0	kW	0.01	Process	REAL

6.2.4 Converter Control Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.4.1	Control Unit Temperature	2952	-50.0	200.0	0.0	°C	0.01	Process	REAL

6.2.5 Protection Monitoring

6.2.5.1 Measured Temp. Protection Status

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.5.1.1	Protection 1 Temp.	5200	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.2	Protection 2 Temp.	5201	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.3	Protection 3 Temp.	5202	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.4	Protection 4 Temp.	5203	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.5	Protection 5 Temp.	5204	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.6	Protection 6 Temp.	5205	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.7	Protection 7 Temp.	5273	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.8	Protection 8 Temp.	5274	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.9	Protection 9 Temp.	5275	-300.0	300.0	0.0	°C	0.01	Process	REAL
1.5.1.10	Protection 10 Temp.	5276	-300.0	300.0	0.0	°C	0.01	Process	REAL

6.2.6 Power Unit Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.6.1	Power Capacity	2836	0.0	100.0	100.0	%	1	Process	REAL
1.6.2	Unit Nominal Voltage	2830	0.0	3.4e+38	400.0	V	0.01	Config	REAL
1.6.3	Unit Nominal Current	2831	0.0	3.4e+38	23.0	A	0.01	Config	REAL
1.6.4	Heat Sink Temperature	2950	-50.0	200.0	0.0	°C	0.01	Process	REAL
1.6.5	Active Power Unit Mask	249	0x0	0xffffffff	0x0		1	Process	DWORD

6.2.7 Cooling Fan Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.7.1	Main Fan Speed	2931	0	32767	0	RPM	1	Process	INT
1.7.2	Internal Fan Speed	2926	0	32767	0	RPM	1	Process	INT

6.2.8 Fieldbus Process Data Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
1.8.1	Fieldbus Control Word	1335	0x0	0xffff	0x4		1	Process	WORD
1.8.2	FB Status Word	1307	0x0	0xffff	0x0		1	Process	WORD
1.8.3	FB DC-link Voltage Limit %	6533	100.0	150.0	112.0	%	0.01	Process	REAL

6.2.9 I/O and Relay Status

This group appears only if an I/O and Relay Option OC7C1 is included in the converter. This menu appears as many times as there are these option boards in the system. Each menu and its parameters have the suffix of their option slot.

Refer to 6.6.1.1 I/O and Relay Status for the content of this menu.

6.2.10 Temperature Measurement Status

This group appears only if a Temperature Measurement Option OC7T0 is included in the converter. This menu appears as many times as there are these option boards in the system. Each menu and its parameters have the suffix of their option slot.

Refer to 6.6.2.1 Temperature Measurement Status for the content of this menu.

6.3 Parameters

6.3.1 Basic Parameters

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.1.1	DC-Link Nominal Voltage	2834	0.0	1500.0	xxx	V	0.01	Config	REAL
2.1.2	Unit Voltage Class	2832	1	4	1		1	Config	UINT

6.3.2 DC-Link Voltage Limit Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.2.1	DC-link Voltage Limit Source	2916	0	1	0		0.1	Config	UINT
2.2.2	DC-link Voltage Limit %	2910	100.00	150.00	112.0	%	0.01	Config	REAL
2.2.3	DC-link Voltage Droop Gain	2912	0.00	10.00	0.00	%	0.01	Config	REAL
2.2.4	DC-link Voltage Droop. Tc	5095	0.000	1.000	0.050	s	0.001	Config	REAL
2.2.5	DC-link Voltage Ctrl. Kp	1902	0.00	1000.00	100.00	%	0.01	Config	REAL
2.2.6	DC-link Voltage Ctrl. Ti	2903	0.00	1000.00	100.00	%	0.01	Config	REAL

6.3.3 Digital and Analog Inputs

6.3.3.1 Digital Inputs

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.3.1.1	Run Enable Input	103	0	29999	1		1	Config	UINT
2.3.1.2	Force I/O Control Input	4513	0	29999	0		1	Config	UINT
2.3.1.3	Force FB Control Input	4511	0	29999	0		1	Config	UINT
2.3.1.4	I/O Start Input	200	0	29999	0		1	Config	UINT
2.3.1.5	I/O Stop Input	201	0	29999	1		1	Config	UINT
2.3.1.6	I/O Reset Input	203	0	29999	0		1	Config	UINT
2.3.1.7	External Event 1 Input	4557	0	29999	0		1	Config	UINT
2.3.1.8	External Event 2 Input	4560	0	29999	0		1	Config	UINT
2.3.1.9	Cooling Monitor Input	2400	0	29999	1		1	Config	UINT

6.3.4 Digital and Analog Outputs

6.3.4.1 Digital Outputs

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.4.1.1	Ready Output	205	0	65535	0		1	Config	UINT
2.4.1.2	Run Output	206	0	65535	0		1	Config	UINT
2.4.1.3	Static Fault Output	208	0	65535	0		1	Config	UINT
2.4.1.4	Static Warning Output	209	0	65535	0		1	Config	UINT
2.4.1.5	Toggling Fault Output	5180	0	65535	0		1	Config	UINT
2.4.1.6	Toggling Warning Output	5181	0	65535	0		1	Config	UINT
2.4.1.7	FB CTW Bit 12 Output	5193	0	29999	0		1	Config	UINT
2.4.1.8	FB CTW Bit 13 Output	5194	0	29999	0		1	Config	UINT
2.4.1.9	FB CTW Bit 14 Output	5198	0	29999	0		1	Config	UINT
2.4.1.10	FB CTW Bit 15 Output	5191	0	29999	0		1	Config	UINT
2.4.1.11	Local Control Active Output	5178	0	65535	0		1	Config	UINT
2.4.1.12	I/O Control Active Output	5177	0	65535	0		1	Config	UINT
2.4.1.13	Fieldbus Control Active Output	5197	0	65535	0		1	Config	UINT
2.4.1.14	Active Event 1 Output	5189	0	65535	0		1	Config	UINT
2.4.1.15	Event 1 Number	5188	0	65535	0		1	Config	UINT
2.4.1.16	Active Event 2 Output	5190	0	65535	0		1	Config	UINT
2.4.1.17	Event 2 Number	5290	0	65535	0		1	Config	UINT
2.4.1.18	Local Control Forcing Requested Output	125	0	29999	0		1	Config	UINT
2.4.1.19	I/O Forcing Requested Output	121	0	65535	0		1	Config	UINT
2.4.1.20	FB Forcing Requested Output	120	0	65535	0		1	Config	UINT

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.4.1.21	Braking Active Output	5199	0	65535	0		1	Config	UINT

6.3.4.2 Analog outputs

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.4.2.1	DC-link Voltage Output	2454	0	65535	0		1	Config	UINT
2.4.2.2	DC-link Voltage Output Max.	2460	100.0	150.0	120.0	%	0.01	Config	REAL
2.4.2.3	DC-link Voltage Output Min.	2461	0.0	100.0	0.0	%	0.01	Config	REAL
2.4.2.4	Converter Output Current Output	2470	0	65535	0		1	Config	UINT
2.4.2.5	Converter Output Current Max.	2471	0.0	10000.0	1000.0	A	0.01	Config	REAL
2.4.2.6	Converter Output Current Min.	2472	0.0	10000.0	0.0	A	0.01	Config	REAL
2.4.2.7	Converter Output Voltage Output	2469	0	65535	0		1	Config	UINT
2.4.2.8	Converter Output Voltage Max.	2473	0.0	2000.0	1000.0	V	0.01	Config	REAL
2.4.2.9	Converter Output Voltage Min.	2474	0.0	2000.0	0.0	V	0.01	Config	REAL
2.4.2.10	Converter Electrical Power Output	2475	0	65535	0		1	Config	UINT
2.4.2.11	Converter Electrical Power Max.	2476	0.0	10000.0	500.0	kW	0.01	Config	REAL
2.4.2.12	Converter Electrical Power Min.	2477	0.0	10000.0	0.0	kW	0.01	Config	REAL

6.3.5 Start and Stop Settings

6.3.5.1 Start Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.5.1.1	Run Enable Input	103	0	29999	1		1	Config	UINT

6.3.5.2 Quick Stop

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.5.2.1	Quick Stop Input	212	0	29999	1		1	Config	UINT
2.5.2.2	Quick Stop Input 2	5104	0	29999	1		1	Config	UINT
2.5.2.3	Quick Stop Response	4587	0	10	10		1	Config	UINT

6.3.6 Control Places

6.3.6.1 Control Place Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.6.1.1	Control Place Selection	114	1	3	3		1	Config	UINT
2.6.1.2	Force FB Control Input	4511	0	29999	0		1	Config	UINT
2.6.1.3	Force I/O Control Input	4513	0	29999	0		1	Config	UINT
2.6.1.4	Control Place Independent Reset	109	0	1	0		1	Config	BOOL

6.3.6.2 Local Control

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.6.2.1	Local Control Mode	107	0	2	0		1	Config	UINT
2.6.2.2	Continue Operation in Local Control	108	0	1	0		1	Config	BOOL

6.3.6.3 I/O Control

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.6.3.1	I/O Start Input	200	0	29999	0		1	Config	UINT
2.6.3.2	I/O Stop Input	201	0	29999	1		1	Config	UINT
2.6.3.3	I/O Reset Input	203	0	29999	0		1	Config	UINT
2.6.3.4	I/O Start Mode	213	0	2	0		1	Config	UINT
2.6.3.5	Continue Operation in I/O Control	5111	0	1	0		1	Config	BOOL

6.3.6.4 Fieldbus Control

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.6.4.1	Continue Operation in Fieldbus Control	5112	0	1	0		1	Config	BOOL
2.6.4.2	Fieldbus Start Mode	5114	0	1	1		1	Config	UINT

6.3.7 Converter Control

6.3.7.1 Power Unit Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.7.1.1	Power Unit Enable Mask	2835	0x0	0xffff	0xffff		1	Config	WORD
2.7.1.2	DC-link Voltage Measurement Corr. Gain	6535	-1.0	1.0	0.0	%	0.01	Config	REAL
2.7.1.3	DC-link Voltage Measurement Corr. Offset	6534	-5.0	5.0	0.0	V	0.01	Config	REAL
2.7.1.4	HF DC-link Filter Mode	2944	0	2	2		1	Config	UINT

6.3.8 Protections and Responses

6.3.8.1 External Event

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.1.1	External Event 1 Input	4557	0	29999	0		1	Config	UINT
2.8.1.2	External Event 1 Response	4559	0	10	10		1	Config	UINT
2.8.1.3	External Event 2 Input	4560	0	29999	0		1	Config	UINT
2.8.1.4	External Event 2 Response	4562	0	10	10		1	Config	UINT

6.3.8.2 Cooling Monitor

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.2.1	Cooling Monitor Input	2400	0	29999	1		1	Config	UINT
2.8.2.2	Cooling Monitor Fault Delay	2401	0.0	300.0	10.0	s	0.01	Config	REAL
2.8.2.3	Cooling Monitor Response	2402	0	3	0		1	Config	UINT

6.3.8.3 Measured Temp. Protection

6.3.8.3.1 Temp. 1 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.1.1	Temp. 1 Input	5206	0	29999	0		1	Config	UINT
2.8.3.1.2	Temp. 1 Limit 1	5207	-300.0	300.0	120.0	°C	0.01	Config	REAL
2.8.3.1.3	Temp. 1 Limit 2	5208	-300.0	300.0	150.0	°C	0.01	Config	REAL
2.8.3.1.4	Temp. 1 Limit 2 Response	5209	3	10	10		1	Config	UINT

6.3.8.3.2 Temp. 2 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.2.1	Temp. 2 Input	5210	0	29999	0		1	Config	UINT
2.8.3.2.2	Temp. 2 Limit 1	5211	-300.0	300.0	120.0	°C	0.01	Config	REAL
2.8.3.2.3	Temp. 2 Limit 2	5212	-300.0	300.0	150.0	°C	0.01	Config	REAL
2.8.3.2.4	Temp. 2 Limit 2 Response	5213	3	10	10		1	Config	UINT

6.3.8.3.3 Temp. 3 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.3.1	Temp. 3 Input	5214	0	29999	0		1	Config	UINT
2.8.3.3.2	Temp. 3 Limit 1	5215	-300.0	300.0	120.0	°C	0.01	Config	REAL
2.8.3.3.3	Temp. 3 Limit 2	5216	-300.0	300.0	150.0	°C	0.01	Config	REAL
2.8.3.3.4	Temp. 3 Limit 2 Response	5217	3	10	10		1	Config	UINT

6.3.8.3.4 Temp. 4 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.4.1	Temp. 4 Input	5218	0	29999	0		1	Config	UINT
2.8.3.4.2	Temp. 4 Limit 1	5219	-300.0	300.0	120.0	°C	0.01	Config	REAL
2.8.3.4.3	Temp. 4 Limit 2	5220	-300.0	300.0	150.0	°C	0.01	Config	REAL
2.8.3.4.4	Temp. 4 Limit 2 Response	5221	3	10	10		1	Config	UINT

6.3.8.3.5 Temp. 5 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.5.1	Temp. 5 Input	5222	0	29999	0		1	Config	UINT
2.8.3.5.2	Temp. 5 Limit 1	5223	-300.0	300.0	120.0	°C	0.01	Config	REAL
2.8.3.5.3	Temp. 5 Limit 2	5224	-300.0	300.0	150.0	°C	0.01	Config	REAL
2.8.3.5.4	Temp. 5 Limit 2 Response	5225	3	10	10		1	Config	UINT

6.3.8.3.6 Temp. 6 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.6.1	Temp. 6 Input	5226	0	29999	0		1	Config	UINT
2.8.3.6.2	Temp. 6 Limit 1	5227	-300.0	300.0	120.0	°C	0.01	Config	REAL
2.8.3.6.3	Temp. 6 Limit 2	5228	-300.0	300.0	150.0	°C	0.01	Config	REAL
2.8.3.6.4	Temp. 6 Limit 2 Response	5229	3	10	10		1	Config	UINT

6.3.8.3.7 Temp. 7 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.7.1	Temp. 7 Input	5239	0	29999	0		1	Config	UINT
2.8.3.7.2	Temp. 7 Limit 1	5243	-300.0	300.0	120.0	°C	1	Config	REAL
2.8.3.7.3	Temp. 7 Limit 2	5269	-300.0	300.0	150.0	°C	1	Config	REAL
2.8.3.7.4	Temp. 7 Limit 2 Response	5235	3	10	10		1	Config	UINT

6.3.8.3.8 Temp. 8 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.8.1	Temp. 8 Input	5240	0	29999	0		1	Config	UINT
2.8.3.8.2	Temp. 8 Limit 1	5247	-300.0	300.0	120.0	°C	1	Config	REAL
2.8.3.8.3	Temp. 8 Limit 2	5270	-300.0	300.0	150.0	°C	1	Config	REAL
2.8.3.8.4	Temp. 8 Limit 2 Response	5236	3	10	10		1	Config	UINT

6.3.8.3.9 Temp. 9 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.9.1	Temp. 9 Input	5241	0	29999	0		1	Config	UINT
2.8.3.9.2	Temp. 9 Limit 1	5249	-300.0	300.0	120.0	°C	1	Config	REAL
2.8.3.9.3	Temp. 9 Limit 2	5271	-300.0	300.0	150.0	°C	1	Config	REAL
2.8.3.9.4	Temp. 9 Limit 2 Response	5237	3	10	10		1	Config	UINT

6.3.8.3.10 Temp. 10 Protection

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.10.1	Temp. 10 Input	5242	0	29999	0		1	Config	UINT
2.8.3.10.2	Temp. 10 Limit 1	5268	-300.0	300.0	120.0	°C	1	Config	REAL
2.8.3.10.3	Temp. 10 Limit 2	5272	-300.0	300.0	150.0	°C	1	Config	REAL
2.8.3.10.4	Temp. 10 Limit 2 Response	5238	3	10	10		1	Config	UINT

6.3.8.3.11 Common

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.3.11.1	Meas. Valid Range	5230	-300.0	300.0	[200,-50]	°C	0.01	Config	REAL
2.8.3.11.2	Meas. Out of Range Response	5231	0	10	3		1	Config	UINT

6.3.8.4 Thermistor Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.4.1	Thermistor Monitoring Response	5232	0	10	10		1	Config	UINT
2.8.4.2	Thermistor Monitor 1 Input	1520	0	29999	0		1	Config	UINT
2.8.4.3	Thermistor Monitor 2 Input	1522	0	29999	0		1	Config	UINT
2.8.4.4	Thermistor Monitor 3 Input	1524	0	29999	0		1	Config	UINT

6.3.8.5 Fieldbus Protections

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.5.1	Fieldbus Fault Response	1304	0	10	1		1	Config	UINT
2.8.5.2	No Fieldbus Connection Response	1305	0	10	1		1	Config	UINT
2.8.5.3	Process Data Timeout Response	1306	1	10	1		1	Config	UINT
2.8.5.4	Process Data Timeout Delay	1340	50.0	3.4e+38	1000.0	s	0.01	Config	REAL
2.8.5.5	Fieldbus Watchdog Response	5244	0	10	3		1	Config	UINT
2.8.5.6	Fieldbus Watchdog Delay	5245	0.0	3000.0	5.0	s	0.01	Config	REAL

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.5.7	Fieldbus Watchdog Start Delay	5246	0.0	3000.0	30.0	s	0.01	Config	REAL

6.3.8.6 HMI Connection Loss

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.6.1	HMI Connection Loss	5420	0	10	10		1	Config	UINT

6.3.8.7 Brake Resistor Monitoring

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
2.8.7.1	Brake Resistor Test Pulse Mode	4202	0	1	0		1	Config	UINT
2.8.7.2	Missing Brake Resistor Response	4203	0	10	3		1	Config	UINT

6.4 Maintenance & Service

6.4.1 Software Information

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
3.1.1	Application Version	151					1	Config	STRING

6.4.2 Events

6.4.2.1 Active Events

This is an active events screen shown only in the control panel. With MyDrive® Insight, the same information is available in the “Events” screen. Check the available information via the control panel or MyDrive® Insight.

6.4.2.2 All Events

This is the event history screen shown only in the control panel. With MyDrive® Insight, the same information is available in the “Events” screen. Check the available information via the control panel or MyDrive® Insight.

6.4.2.3 Event Simulation

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
3.2.1.1	Simulate Persisting Event	1401	0	10	0		1	Config	UINT
3.2.1.2	Simulate Event Number	1402	0	65535	5260		1	Config	UINT

6.4.3 Operational Counters

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
3.3.1	Control Unit On Time	2000	0	4.29e+9	0	h	1	Process	UDINT
3.3.2	Power Unit On Time	2001	0	4.29e+9	0	h	1	Process	UDINT
3.3.3	Energy Consumption	2002	-	-	-	kWh	1	Process	ULINT
3.3.4	Ground Faults	2004	0	50000	0		1	Process	UINT
3.3.5	Overvoltage Faults	2005	0	50000	0		1	Process	UINT
3.3.6	Overcurrent Faults	2006	0	50000	0		1	Process	UINT
3.3.7	Short Circuit Faults	2007	0	50000	0		1	Process	UINT
3.3.8	Number Of Starts	2008	0	4.29e+9	0		1	Process	UDINT
3.3.9	Active Running Hours	2009	0	4.29e+9	0	h	1	Process	UDINT
3.3.10	Flash 0 Wear Counter	2100	0	4.29e+9	0		1	Config	UDINT
3.3.11	Flash 1 Wear Counter	2101	0	4.29e+9	0		1	Config	UDINT

6.4.4 Backup & Restore

6.4.4.1 Backup

This is a menu screen for creating parameter backups from the control panel. With MyDrive® Insight, similar options are available via the “Backup” button within the “Parameters” screen. Check the available settings via the control panel or MyDrive® Insight.

6.4.4.2 Restore

This is a menu for restoring parameter backups from the control panel. With MyDrive® Insight, similar options are available via the “Restore” button within the “Parameters” screen. Check the available settings via the control panel or MyDrive® Insight.

6.4.5 Expert Tools

6.4.5.1 Cybersecurity

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
3.5.1.1	Max. Login Attempts	5900	3	255	10		1	Config	USINT
3.5.1.2	Max. Login Cooldown Time	5901	1	1440	5	min	1	Config	UDINT
3.5.1.3	Security Event Log IP	5902					1	Config	STRING
3.5.1.4	Security Event Log Port	5903	0	65535	6514		1	Config	UINT
3.5.1.5	System Use Notification	5908					1	Config	STRING

6.4.5.2 Troubleshooting

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
3.5.2.1	Force Recommissioning	5904	0	1	0		1	Config	BOOL
3.5.2.2	Save Diagnostic Log	5905	0	1	0		1	Config	BOOL
3.5.2.3	Service Access	5906	0	1	0		1	Config	USINT

6.5 Device Settings

6.5.1 Control Panel

6.5.1.1 Readout Screen 1

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
4.1.1.1	Readout Field 1.1	305	0	4.29e+9	9044		1	Config	UDINT
4.1.1.2	Readout Field 1.2	301	0	4.29e+9	0		1	Config	UDINT
4.1.1.3	Readout Field 1.3	302	0	4.29e+9	0		1	Config	UDINT
4.1.1.4	Readout Field 1.4	303	0	4.29e+9	0		1	Config	UDINT
4.1.1.5	Readout Field 1.5	304	0	4.29e+9	0		1	Config	UDINT

6.5.1.2 Readout Screen 2

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
4.1.2.1	Readout Field 2.1	310	0	4.29e+9	9044		1	Config	UDINT
4.1.2.2	Readout Field 2.2	311	0	4.29e+9	6542		1	Config	UDINT
4.1.2.3	Readout Field 2.3	312	0	4.29e+9	9043		1	Config	UDINT
4.1.2.4	Readout Field 2.4	313	0	4.29e+9	2950		1	Config	UDINT
4.1.2.5	Readout Field 2.5	314	0	4.29e+9	2952		1	Config	UDINT

6.5.2 Date & Time

Index	Name	Num	Min	Max	Default	Reso	Handling Type	Data Type
4.2.1	Date and Time	2800	-	-	-	1	Config	DATE_AND_TIME
4.2.2	Time Mode	6232	0	1	0	1	Config	UINT
4.2.3	NTP Server 1	6233	0.0.0.0	255.255.255.255	-	1	Config	STRING
4.2.4	NTP Server 2	6234	0.0.0.0	255.255.255.255	-	1	Config	STRING

6.6 Option Board Settings

6.6.1 I/O and Relay

This group and its subgroups appear only if an I/O and Relay Option OC7C1 is included in the converter. This menu appears as many times as there are these option boards in the system. Each menu and its parameters have the suffix of their option slot.

6.6.1.1 I/O and Relay Status

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.3.1	Digital Input Bit Word	1614	0x0	0xffff	0x0		1	Process	WORD
9.3.2	Digital Output Bit Word	1615	0x0	0xffff	0x0		1	Process	WORD
9.3.3	T31 Analog Output Value	1613	-20.0	20.0	0.0		0.01	Process	REAL
9.3.4	T33 Analog Input Value	1611	-20.0	20.0	0.0		0.01	Process	REAL

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.3.5	T34 Analog Input Value	1612	-20.0	20.0	0.0		0.01	Process	REAL

6.6.1.2 Digital Inputs/Outputs

6.6.1.2.1 Input T13

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.1.1	T13 Terminal Mode	2015	0	3	0		1	Config	UINT
9.4.1.2	T13 Signal Inversion	2291	0	1	0		1	Config	UINT
9.4.1.3	T13 Standard Debounce Filtering Time	2024	0.0	0.1	0.0	ms	1	Config	REAL

6.6.1.2.2 Input T14

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.2.1	T14 Terminal Mode	2016	0	3	0		1	Config	UINT
9.4.2.2	T14 Signal Inversion	2292	0	1	0		1	Config	UINT
9.4.2.3	T14 Standard Debounce Filtering Time	2029	0.0	0.1	0.0	ms	1	Config	REAL

6.6.1.2.3 Input T15

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.3.1	T15 Terminal Mode	2022	0	3	0		1	Config	UINT
9.4.3.2	T15 Signal Inversion	2295	0	1	0		1	Config	UINT
9.4.3.3	T15 Standard Debounce Filtering Time	2297	0.0	0.1	0.0	ms	1	Config	REAL

6.6.1.2.4 Input T16

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.4.1	T16 Terminal Mode	2298	0	3	0		1	Config	UINT
9.4.4.2	T16 Signal Inversion	2296	0	1	0		1	Config	UINT
9.4.4.3	T16 Standard Debounce Filtering Time	2260	0.0	0.1	0.0	ms	1	Config	REAL

6.6.1.2.5 Input T17

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.5.1	T17 Terminal Mode	2017	0	3	0		1	Config	UINT
9.4.5.2	T17 Signal Inversion	2293	0	1	0		1	Config	UINT
9.4.5.3	T17 Standard Debounce Filtering Time	2034	0.0	0.1	0.0	ms	1	Config	REAL

6.6.1.2.6 Input T18

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.6.1	T18 Terminal Mode	2018	0	3	0		1	Config	UINT
9.4.6.2	T18 Signal Inversion	2294	0	1	0		1	Config	UINT
9.4.6.3	T18 Standard Debounce Filtering Time	2039	0.0	0.1	0.0	ms	1	Config	REAL

6.6.1.2.7 Output T21

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.7.1	T21 Terminal Mode	4015	0	1	0		1	Config	UINT
9.4.7.2	T21 Digital Output Type	4013	0	3	3		1	Config	UINT

6.6.1.2.8 Output T22

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.8.1	T22 Terminal Mode	4016	0	1	0		1	Config	UINT
9.4.8.2	T22 Digital Output Type	4014	0	3	3		1	Config	UINT

6.6.1.3 Analog Inputs/Outputs

6.6.1.3.1 Output T31

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.5.1.1	T31 Terminal Mode	2019	0	5	0		1	Config	UINT
9.5.1.2	T31 Terminal Type	2284	0	2	1		1	Config	UINT
9.5.1.3	T31 Minimum Value	2283	-20.0	20.0	0.0		0.01	Config	REAL
9.5.1.4	T31 Maximum Value	2282	-20.0	20.0	10.0		0.01	Config	REAL

6.6.1.3.2 Input T33

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.5.2.1	T33 Terminal Mode	2020	0	6	0		1	Config	UINT
9.5.2.2	T33 Terminal Type	2273	1	2	1		0.01	Config	UINT
9.5.2.3	T33 Minimum Value	2272	-20.0	20.0	0.0		0.01	Config	REAL
9.5.2.4	T33 Maximum Value	2271	-20.0	20.0	10.0		0.01	Config	REAL
9.5.2.5	T33 Filter Time	2270	0.0	60.0	0.0	ms	1	Config	REAL
9.5.2.6	T33 Live Zero Threshold Value	2274	-20.0	20.0	-10.0		0.01	Config	REAL
9.5.2.7	T33 Live Zero Timeout Value	2275	0.0	60.0	0.0	s	0.01	Config	REAL

6.6.1.3.3 Input T34

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.5.3.1	T34 Terminal Mode	2021	0	6	0		1	Config	UINT
9.5.3.2	T34 Terminal Type	2279	1	2	1		0.01	Config	UINT
9.5.3.3	T34 Minimum Value	2278	-20.0	20.0	0.0		0.01	Config	REAL
9.5.3.4	T34 Maximum Value	2277	-20.0	20.0	10.0		0.01	Config	REAL
9.5.3.5	T34 Filter Time	2276	0.0	60.0	0.0	ms	1	Config	REAL
9.5.3.6	T34 Live Zero Threshold Value	2280	-20.0	20.0	-10.0		0.01	Config	REAL
9.5.3.7	T34 Live Zero Timeout Value	2281	0.0	60.0	0.0	s	0.01	Config	REAL

6.6.2 Temperature Measurement

This group and its subgroups appear only if a Temperature Measurement Option OC7T0 is included in the converter. This menu appears as many times as there are these option boards in the system. Each menu and its parameters have the suffix of their option slot.

6.6.2.1 Temperature Measurement Status

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.3.2	T4 Temperature Value	4040	-1000.0	1000.0	0.0	°C	1	Process	REAL
9.3.3	T8 Temperature Value	4041	-1000.0	1000.0	0.0	°C	1	Process	REAL
9.3.4	T12 Temperature Value	4042	-1000.0	1000.0	0.0	°C	1	Process	REAL
9.3.5	T16 Temperature Value	4043	-1000.0	1000.0	0.0	°C	1	Process	REAL
9.3.6	T20 Temperature Value	4044	-1000.0	1000.0	0.0	°C	1	Process	REAL

6.6.2.2 Temperature Inputs

6.6.2.2.1 Input T4

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.1.1	T4 Terminal Mode	4045	0	7	0		1	Config	UINT
9.4.1.2	T4 Connection Type	4046	0	4	0		1	Config	UINT
9.4.1.3	T4 Temperature Sensor Type	4047	0	19	0		1	Config	UINT
9.4.1.4	T4 Offset	4048	-50.0	50.0	0.0	°C	1	Config	REAL

6.6.2.2.2 Input T8

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.2.1	T8 Terminal Mode	4049	0	7	0		1	Config	UINT
9.4.2.2	T8 Connection Type	4050	0	4	0		1	Config	UINT
9.4.2.3	T8 Temperature Sensor Type	4051	0	19	0		1	Config	UINT
9.4.2.4	T8 Offset	4052	-50.0	50.0	0.0	°C	1	Config	REAL

6.6.2.2.3 Input T12

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.3.1	T12 Terminal Mode	4053	0	7	0		1	Config	UINT
9.4.3.2	T12 Connection Type	4054	0	4	0		1	Config	UINT
9.4.3.3	T12 Temperature Sensor Type	4055	0	19	0		1	Config	UINT
9.4.3.4	T12 Offset	4056	-50.0	50.0	0.0	°C	1	Config	REAL

6.6.2.2.4 Input T16

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.4.1	T16 Terminal Mode	2298	0	7	0		1	Config	UINT
9.4.4.2	T16 Connection Type	4058	0	4	0		1	Config	UINT
9.4.4.3	T16 Temperature Sensor Type	4059	0	19	0		1	Config	UINT
9.4.4.4	T16 Offset	4060	-50.0	50.0	0.0	°C	1	Config	REAL

6.6.2.2.5 Input T20

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
9.4.5.1	T20 Terminal Mode	4017	0	7	0		1	Config	UINT
9.4.5.2	T20 Connection Type	4062	0	4	0		1	Config	UINT
9.4.5.3	T20 Temperature Sensor Type	4063	0	19	0		1	Config	UINT
9.4.5.4	T20 Offset	4064	-50.0	50.0	0.0	°C	1	Config	REAL

6.7 Connectivity

6.7.1 Integrated Communication

6.7.1.1 Communication interfaces

6.7.1.1.1 Host Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
10.1.1.1.1	Fully Qualified Domain Name	7036	-	-	-		1	Config	STRING

6.7.1.1.2 Ethernet Interface X0

6.7.1.1.2.1 IPv4 Settings

This is a menu screen for enabling IP configuration of the X0 interface. Check the available settings via the control panel or MyDrive® Insight.

6.7.1.1.2.2 IPv4 Status

This is a menu screen containing information about the IP configuration of the X0 interface. Check the available information via the control panel or MyDrive® Insight.

6.7.1.1.3 Ethernet Interface X1/X2 Settings

6.7.1.1.3.1 IPv4 Settings

This is a menu screen for enabling IP configuration of the X1/X2 interface. Check the available settings via the control panel or MyDrive® Insight.

6.7.1.1.3.2 IPv4 Status

This is a menu screen containing information about the IP configuration of the X1/X2 interface. Check the available information via the control panel or MyDrive® Insight.

6.7.1.1.4 Ethernet port X0

6.7.1.1.4.1 X0 Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
10.1.1.4.1	Link configuration X0	7047	0	4	0		1	Config	USINT

6.7.1.1.5 Ethernet port X1

6.7.1.1.5.1 X1 Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
10.1.1.5.1	Link Configuration X1	7048	0	4	0		1	Config	USINT

6.7.1.1.6 Ethernet port X2

6.7.1.1.6.1 X2 Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
10.1.1.6.1	Link Configuration X1	7049	0	4	0		1	Config	USINT

6.7.1.1.7 Port Mirroring

This is a menu screen for enabling and disabling the port-mirroring function for network troubleshooting with a network analyzer tool. Check the available configurations via the control panel or MyDrive® Insight.

6.7.1.2 Protocols

6.7.1.2.1 PROFINET®

6.7.1.2.1.1 Status

6.7.1.2.1.1.1 PROFINET® Report

This is the PROFINET® report screen showing active PROFINET® connection and configuration information. Check the available information via the control panel or MyDrive® Insight.

6.7.1.2.1.2 Configuration

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
10.1.2.2.1	Name of Station	7080	-	-	-		1	Config	STRING

6.7.1.2.1.3 Diagnosis

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
10.1.2.3.1	Diagnostic Fault	7081	0	1	1		1	Config	BOOL
10.1.2.3.2	Diagnostic Warning	7083	0	1	1		1	Config	BOOL

6.7.1.2.2 Modbus® TCP

6.7.1.2.2.1 Configuration

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
10.1.3.2.1	Persistent Storage	7061	0	1	0		1	Config	BOOL
10.1.3.2.3	Byte Order	7062	0	1	0		1	Config	USINT
10.1.3.2.4	Word Order	7063	0	1	1		1	Config	USINT

6.7.1.2.3 EtherNet/IP

6.7.1.2.3.1 Status

6.7.1.2.3.1.1 EtherNet/IP Report

This is the EtherNet/IP report screen showing active EtherNet/IP connection and configuration information. Check the available information via the control panel or MyDrive® Insight.

6.7.2 RS-485 Communication OC7F3

This group and its subgroups appear only if an RS-485 Communication Option OC7F3 is included in the drive. This menu appears as many times as there are these option boards in the system. Each menu and its parameters have the suffix of their option slot.

6.7.2.1 RS-485 Settings

This is a menu screen for enabling RS-485 Communication settings. The configurable parameters are port address, baud rate, data frame settings, and line termination. These settings can be configured via the control panel or MyDrive® Insight.

6.7.2.2 Modbus Settings

Index	Name	Num	Min	Max	Default	Unit	Reso	Handling Type	Data Type
-	Persistent Storage	7061	0	1	0		1	Config	BOOL
-	Byte Order	7062	0	1	0		1	Config	USINT
-	Word Order	7063	0	1	1		1	Config	USINT

7 Parameter Descriptions

7.1 How to Read Parameter Descriptions

The following chapters contain descriptions for all the parameters in the Brake Chopper Unit application software. Each chapter represents a single subgroup within the menu structure.

First the group is described. After that all parameters all listed and description. If applicable, the parameter choices are listed in a table, containing further descriptions for each choice.

The following is an example of a parameter description:

P1.2.3[1] Parameter Name[2] No. 1234[3]
This is a parameter description.[4]

Number	Name	Description
0[5]	Name of choice 1[6]	Description of choice 1.[7]
1	Name of choice 2	Description of choice 2.

[1]: The index number of the parameter, that is, the menu location.
[2]: Name of the parameter.
[3]: Unique identification number of the parameter.
[4]: Description of the parameter.
[5]: Selection number.
[6]: Selection name.
[7]: Description of the selection.

7.2 G1 Monitoring

This group contains readouts for monitoring the operation of the converter.

7.2.1 Basic Monitoring

This group contains readouts for monitoring the basic operation of the converter.

P1.1.1 DC-Link Voltage No. 9044
Shows the actual DC-link voltage in Volts.

P1.1.2 DC-Link Voltage % No. 6542
Shows the actual DC-link voltage in percentage of the DC-link nominal voltage.

P1.1.3 DC-Link Voltage Limit Final % No. 2955
Shows the voltage limit for the brake chopper unit in % of DC-link nominal voltage.
The final limit depends on the source selected with ***P2.2.1 DC-Link Voltage Limit Source*** (fieldbus parameter)

P1.1.4 DC-link Power No. 2955
Shows the actual DC-link power in kW.
The final limit depends on the source selected with ***P2.2.1 DC-Link Voltage Limit Source*** (fieldbus parameter)

P1.1.5 Application Status Word No. 6201

Shows the status of the Application Status Word. The meaning of the bits is described in the following table.

Bit No.	Name	Description
0	Ready to Run	0: The unit is not ready to start modulation. 1: The unit is ready to start modulation.
1	Run	0: The unit is not running (modulating) 1: The unit is running (modulating)
2	Info (Static)	0: No info level event is active. 1: One or more info level events are active.
3	Warning (Static)	0: No warning level events are active. 1: One or more warning level events are active.
4	Fault (Static)	0: No fault level events are active. 1: One or more fault level events are active.
5	Info (Toggling)	0 (steady): No info level event is active. 1: One or more info level events are active. If a new info level event becomes active when this bit is high, it is lowered for one second before being raised again.
6	Warning (Toggling)	0 (steady): No warning level event is active. 1: One or more warning level events are active. If a new warning level event becomes active when this bit is high, it is lowered for one second before being raised again.
7	Fault (Toggling)	0 (steady): No fault level event is active. 1: One or more fault level events are active. If a new fault level event becomes active when this bit is high, it is lowered for one second before being raised again.
8	PC Control	0: The active control place is not PC. 1: The active control place is PC.
9	CP Control	0: The active control place is not the control panel. 1: The active control place is the control panel.
10	IO Control	0: The active control place is not I/O. 1: The active control place is I/O.
11	Fieldbus Control	0: The active control place is not fieldbus. 1: The active control place is fieldbus.
12	Run Enable	0: Run enable input is false. 1: Run enable input is true.
13	Start Active	0: Start command is not active. 1: Start command is active.
14	Quick Stop	0: Quick stop is not active. 1: Quick stop is active.
15	Braking Active	0: Converter is not modulating 1: Converter is modulating and actively diverting the excess energy from the DC link to a braking resistor.

P1.1.6 Fault Status Word 1 No. 6203

Shows the fault status word 1. The meaning of the bits is described in the following table. Each bit is active if the associated fault events are active.

Bit No.	Name	Description
0	Over current	DC-link capacitor overcurrent, output overcurrent, or output short circuit has occurred. Event list: events in group number 0x2340
1	DC-Link Over voltage	DC-link voltage is above normal operating range. Event list: events in group number 0x3211 and 0x3212
2	DC-Link Under voltage	DC-link voltage is below normal operating range. Event list: events in group number 0x3221
3	Unit over temperature	IGBT or power unit temperature is above normal operating range. Event list: events in group number 0x4310
4	Unit under temperature	IGBT or power unit temperature is below normal operating range. Event list: events in group number 0x4320
5	Control card over temp	Control Board System on Chip temperature is below normal operating range. Event list: events in group number 0x43FE
6	Reserved	-
7	Reserved	-
8	Earth	High-impedance ground leakage current in output. Event list: events in group number 0x2110 and 0x2330
9	Fan failure	Failure occurred in one or more fans installed in the system. Event list: events in group number 0x70FF
10	Fieldbus issue	Fieldbus process data timeout, watchdog, loss of fieldbus I/O or connection has occurred. Event list: events in group number 0x8100
11	HMI control lost	While in control of the drive, control panel or PC tool connection is lost. Event list: events in group number 0x7580
12	Reserved	-
13	Thermistor	One or more thermistor protection functions are active. Event list: events in group number 0x4281
14	Reserved	-
15	External temperature measurement	One or more temperature measurement protection functions are active. Event list: events in group number 0x4280
16	Reserved	-
17	Reserved	-

P1.1.7 Fault Status Word 2 No. 6204

Shows the current state of the Fault Status Word 2. The meaning of the bits is described in the following table. Each bit is active if the associated fault events are active.

Bit No.	Name	Description
0	Reserved	-
1	Reserved	-

Bit No.	Name	Description
2	Reserved	-
3	Quick stop	A quick stop command has been given via I/O or fieldbus input. Event list: event number 5130
4	Reserved	-
5	Reserved	-
6	External event	An external event command has been given. Event list: events in group number 0xFF01
7	Cooling monitor	An external cooling device is reporting an error. Event list: events in group number 0x4380
8	Reserved	-
9	Reserved	-
10	Reserved	-
11	Reserved	-
12	Brake Chopper	Brake chopper overcurrent, thermal overload, brake resistor is missing, or a brake failure has occurred. Event list: events in group number 0x7113

P1.1.8 Warning Status Word 1 No. 6205

Shows the warning status word 1. The meaning of the bits is described in the following table. Each bit is active if the associated warning events are active.

Bit No.	Name	Description
0	Over current	DC-link capacitor overcurrent, output overcurrent, or output short circuit has occurred. Event list: events in group number 0x2340
1	DC-Link Over voltage	DC-link voltage is above normal operating range. Event list: events in group number 0x3211 and 0x3212
2	DC-Link Under voltage	DC-link voltage is below normal operating range. Event list: events in group number 0x3221
3	Unit over temperature	IGBT or power unit temperature is above normal operating range. Event list: events in group number 0x4310
4	Unit under temperature	IGBT or power unit temperature is below normal operating range. Event list: events in group number 0x4320
5	Control card over temp	Control Board System on Chip temperature is below normal operating range. Event list: events in group number 0x43FE
6	Reserved	-
7	Reserved	-
8	Earth	High-impedance ground leakage current in output. Event list: events in group number 0x2110 and 0x2330
9	Fan failure	Failure occurred in one or more fans installed in the system. Event list: events in group number 0x70FF
10	Fieldbus issue	Fieldbus process data timeout, watchdog, or loss of fieldbus I/O or connection has occurred. Event list: events in group number 0x8100
11	HMI control lost	While in control of the drive, control panel or PC tool connection is lost. Event list: events in group number 0x7580
12	Reserved	-
13	Thermistor	One or more thermistor protection functions are active. Event list: events in group number 0x4281
14	Reserved	-
15	External temperature measurement	One or more temperature measurement protection functions are active. Event list: events in group number 0x4280
16	Reserved	-
17	Reserved	-

P1.1.9 Warning Status Word 2 No. 6206

Shows the current state of the Warning Status Word 2. The meaning of the bits is described in the following table. Each bit is active if the associated warning events are active.

Bit No.	Name	Description
0	Reserved	-
1	Reserved	-
2	Reserved	-
3	Quick stop	A quick stop command has been given via I/O or fieldbus input. Event list: event number 5130
4	Reserved	-
5	Reserved	-
6	External event	An external event command has been given. Event list: events in group number 0xFF01

Bit No.	Name	Description
7	Cooling monitor	An external cooling device is reporting an error. Event list: events in group number 0x4380
8	Reserved	-
9	Reserved	-
10	Reserved	-
11	Reserved	-
12	Brake Chopper	Brake chopper overcurrent, thermal overload, brake resistor is missing, or a brake failure has occurred. Event list: events in group number 0x7113

P1.1.10 Last Fault Number No. 1610

Shows the number of the most recent active fault.

P1.1.11 Last Warning Number No. 1609

Shows the number of the most recent active warning.

P1.1.12 BCU Status Word No. 4200

Shows the current status of the control of Brake Chopper Unit. The meaning of the bits is described in the following table.

Bit No.	Name	Description
0	Ready	0: Converter is not ready (one of the bits of the BCU Ready Status word is not true). 1: Converter is ready.
1	Running	0: Converter is not running. 1: Converter is running.
2	Braking Active	0: Converter is not modulating 1: Converter is modulating and actively diverting the excess energy from the DC link to a braking resistor
3	Fault Active	0: No faults are active. 1: One or more faults are active.
4…15	Reserved	--

P1.1.13 BCU Ready Status Word No. 4201

Shows the current state of BCU Ready Status Word. The meaning of the bits is described in the following table. All bits in this status word must be true before the drive is ready.

Bit No.	Name	Description
0	Run Enabled	0: Run Enable is missing. 1: Run Enable is active.
1	Fault Active Inverse	0: One or more faults are active. 1: No active faults.
2	Reserved	--
3	Reserved	--
4	Power Unit Ready	0: Power unit is not ready.

Bit No.	Name	Description
		1: Power unit is ready.
5	Reserved	--
6	Reserved	--
7	DC Voltage within limits	0: DC-link voltage is not within the instantaneous stop limits. 1: DC-link voltage is within the instantaneous stop limits.
8…15	Reserved	--

7.2.2 Control Place Monitoring

P1.2.1 Active Control Place No. 113

Shows the control place that controls the converter. The indication numbers are presented in the following table.

Number	Name	Description
0	PC control	PC (MyDrive® Insight) is the active control place commanding the converter.
1	Local control	Local control (control panel) is the active control place commanding the converter.
2	Fieldbus control	Fieldbus is the active control place commanding the converter.
3	I/O control	I/O is the active control place commanding the converter.

P1.2.2 FB Forcing Requested No. 116

Shows the status of the fieldbus control place forcing request.

Number	Name	Description
0	Inactive	FB forcing is not requested.
1	Active	FB forcing is requested.

P1.2.3 I/O Forcing Requested No. 117

Shows the status of the I/O-control place forcing request.

Number	Name	Description
0	Inactive	I/O forcing is not requested.
1	Active	I/O forcing is requested.

P1.2.4 Local Control Forcing Requested No. 124

Shows the status of the local control place forcing request (made from control panel REM/LOC button).

Number	Name	Description
0	Inactive	Local (panel) control forcing is not requested.
1	Active	Local (panel) control forcing is requested.

7.2.3 Converter Output Monitoring

P1.3.1 Converter Output Current **No. 9000**
Shows the converter output current.

P1.3.2 Converter Output Current % **No. 9001**
Shows the converter output current in % of unit nominal current.

P1.3.3 U-phase RMS Current **No. 9020**
Shows the RMS current of the U-phase.

P1.3.4 V-phase RMS Current **No. 9021**
Shows the RMS current of the V-phase.

P1.3.5 W-phase RMS Current **No. 9022**
Shows the RMS current of the W-phase.

P1.3.6 Converter Output Voltage **No. 9000**
Shows the converter output voltage.

P1.3.7 Converter Output Voltage % **No. 9005**
Shows the converter output voltage in % of unit nominal voltage.

P1.3.8 Converter Output Electrical Power **No. 9043**
Shows the electrical power of the converter output.

7.2.4 Converter Control Monitoring

P1.4.1 Control Unit Temperature **No. 2952**
Shows the temperature of the control unit.

7.2.5 Protection Monitoring

7.2.5.1 Measured Temp. Protection Status

This group contains the readout values for the temperature values measured by the temperature sensors, which are connected to the Temperature Measurement option board OC7T0.

P1.5.1.1 Protection 1 Temp. **No. 5200**
Shows the temperature measured for the temperature protection.

P1.5.1.2 Protection 2 Temp. **No. 5201**
Shows the temperature measured for the temperature protection.

P1.5.1.3 Protection 3 Temp. **No. 5202**
Shows the temperature measured for the temperature protection.

P1.5.1.4 Protection 4 Temp. **No. 5203**

Shows the temperature measured for the temperature protection.

P1.5.1.5 Protection 5 Temp. No. 5204
Shows the temperature measured for the temperature protection.

P1.5.1.6 Protection 6 Temp. No. 5205
Shows the temperature measured for the temperature protection.

P1.5.1.7 Protection 7 Temp. No. 5273
Shows the temperature measured for the temperature protection.

P1.5.1.8 Protection 8 Temp. No. 5274
Shows the temperature measured for the temperature protection.

P1.5.1.9 Protection 9 Temp. No. 5275
Shows the temperature measured for the temperature protection.

P1.5.1.10 Protection 10 Temp. No. 5276
Shows the temperature measured for the temperature protection.

7.2.6 Power Unit Monitoring

P1.6.1 Power Capacity No. 2836
Shows the power capacity of the drive as a percentage. The value is derived from the number of active power units compared to the nominal power unit count of the drive.

P1.6.2 Unit Nominal Voltage No. 2830
Shows the nominal voltage setting resulting from the setting of parameter ***Unit Voltage Class (No. 2832)***.

P1.6.3 Unit Nominal Current No. 2831
Shows the nominal current of the unit.

P1.6.4 Heat Sink Temperature No. 2950
Shows the temperature of the power unit heat sink.

P1.6.5 Active Power Unit Mask No. 249
A bit mask that represents which of the power units are active.

NOTICE
This parameter is only visible in drives with star coupler board units.

7.2.7 Cooling Fan Monitoring

P1.7.1 Main Fan Speed No. 2931
Shows the speed of the main cooling fan.

P1.7.2 Internal Fan Speed No. 2926

Shows the speed of the internal cooling fan.

7.2.8 Fieldbus Process Data Monitoring

P1.8.1 Fieldbus Control Word No. 1335

Shows the fieldbus control word process data signal value. See chapter *2.2.1 Fieldbus Control Word and Bit Description* for further information.

P1.8.2 Fieldbus Status Word No. 1307

Shows the fieldbus status word process data signal value. See chapter *2.2.2 Fieldbus Status Word and Bit Description* for further information.

P1.8.3 FB DC-link Voltage Limit % No. 6533

Shows the incoming fieldbus process data DC-link voltage limit in % of the grid nominal voltage.

7.3 G2 Parameters

This group houses most of the converter settings.

7.3.1 Basic Parameters

This group contains a collection of the basic parameters needed to get the converter operational.

P2.1.1 DC-link Nominal Voltage No. 2834

Set the nominal DC-link voltage. Calculated automatically based on unit nominal voltage when the unit voltage class is changed (parameter ***No. 2832***). Can also be set manually. If set to 0 the unit nominal voltage (peak amplitude) is used.

P2.1.2 Unit Voltage Class No. 2832

Select the unit voltage class to optimize the performance of the converter. Each power unit is rated for a wide voltage range which the converter can operate in. This parameter is used to specify a narrower band within that range to determine optimized values for the nominal voltage and current of the unit. Set this parameter according to the AC mains voltage. The selected voltage class can be seen from the readout parameter ***Unit Nominal Voltage (No. 2830)***.

No.	Name	Description
1	Low-voltage range	Unit nominal voltage and current are set according to the lowest end of the unit's voltage range. • For example, for T5 units this range is 380–440 V AC. • For example, for T7 units this range is 525–550 V AC.
2	Mid-voltage range	Unit nominal voltage and current are set according to the middle of the unit's voltage range. • For example, for T5 units this range is 440–480 V AC. • For example, for T7 units this range is 550–600 V AC.
3	High-voltage range	Unit nominal voltage and current are set according to the highest end of the unit's voltage range. • For example, for T5 units this range is 480–500 V AC. • For example, for T7 units this range is 600–690 V AC.
4	Wide-voltage range	Unit nominal voltage and current are set according to the unit's whole voltage range. • For example, for T5 units this range is 380–500 V AC. • For example, for T7 units this range is 525–690 V AC.

7.3.2 DC-Link Voltage Limit Settings

P2.2.1 DC-link Voltage Limit Source No. 2916

Select the source for the DC-link voltage limit. The source of the DC-link voltage limit does not follow the control place selection.

No.	Name	Description
0	Parameter	DC-link voltage limit is taken from parameter ***No. 2910***.
1	Fieldbus	DC-link voltage reference is taken from fieldbus via parameter ***No. 6533***.

P2.2.2 DC-link Voltage Limit No. 2910

Set the DC-link voltage limit for the brake chopper unit in % of DC-link nominal voltage.

When the voltage in the DC link exceeds this level, the brake chopper unit activates and starts diverting the excess energy to a braking resistor.

P2.2.3 DC-link Voltage Droop Gain No. 2912
Set the DC-link voltage drooping gain; change of BCU DC voltage limit per (active) current change.

Drooping is typically used to balance the load between the parallel BCU units in the same DC bus system. Refer to chapter *2.1.1 General Features* and the subchapter *Paralleling BCUs* for additional information regarding DC-link voltage drooping.

P2.2.4 DC-link Voltage Ref. Filter Tc No. 2894
Set the DC-link voltage reference low pass filter time constant.

P2.2.5 DC-link Voltage Ctrl Kp No. 2902
Scaling of internally computed DC-link voltage control proportional gain.

P2.2.6 DC-link Voltage Ctrl Ti No. 2903
Scaling of internally computed DC-link voltage control integral time.

7.3.3 Digital and Analog Inputs

7.3.3.1 Digital Inputs

This group is a collection of all the digital input sink selection parameters. All these parameters have the following options.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.3.1.1 Run Enable Input No. 103

Select a digital input for enabling the converter to run. This signal must be active for the converter to be in the ready state. If the signal is deactivated while the converter is running, the converter stops modulating immediately.

P2.3.1.2 Force I/O Control Input No. 4513

Select an input terminal for forcing the control place to I/O.

P2.3.1.3 Force FB Control Input No. 4511

Select an input terminal for forcing the control place to Fieldbus.

P2.3.1.4 I/O Start Input No. 200

Set the input source for starting the unit when the active control place is I/O Control.

NOTICE

When a start command is given, the drive modulates only when the DC-link voltage exceeds the limit set by parameter ***No. 2910***. However, the drive indicates runs state when the start command is given.

P2.3.1.5 I/O Stop Input No. 201

Set the input source for stopping the unit when the active control place is I/O Control. It is activated when the input becomes LOW, FALSE, or 0.

P2.3.1.6 I/O Reset Input No. 203

Select the input source for the reset command for when the converter operates in I/O control.

7.3.4 Digital and Analog Outputs

7.3.4.1 Digital Outputs

This group is a collection of all the digital output sink selection parameters. All these parameters have the following options:

No.	Name	Description
0	None	No output is selected.

No.	Name	Description
*	Available digital output and relay terminals	A dynamically generated selection of available digital output and relay terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.4.1.1 Ready Output No. 205
Select an output for the Ready signal.

P2.4.1.2 Run Output No. 206
Select an output for the Run signal.

P2.4.1.3 Static Fault Output No. 208
Select an output for the Static Fault Active signal.

P2.4.1.4 Static Warning Output No. 209
Select an output for the Static Warning Active signal.

P2.4.1.5 Toggling Fault Output No. 5180
Select an output for the Toggling Fault signal. This signal goes down for 1 second whenever a new fault is registered while another fault is already active.

P2.4.1.6 Toggling Warning Output No. 5181
Select an output for the Toggling Warning signal. This signal goes down for 1 second whenever a new warning is registered while another warning is already active.

P2.4.1.7 FB CTW Bit 12 Output No. 5193
Select an output for the status of the fieldbus control word bit 12.

P2.4.1.8 FB CTW Bit 13 Output No. 5194
Select an output for the status of the fieldbus control word bit 13.

P2.4.1.9 FB CTW Bit 14 Output No. 5198
Select an output for the status of the fieldbus control word bit 14.

P2.4.1.10 FB CTW Bit 15 Output No. 5191
Select an output for the status of the fieldbus control word bit 15.

P2.4.1.11 Local Control Active Output No. 5178
Select an output terminal indicating that the converter is in local control.

P2.4.1.12 I/O Control Active Output No. 5177
Select an output terminal indicating that the converter is in I/O control.

P2.4.1.13 Fieldbus Control Active Output No. 5197
Select an output terminal indicating that the converter is in fieldbus control.

P2.4.1.14 Active Event 1 Output No. 5189
Select an output for monitoring the event activation status (output high = event active).

P2.4.1.15 Event 1 Number No. 5188
Set the number of the event to be assigned for Active Event 1 output.

P2.4.1.16 Active Event 2 Output No. 5190
Select an output for monitoring the event activation status (output high = event active).

P2.4.1.17 Event 2 Number No. 5290
Set the number of the event to be assigned for Active Event 2 output.

P2.4.1.18 Local Control Forcing Requested Output No. 125
Select an output terminal for the indication that the control place forcing to Local Control has been requested with the [*REM/LOC*] button of the control panel (output high = requested).

P2.4.1.19 I/O Forcing Requested Output No. 121
Select an output terminal for the indication that the control place forcing to I/O Control has been requested (output high = requested).

P2.4.1.20 FB Forcing Requested Output No. 120
Select an output terminal for the indication that the control place forcing to Fieldbus Control has been requested (output high = requested).

P2.4.1.21 Braking Active Output No. 5199
Select an output for the status of the braking active signal.

7.3.4.2 Analog Outputs

This group is a collection of all the analog output terminal selection parameters of the converter. All these parameters have the following options:

No.	Name	Description
0	None	No output is selected for the associated parameter.
*	Available analog output terminals	A dynamically generated selection of available analog output terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.4.2.1 DC-link Voltage Output No. 2454
Select an analog output for the DC-link voltage signal. Define the scaling with parameters ***No. 2460*** and ***No. 2461***.

P2.4.2.2 DC-link Voltage Output Max. No. 2460
Set the maximum DC-link voltage value for analog output scaling maximum.

P2.4.2.3 DC-link Voltage Output Min. No. 2461
Set the minimum DC-link voltage value for analog output scaling minimum.

P2.4.2.4 Converter Output Current Output No. 2470
Select an analog output for the converter output current signal. Define the scaling with parameters ***No. 2471*** and ***No. 2472***.

P2.4.2.5 Converter Output Current Max. No. 2471
Set the maximum converter output current value for analog output scaling.

P2.4.2.6 Converter Output Current Min. No. 2472
Set the minimum converter output current value for analog output scaling.

P2.4.2.7 Converter Output Voltage Output No. 2469
Select an analog output for the converter output voltage signal. Define the scaling with parameters ***No. 2473*** and ***No. 2474***.

P2.4.2.8 Converter Output Voltage Max. No. 2473
Set the maximum converter output voltage value for analog output scaling.

P2.4.2.9 Converter Output Voltage Min. No. 2474
Set the minimum converter output voltage value for analog output scaling.

P2.4.2.10 Converter Electrical Power Output No. 2475
Select an analog output for the converter output electrical power. Define the scaling with parameters ***No. 2476*** and ***No. 2477***.

P2.4.2.11 Converter Electrical Power Max. No. 2476
Set the maximum converter output electrical power value for analog output scaling.
P2.4.2.12 Converter Electrical Power Min. No. 2477
Set the minimum converter output electrical power value for analog output scaling.

7.3.5 Start and Stop Settings

7.3.5.1 Start Settings

This group contains parameters for start related settings.

P2.5.1.1 Run Enable Input No. 103
Select a digital input for enabling the converter to run. This signal must be active for the converter to be in the ready state. If the signal is deactivated while the converter is running, the converter stops modulating immediately.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

7.3.5.2 Quick Stop

The quick stop function can be used as a special stop method in exceptional situations, for instance in emergencies. Quick stop is an override function, which stops the converter regardless of the selected control place. With parameters ***No. 212*** and ***No. 5104***, two inverted inputs can be selected for

activating this function. Besides these inputs, a quick stop command can be given via fieldbus control word bit 2.

Quick stop can also be configured to trigger an event, the type of which can be configured with parameter ***No. 4587***. The quick stop command is a separate function from the quick stop event.

NOTICE

Once activated, quick stop blocks the starting of the converter, until all active start commands are removed. In other words, a new start command is always required after a quick stop.

Quick stop is not a functional safety feature.

P2.5.2.1 Quick Stop Input No. 212

Select an input terminal for the quick stop. The functionality is inverted so quick stop is activated when the input becomes low.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.5.2.2 Quick Stop Input 2 No. 5104

Select a second input terminal for quick stop. The functionality is inverted so quick stop is activated when the input becomes low.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.5.2.3 Quick Stop Response No. 4587

Select the response to a quick stop event. The converter stops regardless of the event setting.

No.	Name	Description
0	No response	Quick stop does not trigger an event. A quick stop command can still be given to stop the converter.
1	Info	The converter issues an info event and stops modulation.
3	Warning	The converter issues a warning event and stops modulation.
10	Fault	The converter issues a fault event and stops modulation.

7.3.6 Control Places

The BCU application features four different control places for determining how basic converter commands and references are interfaced. These control places are MyDrive® Insight (PC control), local control (via control panel), fieldbus control, and I/O control.

Selection:

There are two methods for selecting which control place is active, that is, in command of the converter. The first is a simple parameter selection, while the second is a set of signals that can be used to force or request for a specific control place to be in command.

Commands:

A control place is a source for basic control commands (start, stop, reset, and so on). When operating, for instance, in I/O control, the converter cannot be started from the local or fieldbus control places. Control places do not dictate all possible commands. Specific features such as quick stop can be used regardless of the control place and must be configured separately.

7.3.6.1 Control Place Settings

This group contains general control place settings that mainly have to do with control place selection. The following figure presents the control place selection chain diagram. The default method for selecting the control place is by using the parameter ***No. 114 Control Place Selection***. It can be used to select the active control place between local, fieldbus, and I/O control.

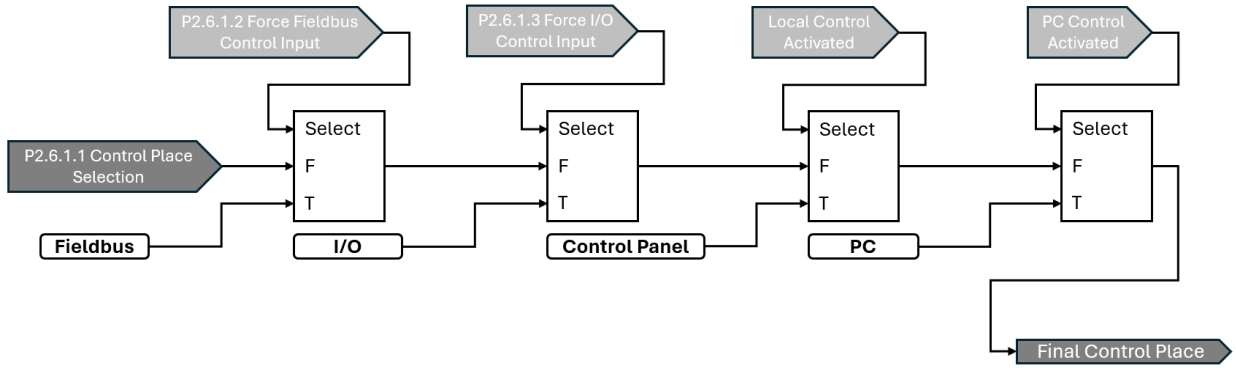


Figure 41: Control place Selection Chain Diagram.

The second option for control place selection is to use control place forcing signals, which override the selection made with the parameter, and can be used to swap between different control places, for example via external push buttons or switches. The forcing signals for fieldbus and I/O control can be mapped to digital inputs or fieldbus. Forcing signals are treated as a state-sensitive signal. Local control forcing is activated with the [*REM/LOC*] button of the control panel.

The only control place which can take over control from any other control place regardless of forcing inputs is MyDrive® Insight. Control is taken by requesting it via the tool itself.

When a control place is changed, the converter will either stop or continue operating (modulation) based on the settings defined with parameters ***No. 108***, ***No. 5112***, and ***No. 5111***, respectively for each control place.

P2.6.1.1 Control Place Selection No. 114

Select the active control place.

No.	Name	Description
0	PC control	
1	Local control	
2	Fieldbus control	
3	I/O control	

P2.6.1.2 Force FB Control Input No. 4511

Select an input terminal for forcing the control place to Fieldbus.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.6.1.3 Force I/O Control Input No. 4513

Select an input terminal for forcing the control place to I/O.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.6.1.4 Control Place Independent Reset No. 109

Enable faults to be reset from all control places. The reset command goes through regardless of whether it was given from the active control place or not.

No.	Name	Description
0	Disabled	Reset goes through only from the active control place.
1	Enabled	Reset goes through from all control places regardless of whether it was given from the active control place or not.

7.3.6.2 Local Control

Local control, also known as panel control, can be selected by the selection parameter or by overriding control by pressing the [*REM/LOC*] button on the control panel. When control is released from the control panel, the control place is determined by the selection parameter or forcing signals. The converter offers a protection feature for monitoring the connection between the converter and the

control panel (parameter ***No. 5420***). If connection is lost while the control panel is in control of the converter, the converter will force-release control to the next control place in line. If local control has not been given any priority with parameter ***No. 107***, the change to local control is disabled with the [*REM/LOC*] button.

P2.6.2.1 Local Control Mode No. 107

Select restrictions of local control by the control panel. Use this parameter to influence the amount of control anyone accessing the control panel can have on the operation of the converter.

No.	Name	Description
0	Allow Local Control	Local Control can become the active control place. Local control can both start and stop the converter.
1	Deny Local Start	Local Control can become the active control place. Local control cannot start the converter, but it can stop it.
2	Deny Local Control	Local Control cannot become the active control place.

P2.6.2.2 Continue Operation in Local Control No. 108

Select whether the start request is retained when the converter is running and the control place is changed to local control.

No.	Name	Description
0	Disabled	The drive stops when the active control place is changed.
1	Enabled	The drive continues operating through the control place transition.

7.3.6.3 I/O Control

The I/O control place is designed to give basic commands (start, stop, reset, and so on) to the converter via a set of digital input signals.

P2.6.3.1 I/O Start Input No. 200

Set the input source for starting the unit when the active control place is I/O Control.

NOTICE

When a start command is given, the drive modulates only when the DC-link voltage exceeds the limit set by parameter ***No. 2910***. However, the drive indicates the run state when the start command is given.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
8201	Logic Start	Logic Start virtual output from the Logic Feature is used as an input.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.6.3.2 I/O Stop Input No. 201

Set the input source for stopping the unit when the active control place is I/O Control. The functionality is inverted so stop is activated when the input becomes low.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
8202	Logic Stop	Logic Stop virtual output from the Logic Feature is used as an input.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.6.3.3 I/O Reset Input No. 203

Select the input source for the reset command for when the converter operates in I/O control.

No.	Name	Description
0	False	No input is selected. A virtual value of FALSE is applied.
1	True	No input is selected. A virtual value of TRUE is applied.
8205	Logic Reset	Logic Reset virtual output from the Logic Feature is used as an input.
*	Fieldbus control word digital input bits	Fieldbus CTW digital input bits 12–15.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.6.3.4 I/O Start Mode No. 213

Select whether start commands for I/O control are state, rising-edge, or pulse sensitive.

No.	Name	Description
0	State High Start	A start is requested based on the high state of the signal. When the start signal is removed, the converter stops modulation. In case the start signal is high when a fault is cleared, or a separate stop signal (quick stop, for example) is removed, the converter starts running immediately. If the converter is stopped from the control panel, a new start signal is needed. Any active stop signal blocks the start.
1	Rising Edge Start	A start is requested based on the combination of the rising-edge and the high-state of the signal. When the start signal is removed, the converter stops modulation. The converter does not start running in case the start signal is high when a fault is cleared, or a separate stop signal (quick stop, for example) is removed. Any active stop signal blocks the start.

No.	Name	Description
2	High Pulse Start	A start is requested based on the rising edge of the signal. The converter is stopped with a rising edge of a separate stop signal. The converter does not start running in case the start signal is high when a fault is cleared, or a separate stop signal (quick stop, for example) is removed. Any active stop signal blocks the start.

P2.6.3.5 Continue Operation in I/O Control No. 5111

Select whether the start request is retained when the converter is running and the control place is changed to I/O, while using edge-sensitive start modes. Any active stop command or auxiliary function such as quick stop may still prohibit continuing operation.

No.	Name	Description
0	Disabled	The converter stops when the active control place is changed.
1	Enabled	The converter continues operating through the control place transition.

7.3.6.4 Fieldbus Control

The converter can be controlled through a fieldbus master. When fieldbus is selected as the active control place, the converter monitors active fieldbus connections for control commands.

P2.6.4.1 Continue Operation in Fieldbus Control No. 5112

Select whether the start request is retained when the converter is running and the control place is changed to fieldbus. Any active stop command or auxiliary function such as quick stop may still prohibit continuing operation. Continuation is possible only if the start is requested from fieldbus before the control place is changed to it.

No.	Name	Description
0	Disabled	The converter stops when the active control place is changed.
1	Enabled	The drive continues operating through the control place transition.

P2.6.4.2 Fieldbus Start Mode No. 5114

Select whether start commands for Fieldbus Control are state or rising-edge sensitive.

No.	Name	Description
0	State High Start	A start is requested based on the high state of the signal. When the start signal is removed, the converter stops modulation. In case the start signal is high when a fault is cleared, or a separate stop signal (quick stop, for example) is removed, the converter starts running immediately. If the converter is stopped from the control panel, a new start signal is needed. Any active stop signal blocks the start.
1	Rising Edge Start	A start is requested based on the combination of the rising-edge and the high-state of the signal. When the start signal is removed the converter stops modulation. The converter does not start running in case the start signal is high when a fault is cleared, or a separate stop signal (quick stop, for example) is removed. Any active stop signal blocks the start.

7.3.7 Converter Control

7.3.7.1 Power Unit Settings

This group contains parameters for setting up the drive's power units.

P2.7.1.1 Power Unit Enable Mask No. 2835

Select which of the commissioned power units are enabled.

The value is given bitwise per each unit. Bit 0 corresponds to the first port in the star coupler board, and bit 15 to the 16th port and so on. An active bit enables the corresponding power unit, and an inactive bit disables it.

This parameter is relevant only for drives with multiple power units, connected to the control board with the star coupler board. Faulty or redundant power units can be disabled temporarily to allow running with reduced capacity. All internal protection functions adjust to the number of enabled power units.

WARNING

Depending on the system's hardware configuration, it might be necessary to galvanically isolate the disabled units and all associated filters from the system. Failing to do so may increase the risk of resonance and damage the rest of the system. Contact Danfoss technical support for further instructions before using this functionality.

NOTICE

This parameter cannot be edited when the drive is running.

NOTICE

After Factory Reset or Node Commissioning, the drive will automatically set this parameter to activate the nominal number of power units starting sequentially from the first port of the star coupler board. If the drive has several power

units, but this parameter does not have the correct value at initial start, it is recommended to run Factory Reset and power-cycle the drive. This operation resets the Power Unit Enable Mask to correspond with the nominal number of power units.

P2.7.1.2 DC-link Voltage Measurement Corr. Gain No. 6535

Set the DC-link voltage measurement correction gain for parallel units.

P2.7.2.3 DC-link Voltage Measurement Corr. Offset No. 6534

Set the DC-link voltage measurement correction offset for parallel units.

P2.7.2.4 HF DC-link Filter Mode No. 2944

Select the mode of the high-frequency filter in the DC link.

No.	Name	Description
0	Filter inactive	
1	Filter active	
2	Fiter matches grid type selection	

7.3.8 Protections and Responses

This group contains parameters for applying most the converter's protection related configurations.

7.3.8.1 External Event

External events are protection functions which can be configured to trigger converter events (warnings, faults, and so on) through inputs. Two separate events are available, both can be triggered with an active-high or active-low signals.

P2.8.1.1 External Event 1 Input No. 4557

Select an input for the external event.

No.	Name	Description
0	None (False)	No input is selected. A virtual value of FALSE is applied.
1	None (True)	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word 1 digital input bits	Fieldbus CTW1 digital input bits 12–15 are presented as options.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.8.1.2 External Event 1 Response No. 4559

Select the response to an external event.

No.	Name	Description
0	No response	-
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

P2.8.1.3 External Event 2 Input No. 4560

Select an input for the external event.

No.	Name	Description
0	None (False)	No input is selected. A virtual value of FALSE is applied.
1	None (True)	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word 1 digital input bits	Fieldbus CTW1 digital input bits 12–15 are presented as options.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.8.1.4 External Event 2 Response No. 4562

Select the response to an external event.

No.	Name	Description
0	No response	-

No.	Name	Description
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.2 Cooling Monitor

The cooling monitor feature is relative for liquid-cooled converters. It is designed to allow the converter to receive a single digital signal from the cooling unit when it experiences errors. The converter then acts as configured.

P2.8.2.1 Cooling Monitor Input No. 2400

Select the input for the negated cooling monitor signal.

No.	Name	Description
0	None (False)	No input is selected. A virtual value of FALSE is applied.
1	None (True)	No input is selected. A virtual value of TRUE is applied.
*	Fieldbus control word 1 digital input bits	Fieldbus CTW1 digital input bits 12–15 are presented as options.
*	Available digital input terminals	A dynamically generated selection of available digital input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.8.2.2 Cooling Monitor Fault Delay No. 2401

Set a delay before the cooling monitor issues a fault. Only valid if fault is selected.

P2.8.2.3 Cooling Monitor Response No. 2402

Select the response to a missing cooling monitor signal. The response is selected for both stopped and running states.

No.	Name	Description
0	Warning while running	The converter issues a warning if the cooling signal is lost, and the converter is running.
1	Warning	The converter issues a warning if the cooling signal is lost.
2	Warning, Fault after Timeout while running	The converter issues a warning if the cooling signal is lost. If the converter is running, the event is escalated into a fault after the fault delay (***No. 2401***).
3	Warning and Fault after Timeout while running	The converter issues a warning if the cooling signal is lost, and the converter is running. After the fault delay (***No. 2401***), the event is escalated into a fault.

7.3.8.3 Measured Temp. Protection

The measured temperature protection offers 10 individual protection channels for monitoring temperatures of external devices like filters or motor windings through temperature probes. Each protection can be configured to trigger an individual event, which can be used to identify the source of the high temperature measurement.

Each protection has two configurable stages, as illustrated in the following figure. Stage 1 is used to trigger a warning, while stage 2 can be used to trigger a more severe event, which may possibly stop the converter (fault). The activation levels of both stages and the event response of stage 2 can be configured. The levels of both stages can be configured to be the same, if two stages are unnecessary.

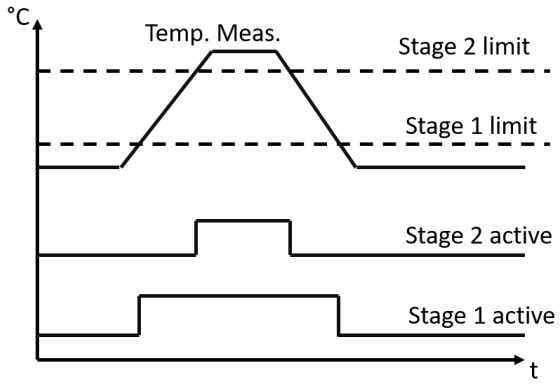


Figure 42: Operation Principle of the Temperature Measurement Protection Function.

A temperature measurement range check feature is also available, as presented in the following figure. A range can be defined for checking the validity of each measured temperature protection. If the absolute measurement value of any protection exceeds this range, a separate event can be triggered.

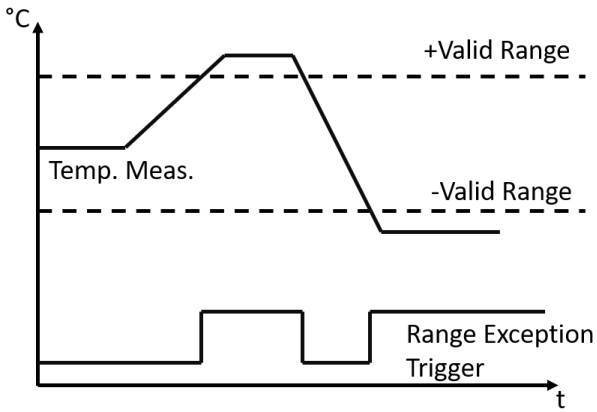


Figure 43: Operation Principle of the Temperature Measurement Range Check.

NOTICE

The range check is also sensor-specific, even though its limits and response are common for all sensors. If the range-check event is triggered for a particular sensor, Stage 2 protection is deactivated for that sensor. This prevents, for example, a wire break (which would cause a rapid temperature rise above the Stage 2 limit in the faulty sensor) from generating a Stage 2 event. Instead, the drive executes the common measurement range check response and generates a sensor-specific Stage 1 warning.

If the common range check is disabled (the response is set to *No Response*), Stage 2 protection is activated according to the response defined by the sensor-specific *Temp. Limit 2 Response* parameters.

7.3.8.3.1 Temp. 1 Protection

P2.8.3.1.1 Temp. 1 Input No. 5206
Select the temperature sensor input for the temperature protection.

P2.8.3.1.2 Temp. 1 Limit 1 No. 5207
Set the temperature level for issuing a warning.

P2.8.3.1.3 Temp. 1 Limit 2 No. 5208
Set the temperature level for issuing a protection response.

P2.8.3.1.4 Temp. 1 Limit 2 Response No. 5209
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.2 Temp. 2 Protection

P2.8.3.2.1 Temp. 2 Input No. 5210
Select the temperature sensor input for the temperature protection.

P2.8.3.2.2 Temp. 2 Limit 1 No. 5211
Set the temperature level for issuing a warning.

P2.8.3.2.3 Temp. 2 Limit 2 No. 5212
Set the temperature level for issuing a protection response.

P2.8.3.2.4 Temp. 2 Limit 2 Response No. 5213
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.3 Temp. 3 Protection

P2.8.3.3.1 Temp. 3 Input No. 5214
Select the temperature sensor input for the temperature protection.

P2.8.3.3.2 Temp. 3 Limit 1 No. 5215
Set the temperature level for issuing a warning.

P2.8.3.3.3 Temp. 3 Limit 2 No. 5216
Set the temperature level for issuing a protection response.

P2.8.3.3.4 Temp. 3 Limit 2 Response No. 5217
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.4 Temp. 4 Protection

P2.8.3.4.1 Temp. 4 Input No. 5218
Select the temperature sensor input for the temperature protection.

P2.8.3.4.2 Temp. 4 Limit 1 No. 5219
Set the temperature level for issuing a warning.

P2.8.3.4.3 Temp. 4 Limit 2 No. 5220
Set the temperature level for issuing a protection response.

P2.8.3.4.4 Temp. 4 Limit 2 Response No. 5221
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.5 Temp. 5 Protection

P2.8.3.5.1 Temp. 5 Input No. 5222
Select the temperature sensor input for the temperature protection.

P2.8.3.5.2 Temp. 5 Limit 1 No. 5223
Set the temperature level for issuing a warning.

P2.8.3.5.3 Temp. 5 Limit 2 No. 5224
Set the temperature level for issuing a protection response.

P2.8.3.5.4 Temp. 5 Limit 2 Response No. 5225
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.6 Temp. 6 Protection

P2.8.3.6.1 Temp. 6 Input No. 5226

Select the temperature sensor input for the temperature protection.

P2.8.3.6.2 Temp. 6 Limit 1 No. 5227
Set the temperature level for issuing a warning.

P2.8.3.6.3 Temp. 6 Limit 2 No. 5228
Set the temperature level for issuing a protection response.

P2.8.3.6.4 Temp. 6 Limit 2 Response No. 5229
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.7 Temp. 7 Protection

P2.8.3.7.1 Temp. 7 Input No. 5239
Select the temperature sensor input for the temperature protection.

P2.8.3.7.2 Temp. 7 Limit 1 No. 5243
Set the temperature level for issuing a warning.

P2.8.3.7.3 Temp. 7 Limit 2 No. 5269
Set the temperature level for issuing a protection response.

P2.8.3.7.4 Temp. 7 Limit 2 Response No. 5235
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.8 Temp. 8 Protection

P2.8.3.8.1 Temp. 8 Input No. 5240
Select the temperature sensor input for the temperature protection.

P2.8.3.8.2 Temp. 8 Limit 1 No. 5247
Set the temperature level for issuing a warning.

P2.8.3.8.3 Temp. 8 Limit 2 No. 5270
Set the temperature level for issuing a protection response.

P2.8.3.8.4 Temp. 8 Limit 2 Response No. 5236
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.9 Temp. 9 Protection

P2.8.3.9.1 Temp. 9 Input No. 5241
Select the temperature sensor input for the temperature protection.

P2.8.3.9.2 Temp. 9 Limit 1 No. 5249
Set the temperature level for issuing a warning.

P2.8.3.9.3 Temp. 9 Limit 2 No. 5271
Set the temperature level for issuing a protection response.

P2.8.3.9.4 Temp. 9 Limit 2 Response No. 5237
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.10 Temp. 10 Protection

P2.8.3.10.1 Temp. 10 Input No. 5242
Select the temperature sensor input for the temperature protection.

P2.8.3.10.2 Temp. 10 Limit 1 No. 5268
Set the temperature level for issuing a warning.

P2.8.3.10.3 Temp. 10 Limit 2 No. 5272
Set the temperature level for issuing a protection response.

P2.8.3.10.4 Temp. 10 Limit 2 Response No. 5238
Select the response for exceeding the limit.

No.	Name	Description
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.3.11 Common

P2.8.3.11.1 Meas. Valid Range No. 5230
Set a valid reading range for the temperature probe measurements. The first element of the array is the higher and the second element the lower limit. An event is triggered if 1 of the readings goes above the higher, or below the lower limit.

P2.8.3.11.2 Meas. Out of Range Response No. 5231

Select the converter response when 1 or more of the probes exceed the valid range.

No.	Name	Description
0	No response	-
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.4 Thermistor Monitoring

The thermistor monitoring function provides three input channels that can be connected to a Positive Temperature Coefficient (PTC) type sensor. After a threshold of 4 kilo-ohms is exceeded in the input, an event is triggered. The event response is configurable.

P2.8.4.1 Thermistor Monitoring Response No. 5232

Select the response to all thermistor monitoring events.

No.	Name	Description
0	No response	-
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

P2.8.4.2 Thermistor Monitor 1 Input No. 1520

Select a thermistor input for the thermistor monitor 1.

No.	Name	Description
0	None (False)	No input is selected. A virtual value of FALSE is applied.
1	None (True)	No input is selected. A virtual value of TRUE is applied.
*	Available thermistor input terminals	A dynamically generated selection of available thermistor input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.8.4.3 Thermistor Monitor 2 Input No. 1522

Select a thermistor input for the thermistor monitor 2.

No.	Name	Description
0	None (False)	No input is selected. A virtual value of FALSE is applied.
1	None (True)	No input is selected. A virtual value of TRUE is applied.
*	Available thermistor input terminals	A dynamically generated selection of available thermistor input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

P2.8.4.4 Thermistor Monitor 3 Input No. 1524

Select a thermistor input for the thermistor monitor 3.

No.	Name	Description
0	None (False)	No input is selected. A virtual value of FALSE is applied.
1	None (True)	No input is selected. A virtual value of TRUE is applied.
*	Available thermistor input terminals	A dynamically generated selection of available thermistor input terminals is presented as an option. The specific set depends on the type and number of I/O options installed in the system.

7.3.8.5 Fieldbus Protections

This group contains parameters for setting responses, delays, and other settings for fieldbus related protections.

P2.8.5.1 Fieldbus Fault Response No. 1304

Select the behavior when a fieldbus fault occurs.

No.	Name	Description
0	No response	-
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

P2.8.5.2 No Fieldbus Connection Response No. 1305

Select the response in case there is no fieldbus connection.

No.	Name	Description
0	No response	-
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

P2.8.5.3 Process Data Timeout Response No. 1306

Select the response to a process data timeout.

No.	Name	Description
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

P2.8.5.4 Process Data Timeout Delay No. 1340

Set a delay for the triggering of the Process Data Timeout event. If process data has not been updated within this delay time, the event is triggered.

P2.8.5.5 Fieldbus Watchdog Response No. 5244
Select the converter response for the fieldbus watchdog event.

No.	Name	Description
0	No response	-
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

P2.8.5.6 Fieldbus Watchdog Delay No. 5245
Set a delay for activating the fieldbus watchdog event.

P2.8.5.7 Fieldbus Watchdog Start Delay No. 5246
Set a startup delay time for activating the fieldbus watchdog event. Counter begins when the converter wakes up.

7.3.8.6 HMI Connection Loss

Selects the converter response for losing connection to MyDrive® Insight or the control panel while they are in control of the converter. Regardless of the response, the control is released to the control place with the next highest control priority.

P2.8.6.1 HMI Connection Loss No. 5420
Select the response after connection is lost to the control panel or PC tool while they are in control. The timeout occurs after 5 s.

No.	Name	Description
0	No response	-
2	Info – persistent	The converter issues an info event that requires acknowledgment to reset.
4	Warning – persistent	The converter issues a warning event that requires acknowledgment to reset.
10	Fault	The converter issues a fault event and stops modulation.

7.3.8.7 Brake Resistor Monitoring

Brake Chopper Unit (BCU) can be configured to monitor the state and the presence of the brake resistor. If the brake resistor is disconnected or damaged during operation, the drive issues an event defined with parameter ***No. 4203***.

P2.8.7.1 Brake Resistor Test Pulse Mode No. 4202
Sets the mode for the brake resistor test pulse feature. When activated, this feature can be used to supervise that the brake resistor is present at the drive output during the operation of BCU. A Brake Resistor Missing event is generated if the feature detects that the resistor is damaged or missing. Define the response for the event with parameter ***No. 4203***.

No.	Name	Description
0	Disabled	Brake resistor test pulse feature is disabled.

No.	Name	Description
1	Periodically When Running	Test pulses are sent to brake resistor in periodic intervals when the converter is running.

P2.8.7.2 Missing Brake Resistor Response No. 4203

Select the response for missing brake resistor monitoring. The drive acts with the selected response if the resistor test pulse feature detects a missing brake resistor.

No.	Name	Description
0	No response	-
1	Info	The converter issues an info event.
3	Warning	The converter issues a warning event.
10	Fault	The converter issues a fault event and stops modulation.

7.4 G3 Maintenance & Service

This group contains auxiliary parameters for monitoring, commissioning, and servicing the converter.

7.4.1 Software Information

This group houses details about the software.

P3.1.1 Application Version No. 151

Shows the version of the application software.

7.4.1.1 Manifest

This is the manifest screen showing detailed software information in the control panel. With MyDrive® Insight, the same information is available in the “Device Info” screen. Check the available information via the control panel or MyDrive® Insight.

7.4.2 Events

If a change in settings or operational conditions occurs, the converter can issue events of the info, warning, or fault response type. This group contains information and parameters for monitoring and simulating these events.

7.4.2.1 Active Events

This is an active events screen shown only in the control panel. With MyDrive® Insight, the same information is available in the *Events* screen. Check the available information via the control panel or MyDrive® Insight.

7.4.2.2 All Events

This is the event history screen shown only in the control panel. With MyDrive® Insight, the same information is available in the *Events* screen. Check the available information via the control panel or MyDrive® Insight.

7.4.2.3 Event Simulation

The event simulation feature can be used to trigger any converter event without meeting the event criteria. This can be used to safely preview how the converter behaves during specific events. For

instance, some events may trigger other functions, such as indications through digital outputs. This feature is useful for checking the setup, configuration, and validity of such functions during specific events.

NOTICE

This feature is for commissioning and testing purposes. It is not meant for functional use.

WARNING

This feature can stop the converter and possibly trigger external events. Do not use without proper knowledge of the system.

How to use:

1. Refer to the Events Summary Table to get the event number and details for the specific event.
2. Set the event number with parameter ***No. 1402***.
3. Activate the simulation by setting parameter ***No. 1401*** to the desired simulation response.
4. To end the simulation, set parameter ***No. 1401*** back to *Disabled*.
5. If required, give a Fault Reset command to acknowledge the simulated event.
6. If required, reboot the converter to acknowledge *Trip Locked* events.

P3.2.1.1 Event Simulation No. 1401

This parameter simulates the selected event with the selected response. The simulation begins when changing the value from *Disabled*. To reset a simulated event, this parameter must be set back to *Disabled* first.

No.	Name	Description
0	Disabled	Event simulator is inactive
1	Lowest Response	The event selected with parameter No. 1402 is activated with its lowest event response. If the event can be configured with a response parameter, the response parameter's setting applies to the simulation.
10	Highest Response	The event selected with parameter No. 1402 is activated with its highest event response. If the event can be configured with a response parameter, the response parameter's setting applies to the simulation.

P3.2.1.2 Event Sim. Number No. 1402

Select the number of an event to be simulated. Refer to the Troubleshooting section to check the number of each event.

7.4.3 Operational Counters

This group shows readouts of the converter's operational counters.

P3.3.1 Control Unit On Time No. 2000

Shows the total operating time for the control unit.

P3.3.2 Power Unit On Time No. 2001

Shows the total operating time for the power unit. The counter only increments if the DC link is powered.

P3.3.3 Energy Consumption No. 2002
Shows the energy consumed.

P3.3.4 Ground Faults No. 2004
Shows the total number of ground faults.

P3.3.5 Overvoltage Faults No. 2005
Shows the total number of overvoltage faults.

P3.3.6 Overcurrent Faults No. 2006
Shows the total number of overcurrent faults.

P3.3.7 Short Circuit Faults No. 2007
Shows the total number of short-circuit faults.

P3.3.8 Number of Starts No. 2008
Shows the number of starts of the converter.

P3.3.9 Active Running Hours No. 2009
Shows the total number of active running hours of the converter.

P3.3.10 Flash 0 Wear Counter No. 2100

Shows the erase count for the most used flash 0 sector.

P3.3.11 Flash 1 Wear Counter No. 2101

Shows the erase count for the most used flash 1 sector.

7.4.4 Backup & Restore
This menu is used to access the backup and restore functions from the control panel.

7.4.4.1 Backup
This is a menu screen for creating parameter backups from the control panel. With MyDrive® Insight, similar options are available via the *Backup* button in the *Parameters* screen. Check the available settings via the control panel or MyDrive® Insight.

7.4.4.2 Restore
This is a menu for restoring parameter backups from the control panel. With MyDrive® Insight, similar options are available via the *Restore* button in the *Parameters* screen. Check the available settings via the control panel or MyDrive® Insight.

7.4.5 Expert Tools
The following parameters can be used to configure cybersecurity settings, and to enable advanced troubleshooting features.

7.4.5.1 Cybersecurity

P3.5.1.1 Max. Login Attempts No. 5900
Set the maximum number of failed login attempts before lockout.

P3.5.1.2 Max. Login Cooldown Time No. 5901
Set the maximum time before login attempts are reset after failures.

P3.5.1.3 Security Event Log IP No. 5902
Set the IP address of the server to which security events are sent and logged.

P3.5.1.4 Security Event Log Port No. 5903
Set the server port used for security event log transmission.

P3.5.1.5 System Use Notification No. 5908
Enter the system use notification text that is shown on the login screen.

7.4.5.2 Troubleshooting

P3.5.2.1 Force Recommissioning No. 5904
Recommission all nodes by clearing and reloading the configuration.

NOTICE

This resets node data.

P3.5.2.2 Save Diagnostic Log No. 5905
Save internal logs persistently for debugging.

NOTICE

Disable this parameter when troubleshooting is complete.

P3.5.2.3 Service Access No. 5906
Temporarily enables special debug or service interfaces for maintenance. Automatically disabled after power cycle.

NOTICE

Use with care: May expose sensitive functions and information.

7.5 Device Settings

7.5.1 Control Panel

The parameters in this group are for selecting 1–5 signals for monitoring in the two control panel readout screens. These screens are visible in the panel's home screen, which can be accessed by pressing the [*Home*] button (the house icon). Readout Screen 1 appears first. By navigating downwards with the arrow buttons, Readout Screen 2 appears.

7.5.1.1 Readout Screen 1

P4.1.1.1 Readout Field 1.1 No. 300

Select the parameter for readout field (screen 1 field 1).

No.	Name	Description
0	None	
9000	Converter Output Current	
9044	DC-link Voltage	
2950	Heat Sink Temperature	
2952	Control Unit Temperature	
9043	Converter Output Electrical Power	
6542	DC-link Voltage %	
2926	Internal Fan Speed	
2931	Main Fan Speed	
4200	BCU Status Word	

P4.1.1.2 Readout Field 1.2 No. 301

Select the parameter for readout field (screen 1 field 2).
Same selection as Field 1.1 (parameter ***No. 300***).

P4.1.1.3 Readout Field 1.3 No. 302

Select the parameter for readout field (screen 1 field 3).
Same selection as Field 1.1 (parameter ***No. 300***).

P4.1.1.4 Readout Field 1.4 No. 303

Select the parameter for readout field (screen 1 field 4).
Same selection as Field 1.1 (parameter ***No. 300***).

P4.1.1.5 Readout Field 1.5 No. 304

Select the parameter for readout field (screen 1 field 5).
Same selection as Field 1.1 (parameter ***No. 300***).

7.5.1.2 Readout Screen 2

P4.1.2.1 Readout Field 2.1 No. 310

Select the parameter for readout field (screen 2 field 1).
Same selection as Field 1.1 (parameter ***No. 300***).

P4.1.2.2 Readout Field 2.2 No. 311
Select the parameter for readout field (screen 2 field 2).
Same selection as Field 1.1 (parameter ***No. 300***).

P4.1.2.3 Readout Field 2.3 No. 312
Select the parameter for readout field (screen 2 field 3).
Same selection as Field 1.1 (parameter ***No. 300***).

P4.1.2.4 Readout Field 2.4 No. 313
Select the parameter for readout field (screen 2 field 4).
Same selection as Field 1.1 (parameter ***No. 300***).

P4.1.2.5 Readout Field 2.5 No. 314
Select the parameter for readout field (screen 2 field 5).
Same selection as Field 1.1 (parameter ***No. 300***).

7.5.2 Date & Time

P4.2.1 Date and Time No. 2800
Set the actual time and date. The format is YYYY-MM-DD and HH:MM:SS.

P4.2.2 Time Mode No. 6232
Select the mode for defining the system time.

No.	Name	Description
0	Manual	System time is set with parameter ***No. 2800***.
1	Auto (NTP)	System time is set by a Network Time Protocol server.

P4.2.3 NTP Server 1 No. 6233
Set the IPv4 address of the requested NTP server 1.

P4.2.4 NTP Server 2 No. 6234
Set the IPv4 address of the requested NTP server 2.

7.6 G9 Option Board Settings

This group contains readouts and parameters for setting up input and output options such as digital and analog I/O, feedback signals, or thermal measurements. The associated parameters appear in this menu based on the options connected to the converter. The following is not a definitive set of all iC7 compatible options, but just a collection of the most common and relevant options for the Brake Chopper Unit application.

7.6.1 I/O And Relay

This group and its subgroups appear only if an I/O And Relay OC7C1 option is included in the converter. This menu appears as many times as there are these options in the system. Each menu and its parameters have the suffix of their option slot.

7.6.1.1 I/O And Relay Status

P9.3.1 Digital Input Bit Word No. 1614

Shows the bitwise status of each digital input of this card.

Bit No.	Name	Description
0	Digital Input T13	TRUE = Over 15 V DC is applied between X13 T13 and Digital Input GND. FALSE = Less than 5 V DC is applied between X13 T13 and Digital Input GND.
1	Digital Input T14	TRUE = Over 15 V DC is applied between X13 T14 and Digital Input GND. FALSE = Less than 5 V DC is applied between X13 T14 and Digital Input GND.
2	Digital Input T15	TRUE = Over 15 V DC is applied between X13 T15 and Digital Input GND. FALSE = Less than 5 V DC is applied between X13 T15 and Digital Input GND.
3	Digital Input T16	TRUE = Over 15 V DC is applied between X13 T16 and Digital Input GND. FALSE = Less than 5 V DC is applied between X13 T16 and Digital Input GND.
4	Digital Input T17	TRUE = Over 15 V DC is applied between X13 T17 and Digital Input GND. FALSE = Less than 5 V DC is applied between X13 T17 and Digital Input GND.
5	Digital Input T18	TRUE = Over 15 V DC is applied between X13 T18 and Digital Input GND. FALSE = Less than 5 V DC is applied between X13 T18 and Digital Input GND.
6–11	Reserved	
12	Thermistor T71	TRUE = More than 4 kΩ is connected between X51 T71 and T72. FALSE = Less than 4 kΩ is connected between X51 T71 and T72.
13–15	Reserved	

P9.3.2 Digital Output Bit Word No. 1615

Shows the bitwise status of each digital output of this card.

Bit No.	Name	Description
0–1	Reserved	
2	Digital Output T21	TRUE = Connection between X13 T21 and I/O GND is active. FALSE = Connection between X13 T21 and I/O GND is active.
3	Digital Output T22	TRUE = Connection between X13 T22 and I/O GND is active. FALSE = Connection between X13 T22 and I/O GND is active.
4–11	Reserved	
12	Relay T02	TRUE = Connection between X101 T01 (COM) and T02 (NO) is active. FALSE = Connection between X101 T01 (COM) and T03 (NC) is active.
13	Relay T05	TRUE = Connection between X102 T04 (COM) and T05 (NO) is active. FALSE = Connection between X102 T04 (COM) and T06 (NC) is active.
14	Relay T08	TRUE = Connection between X103 T04 (COM) and T08 (NO) is active. FALSE = Connection between X103 T04 (COM) and T08 (NO) is inactive.
15	Reserved	

P9.3.3 T31 Analog Output Value No. 1613

Shows the actual value of the terminal.

P9.3.4 T33 Analog Input Value **No. 1611**
Shows the actual value of the terminal.

P9.3.5 T34 Analog Input Value **No. 1612**
Shows the actual value of the terminal.

7.6.1.2 Digital Inputs/Outputs

7.6.1.2.1 Input T13

P9.4.1.1 T13 Terminal Mode **No. 2015**
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
3	Digital Input	

P9.4.1.2 T13 Signal Inversion **No. 2291**
Select whether the signal of the terminal is inverted.

No.	Name	Description
0	Non-Inverted	
1	Digital Inverted	

P9.4.1.3 T13 Standard Debounce Filtering Time **No. 2024**
Set the standard debounce filtering time for the terminal.

7.6.1.2.2 Input T14

P9.4.2.1 T14 Terminal Mode **No. 2016**
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
3	Digital Input	

P9.4.2.2 T14 Signal Inversion **No. 2292**
Select whether the signal of the terminal is inverted.

No.	Name	Description
0	Non-Inverted	
1	Digital Inverted	

P9.4.2.3 T14 Standard Debounce Filtering Time **No. 2029**
Set the standard debounce filtering time for the terminal.

7.6.1.2.3 Input T15

P9.4.3.1 T15 Terminal Mode No. 2022
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
3	Digital Input	

P9.4.3.2 T15 Signal Inversion No. 2295
Select whether the signal of the terminal is inverted.

No.	Name	Description
0	Non-Inverted	
1	Digital Inverted	

P9.4.3.3 T15 Standard Debounce Filtering Time No. 2297
Set the standard debounce filtering time for the terminal.

7.6.1.2.4 Input T16

P9.4.4.1 T16 Terminal Mode No. 2298
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
3	Digital Input	

P9.4.4.2 T16 Signal Inversion No. 2296
Select whether the signal of the terminal is inverted.

No.	Name	Description
0	Non-Inverted	
1	Digital Inverted	

P9.4.4.3 T16 Standard Debounce Filtering Time No. 2260
Set the standard debounce filtering time for the terminal.

7.6.1.2.5 Input T17

P9.4.5.1 T17 Terminal Mode No. 2017
Select the mode for the terminal.

No.	Name	Description
0	Inactive	

No.	Name	Description
3	Digital Input	

P9.4.5.2 T17 Signal Inversion No. 2293
Select whether the signal of the terminal is inverted.

No.	Name	Description
0	Non-Inverted	
1	Digital Inverted	

P9.4.5.3 T17 Standard Debounce Filtering Time No. 2034
Set the standard debounce filtering time for the terminal.

7.6.1.2.6 Input T18

P9.4.6.1 T18 Terminal Mode No. 2018
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
3	Digital Input	

P9.4.6.2 T18 Signal Inversion No. 2294
Select whether the signal of the terminal is inverted.

No.	Name	Description
0	Non-Inverted	
1	Digital Inverted	

P9.4.6.3 T18 Standard Debounce Filtering Time No. 2039
Set the standard debounce filtering time for the terminal.

7.6.1.2.7 Output T21

P9.4.7.1 T21 Terminal Mode No. 4015
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
1	Digital Output	

P9.4.7.2 T21 Digital Output Type No. 4013
Select the operating logic for the digital output.

No.	Name	Description
0	Tri-state	
1	Open collector sink (NPN)	
2	Open collector source (PNP)	
3	Push pull	

7.6.1.2.8 Output T22

P9.4.8.1 T22 Terminal Mode No. 4016
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
1	Digital Output	

P9.4.8.2 T22 Digital Output Type No. 4014
Select the operating logic for the digital output.

No.	Name	Description
0	Tri-state	
1	Open collector sink (NPN)	
2	Open collector source (PNP)	
3	Push pull	

7.6.1.3 Analog Inputs/Outputs

7.6.1.3.1 Output T31

P9.5.1.1 T31 Terminal Mode No. 2019
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
5	Analog Output	

P9.5.1.2 T31 Terminal Type No. 2284
Select the type of the terminal. If voltage is selected, the unit is V. If current is selected, the unit is mA.

No.	Name	Description
0	Off	
1	Voltage	
2	Current	

P9.5.1.3 T31 Minimum Value No. 2283
Set the voltage or current representing 0% of the signal.

P9.5.1.4 T31 Maximum Value No. 2282
Set the voltage or current representing 100% of the signal.

7.6.1.3.2 Input T33
P9.5.2.1T33 Terminal Mode No. 2020
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
6	Analog Input	

P9.5.2.2 T33 Terminal Type No. 2273
Select the type of the terminal. If voltage is selected, the unit is V. If current is selected, the unit is mA.

No.	Name	Description
1	Voltage	
2	Current	

P9.5.2.3 T33 Minimum Value No. 2272
Set the voltage or current representing 0% of the signal.

P9.5.2.4 T33 Maximum Value No. 2271
Set the voltage or current representing 100% of the signal.

P9.5.2.5 T33 Filter Time No. 2270
Set the filter time for the terminal.

P9.5.2.6 T33 Live Zero Threshold Value No. 2274
Set the live zero threshold value for the terminal. The response to a live zero event is defined with parameter No. 4555 “Live Zero Response".

P9.5.2.7 T33 Live Zero Timeout Value No. 2275
Set the live zero timeout value for the terminal. The response to a live zero event is defined with parameter No. 4555 “Live Zero Response".

7.6.1.3.3 Input T34

P9.5.3.1 T34 Terminal Mode No. 2021
Select the mode for the terminal.

No.	Name	Description
0	Inactive	
6	Analog Input	

P9.5.3.2 T34 Terminal Type No. 2279

Select the type of the terminal. If voltage is selected, the unit is V. If current is selected, the unit is mA.

No.	Name	Description
1	Voltage	
2	Current	

P9.5.3.3 T34 Minimum Value No. 2278
Set the voltage or current representing 0% of the signal.

P9.5.3.4 T34 Maximum Value No. 2277
Set the voltage or current representing 100% of the signal.

P9.5.3.5 T34 Filter Time No. 2276
Set the filter time for the terminal.

P9.5.3.6 T34 Live Zero Threshold Value No. 2280
Set the live zero threshold value for the terminal. The response to a live zero event is defined with parameter No. 4555 “Live Zero Response".

P9.5.3.7 T34 Live Zero Timeout Value No. 2281
Set the live zero timeout value for the terminal. The response to a live zero event is defined with parameter No. 4555 “Live Zero Response".

7.6.2 Temperature Measurement

This group and its subgroups appear only if a Temperature Measurement OC7T0 option is included in the converter. This menu appears as many times as there are these options in the system. Each menu and its parameters have the suffix of their option slot.

7.6.2.1 Temperature Measurement Status

P9.3.2 T4 Temperature Value No. 4040
Shows the measured temperature of the terminal.

P9.3.3 T8 Temperature Value No. 4041
Shows the measured temperature of the terminal.

P9.3.4 T12 Temperature Value No. 4042
Shows the measured temperature of the terminal.

P9.3.5 T16 Temperature Value No. 4043
Shows the measured temperature of the terminal.

P9.3.6 T20 Temperature Value No. 4044
Shows the measured temperature of the terminal.

7.6.2.2 Temperature inputs

7.6.2.2.1 Input T4

P9.4.1.1 T4 Terminal Mode No. 4045

Select the mode for the terminal.

No.	Name	Description
0	Inactive	
7	Temperature input	

P9.4.1.2 T4 Connection Type No. 4046

Select the connection type for the sensor.

No.	Name	Description
0	No sensor	
2	2-wire	
3	3-wire	
4	4-wire	

P9.4.1.3 T4 Temperature Sensor Type No. 4047

Select which type of temperature sensor is connected to the terminal.

No.	Name	Description
0	No sensor	
1	Pt100	
2	2xPt100	
3	3xPt100	
4	Pt1000	
5	Ni1000Tk5000	
6	Ni1000Tk6180	
7	KTY84-1x0	
8	KTY84-151	
9	KTY84-152	
10	KTY81/82-1x0	
11	KTY81/82-121	
12	KTY81/82-122	
13	KTY81/82-151	
14	KTY81/82-152	
15	KTY81/82-2x0	
16	KTY81/82-221	
17	KTY81/82-222	
18	KTY81/82-251	
19	KTY81/82-252	

P9.4.1.4 T4 Offset No. 4048

Set the offset of the temperature measured.

7.6.2.2.2 Input T8

P9.4.2.1 T8 Terminal Mode No. 4049

Select the mode for the terminal.

No.	Name	Description
0	Inactive	
7	Temperature input	

P9.4.2.2 T8 Connection Type No. 4050

Select the connection type for the sensor.

No.	Name	Description
0	No sensor	
2	2-wire	
3	3-wire	
4	4-wire	

P9.4.2.3 T8 Temperature Sensor Type No. 4051

Select which type of temperature sensor is connected to the terminal.

No.	Name	Description
0	No sensor	
1	Pt100	
2	2xPt100	
3	3xPt100	
4	Pt1000	
5	Ni1000Tk5000	
6	Ni1000Tk6180	
7	KTY84-1x0	
8	KTY84-151	
9	KTY84-152	
10	KTY81/82-1x0	
11	KTY81/82-121	
12	KTY81/82-122	
13	KTY81/82-151	
14	KTY81/82-152	
15	KTY81/82-2x0	
16	KTY81/82-221	
17	KTY81/82-222	
18	KTY81/82-251	

No.	Name	Description
19	KTY81/82-252	

P9.4.2.4 T8 Offset No. 4052

Set the offset of the temperature measured.

7.6.2.2.3 Input T12

P9.4.3.1 T12 Terminal Mode No. 4053

Select the mode for the terminal.

No.	Name	Description
0	Inactive	
7	Temperature input	

P9.4.3.2 T12 Connection Type No. 4054

Select the connection type for the sensor.

No.	Name	Description
0	No sensor	
2	2-wire	
3	3-wire	
4	4-wire	

P9.4.3.3 T12 Temperature Sensor Type No. 4055

Select which type of temperature sensor is connected to the terminal.

No.	Name	Description
0	No sensor	
1	Pt100	
2	2xPt100	
3	3xPt100	
4	Pt1000	
5	Ni1000Tk5000	
6	Ni1000Tk6180	
7	KTY84-1x0	
8	KTY84-151	
9	KTY84-152	
10	KTY81/82-1x0	
11	KTY81/82-121	
12	KTY81/82-122	
13	KTY81/82-151	
14	KTY81/82-152	
15	KTY81/82-2x0	
16	KTY81/82-221	
17	KTY81/82-222	
18	KTY81/82-251	
19	KTY81/82-252	

P9.4.3.4 T12 Offset No. 4056

Set the offset of the temperature measured.

7.6.2.2.4 Input T16

P9.4.4.1 T16 Terminal Mode No. 2298

Select the mode for the terminal.

No.	Name	Description
0	Inactive	
7	Temperature input	

P9.4.4.2 T16 Connection Type No. 4058

Select the connection type for the sensor.

No.	Name	Description
0	No sensor	
2	2-wire	
3	3-wire	
4	4-wire	

P9.4.4.3 T16 Temperature Sensor Type No. 4059

Select which type of temperature sensor is connected to the terminal.

No.	Name	Description
0	No sensor	
1	Pt100	
2	2xPt100	
3	3xPt100	
4	Pt1000	
5	Ni1000Tk5000	
6	Ni1000Tk6180	
7	KTY84-1x0	
8	KTY84-151	
9	KTY84-152	
10	KTY81/82-1x0	
11	KTY81/82-121	
12	KTY81/82-122	
13	KTY81/82-151	
14	KTY81/82-152	
15	KTY81/82-2x0	
16	KTY81/82-221	
17	KTY81/82-222	
18	KTY81/82-251	
19	KTY81/82-252	

P9.4.4.4 T16 Offset No. 4060

Set the offset of the temperature measured.

7.6.2.2.5 Input T20

P9.4.5.1 T20 Terminal Mode No. 4017

Select the mode for the terminal.

No.	Name	Description
0	Inactive	
7	Temperature input	

P9.4.5.2 T20 Connection Type No. 4062

Select the connection type for the sensor.

No.	Name	Description
0	No sensor	
2	2-wire	
3	3-wire	
4	4-wire	

P9.4.5.3 T20 Temperature Sensor Type No. 4063

Select which type of temperature sensor is connected to the terminal.

No.	Name	Description
0	No sensor	
1	Pt100	
2	2xPt100	
3	3xPt100	
4	Pt1000	
5	Ni1000Tk5000	
6	Ni1000Tk6180	
7	KTY84-1x0	
8	KTY84-151	
9	KTY84-152	
10	KTY81/82-1x0	
11	KTY81/82-121	
12	KTY81/82-122	
13	KTY81/82-151	
14	KTY81/82-152	
15	KTY81/82-2x0	
16	KTY81/82-221	
17	KTY81/82-222	
18	KTY81/82-251	
19	KTY81/82-252	

P9.4.5.4 T20 Offset No. 4064

Set the offset of the temperature measured.

7.7 Connectivity

This section provides information about configuring and monitoring all types of communication interfaces as well as the communication and fieldbus protocols available. The following interfaces are available:

- Communication interface X0 (service port).
- Communication interface X1/X2 (fieldbus ports).
- Attached communication options.

The availability of different fieldbus protocols depends on the product.

7.7.1 Integrated Communication

7.7.1.1 Communication interfaces

7.7.1.1.1 Host Settings

P10.1.1.1.1 Fully Qualified Domain Name No. 7036

Fully Qualified Domain Name. Consists of a host name label and at least 1 higher-level domain separated by the symbol "." with up to 240 characters in total. Each label contains up to 63 characters, starts with a lowercase letter and ends with an alphanumeric lowercase character, and has as interior characters only alphanumeric lowercase characters and '-'.

7.7.1.1.2 Ethernet Interface X0

7.7.1.1.2.1.1 IPv4 Settings

This is a menu screen for enabling IP configuration of the X0 interface. Check the available settings via the control panel or MyDrive® Insight.

7.7.1.1.2.1.2 IPv4 Status

This is a menu screen containing information about the IP configuration of the X0 interface. Check the available information via the control panel or MyDrive® Insight.

7.7.1.1.3 Ethernet Interface X1/X2 Settings

7.7.1.1.3.1.1 IPv4 Settings

This is a menu screen for enabling IP configuration of the X1/2 interface. Check the available settings via the control panel or MyDrive® Insight.

7.7.1.1.3.1.2 IPv4 Status

This is a menu screen containing information about the IP configuration of the X1/X2 interface. Check the available information via the control panel or MyDrive® Insight.

7.7.1.1.4 Ethernet port X0

7.7.1.1.4.1 X0 Settings

P10.1.1.4.1.1 Link configuration X0 No. 7047

Select the configuration of the Ethernet link parameters.

No.	Name	Description
0	Auto negotiation	
1	10 Mbps full duplex	
2	10 Mbps half duplex	
3	100 Mbps full duplex	
4	100 Mbps half duplex	

7.7.1.1.5 Ethernet port X1

7.7.1.1.5.1 X1 Settings

P10.1.1.5.1.1 Link Configuration X1 No. 7048

Select the configuration of the Ethernet link parameters.

No.	Name	Description
0	Auto negotiation	
1	10 Mbps full duplex	
2	10 Mbps half duplex	
3	100 Mbps full duplex	
4	100 Mbps half duplex	

7.7.1.1.6 Ethernet port X2

7.7.1.1.6.1 X2 Settings

P10.1.1.6.1.1 Link Configuration X2 No. 7049

Select the configuration of the Ethernet link parameters.

No.	Name	Description
0	Auto negotiation	
1	10 Mbps full duplex	
2	10 Mbps half duplex	
3	100 Mbps full duplex	
4	100 Mbps half duplex	

7.7.1.1.7 Port Mirroring

This is a menu screen for enabling and disabling the port-mirroring function for network troubleshooting with a network analyzer tool. Check the available configurations via the control panel or MyDrive® Insight.

7.7.1.2 Protocols

7.7.1.2.1.1 PROFINET®

7.7.1.2.1.1.1 Status

7.7.1.2.1.1.1.1 PROFINET® Report

This is the PROFINET® report screen showing active PROFINET® connection and configuration information. Check the available information via the control panel or MyDrive® Insight.

7.7.1.2.1.1.2 Configuration

P10.1.2.1.2.1 Name of Station No. 7080

Set the name of station. The PROFINET® device is identified by its name of station. Each name must be unique in the network.

7.7.1.2.1.1.3 Diagnosis

P10.1.2.1.3.1 Diagnostic Fault No. 7081

Enables diagnostic faults. When disabled, the device does not send any PROFINET® diagnosis messages of "Fault" severity when a fault is present on the device.

No.	Name	Description
0	Disabled	Fault diagnosis messages are not sent.
1	Enabled	Fault diagnosis messages are sent.

P10.1.2.1.3.2 Diagnostic Warning No. 7083

Enables diagnostic warnings. When disabled, the device does not send any PROFINET® diagnosis messages of "Maintenance required" severity when a warning is present on the device.

No.	Name	Description
0	Disabled	Warning diagnosis messages are not sent.
1	Enabled	Warning diagnosis messages are sent.

7.7.1.2.1.2 Modbus® TCP

7.7.1.2.1.2.1 Configuration

P10.1.2.2.1.1 Persistent Storage No. 7061

Select if persistent storage is active for Modbus® writes.

No.	Name	Description
0	Disabled	When writing to configuration parameters via a Modbus® protocol, the latest written value is not stored to memory. If the converter is rebooted the latest written value is lost.
1	Enabled	When writing to configuration parameters via a Modbus® protocol, the latest written value is stored to memory. If the converter is rebooted the latest written value is retained.

P10.1.2.2.1.2 Byte Order No. 7062

Select the byte order.

No.	Name	Description
0	Big Endian	• Decreasing byte order. • The value being read/written starts from the most significant byte and ends with the least significant byte of the source value.
1	Little Endian	• Increasing byte order. • The value being read/written starts from the least significant byte and ends with the most significant byte of the source value.

P10.1.2.2.1.3 Word Order No. 7063

Select the word order.

No.	Name	Description
0	Big Endian	• Decreasing word order. • The value being read/written starts from the most significant word and ends with the least significant word of the source value.
1	Little Endian	• Increasing word order. • The value being read/written starts from the least significant word and ends with the most significant word of the source value.

7.7.1.2.1.3 PROFINET®

7.7.1.2.1.3.1 Status

7.7.1.2.1.3.1.1 EtherNet/IP Report

This is the EtherNet/IP report screen showing active EtherNet/IP connection and configuration information. Check the available information via the control panel or MyDrive® Insight.

7.7.2 RS-485 Communication OC7F3

This group contains parameters for setting up an RS-485 Communication to the drive. This menu and the associated parameters appear if an RS-485 Communication OC7F3 option board is connected to the drive.

7.7.2.1 RS-485 Settings

This is a menu screen for enabling RS-485 Communication settings. The configurable parameters are port address, baud rate, data frame settings, and line termination. These settings can be configured via the control panel or MyDrive® Insight. The supported choices are presented in the following table.

Name	Description
Port Address	Set the port address of the RS-485 communication interface between 0…247.
Baud Rate	Set the baud rate for the RS-485 communication interface. The supported baud rates are: 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200.
Data Frame Settings	Set the desired frame settings, including number of data bits, parity, and number of stop bits. Supported settings are: 524289: 8 data bits, None parity, 1 stop bit 524290: 8 data bits, None parity, 2 stop bits 524545: 8 data bits, Odd parity, 1 stop bit 524801: 8 data bits, Even parity, 1 stop bit.
Line Termination	Enable or disable the use of line termination resistor. This should be enabled only on the last drive in the RS-485 bus.

7.7.2.2 Modbus® Settings

7.7.2.2.1 Persistent Storage No. 7061

Select if persistent storage is active for Modbus® writes.

No.	Name	Description
0	Disabled	When writing to configuration parameters via a Modbus® protocol, the latest written value is not stored to memory. If the drive is rebooted the latest written value is lost.
1	Enabled	When writing to configuration parameters via a Modbus® protocol, the latest written value is stored to memory. If the drive is rebooted the latest written value is retained.

7.7.2.2.2 Byte Order No. 7062

Select the byte order.

No.	Name	Description
0	Big Endian	• Decreasing byte order. • The value being read/written starts from the most significant byte and ends with the least significant byte of the source value.
1	Little Endian	• Increasing byte order. • The value being read/written starts from the least significant byte and ends with the most significant byte of the source value.

7.7.2.2.3 Word Order No. 7061

Select the word order.

No.	Name	Description
0	Big Endian	• Decreasing word order. • The value being read/written starts from the most significant word and ends with the least significant word of the source value.
1	Little Endian	• Increasing word order. • The value being read/written starts from the least significant word and ends with the most significant word of the source value.

8 Troubleshooting

8.1 Viewing and Resetting Events

The iC7 series power converters can produce 3 types of events: info, warning, and fault.

Info events are mainly notifications of situations, or for logging events into the event history. Info events are not highlighted through any indicator LEDs or other ways. An active info and its details can be viewed in the Active Events list, and the same information is stored into the Event History. An info event is reset automatically once the triggering conditions are no longer active.

When a warning event occurs, status indicators on the control panel and control board LEDs turn yellow, and a yellow, triangular warning symbol appears in the device status panel of MyDrive® Insight. An active warning and its details can be viewed in the Active Events list, and the same information is stored into the Event History. While a warning is active, the converter remains operational. A warning event is reset automatically once the triggering conditions are no longer active.

When a fault event occurs, status indicators on the control panel and control board LEDs turn red, and a red, bell-shaped fault symbol appears in the device status panel of MyDrive® Insight. An active fault and its details can be viewed in the Active Events list, and the same information is stored into the Event History. When a fault becomes active, the converter stops operation. Depending on the fault and the settings, the main circuit breaker can also be opened. To reset a fault event, the fault triggering conditions must be inactive and a reset command (fault acknowledgment) must be given to the converter.

To access the Active Events on the control panel, press the [*Info*] button on the home screen, or navigate to **3.2.1 Active Events** in the parameter menu**.** With MyDrive® Insight, establish a connection to the drive and navigate to *Events* > *Live*.

To access the Event History on the control panel, navigate to **3.2.2 Even History** in the parameter menu**.** With MyDrive® Insight, establish a connection to the drive and navigate to *Events* > *Live*.

8.2 Reading the Event Summary Table

The following chapter contains a summarized table of all the events in a Brake Chopper Unit converter.

Events in iC7 converters have 2 different identifiers: Group numbers and Individual numbers. The group numbers for iC7 converters follow the DRIVECOM industry standard error code specification. The specification originated with the Interbus communication profile. The Interbus V3.0 base profile was released on 2018-04-19. The inverter specific profile was released on 1997-12-15. The error code specification was adopted by CAN in Automation and ODVA and is used within their respective Converter Profile. The list of standardized error codes can be found within IEC 61800-7-201.

Unlike individual numbers, the group numbers are not unique since multiple errors can be related to each other. An example is different ground faults which share the Group Number 0x2330.

The rest of the table shows a display name, brief description, possible causes for the event and associated mitigation actions (if applicable).

8.3 Events Summary for Brake Chopper Unit

Group	Number	Name	Description	Possible causes	Mitigation Actions
0x2110	4379	CM Current High	An excessive common mode current has been detected in the LCL-filter.	Faulty components. Loose cable connection. Faulty cables.	Check the components, cables, and connections.
0x2212	4374	DC-link Resonance	A resonance on the DC link with excessive RMS current values has been detected.	The switching frequency or its 2nd multiple is in the range of system resonance frequency.	Contact Danfoss service.
0x2221	4384	Thermal Overload Rectifier	The rectifier is thermally overloaded. The mission profile is too demanding.	Too high loading on the rectifier.	Check the load profile.
0x2222	4373	DC-link Overcurrent	An overcurrent on the main DC-link capacitors has been detected.	Faulty DC-link capacitor.	Contact Danfoss service.
0x2311	4097	Inverter Overload	Thermal overload is detected in the inverter of the drive.	Too high loading of the inverter.	Reduce the output load. Consider applying limits.
	4368	Output Current High 0	The output current of the drive has exceeded its normal range at low speed.	Shock load or too fast acceleration with high-inertia loads can cause this fault.	Check that the motor size matches the drive, and the motor data is correct. Check that the motor shaft can be turned.
	4369	Output Current High 1	The output current of the drive has exceeded its normal range.		
	4375	Excessive Current Limiting	The output current of the drive has exceeded the current limit multiple times.	Motor and drive mismatch. Motor misconfiguration. Too high loading of the inverter. Blocked motor shaft.	Check that the motor size matches the drive, and the motor data is correct. Check that the motor shaft can be turned.
	4377	Smart Derating Fault	A Smart Derating fault is detected.	The load is too demanding for the current derating level.	Lower the switching frequency if possible.
	4380	Current Limit Setting Fault	The actual current limit setting is too high relative to the selected constant control frequency level.	Incorrect current limit or modulation settings.	Reduce the control frequency setting or reduce the current limit setting.
	5129	Overload Event	Overload is detected based on motor current, torque, or power.	Too high loading of the inverter.	Reduce the output load. Consider applying limits.
0x2330	4352	Ground Fault 0	A high-impedance ground fault is detected on the output.	Damaged motor cable or motor.	Check the insulation of motor cable and motor.
	4353	Ground Fault 1			
	4354	Ground Fault 2	A low-impedance ground fault is detected		A power cycle is required.

Group	Number	Name	Description	Possible causes	Mitigation Actions
			on the output.		Check the insulation of motor cable and motor.
	4355	Ground Fault 21	A high or low-impedance ground fault is detected on the output.		
0x2340	4356	Inverter Short Circuit	A short circuit at the inverter output is detected.	Damaged motor cable or motor.	A power cycle is required. Check the motor and motor cable.
	4370	Output Current High 2	A critical output overcurrent has been detected.	Damaged motor cable or motor.	A power cycle is required. Check for short circuits on the output.
	4649	Desat Gate Driver	The gate driver has detected a desaturation condition.	Faulty component. Extremely high overcurrent.	A power cycle is required. Contact the local Danfoss service. If the fault occurs the same time as an overcurrent fault, check installations and components from AC output to load.
0x23fe	4371	Current Imbalance	A current imbalance between paralleled power units has been detected.	Faulty current measurement. Impedance mismatch from parallel modules to point of common coupling. Transistor switching time compensation disabled.	Check installation connections. Contact the local Danfoss distributor.
0x3110	4162	Grid Voltage Spikes	Excessive spikes on the grid voltage have been detected.	Faulty grid supply. Loose cable connection. Faulty cables or fuses.	Check the grid supply, cables, connections, and fuses.
	4164	Grid Voltage High	Grid voltage (RMS) above the normal operating range is detected.	Faulty grid supply. Loose cable connection. Faulty cables or fuses. Wrong unit voltage class selection.	Check unit voltage class selection. Check the grid supply, cables, connections, and fuses.
0x3120	4165	Grid Voltage Low	A grid voltage (RMS) below the normal operating range is detected.	Faulty grid supply. Loose cable connection. Faulty cables or fuses. Wrong unit voltage class selection.	Check unit voltage class selection. Check the grid supply, cables, connections, and fuses.
0x3130	4160	Missing Grid Phase	A missing phase is detected on the grid side.	Faulty grid supply. Loose cable connection. Faulty cables or fuses.	Check the grid supply, cables, connections, and fuses.
	4163	Grid Imbalance	A large imbalance of the		

Group	Number	Name	Description	Possible causes	Mitigation Actions
			grid voltages is detected.		
0x3140	4161	Grid Frequency Out of Range	A grid frequency outside the normal operating range is detected.	Input line phase is missing. Rated current of supply is too low compared to the AFE unit. Grid frequency is too high or too low. Main Circuit Breaker is open.	Check the grid supply, cables, connections, and fuses.
	4166	Grid Synchronization Error	The drive is unable to maintain the synchronization to the grid voltage.		
0x3211	4145	DC-link Voltage High 1	The voltage of the DC link is above the normal operating range and has reached a critical level.	Too fast motor braking. Grid transients.	Increase deceleration time, enable the overvoltage controller, use AC brake, or use a brake resistor while braking.
0x3212	4144	DC-link Voltage High 2	The voltage of the DC link is above the normal operating range and has reached a critical level.		
0x3221	4146	DC-link Voltage Low	The DC-link voltage is below the normal operating range.	Fault in DC-voltage supply (rectifier or front-end converter).	Check the DC-supply unit. Try to enable undervoltage protection to keep the drive running as long as possible.
0x32ff	4147	DC-link Voltage Ripple	Excessive voltage ripple has been detected on the main DC-link capacitors.	Grid voltage imbalance.	Reduce the output power.
	4148	DC-link Imbalance	An imbalance across the DC-link capacitors is detected. If the fault remains after resetting the drive, service is required.	The imbalance can be caused by a component fault of the DC link.	Try resetting the drive. Inspect the drive. Service the drive. Contact Danfoss service.
0x4110	4099	Ambient Temp. High	The ambient temperature is too high.	Excessive heating or insufficient cooling of the drive's ambient temperature.	Check the temperature and cooling conditions. Lower the temperature or improve the cooling conditions.
0x4280	5132	Temp. Protection 1	Temperature protection 1 is triggered. The temperature has exceeded the configured value.	The device under measurement is heating up. The probe connection is faulty.	Check the status of the monitored device. Check the probe connection.
	5133	Temp. Protection 2	Temperature protection 2 is triggered. The temperature has exceeded the configured value.		
	5134	Temp. Protection 3	Temperature protection		

Group	Number	Name	Description	Possible causes	Mitigation Actions
			3 is triggered. The temperature has exceeded the configured value.		
	5135	Temp. Protection 4	Temperature protection 4 is triggered. The temperature has exceeded the configured value.		
	5136	Temp. Protection 5	Temperature protection 5 is triggered. The temperature has exceeded the configured value.		
	5137	Temp. Protection 6	Temperature protection 6 is triggered. The temperature has exceeded the configured value.		
	5147	Temp. Protection 7	Temperature protection 7 is triggered. The temperature has exceeded the configured value.		
	5148	Temp. Protection 8	Temperature protection 8 is triggered. The temperature has exceeded the configured value.		
	5149	Temp. Protection 9	Temperature protection 9 is triggered. The temperature has exceeded the configured value.		
	5154	Temp. Protection 10	Temperature protection 10 is triggered. The temperature has exceeded the configured value.		
	5138	Temperature Sensor Out of Range	One of the temperature sensor readings is outside of the set range.	The temperature probe is faulty. The connection to the probe is faulty.	Check the status and connection of the probe.
	5241	Input Section Overtemperature	An overtemperature is detected in the mains input section of the enclosure.	Insufficient enclosure cooling. Converter overloading. Faulty overtemperature signal wiring or connection.	Check the enclosure cooling. Reduce converter load. Check the signal wiring and connection.
0x4281	5143	Thermistor Monitor 1	The input of thermistor monitor 1 has exceeded the 4 kilo ohm threshold.	The device under measurement is heating up.	Check the status of the monitored device. Check the thermistor

Group	Number	Name	Description	Possible causes	Mitigation Actions
	5144	Thermistor Monitor 2	The input of thermistor monitor 2 has exceeded the 4 kilo ohm threshold.	The thermistor connection is faulty.	connection.
	5145	Thermistor Monitor 3	The input of thermistor monitor 3 has exceeded the 4 kilo ohm threshold.		
0x42ff	4200	Power Option Temp. High 1	The temperature of a power option has exceeded the normal temperature range.	Excessive loading of the power option. Insufficient cooling of the ambient temperature around the power option.	Check the cooling conditions. Reduce the load or the ambient temperature.
	4201	Power Option Temp. High 2	The temperature of a power option has reached a critical level.		
	4202	Power Option Temp. Low	The temperature of a power option component is too low.	Excessive heating or insufficient cooling of the ambient temperature around the power option.	Check the ambient temperature. Increase the ambient temperature around the power option.
	4203	Power Option Temp. Limit	The temperature of a power option component is at the upper limit of the normal temperature.	Excessive loading of the power option. Insufficient cooling of the ambient temperature around the power option.	Check the cooling conditions. Reduce the load or the ambient temperature.
	4204	Power Option Temp. Imbal. 1	The thermal imbalance between the power option components exceeds the normal operating range.	Faulty installation of the power option or its thermal measurement components. Defective power option or its thermal measurement components.	Check the power option component for installation errors or defects. Check the option's thermal measurement components for installation errors, connection issues, or defects.
	4205	Power Option Temp. Imbal. 2	An excessive thermal imbalance between power option components has been detected.		
	4206	Power Option Temp. Imbal. Limit	The thermal imbalance between the power option components is at the upper limit of the normal operating range.		
0x4310	4103	Inverter Temp. Limit	The temperature of the inverter heat sink is at the upper limit of the normal temperature range.	High ambient temperature. Insufficient cooling. Overloading of the drive.	Check cooling and heat sink conditions. Reduce the output current or ambient temperature. The drive may derate if the temperature is not lowered.
	4104	Inverter Temp. High 1	The temperature of the inverter heat sink has exceeded the normal temperature level. Check cooling and heat	High ambient temperature. Insufficient cooling. Overloading of the	Check cooling and heat sink conditions. Reduce the output current to avoid a protected fault.

Group	Number	Name	Description	Possible causes	Mitigation Actions
			sink conditions. Reduce the output current or ambient temperature.	drive.	
	4105	Inverter Temp. High 2	The temperature of the inverter heat sink has reached a critical level.		
	4110	IGBT Temp. High	An inverter IGBT overtemperature has been detected.	High ambient temperature. Insufficient cooling. Overloading of the drive.	Reduce the ambient temperature, the output current and/or the switching frequency. Check the cooling and the condition of the heat sink.
	4113	Rectifier Temp. Limit	The temperature of the rectifier heat sink is at the upper limit of the normal temperature range.	High ambient temperature. Insufficient cooling. Overloading of the drive.	Check cooling and heat sink conditions. Reduce the output power (torque, speed) or the ambient temperature.
	4114	Rectifier Temp. High 1	The temperature of the rectifier heat sink has exceeded the normal temperature range.		
	4115	Rectifier Temp. High 2	The temperature of the rectifier heat sink has reached a critical level.		
	4117	Power Unit Temp. Limit	The internal air temperature of the drive is at the upper limit of the normal temperature range.		
	4118	Power Unit Temp. High 1	The internal air temperature of the drive has exceeded its normal temperature range.	High ambient temperature. Insufficient cooling. Overloading of the drive.	Check cooling and heat sink conditions. Reduce the output power (torque, speed) or the ambient temperature.
	4119	Power Unit Temp. High 2	The internal air temperature of the drive has reached a critical value.		
	4125	IGBT Temp. High	An inverter IGBT temperature has reached a critical value.	High ambient temperature. Insufficient cooling. Overloading of the drive.	Reduce the drive's output current if possible to avoid a protected fault.
0x4320	4102	Ambient Temp. Low	The drive is operated at a too low ambient temperature.	Low ambient temperature. Insufficient heating or excessive cooling.	Check the ambient temperature. Increase the ambient temperature or consider an external heater to increase the temperature around the drive.

Group	Number	Name	Description	Possible causes	Mitigation Actions
	4112	Rectifier Temp. Low	The temperature of the rectifier heat sink is too low.	Low ambient temperature. Insufficient heating or excessive cooling.	Check the ambient temperature. Increase the ambient temperature or consider an external heater to increase the temperature around the drive.
	4116	Power Unit Temp. Low	The internal air temperature of the drive is below the normal operating range.	Low ambient temperature. Insufficient heating or excessive cooling.	The drive is operated at a too low ambient temperature. Consider an external heater to avoid this warning or fault.
0x4380	5240	Cooling Monitor	The cooling signal to an external cooling unit is missing.	Faulty external cooling unit. Faulty external cooling unit signal.	Check the external cooling unit. Check the signal wiring and connections to the cooling unit.
0x43fe	4120	Control Board Temp. Low	The temperature of the control board is below the normal temperature range.	Low ambient temperature. Insufficient heating or excessive cooling.	Check the ambient temperature. Increase the ambient temperature or consider an external heater to increase the temperature at the drive.
	4121	Control Board Temp. Limit	The temperature of the control board is at the upper limit of the normal temperature range.	High ambient temperature. Insufficient cooling. Overloading of the control board.	Check cooling conditions and load of the control board. Reduce the load on the control board or the ambient temperature. To reduce load, consider reducing the switching frequency or the number of active features.
	4122	Control Board Temp. High 1	The temperature of the control board has exceeded its normal temperature range.		
	4123	Control Board Temp. High 2	The temperature of the control board has reached a critical level.		
	4126	IGBT Temperature Imbalance	There is a temperature imbalance between 1 or more IGBTs.	Defective IGBTs. Insufficient cooling. Defective driver boards.	Check the condition of IGBT modules and their connections. Check the cooling of the power unit. Check the driver boards.
	4127	IGBT Temperature Imbalance	An excessive thermal imbalance between the IGBT modules has been detected.		
0x5100	4641	24V Backup Mode	The drive is in 24 V backup mode. The control section (including parameter configurations) and installed options are kept operational.	No connection to the power unit.	Establish or inspect the connection to the power unit.

Group	Number	Name	Description	Possible causes	Mitigation Actions
0x5110	4224	Analog Input Overload	Analog input overload detected.	High input voltage or current from an external source. Short circuit.	Check the input voltage supply and prefer using the I/O option's own 10 V source for analog inputs. Check the connections.
0x5112	4640	24V Supply Fault	The 24 V supply is outside its normal operating range for the control board.	Faulty supply, connection, or cables in the control board +24 V external power supply.	Cycle Power. Inspect the supply source. Inspect the supply connections and cables.
	4226	Supply Overload 24V	24 V supply overload detected in an I/O option board.	Short circuit in the digital I/O +24 V control voltage terminal.	Check the connections.
0x5114	4642	3.3V Supply Low	The voltage of the power board internal 3.3 V supply is below its normal operating range.	Faulty or insufficient supply voltage for the power board. Defective power board components.	Check the power board power supply. Check the power board. Contact Danfoss service.
0x5118	4643	28V Supply Low	The voltage of the power board internal 28 V supply is below its normal operating range.		
0x511a	4227	Supply Overload 10V	10 V supply overload detected in an I/O option.	Short circuit in the analog I/O +10 V reference voltage terminal.	Check the connections.
0x5160	4225	Digital Output Overload	Digital output overload detected.	Overcurrent in the output due to low resistive loading or short circuit.	Inspect the output connections. Consider adding pull-down resistors to reduce the current.
0x51fe	4644	Gate Driver Voltage Fault	The gate driver supply voltage is outside its normal operating range.	Faulty IGBT driver board.	A power cycle is required. Contact Danfoss service.
	4653	Gate Driver Fault	A gate driver fault is detected or a link to the gate driver is broken.	Faulty IGBT driver board or its connection	Contact Danfoss service.
0x51ff	4645	Power Board Supply Fault	A power supply fault on the power board has been detected.	Faulty supply, connection, or cables in the power board +24 V auxiliary power supply.	A power cycle is required. Inspect the supply source. Inspect the supply connections and cables.
	4646	Power Supply Voltage	A power supply voltage is outside its normal operating range.		
0x5210	4378	Current Sensor Fault	A defective current sensor or an error in the calibration of the current sensors has been detected.	A defective current sensor. Sensor calibration error.	Service the drive. Contact Danfoss service.
0x54fd	4647	Function Disabled	The protection logic keeps the trip active until the configuration of the power unit	The Functional Safety module is misconfigured.	Check the Functional Safety Settings.

Group	Number	Name	Description	Possible causes	Mitigation Actions
			protection levels is ready.		
0x54fe	4628	STO Activated	The Safe Torque-Off (STO) is activated and an unintended restart is prevented until the STO-request has been reset.	An STO command was given to the drive. The STO signal or its connection is faulty. Functional Safety module is faulty or installed incorrectly.	Check the validity of the command from its source. Check the health and connection of the STO signal and the Functional Safety module.
	4629	STO Fault Ch. A	The Safe Torque-Off (STO) is activated due to a discrepancy fault: Channel A is not activated, while channel B is activated.		
	4630	STO Fault Ch. B	The Safe Torque-Off (STO) is activated due to a discrepancy fault: Channel B is not activated, while channel A is activated.		
0x54ff	4149	DC-link Short Circuit	An internal short circuit is detected in the DC link.	Faulty DC-link components.	A power cycle is required. Service the drive. Contact Danfoss service.
	4150	DC Capacitor Short Circuit	A short circuit in a DC-link capacitor is detected.		
	4151	DC-link Short Circuit 2	A short circuit in the DC-link capacitor is detected.		
0x5530	4790	Control Data Error	A data error is detected in the control data database EEPROM.	Control Data does not match what the current version of the control software expects.	Contact Danfoss service.
	4791	Invalid PUD	A data error has been detected in the power unit database EEPROM.	Power Unit Data does not match what the current version of the control software expects.	Contact Danfoss service.
0x6100	4134	System Time Adjust	System time has been adjusted.	Event for logging.	No action.
	4135	Real Time Clock Hardware Error	Hardware error has been detected in the real-time clock.	RTC battery missing or with low charge.	Install or replace the RTC battery.
	4304	License Missing	A required license is missing.	A fieldbus connection from an unlicensed protocol was attempted.	Use a licensed protocol. Acquire a license.
	4349	Authenticity Error	Files authenticity verification error occurred.	The application within the drive is either missing or unauthenticated.	Upload an authenticated application.

Group	Number	Name	Description	Possible causes	Mitigation Actions
	4351	System Fault	A system fault has been detected. See additional information for details.	Software issue. Control board overloading. Faulty connection to one or more nodes. Faulty circuit boards.	Cycle power. Check that all boards are properly powered, installed, connected, and wired together. Check the condition of all circuit boards. Reduce control board loading. Contact the Danfoss supplier or the service department if the fault persists.
	4357	Firmware Crash	A firmware crash occurred and detailed information is provided.		
	4567	Restore Status	Provides information about the restore operation of a setting.	Event for logging.	No action.
	4568	Automatic Reset	All event conditions have cleared and triggered events have been automatically reset.	Event for logging.	No action.
	4816	PLC Task Overrun	The high CPU load is inhibiting normal operation of the application (PLC task overrun).	Software issue. Control board overloading. Faulty connection to one or more nodes. Faulty circuit boards.	Cycle power. Check that all boards are properly powered, installed, connected, and wired together. Check the condition of all circuit boards. Reduce control board loading. Contact the Danfoss supplier or the service department if the fault persists.
	4817	PLC Runtime Error	The PLC runtime has stopped responding. The application has been halted.		
	4832	Node Discovery	Node discovery and configuration are in progress. The modulation is inhibited.	Event for logging.	No action.
	4833	Node Commissioning	Nodes are being commissioned.	Event for logging.	No action.
	4834	Node Missing	A previously commissioned node is no longer available. The drive is waiting for the node to be available.	The node is without power. Connection to the node is faulty.	Check that the node is powered on. Check the connection to the node. If the node has been intentionally removed, recommission the drive.

Group	Number	Name	Description	Possible causes	Mitigation Actions
	4851	Restart Required	A configuration change requires a soft-cycle or power-cycle to take effect. Modulation is inhibited.	Configuration change.	Soft- or power-cycle the drive.
	4855	Internal Fault	An internal fault has been detected related to temporal operations. Note the occurrence number for further troubleshooting directions.	Software issue. Control board overloading. Faulty connection to one or more nodes. Faulty circuit boards.	Cycle power. Check that all boards are properly powered, installed, connected, and wired together. Check the condition of all circuit boards. Reduce control board loading. Contact the Danfoss supplier or the service department if the fault persists.
	4856	Internal Fault	An internal fault has been detected related to asynchronous operations. Note the occurrence number for further troubleshooting directions.		
	4857	Software Update	The drive is currently performing an update of the software.	Event for logging.	No action.
	5130	Quick Stop Event	A quick stop has been requested.	The user has requested a quick stop, or the quick stop signal is faulty.	Check why a quick stop was requested. Check the fieldbus or digital input signal health and connection.
0x6180	5260	Event Simulation	The event with the number 5260 is simulated.	The event simulator was activated with its dedicated test event.	No action.
0x6181	4980	A Digital Input terminal is unknown by system	A digital input terminal has been selected that is unknown by the system.	An I/O option has been moved or removed.	Check I/O options. Reconfigure the function that is using the terminal in question.
	4981	A Digital Output terminal is unknown by system	A digital output terminal has been selected that is unknown by the system.		
	4982	An Analog Input terminal is unknown by system	An analog input terminal has been selected that is unknown by the system.		
	4983	An Analog Output terminal is unknown by system	An analog output terminal has been selected that is unknown by the system.		
	4984	A Digital Output occupied	A digital output is in use by another function or fieldbus. If a Fieldbus has taken control over a terminal, it has priority over parameter selection.	Several entities (fieldbus or I/O) have been configured to use the same terminal.	Reconfigure I/O and fieldbus functions to use their individual terminals.

Group	Number	Name	Description	Possible causes	Mitigation Actions
	4985	An Analog Output occupied	An analog output is in use by another function or fieldbus. If a Fieldbus has taken control over a terminal, it has priority over parameter selection.		
0x61f7	4800	Low Storage Space	The available storage space for the file system is low.	Too many parameter backups, datalogger, or event log files within the drive's file system.	Transfer parameter backups, logs, and/or datalogger files to external memory to free up space.
	4801	Data Logger Storage	Volume restriction limits are preventing additional datalogger capture files from being stored.	Low storage space. Demanding datalogger settings.	Transfer files to external memory to free up space. Reduce the sampling time, logging window, or number of signals.
	4802	Event Logger Storage	Volume restriction limits are preventing additional event log capture files from being stored.	Low storage space.	Transfer files to external memory to free up space.
0x61fb	4600	Option Communication Fault	A fault of the communication with an option or other node has been detected. Note the occurrence number for further troubleshooting directions.	Faulty connection to the node. Faulty circuit boards.	Cycle power. Check that all boards are properly powered, installed, connected, and wired together. Check the condition of all circuit boards. Contact the Danfoss supplier or the service department if the fault persists.
	4601	Internal Communication Fault	An internal communication fault has been detected in the auxiliary bus. Note the occurrence number for further troubleshooting directions.		
	4602	Option Communication Fault	A fault of the communication with an option has been detected.		
	4607	Internal Communication Fault	An internal communication fault has been detected between different nodes. Note the occurrence number for further troubleshooting directions.		
	4631	Internal Communication Fault	An internal communication fault to a power node has been		

Group	Number	Name	Description	Possible causes	Mitigation Actions
			detected. Note the occurrence number for further troubleshooting directions.		
	4632	Internal Communication Fault	An internal communication fault to an optional node has been detected. Note the occurrence number for further troubleshooting directions.		
	4654	Control Node Disconnected	Internal communication route to one or more control nodes have been disconnected in a drive-to-drive system.	Control board or extender board is not powered. Faulty connection. Faulty control node or extender board.	Check the control board and associated extender board for power, connection, or defect issues.
0x61fc	4605	Internal Communication Fault	An internal communication fault has been detected with the high-speed bus to power system. Note the occurrence number for further troubleshooting directions.	Faulty connection to the node. Faulty circuit boards.	Cycle power. Check that all boards are properly powered, installed, connected, and wired together. Check the condition of all circuit boards. Contact the Danfoss supplier or the service department if the fault persists.
	4606	Internal Communication Fault	An internal communication fault has been detected. Cycle power, check the wiring if applicable, contact the Danfoss supplier or the service department if the fault persists. Note the occurrence number for further troubleshooting directions.		
	4639	High Speed Bus Sync Error	Internal synchronization error detected with high-speed bus connection to parallel control unit.		
	4648	High Speed Bus Error	Internal error detected with high-speed bus connection to parallel control unit. Unexpected time adjustment.		
	4858	Internal Fault	An internal fault has been detected. The power system has not received the required reference for modulation. Note the occurrence number for		

Group	Number	Name	Description	Possible causes	Mitigation Actions
			further troubleshooting directions.		
	4859	Internal Fault	An internal fault (connection from the power system) has been detected. Note the occurrence number for further troubleshooting directions.		
	4860	Unexpected Time Adjust	An internal fault (unexpected time adjustment) has been detected. Note the occurrence number for further troubleshooting directions.		
	4861	Synchronization Fault	An internal fault (time synchronization error between controller and power system) has been detected. Note the occurrence number for further troubleshooting directions.		
	4862	PDS	Internal error detected with high-speed bus connection from controller.		
	4863	Internal Fault	An internal fault (connection with the power system) has been detected. Note the occurrence number for further troubleshooting directions.		
0x6320	4350	Configuration Error	An invalid system configuration has been detected.	Incompatible motor type and control principle. Too narrow DC-link voltage bandwidth.	Check motor type and motor control principle. Check DC-link voltage controller levels.
	5301	Invalid Control Config.	An invalid control configuration is preventing operation.		
0x7113	4400	Brake Chopper Overload	A brake chopper overcurrent is detected.	Brake size mismatch to application. Overloading of resistor.	Cycle Power. Reduce the generated regenerative and check the rating of the brake resistor.
	4401	Brake Resistor Temp. High	The brake resistor temperature is too high.	Brake size mismatch to application. Insufficient cooling. Overloading of resistor.	Check the rating of the brake resistor and cooling conditions. Reduce the generated regenerative power.
	4402	Brake Resistor Missing	The brake resistor or its connection is missing.	Faulty brake resistor connection.	Check the resistor and connections for

Group	Number	Name	Description	Possible causes	Mitigation Actions
					installation issues or defects.
	4404	Brake Failure	A brake failure is detected, further testing will clarify the failure source. Coast first to run the test.	Defective brake or connections.	Run the brake test.
0x70ff	4128	Control Fan Failure	The control board cooling fan is not running at the commanded speed.	Blocked or faulty fan. Faulty fan wiring.	Check the fan's wiring and whether its blocked or polluted. Replace the fan if necessary.
	4129	Main Fan Failure	The main cooling fan is not following its reference speed.		
	4130	Internal Fan Failure	The internal fan is running below its reference speed. Check the fan's wiring and whether its blocked or polluted. Replace the fan if necessary.		
	4133	LCL Fan Speed Fault	LCL cooling fan not tracking commanded output.		
0x7500	4638	Drive to Drive Connection Lost	Drive to drive connection is lost.	Fault in the connection between drives. Fault in the extender board.	Check the connection between the drives. Check the status of the extender boards.
0x7502	4416	Analog Input Live Zero	A live zero event detected in an analog input terminal.	A faulty wire or connection.	Check the analog input wiring or connections.
0x7580	5141	Control Panel Connection Lost	The connection to the control panel was lost. Panel control has been released.	Fault in the panel connection. Error in the panel.	Check the connection to the panel. Check the panel.
	5142	PC Tool Connection Lost	The connection to the PC tool was lost. PC control has been released.	Fault in the PC connection. Error in the PC software or software was closed.	Check the connection to the PC. Check the status of the PC software.
0x8080	5125	Limit Supervision Event 1	A user define signal is over/under a supervision limit.	The drive is in an undesirable operating point.	Check the operating point. Consider applying speed, current, torque, or power limits.
	5126	Limit Supervision Event 2			
	5127	Limit Supervision Event 3			
0x8100	4256	Address Conflict	The fieldbus has identified an Address Conflict on the network which made the device back off.	Two or more devices in the service or fieldbus networks have the same address.	Change the address of the conflicting devices.
	4257	Ethernet Cable Fault	At link down a	The service or fieldbus	Check the cables and

Group	Number	Name	Description	Possible causes	Mitigation Actions
			measurement is done to measure the distance to the far end of the cable, indicating where the fault has occurred. This warning occurs at distances > 4 m and Link State Change Down. Actual distance is shown in detailed info.	Ethernet connection is faulty due to cable or connection issues.	connections. Utilize the detailed event info.
	4258	Invalid Fieldbus Configuration	An issue due to an invalid configuration of the fieldbus connection has been detected. See additional detail info.	Features not supported by the device. Mismatch between configured and available features. Modules are not available in the device.	Depending on the protocol: Check the custom Modbus® mapping. Check for mismatches in the used device and device description files.
	4260	Redundant Controller Missing	One or more of the expected fieldbus controllers are missing.		Check the fieldbus connection or the status of the fieldbus master.
	4261	Fieldbus Topology Mismatch	The current fieldbus topology does not match the topology provided at commissioning time.	Wiring mistake. Fieldbus master configuration mistake.	Reconfigure the fieldbus master or change the connection between X1/X2 ports.
	4263	Ethernet Link Status Changed	There has been detected a change of the Ethernet link status. Additional info has details about which port and state.	Event for logging.	No action.
	4265	Ethernet Redundancy Error	Primary or backup physical paths are missing.	Connection or cable fault. Wrong interface settings	Check the connection. Check the interface settings.
	4266	X1 Cable Redundancy	The physical path from X1 interface to the controller is missing or wrongly configured.		
	4267	X2 Cable Redundancy	The physical path from X2 interface to the controller is missing or wrongly configured.		
	4269	Network Time Protocol	Information of Network Time Protocol server. See detailed info.	Event for logging.	No action.
	4280	Controller Not in Run	Controller not in RUN state.	Event for logging.	No action.
	4281	Interface Configuration Change	Interface configuration changed. See detailed info.	Event for logging.	No action.
0x8100	5161	Fieldbus Watchdog Supervision	Fieldbus watchdog supervision has detected too long delay	Fieldbus master has lost control, or the current transferred I/O data	Check the fieldbus connection, the status of any Ethernet switches

Group	Number	Name	Description	Possible causes	Mitigation Actions
			between fieldbus data updates.	from the master is not valid. The fieldbus master is not updating the data.	or the status of the fieldbus master.
0x8100	5163	Primary Process Data Timeout	The fieldbus I/O data has not been updating any of the process data monitored by the primary process data monitor (Watchdog1).	This can happen when the direct fieldbus connection to the drive has lost control, or the current received I/O data is not valid.	Check the fieldbus connection directly to the drive or the status of the fieldbus master.
0x8100	5165	Fieldbus Faulted	One or more of the Fieldbus I/O connections has failed from any protocol.	An established Fieldbus I/O Connection has been disrupted by, for example, a cable break or power cut of PLC or other infrastructure components.	Check the fieldbus connection or the status of the fieldbus master.
0x81fd	4270	No Modbus® TCP Connection	No Modbus® TCP communication is currently established.	Can happen during startup until the first connection is established or if all connections have stopped (gracefully or disruptive).	Establish a connection.
	4271	No PROFINET® Connection	No PROFINET® I/O communication is currently established.		
	4272	No EtherNet/IP® Connection	No EtherNet/IP® communication is currently established.		
	4273	No EtherCAT® Connection	No EtherCAT® communication is currently established.		
	4282	No Modbus® TCP Connection	No Modbus® RTU communication is currently established.		
0x81fe	4274	Loss of Modbus TCP I/O	One or more of the Fieldbus I/O connections has failed.	Event for logging.	No action.
	4275	Loss of PROFINET® I/O			
	4276	Loss of EtherNet/IP® I/O			
	4277	Loss of EtherCAT® Connection			
	4283	Loss of Modbus® RTU Connection			
0x81ff	4278 4279	Primary Process Data Timeout Secondary Process Data Timeout	The fieldbus I/O data has not been updating any of the process data monitored by the primary process data monitor (Watchdog1/2).	Event for logging.	No action.
0xff01	5123	External Event 1	An external signal has activated an event.	An external system is requesting for the drive to log an event or to stop running. The event triggering signal is faulty.	Check the external system. Check the health of the signal.
	5124	External Event 2			

Group	Number	Name	Description	Possible causes	Mitigation Actions
0xff06	5901	Logic Input Error	Configured input function reports an error.	Warning event. There is an issue with one or more input signals of one or more logic function blocks.	Change the logic configuration. Check the Logic Feature guide for more information.
	5902	Logic Output Error	Configured output function reports an error.	Warning event. There is an issue with one or more output signals of one or more logic function blocks.	
	5903	Logic Block Configuration Error	Logic block configuration is incorrect.	Warning event. One or more logic function blocks have been configured incorrectly.	
	5904	Logic State Error	Logic state handling reports an error.	Warning event. One or more logic states have been configured incorrectly.	

Danfoss A/S
Ulsnaes 1
DK-6300 Graasten
drives.danfoss.com

M00499
AB556325399770en-010101
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