



MD880-40 Series Active Rectifier

Software User Guide



Industrial
Automation



Intelligent
Elevator



New Energy
Vehicle



Industrial
Robot



Rail
Transit



Data code 19011980 A03

Preface

Thank you for purchasing the Inovance MD880 high-performance AC drive (multidrive system).

The MD880 has set a new industrial benchmark in terms of structure, power density, response, control precision, and scope of application. Product advantages:

- Voltage class: 400 V/690 V
- Rated power range: 3.7 kW to 5600 kW
- Complete rectifier module types: basic rectifier, regenerative rectifier, and active rectifier
- Compatible with asynchronous induction motors
- Excellent dynamic response and control accuracy

Wide scope of application:

- Metallurgy

High-speed wire rod and hot steel strip continuous rolling equipment, wide and thick plate equipment, cold rolling machine, pickling line, annealing line, galvanizing line, color coating line, non-ferrous metal alloy manufacturing equipment, and non-ferrous metal rolling equipment

- Papermaking

Papermaking combined equipment, including continuous production lines such as headbox, wire section, press section, drying section, sizing, hard calendering, coating, supercalender, and rewinding machine

- Harbor equipment and other large lifting equipment

Shore container bridge crane, rubber tired (rail type) container gantry crane, grab ship unloader, gantry grab crane, large shipbuilding gantry crane, and large metallurgical casting crane

- Ships

Marine electric main and auxiliary machine system equipment and installation ships

- Cables

Large frame stranding machine, coiling machine, and copper and aluminum multi-motor large drawing machine

- Others

Wind power converter, unit test bench, low voltage power control, oil and gas transportation, and mine transmission

This software guide is applicable to active rectifiers and other products of the MD880-40 series. The guide provides detailed information about the software, including basic usage, functions, parameters, and troubleshooting. New users must read this guide carefully. If you have any questions, contact Inovance for technical support.

Notes
◆ Drawings in this guide are for illustration only. The structural details may not match the product you purchase.
◆ This guide may be modified without prior notice due to continuous product upgrade.
◆ For any questions during usage, please contact your local agent or customer service center.

§ Related User Guides

Rectifiers	Data Code
MD880-40 Series Active Rectifier Hardware User Guide	19011311
MD880-40 Series Active Rectifier Software User Guide	19011980
MD880-30 Series Regenerative Rectifier Hardware User Guide	19011313
MD880-30 Series Regenerative Rectifier Software User Guide	19010689
MD880-20 Series Basic Rectifier Module Hardware User Guide	19011491
MD880-20 Series Basic Rectifier Module Software User Guide	19010567
Inverters	Data Code
MD880-50 Series Inverter Hardware User Guide	19011312
MD880-50 Series Inverter Software User Guide	19010602
MD880MN-50M Series Inverter Quick Commissioning Guide	19010891
Others	Data Code
SOP-20-880 Smart Operating Panel User Guide	19010611
SOP-20-880 Base Kit Installation Guide	19010401
HCU Control Module User Guide	19010528
HPCU Parallel Control Module User Guide	19010690
HSVM-10 Sync Voltage Detection Module User Guide	19010588
HSVM-20 Sync Voltage Detection Module User Guide	19010726
HPG-10 HTL Incremental Encoder Signal Detection Module User Guide	19010500
HPG-40 Resolver Encoder Signal Detection Module User Guide	19010892
HPG-50 TTL Incremental Encoder Signal Detection Module User Guide	19010501
HIO-10 I/O Function Module User Guide	19010749
HOFM-10 and HOFM-30 Optical Fiber Expansion Module User Guide	19010443
SOP-20-880 Smart Operating Panel User Guide	19010611
SOP-20 Base Kit Installation Guide	19010401
HCAN-10 Fieldbus Adapter Module User Guide	19010727
HMBA-10 Modbus RTU Fieldbus Adapter Module User Guide	19010489

HDP-10 PROFIBUS DP Fieldbus Adapter Module User Guide	19010490
HPFN-10 PROFINET IO Industrial Ethernet Adapter Module User Guide	19010877
HCBC-A0 Pulse-by-Pulse Current Limit Control Module User Guide	19010792
HOFR-50 Optical Fiber Routing Control Module User Guide	19010791

Terms and Abbreviations

Term	Meaning
HCU-40	The active rectifier control module, which can control the MD880-40 series products
SOP-20-880	A smart operating panel used with the HCU-40 control module
InoDriveStudio	A PC commissioning tool used with HCU-40
IDS	Abbreviation of InoDriveStudio
AI	Analog input
AO	Analog output
DI	Digital input
DO	Digital output
RO	Digital output with relay output
HDI	High-speed digital input
HDO	High-speed digital output
OFF1	A start/stop command corresponding to bit0 of control word 1. The rising edge corresponds to the start command, whereas the low-level input corresponds to the stop command.
OFF2	An emergency stop command, corresponding to bit1 of control word 1, that can immediately become active in any state. The high-level input allows the drive to run, whereas the low-level input blocks IGBT output.
Operation enable	A command corresponding to bit3 of control word 1 and determined after the start (OFF1) command becomes active. The high-level input allows the drive to enter the running state and enables IGBT output, whereas the low-level input locks the drive in the ready-to-run state and blocks IGBT output.
Connector	A special read-only parameter to record the running data of HCU-40. Its value can be read through its reference source parameter, and its data change waveform can be recorded by the oscilloscope.
Bit connector	A connector parameter that records only one bit of data, the value of which is 0 or 1
B connector	Bit connector
Word connector	A connector parameter that records a piece of analog data
K connector	Word connector
Reference source parameter	A special parameter that is assigned, as a number, to a connector parameter to read the numerical value of the connector parameter for HCU-40 control
Bit reference source parameter	A reference source parameter that is used to read a bit connector and outputs one bit of data
Word reference source parameter	A reference source parameter that is used to read a word connector and output an analog numerical value
Terminal start/stop module	A set of common ways of using terminals to control drive start/stop

Motor-driven potentiometer	A software-based virtual potentiometer output. Its value can be adjusted by using the UP or DOWN command.

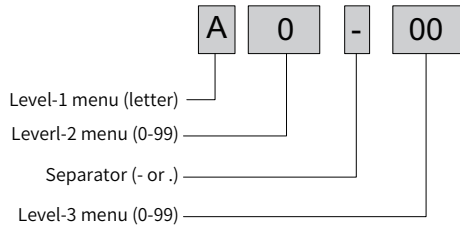


NOTE

- ◆ "Word" and "bit" mentioned in this guide, for example, in "word connector", "bit connector", and "control word", indicate the length of data. "Bit" represents 1-bit data, the value of which can be 0 or 1. "Word" represents 16-bit data, the range of which can be 0 to 65535 (unsigned) or -32768 to +32767 (signed).

Parameter Setpoint and Output Value

The HCU-40 parameters are represented by a three-level menu structure, as shown in the following figure:



NOTE

- ◆ The separators "-" and "." used in parameter menus represent the same meaning. For example, A0-00 is the same as A0.00. This guide uses A0-00, whereas the LED panel may display A0.00.
- ◆ Level-1 menus can contain the following letters: A, b, C, d, E, F, H, L, n, o, P, and U. The letters are case sensitive for the purpose of display on the LED panel.

- The setpoint of a parameter refers to the value set by the user for the parameter.
- The output value of a parameter refers to the value obtained by reading the parameter from the HCU-40 control module.

For most parameters, the output values are equal to the setpoints. However, for reference source parameters of the HCU-40 control module, the setpoint indicates that the value of a parameter (A) is sourced from another parameter (B), that is, the output value of parameter A is equal to the output value of parameter B.

In this guide, "parameter number" indicates the parameter setpoint. "[Parameter number]" indicates the parameter output value. For example:

- U9-32 = 100%
- C0-00 = 1932
- [C0-00] = 100%

C0-00 indicates the channel 1 voltage source, which is the U9-32 connector. When U9-32 is 100%, [C0-00], the actual output value, is 100%.

The setpoint 1932 of C0-00 only indicates that the setpoint is sourced from the U9-32 connector. However, people are concerned about the output value of the channel 1 voltage setting. Therefore, [C0-00] is used to indicate the actual output value, that is, 100%.

Revision History

Date	Version	Description
May 2022	A03	◆ Updated Section 3.3.3 Setting the HSVM Module ◆ Updated Chapter 4 Function Modules ◆ Updated Chapter 5 Parameters ◆ Updated Chapter 6 Connectors ◆ Updated Chapter 7 Troubleshooting
November 2020	A02	◆ Corrected minor errors
April 2019	A01	◆ Changed the logo
January 2018	A00	◆ First release

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Chapter 1 Commissioning Tool

The MD880 series product supports both the SOP-20-880 operating panel and InoDriveStudio for parameter setting and commissioning. Commissioning steps and parameters related to the SOP-20-880 operating panel are basically the same as that related to InoDriveStudio. This chapter describes how to use the SOP-20-880 operating panel and InoDriveStudio for commissioning.

1.1 SOP-20-880

The SOP-20-880 smart operating panel features LCD display and a wide power supply range and is applicable to single-drive/multi-drive systems. The operating panel provides functions such as parameter setting, status monitoring, parameter copy, fault analysis and locating, program download, USB relay, and mass storage.

1.1.1 Keys and Display

1 Keys

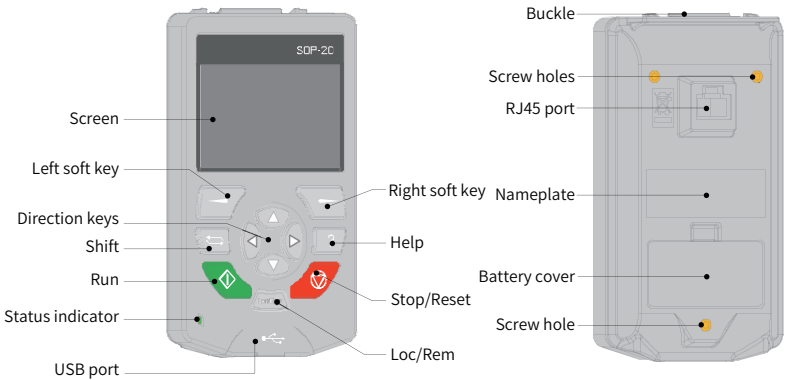
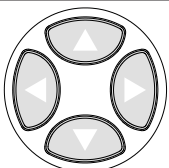


Figure 1-1 Diagram of SOP-20-880 appearance and keys

Table 1-1 Shortcut key functions

Key	Name	Description
Left soft key		Used for exiting or cancellation
Right soft key		Used for selection or confirmation
Shift		Used to quickly access the device selection page On some pages where operations cannot be interrupted, the quick device switchover function is disabled and this key is disabled.

Key	Name	Description
Help		Used to open a help page Content on the help page is contextual. That is, content on the help page depends on the menu or view displayed previously.
Run		Used to start the device in the local control mode
Stop/Reset		Used to stop the device in the local control mode When the device is faulty, the stop key is used to reset the device.
Loc/Rem		Used to switch between the local SOP-20-880 control and remote control
Arrow keys		The up and down arrow keys are used to select options in a menu or list, scroll up or down a text page, and adjust a value (such as setting time, inputting a password, and changing a parameter value). The left and right arrow keys are used to move the cursor left and right.

2 Homepage

SOP-20 has a monochrome LCD display featuring a resolution of 240 x 160 pixel and white backlight.

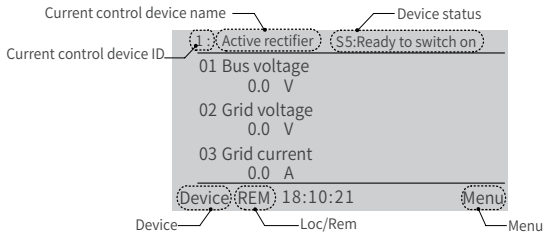


Figure 1-2 Homepage

Table 1-2 Homepage description

No.	Content	Description
1	Controlled device name	The name of the device that is being controlled by SOP-20-880
2	Controlled device ID	The ID of the device that is being controlled by SOP-20-880

No.	Content	Description
3	Device status	The status of the current device, including the machine status, fault, and alarm messages
4	Loc/Rem	The current control permission of SOP-20-880. When "Loc" is displayed, the device is controlled by SOP-20-880.
5	Device	Used to view all the devices connected to SOP-20-880
6	Menu	Accesses the function menu of SOP-20-880

3 Status indicator

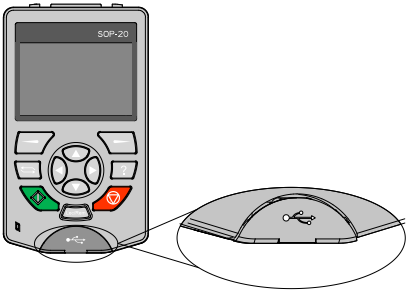
Table 1-3 Status indicator

Indicator	Illustration	Meaning
Steady green		The device is running properly.
Blinking green		The SOP-20-880 is interchanging data with the PC through USB connection.
Steady red		Communication between the SOP-20-880 and the device is normal, but the device is faulty.
Blinking red		Communication between the SOP-20-880 and the device is interrupted.

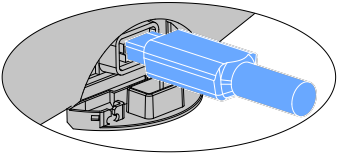
1.1.2 Relay-to-PC Connection

The Type-B Mini USB port on the bottom of the SOP-20-880 is used to connect to a PC. Use a cable not longer than 3 m for the connection. Communication between the SOP-20-880 and the PC is implemented using the USB 2.0 communication protocol.

1) Uncap the USB port.

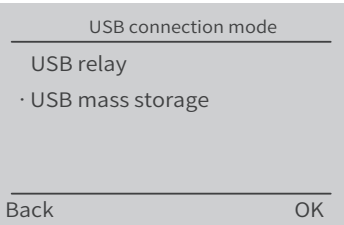


2) Connect the USB port to the PC using a cable with a ferrite core.



3) After the SOP-20-880 is connected to the PC through the USB cable, the USB relay mode and the USB mass storage mode are displayed for selection.

- ◆ In the USB relay mode, the SOP-20-880 serves as a relay for communication between the device and the PC. To use InoDriveStudio for commissioning, select the USB relay mode.
- ◆ In the USB mass storage mode, the SOP-20-880 serves as a memory.



NOTE

- ◆ For details about how to use the SOP-20-880, see the SOP-20-880 Smart Operating Panel User Guide.

1.2 Introduction to InoDriveStudio

InoDriveStudio (IDS for short) is independently developed by Inovance and Inovance fully owns the intellectual property rights to it. InoDriveStudio is high-performance commissioning software for engineering drives, and can be used for control, commissioning, fault diagnosis, and operation status monitoring on drives.

InoDriveStudio only supports the Windows platform, including but not limited to the following operating systems: Windows XP Professional, Windows Server 2003, Windows Vista, Windows 7, Windows 8, and Windows 10.

1.2.1 Main Screen

Double-click  to access the software. The following page is displayed.

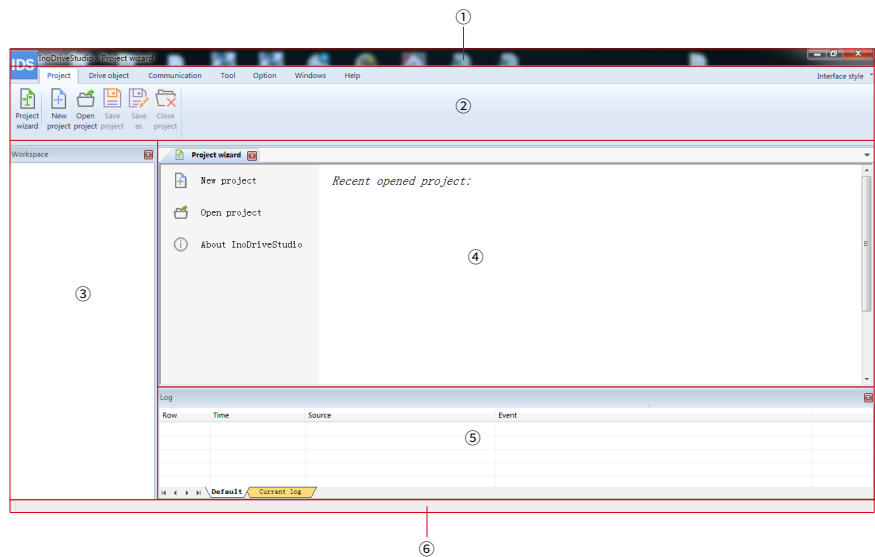


Figure 1-3 Start page

Table 1-4 Start page description

No.	Name	Description
①	Title bar	Displays information such as the window title or opened files.
②	Menu bar	Displays function modules by category.
③	Workspace	Displays relevant navigation information such as the current projects.
④	Window area	Displays details of an item specified in the Workspace .
⑤	Multi-functional area	Accommodates the log window, monitoring window, control panel window, and fault alarm window.
⑥	Status bar	Displays the current project status.

1.2.2 Creating a Project

- 1) Choose **Project > New project** in figure 1-4 to create an online project, and a dialog box will appear, as shown in figure 1-5.

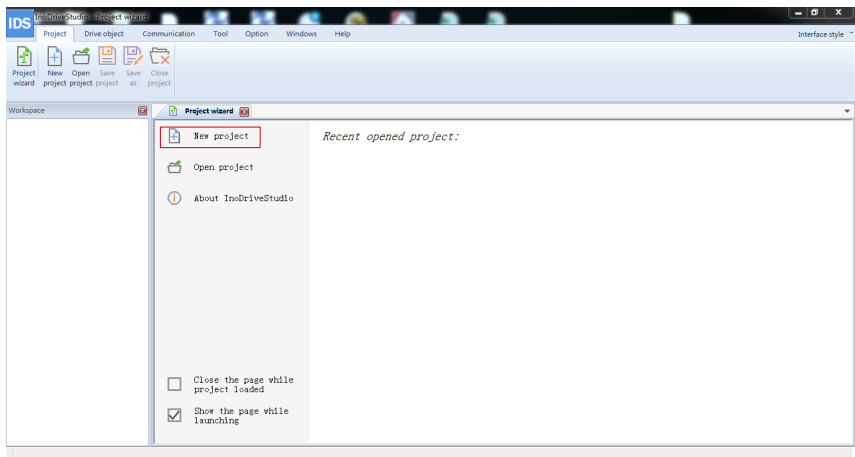


Figure 1-4 New project page

Table 1-5 Description of the New project page

Name	Description
New project	Click this button to open the dialog box for creating projects as required.
Open project	Click this button to open the dialog box for selecting a project file to open.
About InoDriveStudio	Click this button to view information relevant to the current InoDriveStudio system version.
Help	Click this button to view the help document.
Close the page while project loaded	If this item is selected, the project wizard will automatically close after the project is loaded. If this item is not selected, the project wizard will not close.
Show the page while launching	If this item is selected, the project wizard will automatically appear after the software is started. If this item is not selected, you can choose Project > Project wizard to access the wizard.
Recent opened project	Click this option to view eight recently opened projects, which are listed in descending chronological order. You can double-click a file name to open the corresponding project. Hover the cursor over a file name, the file background color will change to light blue and  will appear. If you click the icon, the file will be excluded from the list of latest projects, but will not be deleted.

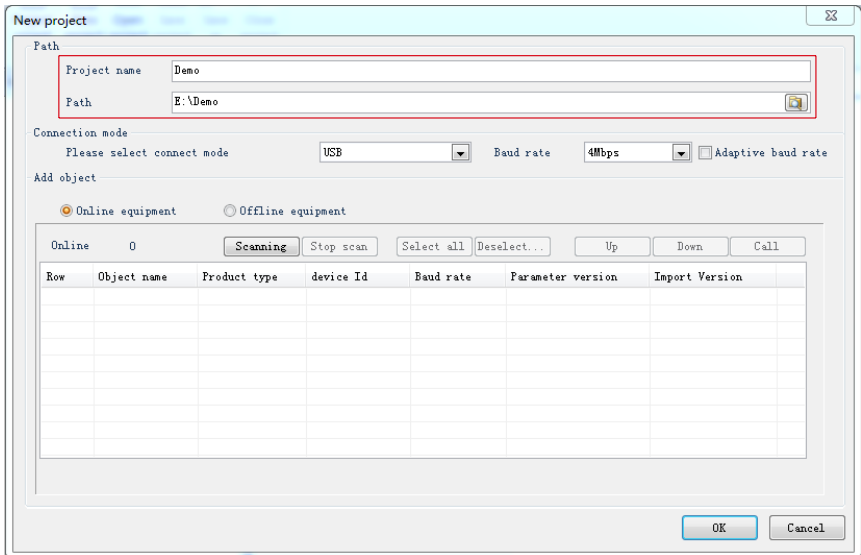


Figure 1-5 New project page

Name	Description
Project name	Specify a name for the project to be created.
Path	Specify a path on the computer for storing the project to be created.
Connect mode	Specify a communication mode and relevant parameters for the project to be created. Only the USB and TCP/IP communication modes are supported. You can also change the connection method through Communication Settings under the Communication menu bar. The project will be connected to the device in the set connection mode.
Adaptive baud rate	In the USB communication mode, specify whether to scan the drive controller in the adaptive baud rate mode. If this item is selected, objects on all the supported baud rates will be scanned. If this item is not selected, only the drive objects on the specified baud rate will be scanned.
Online equipment	Specify an online object you want to add to the project to be created. Online objects can be scanned and displayed.
Offline equipment	Specify an offline object you want to add to the project to be created. Offline objects can be confirmed based on information such as product types and versions.



NOTE

- ◆ When multiple devices are connected, ensure that communication addresses (A10-03) of these devices are different but the baud rates (A10-04) are the same.
- ◆ When multiple devices are scanned, ensure that device names are different; otherwise, the new project cannot be created.

2) Click **Scanning**.

In the USB connection mode:

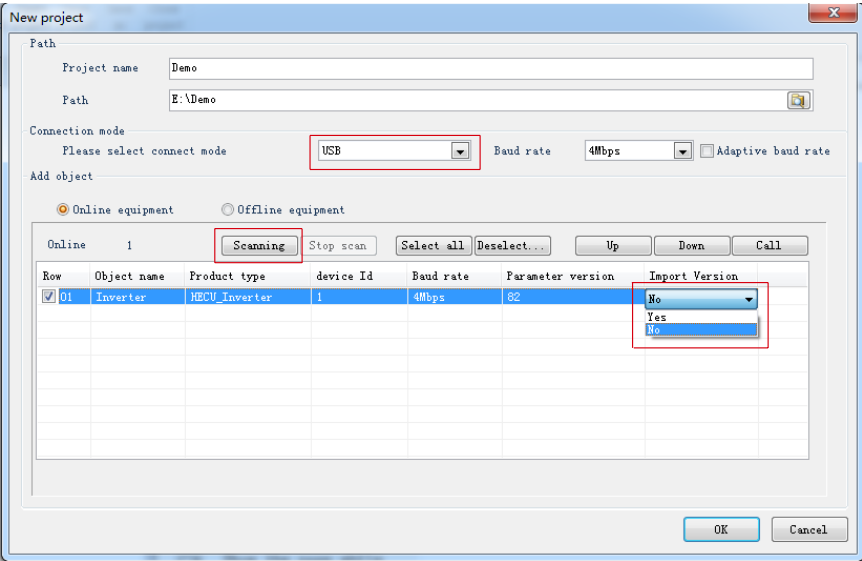


Figure 1-6 Starting scanning in the USB connection mode

In the TCP/IP connection mode:

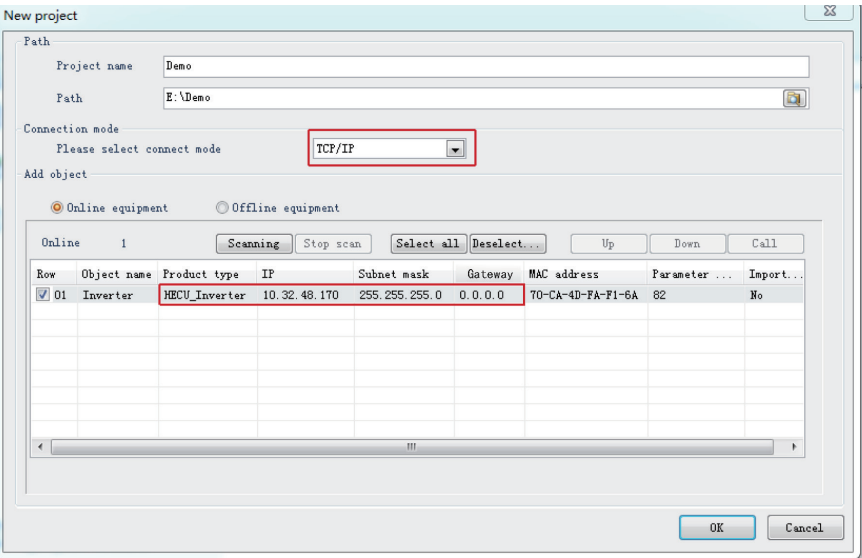


Figure 1-7 Starting scanning in the TCP/IP connection mode

- 3) Click **OK**. The new project is created, as shown in the following figure. Then, you can perform settings and commissioning operations.

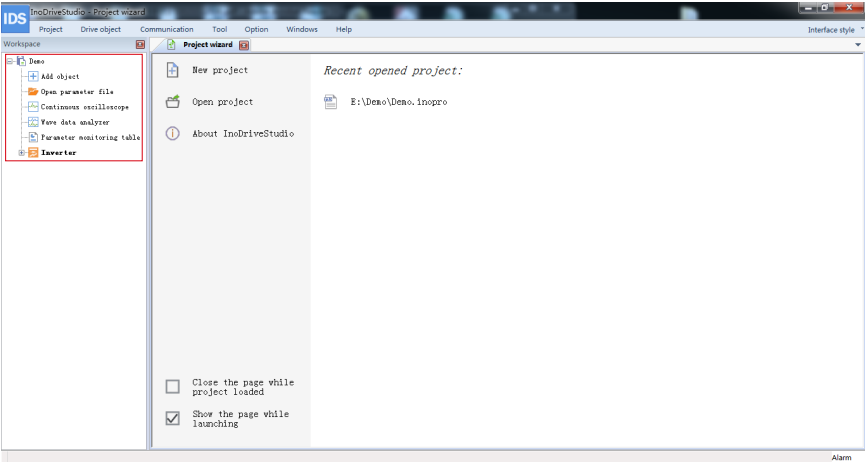


Figure 1-8 Main screen after the new project is created

1.2.3 Basic Operations

- 1) Viewing and modifying parameters

Parameter viewing and modification are basic functions of the InoDriveStudio commissioning software. After connecting the device, choose **Inverter > Parameter table > Parameter list** under the **Workspace** section on the main screen. The parameter list of the current device is displayed, as shown in Figure 1-9ure 1-9.

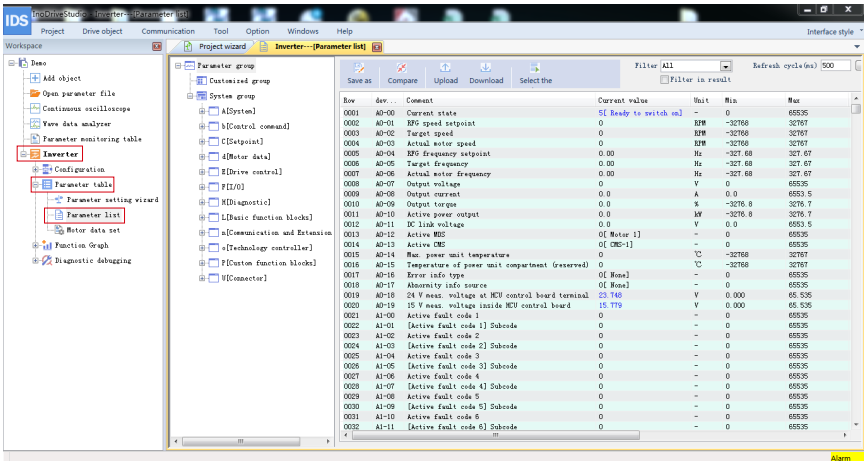


Figure 1-9 Parameter list

- The left side of the parameter list shows parameter groups, and the right side shows

the parameter information of one group.

- The parameter information columns include the parameter name, current value, default value, unit, modification mode, and communication address.
- After parameters are modified, they are downloaded to the device.
- When the current value of a parameter differs from the default value, the current value is blue.
- When the new value of a parameter exceeds the parameter value range, the new value does not take effect and the original setpoint is used.
- If a parameter supposed to be modified only at stop is modified during device running, the modification does not take effect.

2) Control panel

The control panel of InoDriveStudio can be used to start or stop devices and reset devices upon faults. Choose **Inverter > Diagnostic debugging > Debug > Control Panel** to access the control panel, as shown in Figure 1-101-10.

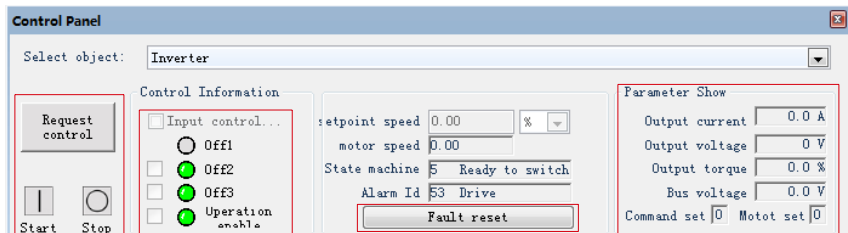
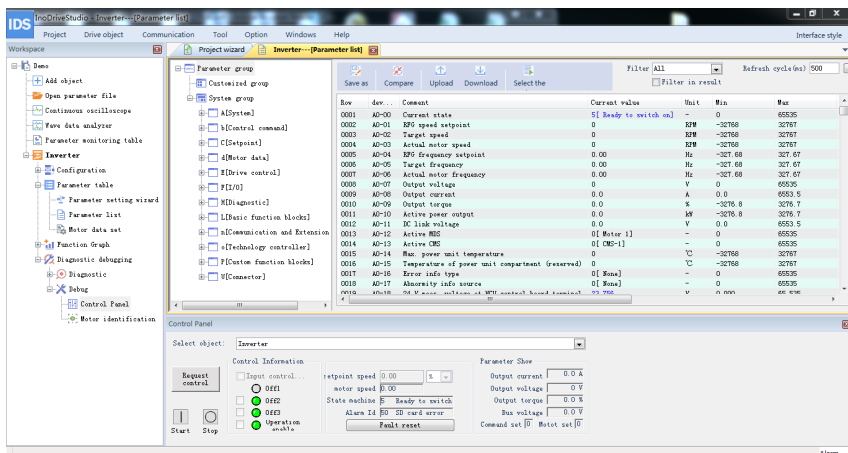


Figure 1-10 Control panel

The control panel can be used to control start and stop of the device and monitor the device status.

To control the device through the control panel, click **Request control** to obtain the device control permission.

Then, click **Start** or **Stop** to start or stop the device.

If **Input control bit** is selected, you can click **Off2** or **Operation enable** to switch control words to start or stop the device.

3) Viewing faults and alarms

The following two methods are available for viewing faults using InoDriveStudio.

■ Method 1:

Choose **Inverter > Diagnostic debugging > Diagnostic > Fault alarm table** to access the list of current faults and alarms, as shown in Figure 1-11.

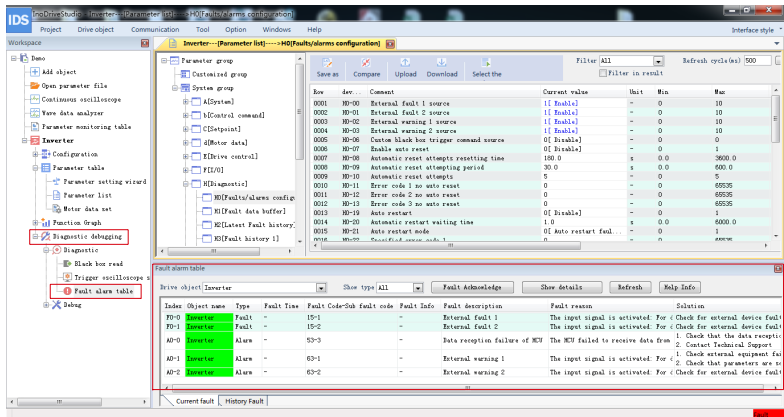


Figure 1-11 List of faults and alarms

■ Method 2:

Access parameters of group A1 to check current faults and alarms, as shown in Figure 1-12.

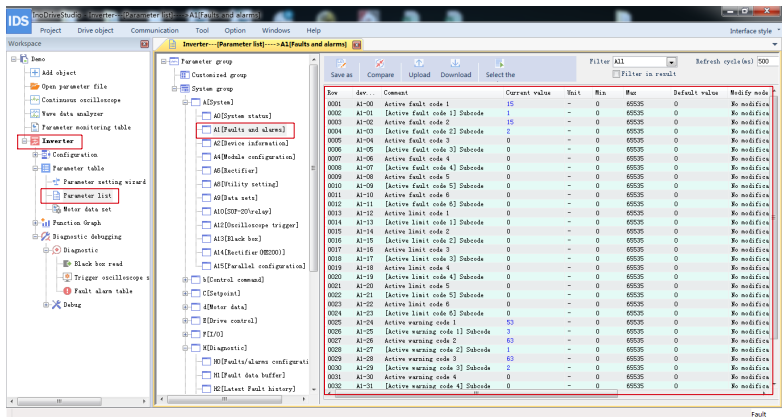


Figure 1-12 Viewing faults through parameters

1.2.4 Waveform Recording and Analysis

Analysis of real-time data curves is the most important for commissioning.

InoDriveStudio provides three means for online real-time recording and conditional triggering recording of data curves, and offline viewing of waveforms.

1) Continuous oscilloscope

Field commissioning often requires monitoring the device running status in real time. The continuous oscilloscope of InoDriveStudio can monitor and record device data or status in real time. Click **Continuous oscilloscope** under **Workspace** to access the **Continuous oscilloscope** window. This window mainly consists of the channel selection, waveform display, waveform configuration, and toolbar parts, as shown in Figure 1-13.

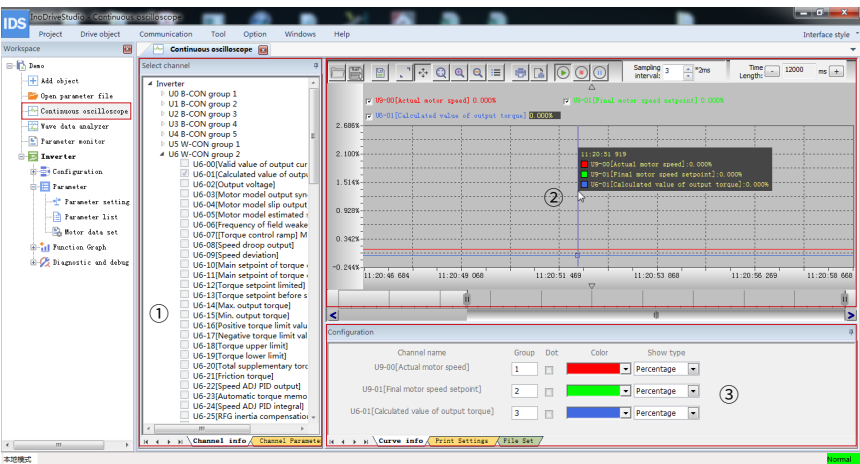


Figure 1-13 Continuous oscilloscope

Note: ① Channel selection section; ② Waveform display section; ③ Waveform configuration section

You can open only one continuous oscilloscope window for each project. In the continuous oscilloscope window, you can record and analyze waveforms of all devices in the current project.

In the channel selection section, select the data channel you want to monitor. All parameters in group U can be used as the data source for recording curve, among which:

- Parameters U5-00 to U8-99 use one record channel for recording each data entry.
- Parameters U9-00 and U9-99 use one record channel for recording each data entry by default. To obtain waveforms of higher accuracy, you can modify single word to double word in the configuration to occupy two record channels.
- Parameters U0-00 to U4-99 are used to record digital waveforms. Up to eight digital

waveforms per device can be recorded. All digital waveforms of one device occupy only one record data.

The channel number limit is related to the communication baud rate and sampling interval. Their relationship is shown in the following figure.

Baud Rate	Sampling Interval	Max. Number of Channels	Sampling Interval	Max. Number of Channels	Sampling Interval	Max. Number of Channels
115200 bps	2 ms	4	4 ms	7	> 4 ms	8
1 Mbps	2 ms	8	4 ms	8	> 4 ms	8
2 Mbps	2 ms	8	4 ms	8	> 4 ms	8
4 Mbps	2 ms	8	4 ms	8	> 4 ms	8

For how to configure the waveform and use the toolbar, see the help document delivered with the InoDriveStudio software.

2) Trigger oscilloscope

To trigger waveform recording based on alarm, fault, or other conditions, use the trigger oscilloscope function. The method is as follows:

① Access the **Trigger oscilloscope** page

Choose **Inverter > Diagnostic debugging > Diagnostic > Trigger oscilloscope setting and reading**.

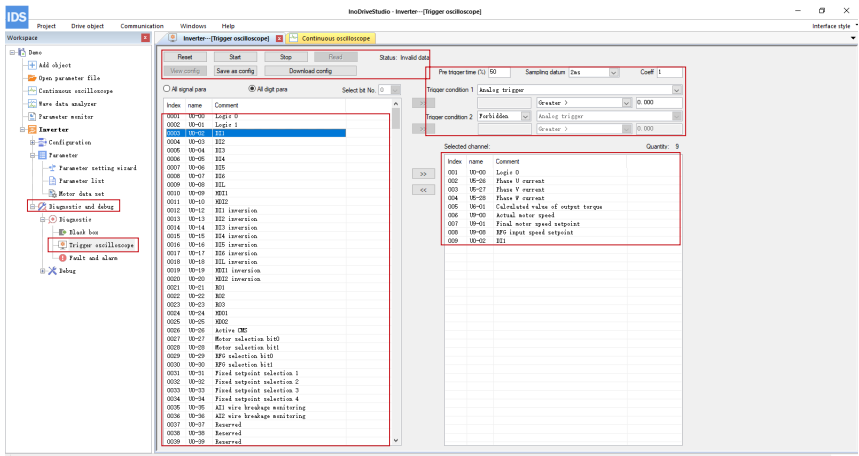


Figure 1-14 Trigger oscilloscope setting page

② Select the parameters you want to record

The recorded parameters can be analog or digital. For example, if you want to monitor

U5-11 (Measured module temperature), select **All signal para**, select U5-11, and then click  to move U5-11 to the **Selected channel** section, as shown in the following figure.

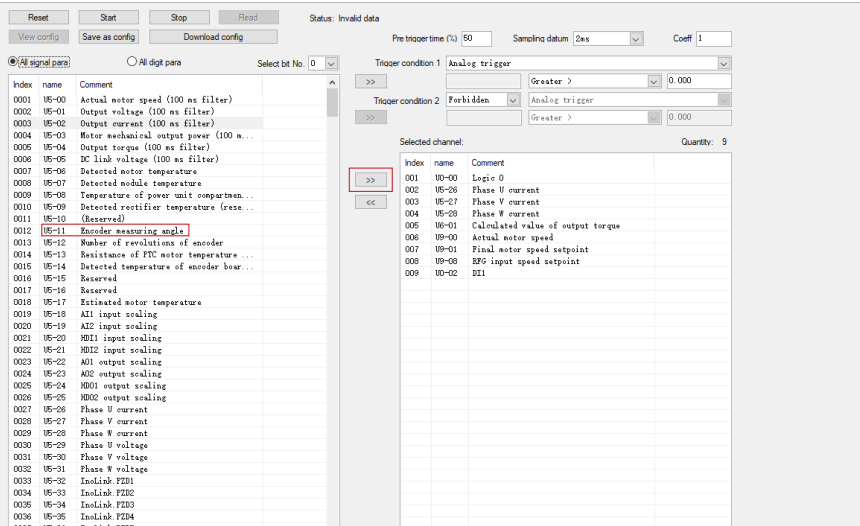


Figure 1-15 Recording parameters

You can also double-click the selected parameter to move it to the **Selected channel** section. To remove a parameter from the **Selected channel** section, double-click the parameter or click .

③ Trigger setting

Trigger conditions include:

- Sampling base value. Options are **Carrier period** and **2 ms** or its multiples.
- Pre-trigger time, which refers to the time when the trigger is ready to start. When it is set to 50%, the trigger waveform is recorded in the middle of the whole waveform time axis.
- Set trigger conditions and select the trigger quantity and its value. You can set two trigger conditions at a time. In this case, only when both conditions are met will the trigger be effective. When only one condition is met, the trigger condition 2 is disabled.

Index	name	Comment
001	U0-00	Logic 0
002	U5-26	Phase U current
003	U5-27	Phase V current
004	U5-28	Phase W current
005	U6-01	Calculated value of output torque
006	U9-00	Actual motor speed
007	U9-01	Final motor speed setpoint
008	U9-08	RFG input speed setpoint
009	U0-02	DI1

Figure 1-16 Trigger settings

When all settings (including parameter selection and trigger settings) are completed, the trigger settings can be saved to a file, which can be directly downloaded for use next time.

④ Start

After the setting is completed, click **Start**. When the trigger conditions are met, the system prompts that the trigger is executed. After the waveform recording is completed, the status will change to ready. Click **Read** and name and save the file. Then, the software automatically opens the recorded waveform and you can select the channel you want to view.

3) Black box function

When a fault occurs, the HCU control module collects data generated within 1.5s before and 0.5s after the fault. The data includes 16 ADC interruption internal data entries, 48 internal data entries at 2 ms interval, and 16 user-defined data entries at 2 ms interval. The collected data will be automatically saved to the SD card of HCU, which can store up to 1000 recent fault data.

① Choose **Inverter > Diagnostic and debug > Diagnostic > Black box**. On the black box page displayed, click **Refresh**. The faults occurred on the device and their occurrence time are displayed.

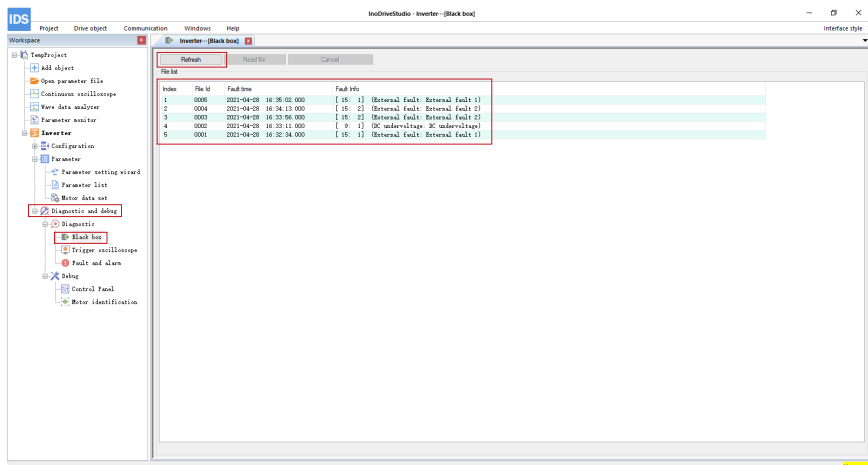


Figure 1-17 Black box opening page

② Select a fault, click **Read file**, and name and save the file. After the file is saved, InoDriveStudio automatically lists the saved black box data. Select the channel you want to view. The recorded information will be displayed.

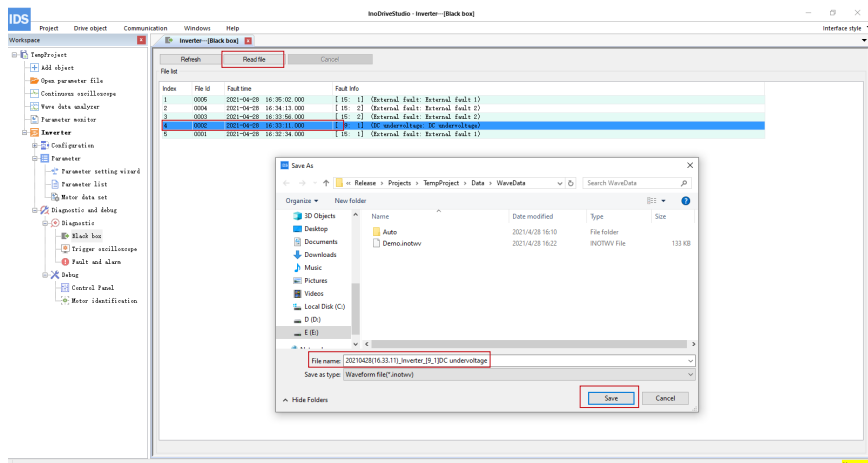


Figure 1-18 Saving black box fault data

Chapter 2 System

2.1 Typical Topology of the MD880 System

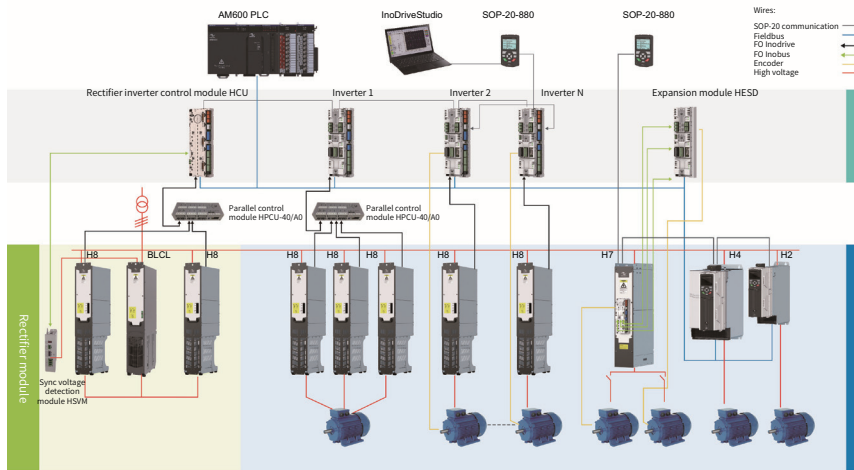


Figure 2-1 Typical topology of the MD880 AC drive (multidrive system)

Figure 2-1 shows a typical topology of the MD880 AC drive (multidrive system), which consists of control modules and power modules. The control modules can be connected to the PLC through fieldbus for centralized control. Control modules can be debugged and monitored in a centralized manner through the RS485 bus. The power modules can be expanded in parallel through HPCU.

2.1.1 Electrical Diagram of Single Active Rectifier

The active rectifier module must be used with a matching active rectifier filter module. The following figure shows the electrical diagram. For the use of standard peripheral terminals of the HCU controlam of a single rectifier:

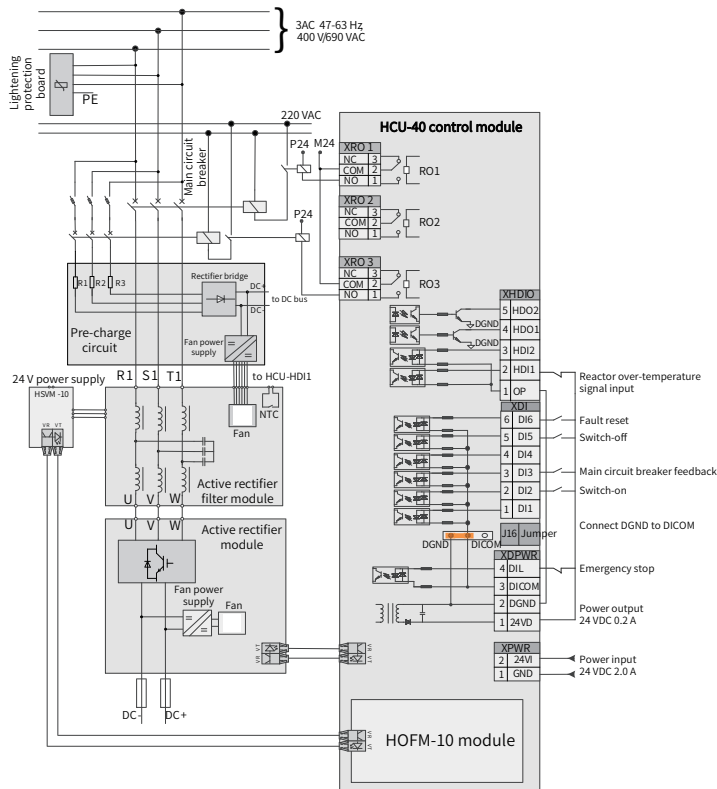


Figure 2-2 Electrical diagram of single active rectifier



NOTE

- ◆ The figure shows default ports of HCU-40. For more configuration details, see ["4.3 Terminal Start/Stop Modules"](#).

2.1.2 Electrical Diagram of Parallel Active Rectifiers

Active rectifier modules are connected in parallel through HPCU, and up to 10 modules can be connected in parallel. The electrical diagram of the parallel topology is as follows:

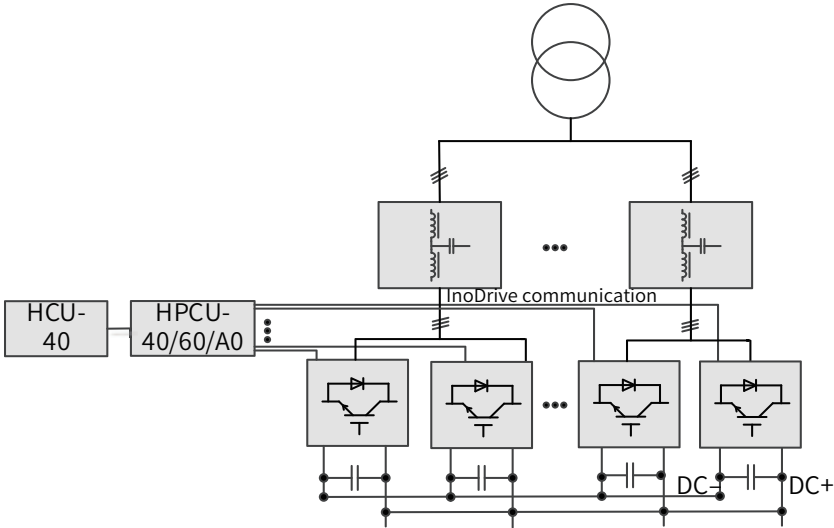


Figure 2-3 Electrical diagram of parallel active rectifiers

For the setting of power module and parallel connection parameters, see ["3.3 Checking and Setting the Power Module"](#). Basic information of the module can be viewed through the parameters in the following table.

Table 2-1 Viewing module information

Para.	Name	Description
A2-00	Product type	The type of the current device Normal display: 2 [Active rectifier]
A2-01	Module rated power	The rated power of a single module
A2-02	Module rated voltage	The rated voltage of the module
A2-03	Module rated current	The rated current of the module
A2-04	Total rated power	The total rated power of modules connected in parallel
A2-05	Total rated current	The total rated current of modules connected in parallel



NOTE

- ◆ When modules are connected in parallel, their total power and current will be derated to some extent. For the derating coefficient, see MD880-40 Series Active Rectifier Hardware User Guide.
- ◆ For example, when two active rectifier modules rated at 556 kW (A2-01)/810 A (A2-03) are connected in parallel, the total rated power (A2-04) is 1056 kW and the total rated current (A2-05) is 1539 A.

2.1.3 Use of the HCU Control Module

1) Indicators

HCU comes with three indicators:

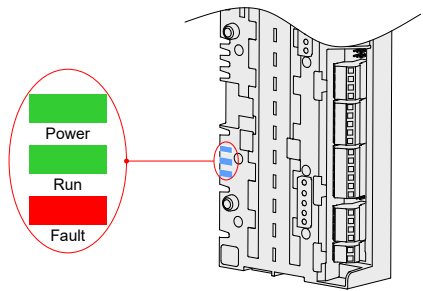


Figure 2-4 HCU indicators

No.	Name	Status	Description
1	Power	Steady on	The HCU power supply is normal.
		Off	The HCU is not energized or the power supply is faulty.
2	Run	Steady on	The power module is running.
		Off	The power module is not running.
3	Fault	Steady on	The system is faulty.
		Off	The system is normal
		Blinking	The HCU auxiliary power supply is faulty. Check the 24 V power supply and other power supplies for short circuit or overload.
4	Fault and Run	Blinking	The HCU is selected by the PC or SOP-20-880. The indicators stop blinking 10s later.

2) Peripheral terminals and parameter settings

For the use of standard peripheral terminals of the HCU control module, see the HCU Control Module User Guide. This guide only describes the ports and corresponding parameter groups. The following table lists the terminals and parameters.

Name	Group	Remarks
RS485	A10	Sets the baud rate and address
DI	F0	Shows DI status, and switch-on/off delay settings
RO	F1	Selects an output source The selection is indicated by U0-21 to U0-23.
AI	F2	The final results are displayed in U5-18 or U5-19.
AO	F3	Selects an output source The selection is indicated by U5-22 or U5-23

Name	Group	Remarks
HDI	F4	Sets high-speed DI
HDO	F5	Sets high-speed DO
InoLink	n0	Transmits data between HCU5 U5-32 to U5-39 display receive data. U2-32 to U2-47 display receive data.

3) Expansion modules of HCU and their usage

For details of hardware of an expansion module, see the user guide of the corresponding module. Using an expansion module involves three steps:

- ① Determine the module type.
- ② Select the slot to which you want to insert the module. Up to three input/output modules or encoder detection modules can be used at a time. You need to configure each module separately.
- ③ Configure other parameters of the module. For a communication expansion module, you also need to set the n1/n2 group network adapter. For details, see ["4.4 Communication Modules"](#).

Table 2-2 List of common expansion modules

Model	Name	Type	Para. Group	Related Para. Group
HIO-10/ HIO-20	Digital and analog expansion module	I/O module	n7/n8/n9	/
HMBA-10	Modbus RTU module	Fieldbus module	n10	n1/n2/n3
HDP-10	PROFIBUS DP fieldbus module		n16	n1/n2/n3
HCAN-10	CANopen fieldbus module		n12	n1/n2/n3
HETC-10/ HETC-20	EtherCAT Industrial Ethernet module		n14	n1/n2/n3
HPFN-10	PROFINET IO industrial Ethernet module	Industrial Ethernet module	n17	n1/n2/n3
HMBT-10	Modbus TCP industrial Ethernet module		n18	/
HETN-10	Ethernet test module	Ethernet module	n13	n1/n2/n3
HSVM-10	Synchronous voltage detection module	Voltage detection module	n19	/

You can view the versions and other information of inserted communication expansion modules through parameters in group A2.

Table 2-3 Parameters for viewing expansion module information

Expansion Slot	Module Type Para.	Software Version Para.	Expansion Slot	Module Type Para.	Software Version Para.
SLOT1_1	A2-24	A2-25	SLOT2_1	A2-30	A2-31

Expansion Slot	Module Type Para.	Software Version Para.	Expansion Slot	Module Type Para.	Software Version Para.
SLOT1_2	A2-26	A2-27	SLOT2_2	A2-32	A2-33
SLOT1_3	A2-28	A2-29	SLOT2_3	A2-34	A2-35
SLOT3_1	A2-36	A2-37	-	-	-

2.2 Backing up and Restoring Parameters

2.2.1 Restoring Factory Settings

Parameters in group A8 (Environment setting) are used to restore parameters to factory settings as needed. For this purpose, select an operation through A8-00 and set A8-01 to confirm.

1) Partial parameters

Set the following parameters in sequence:

- ① Set A8-00 to 1 (Restore partial parameters to factory settings).
- ② Set A8-01 to 1 to confirm the operation specified in A8-00.



NOTE

- ◆ Parameters related to the power module will be restored to the default values of the module rather than the factory settings.
- ◆ A10-03, A10-04, n19-00, H0-00, d1-00, d2-01, and E0-15 are not restored.
- ◆ The record parameters in groups H1 to H8 are not restored.
- ◆ The device name is not restored.

2) All parameters

Set the following parameters in sequence:

- ① Set A8-00 to 2 (Restore all parameters to factory settings).
- ② Set A8-01 to 1 to confirm the operation specified in A8-00.



NOTE

- ◆ Parameters related to the power module will be restored to the default values of the module rather than the factory settings.
- ◆ A10-03, A10-04, n19-00, H0-00, d1-00, d2-01, and E0-15 are not restored.
- ◆ The record parameters in groups H1 to H8 are not restored.
- ◆ The device name is not restored.

3) Record parameters

Set the following parameters in sequence:

- ① Set A8-00 to 3 (Clear record parameters).
- ② Set A8-01 to 1 to confirm the operation specified in A8-00.

**NOTE**

- ◆ The record parameters of groups H1 to H8 are cleared.
- ◆ Data of U9-00 and U9-01 are cleared.

4) Deleting record files on the SD card of HCU

- ① Set A8-00 to 4 (Clear black box records).
- ② Set A8-01 to 1 to confirm the operation specified in A8-00.

**NOTE**

- ◆ The parameter file backed up on the SD card is deleted, without affecting current setpoints of any parameters.
- ◆ For backing up parameter files on the SD card, see the next section.

2.2.2 Backing Up Parameters on the SD Card of HCU

To save all the parameter values to the SD card or restore parameter backup in the SD card to HCU, use parameters in group A8 (Environment setting). Specifically, set A8-05 to the operation as needed and set A8-06 to confirm the operation.

1) Saving parameters to the SD card

Set the following parameters in sequence:

- ① Set A8-05 to 1 to back up all parameters of HCU to the SD card.
- ② Set A8-06 to 1 to confirm the operation specified in A8-05.
- ③ Parameters of HCU can be saved in the SD card, which is convenient for spare parts replacement. Only one backup parameter file is allowed. A new backup will overwrite the previous one.
- ④ If backup is successful, A8-07 will display status 2 "Parameter saved".

2) Restoring parameters from the SD card to HCU

Set the following parameters in sequence:

- ① Set A8-05 to 2 to restore all HCU parameters from the backup file in the SD card.
- ② Set A8-06 to 1 to confirm the operation specified in A8-05.
- ③ Use the parameters backed up in the SD card to overwrite the current parameters of the HCU. When using a new HCU, you can use this function to quickly restore the parameters from the SD card of the old HCU.
- ④ If the recovery is successful, you are supposed to read status 5 "Parameter recovery completed" in A8-07; otherwise there may be no backup file in the SD card, or the SD card is currently being used by other processes.

3) Checking the parameter file

Set the following parameters in sequence:

- ① Set A8-05 to 3 to select parameter check.
- ② Set A8-06 to 1 to confirm the operation specified in A8-05.

- ③ The program will check the parameters backed up in SD card against the current parameters in HCU.
- 4) Deleting record files on the SD card

Set the following parameters in sequence:

- ① Set A8-00 to 4 to clear parameters recorded on the SD card.
- ② Set A8-01 to 1 to confirm the operation specified in A8-00.
- ③ The parameter file backed up on the SD card is deleted, without affecting current setpoints of any parameters.

2.2.3 Backing Up Parameters with SOP-20-880

On the SOP-20-880, select the target device and log in to the system, and then choose **Operations > Copy parameter** to back up or restore parameters.

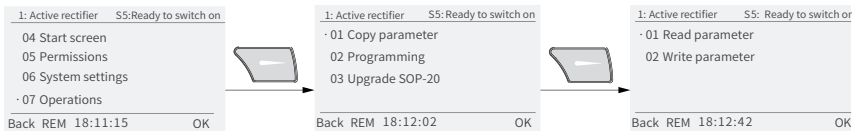


Figure 2-5 Accessing the **Copy parameter** page after system login

- 1) Saving parameters to an SOP-20-880 file
- ① When the parameter read operation is selected, all parameters of the device will be read and saved to a file on the SD card of SOP-20-880.
- ② After selecting the parameter read operation, set the user-defined part (five characters) of the parameter file name. Press the leftward and rightward keys to select the character to be set, and press the upward and downward keys to set the character value. The value range is 0 to 9 and A to Z. The file name is in the format of "Device name-User-defined name of five characters.ipv".

Example: Active rectifier-12ABC.ipv

The file name means that the device name is active rectifier, and the user-defined name is 12ABC.

After the file name is set, press  to read the parameters. After the parameters are read, a prompt indicating successful parameter copy is displayed on the screen. If the operation fails, the failure reason is displayed on the screen.

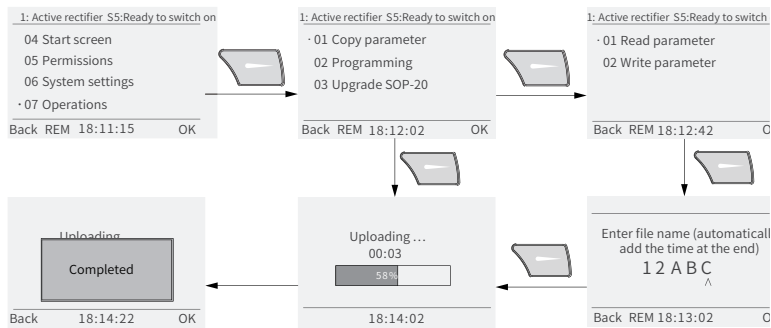


Figure 2-6 Saving parameters to an SOP-20-880 file

2) Restoring parameters from an SOP-20-880 file

- ① To download parameters saved in an SOP-20-880 file to the HCU, select **Write parameter**.
- ② Then, select a parameter file in the SD card, and select **Copy all** to restore all parameters in the HCU to those in the file.

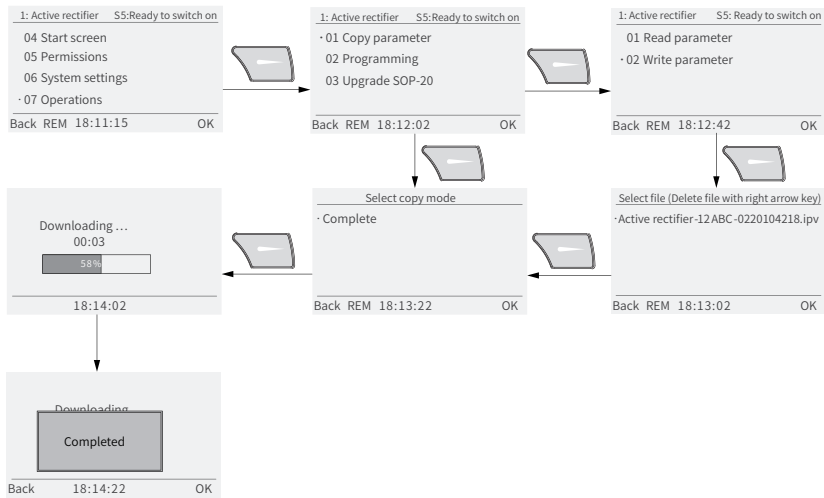


Figure 2-7 Example of writing parameters



NOTE

◆ Files saved and read by using the parameter copy function are stored in the SD card of SOP-20-880. Before using the parameter copy function, ensure that the SD card of SOP-20-880 is properly installed.

2.2.4 Backing up Parameters with InoDriveStudio

When using the InoDriveStudio commissioning software, you can click **Upload** on the **Parameter list** page to back up HCU parameters to the computer. To restore parameter files in the computer to HCU, click **Download**.

1) Saving parameters to a file in the computer

On the **Parameter list** page, click **Upload**. In the **Save As** dialog box displayed, select a path, input the file name, and then click **Save**. Then all parameters on the HCU are uploaded to the file (.inoprm).

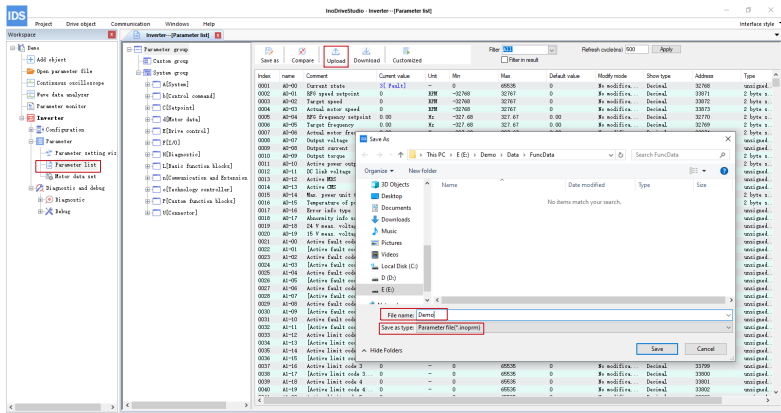


Figure 2-8 Parameter saving

2) Restoring parameters from a file on the computer to HCU

On the **Parameter list** page, click **Download**. In the **Open** dialog box displayed, select the file name, and then click open. Parameters in the selected file are downloaded to the HCU.

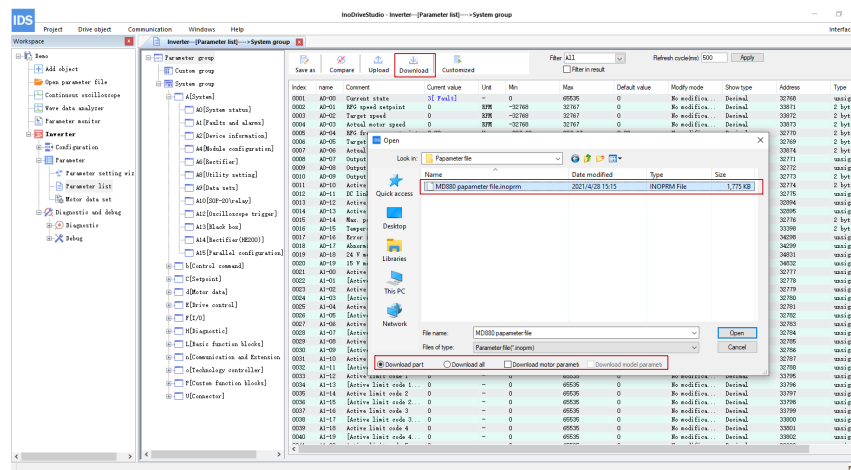


Figure 2-9 Restoring parameters

Parameters can be downloaded in the following modes:

■ Download part

By default, all the parameters are downloaded, excluding model parameters, communication baud rate (A10-04) and communication address (A10-03) of the SOP-20-880. This mode is applicable to most parameter restoration occasions.

■ Download all

By default, all the parameters, excluding model parameters, are downloaded. If the communication baud rate (A10-04) and communication address (A10-03) of the SOP-20-880 differ from the current parameter settings, a prompt asking for modification is displayed. Exert caution when modifying parameters to prevent communication failure caused by duplicate device IDs. To download all parameters, select **Download model parameters**.



◆ Exert caution about downloading model parameters. Arrange for only professionals to download model parameters. If the model data is incorrect, the device cannot run normally, which may damage the drive or user's equipment.

2.3 Drive Object Configuration Information

2.3.1 Device ID and Baud Rate

When SOP-20-880 or InoDriveStudio connects to HCU, you must set the correct device ID and baud rate. When multiple HCUs are cascaded in the same network, set the baud rate and device ID of each HCU separately using SOP-20-880 and ensure that the baud rates of all devices in the same network are the same but the device IDs are different.

■ Method 1:

Connect SOP-20-880 to HCU, and set the baud rate and device ID by choosing **Menu > 01 Parameter settings > A System > A10 SOP-20/Relay communication > A10-03 SOP-20/Relay communication address** or **A10-04 SOP-20/Relay baud rate**.

■ Method 2:

When creating a project on InoDriveStudio, after a device is scanned, change the device baud rate and device ID, as shown in the following figure.

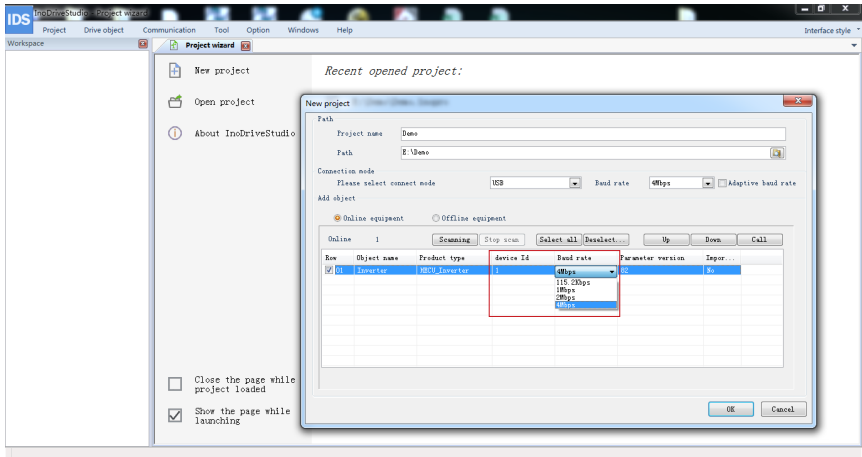


Figure 2-10 Changing the device ID and baud rate

Method 3:

Connect InoDriveStudio to the device and then change the device ID (A10-03) and baud rate (A10-04) in the parameter list.

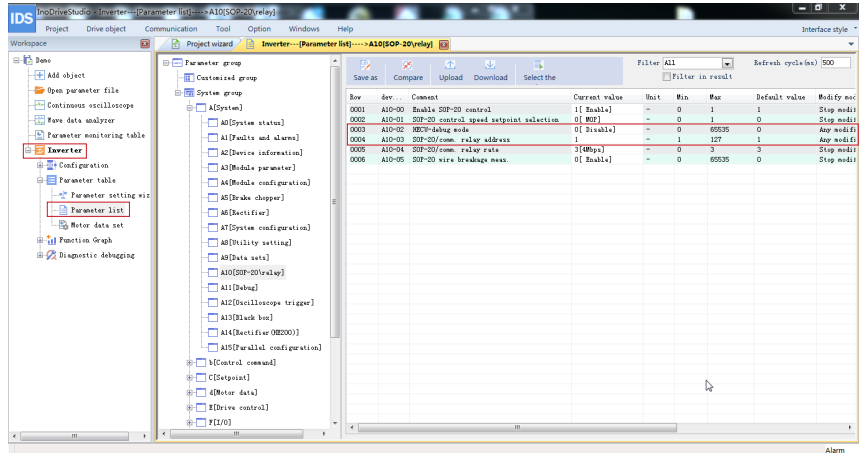


Figure 2-11 Changing the device ID and baud rate in the parameter list

Method 4:

Access the **Drive object configuration** page of InoDriveStudio and change the device ID and baud rate.

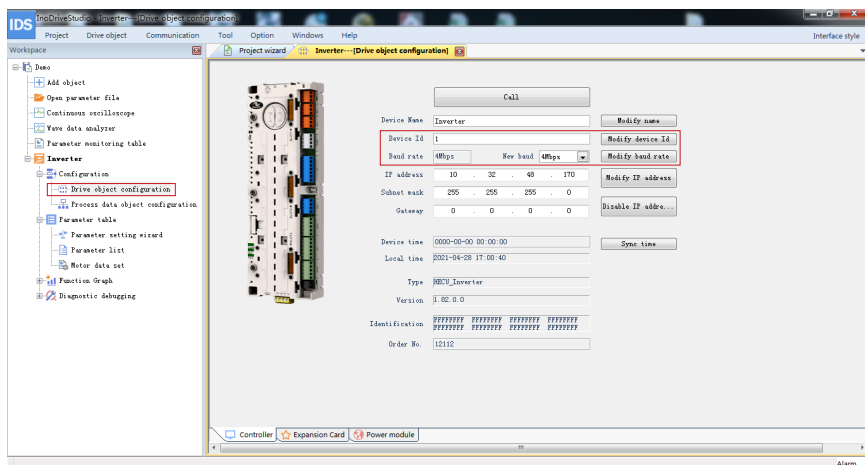


Figure 2-12 Changing the device ID and baud rate on the configuration page

2.3.2 System Time

The built-in RTC clock chip of HCU supports recording of the system date and time. You can view and change the system date and time using SOP-20-880 or InoDriveStudio.

1) Viewing and changing device time using SOP-20-880

■ Method 1:

Choose **Menu > 05 System settings > 04 Date/Time > 03 Device object time**. On the page displayed, view and change the current system date and time.

■ Method 2:

Choose **Menu > 05 System settings > 04 Date/Time > 03 Sync object time**. On the page displayed, synchronize the system date and time of SOP-20-880 to HCU.

2) Viewing and changing system date and time using InoDriveStudio

In InoDriveStudio, choose **Configuration > Drive object configuration** to view the HCU system time (device time) and the PC time (local time), and click **Sync time** to synchronize the PC time to HCU.

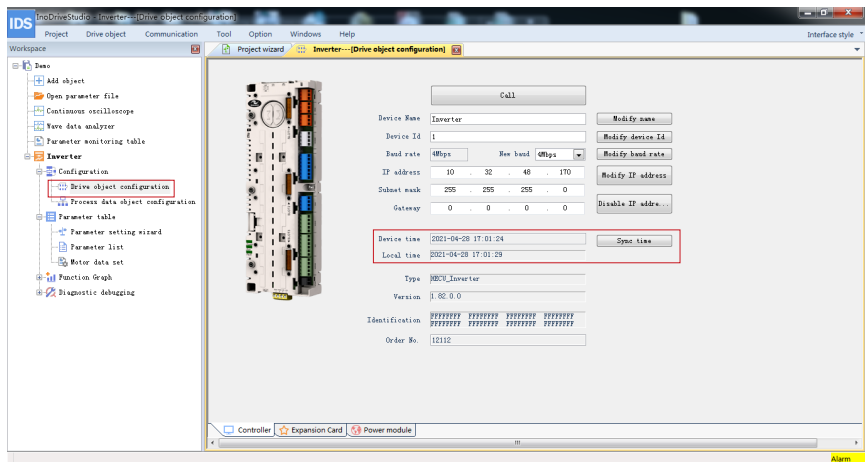


Figure 2-13 InoDriveStudio system time

2.3.3 Device Name

HCU allows you to define the device name. A user-defined device name is retained at power failure. During restoration of some parameters to factory settings (A8-00 set to 1), the device name is not reset. During restoration of all parameters to factory settings (A8-00 set to 2), the device name is reset to factory setting. HCU supports three methods of viewing and changing device names.

■ Method 1:

When creating a project on InoDriveStudio, after a device is scanned, change the device name directly, as shown in Figure 2-14.

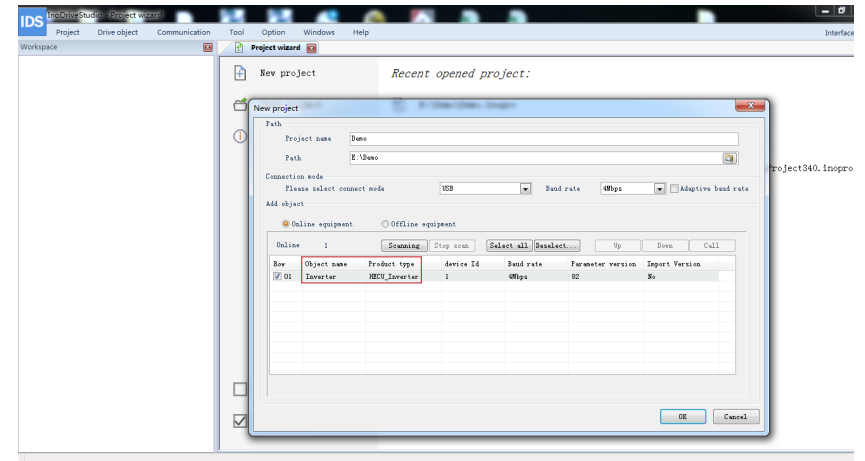


Figure 2-14 Directly changing the device name on InoDriveStudio

■ Method 2:

In the **Workspace** section of InoDriveStudio, right-click the device and choose **Rename** to change the device name.

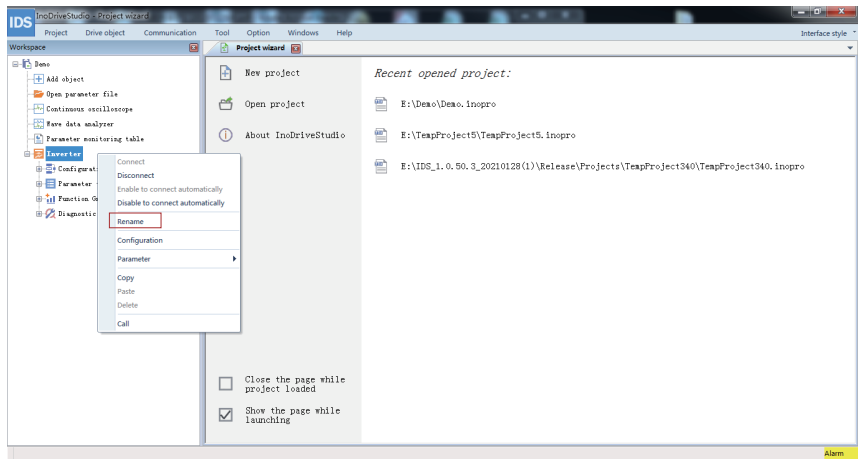


Figure 2-15 Renaming the device on InoDriveStudio

■ Method 3:

On InoDriveStudio, choose **Configuration > Drive object configuration**. On the tab page displayed, change the device name, as shown in Figure 2-16.

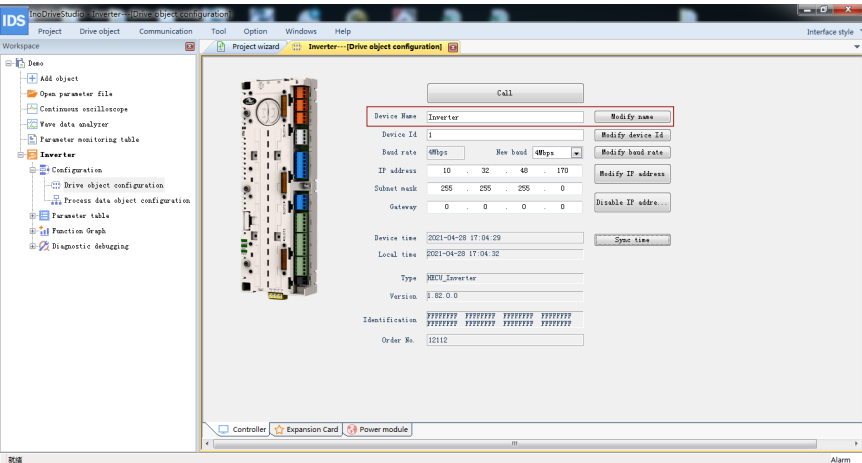


Figure 2-16 Changing the device name on InoDriveStudio



- ◆ When multiple devices are cascaded in the same monitoring network and connected through InoDriveStudio, ensure that each device name is unique.

NOTE

2.4 Per-unit Value System

In general circuit calculation, the units of current, voltage, power, and impedance are expressed as A, V, W, and Ω , respectively. This method of expressing physical quantities in actual named units is called the named unit system.

When the named unit system is used for calculation, even parameters for motors of the same type are completely different due to difference in capacities, causing inconvenience in parameter calculation. On that account, the per-unit value system is typically used in engineering to simplify calculation and facilitate analysis on physical status changes.

The per-unit value is a common way to mark numerical values in engineering calculation. It indicates the relative value of each physical quantity and parameter. A per-unit value is relative to a base value. For the same named value, per-unit values vary with base values. The conversion between per-unit values and named values is as follows:

$$\text{Per-unit value} = \text{Named value} / \text{Base value}$$

2.4.1 Selection of Per-unit Values

To unify setpoint reference methods, the HCU control module uses model-related parameters to convert measurement and control variables into per-unit values.

- **Voltage:** The rated voltage value of the device is used as the voltage base value.
- **Current:** The rated current value (A2-03) of the device is used as the current base value. When multiple devices are connected in parallel, the total current not derated is used as the base value.
- **Power:** The rated power value (A2-01) of the device is used as the power base value. When multiple devices are connected in parallel, the total power not derated is used as the base value.

Base Value	Parameter	Per-unit Value
Per-unit base value of voltage	d3-00	400 V system: 600 V 690 V system: 1050 V
Per-unit base value of current	d3-01	Single device: A2-03 Multiple devices: A2-03 x Number of devices connected in parallel
Per-unit base value of power	d3-02	Single device: A2-01 Multiple devices: A2-01 x Number of devices connected in parallel

2.4.2 Representation of Per-unit Values

In the HCU control module system, parameter values are integers expressed in the 16-bit or 32-bit format, depending on accuracy requirements. The following rules apply to expression of per-unit values.

- When the 16-bit format is used, 100% is expressed as 4096 (hexadecimal 0x1000), the accuracy is 0.0244%, and the value range is -799.9% to +799.9%. This format is typically used to indicate the per-unit value of current, voltage, and power.
- When the 32-bit format is used, 100% is expressed as hexadecimal 0x1000 0000, the accuracy is higher than that in the 16-bit format, and the value range is -799.99% to +799.99%. Typically, this format is used for the per-unit value of motor speed.

The 16-bit and 32-bit numerical values can be automatically converted to each other in the system. A 32-bit value can be used as a 16-bit value when its low 16 bits are removed. A 16-bit value can be used as a 32-bit value when 16 zeros are added to its low bits.

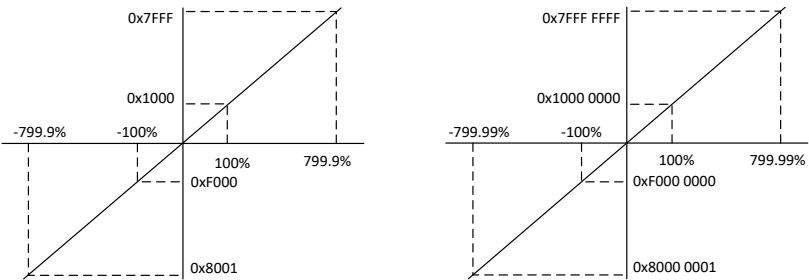


Figure 2-17 Per-unit value expressed in the 16-bit and 32-bit numerical value formats

2.4.3 Per-unit Value Range

In the HCU control module, the ranges of both the 16-bit and 32-bit per-unit values are -799.9% to +799.9%. However, 32-bit values include more valid digits to increase the accuracy of expressed numerical values. The following table lists the data error of 16-bit and 32-bit per-unit values when they are both 123.45%.

	Stored Numerical Value	Per-unit Value	Absolute Error	Relative Error
16-bit per-unit value	5056	123.4375%	-0.0125%	1.0126%
32-bit per-unit value	331383570	123.44999984%	-0.00000016%	< 0.0001%

2.5 Parameter Interconnection System

To set a function of the HCU control module, first find the parameter corresponding to the function, and then set the parameter to select a reference source.

For example, to use DI1 to implement the user-defined OFF1 command (Start/stop command) for channel 1, you need to set b1-01 to U0-02 (1002), where U0-02 is a bit

connector and indicates the status of DI1; b1-01 is used to select any bit connector as the input source.

**NOTE**

- ◆ 1002 indicates the number of the connector U0-02.

■ Example 1:

A9-00 = U0-02: U0-02 stores the status of DI1 of the HCU, while A9-00 controls channel selection. The setting indicates that DI1 is used for the channel switchover. When DI1 is low level, channel 1 is enabled. When DI1 is high level, channel 2 is enabled.

■ Example 2:

C0-00 = U5-45: U5-45 stores numerical values of process data PZD2 received by fieldbus adapter A, while C0-00 specifies the voltage reference source of command channel 1. The setting indicates that the voltage reference of command channel 1 is sourced from process data PZD2 received by fieldbus adapter A.

2.5.1 Connector

Parameters in group U are read-only and stores different states and data of the drive. These parameters are called connectors, which can be viewed by users, or read or used by other parameters.

Connector parameters are classified as follows based on different numerical value properties:

- Bit connector (B connector): Indicates a digital value, which is either 0 or 1. It includes DI, DO, a bit of a communication word, a bit of a control word and a status word, and status information of a fault. It is in parameter groups U0 to U4.
- Word connector (K connector): Indicates an analog value. It includes drive control data such as the voltage, current, and power, as well as the hardware detection analog signal such as the communication receive data or AI/AO. It is in parameter groups U5 to U9.

Connector parameters are also needed when you use InoDriveStudio's continuous oscilloscope, trigger oscilloscope, or black box data recording function. Only connector parameters can be read or used by other parameters or modules.

2.5.2 Reference Source Parameters

Parameters used to read connector parameters are reference source parameters, which are divided into two categories according to connector types.

- Bit reference source parameter: Sets a bit connector as the reference source and reads the value of the bit connector as the reference source parameter output.
- Word reference source parameter: Sets a word connector as the reference source and reads the value of the word connector as the reference source parameter

output.

Connectors in groups U0-00 to U9-99 are numbered from 1000 to 1999.

One connector parameter can be read by multiple reference source parameters. However, one reference source parameter can read only one connector each time.

2.6 Command Channel and Local Control

The HCU-40 control module supports two groups of commands for channel selection, shorted as channel. Each command channel contains one group of control channel and one group of setpoint channel. When the command channel group is switched, the corresponding control channel and setpoint channel are also switched.

By default, HCU-40 uses the factory settings and the device start/stop mode is fixed. To use the control channel to set the device start/stop mode, set b0-00 to 0 to disable the factory settings.

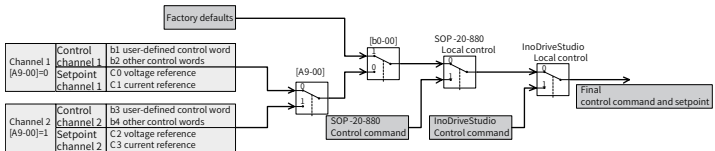


Figure 2-18 Command channel selection

2.6.1 Local and Remote

"Local" and "Remote" in this guide are defined from the perspective of the HCU-40 control module.

- Remote: The device is controlled through the control channel or the factory settings.
- Local: The device is controlled through SOP-20-880 or InoDriveStudio. This mode is mainly used for commissioning and maintenance. In this mode, the command word set through the control channel is invalid.

Some cabinet manufacturers may add start/stop buttons and potentiometers on drive cabinet doors or local consoles to implement operations with the cabinet doors or local consoles, and define such control as local control and the PLC control as remote control. This is not the case in this guide.

As for the HCU-40 control module, cabinet button control and PLC control are both remote control. Control commands or references are set through terminals or communication, and the two command channels are used for switching command sources. The Loc/Rem switchover button on the cabinet door or console is usually connected to the HCU-40 control module through a DI signal, which must be set as the source of A9-00 (Command channel switchover).

2.6.2 Local and Remote Control

The local control of InoDriveStudio has the highest commissioning priority. Once InoDriveStudio local control is enabled, the command channel and the SOP-20-880 control are disabled. The switchover between local control and remote control is allowed only in the stop state.

- The local/remote control status is indicated by U1-78. The value 0 indicates that local control is activated. The value 1 indicates that remote control is activated.
- You can set b0-00 to enable or disable factory settings. The value 0 indicates that factory settings are not enabled. The value 1 indicates that factory settings are enabled; in this case, the command word of the control channel is invalid.
- You can view the enabling status of factory settings in U1-32. The value 0 indicates that factory settings are not enabled. The value 1 indicates that factory settings are enabled.
- Control channel switchover is implemented by the parameter A9-00, and the status is indicated by U0-26. The value 0 indicates that control channel 1 is active. The value 1 indicates that control channel 2 is active.

The following table lists the actually activated control sources and the connector states.

IDS Local Control	SOP Local Control	[b0-00]	[A9-00]	U1-78	U0-26	U1-32	Control Command Source	Setpoint Source
1	x	0	0	0	0	0	InoDriveStudio	Setpoint channel 1
1	x	0	1	0	1	0	InoDriveStudio	Setpoint channel 2
1	x	1	0	0	0	1	InoDriveStudio	Setpoint channel 1
1	x	1	1	0	1	1	InoDriveStudio	Setpoint channel 2
0	1	0	0	0	0	0	SOP-20-880	Setpoint channel 1
0	1	0	1	0	1	0	SOP-20-880	Setpoint channel 2
0	1	1	0	0	0	1	SOP-20-880	Setpoint channel 1
0	1	1	1	0	1	1	SOP-20-880	Setpoint channel 2
0	0	1	0	1	0	1	Factory settings	Setpoint channel 1
0	0	1	1	1	1	1	Factory settings	Setpoint channel 2
0	0	0	0	1	0	0	Control channel 1	Setpoint channel 1
0	0	0	1	1	1	0	Control channel 2	Setpoint channel 2



NOTE

- ◆ When factory settings are enabled, the control channel is inactive, but other control word and setpoint channels are still active. You can set A9-00 (Channel selection) to select an appropriate setpoint channel.

1) Star/Stop control with SOP-20-880

After SOP-20-880 and HCU-40 are properly connected, pressing Loc/Rem on SOP-20-880 can switch the control permission. The switchover is valid only when the drive is in the stop state.

When **Loc** is displayed at the lower left corner of SOP-20-880, SOP-20-880 has obtained the control permission, and the start/stop control through control channels is inactive. To restore the control channel function, press Loc/Rem on SOP-20-880 again.

1 : Active rectifier	S5: Ready to switch on
01 Bus voltage	0.0 V
02 Grid voltage	0.0 V
03 Grid current	0.0 A
Device	Loc 18:10:21 Menu

Figure 2-19 Local control with SOP-20-880

You can set A10-00 to 0 to prevent SOP-20-880 from obtaining the control permission. After local control is disabled, the Loc/Rem button on SOP-20-880 is unavailable.

When SOP-20-880 obtains the control permission, the device start/stop command can be controlled by buttons of SOP-20-880.

2) Start/Stop control with InoDriveStudio

For how to control stop and start of InoDriveStudio through the control panel, see ["1.2.3 Basic Operations"](#).

3) Start/Stop control with control channel

For details, see ["2.6.3 Control Channel and Setpoint Channel"](#) and ["4.3 Terminal Start/Stop Modules"](#).

4) Start/Stop control with factory settings

Typically, the active rectifier module is delivered with the cabinet which provides a start/stop button by default. The following table lists the details.

Para.	Meaning	Default	Description
b0-02	Start command source	Value of DI2 changed from 0 to 1: Start	Unmodifiable
b0-03	Stop command source	DI5 1: Stop	Unmodifiable

Para.	Meaning	Default	Description
b0-04	Operation enable source	1: Enabled	Can be set
b0-05	Fault reset command source	0 changed to 1: Reset	Unmodifiable

2.6.3 Control Channel and Setpoint Channel

In the remote control mode, you need to select the control channel and setpoint channel. In different control modes, the scopes of application of the control channel and setpoint channel are different. For details, see Table 2-4.

You can use A9-00 to set different reference sources.

Table 2-4 Control channel and setpoint channel

Type	Scope of Application	Description
InoDriveStudio	Control panel Command channel 1: groups b1, b6, C0, and C1 Command channel 2: groups b4, b6, C2, and C3	The control panel is used to start or stop the rectifier. The setpoint is sourced from the selected setpoint channel.
SOP-20-880	Start/stop button Command channel 1: groups b1, b6, C0, and C1 Command channel 2: groups b4, b6, C2, and C3	OFF1 is sourced from buttons on SOP-20. The setpoint is sourced from the selected setpoint channel.
Factory settings	Group b0 Command channel 1: groups b2, b6, C0, and C1 Command channel 2: groups b4, b6, C2, and C3	OFF1 is sourced from factory settings. The setpoint is sourced from the selected setpoint channel.
Command channel 1	Groups b1, b2, b5, b6, C0, and C1	The control channel 1 controls start or stop of the rectifier. The setpoint is sourced from the setpoint channel 1.
Command channel 2	Groups b3, b4, b5, b6, C2, and C3	The control channel 2 controls start or stop of the rectifier. The setpoint is sourced from the setpoint channel 2.

2.6.4 Control Channel Switchover

The switchover between local control and remote control is allowed only in the stop state. The switchover between the two remote control channels is allowed in any state. Table 2-5 lists statuses before and after the switchover.

Table 2-5 Statuses before and after the switchover

Status Before Switchover	OFF1 Before Switchover	OFF1 After Switchover	Status After Switchover
Switch-on inhibited	1	0	Ready to switch on
Switch-on inhibited	1	1	Switch-on inhibited
Ready to switch on	0	0	Ready to switch on
Ready to switch on	0	1	Switch-on inhibited
Started	1	0	Ready to switch on
Started	1	1	Retain the started status

The control channel switchover helps to implement the control permission switchover of two different control GNDs. For example, after the console DI on the field is started, devices can be switched to centralized control on the PLC, or the devices in centralized control on the PLC can be switched to the console on the field for manual operation.



NOTE

- ◆ If the state machine is in the ready-to-switch-on state (OFF1 set to 0) before the control channel switchover, and OFF1 becomes 1 after the switchover, the state machine enters the switch-on-inhibited state. In this case, the state machine can return to the ready-to-switch-on state only after OFF1 is reset to 0.
- ◆ When [b6-09] is set to 1 to enable forced switch-off during control source switchover, forced switch-off is performed when the control source changes and the switchover relationship listed in Table 2-5 does not take effect.

2.7 Operating Mode

The parameter E0-01 (Active rectifier mode) is used to set the operating mode of the active rectifier to voltage or current.

2.7.1 Voltage Mode

When E0-01 is set to 0, the active rectifier operates in the voltage mode. In this mode, the output DC bus voltage is controlled to be the voltage setpoint and provides programmable constant DC voltage source for subsequent load within the rated power range.

1) Rectification and regeneration mode

When E0-03 (Operating mode) is set to 0, the active rectifier operates in the four-quadrant mode, which is the most common mode for active rectifier. In this mode, energy can flow to both the rectification direction and the regeneration direction.

2) Rectification mode

When E0-03 (Operating mode) is set to 1, the active rectifier operates in the rectification mode. In this mode, energy can only flow from the three-phase AC power supply to the active rectifier. This mode is applicable when the three-phase AC power supply does not support energy feedback, such as generators of specific type or AC inverter power supply with uncontrolled rectification.

2.7.2 Current Mode

When E0-01 is set to 1, the active rectifier operates in the current mode. In this mode, the valid input three-phase AC current is controlled to be the valid setpoint and provides programmable constant current source for subsequent load within the rated power range.

1) Active current setting

When you use parameters of group C1 or C3 to set the current to a positive value, the active rectifier absorbs active current from the three-phase AC power supply, charges the subsequent DC load or test the rectification output characteristics of the three-phase AC power supply. When the current is set to a negative value, the active rectifier feeds back active current to the three-phase AC power supply to discharge the subsequent DC load or test the regenerative output characteristics of the three-phase AC power supply.

2) Idle current setting

Set E0-07. 100% indicates the per-unit current base value (d3-01). The active rectifier absorbs the capacitive idle current 90° ahead of the three-phase AC power supply, and its external performance is similar to that of a capacitor, and performs capacitive idle compensation for the AC power supply.

Chapter 3 Quick Commissioning Guide

This chapter describes the basic commissioning steps of the MD880-40, including power-on, trial run, and commissioning of the drive system.

The following figure shows the system commissioning process.

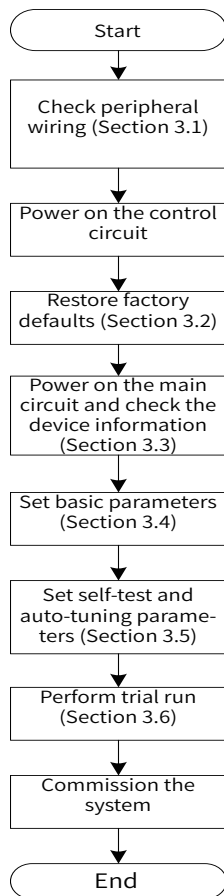


Figure 3-1 Flowchart of commissioning upon initial power-on

**NOTE**

- ◆ The preceding flowchart of commissioning upon system power-on includes basic steps of using the MD880-40. Before using the product, read carefully and follow the commissioning steps.
- ◆ Parameters of the MD880-40 series active rectifier can be modified with SOP-20-880 or InoDriveStudio.

3.1 Checking Peripheral Connection

Before powering on and commissioning the control system, ensure that the preparation for power-on has been completed, and check each item in the table.

Table 3-1 Checklist before running

No.	Check Item	Compliance	Completed or Not
1	The power input of the main circuit is correctly connected according to terminal (R1, S1, and T1) labels.	☐	☐
2	The output terminals (DC+ and DC-) of the main circuit are connected in the correct polarity.	☐	☐
3	The input terminals (R1, S1, and T1) and output terminals (U, V, and W) of the active rectifier filter module are not reversed, and are connected in the same phase sequence as that of the active rectifier module.	☐	☐
4	The active rectifier filter module and active rectifier module are grounded reliably.	☐	☐
5	The power input of the auxiliary circuit is correctly connected according to terminal (L/N) labels.	☐	☐
6	The communication cable is connected correctly.	☐	☐
7	External ports such as I/O are connected correctly.	☐	☐

3.2 Restoring Factory Settings

After initial power-on of the control circuit, restore factory settings first. Restore factory settings in the following two steps with the following parameters:

- 1) Set A8-00 to 2 (Restore all parameters to factory settings).
- 2) Set A8-01 to 1 to confirm the restoration.

After the operations, the state machine A0-00 enters the S20 state machine (Parameter restoration) and then exits the state machine after restoration ends.

3.3 Checking and Setting the Power Module

3.3.1 Setting Parameters for Single and Parallel Modules

The following table shows parameter settings for single and parallel modules.

No.	Para.	Meaning	Remarks
1	A15-00	Parallel function selection	0: Single 1: Parallel
2	A15-01	HPCU online flag	0: Offline 1: Online Read-only
3	A15-02	Parallel module enable 1	Ones to ten thousands positions correspond to the enabling of modules 1 to 5. 0: Disabled 1: Enabled
4	A15-03	Parallel module enable 2	Ones to ten thousands positions correspond to the enabling of modules 6 to 10. 0: Disabled 1: Enabled
5	A15-04	Number of enabled parallel modules	Read-only After A15-01 and A15-02 are set, the value of this parameter is automatically calculated.
6	A15-05	Parallel module online display 1	Read-only
7	A15-06	Parallel module online display 2	Read-only
8	A15-07	Number of online parallel modules	0 to 10
9	A15-15 to A15-24	Status of parallel modules to 1 to 10	0: Offline 1: Online Read-only

**NOTE**

- ◆ For the parallel module enable setting, the parallel modules 1 to 10 correspond to CH1 to CH10 on the HPCU.
- ◆ For example, in paralleling of two active rectifiers, connect the power module to CH1 and CH2 of HPCU:
 - ① Set A15-00 to 1 to enable the parallel mode.
 - ② Set A15-02 to 00011 and A15-03 to 00000 to enable the CH1 and CH2 ports.

After parameter setting, check whether values of A15-04 to A15-07 and A15-15 to A15-24 are consistent with the actual ones.

3.3.2 Checking Device Information

The following table lists the parameters used for checking device information.

Para.	Name	Description
A2-00	Product type	The product type Shows 2 (Active rectifier) under normal conditions
A2-01	Module rated power	-

Para.	Name	Description
A2-02	Module rated voltage	-
A2-03	Module rated current	-
A2-04	Total rated power	-
A2-05	Total rated current	-
A2-07	HCU software type	The HCU software type Shows 2 (Active rectifier) under normal conditions
A2-08	HCU-DSP function software version	-
A2-10	HCU-DSP performance software version	-
A2-16	HCU-FPGA software version	-
A2-18	HINT type	The HINT type Shows 2 (Active rectifier) HINT is normal Shows 100 (Offline) when HINT is abnormal
A2-19	HINT software version	0.00 to 655.35
A2-22	HPCU software version	0.00 to 655.35

If the rated power or voltage class of the power module is inconsistent with that on the module nameplate, the model setting may be incorrect. In this case, please contact the manufacturer to reset and re-download the model.

3.3.3 Setting the HSVM Module

Before starting the active rectifier, set the HSVM voltage detection module correctly. If the HSVM voltage detection module is set incorrectly or disconnected, ERR80-4 will be reported when the rectifier is started.

- You can view the expansion slot of the HSVM module in parameters A2-24 to A2-37. The factory setting is slot 1_2.
- If the HSVM module expansion slot is not displayed in parameters A2-24 to A2-37, check whether the HSVM module is connected or its power supply is normal.
- If the HSVM module expansion slot is displayed in parameters A2-24 to A2-37, set n19-00 to the expansion slot of the HSVM module.
- If the settings are normal, the value of n19-01 is 1 (Online). n19-12 to n19-17 display the real-time sampling data.

3.3.4 Setting the Overload Mode

For details about load modes, see relevant sections in the MD880-40 Series Active Rectifier Hardware User Guide.

The controller automatically records the real-time output current of the power module and calculates the load ratio. When the module load exceeds the limit, ERR10-1 (Drive overload) is reported. In this case, check whether the drive matches the load and whether the output current exceeds the limit.

Typical working conditions:

- No-overload mode: The maximum output current never exceeds the non-overload current of the drive, and the drive can run in this mode for a long time.
- Light overload mode: In every 300s, the drive runs for 240s within the drive light-overload current and then be overloaded for 60s within 1.1 times the light-overload current. The drive can run in this mode in cycles of 300s.
- Heavy overload mode: In every 300s, the drive runs for 240s within the rectifier heavy-overload current and then be overloaded for 60s within 1.5 times the heavy-overload current. The drive can run in this mode in cycles of 300s.

3.4 Setting Basic Parameters

3.4.1 Setting the Grid Voltage

- If the grid voltage can be measured, measure the actual grid voltage and then input the measured value to E0-15 (Preset line supply voltage).
- If not, start the device, input the grid voltage measured by HCU-40 to E0-15. The following table lists the default preset line supply voltage.

Table 3-2 Default preset line supply voltage

Model	Default Preset Line Supply Voltage (E0-15)
400 V	400 V
690 V	690 V

3.4.2 Setting the Operating Mode

HCU-40 works in the voltage mode by default. You can use E0-01 to set the operating mode.

Para.	Name	Description
E0-01	Active rectifier mode	0: Voltage mode 1: Current mode

Set the operating mode based on the actual working condition. For working conditions corresponding to different operating modes, see ["2.7 Operating Mode"](#).

3.4.3 Setting the Voltage or Current

Voltage or current settings depend on the operating mode set in ["3.4.2 Setting the Operating Mode"](#).

- In the voltage mode, set an appropriate target voltage value.
- In the current mode, set an appropriate target current value.

The voltage and current are set by the setpoint channels. The parameter group varies with the selected setpoint channel. For details, see ["4.2 Setpoint Channel"](#). The following description takes the setpoint channel 1 as an example.

1) Voltage setpoint

By default, the voltage setpoint is 1.5 times the preset line supply voltage. The preset line supply voltage is set through E0-15 and the coefficient is set through E0-16.

You can use C0-00 to modify the source of the voltage setpoint. When C0-00 is set to 0, you can use C0-01 to directly set the expected target voltage value.

The actual target voltage value can be viewed in C0-02.

2) Current setpoint

By default, the current setpoint is 0, which can be modified in C1-01.

You can use C1-00 to modify the source of the current setpoint.

The actual target current value can be viewed in C1-02.

3.5 Self-test and Auto-tuning

3.5.1 Phase Sequence Self-test

During field application, production, and assembly, if the voltage sampling RST do not match the current sampling RST of three-phase AC power supply, overcurrent or over-voltage occurs upon start of the active rectifier. Such a fault cannot be easily located. When phase sequence self-test is enabled, the software can detect the sampling relationship between the voltage and current of the three-phase AC power supply and adjust them automatically, reducing the commissioning time and difficulty.

You can set three self-test modes through b7-02.

- If phase sequence self-test has been performed and the line connections are not changed, self-test is not required. In this case, set b7-02 to 0.
- If phase sequence self-test is not performed or the line connection correctness cannot be confirmed, set b7-02 to 1 to make the system perform one self-test before running.
- If the line connection needs to be changed frequently during the operation of the active rectifier, set b7-02 to 2 to make the system perform self-test before each running.

Para.	Value	Description
b7-02	0	No self-test
	1	Perform one self-test
	2	Perform self-test upon each running

During phase sequence self-test, the status machine is S9 (Check before running) and the self-test takes about 8s. The self-test result can be viewed through d1-00. After self-test, the device runs normally and the status machine becomes S12 (Running).

3.5.2 Capacitance Auto-tuning

In multidrive applications, a common DC busbar is used and the drive power and quantity are unknown. When the active rectifier works in the voltage mode, the voltage setpoint is used as the common DC busbar voltage and the regulator parameters of the voltage outer loop are directly related to the capacitance on the DC bus.

After bus capacitance auto-tuning is enabled, the software can detect the total capacitance on the DC bus, and automatically adjust the regulator parameters of the voltage loop to improve the dynamic response.

You can set three auto-tuning modes through b7-08.

- If capacitance auto-tuning has been performed and the backend load capacitance remains unchanged, set b7-08 to 0 to skip capacitance auto-tuning.
- If capacitance auto-tuning is not performed or the backend load capacitance is unclear, set b7-08 to 1 to perform capacitance auto-tuning before initial running.
- If the backend load capacitance may change, set b7-08 to 2 to perform capacitance auto-tuning before each running.

If the load changes slowly and fast dynamic response is not required, set b7-08 to 0 to skip capacitance auto-tuning.

Para.	Value	Description
b7-08	0	Skip auto-tuning
	1	Perform auto-tuning once
	2	Perform auto-tuning before each running



- ◆ The active rectifier can be configured with inverters of up to 4 times the rectifier power.

3.6 Trial Run

3.6.1 Starting Device in Local Control Mode

It is recommended to use InoDriveStudio or SOP-20-880 to start the device for the initial trial run. For the operation details, see "[Chapter 1 Commissioning Tool](#)".

3.6.2 Starting Device with Factory Settings

For active rectifiers delivered in a cabinet, the cabinet provides start, switch-off, and reset buttons. When [b0-00] is set to 1 (the factory settings are enabled), the device can be started directly. The following table lists the factory settings.

Table 3-3 Factory Settings

Para.	Name	Value	Description
b0-00	Factory settings enable	0: Disabled 1: Enabled	This parameter must be set to 1.
b0-01	Factory settings active	0: Inactive 1: Active	Indicates whether the current factory settings are active. This parameter is read-only.
b0-02	Factory settings enable command source	3: DI2	The device is started with DI2 by default, which cannot be changed. The start command is active when DI5 is low level and the rising edge of DI2 changes.
b0-03	Factory settings stop command source	6: DI5	The device is stopped with DI5 by default, which cannot be changed. The stop command is active when DI5 is high level.
b0-04	Factory settings running command source	0: Disabled 1: Enabled	The default value is 1, which can be changed.
b0-05	Factory settings reset signal source	7: DI6	The fault is reset with DI6 by default, which cannot be changed.

**NOTE**

- ◆ To control device start or stop in other remote modes, set [b0-00] to 0 to disable the factory settings.

3.6.3 Starting or Stopping a Device with DI

The HCU-40 control module allows you to start or stop a device with DI terminals. For example, DI1 is used as the start command, DI2 is used as the output blocking command, and DI3 is used as the fault reset command.

Table 3-4 Example of starting or stopping a device with DI

Para.	Name	Value	Description
b0-00	Factory settings enable	0	The factory settings are not enabled.
b1-00	[Channel 1] Control source setting	1	User-defined start/stop control word
b1-01	[Channel 1] user-defined OFF1 source	2	Selects DI1 as the OFF1 command source
b1-02	[Channel 1] user-defined OFF2 source	3	Selects DI2 as the OFF2 command source
b1-03	[Channel 1] user-defined running command source	1	Running permission
b1-04	[Channel 1] user-defined reset signal source	4	Selects DI3 as the command source for reset upon fault

3.6.4 Starting or Stop a Device with Fieldbus

This section only describes the source of start, stop, and reset commands for the device through the fieldbus and the setpoint source.

1) User-defined method

To start a device using a user-defined fieldbus communication method, specify a protocol to use with the automation system, and set parameters according to the protocol. In the following example, the fieldbus adapter A is configured as a PROFIBUS DP bus to start the device.

Table 3-5 shows the definition of control words received by the active rectifier.

Table 3-5 Control word definition

Bit	1	0	Description
Bit0	Start	Stop	Starts at the rising edge and remains started
Bit1	Block inactive	Block active	Necessary start condition 1
Bit2	Reserved	Reserved	-
Bit3	Running permitted	Running inhibited	-
Bit4	-	-	-
Bit5	-	-	-
Bit6	-	-	-
Bit7	Fault reset	None	Rising edge valid
Bit8	-	-	-
Bit9	-	-	-
Bit10	PZD data enable	PZD data disable	This bit of the communication data must be always 1.
Bit11	-	-	-
Bit12	-	-	-
Bit13	-	-	-
Bit14	-	-	-
Bit15	-	-	-

Table 3-6 shows the definition of status words sent by the active rectifier.

Table 3-6 Status word definition

Word	Value range	Definition	Description
PZD1	0 to 0xFFFF	Status word 1	"4.1.4 Status Words"
PZD2	0 to 15000	DC bus voltage	For base value calibration, see "4.4 Communication Modules" . One decimal place: 1000 indicates that the voltage is 100.0 V.

Parameter settings:

Table 3-7 Bus definition and settings

Para.	Name	Value	Description
n1-00	Bus type for fieldbus adapter	7	Defines the bus type for fieldbus adapter A to PROFIBUS DP
n1-01	Communication disconnection detection delay	1	The communication fault is reported 1s after communication becomes disconnected.
n1-03	Detection setting for continuous CRC check errors in communication	0	No CRC check is performed.
n1-04	Process data output 1	1809	Sets the process data 1 as the sent status 1
n1-05	Process data output 2	1502	Sets the process data 2 as the DC bus voltage
n1-20	Communication base value for process data output 1	0	The default configuration is used. That is, 4096 corresponds to 100% of the rated value.
n1-21	Communication base value for process data output 2	0	The default configuration is used. That is, 4096 corresponds to 100% of the rated value.
n1-36	Communication base value for process data input 1	0	The default configuration is used. That is, 4096 corresponds to 100% of the rated value.
n1-37	Communication base value for process data input 2	0	The default configuration is used. That is, 4096 corresponds to 100% of the rated value.
n16-00	Expansion slot	7	The PROFIBUS DP communication module is at expansion slot 3_1.
n16-02	Expansion module ID	2	Sets the PROFIBUS DP address to 2.

The control channels are set based on the definition of control words.

Para.	Name	Value	Description
b0-00	Factory settings enable	0	The factory settings are not enabled.
b1-00	[Channel 1] Control source setting	1	User-defined start/stop control word
b1-01	[Channel 1] user-defined OFF1 source	1200	Selects the fieldbus adapter A.PZD1.0 as the OFF1 command source
b1-02	[Channel 1] user-defined OFF2 source	1201	Selects the fieldbus adapter A.PZD1.1 as the OFF2 command source
b1-03	[Channel 1] user-defined running command source	1203	Selects the fieldbus adapter A.PZD1.3 as the running permission command source
b1-04	[Channel 1] user-defined reset signal source	1207	Selects the fieldbus adapter A.PZD1.7 as the fault reset command source

3.6.5 Control with Modbus (Mailbox Data)

1 Special address control

The Modbus communication protocol directly reads and writes parameters through communication addresses and does not generate any process data.

To enable Modbus to control device start/stop, HCU provides several special communication addresses for Modbus access, and updates the written data to a specific connector which can be read by the setpoint source parameter.

Table 3-8 Communication addresses

Comm. Addr.	Write Connector	Name	Description
34230	U5-40	Modbus communication setpoint 1	The value range is -32768 to +32767. This parameter is used to receive control words or setpoints.
34231	U5-41	Modbus communication setpoint 2	
34232	U9-50	Modbus communication double word setpoint	The value range is -2^{31} to $(2^{31} - 1)$. This parameter is used to receive high-precision setpoints. The communication address 34232 is written to the high 16 bits, and the communication address 34233 is written to the low 16 bits.
34233			

Parameter configuration:

Table 3-9 Parameter configuration

Para.	Name	Value	Description
b0-00	Factory settings enable	0	The factory settings are not enabled.
n1-00	Bus type for fieldbus adapter	1	The fieldbus adapter A is of the Modbus RTU type.
n10-00	Expansion slot	7	The Modbus RTU module is inserted in the expansion slot 3_1.
n10-04	Modbus local address	4	The address of the Modbus RTU module is 4.
b1-00	[Channel 1] control source setting	1	User-defined start/stop control word
b1-01	[Channel 1] user-defined OFF1 source	1248	Uses the bit-to-word input bit0 as the OFF1 start/stop command source.
L0-00	Word-to-bit conversion 1 input selection	1540	Uses the data 1 sent by Modbus as the word-to-bit input

After setting, writing 0 to the communication address 34230 through Modbus can stop the device, and writing 1 to 34230 can start the device.

2 Continuous address control

HCU provides only a limited number of special communication addresses. Therefore, Modbus RTU and Modbus TCP support the write operation on process data n1-68 to n1-83 (n2-68 to n2-83). Then, the process data is converted using communication base values n1-36 to n1-51 (n2-36 to n2-51) and finally updated to the corresponding connectors U5-44 to U5-59 (U5-60 to U5-75). The related parameters are listed below.

2) Fieldbus adapter A:

Comm. Addr.	Write Para.	Name	Description
33807	n1-68	Display of process data input 1	Written through Modbus communication, converted using base value n1-36, and updated to connector U5-44
33808	n1-69	Display of process data input 2	Written through Modbus communication, converted using base value n1-37, and updated to connector U5-45
33809	n1-70	Display of process data input 3	Written through Modbus communication, converted using base value n1-38, and updated to connector U5-46
33810	n1-71	Display of process data input 4	Written through Modbus communication, converted using base value n1-39, and updated to connector U5-47
33811	n1-72	Display of process data input 5	Written through Modbus communication, converted using base value n1-40, and updated to connector U5-48
33812	n1-73	Display of process data input 6	Written through Modbus communication, converted using base value n1-41, and updated to connector U5-49
33813	n1-74	Display of process data input 7	Written through Modbus communication, converted using base value n1-42, and updated to connector U5-50
33814	n1-75	Display of process data input 8	Written through Modbus communication, converted using base value n1-43, and updated to connector U5-51
33815	n1-76	Display of process data input 9	Written through Modbus communication, converted using base value n1-44, and updated to connector U5-52
33816	n1-77	Display of process data input 10	Written through Modbus communication, converted using base value n1-45, and updated to connector U5-53
33817	n1-78	Display of process data input 11	Written through Modbus communication, converted using base value n1-46, and updated to connector U5-54
33818	n1-79	Display of process data input 12	Written through Modbus communication, converted using base value n1-47, and updated to connector U5-55
33819	n1-80	Display of process data input 13	Written through Modbus communication, converted using base value n1-48, and updated to connector U5-56
33820	n1-81	Display of process data input 14	Written through Modbus communication, converted using base value n1-49, and updated to connector U5-57

Comm. Addr.	Write Para.	Name	Description
33821	n1-82	Display of process data input 15	Written through Modbus communication, converted using base value n1-50, and updated to connector U5-58
33822	n1-83	Display of process data input 16	Written through Modbus communication, converted using base value n1-51, and updated to connector U5-59

3) Fieldbus adapter B:

Comm. Addr.	Write Para.	Name	Description
33839	n2-68	Display of process data input 1	Written through Modbus communication, converted using base value n1-36, and updated to connector U5-60
33840	n2-69	Display of process data input 2	Written through Modbus communication, converted using base value n1-37, and updated to connector U5-61
33841	n2-70	Display of process data input 3	Written through Modbus communication, converted using base value n1-38, and updated to connector U5-62
33842	n2-71	Display of process data input 4	Written through Modbus communication, converted using base value n1-39, and updated to connector U5-63
33843	n2-72	Display of process data input 5	Written through Modbus communication, converted using base value n1-40, and updated to connector U5-64
33844	n2-73	Display of process data input 6	Written through Modbus communication, converted using base value n1-41, and updated to connector U5-65
33845	n2-74	Display of process data input 7	Written through Modbus communication, converted using base value n1-42, and updated to connector U5-66
33846	n2-75	Display of process data input 8	Written through Modbus communication, converted using base value n1-43, and updated to connector U5-67
33847	n2-76	Display of process data input 9	Written through Modbus communication, converted using base value n1-44, and updated to connector U5-68
33848	n2-77	Display of process data input 10	Written through Modbus communication, converted using base value n1-45, and updated to connector U5-69
33849	n2-78	Display of process data input 11	Written through Modbus communication, converted using base value n1-46, and updated to connector U5-70

Comm. Addr.	Write Para.	Name	Description
33850	n2-79	Display of process data input 12	Written through Modbus communication, converted using base value n1-47, and updated to connector U5-71
33851	n2-80	Display of process data input 13	Written through Modbus communication, converted using base value n1-48, and updated to connector U5-72
33852	n2-81	Display of process data input 14	Written through Modbus communication, converted using base value n1-49, and updated to connector U5-73
33853	n2-82	Display of process data input 15	Written through Modbus communication, converted using base value n1-50, and updated to connector U5-74
33854	n2-83	Display of process data input 16	Written through Modbus communication, converted using base value n1-51, and updated to connector U5-75

For device start/stop, reset commands, and reference source settings using continuous address control over Modbus communications, see ["3.6.3 Starting or Stopping a Device with DI"](#).

Chapter 4 Function Modules

4.1 Control Words and Status Words

- Control words are mainly used by the system to control the drive. The drive switches between states and enables or disables a function based on the bit code commands of the control words.
- Status words are a set of bit codes used when the drive is in a certain state.

4.1.1 Start and Run

1) Control word

HCU-40 involves two commands related to rectifier start/stop control. The commands can be set by using start/stop control words.

■ OFF1 command:

When the OFF2 command is inactive and no fault occurs, the system enters the ready-to-switch-on state (S5). In this case, the OFF1 command changes from 0 to 1 to trigger the startup of the rectifier, and the rectifier enters the pre-charge state (S6) and then the ready-to-run state (S7), and waits for the running permission command.

When OFF1 is 0, the rectifier stops and the status machine returns to the ready-to-switch-on state (S5).

■ Running permission command:

This command controls the triggering of IGBT on the premise that the rectifier has been started by the OFF1 command and pre-charged. When OFF1 is 0, this command alone cannot control the running of the rectifier.

If this command is inactive, IGBT will not be triggered and the rectifier will be in the ready-to-run state (S7) even if the OFF1 command is switched on. Wait until the running permission command becomes active before triggering IGBT.

During normal running, the running permission command must remain active (high level).

Table 4-1 OFF1 command and running permission command sources

Factory Settings b0-00	Command Channel Selection A9- 00	Control Source	OFF1	Running Permission Command
1: Active	-	-	DI2 and DI5	b0-04/b6-06/b6-07

Factory Settings b0-00	Command Channel Selection A9- 00	Control Source	OFF1	Running Permission Command
0: Inactive	0: Command channel 1	0: Terminal start/ stop module	Group b5	b5-08/b5-09
		1: User-defined start/stop	b1-01	b1-03
	1: Command channel 2	0: Terminal start/ stop module	Group b5	b5-08/b5-09
		1: User-defined start/stop	b3-01	b3-03



NOTE

◆ When SOP-20-880 is used to control the drive start/stop, the running permission command can be set by A10-06.

2) Start time sequence

After receiving the start command (OFF1), the HCU-40 control module controls the auxiliary contact to close. In this case, the three-phase AC input charges the DC bus through the pre-charge circuit to gradually increase the DC voltage.

After pre-charge, HCU-40 controls the main circuit breaker to close, receives the close feedback signal (DI3) from the main circuit breaker, disconnects the auxiliary contactor, and then waits for a time preset in E0-00 (2.5s).

After the wait time expires, if the running permission command is active, the active rectifier runs normally. Figure 4-1 shows the startup time sequence when the active rectifier works in the voltage mode.

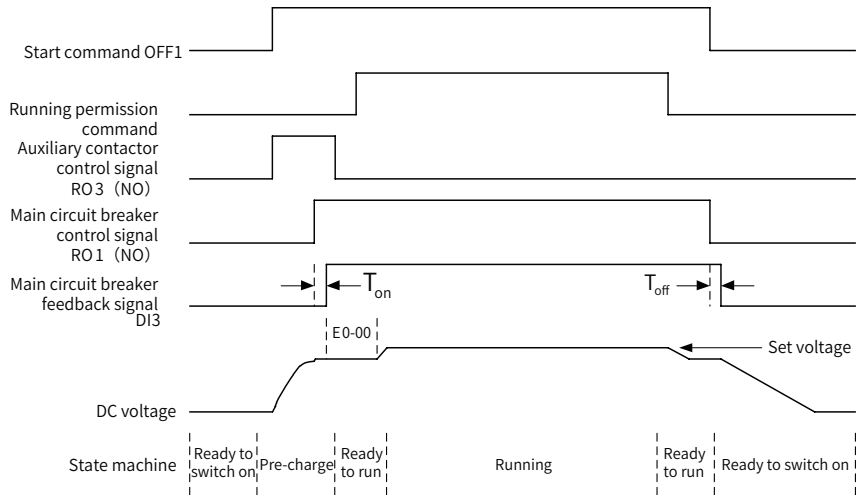


Figure 4-1 Startup time sequence of active rectifier in the voltage mode



NOTE

- ◆ When the close delay time T_{on} of the main circuit breaker exceeds the setpoint of E7-08 (5s by default) or its open delay time T_{off} exceeds the setpoint of E7-09 (2s by default), ERR73-1 (Main circuit breaker feedback error) is reported.
- ◆ The control signal of the auxiliary contactor is the normally open contact RO3, which cannot be changed.
- ◆ The control signal of the main circuit breaker is the normally open contact RO1, and the feedback signal of the main circuit breaker is DI3, which cannot be changed.

4.1.2 Emergency Stop Command

OFF2 emergency stop: The IGBT output is blocked unconditionally to switch off the system when the command is received. The emergency stop command is active low. When OFF2 of the device is 0, the device stops immediately.

The OFF2 command has multiple sources. Active parameters vary with the settings of control channels. When any one of the multiple OFF2 sources is 0, the rectifier stops according to OFF2.

Table 4-2 OFF2 command sources

Command Channel	Control Source	OFF2 Source							
		b1-02	b2-00	b2-01	b3-02	b4-00	b4-01	SOP	IDS
[A9-00] = 0	[b1-00] = 0 Terminal start/stop	x	Active	Active	x	x	x	x	x
	[b1-00] = 1 User-defined start/stop	Active	Active	Active	x	x	x	x	x
	Factory settings	x	Active	Active	x	x	x	x	x
	SOP control	Active ([b1-00] = 1)	Active	Active	x	x	x	x	x
	IDS control	Active ([b1-00] = 1)	Active	Active	x	x	x	x	Active

Command Channel	Control Source	OFF2 Source							
		b1-02	b2-00	b2-01	b3-02	b4-00	b4-01	SOP	IDS
[A9-00] = 1	[b3-00] = 0 Terminal start/stop	x	x	x	x	Active	Active	x	x
	[b3-00] = 1 User-defined start/stop	x	x	x	Active	Active	Active	x	x
	Factory settings	x	x	x	x	Active	Active	x	x
	SOP control	x	x	x	Active ([b3-00] = 1)	Active	Active	x	x
	IDS control	x	x	x	Active ([b3-00] = 1)	Active	Active	x	Active

**NOTE**

- ◆ An "x" in the table indicates that the OFF2 command source is inactive.
- ◆ The default source of b2-00 and b4-00 is DIL.

4.1.3 Control Words

1) Control word 1 (U8-07)

Bit	Name	Para.	Value	Description
0	Start/Stop (OFF1)	See Table 4-1.	0	Stop: The drive enters the ready-to-switch-on state (S5).
			0 → 1	Start: On the rising edge, the drive transits from the ready-to-switch-on state (S5) to the power-on check state (S2), the pre-charge state (S6), and then to the ready-to-run state (S7).
1	Output blocking (OFF2)	See Table 4-2.	0	IGBT is blocked and the drive enters the switch-on-inhibited state (S4).
			1	Necessary start condition
2	Reserved	-	-	-
3	Running permission	See Table 4-1.	0	IGBT does not run.
			1	In the ready-to-run (S7) state, the drive performs check before running and then enters the running state.
4 to 6	Reserved	-	-	-

Bit	Name	Para.	Value	Description
7	Fault reset	b0-05 b1-04 b2-02/b2-03 b3-04 b4-02/b4-03 b5-09/b5-14	0	Inactive
			0 → 1	The fault reset command is active. If the current fault cause is eliminated, the fault is cleared and the drive enters the switch-on-inhibited (S4) state.
8 and 9	Reserved	-	-	-
10	Remote control enable	-	0	Disable
			1	Controlled by the command channel 1 or 2.
11	Reserved	-	-	-
12	Motor-driven potentiometer increase	C4-05	0	Invalid
			1	The motor-driven potentiometer output increases at the defined slope.
13	Motor-driven potentiometer decrease	C4-06	0	Invalid
			1	The motor-driven potentiometer output decreases at the defined slope.
14	External fault 1	H0-00	0	Invalid
			1	External fault 1 is triggered.
15	External fault 2	H0-01	0	Invalid
			1	External fault 2 is triggered.

2) Control word 2 (U8-08)

Bit	Name	Para.	Value	Description
0	External alarm 1	H0-02	0	Invalid
			1	External alarm 1 is triggered.
1	External alarm 2	H0-03	0	Invalid
			1	External alarm 2 is triggered.
2 and 3	Reserved	-	-	-
4 to 7	Multi-reference data selection	C6-01 to C6-04	0 and 15	The values correspond to C6-01 to C6-04. Select one from the 16 fixed values of C6-05 to C6-20 as the multi-reference output value.
8	Command channel selection	A9-00	0	The command channel 1 is activated. When factory settings are not enabled, group b1/b2 is selected as the control channel and group C0/C1 is selected as the setpoint channel.
			1	The command channel 2 is activated. When factory settings are not enabled, group b3/b4 is selected as the control channel and group C2/C3 is selected as the setpoint channel.

Bit	Name	Para.	Value	Description
9 to 15	Reserved	-	-	-

4.1.4 Status Words

1) Status word 1 (U8-09)

Bit	Name	Value	Description
0	Ready to switch on	0	The drive is faulty or external conditions are not met (see switch-on inhibited).
		1	Operation preparation is completed. The value is 1 regardless of whether there is a run (OFF1) command or not.
1	Ready to run	0	No run command is available.
		1	A run command is received and the bus voltage has built up. The value is 1 regardless of whether there is a running permission command or not.
2	Start	0	Not started
		1	Started
3	Fault activation	0	No fault is activated.
		1	A fault is activated.
4	Output blocking activation (OFF2)	0	Output blocking is activated.
		1	Output blocking is not activated.
5	Reserved	-	-
6	Switch-on inhibited	0	Normal
		1	External conditions are not met (OFF2 active) or faults occur.
7	Alarm or limit	0	Normal
		1	A limit or alarm is activated.
8	Reserved	-	-
9	Remote control enable	0	The current control channel is inactive and the device is commissioned and controlled by InoDriveStudio.
		1	The device can be controlled by the command channel.
10	Reserved	-	-
11	Reserved	-	-
12	Reserved	-	-
13	Reserved	-	-
14	Reserved	-	-
		-	-
15	IGBT operation	0	IGBT is blocked.
		1	IGBT is triggered.

2) Status word 2 (U8-10)

Bit	Name	Value	Description
0 to 2	Reserved	-	-
3	Normal running	0	Not running
		1	Running
4 to 5	Reserved	-	-
6	Parameter auto-tuning	0	Auto-tuning is not ongoing.
		1	Parameter auto-tuning is ongoing.
7	Limit activation	0	No limit is activated.
		1	Limit activation
8	Alarm activation	0	No alarm is activated.
		1	An alarm is activated.
9 to 10	Reserved	-	-
11	SOP-20-880 local control activation	0	SOP-20 local control is not activated.
		1	SOP-20 local control is activated by using the Loc/Rem button of the SOP-20, which controls the drive operation on behalf of the control channel.
12 to 15	Reserved	-	-

4.1.5 State Machine

Table 4-3 lists state machines of the active rectifier.

Table 4-3 Definition of each state of the state machine

State	Name	Description
S1	System initialization	The program is initialized and waits for control voltage build-up. When the condition is met, the state machine enters S4.
S2	Power-on check	The system directly enters the state S6 if no power-on check item is selected.
S3	Fault	The state machine enters S3 when a fault occurs in any state other than S20 and S21. The system enters S4 after the fault is cleared and reset is performed.
S4	Switch-on inhibited	The system enters S5 when OFF2 is 1 and OFF1 is 0. The system remains in the state S4 when OFF2 is 0 or OFF1 is 1.
S5	Ready to switch on	The system waits for the run command and then enters S2 on the rising edge of the command OFF1.
S6	Pre-charge	The system is being pre-charged. After pre-charge, the system enters S7 when it receives the feedback signal from the main circuit breaker. When the S6 duration exceeds the time defined in E7-10 (15s by default), the pre-charge error will occur.

State	Name	Description
S7	Ready to run	The system enters S9 after receiving the running permission signal.
S9	Detection before running	The state machine detects the selected item. If no detection item before running is selected, the state machine skips this state and enters S12.
S12	Running	The system runs normally. The system enters S5 when OFF1 is 0. The system enters S4 when OFF2 is 0.
S20	Parameter restoration	The system is restoring parameters to their factory settings. After restoration, the system enters S4.
S21	Parameter downloading	The system is downloading parameters through SOP-20-880. After parameters are downloaded, the system enters S4.

4.2 Setpoint Channel

4.2.1 Voltage Reference

HCU-40 provides two separate voltage reference channels, which can be switched over online by A9-00. The voltage setpoint is a percentage, and the voltage setpoint base value can be viewed in d3-00.

400 V device: The voltage setpoint base value is 600 V.

690 V device: The voltage setpoint base value is 1050 V.

Table 4-4 Voltage reference channel selection

Channel Selection	Para.	Name	Description
[A9-00] = 0 Channel 1	C0-00	Voltage reference source	0: Digital setting 1: Multi-reference value 1 2: Calculated based on the preset line supply voltage 6: Multi-reference value 7: Motor-driven potentiometer Other: K connector
	C0-01	Voltage digital setting	Digitally set voltage value
	C0-02	Actual valid voltage	The actually valid voltage setpoint after limiting
	C0-03	Voltage setpoint upper limit	400 V device: 510 V to 720 V 690 V device: 700 V to 1150 V
	C0-04	Voltage setpoint lower limit	

Channel Selection	Para.	Name	Description
[A9-00] = 1 Channel 2	C2-00	Voltage reference source	0: Digital setting 1: Multi-reference value 1 2: Calculated based on the preset line supply voltage 6: Multi-reference value 7: Motor-driven potentiometer Other: K connector
	C2-01	Voltage digital setting	Digitally set voltage value
	C2-02	Actual valid voltage	The actually valid voltage setpoint after limiting
	C2-03	Voltage setpoint upper limit	400 V device: 510 V to 720 V 690 V device: 700 V to 1150 V
	C2-04	Voltage setpoint lower limit	

4.2.2 Current Reference

HCU-40 provides two separate current reference channels, which can be switched over online by A9-00. The current setpoint is a percentage, and the current setpoint base value can be viewed in d3-01. The current setpoint base value is related to the device rated current.

- In the single device mode, the current setpoint base value d3-01 equals the device rated current A2-02.
- In the parallel connection mode, the current setpoint base value d3-01 equals the device rated current A2-02 multiplied by the number of parallel devices, rather than the total rated current of parallel devices (A2-05). Parallel connection parameters can be viewed in group A15.

Table 4-5 Current reference channel selection

Channel Selection	Para.	Name	Description
[A9-00] = 0 Channel 1	C1-00	Current reference source	0: Digital setting 1: Multi-reference value 1 6: Multi-reference value 7: Motor-driven potentiometer Other: K connector
	C1-01	Current digital setting	Digitally set voltage value
	C1-02	Actual valid current	The actually valid current setpoint after limiting
	C1-04	Current setpoint upper limit	400 V device: 510 V to 720 V 690 V device: 700 V to 1150 V
	C1-05	Current setpoint lower limit	
[A9-00] = 1 Channel 2	C3-00	Current reference source	0: Digital setting 1: Multi-reference value 1 6: Multi-reference value 7: Motor-driven potentiometer Other: K connector
	C3-01	Current digital setting	Digitally set current value
	C3-02	Actual valid current	The actually valid current setpoint after limiting
	C3-04	Current setpoint upper limit	400 V device: 510 V to 720 V 690 V device: 700 V to 1150 V
	C3-05	Current setpoint lower limit	

4.2.3 Multi-reference

In the multi-reference mode, you need to select the reference sources. The parameter settings are as follows:

Table 4-6 Multi-reference parameter settings

Para.	Name	Value
C6-01	Multi-reference value selection 1 command source	0: 0 1: 1 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector

Para.	Name	Value
C6-02	Multi-reference value selection 2 command source	Same as C6-01
C6-03	Multi-reference value selection 3 command source	Same as C6-01
C6-04	Multi-reference value selection 4 command source	Same as C6-01
C6-05	Multi-reference value 1	-600.0% to +600.0%
C6-06	Multi-reference value 2	-600.0% to +600.0%
C6-07	Multi-reference value 3	-600.0% to +600.0%
C6-08	Multi-reference value 4	-600.0% to +600.0%
C6-09	Multi-reference value 5	-600.0% to +600.0%
C6-10	Multi-reference value 6	-600.0% to +600.0%
C6-11	Multi-reference value 7	-600.0% to +600.0%
C6-12	Multi-reference value 8	-600.0% to +600.0%
C6-13	Multi-reference value 9	-600.0% to +600.0%
C6-14	Multi-reference value 10	-600.0% to +600.0%
C6-15	Multi-reference value 11	-600.0% to +600.0%
C6-16	Multi-reference value 12	-600.0% to +600.0%
C6-17	Multi-reference value 13	-300.00% to +300.00%
C6-18	Multi-reference value 14	-300.00% to +300.00%
C6-19	Multi-reference value 15	-300.00% to +300.00%
C6-20	Multi-reference value 16	-300.00% to +300.00%

HCU-40 provides 16 multi-reference values. Activation of multi-reference values is determined by C6-01 to C6-04. 0000 (binary) to 1111 (binary) correspond to multi-reference

value 1 to multi-reference value 16, respectively. The multi-reference value setpoint can be viewed in C6-00.

Table 4-7 Multi-reference value parameters

[C6-01]	[C6-02]	[C6-03]	[C6-04]	Enabled Multi-Reference Value of U9-30	Connector
0	0	0	0	C6-05	U9-31
1	0	0	0	C6-06	U9-32
0	1	0	0	C6-07	U9-33
1	1	0	0	C6-08	U9-34
0	0	1	0	C6-09	U9-35
1	0	1	0	C6-10	U9-36
0	1	1	0	C6-11	U9-37
1	1	1	0	C6-12	U9-38
0	0	0	1	C6-13	U9-39
1	0	0	1	C6-14	U9-40
0	1	0	1	C6-15	U9-41
1	1	0	1	C6-16	U9-42
0	0	1	1	C6-17	U9-43
1	0	1	1	C6-18	U9-44
0	1	1	1	C6-19	U9-45
1	1	1	1	C6-20	U9-46

4.2.4 Motor-driven Potentiometer

Figure 4-2 shows the function of the motor-driven potentiometer.

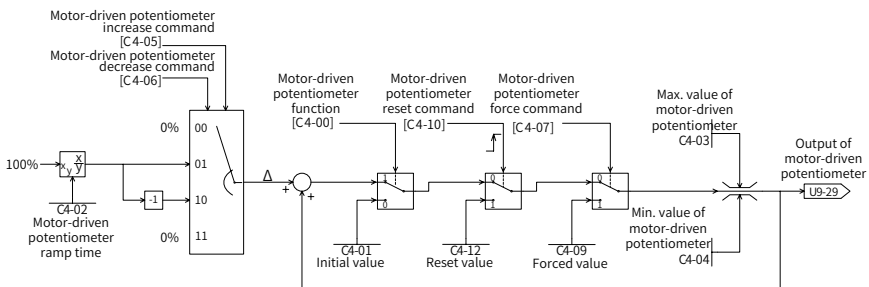


Figure 4-2 Function diagram of motor-driven potentiometer

When SOP-20-880 is used to control the device, local control is active. The increase and decrease of the motor-driven potentiometer is controlled by the SOP-20-880.

The following table lists the function parameters of the motor-driven potentiometer.

Para.	Name	Function Description	Value
C4-00	Motor-driven potentiometer function	0: Disabled 1: Not retentive at power failure 2: Retentive at power failure	-
C4-01	Initial value of motor-driven potentiometer	Initial value after power on when C4-00 is set to 1	-600.0% to +600.0%
C4-02	Ramp time of motor-driven potentiometer	Time for output to increase from 0% or 100% or decrease from 100% to 0%	0.1s to 3000.0s
C4-03	Maximum value of motor-driven potentiometer	Upper limit of output value	-600.0% to +600.0%
C4-04	Minimum value of motor-driven potentiometer	Lower Limit of output value	-600.0% to +600.0%
C4-05	Source of motor-driven potentiometer increase command	When increase or decrease is active, the output increases or decreases at the set rate. When increase and decrease are both active or inactive, the output value remains unchanged.	0: 0 1: 1 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector
C4-06	Source of motor-driven potentiometer decrease command		
C4-07	Source of motor-driven potentiometer force value	When the force function is enabled, the output of the motor-driven potentiometer is forced to be the force value selected by C4-08.	Same as C4-05
C4-08	Source of motor-driven potentiometer force value	Sets the source of the force value.	0: 0 1: 100% 2: Set by C4-09 Other: K connector
C4-09	Force value setpoint of motor-driven potentiometer	The forced value of digital setting	-600.0% to +600.0%

Para.	Name	Function Description	Value
C4-10	Source of motor-driven potentiometer reset command	The rising edge of the reset command triggers a reset of the output value to the value selected by C4-11.	Same as C4-05
C4-11	Source of motor-driven potentiometer reset value	Sets the source of the reset value.	0: 0 1: 100% 2: Set by C4-12 Other: K connector
C4-12	Reset value of motor-driven potentiometer	The reset value of digital setting	-600.0% to +600.0%

4.3 Terminal Start/Stop Modules

HCU-40 supports two terminal start/stop modules: terminal module 1 and terminal module 2. The two modules have the same functions and can be switched over. Only one module can be activated at a time.

The terminal start/stop modules output three command words: start command (OFF1), running permission, and reset.

The two modules are configured with different control modes, which can be switched over.

4.3.1 Terminal Start/Stop Module Switchover

The two modules can be switched over online. The following table lists the output commands for switching over the two modules.

Table 4-8 Output command switchover parameters

Para.	Enabled Module (b5-00)	OFF1 (b5-01)	Running Permission	Reset Command
[b5-04] = 0	0: Module 1	b5-02 b5-05 [b5-06] [b5-07]	[b5-08]	[b5-09]
[b5-04] = 1	1: Module 2	b5-03 b5-10 [b5-11] [b5-12]	[b5-13]	[b5-14]

4.3.2 Basic Parameters of Terminal Start/Stop Modules

The modules contain five basic parameters: mode, input 1, input 2, running permission command source, and reset command source. The following table lists the functions of each parameter.

Table 4-9 Basic parameters

Para.	Name	Function Description
b5-00	Enabled terminal start/stop module	Displays the enabled terminal start/stop module. 0: Module 1 1: Module 2
b5-01	Terminal start/stop module OFF1 status	Displays the OFF1 status of the terminal start/stop module.
b5-02	[Module 1] OFF1 status	Displays the OFF1 status of the terminal start/stop module 1.
b5-03	[Module 2] OFF1 status	Displays the OFF1 status of the terminal start/stop module 2.
b5-04	Terminal start/stop module 1/2 selection	Selects the terminal start/stop module. When [b5-04] is set to 0, the terminal start/stop module 1 is used. When [b5-04] is set to 1, the terminal start/stop module 2 is used.
b5-05	[Module 1] mode	Sets the control mode of the terminal start/stop module 1. 0: Level mode IN1 (1) 1: IN1 (1), IN2 (changing from 0 to 1) Edge trigger mode 1 2: IN1 (1), IN2 (changing from 0 to 1 and then retained at 1) Edge trigger mode 2 3: IN1 (changing from 0 to 1), IN2 (0) Edge trigger mode 3 For details, see Sections 4.3.3 to 4.3.6.
b5-06	[Module 1] input 1	Sets the input 1 source of the terminal start/stop module 1.
b5-07	[Module 1] input 2	Sets the input 1 source of the terminal start/stop module 2.
b5-08	[Module 1] running permission command source	Sets the running permission command source of the terminal start/stop module 1.
b5-09	[Module 1] reset signal source	Sets the reset command source of the terminal start/stop module 1.
b5-10	[Module 2] mode	Sets the control mode of the terminal start/stop module 2. 0: Level mode IN1 (1) 1: IN1 (1), IN2 (changing from 0 to 1) Edge trigger mode 1 2: IN1 (1), IN2 (changing from 0 to 1 and then retained at 1) Edge trigger mode 2 3: IN1 (changing from 0 to 1), IN2 (0) Edge trigger mode 3 For details, see Sections 4.3.3 to 4.3.6.
b5-11	[Module 2] input 1	Sets the input 2 source of the terminal start/stop module 1.
b5-12	[Module 2] input 2	Sets the input 2 source of the terminal start/stop module 2.

Para.	Name	Function Description
b5-13	[Module 2] running permission command source	Sets the running permission command source of the terminal start/stop module 2.
b5-14	[Module 2] reset signal source	Sets the reset command source of the terminal start/stop module 2.

4.3.3 Terminal Start/Stop Mode: Level Mode

When b5-05/b5-10 is set to 0, the level mode is active.

In the level mode, the level of input 1 determines the status of OFF1 (the start or stop of the drive), and the status of input 2 is inactive. When input 1 is high level, OFF1 is active. When input 1 is low level, OFF1 is inactive.

Table 4-10 Parameters in the level mode

Module Selection [b5-04]	Mode Selection b5-05/b5-10	Input 1 of Module 1 [b5-06]	Input 2 of Module 1 [b5-07]	Input 1 of Module 2 [b5-11]	Input 2 of Module 2 [b5-12]	Output OFF1 Status b5-01
0 Terminal module 1	0	0	x	x	x	0
	0	1	x	x	x	1
1 Terminal module 2	0	x	x	0	x	0
	0	x	x	1	x	1

For example, when DI1 controls the device start/stop, as shown in Figure 4-3, parameter settings are as those shown in Table 4-11.

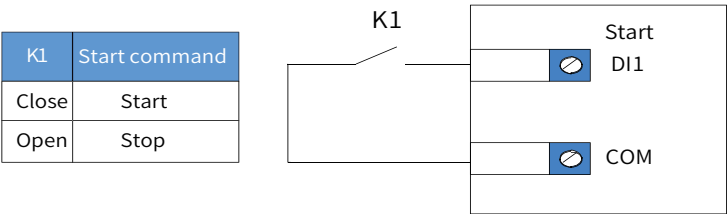


Figure 4-3 An example of the level mode

Table 4-11 Parameter settings in the level mode

Para.	Value	Description
b5-04	0	Selects the terminal start/stop module 1
b5-05	0	Selects the level mode
b5-06	U0-02 (1002)	Selects DI1 as the start/stop command source

4.3.4 Terminal Start/Stop Mode: Edge Trigger Mode 1

When b5-05/b5-10 is set to 1, the edge trigger mode 1 is active.

In this mode, when input 1 is high level and input 2 is on the rising edge, OFF1 is 1. When input 1 is low level, OFF1 is 0. If OFF1 is 1, when input 2 changes from high level to low level, OFF1 retains at 1. That is, after the drive is started, you do not need to retain input 2 at high level. In this mode, input 2 is normally connected to the transient start button and input 1 is normally connected to the switch-off switch of the NC contact.

Table 4-12 Parameters in the edge trigger mode 1

Module Selection [b5-04]	Mode Selection b5-05/b5-10	Input 1 of Module 1 [b5-06]	Input 2 of Module 1 [b5-07]	Input 1 of Module 2 [b5-11]	Input 2 of Module 2 [b5-12]	Output OFF1 Status b5-01
0 Terminal module 1	1	0	x	x	x	0
	1	1	0 → 1	x	x	1
1 Terminal module 2	1	x	x	0	x	0
	1	x	x	1	0 → 1	1

For example, when DI1 controls the device start while DI2 controls the device stop, as shown in Figure 4-4, the parameter settings are as those shown in Table 4-13.

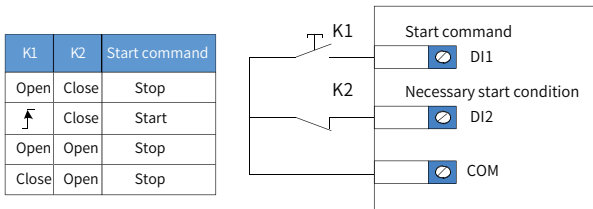


Figure 4-4 An example of the edge trigger mode 1

Table 4-13 Parameter settings in the edge trigger mode 1

Para.	Value	Description
b5-04	0	Selects the terminal start/stop module 1
b5-05	1	Selects the edge trigger mode 1
b5-06	U0-03 (1003)	DI2 controls the device stop.
b5-07	U0-02 (1002)	DI1 controls the device start.

4.3.5 Terminal Start/Stop Mode: Edge Trigger Mode 2

When b5-05/b5-10 is set to 2, the edge trigger mode 2 is active.

In this mode, when input 1 is high level and input 2 is on the rising edge and remains at the high level, OFF1 is 1. When either input 1 or input 2 is low level, OFF1 is 0. That is, after OFF1 becomes active, input 2 must be kept at 1; otherwise, OFF1 becomes 0. In this mode, input 2 is normally connected to the self-lock start switch and input 1 is normally connected to the switch-off switch of the NC contact.

Table 4-14 Parameters in the edge trigger mode 2

Module Selection [b5-04]	Mode Selection b5-05/b5-10	Input 1 of Module 1 [b5-06]	Input 2 of Module 1 [b5-07]	Input 1 of Module 2 [b5-11]	Input 2 of Module 2 [b5-12]	Output OFF1 Status b5-01
0 Terminal module 1	2	0	1	x	x	0
	2	x	0	x	x	0
	2	1	0 → 1	x	x	1
1 Terminal module 2	2	x	x	0	x	0
	2	x	x	x	0	0
	2	x	x	1	0 → 1	1

For example, when DI1 controls the device start/stop and DI2 controls the device stop, as shown in Figure 4-5, the parameter settings are shown in Table 4-15.

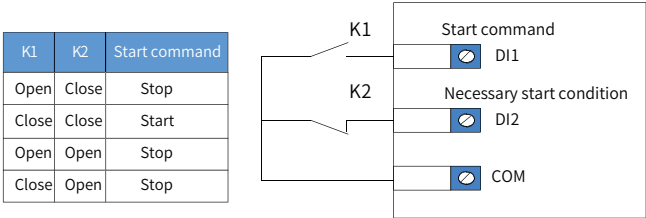


Figure 4-5 An example of the edge trigger mode 2

Table 4-15 Parameter settings in the edge trigger mode 2

Para.	Value	Description
b5-04	0	Selects the terminal start/stop module 1
b5-05	2	Selects the edge trigger mode 2
b5-06	U0-03 (1003)	DI2 controls the device stop.
b5-07	U0-02 (1002)	DI1 controls the device start/stop.

4.3.6 Terminal Start/Stop Mode: Edge Trigger Mode 3

When b5-05/b5-10 is set to 3, the edge trigger mode 3 is active.

In this mode, when input 2 is low level and input 1 is on the rising edge, OFF1 is 1. When input 2 is high level, OFF1 is 0. When OFF1 is 1, you do not need to keep input 1 at high level. In this mode, input 1 is normally connected to the transient start button and input 2 is normally connected to the transient stop button.

Table 4-16 Parameters in the edge trigger mode 3

Module Selection [b5-04]	Mode Selection b5-05/b5-10	Input 1 of Module 1 [b5-06]	Input 2 of Module 1 [b5-06]	Input 1 of Module 2 [b5-11]	Input 2 of Module 2 [b5-12]	Output OFF1 Status b5-01
0 Terminal module 1	3	x	1	x	x	0
	3	0 → 1	0	x	x	1
1 Terminal module 2	3	x	x	x	1	0
	3	x	x	0 → 1	0	1

For example, when DI1 controls the device start while DI2 controls the device stop, as shown in Figure 4-6, the parameter settings are as those shown in Table 4-17.

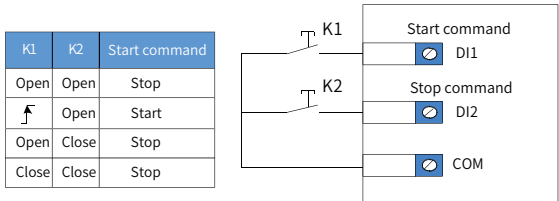


Figure 4-6 An example of the edge trigger mode 3

Table 4-17 Parameter settings in the edge trigger mode 3

Para.	Value	Description
b5-04	0	Selects the terminal start/stop module 1
b5-05	3	Selects the edge trigger mode 3
b5-06	U0-02 (1002)	DI1 controls the device start.
b5-07	U0-03 (1003)	DI2 controls the device stop.

4.4 Communication Modules

4.4.1 Fieldbus Adapter

Fieldbus adapters are used for communication between the fieldbus and the drive. Three fieldbus adapters are supported, with two used independently and the third one used for redundancy. The redundant adapter must be selected for fieldbus adapter A or B. The system automatically switches to the redundant adapter for receiving and sending data when adapter A or B fails due to an error.

A fieldbus adapter supports a maximum of 16 pieces of 16-bit process data. Figure 4-7 is the fieldbus adapter working diagram.

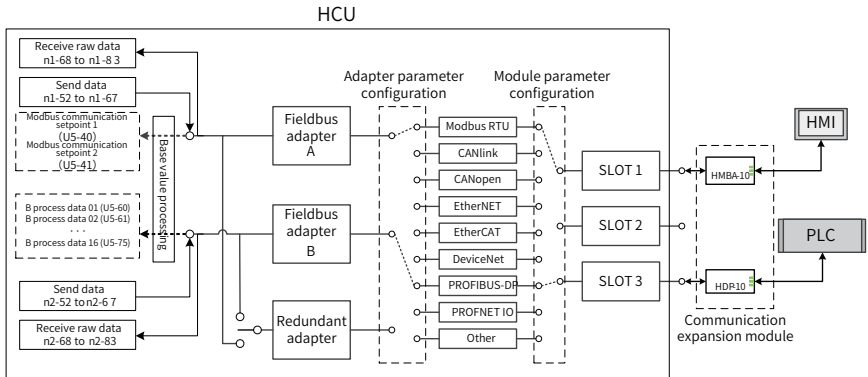


Figure 4-7 Fieldbus adapter working diagram

Fieldbus adapters support nine communication modules:

Modbus RTU fieldbus module, CANlink fieldbus module, CANopen fieldbus module, Ethernet/IP industrial Ethernet module, EtherCAT industrial Ethernet module, DeviceNet fieldbus module, PROFIBUS DP fieldbus module, PROFINET IO industrial Ethernet module, and other customized communication modules.

Table 4-18 Fieldbus adapter parameters

No.	Fieldbus Adapter A	Fieldbus Adapter B	Description
1	n1-00	n2-00	Selects the required bus protocol type 0: No fieldbus is selected.
2	n1-01	n2-01	Enables or disables communication timeout detection 0.00: Communication timeout fault is not detected.
3	n1-02	n2-02	Communication fault detection enable switch 0: Communication faults are detected. 1: Communication faults are not detected.
4	n1-03	n2-03	Enables or disables communication CRC error verification 0: CRC fault detection is disabled.
5	n1-04 to n1-19	n2-04 to n2-19	Sets the source of the data to be sent by the drive and obtains the original send data
6	n1-20 to n1-35	n2-20 to n2-35	Sets the base value of the data sent by the drive Actually send data = Original send data x Base value of the send data/4096. When the parameter is set to 0, the base value is 4096.
7	n1-52 to n1-67	n2-52 to n2-67	Displays the process data actually sent by the drive

No.	Fieldbus Adapter A	Fieldbus Adapter B	Description
8	n1-36 to n1-51	n2-36 to n2-51	Sets the base value of the data received by the drive Receive data = Original receive data x Base value of the receive data/4096. When the parameter is set to 0, the base value is 4096.
9	n1-68 to n1-83	n2-68 to n2-83	Displays the original process data received by the drive
10	n1-90	n2-90	Sets whether to save written parameters to EEPROM
11	n1-91	n2-91	Sets whether to upload the current fault information of devices to the host controller
12	U5-44 to U5-59	U5-60 to U5-75	Displays the receive process data converted using the base value
13	U2-00 to U2-15	U2-16 to U2-31	Displays the status of 16 bits of the process data PZD1 converted using the base value

Table 4-19 Redundant adapter settings

No.	Redundant Adapter	Description
1	n3-00	Forces to bind the Ethernet commissioning module
2	n3-03	Sets whether to save written parameters to EEPROM

Fieldbus adapters support the mailbox and process data formats.

- Mailbox data is used for parameter read and write, start/stop control, fault reset, status monitoring, and command delivery. Mailbox data is transmitted non-periodically.
- Process data is used for command reference, status interaction, speed reference, and torque reference. Process data is subject to periodical data exchange.

4.4.2 Process Data Configuration

HCU-40 supports two independent fieldbus adapters. Each fieldbus adapter can send and receive up to 16 pieces of process data. The process data sending source can be set independently. You can set different base values for each sent and received process data for per-unit processing.

1) Process data received by the drive

Original data received by the fieldbus adapter can be viewed in parameters n1-68 to n1-83 or n2-68 to n2-83.

The value obtained after the receive data is converted using the base value can be viewed in parameters U5-44 to U5-59 or U5-60 to U5-75. For methods of conversion using base value, see ["4.4.3 Communication Base Values"](#).

After base value conversion, the process data PZD1 is divided into 16 bits and the status of each bit can be viewed in parameters U2-00 to U2-15 or U2-16 to U2-31. To divide oth-

er process data into bits, you can use the bit-to-word function blocks (L0-00, L0-01, and L0-02).

To use received process data for control, configure corresponding control channel and setpoint channel parameters. For details, see "[4.2 Setpoint Channel](#)".



NOTE

- ◆ When PROFIBUS DP is used for communication, bit10 of the process data PZD1 must be 1. Otherwise, HCU-40 considers that the received process data is invalid, U5-44 to U5-59 (or U5-60 to U5-75) will retain the earlier data, but n1-68 to n1-83 (or n2-68 to n2-83) will display the actually received raw data.

2) Process data sent by the drive

You can use parameters n1-04 to n1-19 or n2-04 to n2-19 to set the source of data sent or uploaded by the drive.

If you want to send data consisting of bits, use the bit-to-word function block (group L0) to generate the expected data (U5-86 to U5-89) and then bind n1-04 to n1-19 (or n2-04 to n2-19) with U5-86 to U5-89.

You can set a separate base value for each process data by using parameters n1-20 to n1-35 (n2-20 to n2-35). Data received by the host controller or PLC is the values converted from n1-04 to n1-19 (or n2-04 to n2-19) using the base values. For methods of conversion using base value, see "[4.4.3 Communication Base Values](#)".

You can view the finally sent data in parameters n1-52 to n1-67 (n2-52 to n2-67).

4.4.3 Communication Base Values

The HCU-40 control module represents the current and voltage setpoints in percentage. You can view the base value of the percentages in group d3. 100% corresponds to the displayed base value in group d3.

In the HCU-40 control module, 4096 corresponds to 100%, that is, 4096 corresponds to the per-unit base value displayed in group d3. In the HCU-40 control module, the default communication base value is 0, which means that the base values of send and receive data are not converted.

Table 4-20 Per-unit base values

Para.	Name
d3-00	Per-unit base value of voltage
d3-01	Per-unit base value of current
d3-02	Per-unit base value of power

Typically, base values of data consisting of bits are not converted and the communication base value is 0.

Assume that the voltage is set through communication, the expected setpoint is 720 V, the data sent through communication is 7200, the per-unit base value d3-00 is 600 V, and the voltage is set by the process data PZD2. Then, you need to set the parameters as

follows:

- Set C0-00 (Voltage reference source) to U5-45 (Fieldbus adapter A.PZD2).
- Then, the communication base value of the process data input 2 (n1-37) = $(7200 \times 600)/720 = 6000$.

Formula for calculating the communication base value:

$$\text{Communication base value} = \frac{\text{Per unit value} \times \text{Communication transmission data}}{\text{Expected setting value}}$$

4.4.4 Communication Expansion Modules

Table 4-21 Communication expansion modules

No.	Expansion Module	Description
1	Modbus RTU module	This module is used for the Modbus communication protocol, which is a standard communication protocol. For details, see the communication expansion module guide. Parameters of this module are in group n10.
2	CANlink module	This module is used for the CANlink communication protocol, which is a custom protocol of Inovance. For details, see the communication expansion module guide. The CANlink expansion card supports seven communication speeds. Parameters of this module are in group n11.
3	CANopen module	This module is used for the CANopen communication protocol. For details, see the communication expansion module guide. The CANopen expansion module supports seven communication speeds. Parameters of this module are in group n12.
4	Ethernet module	This module is used for the Ethernet communication protocol. For details, see the communication expansion module guide. The Ethernet expansion module supports automatic IP address assignment. Parameters of this module are in group n13.
5	EtherCAT module	This module is used for the EtherCAT communication protocol. For details, see the communication expansion module guide. Parameters of this module are in group n14.
6	DeviceNet module	This module is used for the DeviceNet communication protocol. For details, see the communication expansion module guide. Parameters of this module are in group n15.
7	PROFIBUS DP module	This module is used for the PROFIBUS DP communication protocol. For details, see the communication expansion module guide. Parameters of this module are in group n16.

No.	Expansion Module	Description
8	PROFINET IO module	This module is used for the PROFINET communication protocol. For details, see the communication expansion module guide. Parameters of this module are in group n17.
9	Customized communication module	This module is used for user-defined communication protocols for various application scenarios. For details, see the communication protocol expansion module guide. Parameters of this module are in group n18.

4.4.5 InoLink Communication Network

InoLink is used for master/slave communication among multiple devices. Master/slave communication means that the logic master station in a network sends information such as control bit or setpoints to logic slave stations.

- Currently, each InoLink node can send and receive up to eight pieces of 16-bit data, respectively.
- An InoLink communication network supports up to 16 communication nodes, with each node corresponding to one drive. The network must contain a communication node whose address is 1, the addresses of other nodes cannot be the same, and the maximum node address is 16.
- The InoLink communication baud rate is 5 Mbps and the interaction interval is 2ms.

If a node does not receive data from another node in 2s, a disconnection error occurs at this node. If a non-master node does not receive the data request from the No. 1 node, this node will report a master disconnection error. If the addresses of two nodes in the network are the same, the address conflict error will occur when an existing address is set to a new node.

Table 4-22 InoLink communication parameters

No.	InoLink Communication Parameters	Description
1	n0-00	Enables or disables InoLink communication. 0: Disabled 1: Enabled
2	n0-01	Sets the address of an InoLink communication node. The value range is 1 to 16.
3	n0-02, n0-04, n0-06, n0-08, n0-10, n0-12, n0-14, and n0-16	Sets the address of the node that you want to receive the data. It cannot be the address of the local node.
4	n0-03, n0-05, n0-07, n0-09, n0-11, n0-13, n0-15, n0-17,	Sets which piece of data you want the node set in 3 to send.

No.	InoLink Communication Parameters	Description
5	n0-18 to n0-25	Sets the proportional coefficient of the received data, that is, the data finally used by this node is the data sent by the logical master station multiplied by the coefficient.
6	n0-26 to n0-33	Sets the data to be sent by the current node.
7	U5-32 to U5-39	Displays the data received by the current node, which is the value multiplied by the proportional coefficient.

4.4.6 Fieldbus Adapter Slot Configuration

You must set the number of the slot to which you want to insert an expansion module. For example, the slots for PROFIBUS DP expansion modules must be set according to parameters in the following table.

Para.	Name	Value Range
n16-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1

For example, when installing a PROFIBUS DP module in the SLOT3, set n16-00 to 7 to select the expansion slot 3_1.

HCU contains three slots. See the following figure for details:

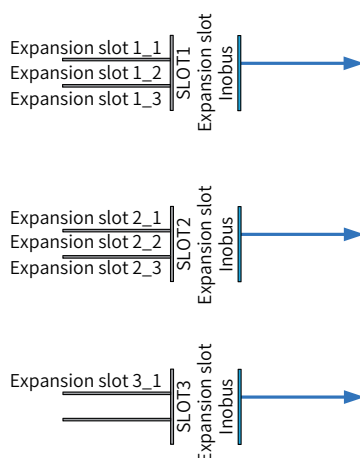


Figure 4-8 Definition of expansion slots

When the communication expansion module is directly inserted into a slot on the HCU, such as SLOT2, its expansion slot selection parameter can be set to any of expansion slot 2_1, expansion slot 2_2, and expansion slot 2_3.

SLOT1 and SLOT2 can be expanded into three slots (one HOFM and three HSEDs) by installed the HOFM module and HSED function module. Note that the parameter configuration cannot conflict with the expansion slot selection of the other two expansion slots (if any). Taking SLOT2 as an example, the topology is as follows:

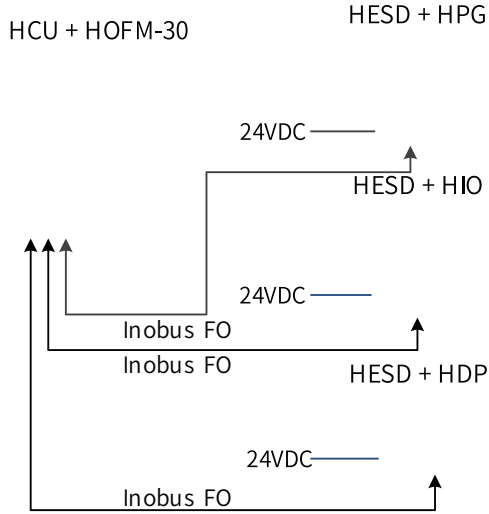


Figure 4-9 SLOT2 topology

When installing function modules in three slots, abide by the following principles:

- Each slot supports expansion of three expansion slots, but only one of the three expansion slots is allowed to connect with a communication expansion module, and the other two slots can connect with non-communication expansion modules, such as HIO modules.
- In this case, the HSED function module cannot connect with the optical fiber expansion module HOFM.
- The HDP-10 module can theoretically be inserted to any slot, but due to the size limitation of the PROFIBUS DP bus terminal, when it is inserted in SLOT1 or SLOT2, SLOT2 or SLOT3 cannot connect with other expansion modules. Therefore, it is recommended to insert HDP-10 in SLOT3.

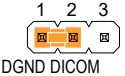
4.5 DIO, AIO, and HDIO

The HCU-40 controller is equipped with seven DIs (DI1 to DI6, and DIL), two high-speed DIs (HDIs), three relay outputs (ROs), two high-speed DOs (HDOs), two analog inputs (AIs), and two analog outputs (AOs). Relevant parameters are in group F.

4.5.1 DI

The HCU-40 controller is configured with seven DIs and two HDIs (which can be configured as DIs).

Before using DI terminals, configure the DI internal and external power supply jumper J16 based on the actual hardware connection, as shown in the following table.

Diagram	Description
 1 2 3 DGND DICOM	By shorting DGND and DICOM, DI is powered by the 24 VDC internal power supply.
 1 2 3 DGND DICOM	When DGND is disconnected from DICOM, DI is powered by the external power supply.

1) DI forcing

The DI state supports the forcing function. F0-02 is used to select the DI to be forced, and F0-03 is used to set the status of the forced DI. One bit corresponds to the status of one DI. Bit0 to bit 5 correspond to DI1 to DI6, bit6 corresponds to DIL, bit7 corresponds to HDI1, and bit8 corresponds to HDI2. Table 4-23 lists the forced states.

Table 4-23 DI forced state

F0-02		DI1 (U0-02)	DI2 (U0-03)	DI3 (U0-04)	DI4 (U0-05)	DI5 (U0-06)	DI6 (U0-07)	DIL (U0-08)	HDI1 (U0-09)	HDI2 (U0-10)
Bit0	0	Hard- ware DI1	x	x	x	x	x	x	x	x
	1	F0-03 (Bit0)	x	x	x	x	x	x	x	x
Bit1	0	x	Hard- ware DI2	x	x	x	x	x	x	x
	1	x	F0-03 (Bit1)	x	x	x	x	x	x	x
Bit2	0	x	x	Hard- ware DI3	x	x	x	x	x	x
	1	x	x	F0-03 (Bit2)	x	x	x	x	x	x

F0-02		DI1 (U0-02)	DI2 (U0-03)	DI3 (U0-04)	DI4 (U0-05)	DI5 (U0-06)	DI6 (U0-07)	DIL (U0-08)	HDI1 (U0-09)	HDI2 (U0-10)
Bit3	0	x	x	x	Hard- ware DI4	x	x	x	x	x
	1	x	x	x	F0-03 (Bit3)	x	x	x	x	x
Bit4	0	x	x	x	x	Hard- ware DI5	x	x	x	x
	1	x	x	x	x	F0-03 (Bit4)	x	x	x	x
Bit5	0	x	x	x	x	x	Hard- ware DI6	x	x	x
	1	x	x	x	x	x	F0-03 (Bit5)	x	x	x
Bit6	0	x	x	x	x	x	x	Hard- ware DIL	x	x
	1	x	x	x	x	x	x	F0-03 (Bit6)	x	x
Bit7	0	x	x	x	x	x	x	x	Hard- ware HDI1	x
	1	x	x	x	x	x	x	x	F0-03 (Bit7)	x
Bit8	0	x	x	x	x	x	x	x	x	Hard- ware HDI2
	1	x	x	x	x	x	x	x	x	F0-03 (Bit8)
Bit9 to bit15	x	x	x	x	x	x	x	x	x	x

2) DI delay

Switch-on delay and switch-off delay can be separately set for each DI of HCU-40. As shown in Figure 4-10, the DI filter function is provided for both switch-on delay and switch-off delay. When the DI signal status holding time is shorter than the duration reference, the DI status will be maintained. Parameters F0-04 to F0-21 are used to set the switch-on delay and switch-off delay for each DI.

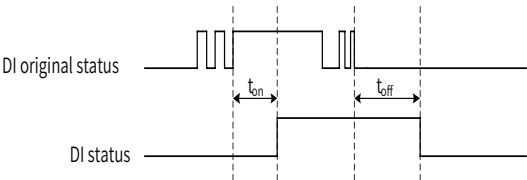


Figure 4-10 DI delay processing

3) DI connector

When using DI for drive control or other functions, associate relevant parameters with the DI connector. Two sets of bit connectors are provided for DI status.

Table 4-24 DI connector parameters

Para.	Meaning	Para.	Description
U0-02	DI1 status	U0-12	DI1 status inversion
U0-03	DI2 status	U0-13	DI2 status inversion
U0-04	DI3 status	U0-14	DI3 status inversion
U0-05	DI4 status	U0-15	DI4 status inversion
U0-06	DI5 status	U0-16	DI5 status inversion
U0-07	DI6 status	U0-17	DI6 status inversion
U0-08	DIL status	U0-18	DIL status inversion
U0-09	HDI1 status	U0-19	HDI1 status inversion
U0-10	HDI2 status	U0-20	HDI2 status inversion



NOTE

◆ In the HCU-40 controller, DI3 is forced to be the feedback signal source of the main circuit breaker. Low level means that the main circuit breaker is disconnected and high level means that the main circuit breaker is closed. HDI1 is forced to be the reactor over-temperature detection signal. Low level means that the reactor temperature is too high and high level means that the reactor temperature is normal.

4.5.2 DO

HCU-40 supports three ROs and two HDOs, both of which can set the switch-on delay and switch-off delay independently. They all allow negative logic processing, which can be set through F1-17. When the negative logic is active, logic 0 indicates that the output (normally open) is enabled, and logic 1 indicates that the output (normally open) is disabled.

F1-00 indicates the DO source signal status. F1-01 indicates the status after delay logic and positive and negative logic processing.



- ◆ In the HCU-40 controller, DI3 is forced to be the feedback signal source of the main circuit breaker. Low level means that the main circuit breaker is disconnected and high level means that the main circuit breaker is closed. HDI1 is forced to be the reactor over-temperature detection signal. Low level means that the reactor temperature is too high and high level means that the reactor temperature is normal.

4.5.3 AI

HCU-40 supports two AIs and two types of signals: current and voltage.

Before using an AI, check the external signal is a current signal or a voltage signal and then set jumpers J14 and J15 correctly. Then, set parameters F2-04 and F2-05.

Table 4-25 Jumper J14: AI1 current or voltage signal input selection

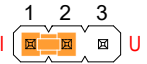
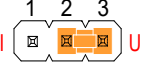
Diagram	Description
	AI1 current signal input by shorting 1 and 2
	AI1 voltage signal input by shorting 2 and 3

Table 4-26 Jumper J15: AI2 current or voltage signal input selection

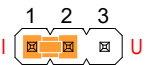
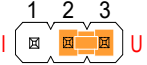
Diagram	Description
	AI2 current signal input by shorting 1 and 2
	AI2 voltage signal input by shorting 2 and 3

Table 4-27 AI parameter settings

Para.	Name	Description
F2-00	AI1 input value	Displays the AI1 input value.
F2-01	AI1 input proportion	Displays the percentage of the AI1 input value.
F2-02	AI2 input value	Displays the AI2 input value.
F2-03	AI2 input proportion	Displays the percentage of the AI2 input value.
F2-04	AI1 type	Sets the input signal type of AI1. Select the corresponding jumper on the HCU and connect it correctly based on the selected signal type. For details, see MD880-40 Series Active Rectifier Hardware User Guide. 0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA

Para.	Name	Description
F2-05	AI2 type	Sets the input signal type of AI2. Select the corresponding jumper on the HCU and connect it correctly based on the selected signal type. For details, see MD880-40 Series Active Rectifier Hardware User Guide. 0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA
F2-06	Min. input value of AI1 curve	Calibrates AI1.
F2-07	Min. input proportion of AI1 curve	
F2-08	Max. input value of AI1 curve	
F2-09	Max. input proportion of AI1 curve	
F2-10	Min. input value of AI2 curve	Calibrates AI2.
F2-11	Min. input proportion of AI2 curve	
F2-12	Max. input value of AI2 curve	
F2-13	Max. input proportion of AI2 curve	
F2-14	Setting for AI lower than minimum input	Ones: Setting for AI1 lower than minimum input 0: Percentage corresponding to minimum input 1: 0.0% Tens: Setting for AI2 lower than minimum input 0: Percentage corresponding to minimum input 1: 0.0%
F2-15	AI1 filter time	Sets the AI filter time.
F2-16	AI2 filter time	
F2-17	AI1 denoising threshold	Defines the denoising threshold. When the AI input fluctuation is smaller than the threshold, the AI input proportion remains unchanged.
F2-18	AI2 denoising threshold	
F2-19	AI setting zero-crossing threshold	When the AI value is smaller than the threshold, the AI value is 0%.
F2-20	AI1 enable	Enables or disables AI1. When AI1 is disabled, its value is forced to be 0.
F2-21	AI2 enable	Enables or disables AI2. When AI2 is disabled, its value is forced to be 0.

Para.	Name	Description
F2-22	AI1 disconnection monitoring threshold	0 mA to 4.000 mA
F2-23	AI2 disconnection monitoring threshold	0 mA to 4.000 mA
F2-24	AI1 disconnection monitoring delay	0s to 1.000s
F2-25	AI2 disconnection monitoring delay	0s to 1.000s
F2-26	AI disconnection monitoring enable	Enables or disables disconnection monitoring. Monitoring is only enabled when the signal type is 4 mA to 20 mA. When the AI value is smaller than the setpoint and this status lasts for the defined time, AI is disconnected.

4.5.4 AO

The HCU-40 controller supports two AOs and supports two signal types: voltage and current. Before using an AO, set the hardware jumpers J18 and J19.

Table 4-28 Jumper J18: AO1 current and voltage signal selection

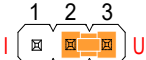
Diagram	Description
	AO1 current signal output by shorting 1 and 2
	AO1 voltage signal output by shorting 2 and 3

Table 4-29 Jumper J19: AO2 current and voltage signal selection

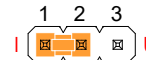
Diagram	Description
	AO2 current signal output by shorting 1 and 2
	AO2 voltage signal output by shorting 2 and 3

Table 4-30 AO parameter settings

Para.	Name	Description
F3-00	AO1 output value	Displays the AO1 output value.
F3-01	AO1 output proportion	Displays the percentage of AO1 output.
F3-02	AO2 output value	Displays the AO2 output value.

Para.	Name	Description
F3-03	AO2 output proportion	Displays the percentage of AO2 output.
F3-04	AO1 signal source	Sets the signal source of AO1 output.
F3-05	AO2 signal source	Sets the signal source of AO2 output.
F3-06	AO1 type	Sets the output signal type of AO1, which requires proper wiring. For details, see MD880-40 Series Active Rectifier Hardware User Guide. 0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA
F3-07	AO2 type	Sets the output signal type of AO2, which requires proper wiring. For details, see MD880-40 Series Active Rectifier Hardware User Guide. 0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA
F3-08	Min. output proportion of AO1 curve	Sets the scale factor of AO1.
F3-09	Min. output value of AO1 curve	
F3-10	Max. output proportion of AO1 curve	
F3-11	Max. output value of AO1 curve	
F3-12	Min. output proportion of AO2 curve	Sets the scale factor of AO2.
F3-13	Min. output value of AO2 curve	
F3-14	Max. output proportion of AO2 curve	
F3-15	Max. output value of AO2 curve	

4.5.5 HDI

The HCU-40 control module supports two HDI signals. For details about HDI, see MD880-40 Series Active Rectifier Hardware User Guide.



NOTE

- ◆ HDI can be used as DI. For details about relevant parameter settings in this case, see ["4.5.1 DI"](#).
- ◆ HDI1 is forced to be used as DI, and is used as the reactor over-temperature detection signal.

4.5.6 HDO

The HCU-40 controller supports two HDO signals. For details about HDO, see MD880-40 Series Active Rectifier Hardware User Guide.



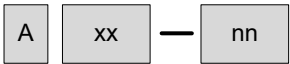
NOTE

- ◆ HDO can be used as DO. For details about relevant parameter settings in this case, see ["4.5.2 DO"](#).

Chapter 5 Parameters

5.1 Parameter Classification

Parameters of HCU-40 are grouped by function and displayed in three levels of menus, as shown below:



- A indicates a level-1 menu, which is represented by one letter and corresponds to a group of complete functions.
- xx indicates the number of the level-2 menu, which is represented by one or two digits. It combines with the level-1 menu to indicate a group of specific functions.
- nn indicates the number of the level-3 menu, which is represented by two digits. It combines with the level-1 or level-2 menu to indicate a specific parameter.

The level-2 menu and the level-3 menu are separated by "-" for the communication purpose, or by "." for display on LEDs. Axx-nn and Axx.nn indicate the same parameter.

The following table shows the menu classification of parameters.

Level-1 Menu	Name of Level-1 Menu	Level-2 Menu	Name of Level-2 Menu	Remarks
A	System	A0	Status monitoring	Common monitoring variables
		A1	Fault and alarm	Displays current fault or alarm.
		A2	Drive information	Displays basic information of the drive and the status of expansion modules.
		A4	Power unit control	Parameter settings related to the power module
		A8	Environment setting	Parameter reset and application macro setting
		A9	Data set selection	Command channel switchover
		A10	SOP-20/relay communication	Parameters related to SOP-20-880 (InoDriveStudio)
		A12	Trigger oscilloscope	Parameters related to InoDriveStudio trigger oscilloscope
		A13	Black box user-defined channel	Customizes data you want to additionally record when a fault occurs.
		A15	Parallel parameters	Sets parameters when multiple modules run in parallel.
b	Control channel	b0	Factory settings	Views the default control mode.
		b1	User-defined control word setting of channel 1	Sets the user-defined start/stop control word of channel 1.
		b2	Other control word setting of channel 1	Sets other control words of channel 1.
		b3	User-defined control word setting of channel 2	Sets the user-defined start/stop control word of channel 2.
		b4	Other control word setting of channel 2	Sets other control words of channel 2.
		b5	Terminal start/stop module	Parameters related to the terminal control module
		b6	Auxiliary control word setting	Sets auxiliary control parameters.
		b7	Auto-tuning/self-test	Sets functions related to auto-tuning and self-test.

Level-1 Menu	Name of Level-1 Menu	Level-2 Menu	Name of Level-2 Menu	Remarks
C	Refer- ence channel	C0	Voltage reference of channel 1	Sets the voltage reference source of channel 1.
		C1	Current reference of channel 1	Sets the current reference source of channel 1.
		C2	Voltage reference of channel 2	Sets the voltage reference source of channel 2.
		C3	Current reference of channel 2	Sets the current reference source of channel 2.
		C4	Motor-driven potentiometer	Sets parameters of the motor-driven potentiometer.
		C6	Multi-reference value setting	Sets the 16 fixed setpoints.
d	Rated system parameters	d0	Basic grid parameters	Sets basic parameters, including rated grid voltage and rated grid frequency.
		d1	Grid auto-tuning parameters	Basic auto-tuned parameters
		d2	Additional auto-tuning parameters	Additional auto-tuned parameters
		d3	Base value information	Views the per-unit base values.
E	Rectifier control	E0	Control parameter setting	Control performance adjustment parameters
		E4	Auxiliary parameter setting	Auxiliary control parameters
		E6	Limit setting	Parameters related to output limit
		E7	Fault protection parameter setting	Parameters related to fault protection judgment
		E8	Fault protection enable	Parameters related to fault protection enable
F	Input and output	F0	DI	-
		F1	DO	-
		F2	AI	-
		F3	AO	-
		F4	HDI	-
		F5	HDO	-
		F6	AI/AO correction parameters	-

Level-1 Menu	Name of Level-1 Menu	Level-2 Menu	Name of Level-2 Menu	Remarks
H	Protection and auxiliary	H0	Troubleshooting	Fault related parameters
		H1	Fault level change	Fault, active limit, and alarm related records
		H2	Last fault code record	
		H3	Last 2nd fault code record	
		H4	Last 3rd fault code record	
		H5	Last 4th fault code record	
		H6	Last 5th fault code record	
		H7	Last active limit code record	
		H8	Last alarm code record	
		H10	User-defined fault word	User-defined fault flag combination
		H11	User-defined error setting	-

Level-1 Menu	Name of Level-1 Menu	Level-2 Menu	Name of Level-2 Menu	Remarks
L	Application functions	L0	Word-bit conversion	Word-to-bit and bit-to-word function blocks
		L2	Logic operation function	AND, NOT, OR, XOR, SOR, and AND/OR logic functions
		L3	W-DW conversion function	W-to-DW and DW-to-W function blocks
		L5	Switch function block	Binary selector and numeric switch function blocks
		L6	Control function block	Filter, level-pulse conversion, and logic delay function blocks
		L7	Arithmetic function block	Absolute value, addition, subtraction, multiplication, division, comparison, and limit function blocks
		L8	Multi-point curve module	Multi-point curve function block
		L9	Constant setting module	Constant setting function block
		L10	Parameter monitoring and modification	Parameter monitoring and parameter mapping modification function blocks
		L11	Arithmetic function module 2	Scaling function Block

Level-1 Menu	Name of Level-1 Menu	Level-2 Menu	Name of Level-2 Menu	Remarks
n	Fieldbus adapter and expansion module	n0	InoLink communication	Implements peer-to-peer communication between HCU's or load distribution or master-slave control.
		n1	Fieldbus adapter A	Sets and views process data of the fieldbus adapter.
		n2	Fieldbus adapter B	
		n3	Fieldbus adapter C	
		n7	Configuration of HIO module 1	Selects the HIO module type and monitors parameters.
		n8	Configuration of HIO module 2	
		n9	Configuration of HIO module 3	
		n10	Modbus RTU module	Sets the slot and inherent parameters for the communication module.
		n11	CANlink module	
		n12	CANopen module	
		n13	Ethernet module	
		n14	EtherCAT module	
		n15	DeviceNet module	
		n16	PROFIBUS DP module	
		n17	PROFINET IO module	
		n18	Customized communication module	More other communication modules use this parameter group for setting.
		n19	Synchronous voltage detection module	Parameters related to the synchronous voltage detection module
		n23	Parameter settings of HIO module 1 (HIO-10)	Parameter configuration of the HIO module 1 in group n7. n23 corresponds to n7-02 = HIO-10, n24 corresponds to n7-02 = HIO-20, and n25 corresponds to n7-02 = HIO-30.
		n24	Parameter settings of HIO module 1 (HIO-20)	
		n25	Parameter settings of HIO module 1 (HIO-30)	

Level-1 Menu	Name of Level-1 Menu	Level-2 Menu	Name of Level-2 Menu	Remarks
n	Fieldbus adapter and expansion module	n26	Parameter settings of HIO module 2 (HIO-10)	Parameter configuration of the HIO module 2 in group n8. n26 corresponds to n8-02 = HIO-10, n27 corresponds to n8-02 = HIO-20, and n28 corresponds to n8-02 = HIO-30.
		n27	Parameter settings of HIO module 2 (HIO-20)	
		n28	Parameter settings of HIO module 2 (HIO-30)	
		n29	Parameter settings of HIO module 3 (HIO-10)	Parameter configuration of the HIO module 3 in group n9. n29 corresponds to n9-02 = HIO-10, n30 corresponds to n9-02 = HIO-20, and n31 corresponds to n9-02 = HIO-30.
		n30	Parameter settings of HIO module 3 (HIO-20)	
		n31	Parameter settings of HIO module 3 (HIO-30)	
U	Connector	U0 to U9, U15, and U19	-	Read-only parameters, which can be used to view the status of inputs, outputs, and program execution, or used as inputs for reference source parameters

5.2 Function Parameter Table

Group A: System

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group A0: Status monitoring						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A0-00	Current state machine	1: System initialization 2: Power-on self-test 3: Fault 4: Switch-on inhibited 5: Ready to switch on 6: Pre-charge 7: Ready to run 9: Detection before running 12: Running 20: Parameter restore 21: Parameter download	-	0	Unmodifiable	32768
A0-01	Pre-charge state	0: Not pre-charged 1: Wait for pre-charge 2: Pre-charging 3: Pre-charge completed	-	0	Unmodifiable	33935
A0-02	Bus voltage	0.0 to 6553.5	V	0	Unmodifiable	33936
A0-03	Grid voltage	0.0 to 6553.5	V	0	Unmodifiable	33929
A0-04	Grid frequency	0.00 to 655.35	Hz	0	Unmodifiable	33930
A0-05	Grid current	-32768 to +32767	A	0	Unmodifiable	33932
A0-09	Power	-32768 to +32767	kVA	0	Unmodifiable	33931
A0-10	Power factor	-327.68 to +327.67	-	0	Unmodifiable	33933
A0-11	Three-phase unbalance factor	0.0 to 6553.5	%	0	Unmodifiable	33934
A0-12	Max. power unit temperature	-32768 to +32767	°C	0	Unmodifiable	32776

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A0-16	Error prompt type	0: None 1: Switch-on block due to OFF1, factory settings, terminal start-stop command reset failure 2: Switch-on block because OFF2 is activated 3: Reserved 4: The system remains in the ready-to-run state because running activation is prohibited 5: External fault 1 activated, parameter H0.00 (reserved) 6: External fault 2 activated, parameter H0.01 (reserved) 7: External alarm 1 activated, parameter H0.02 (reserved) 8: External alarm 2 activated, parameter H0.03 (reserved) 9: STO activated (reserved) 10: DP bus data privilege released but PZD1. check bit not set to 1 11: Reserved 12: Reserved	-	0	Unmodifiable	34298

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A0-17	Error prompt source	0: None 1: Set to normally activated. Check parameter settings 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 11: Fieldbus adapter A.PZD1.0 12: Fieldbus adapter A.PZD1.1 13: Fieldbus adapter A.PZD1.2 14: Fieldbus adapter A.PZD1.3 15: Fieldbus adapter A.PZD1.8 16: Fieldbus adapter A.PZD1.9	-	0	Unmodifiable	34299

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A0-17	Error prompt source	17: Fieldbus adapter B.PZD1.0 18: Fieldbus adapter B.PZD1.1 19: Fieldbus adapter B.PZD1.2 20: Fieldbus adapter B.PZD1.3 21: Fieldbus adapter B.PZD1.8 22: Fieldbus adapter B.PZD1.9 23: PC control bit activated 24: Fieldbus adapter A.PZD1. check bit 25: Fieldbus adapter B.PZD1. check bit 26: Reserved 27: Reserved 28: HINT not ready due to reasons such as model parameter error Other: B connect	-	0	Unmodi- fiable	34299
A0-18	Port 24 V detection voltage of the HCU control board	0.000 to 65.535	V	0	Unmodi- fiable	34831
A0-19	Internal 15 V detection voltage of the HCU control board	0.000 to 65.535	V	0	Unmodi- fiable	34832
Group A1: Fault and alarm						
A1-00	Current fault code 1	0 to 65535	-	0	Unmodi- fiable	32777
A1-01	Subcode of current fault 1	0 to 65535	-	0	Unmodi- fiable	32778
A1-02	Current fault code 2	0 to 65535	-	0	Unmodi- fiable	32779
A1-03	Subcode of current fault 2	0 to 65535	-	0	Unmodi- fiable	32780
A1-04	Current fault code 3	0 to 65535	-	0	Unmodi- fiable	32781
A1-05	Subcode of current fault 3	0 to 65535	-	0	Unmodi- fiable	32782

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A1-06	Current fault code 4	0 to 65535	-	0	Unmodifiable	32783
A1-07	Subcode of current fault 4	0 to 65535	-	0	Unmodifiable	32784
A1-08	Current fault code 5	0 to 65535	-	0	Unmodifiable	32785
A1-09	Subcode of current fault 5	0 to 65535	-	0	Unmodifiable	32786
A1-10	Current fault code 6	0 to 65535	-	0	Unmodifiable	32787
A1-11	Subcode of current fault 6	0 to 65535	-	0	Unmodifiable	32788
A1-12	Active limit code 1	0 to 65535	-	0	Unmodifiable	33795
A1-13	Subcode of active limit 1	0 to 65535	-	0	Unmodifiable	33796
A1-14	Active limit code 2	0 to 65535	-	0	Unmodifiable	33797
A1-15	Subcode of active limit 2	0 to 65535	-	0	Unmodifiable	33798
A1-16	Active limit code 3	0 to 65535	-	0	Unmodifiable	33799
A1-17	Subcode of active limit 3	0 to 65535	-	0	Unmodifiable	33800
A1-18	Active limit code 4	0 to 65535	-	0	Unmodifiable	33801
A1-19	Subcode of active limit 4	0 to 65535	-	0	Unmodifiable	33802
A1-20	Active limit code 5	0 to 65535	-	0	Unmodifiable	33803
A1-21	Subcode of active limit 5	0 to 65535	-	0	Unmodifiable	33804
A1-22	Active limit code 6	0 to 65535	-	0	Unmodifiable	33805
A1-23	Subcode of active limit 6	0 to 65535	-	0	Unmodifiable	33806
A1-24	Current alarm code 1	0 to 65535	-	0	Unmodifiable	32789
A1-25	Subcode of current alarm 1	0 to 65535	-	0	Unmodifiable	32790
A1-26	Current alarm code 2	0 to 65535	-	0	Unmodifiable	32791

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A1-27	Subcode of current alarm 2	0 to 65535	-	0	Unmodifiable	32792
A1-28	Current alarm code 3	0 to 65535	-	0	Unmodifiable	32793
A1-29	Subcode of current alarm 3	0 to 65535	-	0	Unmodifiable	32794
A1-30	Current alarm code 4	0 to 65535	-	0	Unmodifiable	32795
A1-31	Subcode of current alarm 4	0 to 65535	-	0	Unmodifiable	32796
A1-32	Current alarm code 5	0 to 65535	-	0	Unmodifiable	32797
A1-33	Subcode of current alarm 5	0 to 65535	-	0	Unmodifiable	32798
A1-34	Current alarm code 6	0 to 65535	-	0	Unmodifiable	32799
A1-35	Subcode of current alarm 6	0 to 65535	-	0	Unmodifiable	32800
Group A2: Drive information						
A2-00	Product type	0: Diode rectifier 1: Basic rectifier 2: Active rectifier 3: Regenerative rectifier 4: Three-phase brake 5: DC-DC	-	0	Unmodifiable	33941
A2-01	Module rated power	0.0 to 6553.5	kW	0	Unmodifiable	32868
A2-02	Module rated voltage	0 to 65535	V	0	Unmodifiable	32869
A2-03	Module rated current	0.0 to 6553.5	A	0	Unmodifiable	32870
A2-04	Total rated power	0 to 65535	kW	0	Unmodifiable	34118
A2-05	Total rated current	0 to 65535	A	0	Unmodifiable	34119

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A2-07	HCU software type	0: Multi-drive drive unit 1: Basic rectifier 2: Active rectifier 3: Regenerative rectifier 4: Three-phase braking 5: DC-DC 6: Single-drive rectifier 7: HE200 9999: Unknown	-	0	Unmodifiable	34017
A2-08	HCU-DSP function software version	0.00 to 655.35	-	0	Unmodifiable	32871
A2-10	HCU-DSP performance software version	0.00 to 655.35	-	0	Unmodifiable	33942
A2-16	HCU-FPGA software version	0.00 to 655.35	-	0	Unmodifiable	32873
A2-18	HINT type	0: Diode rectifier 1: Basic rectifier 2: Active rectifier 3: Regenerative rectifier 4: Drive unit 5: DC-DC 6: Three-phase braking 7: Shore power 8: Single drive 100: Offline 101: Inconsistent type 102: Inconsistent software version 103: Unknown	-	0	Unmodifiable	33984
A2-19	HINT software version	0.00 to 655.35	-	0	Unmodifiable	32874
A2-20	HINT software sub-version	0.00 to 655.35	-	0	Unmodifiable	34297
A2-22	HPCU software version	0.00 to 655.35	-	0	Unmodifiable	32875

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A2-24	Expansion slot 1_1 module type	0: No expansion module 32: Encoder detection module 48: Sync voltage detection module 64: HINT module (HE200 rectifier) 96: HOFR module 112: PROFIBUS DP module 113: CANopen module 114: CANlink module 115: Modbus RTU module 116: Modbus TCP module 117: PROFINET IO module 118: EtherCAT module 121: Ethernet module 122: DeviceNet module 125: Customized communication module	-	0	Unmodifiable	32876
A2-25	Expansion slot 1_1 software version	0.00 to 655.35	-	0	Unmodifiable	32877
A2-26	Expansion slot 1_2 module type	Same as A2-24	-	0	Unmodifiable	32878
A2-27	Expansion slot 1_2 software version	0.00 to 655.35	-	0	Unmodifiable	32879
A2-28	Expansion slot 1_3 module type	Same as A2-24	-	0	Unmodifiable	32880
A2-29	Expansion slot 1_3 software version	0.00 to 655.35	-	0	Unmodifiable	32881
A2-30	Expansion slot 2_1 module type	Same as A2-24	-	0	Unmodifiable	32882
A2-31	Expansion slot 2_1 software version	0.00 to 655.35	-	0	Unmodifiable	32883
A2-32	Expansion slot 2_2 module type	Same as A2-24	-	0	Unmodifiable	32884
A2-33	Expansion slot 2_2 software version	0.00 to 655.35	-	0	Unmodifiable	32885

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A2-34	Expansion slot 2_3 module type	Same as A2-24	-	0	Unmodi- fiable	32886
A2-35	Expansion slot 2_3 software version	0.00 to 655.35	-	0	Unmodi- fiable	32887
A2-36	Expansion slot 3_1 module type	Same as A2-24	-	0	Unmodi- fiable	32888
A2-37	Expansion slot 3_1 software version	0.00 to 655.35	-	0	Unmodi- fiable	32889
A2-38	Available HCU-FPGA functions	0x0000 to 0xFFFF	-	0	Unmodi- fiable	34826
A2-39	Enabled HCU-FPGA functions	0x0000 to 0xFFFF	-	0	Unmodi- fiable	34827
A2-40	Available HINT func- tions	0x0000 to 0xFFFF	-	0	Unmodi- fiable	34828
A2-41	Enabled HINT func- tions	0x0000 to 0xFFFF	-	0	Unmodi- fiable	34829
A2-42	Current year	0 to 65535	-	0	Unmodi- fiable	34836
A2-43	Current date	0 to 65535	-	0	Unmodi- fiable	34837
A2-44	Current time	0 to 65535	-	0	Unmodi- fiable	34838
A2-45	Current second	0 to 65535	-	0	Unmodi- fiable	34864
A2-46	Year of current pow- er-on	0 to 65535	-	0	Unmodi- fiable	34839
A2-47	Date of current pow- er-on	0 to 65535	-	0	Unmodi- fiable	34840
A2-48	Time of current power-on	0 to 65535	-	0	Unmodi- fiable	34841
A2-49	Second of current power-on	0 to 65535	-	0	Unmodi- fiable	34865
Group A4: Power module control						
A4-00	Max. permissible carrier frequency	2.70 to 6.00	kHz	3	Unmodi- fiable	47
A4-01	Actual effective carrier frequency	2.70 to 6.00	kHz	3	Unmodi- fiable	48
A4-13	DC bus overvoltage threshold	80.0 to 100.0	%	100	At stop	60
A4-19	Module pre-over- temperature thresh- old	0 to 60	° C	5	At once	2913

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A4-20	Module fan running control selection	0: Run at full speed when the system is running 1: Run at full speed after power-on 2: Automatically adjust the speed during running 3: Automatically adjust the speed after power-on	-	3	At once	3211
A4-21	Module fan error detection enable	0: Disabled 1: Enabled Other: B connector	-	1	At once	1628
Group A8: Environment setting						
A8-00	Parameter reset mode	0: Disabled 1: Restore partial parameters to factory settings 2: Restore all parameters to factory settings 3: Clear fault records 4: Clear black box records	-	0	At stop	33787
A8-01	Parameter reset	0: Cancel 1: Confirm	-	0	At stop	33788
A8-02	Parameter access level	0: Standard parameter 1: Expansion parameter 2: Expert parameter 3: Maintenance parameter	-	0	At once	34064
A8-03	Factory password	0 to 65535	-	0	At once	78
A8-05	Parameter backup function selection	0: None 1: Save to SD card 2: Restore from SD card 3: Check parameters	-	0	At once	34236

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A8-06	Parameter backup function confirmation	0: Cancel 1: Confirm	-	0	At once	34238
A8-07	Parameter backup status	0: None 1: Saving 2: Saved 3: Failed to save 4: Restoring 5: Restored 6: Failed to restore 7: Checking 8: Parameter file error 9: Parameter consistent 10: Parameter inconsistent 11: SD card busy	-	0	Unmodifiable	34237
A8-11	Application macro selection	0: Universal 1: Bidirectional DC power supply mode	-	0	At stop	34036
A8-12	Application macro confirmation	0: Cancel 1: Confirm	-	0	At stop	34037
A8-13	Application macro activation	0: Universal 1: Bidirectional DC power supply mode	-	0	Unmodifiable	2843
A8-17	Time statistics reset selection	0: None 1: Reset current statistics time 2: Reset accumulated statistics time 3: Reset all statistics time	-	0	At once	34842
A8-18	Time statistics reset confirmation	0: Cancel 1: Confirm	-	0	At once	34843
Group A9: Data group selection						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A9-00	Command channel source selection	0: Command channel 1 1: Command channel 2 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At stop	80
A9-01	Setpoint channel source selection	0: A9-00 Other: B connector	-	0	At once	1669
Group A10: SOP-20/relay communication						
A10-00	SOP-20 control enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	84
A10-03	SOP-20/relay communication address	1 to 128	-	1	At once	88
A10-04	SOP-20/relay communication baud rate	0: 115200 bps 1: 1 Mbps 2: 2 Mbps 3: 4 Mbps	-	3	At stop	89
A10-05	SOP-20 disconnection detection	0: Enabled 1: Disabled	-	0	At once	34195
A10-06	SOP-20 control running command source	0: Running inhibited 1: Running permitted 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2200
Group A12: Trigger oscilloscope						
A12-00	Trigger oscilloscope state	0: Not triggered 1: Triggered	-	0	Unmodifiable	33784
A12-01	Trigger oscilloscope start	0: Stop 1: Start	-	0	At once	33783

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A12-02	Trigger oscilloscope sampling period	0: Carrier cycle 1: 2 ms	-	1	At once	1867
A12-03	Trigger oscilloscope sampling period multiplier	1 to 16	-	1	At once	1868
A12-04	Trigger oscilloscope trigger ratio	10 to 90	%	50	At once	1869
A12-05	Trigger mode of trigger condition 1	0: By analog 1: By analog bit 2: By digital 3: By state machine 4: By fault 5: By active limit 6: By alarm	-	0	At once	1870
A12-06	Analog selection of trigger condition 1	0: Invalid Other: K connector	-	1500	At once	1871
A12-07	Analog bit selection of trigger condition 1	0 to 15	-	0	At once	1872
A12-08	Digital selection of trigger condition 1	0: Invalid Other: B connector	-	1000	At once	1873
A12-09	Analog comparison condition of trigger condition 1	0: Greater than (>) 1: Smaller than (<) 2: Equal to (=) 3: Greater than or equal to ($\geq$) 4: Smaller than or equal to ($\leq$)	-	0	At once	1874
A12-10	Bit comparison condition of trigger condition 1	0: Rising edge changing from 0 to 1 1: Falling edge changing from 1 to 0 2: Edge changing from 0 to 1 or from 1 to 0 3: High signal 1 4: Low signal 0	-	0	At once	1875
A12-11	Analog value of trigger condition 1	-32768 to +32767	-	0	At once	1876
A12-12	Trigger condition relation	0: Trigger condition 2 invalid 1: AND 2: OR 3: XOR	-	0	At once	1877

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A12-13	Trigger mode of trigger condition 2	0: By analog 1: By analog bit 2: By digital 3: By state machine 4: By fault 5: By active limit 6: By alarm	-	0	At once	1878
A12-14	Analog selection of trigger condition 2	0: Invalid Other: K connector	-	1500	At once	1879
A12-15	Analog bit selection of trigger condition 2	0 to 15	-	0	At once	1880
A12-16	Digital selection of trigger condition 2	0: Invalid Other: B connector	-	1000	At once	1881
A12-17	Analog comparison condition of trigger condition 2	0: Greater than (>) 1: Smaller than (<) 2: Equal to (=) 3: Greater than or equal to ($\geq$) 4: Smaller than or equal to ($\leq$)	-	0	At once	1882
A12-18	Bit comparison condition of trigger condition 2	0: Rising edge changing from 0 to 1 1: Falling edge changing from 1 to 0 2: Edge changing from 0 to 1 or from 1 to 0 3: High signal 1 4: Low signal 0	-	0	At once	1883
A12-19	Analog value of trigger condition 2	-32768 to +32767	-	0	At once	1884
A12-20	Number of trigger oscilloscope sampling channels	0 to 50	-	0	At once	1935
A12-21	Trigger oscilloscope channel 1 selection	1000 to 1999	-	1000	At once	1885
A12-22	Trigger oscilloscope channel 2 selection	1000 to 1999	-	1000	At once	1886
A12-23	Trigger oscilloscope channel 3 selection	1000 to 1999	-	1000	At once	1887
A12-24	Trigger oscilloscope channel 4 selection	1000 to 1999	-	1000	At once	1888
A12-25	Trigger oscilloscope channel 5 selection	1000 to 1999	-	1000	At once	1889

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A12-26	Trigger oscilloscope channel 6 selection	1000 to 1999	-	1000	At once	1890
A12-27	Trigger oscilloscope channel 7 selection	1000 to 1999	-	1000	At once	1891
A12-28	Trigger oscilloscope channel 8 selection	1000 to 1999	-	1000	At once	1892
A12-29	Trigger oscilloscope channel 9 selection	1000 to 1999	-	1000	At once	1893
A12-30	Trigger oscilloscope channel 10 selection	1000 to 1999	-	1000	At once	1894
A12-31	Trigger oscilloscope channel 11 selection	1000 to 1999	-	1000	At once	1895
A12-32	Trigger oscilloscope channel 12 selection	1000 to 1999	-	1000	At once	1896
A12-33	Trigger oscilloscope channel 13 selection	1000 to 1999	-	1000	At once	1897
A12-34	Trigger oscilloscope channel 14 selection	1000 to 1999	-	1000	At once	1898
A12-35	Trigger oscilloscope channel 15 selection	1000 to 1999	-	1000	At once	1899
A12-36	Trigger oscilloscope channel 16 selection	1000 to 1999	-	1000	At once	1900
A12-37	Trigger oscilloscope channel 17 selection	1000 to 1999	-	1000	At once	1901
A12-38	Trigger oscilloscope channel 18 selection	1000 to 1999	-	1000	At once	1902
A12-39	Trigger oscilloscope channel 19 selection	1000 to 1999	-	1000	At once	1903
A12-40	Trigger oscilloscope channel 20 selection	1000 to 1999	-	1000	At once	1904
A12-41	Trigger oscilloscope channel 21 selection	1000 to 1999	-	1000	At once	1905
A12-42	Trigger oscilloscope channel 22 selection	1000 to 1999	-	1000	At once	1906
A12-43	Trigger oscilloscope channel 23 selection	1000 to 1999	-	1000	At once	1907
A12-44	Trigger oscilloscope channel 24 selection	1000 to 1999	-	1000	At once	1908
A12-45	Trigger oscilloscope channel 25 selection	1000 to 1999	-	1000	At once	1909
A12-46	Trigger oscilloscope channel 26 selection	1000 to 1999	-	1000	At once	1910

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A12-47	Trigger oscilloscope channel 27 selection	1000 to 1999	-	1000	At once	1911
A12-48	Trigger oscilloscope channel 28 selection	1000 to 1999	-	1000	At once	1912
A12-49	Trigger oscilloscope channel 29 selection	1000 to 1999	-	1000	At once	1913
A12-50	Trigger oscilloscope channel 30 selection	1000 to 1999	-	1000	At once	1914
A12-51	Trigger oscilloscope channel 31 selection	1000 to 1999	-	1000	At once	1915
A12-52	Trigger oscilloscope channel 32 selection	1000 to 1999	-	1000	At once	1916
A12-53	Trigger oscilloscope channel 33 selection	1000 to 1999	-	1000	At once	1917
A12-54	Trigger oscilloscope channel 34 selection	1000 to 1999	-	1000	At once	1918
A12-55	Trigger oscilloscope channel 35 selection	1000 to 1999	-	1000	At once	1919
A12-56	Trigger oscilloscope channel 36 selection	1000 to 1999	-	1000	At once	1920
A12-57	Trigger oscilloscope channel 37 selection	1000 to 1999	-	1000	At once	1921
A12-58	Trigger oscilloscope channel 38 selection	1000 to 1999	-	1000	At once	1922
A12-59	Trigger oscilloscope channel 39 selection	1000 to 1999	-	1000	At once	1923
A12-60	Trigger oscilloscope channel 40 selection	1000 to 1999	-	1000	At once	1924
A12-61	Trigger oscilloscope channel 41 selection	1000 to 1999	-	1000	At once	1925
A12-62	Trigger oscilloscope channel 42 selection	1000 to 1999	-	1000	At once	1926
A12-63	Trigger oscilloscope channel 43 selection	1000 to 1999	-	1000	At once	1927
A12-64	Trigger oscilloscope channel 44 selection	1000 to 1999	-	1000	At once	1928
A12-65	Trigger oscilloscope channel 45 selection	1000 to 1999	-	1000	At once	1929
A12-66	Trigger oscilloscope channel 46 selection	1000 to 1999	-	1000	At once	1930
A12-67	Trigger oscilloscope channel 47 selection	1000 to 1999	-	1000	At once	1931

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A12-68	Trigger oscilloscope channel 48 selection	1000 to 1999	-	1000	At once	1932
A12-69	Trigger oscilloscope channel 49 selection	1000 to 1999	-	1000	At once	1933
A12-70	Trigger oscilloscope channel 50 selection	1000 to 1999	-	1000	At once	1934
Group A13: Black box user-defined channel						
A13-00	Black box user-defined channel 1	0: 0 Other: K connector	-	0	At once	1954
A13-01	Black box user-defined channel 2	0: 0 Other: K connector	-	0	At once	1955
A13-02	Black box user-defined channel 3	0: 0 Other: K connector	-	0	At once	1956
A13-03	Black box user-defined channel 4	0: 0 Other: K connector	-	0	At once	1957
A13-04	Black box user-defined channel 5	0: 0 Other: K connector	-	0	At once	1958
A13-05	Black box user-defined channel 6	0: 0 Other: K connector	-	0	At once	1959
A13-06	Black box user-defined channel 7	0: 0 Other: K connector	-	0	At once	1960
A13-07	Black box user-defined channel 8	0: 0 Other: K connector	-	0	At once	1961
A13-08	Black box user-defined channel 9	0: 0 Other: K connector	-	0	At once	1962
A13-09	Black box user-defined channel 10	0: 0 Other: K connector	-	0	At once	1963
A13-10	Black box user-defined channel 11	0: 0 Other: K connector	-	0	At once	1964
A13-11	Black box user-defined channel 12	0: 0 Other: K connector	-	0	At once	1965
A13-12	Black box user-defined channel 13	0: 0 Other: K connector	-	0	At once	1966
A13-13	Black box user-defined channel 14	0: 0 Other: K connector	-	0	At once	1967
A13-14	Black box user-defined channel 15	0: 0 Other: K connector	-	1847	At once	1968
A13-15	Black box user-defined channel 16	0: 0 Other: K connector	-	1848	At once	1969
Group A15: Parallel parameters						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A15-00	Parallel function selection	0: Single 1: Parallel	-	0	At stop	2419
A15-01	HPCU online flag	0: Offline 1: Online	-	0	Unmodi- fiable	34122
A15-02	Parallel module enable 1	Ones position: Mod- ule 1 0: Disabled 1: Enabled Tens position: Module 2 0: Disabled 1: Enabled Hundreds position: Module 3 0: Disabled 1: Enabled Thousands position: Module 4 0: Disabled 1: Enabled Ten thousands posi- tion: Module 5 0: Disabled 1: Enabled	-	0	At stop	2420
A15-03	Parallel module enable 2	Ones position: Mod- ule 6 0: Disabled 1: Enabled Tens position: Module 7 0: Disabled 1: Enabled Hundreds position: Module 8 0: Disabled 1: Enabled Thousands position: Module 9 0: Disabled 1: Enabled Ten thousands posi- tion: Module 10 0: Disabled 1: Enabled	-	0	At stop	2421
A15-04	Number of enabled parallel modules	0 to 65535	-	0	Unmodi- fiable	34123

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A15-05	Parallel module online display 1	0 to 65535	-	0	Unmodifiable	34125
A15-06	Parallel module online display 2	0 to 65535	-	0	Unmodifiable	34126
A15-07	Number of online parallel modules	0 to 65535	-	0	Unmodifiable	34124
A15-08	Parallel current sharing enable	0: Disabled 1: Enabled	-	0	At stop	2422
A15-15	Status of parallel module 1	0: Offline 1: Online 2: Running 300: Wait for pre-charge 302: Pre-charging 303: Pre-charged	-	0	Unmodifiable	34019
A15-16	Status of parallel module 2	Same as A15-15	-	0	Unmodifiable	34020
A15-17	Status of parallel module 3	Same as A15-15	-	0	Unmodifiable	34021
A15-18	Status of parallel module 4	Same as A15-15	-	0	Unmodifiable	34022
A15-19	Status of parallel module 5	Same as A15-15	-	0	Unmodifiable	34023
A15-20	Status of parallel module 6	Same as A15-15	-	0	Unmodifiable	34024
A15-21	Status of parallel module 7	Same as A15-15	-	0	Unmodifiable	34025
A15-22	Status of parallel module 8	Same as A15-15	-	0	Unmodifiable	34026
A15-23	Status of parallel module 9	Same as A15-15	-	0	Unmodifiable	34027
A15-24	Status of parallel module 10	Same as A15-15	-	0	Unmodifiable	34028
A15-25	Ambient temperature of parallel module 1	-32768 to +32767	°C	0	Unmodifiable	34098
A15-26	Temperature of parallel module 1	-32768 to +32767	°C	0	Unmodifiable	34108
A15-27	Ambient temperature of parallel module 2	-32768 to +32767	°C	0	Unmodifiable	34099

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A15-28	Temperature of parallel module 2	-32768 to +32767	° C	0	Unmodifiable	34109
A15-29	Ambient temperature of parallel module 3	-32768 to +32767	° C	0	Unmodifiable	34100
A15-30	Temperature of parallel module 3	-32768 to +32767	° C	0	Unmodifiable	34110
A15-31	Ambient temperature of parallel module 4	-32768 to +32767	° C	0	Unmodifiable	34101
A15-32	Temperature of parallel module 4	-32768 to +32767	° C	0	Unmodifiable	34111
A15-33	Ambient temperature of parallel module 5	-32768 to +32767	° C	0	Unmodifiable	34102
A15-34	Temperature of parallel module 5	-32768 to +32767	° C	0	Unmodifiable	34112
A15-35	Ambient temperature of parallel module 6	-32768 to +32767	° C	0	Unmodifiable	34103
A15-36	Temperature of parallel module 6	-32768 to +32767	° C	0	Unmodifiable	34113
A15-37	Ambient temperature of parallel module 7	-32768 to +32767	° C	0	Unmodifiable	34104
A15-38	Temperature of parallel module 7	-32768 to +32767	° C	0	Unmodifiable	34114
A15-39	Ambient temperature of parallel module 8	-32768 to +32767	° C	0	Unmodifiable	34105
A15-40	Temperature of parallel module 8	-32768 to +32767	° C	0	Unmodifiable	34115
A15-41	Ambient temperature of parallel module 9	-32768 to +32767	° C	0	Unmodifiable	34106
A15-42	Temperature of parallel module 9	-32768 to +32767	° C	0	Unmodifiable	34116
A15-43	Ambient temperature of parallel module 10	-32768 to +32767	° C	0	Unmodifiable	34107

Para.	Name	Value Range	Unit	Default	Change Mode	Address
A15-44	Temperature of parallel module 10	-32768 to +32767	° C	0	Unmodifiable	34117

Group b: Control Channels

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group b0: Factory settings						
b0-00	Factory settings enable	0: Disabled 1: Enabled Other: B connector	-	1	At once	2887
b0-01	Factory settings active	0: Inactive 1: Active	-	0	Unmodifiable	33968
b0-02	Factory settings enable command source	0: Start command inactive 1: Start command active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	3	Unmodifiable	2889
b0-03	Factory settings stop command source	0: Stop command inactive 1: Stop command active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	6	Unmodifiable	2890

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b0-04	Factory settings running command source	0: Running inhibited 1: Running permitted 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2202
b0-05	Factory settings reset signal source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	7	Unmodifiable	2891
Group b1: User-defined control word setting of channel 1						
b1-00	[Channel 1] control source setting	0: Terminal start/stop module 1: User-defined start/stop (group b1) Other: B connector	-	1	At stop	2254
b1-01	[Channel 1] user-defined OFF1 source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2255

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b1-02	[Channel 1] user-defined OFF2 source	0: Switch-off active 1: Switch-off inactive 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2256
b1-03	[Channel 1] user-defined running command source	0: Running inhibited 1: Running permitted 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2259
b1-04	[Channel 1] user-defined reset signal source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2260
Group b2: Other control word setting of channel 1						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b2-00	[Channel 1] OFF2 source 2	0: Switch-off active 1: Switch-off inactive 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1008	At once	2257
b2-01	[Channel 1] OFF2 source 3	0: Switch-off active 1: Switch-off inactive 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2258
b2-02	[Channel 1] reset signal source 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2261

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b2-03	[Channel 1] reset signal source 3	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2262
Group b3: User-defined control word setting of channel 2						
b3-00	[Channel 2] control source setting	0: Terminal start/stop module 1: User-defined start/stop (group b3) Other: B connector	-	1	At stop	2888
b3-01	[Channel 2] user-defined OFF1 source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2879
b3-02	[Channel 2] user-defined OFF2 source	0: Switch-off active 1: Switch-off inactive 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2880

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b3-03	[Channel 2] user-defined running command source	0: Running inhibited 1: Running permitted 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2883
b3-04	[Channel 2] user-defined reset signal source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2884
Group b4: Other control word setting of channel 2						
b4-00	[Channel 2] OFF2 source 2	0: Switch-off active 1: Switch-off inactive 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1008	At once	2881

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b4-01	[Channel 2] OFF2 source 3	0: Switch-off active 1: Switch-off inactive 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2882
b4-02	[Channel 2] reset signal source 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2885
b4-03	[Channel 2] reset signal source 3	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2886
Group b5: Terminal start/stop module						
b5-00	Enabled terminal start/stop module	0: Module 1 1: Module 2	-	0	Unmodifiable	33958

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b5-01	Terminal start/stop module OFF1 status	0: Invalid 1: Valid	-	0	Unmodifiable	33959
b5-02	[Module 1] OFF1 status	0: Invalid 1: Valid	-	0	Unmodifiable	33960
b5-03	[Module 2] OFF1 status	0: Invalid 1: Valid	-	0	Unmodifiable	33961
b5-04	Terminal start/stop module 1/2 selection	0: Module 1 1: Module 2 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2873
b5-05	[Module 1] mode	0: Level mode IN1 (1) 1: IN1 (1), IN2 (changing from 0 to 1) 2: IN1 (1), IN2 (changing from 0 to 1 and then retained at 1) 3: IN1 (changing from 0 to 1), IN2 (0)	-	0	At stop	2263
b5-06	[Module 1] input 1	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2212

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b5-07	[Module 1] input 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2213
b5-08	[Module 1] running permission command source	0: Running inhibited 1: Running permitted 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2210
b5-09	[Module 1] reset signal source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2209

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b5-10	[Module 2] mode	0: Level mode IN1 (1) 1: IN1 (1), IN2 (changing from 0 to 1) 2: IN1 (1), IN2 (changing from 0 to 1 and then retained at 1) 3: IN1 (changing from 0 to 1), IN2 (0)	-	0	At stop	2874
b5-11	[Module 2] input 1	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DI1 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2875
b5-12	[Module 2] input 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DI1 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2876

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b5-13	[Module 2] running permission command source	0: Running inhibited 1: Running permitted 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DI1 9: HDI1 10: HDI2 Other: B connector	-	1	At once	2877
b5-14	[Module 2] reset signal source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DI1 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2878
Group b6: Auxiliary control word setting						
b6-00	Control signal of main circuit breaker	0: DO1 normally open (NO) 1: DO1 normally closed (NC) 2: DO2 normally open (NO) 3: DO2 normally closed (NC) 4: DO3 normally open (NO) 5: DO3 normally closed (NC)	-	0	Unmodifiable	33954

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b6-01	Feedback signal source of main circuit breaker	0: Active 1: Inactive 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	Unmodifiable	33970
b6-02	Control signal of auxiliary contactor	0: DO1 normally open (NO) 1: DO1 normally closed (NC) 2: DO2 normally open (NO) 3: DO2 normally closed (NC) 4: DO3 normally open (NO) 5: DO3 normally closed (NC)	-	0	Unmodifiable	33956
b6-04	Reactor over-temperature signal source	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2	-	0	Unmodifiable	33971

Para.	Name	Value Range	Unit	Default	Change Mode	Address
b6-06	Running inhibited command source 1	0: Running permitted 1: Running inhibited 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2191
b6-07	Running inhibited command source 2	0: Running permitted 1: Running inhibited 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2192
b6-08	Recorded information clear command source	0: Inactive 1: Active Other: B connector	-	0	At once	2837
b6-09	Forced switch-off enable upon control source change	0: Disabled 1: Enabled Other: B connector	-	0	At stop	2908

Group C: Setpoint Channels

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group C0: Voltage reference of channel 1						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C0-00	[Channel 1] voltage reference source	0: Digital setting 1: Multi-reference value 1 2: Calculated based on the preset line supply voltage 3: Reserved 4: Reserved 5: Reserved 6: Multi-reference value setting 7: Motor-driven potentiometer 8: Reserved 9: Reserved 10: Reserved Other: K connector	-	2	At once	2223
C0-01	[Channel 1] voltage digital setting	510.0 to 1270.0	V	600	At once	2214
C0-02	[Channel 1] actual valid voltage	0.0 to 6553.5	V	0	Unmodifiable	33944
C0-03	[Channel 1] voltage reference upper limit	510.0 to 1270.0	V	720	Unmodifiable	2190
C0-04	[Channel 1] voltage reference lower limit	510.0 to 1270.0	V	510	Unmodifiable	2844
C0-05	[Channel 1] voltage rising ramp setting	1 to 600	V/s	600	At once	1031
C0-06	[Channel 1] voltage falling ramp setting	1 to 600	V/s	600	At once	1033
Group C1: Current reference of channel 1						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C1-00	[Channel 1] current reference source	0: Digital setting 1: Multi-reference value 1 2: Reserved 3: Reserved 4: Reserved 5: Reserved 6: Multi-reference value setting 7: Motor-driven potentiometer 8: Reserved 9: Reserved 10: Reserved Other: K connector	-	0	At once	2731
C1-01	[Channel 1] current digital setting	-30000 to +30000	A	0	At once	2732
C1-02	[Channel 1] actual valid current	-32768 to +32767	A	0	Unmodifiable	34035
C1-03	Forward current limit	-32768 to +32767	A	0	Unmodifiable	34892
C1-04	Reverse current limit	-32768 to +32767	A	0	Unmodifiable	34893
C1-05	[Channel 1] current reference upper limit	0 to 30000	A	30000	At once	2840
C1-06	[Channel 1] current reference lower limit	-30000 to 0	A	-30000	At once	2839
Group C2: Voltage reference of channel 2						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C2-00	[Channel 2] voltage reference source	0: Digital setting 1: Multi-reference value 1 2: Calculated based on the grid voltage 3: Reserved 4: Reserved 5: Reserved 6: Multi-reference value setting 7: Motor-driven potentiometer 8: Reserved 9: Reserved 10: Reserved Other: K connector	-	2	At once	2893
C2-01	[Channel 2] voltage digital setting	510.0 to 1270.0	V	600	At once	2894
C2-02	[Channel 2] actual valid voltage	0.0 to 6553.5	V	0	Unmodifiable	34040
C2-03	[Channel 2] voltage reference upper limit	510.0 to 1270.0	V	720	Unmodifiable	2895
C2-04	[Channel 2] voltage reference lower limit	510.0 to 1270.0	V	510	Unmodifiable	2896
C2-05	[Channel 2] voltage rising ramp setting	1 to 600	V/s	600	At once	1032
C2-06	[Channel 2] voltage falling ramp setting	1 to 600	V/s	600	At once	1034
Group C3: Current reference of channel 2						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C3-00	[Channel 2] current reference source	0: Digital setting 1: Multi-reference value 1 2: Reserved 3: Reserved 4: Reserved 5: Reserved 6: Multi-reference value setting 7: Motor-driven potentiometer 8: Reserved 9: Reserved 10: Reserved Other: K connector	-	0	At once	2897
C3-01	[Channel 2] current digital setting	-30000 to +30000	A	0	At once	2898
C3-02	[Channel 2] actual valid current	-32768 to +32767	A	0	Unmodifiable	34041
C3-03	Forward current limit	-32768 to +32767	A	0	Unmodifiable	34892
C3-04	Reverse current limit	-32768 to +32767	A	0	Unmodifiable	34893
C3-05	[Channel 2] current reference upper limit	0 to 30000	A	30000	At once	2845
C3-06	[Channel 2] current reference lower limit	-30000 to 0	A	-30000	At once	2892
Group C4: Motor-driven potentiometer						
C4-00	Motor-driven potentiometer function	0: Disabled 1: Not retentive at power failure 2: Retentive at power failure	-	0	At stop	178
C4-01	Initial value of motor-driven potentiometer	-600.0 to +600.0	%	100	At stop	179
C4-02	Ramp time of motor-driven potentiometer	0.1 to 3000.0	s	10	At once	180
C4-03	Maximum value of motor-driven potentiometer	-600.0 to +600.0	%	100	At once	182

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C4-04	Minimum value of motor-driven potentiometer	-600.0 to +600.0	%	-100	At once	181
C4-05	Source of motor-driven potentiometer increase command	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	1944
C4-06	Source of motor-driven potentiometer decrease command	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	1945
C4-07	Source of motor-driven potentiometer force value	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2589
C4-08	Source of motor-driven potentiometer force value	0: 0 1: 100% 2: Digital setting Other: K connector		2	At once	2899
C4-09	Force value set-point of motor-driven potentiometer	-600.0 to +600.0	%	100	At once	2590

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C4-10	Source of motor-driven potentiometer reset command	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	2900
C4-11	Source of motor-driven potentiometer reset value	0: 0 1: 100% 2: Digital setting Other: K connector	-	2	At once	2901
C4-12	Reset value of motor-driven potentiometer	-600.0 to +600.0	%	100	At once	2902
Group C6: Multi-reference value setting						
C6-00	Setpoint	-3276.8 to +3276.7	%	0	Unmodifiable	32801
C6-01	Multi-reference selection 1	0: 0 1: 1 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	187
C6-02	Multi-reference selection 2	0: 0 1: 1 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	188

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C6-03	Multi-reference selection 3	0: 0 1: 1 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	189
C6-04	Multi-reference selection 4	0: 0 1: 1 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	190
C6-05	Multi-reference value 1	-600.0 to +600.0	%	100	At once	191
C6-06	Multi-reference value 2	-600.0 to +600.0	%	100	At once	192
C6-07	Multi-reference value 3	-600.0 to +600.0	%	100	At once	193
C6-08	Multi-reference value 4	-600.0 to +600.0	%	100	At once	194
C6-09	Multi-reference value 5	-600.0 to +600.0	%	100	At once	195
C6-10	Multi-reference value 6	-600.0 to +600.0	%	100	At once	196
C6-11	Multi-reference value 7	-600.0 to +600.0	%	100	At once	197
C6-12	Multi-reference value 8	-600.0 to +600.0	%	100	At once	198
C6-13	Multi-reference value 9	-600.0 to +600.0	%	100	At once	199
C6-14	Multi-reference value 10	-600.0 to +600.0	%	100	At once	200

Para.	Name	Value Range	Unit	Default	Change Mode	Address
C6-15	Multi-reference value 11	-600.0 to +600.0	%	100	At once	201
C6-16	Multi-reference value 12	-600.0 to +600.0	%	100	At once	202
C6-17	Multi-reference value 13	-300.00 to +300.00	%	100	At once	203
C6-18	Multi-reference value 14	-300.00 to +300.00	%	100	At once	204
C6-19	Multi-reference value 15	-300.00 to +300.00	%	100	At once	205
C6-20	Multi-reference value 16	-300.00 to +300.00	%	100	At once	206

Group d: Rated System

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group d0: Basic grid parameters						
d0-00	Rated grid voltage	100 to 1500	V	380	Unmodi- fiable	2279
d0-01	Rated grid frequency	0: 50 Hz 1: 60 Hz	-	0	At stop	2280
Group d1: Grid auto-tuning parameters						
d1-00	Grid phase sequence	0: RST 1: RTS 2: SRT 3: STR 4: TSR 5: TRS	-	0	At stop	2264
Group d2: Additional auto-tuning parameters						
d2-00	DC bus capacitance (rated)	0.1 to 6000.0	mF	18	Unmodi- fiable	2905
d2-01	DC bus capacitance (auto-tuned)	0.1 to 6000.0	mF	18	At stop	2906
Group d3: Base value information						
d3-00	Per-unit base value of voltage	0.0 to 6553.5	V	0	Unmodi- fiable	33943
d3-01	Per-unit base value of current	-32768 to +32767	A	0	Unmodi- fiable	34033

Para.	Name	Value Range	Unit	Default	Change Mode	Address
d3-02	Per-unit base value of power	0 to 65535	kVA	0	Unmodifiable	34042

Group E: Rectifier Control

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group E0: Control parameter setting						
E0-00	Ready-to-run waiting time	2.50 to 600.00	s	2.5	At once	2207
E0-01	Active rectifier mode	0: Voltage mode 1: Current mode	-	0	At once	2231
E0-02	Input capacitance reactive compensation selection	0: No compensation 1: Compensation	-	0	At once	2230
E0-03	Operating Mode	0: Rectification + regeneration 1: Rectification	-	0	At stop	2195
E0-07	Idle current value	0.0 to 150.0	%	0	At once	2234
E0-15	Preset line supply voltage (line voltage)	280.0 to 850.0	V	400	At stop	2903
E0-16	DC bus voltage coefficient	1.420 to 1.900	-	1.5	At once	2904
E0-17	IGBT trigger enable	0: Disabled 1: Enabled Other: B connector	-	1	At once	1624
E0-22	Rectifier-mode-only scheme selection	0: Scheme 1 1: Scheme 2	-	0	At stop	1060
E0-23	Regenerative current limit setting (rectifier-mode-only scheme 1)	-10.0 to 0.0	-	-2	At once	1061
E0-24	Running current lower limit (rectifier-mode-only scheme 2)	-10.0 to +10.0	%	5	At once	3110
E0-25	Voltage setting for stopping IGBT trigger (rectifier-mode-only scheme 2)	580.0 to 1180.0	V	770	At once	3111

Para.	Name	Value Range	Unit	Default	Change Mode	Address
E0-26	Valid voltage upon IGBT trigger stop (rectifier-mode-only scheme 2)	0.0 to 6553.5	V	0	Unmodifiable	34880
E0-27	Voltage upper limit for IGBT trigger stop (rectifier-mode-only scheme 2)	580.0 to 1180.0	V	780	Unmodifiable	3112
E0-28	Voltage lower limit for IGBT trigger stop (rectifier-mode-only scheme 2)	580.0 to 1180.0	V	580	Unmodifiable	3113
E0-29	Voltage offset for starting IGBT trigger (rectifier-mode-only scheme 2)	0.0 to 200.0	V	20	At once	3114
E0-30	Valid voltage upon starting IGBT trigger (rectifier-mode-only scheme 2)	0.0 to 6553.5	V	0	Unmodifiable	34881
Group E4: Auxiliary parameter setting						
E4-02	Feedback signal filter time of main circuit breaker	0.010 to 5.000	s	0.5	At once	2204
Group E6: Limit setting						
E6-00	Current limit source	0: Digital setting 1: Multi-reference value 1 2: 100% 3: Reserved 4: Reserved 5: Reserved 6: Multi-reference value setting 7: Motor-driven potentiometer 8: Reserved 9: Reserved 10: Reserved Other: K connector	-	0	At once	2521

Para.	Name	Value Range	Unit	Default	Change Mode	Address
E6-01	Current limit digital setting	0.0 to 150.0	%	150	At once	2208
E6-02	Digital setting of rectifier current limit 1	0.0 to 150.0	%	150	At once	3128
E6-03	Digital setting of regenerative current limit 1	-150.0 to 0.0	%	-150	At once	3130
E6-04	Reference selection of rectifier current limit 2	0: 150% Other: K connector	-	0	At once	3127
E6-05	Reference selection of regenerative current limit 2	0: -150% Other: K connector	-	0	At once	3129
E6-16	Power limit source	0: Digital setting Other: K connector	-	0	At once	3131
E6-17	Power limit digital setting	0.0 to 200.0	%	200	At once	3132
E6-18	Digital setting of rectifier power limit 1	0.0 to 200.0	%	200	At once	3124
E6-19	Digital setting of regenerative power limit 1	-200.0 to 0.0	%	-200	At once	3126
E6-20	Reference selection of rectifier power limit 2	0: 200% Other: K connector	-	0	At once	3123
E6-21	Reference selection of regenerative power limit 2	0: -200% Other: K connector	-	0	At once	3125
Group E7: Fault protection parameter setting						
E7-00	High grid voltage judgment threshold	110.0 to 120.0	%	115	At once	2217
E7-01	Low grid voltage judgment threshold	80.0 to 84.0	%	84	At once	2218
E7-02	High grid frequency judgment threshold	3 to 6	Hz	6	At once	2219
E7-03	Low grid frequency judgment threshold	3 to 6	Hz	6	At once	2220

Para.	Name	Value Range	Unit	Default	Change Mode	Address
E7-04	Three-phase unbalance judgment threshold	5.0 to 15.0	%	8	At once	2221
E7-05	Leakage current protection judgment threshold	25.0 to 100.0	%	50	At once	2222
E7-08	Close timeout time of main circuit breaker (auxiliary contactor)	1.00 to 10.00	s	5	At once	2206
E7-09	Disconnection timeout time of main circuit breaker (auxiliary contactor)	0.50 to 5.00	s	2	At once	2205
E7-10	Pre-charge time-out time	5.0 to 30.0	s	15	At once	2201
Group E8: Fault protection enable						
E8-00	Fault protection enable 1	Ones position: Reserved 0: Invalid 1: Valid Tens position: Reserved 0: Invalid 1: Valid Hundreds position: High ambient temperature detection enable 0: Invalid 1: Valid Thousands position: Low ambient temperature detection enable 0: Invalid 1: Valid Ten thousands position: Reserved 0: Invalid 1: Valid	-	1111	At once	2293

Para.	Name	Value Range	Unit	Default	Change Mode	Address
E8-01	Fault protection enable 2	Ones position: Low HCU 24 V input voltage detection enable 0: Invalid 1: Valid Tens position: SD card black box fault recording condition 0: Fault occurring after start 1: Fault occurring at any time Hundreds position: RTC low battery capacity detection enable 0: Invalid 1: Valid Thousands position: SD card not installed detection enable 0: Invalid 1: Valid Ten thousands position: Reserved 0: Invalid 1: Valid	-	1111	At once	2294

Para.	Name	Value Range	Unit	Default	Change Mode	Address
E8-02	Fault protection enable 3	Ones position: HSVM module connection error detection 0: Invalid 1: Valid Tens position: Main circuit breaker close error detection 0: Invalid 1: Valid Hundreds position: Main circuit breaker disconnection error detection 0: Invalid 1: Valid Thousands position: Bus voltage too low detection 0: Invalid 1: Valid Tens thousands position: Main circuit breaker close error detection when the grid is abnormal (rectifier) 0: Invalid 1: Valid	-	11111	At once	2295

Para.	Name	Value Range	Unit	Default	Change Mode	Address
E8-03	Fault protection enable 4	Ones position: Current unbalance detection enable 0: Invalid 1: Valid Tens position: Leakage current detection enable 0: Invalid 1: Valid Hundreds position: Automatically clear OFF1 factory settings 0: Invalid 1: Valid Thousands position: Auxiliary contactor close fault detection (DC-DC) 0: Invalid 1: Valid Ten thousands position: Auxiliary contactor disconnection fault detection (DC-DC) 0: Invalid 1: Valid	-	111	At once	2296

Para.	Name	Value Range	Unit	Default	Change Mode	Address
E8-04	Fault protection enable 5	Ones position: Start timeout detection enable 0: Invalid 1: Valid Tens position: Sampling setting error detection enable (DC-DC) 0: Invalid 1: Valid Hundreds position: Reserved 0: Invalid 1: Valid Thousands position: Reserved 0: Invalid 1: Valid Ten thousands position: Reserved 0: Invalid 1: Valid	-	1	At once	2297

Group F: Input and Output

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group F0: DI						
F0-00	DI physical status value	0x0000 to 0xFFFF	-	0	Unmodifiable	32805
F0-01	DI status value after processing	0x0000 to 0xFFFF	-	0	Unmodifiable	32806
F0-02	DI force selection	0x0000 to 0x01FF	-	0	At once	1117
F0-03	DI force data	0x0000 to 0x01FF	-	0	At once	1118
F0-04	DI1 switch-on delay	0.00 to 360.00	s	0.01	At once	1119
F0-05	DI1 switch-off delay	0.00 to 360.00	s	0.01	At once	1120
F0-06	DI2 switch-on delay	0.00 to 360.00	s	0.01	At once	1121
F0-07	DI2 switch-off delay	0.00 to 360.00	s	0.01	At once	1122
F0-08	DI3 switch-on delay	0.00 to 360.00	s	0.01	At once	1123
F0-09	DI3 switch-off delay	0.00 to 360.00	s	0.01	At once	1124
F0-10	DI4 switch-on delay	0.00 to 360.00	s	0.01	At once	1125
F0-11	DI4 switch-off delay	0.00 to 360.00	s	0.01	At once	1126

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F0-12	DI5 switch-on delay	0.00 to 360.00	s	0.01	At once	1127
F0-13	DI5 switch-off delay	0.00 to 360.00	s	0.01	At once	1128
F0-14	DI6 switch-on delay	0.00 to 360.00	s	0.01	At once	1129
F0-15	DI6 switch-off delay	0.00 to 360.00	s	0.01	At once	1130
F0-16	DIL switch-on delay	0.00 to 360.00	s	0.01	At once	1131
F0-17	DIL switch-off delay	0.00 to 360.00	s	0.01	At once	1132
F0-18	HDI1 switch-on delay	0.00 to 360.00	s	0.01	At once	1133
F0-19	HDI1 switch-off delay	0.00 to 360.00	s	0.01	At once	1134
F0-20	HDI2 switch-on delay	0.00 to 360.00	s	0.01	At once	1135
F0-21	HDI2 switch-off delay	0.00 to 360.00	s	0.01	At once	1136
Group F1: DO						
F1-00	DO signal source status value	0x0000 to 0xFFFF	-	0	Unmodifiable	32807
F1-01	DO status value after processing	0x0000 to 0xFFFF	-	0	Unmodifiable	32808
F1-02	RO1 signal source	0: Low level 1: High level 2: Ready to switch on 3: Started 4: Start completed 5: Charging 6: Running 7: Main circuit breaker control 8: Auxiliary contactor control 9: Alarm 10: Fault Other: B connector	-	7	Unmodifiable	2469

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F1-03	RO2 signal source	0: Low level 1: High level 2: Ready to switch on 3: Started 4: Start completed 5: Charging 6: Running 7: Main circuit breaker control 8: Auxiliary contactor control 9: Alarm 10: Fault Other: B connector	-	10	At stop	2470
F1-04	RO3 signal source	0: Low level 1: High level 2: Ready to switch on 3: Started 4: Start completed 5: Charging 6: Running 7: Main circuit breaker control 8: Auxiliary contactor control 9: Alarm 10: Fault Other: B connector	-	8	Unmodifiable	2471
F1-05	HDO1 as DO signal source	0: Low level 1: High level 2: Ready to switch on 3: Started 4: Start completed 5: Charging 6: Running 7: Main circuit breaker control 8: Auxiliary contactor control 9: Alarm 10: Fault Other: B connector	-	0	At stop	2472

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F1-06	HDO2 as DO signal source	0: Low level 1: High level 2: Ready to switch on 3: Started 4: Start completed 5: Charging 6: Running 7: Main circuit breaker control 8: Auxiliary contactor control 9: Alarm 10: Fault Other: B connector	-	0	At stop	2473
F1-07	RO1 switch-on delay	0.00 to 360.00	s	0	Unmodifiable	1143
F1-08	RO1 switch-off delay	0.00 to 360.00	s	0	Unmodifiable	1144
F1-09	RO2 switch-on delay	0.00 to 360.00	s	0	At once	1145
F1-10	RO2 switch-off delay	0.00 to 360.00	s	0	At once	1146
F1-11	RO3 switch-on delay	0.00 to 360.00	s	0	Unmodifiable	1147
F1-12	RO3 switch-off delay	0.00 to 360.00	s	0	Unmodifiable	1148
F1-13	HDO1 as DO switch-on delay	0.00 to 360.00	s	0	At once	1149
F1-14	HDO1 as DO switch-off delay	0.00 to 360.00	s	0	At once	1150
F1-15	HDO2 as DO switch-on delay	0.00 to 360.00	s	0	At once	1151
F1-16	HDO2 as DO switch-off delay	0.00 to 360.00	s	0	At once	1152
F1-17	DO positive and negative logic	0x0000 to 0x001F	-	0	Unmodifiable	1153
Group F2: AI						
F2-00	AI1 input value	-32.768 to +32.767	-	0	Unmodifiable	32809
F2-01	AI1 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32810
F2-02	AI2 input value	-32.768 to +32.767	-	0	Unmodifiable	32811

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F2-03	AI2 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32812
F2-04	AI1 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	1154
F2-05	AI2 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	1155
F2-06	Min. input value of AI1 curve	-20.000 to +20.000	-	-10	At once	1156
F2-07	Min. input proportion of AI1 curve	-600.0 to +600.0	%	-100	At once	1157
F2-08	Max. input value of AI1 curve	-20.000 to +20.000	-	10	At once	1158
F2-09	Max. input proportion of AI1 curve	-600.0 to +600.0	%	100	At once	1159
F2-10	Min. input value of AI2 curve	-20.000 to +20.000	-	-10	At once	1160
F2-11	Min. input proportion of AI2 curve	-600.0 to +600.0	%	-100	At once	1161
F2-12	Max. input value of AI2 curve	-20.000 to +20.000	-	10	At once	1162
F2-13	Max. input proportion of AI2 curve	-600.0 to +600.0	%	100	At once	1163
F2-14	Setting for AI lower than minimum input	Ones position: Setting for AI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for AI2 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At once	1164

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F2-15	AI1 filter time	0.000 to 10.000	s	0	At once	1165
F2-16	AI2 filter time	0.000 to 10.000	s	0	At once	1166
F2-17	AI1 denoising threshold	0.0 to 20.0	%	0	At once	1167
F2-18	AI2 denoising threshold	0.0 to 20.0	%	0	At once	1168
F2-19	AI setting zero-crossing threshold	0.0 to 1.0	%	0	At once	2185
F2-20	AI1 enable	0: Disabled 1: Enabled 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	1169
F2-21	AI2 enable	0: Disabled 1: Enabled 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	1	At once	1170
F2-22	AI1 disconnection monitoring threshold	0.000 to 4.000	mA	2	At once	1171
F2-23	AI2 disconnection monitoring threshold	0.000 to 4.000	mA	2	At once	1172
F2-24	AI1 disconnection monitoring delay	0.00 to 10.00	s	1	At once	1173
F2-25	AI2 disconnection monitoring delay	0.00 to 10.00	s	1	At once	1174

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F2-26	AI disconnection monitoring enable	Ones position: AI1 disconnection monitoring enable 0: Disabled 1: Enabled Tens position: AI2 disconnection monitoring enable 0: Disabled 1: Enabled	-	0	At once	1175
Group F3: AO						
F3-00	AO1 output value	0.000 to 65.535	-	0	Unmodifiable	32813
F3-01	AO1 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32814
F3-02	AO2 output value	0.000 to 65.535	-	0	Unmodifiable	32815
F3-03	AO2 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32816
F3-04	AO1 signal source	0: 0 1: Grid voltage 2: Grid frequency 3: Grid current 4: Three-phase unbalance factor 5: Bus voltage 6: Power 7: Bus voltage reference 8: Ambient temperature 9: Power unit temperature Other: K connector	-	0	At stop	2462

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F3-05	AO2 signal source	0: 0 1: Grid voltage 2: Grid frequency 3: Grid current 4: Three-phase unbalance factor 5: Bus voltage 6: Power 7: Bus voltage reference 8: Ambient temperature 9: Power unit temperature Other: K connector	-	0	At stop	2463
F3-06	AO1 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	1178
F3-07	AO2 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	1179
F3-08	Min. output proportion of AO1 curve	-600.0 to +600.0	%	0	At once	1180
F3-09	Min. output value of AO1 curve	0.000 to 20.000	-	0	At once	1181
F3-10	Max. output proportion of AO1 curve	-600.0 to +600.0	%	100	At once	1182
F3-11	Max. output value of AO1 curve	0.000 to 20.000	-	10	At once	1183
F3-12	Min. output proportion of AO2 curve	-600.0 to +600.0	%	0	At once	1184
F3-13	Min. output value of AO2 curve	0.000 to 20.000	-	0	At once	1185
F3-14	Max. output proportion of AO2 curve	-600.0 to +600.0	%	100	At once	1186
F3-15	Max. output value of AO2 curve	0.000 to 20.000	-	10	At once	1187
Group F4: HDI						
F4-00	HDI1 input value	0.00 to 655.35	kHz	0	Unmodifiable	32817
F4-01	HDI1 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32818

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F4-02	HDI2 input value	0.00 to 655.35	kHz	0	Unmodifiable	32819
F4-03	HDI2 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32820
F4-04	Using HDI as DI	Ones position: Using HDI1 as DI 0: Not using as DI 1: Using as DI Tens position: Using HDI2 as DI 0: Not using as DI 1: Using as DI	-	11	At stop	1188
F4-05	Min. input frequency of HDI1 curve	10.00 to 100.00	kHz	10	At once	1191
F4-06	Min. input proportion of HDI1 curve	-600.0 to +600.0	%	0	At once	1192
F4-07	Max. input frequency of HDI1 curve	10.00 to 100.00	kHz	100	At once	1193
F4-08	Max. input proportion of HDI1 curve	-600.0 to +600.0	%	100	At once	1194
F4-09	Min. input frequency of HDI2 curve	10.00 to 100.00	kHz	10	At once	1195
F4-10	Min. input proportion of HDI2 curve	-600.0 to +600.0	%	0	At once	1196
F4-11	Max. input frequency of HDI2 curve	10.00 to 100.00	kHz	100	At once	1197
F4-12	Max. input proportion of HDI2 curve	-600.0 to +600.0	%	100	At once	1198
F4-13	Setting for HDI lower than minimum input	Ones position: Setting for HDI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for HDI2 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At once	2046
F4-14	HDI1 filter time	0.000 to 10.000	s	0	At once	1189
F4-15	HDI2 filter time	0.000 to 10.000	s	0	At once	1190

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F4-16	HDI setting zero-crossing threshold	0.0 to 1.0	%	0	At once	2186
Group F5: HDO						
F5-00	HDO1 output value	0.00 to 655.35	kHz	0	Unmodifiable	32821
F5-01	HDO1 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32822
F5-02	HDO2 output value	0.00 to 655.35	kHz	0	Unmodifiable	32823
F5-03	HDO2 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	32824
F5-04	Using HDO as common DO	Ones position: Using HDO1 as DO 0: 0: Not using as DO 1: Using as DO Tens position: Using HDO2 as DO 0: 0: Not using as DO 1: Using as DO	-	0	At stop	1199
F5-05	HDO1 signal source	0: 0 1: Grid voltage 2: Grid frequency 3: Grid current 4: Three-phase unbalance factor 5: Bus voltage 6: Power 7: Bus voltage reference 8: Ambient temperature 9: Power unit temperature Other: K connector	-	0	At stop	2464

Para.	Name	Value Range	Unit	Default	Change Mode	Address
F5-06	HDO2 signal source	0: 0 1: Grid voltage 2: Grid frequency 3: Grid current 4: Three-phase unbalance factor 5: Bus voltage 6: Power 7: Bus voltage reference 8: Ambient temperature 9: Power unit temperature Other: K connector	-	0	At stop	2465
F5-07	Min. output proportion of HDO1 curve	-600.0 to +600.0	%	0	At once	1202
F5-08	Min. output frequency of HDO1 curve	0.00 to 100.00	kHz	0	At once	1203
F5-09	Max. output proportion of HDO1 curve	-600.0 to +600.0	%	100	At once	1204
F5-10	Max. output frequency of HDO1 curve	0.00 to 100.00	kHz	100	At once	1205
F5-11	Min. output proportion of HDO2 curve	-600.0 to +600.0	%	0	At once	1206
F5-12	Min. output frequency of HDO2 curve	0.00 to 100.00	kHz	0	At once	1207
F5-13	Max. output proportion of HDO2 curve	-600.0 to +600.0	%	100	At once	1208
F5-14	Max. output frequency of HDO2 curve	0.00 to 100.00	kHz	100	At once	1209
Group F6: AI/AO correction parameters						
F6-16	AO1 current output gain	95.0 to 105.0	%	100	At once	4201
F6-17	AO2 current output gain	95.0 to 105.0	%	100	At once	4202

Group H: Protection and auxiliary

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group H0: Troubleshooting						
H0-00	Source of external fault 1	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	1210
H0-01	Source of external fault 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	1211
H0-02	Source of external alarm 1	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	1212

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H0-03	Source of external alarm 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	1213
H0-06	User-defined black box trigger command source	0: Invalid Other: B connector	-	0	At once	1216
H0-07	Auto fault reset	0: Invalid 1: Valid	-	0	At once	1217
H0-08	Time for clearing reset attempts	0.0 to 3600.0	s	180	At once	1218
H0-09	Interval of reset attempts	0.0 to 600.0	s	30	At once	1219
H0-10	Fault reset attempts	0 to 5	-	5	At once	1220
H0-11	Code of non-resettable error 1	0 to 65535	-	0	At once	1221
H0-12	Code of non-resettable error 2	0 to 65535	-	0	At once	1222
H0-13	Code of non-resettable error 3	0 to 65535	-	0	At once	1223
H0-20	Waiting time of restart after auto reset	0 to 60000	s	10	At once	1229
H0-33	STO signal filter time	0 to 15	ms	4	At once	1215
Group H1: Fault level change						
H1-00	Error level change error code 1	0 to 65535	-	0	At once	2431

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H1-02	Level of error code 1	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2432
H1-04	Error level change error code 2	0 to 65535	-	0	At once	2433
H1-06	Level of error code 2	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2434
H1-08	Error level change error code 3	0 to 65535	-	0	At once	2435
H1-10	Level of error code 3	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2436
H1-12	Error level change error code 4	0 to 65535	-	0	At once	2437
H1-14	Level of error code 4	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2438

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H1-16	Error level change error code 5	0 to 65535	-	0	At once	2439
H1-18	Level of error code 5	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2440
H1-20	Error level change error code 6	0 to 65535	-	0	At once	2441
H1-22	Level of error code 6	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2442
H1-24	Error level change error code 7	0 to 65535	-	0	At once	2443
H1-26	Level of error code 7	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2444
H1-28	Error level change error code 8	0 to 65535	-	0	At once	2445

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H1-30	Level of error code 8	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2446
H1-32	Error level change error code 9	0 to 65535	-	0	At once	2447
H1-34	Level of error code 9	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2448
H1-36	Error level change error code 10	0 to 65535	-	0	At once	2449
H1-38	Level of error code 10	0: Switch-off 1: Reserved 2: Stop running 3: Reserved 4: Reserved 5: Reserved 6: Display alarm only 7: No error processing	-	0	At once	2450
Group H2: Last fault code record						
H2-00	Fault code 1	0 to 65535	-	0	Unmodifiable	1293
H2-01	Subcode of fault 1	0 to 65535	-	0	Unmodifiable	1294
H2-02	Fault code 2	0 to 65535	-	0	Unmodifiable	1295
H2-03	Subcode of fault 2	0 to 65535	-	0	Unmodifiable	1296
H2-04	Fault code 3	0 to 65535	-	0	Unmodifiable	1297

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H2-05	Subcode of fault 3	0 to 65535	-	0	Unmodifiable	1298
H2-06	Fault code 4	0 to 65535	-	0	Unmodifiable	1299
H2-07	Subcode of fault 4	0 to 65535	-	0	Unmodifiable	1300
H2-08	Fault code 5	0 to 65535	-	0	Unmodifiable	1301
H2-09	Subcode of fault 5	0 to 65535	-	0	Unmodifiable	1302
H2-10	Fault code 6	0 to 65535	-	0	Unmodifiable	1303
H2-11	Subcode of fault 6	0 to 65535	-	0	Unmodifiable	1304
H2-12	Bus voltage upon last fault	0.0 to 6553.5	V	0	Unmodifiable	2281
H2-13	Grid voltage upon last fault	0.0 to 6553.5	V	0	Unmodifiable	2282
H2-14	Module current upon last fault	-32768 to +32767	A	0	Unmodifiable	2283
H2-15	Grid frequency upon last fault	0.00 to 655.35	Hz	0	Unmodifiable	2284
H2-26	Control word 1 upon last fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1267
H2-27	Control word 2 upon last fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1268
H2-28	State word upon last fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1269
H2-29	State machine upon latest fault	0 to 65535	-	0	Unmodifiable	1270
H2-30	Last fault occurrence time	0 to 65535	-	0	Unmodifiable	1271
H2-31	Last fault occurrence date	0 to 65535	-	0	Unmodifiable	1272
Group H3: Last 2nd fault code record						
H3-00	Fault code 1	0 to 65535	-	0	Unmodifiable	1305
H3-01	Subcode of fault 1	0 to 65535	-	0	Unmodifiable	1306
H3-02	Fault code 2	0 to 65535	-	0	Unmodifiable	1307

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H3-03	Subcode of fault 2	0 to 65535	-	0	Unmodifiable	1308
H3-04	Fault code 3	0 to 65535	-	0	Unmodifiable	1309
H3-05	Subcode of fault 3	0 to 65535	-	0	Unmodifiable	1310
H3-06	Fault code 4	0 to 65535	-	0	Unmodifiable	1311
H3-07	Subcode of fault 4	0 to 65535	-	0	Unmodifiable	1312
H3-08	Fault code 5	0 to 65535	-	0	Unmodifiable	1313
H3-09	Subcode of fault 5	0 to 65535	-	0	Unmodifiable	1314
H3-10	Fault code 6	0 to 65535	-	0	Unmodifiable	1315
H3-11	Subcode of fault 6	0 to 65535	-	0	Unmodifiable	1316
H3-12	Bus voltage upon last 2nd fault	0.0 to 6553.5	V	0	Unmodifiable	2285
H3-13	Grid voltage upon last 2nd fault	0.0 to 6553.5	V	0	Unmodifiable	2286
H3-14	Module current upon last 2nd fault	-32768 to +32767	A	0	Unmodifiable	2287
H3-15	Grid frequency upon last 2nd fault	0.00 to 655.35	Hz	0	Unmodifiable	2288
H3-26	Control word 1 upon last 2nd fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1277
H3-27	Control word 2 upon last 2nd fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1278
H3-28	Status word upon last 2nd fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1279
H3-29	Status machine upon last 2nd fault	0 to 65535	-	0	Unmodifiable	1280
H3-30	Last 2nd fault occurrence time	0 to 65535	-	0	Unmodifiable	1281
H3-31	Last 2nd fault occurrence date	0 to 65535	-	0	Unmodifiable	1282
Group H4: Last 3rd fault code record						
H4-00	Fault code 1	0 to 65535	-	0	Unmodifiable	1317

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H4-01	Subcode of fault 1	0 to 65535	-	0	Unmodifiable	1318
H4-02	Fault code 2	0 to 65535	-	0	Unmodifiable	1319
H4-03	Subcode of fault 2	0 to 65535	-	0	Unmodifiable	1320
H4-04	Fault code 3	0 to 65535	-	0	Unmodifiable	1321
H4-05	Subcode of fault 3	0 to 65535	-	0	Unmodifiable	1322
H4-06	Fault code 4	0 to 65535	-	0	Unmodifiable	1323
H4-07	Subcode of fault 4	0 to 65535	-	0	Unmodifiable	1324
H4-08	Fault code 5	0 to 65535	-	0	Unmodifiable	1325
H4-09	Subcode of fault 5	0 to 65535	-	0	Unmodifiable	1326
H4-10	Fault code 6	0 to 65535	-	0	Unmodifiable	1327
H4-11	Subcode of fault 6	0 to 65535	-	0	Unmodifiable	1328
H4-12	Bus voltage upon last 3rd fault	0.0 to 6553.5	V	0	Unmodifiable	2289
H4-13	Grid voltage upon last 3rd fault	0.0 to 6553.5	V	0	Unmodifiable	2290
H4-14	Module current upon last 3rd fault	-32768 to +32767	A	0	Unmodifiable	2291
H4-15	Grid frequency upon last 3rd fault	0.00 to 655.35	Hz	0	Unmodifiable	2292
H4-26	Control word 1 upon last 3rd fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1287
H4-27	Control word 2 upon last 3rd fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1288
H4-28	Status word upon last 3rd fault	0x0000 to 0xFFFF	-	0	Unmodifiable	1289
H4-29	Status machine upon last 3rd fault	0 to 65535	-	0	Unmodifiable	1290
H4-30	Last 3rd fault occurrence time	0 to 65535	-	0	Unmodifiable	1291
H4-31	Last 3rd fault occurrence date	0 to 65535	-	0	Unmodifiable	1292

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group H5: Last 4th fault code record						
H5-00	Fault code 1	0 to 65535	-	0	Unmodifiable	1329
H5-01	Subcode of fault 1	0 to 65535	-	0	Unmodifiable	1330
H5-02	Fault code 2	0 to 65535	-	0	Unmodifiable	1331
H5-03	Subcode of fault 2	0 to 65535	-	0	Unmodifiable	1332
H5-04	Fault code 3	0 to 65535	-	0	Unmodifiable	1333
H5-05	Subcode of fault 3	0 to 65535	-	0	Unmodifiable	1334
H5-06	Fault code 4	0 to 65535	-	0	Unmodifiable	1335
H5-07	Subcode of fault 4	0 to 65535	-	0	Unmodifiable	1336
H5-08	Fault code 5	0 to 65535	-	0	Unmodifiable	1337
H5-09	Subcode of fault 5	0 to 65535	-	0	Unmodifiable	1338
H5-10	Fault code 6	0 to 65535	-	0	Unmodifiable	1339
H5-11	Subcode of fault 6	0 to 65535	-	0	Unmodifiable	1340
H5-12	Bus voltage upon last 4th fault	0.0 to 6553.5	V	0	Unmodifiable	5104
H5-13	Grid voltage upon last 4th fault	0.0 to 6553.5	V	0	Unmodifiable	5105
H5-14	Module current upon last 4th fault	-32768 to +32767	A	0	Unmodifiable	5106
H5-15	Grid frequency upon last 4th fault	0.00 to 655.35	Hz	0	Unmodifiable	5107
H5-26	Control word 1 upon last 4th fault	0x0000 to 0xFFFF	-	0	Unmodifiable	5055
H5-27	Control word 2 upon last 4th fault	0x0000 to 0xFFFF	-	0	Unmodifiable	5056
H5-28	Status word upon last 4th fault	0x0000 to 0xFFFF	-	0	Unmodifiable	5057
H5-29	Status machine upon last 4th fault	0 to 65535	-	0	Unmodifiable	5058

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H5-30	Last 4th fault occurrence time	0 to 65535	-	0	Unmodifiable	5059
H5-31	Last 4th fault occurrence date	0 to 65535	-	0	Unmodifiable	5060
Group H6: Last 5th fault code record						
H6-00	Fault code 1	0 to 65535	-	0	Unmodifiable	1341
H6-01	Subcode of fault 1	0 to 65535	-	0	Unmodifiable	1342
H6-02	Fault code 2	0 to 65535	-	0	Unmodifiable	1343
H6-03	Subcode of fault 2	0 to 65535	-	0	Unmodifiable	1344
H6-04	Fault code 3	0 to 65535	-	0	Unmodifiable	1345
H6-05	Subcode of fault 3	0 to 65535	-	0	Unmodifiable	1346
H6-06	Fault code 4	0 to 65535	-	0	Unmodifiable	1347
H6-07	Subcode of fault 4	0 to 65535	-	0	Unmodifiable	1348
H6-08	Fault code 5	0 to 65535	-	0	Unmodifiable	1349
H6-09	Subcode of fault 5	0 to 65535	-	0	Unmodifiable	1350
H6-10	Fault code 6	0 to 65535	-	0	Unmodifiable	1351
H6-11	Subcode of fault 6	0 to 65535	-	0	Unmodifiable	1352
H6-12	Bus voltage upon last 5th fault	0.0 to 6553.5	V	0	Unmodifiable	5111
H6-13	Grid voltage upon last 5th fault	0.0 to 6553.5	V	0	Unmodifiable	5112
H6-14	Module current upon last 5th fault	-32768 to +32767	A	0	Unmodifiable	5113
H6-15	Grid frequency upon last 5th fault	0.00 to 655.35	Hz	0	Unmodifiable	5114
H6-26	Control word 1 upon last 5th fault	0x0000 to 0xFFFF	-	0	Unmodifiable	5065
H6-27	Control word 2 upon last 5th fault	0x0000 to 0xFFFF	-	0	Unmodifiable	5066

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H6-28	Status word upon last 5th fault	0x0000 to 0xFFFF	-	0	Unmodifiable	5067
H6-29	Status machine upon last 5th fault	0 to 65535	-	0	Unmodifiable	5068
H6-30	Last 5th fault occurrence time	0 to 65535	-	0	Unmodifiable	5069
H6-31	Last 5th fault occurrence date	0 to 65535	-	0	Unmodifiable	5070
Group H7: Last active limit code record						
H7-00	Active limit code 1	0 to 65535	-	0	Unmodifiable	1353
H7-01	Subcode of active limit 1	0 to 65535	-	0	Unmodifiable	1354
H7-02	Active limit code 2	0 to 65535	-	0	Unmodifiable	1355
H7-03	Subcode of active limit 2	0 to 65535	-	0	Unmodifiable	1356
H7-04	Active limit code 3	0 to 65535	-	0	Unmodifiable	1357
H7-05	Subcode of active limit 3	0 to 65535	-	0	Unmodifiable	1358
H7-06	Active limit code 4	0 to 65535	-	0	Unmodifiable	1359
H7-07	Subcode of active limit 4	0 to 65535	-	0	Unmodifiable	1360
H7-08	Active limit code 5	0 to 65535	-	0	Unmodifiable	1361
H7-09	Subcode of active limit 5	0 to 65535	-	0	Unmodifiable	1362
H7-10	Active limit code 6	0 to 65535	-	0	Unmodifiable	1363
H7-11	Subcode of active limit 6	0 to 65535	-	0	Unmodifiable	1364
Group H8: Last alarm code record						
H8-00	Alarm code 1	0 to 65535	-	0	Unmodifiable	1365
H8-01	Subcode of alarm 1	0 to 65535	-	0	Unmodifiable	1366
H8-02	Alarm code 2	0 to 65535	-	0	Unmodifiable	1367

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H8-03	Subcode of alarm 2	0 to 65535	-	0	Unmodifiable	1368
H8-04	Alarm code 3	0 to 65535	-	0	Unmodifiable	1369
H8-05	Subcode of alarm 3	0 to 65535	-	0	Unmodifiable	1370
H8-06	Alarm code 4	0 to 65535	-	0	Unmodifiable	1371
H8-07	Subcode of alarm 4	0 to 65535	-	0	Unmodifiable	1372
H8-08	Alarm code 5	0 to 65535	-	0	Unmodifiable	1373
H8-09	Subcode of alarm 5	0 to 65535	-	0	Unmodifiable	1374
H8-10	Alarm code 6	0 to 65535	-	0	Unmodifiable	1375
H8-11	Subcode of alarm 6	0 to 65535	-	0	Unmodifiable	1376
Group H10: User-defined fault words						
H10-00	User-defined fault word 1	0x0000 to 0xFFFF	-	0	Unmodifiable	34914
H10-01	User-defined fault word 2	0x0000 to 0xFFFF	-	0	Unmodifiable	34915
H10-02	Fault word 1 - BIT00 error code	0 to 65535	-	1	At once	3239

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-03	Fault word 1 - BIT00 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3240
H10-04	Fault word 1 - BIT01 error code	0 to 65535	-	2	At once	3241

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-05	Fault word 1 - BIT01 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3242
H10-06	Fault word 1 - BIT02 error code	0 to 65535	-	14	At once	3243

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-07	Fault word 1 - BIT02 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3244
H10-08	Fault word 1 - BIT03 error code	0 to 65535	-	59	At once	3245

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-09	Fault word 1 - BIT03 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3246
H10-10	Fault word 1 - BIT04 error code	0 to 65535	-	57	At once	3247

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-11	Fault word 1 - BIT04 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3248
H10-12	Fault word 1 - BIT05 error code	0 to 65535	-	67	At once	3249

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-13	Fault word 1 - BIT05 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3250
H10-14	Fault word 1 - BIT06 error code	0 to 65535	-	68	At once	3251

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-15	Fault word 1 - BIT06 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3252
H10-16	Fault word 1 - BIT07 error code	0 to 65535	-	72	At once	3253

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-17	Fault word 1 - BIT07 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3254
H10-18	Fault word 1 - BIT08 error code	0 to 65535	-	73	At once	3255

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-19	Fault word 1 - BIT08 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3256
H10-20	Fault word 1 - BIT09 error code	0 to 65535	-	80	At once	3257

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-21	Fault word 1 - BIT09 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3258
H10-22	Fault word 1 - BIT10 error code	0 to 65535	-	81	At once	3259

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-23	Fault word 1 - BIT10 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3260
H10-24	Fault word 1 - BIT11 error code	0 to 65535	-	15	At once	3261

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-25	Fault word 1 - BIT11 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3262
H10-26	Fault word 1 - BIT12 error code	0 to 65535	-	0	At once	3263

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-27	Fault word 1 - BIT12 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3264
H10-28	Fault word 1 - BIT13 error code	0 to 65535	-	0	At once	3265

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-29	Fault word 1 - BIT13 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3266
H10-30	Fault word 1 - BIT14 error code	0 to 65535	-	0	At once	3267

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-31	Fault word 1 - BIT14 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3268
H10-32	Fault word 1 - BIT15 error code	0 to 65535	-	0	At once	3269

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-33	Fault word 1 - BIT15 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3270
H10-34	Fault word 2 - BIT00 error code	0 to 65535	-	0	At once	3271

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-35	Fault word 2 - BIT00 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3272
H10-36	Fault word 2 - BIT01 error code	0 to 65535	-	0	At once	3273

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-37	Fault word 2 - BIT01 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3274
H10-38	Fault word 2 - BIT02 error code	0 to 65535	-	0	At once	3275

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-39	Fault word 2 - BIT02 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3276
H10-40	Fault word 2 - BIT03 error code	0 to 65535	-	0	At once	3277

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-41	Fault word 2 - BIT03 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3278
H10-42	Fault word 2 - BIT04 error code	0 to 65535	-	0	At once	3279

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-43	Fault word 2 - BIT04 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3280
H10-44	Fault word 2 - BIT05 error code	0 to 65535	-	0	At once	3281

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-45	Fault word 2 - BIT05 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3282
H10-46	Fault word 2 - BIT06 error code	0 to 65535	-	0	At once	3283

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-47	Fault word 2 - BIT06 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3284
H10-48	Fault word 2 - BIT07 error code	0 to 65535	-	0	At once	3285

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-49	Fault word 2 - BIT07 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3286
H10-50	Fault word 2 - BIT08 error code	0 to 65535	-	0	At once	3287

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-51	Fault word 2 - BIT08 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3288
H10-52	Fault word 2 - BIT09 error code	0 to 65535	-	0	At once	3289

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-53	Fault word 2 - BIT09 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3290
H10-54	Fault word 2 - BIT10 error code	0 to 65535	-	0	At once	3291

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-55	Fault word 2 - BIT10 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3292
H10-56	Fault word 2 - BIT11 error code	0 to 65535	-	0	At once	3293

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-57	Fault word 2 - BIT11 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3294
H10-58	Fault word 2 - BIT12 error code	0 to 65535	-	0	At once	3295

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-59	Fault word 2 - BIT12 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3296
H10-60	Fault word 2 - BIT13 error code	0 to 65535	-	0	At once	3297

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-61	Fault word 2 - BIT13 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3298
H10-62	Fault word 2 - BIT14 error code	0 to 65535	-	0	At once	3299

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-63	Fault word 2 - BIT14 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3300
H10-64	Fault word 2 - BIT15 error code	0 to 65535	-	0	At once	3301

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H10-65	Fault word 2 - BIT15 error subcode	0: All error sub-codes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16	-	0	At once	3302
Group H11: User-defined error setting						
H11-00	Source of user-defined fault 1	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4988

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-01	Source of user-defined fault 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4989
H11-02	Source of user-defined fault 3	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4990
H11-03	Source of user-defined fault 4	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4991

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-04	Source of user-defined fault 5	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4992
H11-05	Source of user-defined fault 6	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4993
H11-06	Source of user-defined fault 7	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4994

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-07	Source of user-defined fault 8	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4995
H11-08	Source of user-defined fault 9	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4996
H11-09	Source of user-defined fault 10	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4997

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-10	Source of user-defined fault 11	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4998
H11-11	Source of user-defined fault 12	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	4999
H11-12	Source of user-defined fault 13	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5000

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-13	Source of user-defined fault 14	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5001
H11-14	Source of user-defined fault 15	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5002
H11-15	Source of user-defined fault 16	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5003

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-16	Source of user-defined alarm 1	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5004
H11-17	Source of user-defined alarm 2	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5005
H11-18	Source of user-defined alarm 3	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5006
H11-19	Source of user-defined alarm 4	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5007

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-20	Source of user-defined alarm 5	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5008
H11-21	Source of user-defined alarm 6	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5009
H11-22	Source of user-defined alarm 7	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5010

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-23	Source of user-defined alarm 8	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5011
H11-24	Source of user-defined alarm 9	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5012
H11-25	Source of user-defined alarm 10	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5013

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-26	Source of user-defined alarm 11	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5014
H11-27	Source of user-defined alarm 12	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5015
H11-28	Source of user-defined alarm 13	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5016

Para.	Name	Value Range	Unit	Default	Change Mode	Address
H11-29	Source of user-defined alarm 14	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5017
H11-30	Source of user-defined alarm 15	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5018
H11-31	Source of user-defined alarm 16	0: Inactive 1: Active 2: DI1 3: DI2 4: DI3 5: DI4 6: DI5 7: DI6 8: DIL 9: HDI1 10: HDI2 Other: B connector	-	0	At once	5019

Group L: Application Functions

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group L0: Word-bit conversion function						
L0-00	Word-to-bit conversion 1 input selection	0: Invalid Other: K connector	-	0	At once	2047

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L0-01	Word-to-bit conversion 2 input selection	0: Invalid Other: K connector	-	0	At once	2048
L0-02	Word-to-bit conversion 3 input selection	0: Invalid Other: K connector	-	0	At once	2049
L0-03	Word-to-bit conversion 4 input selection	0: Invalid Other: K connector	-	0	At once	3339
L0-10	Bit-to-word function 1 - Bit00 selection	0: Invalid Other: B connector	-	0	At once	2050
L0-11	Bit-to-word function 1 - Bit01 selection	0: Invalid Other: B connector	-	0	At once	2051
L0-12	Bit-to-word function 1 - Bit02 selection	0: Invalid Other: B connector	-	0	At once	2052
L0-13	Bit-to-word function 1 - Bit03 selection	0: Invalid Other: B connector	-	0	At once	2053
L0-14	Bit-to-word function 1 - Bit04 selection	0: Invalid Other: B connector	-	0	At once	2054
L0-15	Bit-to-word function 1 - Bit05 selection	0: Invalid Other: B connector	-	0	At once	2055
L0-16	Bit-to-word function 1 - Bit06 selection	0: Invalid Other: B connector	-	0	At once	2056
L0-17	Bit-to-word function 1 - Bit07 selection	0: Invalid Other: B connector	-	0	At once	2057
L0-18	Bit-to-word function 1 - Bit08 selection	0: Invalid Other: B connector	-	0	At once	2058
L0-19	Bit-to-word function 1 - Bit09 selection	0: Invalid Other: B connector	-	0	At once	2059
L0-20	Bit-to-word function 1 - Bit10 selection	0: Invalid Other: B connector	-	0	At once	2060

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L0-21	Bit-to-word function 1 - Bit11 selection	0: Invalid Other: B connector	-	0	At once	2061
L0-22	Bit-to-word function 1 - Bit12 selection	0: Invalid Other: B connector	-	0	At once	2062
L0-23	Bit-to-word function 1 - Bit13 selection	0: Invalid Other: B connector	-	0	At once	2063
L0-24	Bit-to-word function 1 - Bit14 selection	0: Invalid Other: B connector	-	0	At once	2064
L0-25	Bit-to-word function 1 - Bit15 selection	0: Invalid Other: B connector	-	0	At once	2065
L0-26	Bit-to-word function 2 - Bit00 selection	0: Invalid Other: B connector	-	0	At once	2066
L0-27	Bit-to-word function 2 - Bit01 selection	0: Invalid Other: B connector	-	0	At once	2067
L0-28	Bit-to-word function 2 - Bit02 selection	0: Invalid Other: B connector	-	0	At once	2068
L0-29	Bit-to-word function 2 - Bit03 selection	0: Invalid Other: B connector	-	0	At once	2069
L0-30	Bit-to-word function 2 - Bit04 selection	0: Invalid Other: B connector	-	0	At once	2070
L0-31	Bit-to-word function 2 - Bit05 selection	0: Invalid Other: B connector	-	0	At once	2071
L0-32	Bit-to-word function 2 - Bit06 selection	0: Invalid Other: B connector	-	0	At once	2072
L0-33	Bit-to-word function 2 - Bit07 selection	0: Invalid Other: B connector	-	0	At once	2073
L0-34	Bit-to-word function 2 - Bit08 selection	0: Invalid Other: B connector	-	0	At once	2074

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L0-35	Bit-to-word function 2 - Bit09 selection	0: Invalid Other: B connector	-	0	At once	2075
L0-36	Bit-to-word function 2 - Bit10 selection	0: Invalid Other: B connector	-	0	At once	2076
L0-37	Bit-to-word function 2 - Bit11 selection	0: Invalid Other: B connector	-	0	At once	2077
L0-38	Bit-to-word function 2 - Bit12 selection	0: Invalid Other: B connector	-	0	At once	2078
L0-39	Bit-to-word function 2 - Bit13 selection	0: Invalid Other: B connector	-	0	At once	2079
L0-40	Bit-to-word function 2 - Bit14 selection	0: Invalid Other: B connector	-	0	At once	2080
L0-41	Bit-to-word function 2 - Bit15 selection	0: Invalid Other: B connector	-	0	At once	2081
L0-42	Bit-to-word function 3 - Bit00 selection	0: Invalid Other: B connector	-	0	At once	2082
L0-43	Bit-to-word function 3 - Bit01 selection	0: Invalid Other: B connector	-	0	At once	2083
L0-44	Bit-to-word function 3 - Bit02 selection	0: Invalid Other: B connector	-	0	At once	2084
L0-45	Bit-to-word function 3 - Bit03 selection	0: Invalid Other: B connector	-	0	At once	2085
L0-46	Bit-to-word function 3 - Bit04 selection	0: Invalid Other: B connector	-	0	At once	2086
L0-47	Bit-to-word function 3 - Bit05 selection	0: Invalid Other: B connector	-	0	At once	2087
L0-48	Bit-to-word function 3 - Bit06 selection	0: Invalid Other: B connector	-	0	At once	2088

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L0-49	Bit-to-word function 3 - Bit07 selection	0: Invalid Other: B connector	-	0	At once	2089
L0-50	Bit-to-word function 3 - Bit08 selection	0: Invalid Other: B connector	-	0	At once	2090
L0-51	Bit-to-word function 3 - Bit09 selection	0: Invalid Other: B connector	-	0	At once	2091
L0-52	Bit-to-word function 3 - Bit10 selection	0: Invalid Other: B connector	-	0	At once	2092
L0-53	Bit-to-word function 3 - Bit11 selection	0: Invalid Other: B connector	-	0	At once	2093
L0-54	Bit-to-word function 3 - Bit12 selection	0: Invalid Other: B connector	-	0	At once	2094
L0-55	Bit-to-word function 3 - Bit13 selection	0: Invalid Other: B connector	-	0	At once	2095
L0-56	Bit-to-word function 3 - Bit14 selection	0: Invalid Other: B connector	-	0	At once	2096
L0-57	Bit-to-word function 3 - Bit15 selection	0: Invalid Other: B connector	-	0	At once	2097
L0-58	Bit-to-word function 4 - Bit00 selection	0: Invalid Other: B connector	-	0	At once	2098
L0-59	Bit-to-word function 4 - Bit01 selection	0: Invalid Other: B connector	-	0	At once	2099
L0-60	Bit-to-word function 4 - Bit02 selection	0: Invalid Other: B connector	-	0	At once	2100
L0-61	Bit-to-word function 4 - Bit03 selection	0: Invalid Other: B connector	-	0	At once	2101
L0-62	Bit-to-word function 4 - Bit04 selection	0: Invalid Other: B connector	-	0	At once	2102

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L0-63	Bit-to-word function 4 - Bit05 selection	0: Invalid Other: B connector	-	0	At once	2103
L0-64	Bit-to-word function 4 - Bit06 selection	0: Invalid Other: B connector	-	0	At once	2104
L0-65	Bit-to-word function 4 - Bit07 selection	0: Invalid Other: B connector	-	0	At once	2105
L0-66	Bit-to-word function 4 - Bit08 selection	0: Invalid Other: B connector	-	0	At once	2106
L0-67	Bit-to-word function 4 - Bit09 selection	0: Invalid Other: B connector	-	0	At once	2107
L0-68	Bit-to-word function 4 - Bit10 selection	0: Invalid Other: B connector	-	0	At once	2108
L0-69	Bit-to-word function 4 - Bit11 selection	0: Invalid Other: B connector	-	0	At once	2109
L0-70	Bit-to-word function 4 - Bit12 selection	0: Invalid Other: B connector	-	0	At once	2110
L0-71	Bit-to-word function 4 - Bit13 selection	0: Invalid Other: B connector	-	0	At once	2111
L0-72	Bit-to-word function 4 - Bit14 selection	0: Invalid Other: B connector	-	0	At once	2112
L0-73	Bit-to-word function 4 - Bit15 selection	0: Invalid Other: B connector	-	0	At once	2113
Group L2: Logic operation function						
L2-00	Input 1 of logic AND module A	1: Invalid Other: B connector	-	1	At once	2301
L2-01	Input 2 of logic AND module A	1: Invalid Other: B connector	-	1	At once	2302
L2-02	Input 3 of logic AND module A	1: Invalid Other: B connector	-	1	At once	2303
L2-03	Input 4 of logic AND module A	1: Invalid Other: B connector	-	1	At once	2304

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L2-04	Input 1 of logic AND module B	1: Invalid Other: B connector	-	1	At once	2305
L2-05	Input 2 of logic AND module B	1: Invalid Other: B connector	-	1	At once	2306
L2-06	Input 3 of logic AND module B	1: Invalid Other: B connector	-	1	At once	2307
L2-07	Input 4 of logic AND module B	1: Invalid Other: B connector	-	1	At once	2308
L2-08	Input 1 of logic AND module C	1: Invalid Other: B connector	-	1	At once	2309
L2-09	Input 2 of logic AND module C	1: Invalid Other: B connector	-	1	At once	2310
L2-10	Input 3 of logic AND module C	1: Invalid Other: B connector	-	1	At once	2311
L2-11	Input 4 of logic AND module C	1: Invalid Other: B connector	-	1	At once	2312
L2-12	Input 1 of logic AND module D	1: Invalid Other: B connector	-	1	At once	2313
L2-13	Input 2 of logic AND module D	1: Invalid Other: B connector	-	1	At once	2314
L2-14	Input 3 of logic AND module D	1: Invalid Other: B connector	-	1	At once	2315
L2-15	Input 4 of logic AND module D	1: Invalid Other: B connector	-	1	At once	2316
L2-16	Input of logic NOT module A	0: Invalid Other: B connector	-	0	At once	2317
L2-17	Input of logic NOT module B	0: Invalid Other: B connector	-	0	At once	2318
L2-18	Input of logic NOT module C	0: Invalid Other: B connector	-	0	At once	2319
L2-19	Input of logic NOT module D	0: Invalid Other: B connector	-	0	At once	2320
L2-20	Input of logic NOT module E	0: Invalid Other: B connector	-	0	At once	2321
L2-21	Input of logic NOT module F	0: Invalid Other: B connector	-	0	At once	2322
L2-22	Input of logic NOT module G	0: Invalid Other: B connector	-	0	At once	2323
L2-23	Input of logic NOT module H	0: Invalid Other: B connector	-	0	At once	2324

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L2-24	Input 1 of logic OR module A	0: Invalid Other: B connector	-	0	At once	2325
L2-25	Input 2 of logic OR module A	0: Invalid Other: B connector	-	0	At once	2326
L2-26	Input 3 of logic OR module A	0: Invalid Other: B connector	-	0	At once	2327
L2-27	Input 4 of logic OR module A	0: Invalid Other: B connector	-	0	At once	2328
L2-28	Input 1 of logic OR module B	0: Invalid Other: B connector	-	0	At once	2329
L2-29	Input 2 of logic OR module B	0: Invalid Other: B connector	-	0	At once	2330
L2-30	Input 3 of logic OR module B	0: Invalid Other: B connector	-	0	At once	2331
L2-31	Input 4 of logic OR module B	0: Invalid Other: B connector	-	0	At once	2332
L2-32	Input 1 of logic OR module C	0: Invalid Other: B connector	-	0	At once	2333
L2-33	Input 2 of logic OR module C	0: Invalid Other: B connector	-	0	At once	2334
L2-34	Input 3 of logic OR module C	0: Invalid Other: B connector	-	0	At once	2335
L2-35	Input 4 of logic OR module C	0: Invalid Other: B connector	-	0	At once	2336
L2-36	Input 1 of logic OR module D	0: Invalid Other: B connector	-	0	At once	2337
L2-37	Input 2 of logic OR module D	0: Invalid Other: B connector	-	0	At once	2338
L2-38	Input 3 of logic OR module D	0: Invalid Other: B connector	-	0	At once	2339
L2-39	Input 4 of logic OR module D	0: Invalid Other: B connector	-	0	At once	2340
L2-40	Function of logic XOR/XNOR module A	0: XOR 1: XNOR	-	0	At once	2591
L2-41	Input 1 of logic XOR/XNOR module A	0: Invalid Other: B connector	-	0	At once	2595
L2-42	Input 2 of logic XOR/XNOR module A	0: Invalid Other: B connector	-	0	At once	2596

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L2-43	Function of logic XOR/XNOR module B	0: XOR 1: XNOR	-	0	At once	2592
L2-44	Input 1 of logic XOR/XNOR module B	0: Invalid Other: B connector	-	0	At once	2597
L2-45	Input 2 of logic XOR/XNOR module B	0: Invalid Other: B connector	-	0	At once	2598
L2-46	Function of logic XOR/XNOR module C	0: XOR 1: XNOR	-	0	At once	2593
L2-47	Input 1 of logic XOR/XNOR module C	0: Invalid Other: B connector	-	0	At once	2599
L2-48	Input 2 of logic XOR/XNOR module C	0: Invalid Other: B connector	-	0	At once	2600
L2-49	Function of logic XOR/XNOR module D	0: XOR 1: XNOR	-	0	At once	2594
L2-50	Input 1 of logic XOR/XNOR module D	0: Invalid Other: B connector	-	0	At once	2601
L2-51	Input 2 of logic XOR/XNOR module D	0: Invalid Other: B connector	-	0	At once	2602
L2-60	Function of logic AND-OR module A	0: Disabled 1: AND 2: OR	-	0	At once	3347
L2-61	Input 1 of logic AND-OR module A	0: Logic 0 Other: B connector	-	0	At once	3355
L2-62	Input 2 of logic AND-OR module A	0: Logic 0 Other: B connector	-	0	At once	3363
L2-63	Input 3 of logic AND-OR module A	0: Logic 0 Other: B connector	-	0	At once	3371
L2-64	Function of logic AND-OR module B	0: Disabled 1: AND 2: OR	-	0	At once	3348
L2-65	Input 1 of logic AND-OR module B	0: Logic 0 Other: B connector	-	0	At once	3356
L2-66	Input 2 of logic AND-OR module B	0: Logic 0 Other: B connector	-	0	At once	3364

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L2-67	Input 3 of logic AND-OR module B	0: Logic 0 Other: B connector	-	0	At once	3372
L2-68	Function of logic AND-OR module C	0: Disabled 1: AND 2: OR	-	0	At once	3349
L2-69	Input 1 of logic AND-OR module C	0: Logic 0 Other: B connector	-	0	At once	3357
L2-70	Input 2 of logic AND-OR module C	0: Logic 0 Other: B connector	-	0	At once	3365
L2-71	Input 3 of logic AND-OR module C	0: Logic 0 Other: B connector	-	0	At once	3373
L2-72	Function of logic AND-OR module D	0: Disabled 1: AND 2: OR	-	0	At once	3350
L2-73	Input 1 of logic AND-OR module D	0: Logic 0 Other: B connector	-	0	At once	3358
L2-74	Input 2 of logic AND-OR module D	0: Logic 0 Other: B connector	-	0	At once	3366
L2-75	Input 3 of logic AND-OR module D	0: Logic 0 Other: B connector	-	0	At once	3374
L2-76	Function of logic AND-OR module E	0: Disabled 1: AND 2: OR	-	0	At once	3351
L2-77	Input 1 of logic AND-OR module E	0: Logic 0 Other: B connector	-	0	At once	3359
L2-78	Input 2 of logic AND-OR module E	0: Logic 0 Other: B connector	-	0	At once	3367
L2-79	Input 3 of logic AND-OR module E	0: Logic 0 Other: B connector	-	0	At once	3375
L2-80	Function of logic AND-OR module F	0: Disabled 1: AND 2: OR	-	0	At once	3352
L2-81	Input 1 of logic AND-OR module F	0: Logic 0 Other: B connector	-	0	At once	3360
L2-82	Input 2 of logic AND-OR module F	0: Logic 0 Other: B connector	-	0	At once	3368
L2-83	Input 3 of logic AND-OR module F	0: Logic 0 Other: B connector	-	0	At once	3376
L2-84	Function of logic AND-OR module G	0: Disabled 1: AND 2: OR	-	0	At once	3353

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L2-85	Input 1 of logic AND-OR module G	0: Logic 0 Other: B connector	-	0	At once	3361
L2-86	Input 2 of logic AND-OR module G	0: Logic 0 Other: B connector	-	0	At once	3369
L2-87	Input 3 of logic AND-OR module G	0: Logic 0 Other: B connector	-	0	At once	3377
L2-88	Function of logic AND-OR module H	0: Disabled 1: AND 2: OR	-	0	At once	3354
L2-89	Input 1 of logic AND-OR module H	0: Logic 0 Other: B connector	-	0	At once	3362
L2-90	Input 2 of logic AND-OR module H	0: Logic 0 Other: B connector	-	0	At once	3370
L2-91	Input 3 of logic AND-OR module H	0: Logic 0 Other: B connector	-	0	At once	3378
Group L3: W-DW conversion function						
L3-00	High word of W-DW conversion 1	0: Invalid Other: K connector	-	0	At once	2352
L3-01	Low word of W-DW conversion 1	0: Invalid Other: K connector	-	0	At once	2353
L3-02	Base value of W-DW conversion 1	0 to 65535	-	0	At once	2354
L3-03	High word of W-DW conversion 2	0: Invalid Other: K connector	-	0	At once	2355
L3-04	Low word of W-DW conversion 2	0: Invalid Other: K connector	-	0	At once	2356
L3-05	Base value of W-DW conversion 2	0 to 65535	-	0	At once	2357
L3-06	High word of W-DW conversion 3	0: Invalid Other: K connector	-	0	At once	2358
L3-07	Low word of W-DW conversion 3	0: Invalid Other: K connector	-	0	At once	2359
L3-08	Base value of W-DW conversion 3	0 to 65535	-	0	At once	2360
L3-09	DW-W conversion 1 selection	0: Invalid Other: K connector	-	0	At once	2361
L3-10	Base value of DW-W conversion 1	0 to 65535	-	0	At once	2362
L3-11	DW-W conversion 2 selection	0: Invalid Other: K connector	-	0	At once	2363
L3-12	Base value of DW-W conversion 2	0 to 65535	-	0	At once	2364

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L3-13	DW-W conversion 3 selection	0: Invalid Other: K connector	-	0	At once	2365
L3-14	Base value of DW-W conversion 3	0 to 65535	-	0	At once	2366
Group L5: Switch function block						
L5-00	Input source of binary selector module 1	0: Input 1 1: Input 2 Other: B connector	-	0	At once	2603
L5-01	Input 1 of binary selector module 1	0: Invalid Other: B connector	-	0	At once	2605
L5-02	Input 2 of binary selector module 1	0: Invalid Other: B connector	-	0	At once	2606
L5-03	Input source of binary selector module 2	0: Input 1 1: Input 2 Other: B connector	-	0	At once	2604
L5-04	Input 1 of binary selector module 2	0: Invalid Other: B connector	-	0	At once	2607
L5-05	Input 2 of binary selector module 2	0: Invalid Other: B connector	-	0	At once	2608
L5-06	Input source of binary selector module 3	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3089
L5-07	Input 1 of binary selector module 3	0: Invalid Other: B connector	-	0	At once	3091
L5-08	Input 2 of binary selector module 3	0: Invalid Other: B connector	-	0	At once	3092
L5-09	Input source of binary selector module 4	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3090
L5-10	Input 1 of binary selector module 4	0: Invalid Other: B connector	-	0	At once	3093
L5-11	Input 2 of binary selector module 4	0: Invalid Other: B connector	-	0	At once	3094
L5-12	Input source of binary selector module 5	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3381
L5-13	Input 1 of binary selector module 5	0: Invalid Other: B connector	-	0	At once	3385
L5-14	Input 2 of binary selector module 5	0: Invalid Other: B connector	-	0	At once	3389

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L5-15	Input source of binary selector module 6	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3382
L5-16	Input 1 of binary selector module 6	0: Invalid Other: B connector	-	0	At once	3386
L5-17	Input 2 of binary selector module 6	0: Invalid Other: B connector	-	0	At once	3390
L5-18	Input source of binary selector module 7	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3383
L5-19	Input 1 of binary selector module 7	0: Invalid Other: B connector	-	0	At once	3387
L5-20	Input 2 of binary selector module 7	0: Invalid Other: B connector	-	0	At once	3391
L5-21	Input source of binary selector module 8	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3384
L5-22	Input 1 of binary selector module 8	0: Invalid Other: B connector	-	0	At once	3388
L5-23	Input 2 of binary selector module 8	0: Invalid Other: B connector	-	0	At once	3392
L5-30	Input source of numeric switch module 1	0: Input 1 1: Input 2 Other: B connector	-	0	At once	2609
L5-31	Input 1 of numeric switch module 1	0: Invalid Other: K connector	-	0	At once	2611
L5-32	Input 2 of numeric switch module 2	0: Invalid Other: K connector	-	0	At once	2612
L5-33	Input source of numeric switch module 2	0: Input 1 1: Input 2 Other: B connector	-	0	At once	2610
L5-34	Input 1 of numeric switch module 2	0: Invalid Other: K connector	-	0	At once	2613
L5-35	Input 2 of numeric switch module 2	0: Invalid Other: K connector	-	0	At once	2614
L5-36	Input source of numeric switch module 3	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3095
L5-37	Input 1 of numeric switch module 3	0: Invalid Other: K connector	-	0	At once	3097
L5-38	Input 2 of numeric switch module 3	0: Invalid Other: K connector	-	0	At once	3098

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L5-39	Input source of numeric switch module 4	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3096
L5-40	Input 1 of numeric switch module 4	0: Invalid Other: K connector	-	0	At once	3099
L5-41	Input 2 of numeric switch module 4	0: Invalid Other: K connector	-	0	At once	3100
L5-42	Input source of numeric switch module 5	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3393
L5-43	Input 1 of numeric switch module 5	0: Invalid Other: K connector	-	0	At once	3397
L5-44	Input 2 of numeric switch module 5	0: Invalid Other: K connector	-	0	At once	3401
L5-45	Input source of numeric switch module 6	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3394
L5-46	Input 1 of numeric switch module 6	0: Invalid Other: K connector	-	0	At once	3398
L5-47	Input 2 of numeric switch module 6	0: Invalid Other: K connector	-	0	At once	3402
L5-48	Input source of numeric switch module 7	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3395
L5-49	Input 1 of numeric switch module 7	0: Invalid Other: K connector	-	0	At once	3399
L5-50	Input 2 of numeric switch module 7	0: Invalid Other: K connector	-	0	At once	3403
L5-51	Input source of numeric switch module 8	0: Input 1 1: Input 2 Other: B connector	-	0	At once	3396
L5-52	Input 1 of numeric switch module 8	0: Invalid Other: K connector	-	0	At once	3400
L5-53	Input 2 of numeric switch module 8	0: Invalid Other: K connector	-	0	At once	3404
L5-54	Input source of numeric switch module 9	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1085
L5-55	Input 1 of numeric switch module 9	0: Invalid Other: K connector	-	0	At once	1089
L5-56	Input 2 of numeric switch module 9	0: Invalid Other: K connector	-	0	At once	1093

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L5-57	Input source of numeric switch module 10	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1086
L5-58	Input 1 of numeric switch module 10	0: Invalid Other: K connector	-	0	At once	1090
L5-59	Input 2 of numeric switch module 10	0: Invalid Other: K connector	-	0	At once	1094
L5-60	Input source of numeric switch module 11	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1087
L5-61	Input 1 of numeric switch module 11	0: Invalid Other: K connector	-	0	At once	1091
L5-62	Input 2 of numeric switch module 11	0: Invalid Other: K connector	-	0	At once	1095
L5-63	Input source of numeric switch module 12	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1088
L5-64	Input 1 of numeric switch module 12	0: Invalid Other: K connector	-	0	At once	1092
L5-65	Input 2 of numeric switch module 12	0: Invalid Other: K connector	-	0	At once	1096
L5-66	Input source of numeric switch module 13	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1069
L5-67	Input 1 of numeric switch module 13	0: Invalid Other: K connector	-	0	At once	1073
L5-68	Input 2 of numeric switch module 13	0: Invalid Other: K connector	-	0	At once	1077
L5-69	Input source of numeric switch module 14	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1070
L5-70	Input 1 of numeric switch module 14	0: Invalid Other: K connector	-	0	At once	1074
L5-71	Input 2 of numeric switch module 14	0: Invalid Other: K connector	-	0	At once	1078
L5-72	Input source of numeric switch module 15	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1071
L5-73	Input 1 of numeric switch module 15	0: Invalid Other: K connector	-	0	At once	1075
L5-74	Input 2 of numeric switch module 15	0: Invalid Other: K connector	-	0	At once	1079

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L5-75	Input source of numeric switch module 16	0: Input 1 1: Input 2 Other: B connector	-	0	At once	1072
L5-76	Input 1 of numeric switch module 16	0: Invalid Other: K connector	-	0	At once	1076
L5-77	Input 2 of numeric switch module 16	0: Invalid Other: K connector	-	0	At once	1080
Group L6: Control function block						
L6-00	Function selection of filter module A	0: Invalid 1: Valid Other: B connector	-	1	At once	2615
L6-01	Input of filter module A	0: Invalid Other: K connector	-	0	At once	2619
L6-02	Filter time of filter module A	0.000 to 10.000	s	0	At once	2623
L6-03	Function selection of filter module B	0: Invalid 1: Valid Other: B connector	-	1	At once	2616
L6-04	Input of filter module B	0: Invalid Other: K connector	-	0	At once	2620
L6-05	Filter time of filter module B	0.000 to 10.000	s	0	At once	2624
L6-06	Function selection of filter module C	0: Invalid 1: Valid Other: B connector	-	1	At once	2617
L6-07	Input of filter module C	0: Invalid Other: K connector	-	0	At once	2621
L6-08	Filter time of filter module C	0.000 to 10.000	s	0	At once	2625
L6-09	Function selection of filter module D	0: Invalid 1: Valid Other: B connector	-	1	At once	2618
L6-10	Input of filter module D	0: Invalid Other: K connector	-	0	At once	2622
L6-11	Filter time of filter module D	0.000 to 10.000	s	0	At once	2626
L6-12	Function of level-pulse conversion module A	0: Level to pulse 1: Pulse to level	-	0	At once	2627
L6-13	Input of level-pulse conversion module A	0: Invalid Other: B connector	-	0	At once	2631

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L6-14	Pulse output time of level-to-pulse conversion module A	0.00 to 600.00	s	0.1	At once	2635
L6-15	Function of level-pulse conversion module B	0: Level to pulse 1: Pulse to level	-	0	At once	2628
L6-16	Input of level-pulse conversion module B	0: Invalid Other: B connector	-	0	At once	2632
L6-17	Pulse output time of level-to-pulse conversion module B	0.00 to 600.00	s	0.1	At once	2636
L6-18	Function of level-pulse conversion module C	0: Level to pulse 1: Pulse to level	-	0	At once	2629
L6-19	Input of level-pulse conversion module C	0: Invalid Other: B connector	-	0	At once	2633
L6-20	Pulse output time of level-to-pulse conversion module C	0.00 to 600.00	s	0.1	At once	2637
L6-21	Function of level-pulse conversion module D	0: Level to pulse 1: Pulse to level	-	0	At once	2630
L6-22	Input of level-pulse conversion module D	0: Invalid Other: B connector	-	0	At once	2634
L6-23	Pulse output time of level-to-pulse conversion module D	0.00 to 600.00	s	0.1	At once	2638
L6-24	Input of logic delay module A	0: Invalid Other: B connector	-	0	At once	2395
L6-25	Function selection of logic delay module A	0: Switch-on delay 1: Switch-off delay 2: Bidirectional delay	-	0	At once	2399
L6-26	Delay time of logic delay module A	0 to 60000	-	0	At once	2403

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L6-27	Time unit of logic delay module A	0: 0.01s 1: 0.1s 2: 1s	-	0	At once	1620
L6-28	Input of logic delay module B	0: Invalid Other: B connector	-	0	At once	2396
L6-29	Function selection of logic delay module B	0: Switch-on delay 1: Switch-off delay 2: Bidirectional delay	-	0	At once	2400
L6-30	Delay time of logic delay module B	0 to 60000	-	0	At once	2404
L6-31	Time unit of logic delay module B	0: 0.01s 1: 0.1s 2: 1s	-	0	At once	1621
L6-32	Input of logic delay module C	0: Invalid Other: B connector	-	0	At once	2397
L6-33	Function selection of logic delay module C	0: Switch-on delay 1: Switch-off delay 2: Bidirectional delay	-	0	At once	2401
L6-34	Delay time of logic delay module C	0 to 60000	-	0	At once	2405
L6-35	Time unit of logic delay module C	0: 0.01s 1: 0.1s 2: 1s	-	0	At once	1622
L6-36	Input of logic delay module D	0: Invalid Other: B connector	-	0	At once	2398
L6-37	Function selection of logic delay module D	0: Switch-on delay 1: Switch-off delay 2: Bidirectional delay	-	0	At once	2402
L6-38	Delay time of logic delay module D	0 to 60000	-	0	At once	2406
L6-39	Time unit of logic delay module D	0: 0.01s 1: 0.1s 2: 1s	-	0	At once	1623
Group L7: Arithmetic function block						
L7-00	Input of absolute value module A	0: Invalid Other: K connector	-	0	At once	2639
L7-01	Input of absolute value module B	0: Invalid Other: K connector	-	0	At once	2640
L7-02	Input of absolute value module C	0: Invalid Other: K connector	-	0	At once	2641

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L7-03	Input of absolute value module D	0: Invalid Other: K connector	-	0	At once	2642
L7-04	Input 1 of addition and subtraction module A (ADD)	0: Invalid Other: K connector	-	0	At once	2643
L7-05	Input 2 of addition and subtraction module A (ADD)	0: Invalid Other: K connector	-	0	At once	2644
L7-06	Input 3 of addition and subtraction module A (ADD)	0: Invalid Other: K connector	-	0	At once	2645
L7-07	Input 4 of addition and subtraction module A (SUB-TRACT)	0: Invalid Other: K connector	-	0	At once	2646
L7-08	Input 1 of addition and subtraction module B (ADD)	0: Invalid Other: K connector	-	0	At once	2647
L7-09	Input 2 of addition and subtraction module B (ADD)	0: Invalid Other: K connector	-	0	At once	2648
L7-10	Input 3 of addition and subtraction module B (ADD)	0: Invalid Other: K connector	-	0	At once	2649
L7-11	Input 4 of addition and subtraction module B (SUB-TRACT)	0: Invalid Other: K connector	-	0	At once	2650
L7-12	Input 1 of addition and subtraction module C (ADD)	0: Invalid Other: K connector	-	0	At once	2651
L7-13	Input 2 of addition and subtraction module C (ADD)	0: Invalid Other: K connector	-	0	At once	2652
L7-14	Input 3 of addition and subtraction module C (ADD)	0: Invalid Other: K connector	-	0	At once	2653
L7-15	Input 4 of addition and subtraction module C (SUB-TRACT)	0: Invalid Other: K connector	-	0	At once	2654
L7-16	Input 1 of addition and subtraction module D (ADD)	0: Invalid Other: K connector	-	0	At once	2655

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L7-17	Input 2 of addition and subtraction module D (ADD)	0: Invalid Other: K connector	-	0	At once	2656
L7-18	Input 3 of addition and subtraction module D (ADD)	0: Invalid Other: K connector	-	0	At once	2657
L7-19	Input 4 of addition and subtraction module D (SUBTRACT)	0: Invalid Other: K connector	-	0	At once	2658
L7-20	Input 1 of multiplication and division module A (MULTIPLY)	0: Prohibited by module Other: K connector	-	0	At once	2659
L7-21	Input 2 of multiplication and division module A (MULTIPLY)	0: Not used for calculation Other: K connector	-	0	At once	2660
L7-22	Input 3 of multiplication and division module A (DIVIDE)	0: Not used for calculation Other: K connector	-	0	At once	2661
L7-23	Input 1 of multiplication and division module B (MULTIPLY)	0: Prohibited by module Other: K connector	-	0	At once	2662
L7-24	Input 2 of multiplication and division module B (MULTIPLY)	0: Not used for calculation Other: K connector	-	0	At once	2663
L7-25	Input 3 of multiplication and division module B (DIVIDE)	0: Not used for calculation Other: K connector	-	0	At once	2664
L7-26	Input 1 of multiplication and division module C (MULTIPLY)	0: Prohibited by module Other: K connector	-	0	At once	2665
L7-27	Input 2 of multiplication and division module C (MULTIPLY)	0: Not used for calculation Other: K connector	-	0	At once	2666
L7-28	Input 3 of multiplication and division module C (DIVIDE)	0: Not used for calculation Other: K connector	-	0	At once	2667

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L7-29	Input 1 of multiplication and division module D (MULTIPLY)	0: Prohibited by module Other: K connector	-	0	At once	2668
L7-30	Input 2 of multiplication and division module D (MULTIPLY)	0: Not used for calculation Other: K connector	-	0	At once	2669
L7-31	Input 3 of multiplication and division module D (DIVIDE)	0: Not used for calculation Other: K connector	-	0	At once	2670
L7-32	Function of comparison module A	0: Greater than (>) 1: Lower than (<) 2: Equal to (=)	-	0	At once	2671
L7-33	Input 1 of comparison module A	0: 0 Other: K connector	-	0	At once	2673
L7-34	Input 2 of comparison module A	0: 0 Other: K connector	-	0	At once	2674
L7-35	Hysteresis input of comparison module A	0.0 to 100.0	%	0	At once	2675
L7-36	Function of comparison module B	0: Greater than (>) 1: Lower than (<) 2: Equal to (=)	-	0	At once	2672
L7-37	Input 1 of comparison module B	0: 0 Other: K connector	-	0	At once	2676
L7-38	Input 2 of comparison module B	0: 0 Other: K connector	-	0	At once	2677
L7-39	Hysteresis input of comparison module B	0.0 to 100.0	%	0	At once	2678
L7-40	Function of comparison module C	0: Greater than (>) 1: Lower than (<) 2: Equal to (=)	-	0	At once	3101
L7-41	Input 1 of comparison module C	0: 0 Other: K connector	-	0	At once	3103
L7-42	Input 2 of comparison module C	0: 0 Other: K connector	-	0	At once	3104
L7-43	Hysteresis input of comparison module C	0.0 to 100.0	%	0	At once	3105

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L7-44	Function of comparison module D	0: Greater than (> 1: Lower than (< 2: Equal to (=)	-	0	At once	3102
L7-45	Input 1 of comparison module D	0: 0 Other: K connector	-	0	At once	3106
L7-46	Input 2 of comparison module D	0: 0 Other: K connector	-	0	At once	3107
L7-47	Hysteresis input of comparison module D	0.0 to 100.0	%	0	At once	3108
L7-48	Function of comparison module E	0: Input 1 > Input 2 1: Input 1 < Input 2 2: Input 1 = Input 2	-	0	At once	3417
L7-49	Input 1 of comparison module E	0: Invalid Other: K connector	-	0	At once	3421
L7-50	Input 2 of comparison module E	0: Invalid Other: K connector	-	0	At once	3425
L7-51	Hysteresis input of comparison module E	0.0 to 100.0	%	0	At once	3341
L7-60	Input of limiting module A	0: Invalid Other: K connector	-	0	At once	3405
L7-61	Upper limit of limiting module A	0: Invalid Other: K connector	-	0	At once	3409
L7-62	Lower limit of limiting module A	0: Invalid Other: K connector	-	0	At once	3413
L7-63	Input of limiting module B	0: Invalid Other: K connector	-	0	At once	3406
L7-64	Upper limit of limiting module B	0: Invalid Other: K connector	-	0	At once	3410
L7-65	Lower limit of limiting module B	0: Invalid Other: K connector	-	0	At once	3414
L7-66	Input of limiting module C	0: Invalid Other: K connector	-	0	At once	3407
L7-67	Upper limit of limiting module C	0: Invalid Other: K connector	-	0	At once	3411
L7-68	Lower limit of limiting module C	0: Invalid Other: K connector	-	0	At once	3415
L7-69	Input of limiting module D	0: Invalid Other: K connector	-	0	At once	3408
L7-70	Upper limit of limiting module D	0: Invalid Other: K connector	-	0	At once	3412

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L7-71	Lower limit of limiting module D	0: Invalid Other: K connector	-	0	At once	3416
Group L8: Multi-point curve module						
L8-00	Input of multi-point curve module A	0: Module disabled Other: K connector	-	0	At once	2770
L8-01	Setpoint X1 of multi-point curve module A	-600.0 to +600.0	%	0	At once	2771
L8-02	Setpoint Y1 of multi-point curve module A	-600.0 to +600.0	%	0	At once	2781
L8-03	Setpoint X2 of multi-point curve module A	-600.0 to +600.0	%	10	At once	2772
L8-04	Setpoint Y2 of multi-point curve module A	-600.0 to +600.0	%	10	At once	2782
L8-05	Setpoint X3 of multi-point curve module A	-600.0 to +600.0	%	20	At once	2773
L8-06	Setpoint Y3 of multi-point curve module A	-600.0 to +600.0	%	20	At once	2783
L8-07	Setpoint X4 of multi-point curve module A	-600.0 to +600.0	%	30	At once	2774
L8-08	Setpoint Y4 of multi-point curve module A	-600.0 to +600.0	%	30	At once	2784
L8-09	Setpoint X5 of multi-point curve module A	-600.0 to +600.0	%	40	At once	2775
L8-10	Setpoint Y5 of multi-point curve module A	-600.0 to +600.0	%	40	At once	2785
L8-11	Setpoint X6 of multi-point curve module A	-600.0 to +600.0	%	50	At once	2776
L8-12	Setpoint Y6 of multi-point curve module A	-600.0 to +600.0	%	50	At once	2786

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L8-13	Setpoint X7 of multi-point curve module A	-600.0 to +600.0	%	60	At once	2777
L8-14	Setpoint Y7 of multi-point curve module A	-600.0 to +600.0	%	60	At once	2787
L8-15	Setpoint X8 of multi-point curve module A	-600.0 to +600.0	%	70	At once	2778
L8-16	Setpoint Y8 of multi-point curve module A	-600.0 to +600.0	%	70	At once	2788
L8-17	Setpoint X9 of multi-point curve module A	-600.0 to +600.0	%	80	At once	2779
L8-18	Setpoint Y9 of multi-point curve module A	-600.0 to +600.0	%	80	At once	2789
L8-19	Setpoint X10 of multi-point curve module A	-600.0 to +600.0	%	90	At once	2780
L8-20	Setpoint Y10 of multi-point curve module A	-600.0 to +600.0	%	90	At once	2790
L8-21	Input of multi-point curve module B	0: Module disabled Other: K connector	-	0	At once	2791
L8-22	Setpoint X1 of multi-point curve module B	-600.0 to +600.0	%	0	At once	2792
L8-23	Setpoint Y1 of multi-point curve module B	-600.0 to +600.0	%	0	At once	2802
L8-24	Setpoint X2 of multi-point curve module B	-600.0 to +600.0	%	10	At once	2793
L8-25	Setpoint Y2 of multi-point curve module B	-600.0 to +600.0	%	10	At once	2803
L8-26	Setpoint X3 of multi-point curve module B	-600.0 to +600.0	%	20	At once	2794

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L8-27	Setpoint Y3 of multi-point curve module B	-600.0 to +600.0	%	20	At once	2804
L8-28	Setpoint X4 of multi-point curve module B	-600.0 to +600.0	%	30	At once	2795
L8-29	Setpoint Y4 of multi-point curve module B	-600.0 to +600.0	%	30	At once	2805
L8-30	Setpoint X5 of multi-point curve module B	-600.0 to +600.0	%	40	At once	2796
L8-31	Setpoint Y5 of multi-point curve module B	-600.0 to +600.0	%	40	At once	2806
L8-32	Setpoint X6 of multi-point curve module B	-600.0 to +600.0	%	50	At once	2797
L8-33	Setpoint Y6 of multi-point curve module B	-600.0 to +600.0	%	50	At once	2807
L8-34	Setpoint X7 of multi-point curve module B	-600.0 to +600.0	%	60	At once	2798
L8-35	Setpoint Y7 of multi-point curve module B	-600.0 to +600.0	%	60	At once	2808
L8-36	Setpoint X8 of multi-point curve module B	-600.0 to +600.0	%	70	At once	2799
L8-37	Setpoint Y8 of multi-point curve module B	-600.0 to +600.0	%	70	At once	2809
L8-38	Setpoint X9 of multi-point curve module B	-600.0 to +600.0	%	80	At once	2800
L8-39	Setpoint Y9 of multi-point curve module B	-600.0 to +600.0	%	80	At once	2810
L8-40	Setpoint X10 of multi-point curve module B	-600.0 to +600.0	%	90	At once	2801

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L8-41	Setpoint Y10 of multi-point curve module B	-600.0 to +600.0	%	90	At once	2811
Group L9: Constant setting module						
L9-00	Constant setpoint 1 (U7-85)	-600.0 to +600.0	%	0	At once	3429
L9-01	Constant setpoint 2 (U7-86)	-600.0 to +600.0	%	0	At once	3430
L9-02	Constant setpoint 3 (U7-87)	-600.0 to +600.0	%	0	At once	3431
L9-03	Constant setpoint 4 (U7-88)	-600.0 to +600.0	%	0	At once	3432
L9-04	Constant setpoint 5 (U7-89)	-600.0 to +600.0	%	0	At once	3433
L9-05	Constant setpoint 6 (U9-51)	-300.00 to +300.00	%	0	At once	3434
L9-06	Constant setpoint 7 (U9-52)	-300.00 to +300.00	%	0	At once	3435
L9-07	Constant setpoint 8 (U9-53)	-300.00 to +300.00	%	0	At once	3436
L9-08	Constant setpoint 9 (U9-54)	-300.00 to +300.00	%	0	At once	3437
L9-09	Constant setpoint 10 (U9-55)	-300.00 to +300.00	%	0	At once	3438
L9-10	Constant setpoint 11 (U15-80)	0 to 65535	-	0	At once	1708
L9-11	Base value of constant setpoint 11	0 to 65535	-	0	At once	1097
L9-12	Constant setpoint 12 (U15-81)	0 to 65535	-	0	At once	1709
L9-13	Base value of constant setpoint 12	0 to 65535	-	0	At once	1098
L9-14	Constant setpoint 13 (U15-82)	0 to 65535	-	0	At once	1710
L9-15	Base value of constant setpoint 13	0 to 65535	-	0	At once	1099
L9-16	Constant setpoint 14 (U15-83)	0 to 65535	-	0	At once	1711
L9-17	Base value of constant setpoint 14	0 to 65535	-	0	At once	1100
L9-18	Constant setpoint 15 (U15-84)	0 to 65535	-	0	At once	1712

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L9-19	Base value of constant setpoint 15	0 to 65535	-	0	At once	1101
L9-20	Constant setpoint 16 (U15-85)	0 to 65535	-	0	At once	1713
L9-21	Base value of constant setpoint 16	0 to 65535	-	0	At once	1102
L9-22	Constant setpoint 17 (U15-86)	0 to 65535	-	0	At once	1714
L9-23	Base value of constant setpoint 17	0 to 65535	-	0	At once	1103
L9-24	Constant setpoint 18 (U15-87)	0 to 65535	-	0	At once	1715
L9-25	Base value of constant setpoint 18	0 to 65535	-	0	At once	1104
L9-26	Constant setpoint 19 (U15-88)	0 to 65535	-	0	At once	1716
L9-27	Base value of constant setpoint 19	0 to 65535	-	0	At once	1105
L9-28	Constant setpoint 20 (U15-89)	0 to 65535	-	0	At once	1717
L9-29	Base value of constant setpoint 20	0 to 65535	-	0	At once	1106
L9-30	Constant setpoint 21 (U15-90)	-32768 to +32767	-	0	At once	1718
L9-31	Base value of constant setpoint 21	0 to 65535	-	0	At once	1107
L9-32	Constant setpoint 22 (U15-91)	-32768 to +32767	-	0	At once	1719
L9-33	Base value of constant setpoint 22	0 to 65535	-	0	At once	1108
L9-34	Constant setpoint 23 (U15-92)	-32768 to +32767	-	0	At once	1720
L9-35	Base value of constant setpoint 23	0 to 65535	-	0	At once	1109
L9-36	Constant setpoint 24 (U15-93)	-32768 to +32767	-	0	At once	1721
L9-37	Base value of constant setpoint 24	0 to 65535	-	0	At once	1110
L9-38	Constant setpoint 25 (U15-94)	-32768 to +32767	-	0	At once	1722
L9-39	Base value of constant setpoint 25	0 to 65535	-	0	At once	1111

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L9-40	Constant setpoint 26 (U15-95)	-32768 to +32767	-	0	At once	1723
L9-41	Base value of constant setpoint 26	0 to 65535	-	0	At once	1112
L9-42	Constant setpoint 27 (U15-96)	-32768 to +32767	-	0	At once	1724
L9-43	Base value of constant setpoint 27	0 to 65535	-	0	At once	1113
L9-44	Constant setpoint 28 (U15-97)	-32768 to +32767	-	0	At once	1725
L9-45	Base value of constant setpoint 28	0 to 65535	-	0	At once	1114
L9-46	Constant setpoint 29 (U15-98)	-32768 to +32767	-	0	At once	1726
L9-47	Base value of constant setpoint 29	0 to 65535	-	0	At once	1115
L9-48	Constant setpoint 30 (U15-99)	-32768 to +32767	-	0	At once	1727
L9-49	Base value of constant setpoint 30	0 to 65535	-	0	At once	1116
L9-50	Constant setpoint 31 (U15-70)	-32768 to +32767	-	0	At once	981
L9-51	Base value of constant setpoint 31	0 to 65535	-	0	At once	991
L9-52	Constant setpoint 32 (U15-71)	-32768 to +32767	-	0	At once	982
L9-53	Base value of constant setpoint 32	0 to 65535	-	0	At once	992
L9-54	Constant setpoint 33 (U15-72)	-32768 to +32767	-	0	At once	983
L9-55	Base value of constant setpoint 33	0 to 65535	-	0	At once	993
L9-56	Constant setpoint 34 (U15-73)	-32768 to +32767	-	0	At once	984
L9-57	Base value of constant setpoint 34	0 to 65535	-	0	At once	994
L9-58	Constant setpoint 35 (U15-74)	-32768 to +32767	-	0	At once	985
L9-59	Base value of constant setpoint 35	0 to 65535	-	0	At once	995
L9-60	Constant setpoint 36 (U15-75)	-32768 to +32767	-	0	At once	986

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L9-61	Base value of constant setpoint 36	0 to 65535	-	0	At once	996
L9-62	Constant setpoint 37 (U15-76)	-32768 to +32767	-	0	At once	987
L9-63	Base value of constant setpoint 37	0 to 65535	-	0	At once	997
L9-64	Constant setpoint 38 (U15-77)	-32768 to +32767	-	0	At once	988
L9-65	Base value of constant setpoint 38	0 to 65535	-	0	At once	998
L9-66	Constant setpoint 39 (U15-78)	-32768 to +32767	-	0	At once	989
L9-67	Base value of constant setpoint 39	0 to 65535	-	0	At once	999
L9-68	Constant setpoint 40 (U15-79)	-32768 to +32767	-	0	At once	990
L9-69	Base value of constant setpoint 40	0 to 65535	-	0	At once	1000
Group L10: Parameter monitoring and modification						
L10-00	Parameter monitoring parameter address 1	0 to 65535	-	0	At once	3067
L10-01	Parameter monitoring parameter address 2	0 to 65535	-	0	At once	3068
L10-02	Parameter monitoring parameter address 3	0 to 65535	-	0	At once	3069
L10-03	Parameter monitoring parameter address 4	0 to 65535	-	0	At once	3070
L10-04	Parameter monitoring parameter address 5	0 to 65535	-	0	At once	3071
L10-05	Parameter monitoring parameter address 6	0 to 65535	-	0	At once	3072
L10-06	Parameter monitoring parameter address 7	0 to 65535	-	0	At once	3073

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L10-07	Parameter monitoring parameter address 8	0 to 65535	-	0	At once	3074
L10-08	Parameter monitoring parameter address 9	0 to 65535	-	0	At once	3075
L10-09	Parameter monitoring parameter address 10	0 to 65535	-	0	At once	3076
L10-16	Parameter mapping modification save EEPROM		-	0	At once	3303
L10-17	Modification range overlimit		-	0	At once	3304
L10-18	Parameter mapping modification parameter address 1	0 to 65535	-	0	At once	3305
L10-19	Parameter mapping modification source 1	0: Invalid Other: K connector	-	0	At once	3321
L10-20	Parameter mapping modification parameter address 2	0 to 65535	-	0	At once	3306
L10-21	Parameter mapping modification source 2	0: Invalid Other: K connector	-	0	At once	3322
L10-22	Parameter mapping modification parameter address 3	0 to 65535	-	0	At once	3307
L10-23	Parameter mapping modification source 3	0: Invalid Other: K connector	-	0	At once	3323
L10-24	Parameter mapping modification parameter address 4	0 to 65535	-	0	At once	3308
L10-25	Parameter mapping modification source 4	0: Invalid Other: K connector	-	0	At once	3324

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L10-26	Parameter mapping modification parameter address 5	0 to 65535	-	0	At once	3309
L10-27	Parameter mapping modification source 5	0: Invalid Other: K connector	-	0	At once	3325
L10-28	Parameter mapping modification parameter address 6	0 to 65535	-	0	At once	3310
L10-29	Parameter mapping modification source 6	0: Invalid Other: K connector	-	0	At once	3326
L10-30	Parameter mapping modification parameter address 7	0 to 65535	-	0	At once	3311
L10-31	Parameter mapping modification source 7	0: Invalid Other: K connector	-	0	At once	3327
L10-32	Parameter mapping modification parameter address 8	0 to 65535	-	0	At once	3312
L10-33	Parameter mapping modification source 8	0: Invalid Other: K connector	-	0	At once	3328
L10-34	Parameter mapping modification parameter address 9	0 to 65535	-	0	At once	3313
L10-35	Parameter mapping modification source 9	0: Invalid Other: K connector	-	0	At once	3329
L10-36	Parameter mapping modification parameter address 10	0 to 65535	-	0	At once	3314
L10-37	Parameter mapping modification source 10	0: Invalid Other: K connector	-	0	At once	3330

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L10-38	Parameter mapping modification parameter address 11	0 to 65535	-	0	At once	3315
L10-39	Parameter mapping modification source 11	0: Invalid Other: K connector	-	0	At once	3331
L10-40	Parameter mapping modification parameter address 12	0 to 65535	-	0	At once	3316
L10-41	Parameter mapping modification source 12	0: Invalid Other: K connector	-	0	At once	3332
L10-42	Parameter mapping modification parameter address 13	0 to 65535	-	0	At once	3317
L10-43	Parameter mapping modification source 13	0: Invalid Other: K connector	-	0	At once	3333
L10-44	Parameter mapping modification parameter address 14	0 to 65535	-	0	At once	3318
L10-45	Parameter mapping modification source 14	0: Invalid Other: K connector	-	0	At once	3334
L10-46	Parameter mapping modification parameter address 15	0 to 65535	-	0	At once	3319
L10-47	Parameter mapping modification source 15	0: Invalid Other: K connector	-	0	At once	3335
L10-48	Parameter mapping modification parameter address 16	0 to 65535	-	0	At once	3320
L10-49	Parameter mapping modification source 16	0: Invalid Other: K connector	-	0	At once	3336
Group L11: Arithmetic function block 2						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L11-00	Calculation method of proportion module		-	0	At once	2043
L11-01	Data type of numerical value source (raw value method)		-	0	At once	2044
L11-02	Numerical value source input 1 of proportion module 1	0: Invalid Other: K connector	-	0	At once	1998
L11-03	Input 2 of proportion module 1 (MULTIPLY)	-32768 to +32767	-	1	At once	2008
L11-04	Input 3 of proportion module 1 (DIVIDE)	1 to 65535	-	1	At once	2018
L11-05	Numerical value source input 1 of proportion module 2	0: Invalid Other: K connector	-	0	At once	1999
L11-06	Input 2 of proportion module 2 (MULTIPLY)	-32768 to +32767	-	1	At once	2009
L11-07	Input 3 of proportion module 2 (DIVIDE)	1 to 65535	-	1	At once	2019
L11-08	Numerical value source input 1 of proportion module 3	0: Invalid Other: K connector	-	0	At once	2000
L11-09	Input 2 of proportion module 3 (MULTIPLY)	-32768 to +32767	-	1	At once	2010
L11-10	Input 3 of proportion module 3 (DIVIDE)	1 to 65535	-	1	At once	2020
L11-11	Numerical value source input 1 of proportion module 4	0: Invalid Other: K connector	-	0	At once	2001
L11-12	Input 2 of proportion module 4 (MULTIPLY)	-32768 to +32767	-	1	At once	2011

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L11-13	Input 3 of proportion module 4 (DIVIDE)	1 to 65535	-	1	At once	2021
L11-14	Numerical value source input 1 of proportion module 5	0: Invalid Other: K connector	-	0	At once	2002
L11-15	Input 2 of proportion module 5 (MULTIPLY)	-32768 to +32767	-	1	At once	2012
L11-16	Input 3 of proportion module 5 (DIVIDE)	1 to 65535	-	1	At once	2022
L11-17	Numerical value source input 1 of proportion module 6	0: Invalid Other: K connector	-	0	At once	2003
L11-18	Input 2 of proportion module 6 (MULTIPLY)	-32768 to +32767	-	1	At once	2013
L11-19	Input 3 of proportion module 6 (DIVIDE)	1 to 65535	-	1	At once	2023
L11-20	Numerical value source input 1 of proportion module 7	0: Invalid Other: K connector	-	0	At once	2004
L11-21	Input 2 of proportion module 7 (MULTIPLY)	-32768 to +32767	-	1	At once	2014
L11-22	Input 3 of proportion module 7 (DIVIDE)	1 to 65535	-	1	At once	2024
L11-23	Numerical value source input 1 of proportion module 8	0: Invalid Other: K connector	-	0	At once	2005
L11-24	Input 2 of proportion module 8 (MULTIPLY)	-32768 to +32767	-	1	At once	2015
L11-25	Input 3 of proportion module 8 (DIVIDE)	1 to 65535	-	1	At once	2025

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L11-26	Numerical value source input 1 of proportion module 9	0: Invalid Other: K connector	-	0	At once	2006
L11-27	Input 2 of proportion module 9 (MULTIPLY)	-32768 to +32767	-	1	At once	2016
L11-28	Input 3 of proportion module 9 (DIVIDE)	1 to 65535	-	1	At once	2026
L11-29	Numerical value source input 1 of proportion module 10	0: Invalid Other: K connector	-	0	At once	2007
L11-30	Input 2 of proportion module 10 (MULTIPLY)	-32768 to +32767	-	1	At once	2017
L11-31	Input 3 of proportion module 10 (DIVIDE)	1 to 65535	-	1	At once	2027
L11-32	Numerical value source input 1 of proportion module 11	0: Invalid Other: K connector	-	0	At once	2028
L11-33	Input 2 of proportion module 11 (MULTIPLY)	-32768 to +32767	-	1	At once	2033
L11-34	Input 3 of proportion module 11 (DIVIDE)	1 to 65535	-	1	At once	2038
L11-35	Numerical value source input 1 of proportion module 12	0: Invalid Other: K connector	-	0	At once	2029
L11-36	Input 2 of proportion module 12 (MULTIPLY)	-32768 to +32767	-	1	At once	2034
L11-37	Input 3 of proportion module 12 (DIVIDE)	1 to 65535	-	1	At once	2039
L11-38	Numerical value source input 1 of proportion module 13	0: Invalid Other: K connector	-	0	At once	2030

Para.	Name	Value Range	Unit	Default	Change Mode	Address
L11-39	Input 2 of proportion module 13 (MULTIPLY)	-32768 to +32767	-	1	At once	2035
L11-40	Input 3 of proportion module 13 (DIVIDE)	1 to 65535	-	1	At once	2040
L11-41	Numerical value source input 1 of proportion module 14	0: Invalid Other: K connector	-	0	At once	2031
L11-42	Input 2 of proportion module 14 (MULTIPLY)	-32768 to +32767	-	1	At once	2036
L11-43	Input 3 of proportion module 14 (DIVIDE)	1 to 65535	-	1	At once	2041
L11-44	Numerical value source input 1 of proportion module 15	0: Invalid Other: K connector	-	0	At once	2032
L11-45	Input 2 of proportion module 15 (MULTIPLY)	-32768 to +32767	-	1	At once	2037
L11-46	Input 3 of proportion module 15 (DIVIDE)	1 to 65535	-	1	At once	2042

Group n: Fieldbus Adapter and Expansion Module

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group n0: InoLink communication						
n0-00	InoLink communication enable	0: Disabled 1: Enabled Other: B connector	-	0	At once	1377
n0-01	Current node address	0 to 16	-	0	At once	1378

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n0-02	Receive data 1 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2175
n0-03	Receive data 1 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1379
n0-04	Receive data 2 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2176

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n0-05	Receive data 2 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1380
n0-06	Receive data 3 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2177
n0-07	Receive data 3 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1381

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n0-08	Receive data 4 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2178
n0-09	Receive data 4 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1382
n0-10	Receive data 5 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2179

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n0-11	Receive data 5 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1383
n0-12	Receive data 6 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2180
n0-13	Receive data 6 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1384

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n0-14	Receive data 7 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2181
n0-15	Receive data 7 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1385
n0-16	Receive data 8 source node	0: Invalid 1: Node 1 2: Node 2 3: Node 3 4: Node 4 5: Node 5 6: Node 6 7: Node 7 8: Node 8 9: Node 9 10: Node 10 11: Node 11 12: Node 12 13: Node 13 14: Node 14 15: Node 15 16: Node 16	-	0	At once	2182

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n0-17	Receive data 8 data selection	1: Data 1 2: Data 2 3: Data 3 4: Data 4 5: Data 5 6: Data 6 7: Data 7 8: Data 8	-	1	At once	1386
n0-18	Receive data 1 scaling	-8.000 to +8.000	-	1	At once	1387
n0-19	Receive data 2 scaling	-8.000 to +8.000	-	1	At once	1388
n0-20	Receive data 3 scaling	-8.000 to +8.000	-	1	At once	1389
n0-21	Receive data 4 scaling	-8.000 to +8.000	-	1	At once	1390
n0-22	Receive data 5 scaling	-8.000 to +8.000	-	1	At once	1391
n0-23	Receive data 6 scaling	-8.000 to +8.000	-	1	At once	1392
n0-24	Receive data 7 scaling	-8.000 to +8.000	-	1	At once	1393
n0-25	Receive data 8 scaling	-8.000 to +8.000	-	1	At once	1394
n0-26	Send data 1 selection	0: 0 Other: K connector	-	0	At once	1395
n0-27	Send data 2 selection	0: 0 Other: K connector	-	0	At once	1396
n0-28	Send data 3 selection	0: 0 Other: K connector	-	0	At once	1397
n0-29	Send data 4 selection	0: 0 Other: K connector	-	0	At once	1398
n0-30	Send data 5 selection	0: 0 Other: K connector	-	0	At once	1399
n0-31	Send data 6 selection	0: 0 Other: K connector	-	0	At once	1400
n0-32	Send data 7 selection	0: 0 Other: K connector	-	0	At once	1401
n0-33	Send data 8 selection	0: 0 Other: K connector	-	0	At once	1402
Group n1: Fieldbus adapter A						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n1-00	Bus type for fieldbus adapter	0: None 1: Modbus RTU module 2: CANlink module 3: CANopen module 4: Ethernet module 5: EtherCAT module 6: DeviceNet module 7: PROFIBUS DP module 8: PROFINET IO module 9: Customized communication module 10: Reserved 11: Customized communication module 2	-	0	At once	1403
n1-01	Communication disconnection detection delay	0.00 to 60.00	s	0	At once	1404
n1-02	Communication mode for fieldbus adapter	0: Standard mode 1: No fault information Other: B connector	-	0	At once	3907
n1-03	Continuous CRC error detection setting	0 to 5000	-	0	At once	1406
n1-04	Process data output 1	0: 0 Other: K connector	-	0	At once	1407
n1-05	Process data output 2	0: 0 Other: K connector	-	0	At once	1408
n1-06	Process data output 3	0: 0 Other: K connector	-	0	At once	1409
n1-07	Process data output 4	0: 0 Other: K connector	-	0	At once	1410
n1-08	Process data output 5	0: 0 Other: K connector	-	0	At once	1411
n1-09	Process data output 6	0: 0 Other: K connector	-	0	At once	1412
n1-10	Process data output 7	0: 0 Other: K connector	-	0	At once	1413
n1-11	Process data output 8	0: 0 Other: K connector	-	0	At once	1414

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n1-12	Process data output 9	0: 0 Other: K connector	-	0	At once	1415
n1-13	Process data output 10	0: 0 Other: K connector	-	0	At once	1416
n1-14	Process data output 11	0: 0 Other: K connector	-	0	At once	1417
n1-15	Process data output 12	0: 0 Other: K connector	-	0	At once	1418
n1-16	Process data output 13	0: 0 Other: K connector	-	0	At once	1419
n1-17	Process data output 14	0: 0 Other: K connector	-	0	At once	1420
n1-18	Process data output 15	0: 0 Other: K connector	-	0	At once	1421
n1-19	Process data output 16	0: 0 Other: K connector	-	0	At once	1422
n1-20	Communication base value for process data output 1	0 to 65535	-	0	At once	1439
n1-21	Communication base value for process data output 2	0 to 65535	-	0	At once	1440
n1-22	Communication base value for process data output 3	0 to 65535	-	0	At once	1441
n1-23	Communication base value for process data output 4	0 to 65535	-	0	At once	1442
n1-24	Communication base value for process data output 5	0 to 65535	-	0	At once	1443
n1-25	Communication base value for process data output 6	0 to 65535	-	0	At once	1444
n1-26	Communication base value for process data output 7	0 to 65535	-	0	At once	1445
n1-27	Communication base value for process data output 8	0 to 65535	-	0	At once	1446
n1-28	Communication base value for process data output 9	0 to 65535	-	0	At once	1447

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n1-29	Communication base value for process data output 10	0 to 65535	-	0	At once	1448
n1-30	Communication base value for process data output 11	0 to 65535	-	0	At once	1449
n1-31	Communication base value for process data output 12	0 to 65535	-	0	At once	1450
n1-32	Communication base value for process data output 13	0 to 65535	-	0	At once	1451
n1-33	Communication base value for process data output 14	0 to 65535	-	0	At once	1452
n1-34	Communication base value for process data output 15	0 to 65535	-	0	At once	1453
n1-35	Communication base value for process data output 16	0 to 65535	-	0	At once	1454
n1-36	Communication base value for process data input 1	0 to 65535	-	0	At once	1423
n1-37	Communication base value for process data input 2	0 to 65535	-	0	At once	1424
n1-38	Communication base value for process data input 3	0 to 65535	-	0	At once	1425
n1-39	Communication base value for process data input 4	0 to 65535	-	0	At once	1426
n1-40	Communication base value for process data input 5	0 to 65535	-	0	At once	1427
n1-41	Communication base value for process data input 6	0 to 65535	-	0	At once	1428
n1-42	Communication base value for process data input 7	0 to 65535	-	0	At once	1429

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n1-43	Communication base value for process data input 8	0 to 65535	-	0	At once	1430
n1-44	Communication base value for process data input 9	0 to 65535	-	0	At once	1431
n1-45	Communication base value for process data input 10	0 to 65535	-	0	At once	1432
n1-46	Communication base value for process data input 11	0 to 65535	-	0	At once	1433
n1-47	Communication base value for process data input 12	0 to 65535	-	0	At once	1434
n1-48	Communication base value for process data input 13	0 to 65535	-	0	At once	1435
n1-49	Communication base value for process data input 14	0 to 65535	-	0	At once	1436
n1-50	Communication base value for process data input 15	0 to 65535	-	0	At once	1437
n1-51	Communication base value for process data input 16	0 to 65535	-	0	At once	1438
n1-52	Display of process data output 1	0x0000 to 0xFFFF	-	0	Unmodifiable	33823
n1-53	Display of process data output 2	0x0000 to 0xFFFF	-	0	Unmodifiable	33824
n1-54	Display of process data output 3	0x0000 to 0xFFFF	-	0	Unmodifiable	33825
n1-55	Display of process data output 4	0x0000 to 0xFFFF	-	0	Unmodifiable	33826
n1-56	Display of process data output 5	0x0000 to 0xFFFF	-	0	Unmodifiable	33827
n1-57	Display of process data output 6	0x0000 to 0xFFFF	-	0	Unmodifiable	33828
n1-58	Display of process data output 7	0x0000 to 0xFFFF	-	0	Unmodifiable	33829
n1-59	Display of process data output 8	0x0000 to 0xFFFF	-	0	Unmodifiable	33830

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n1-60	Display of process data output 9	0x0000 to 0xFFFF	-	0	Unmodifiable	33831
n1-61	Display of process data output 10	0x0000 to 0xFFFF	-	0	Unmodifiable	33832
n1-62	Display of process data output 11	0x0000 to 0xFFFF	-	0	Unmodifiable	33833
n1-63	Display of process data output 12	0x0000 to 0xFFFF	-	0	Unmodifiable	33834
n1-64	Display of process data output 13	0x0000 to 0xFFFF	-	0	Unmodifiable	33835
n1-65	Display of process data output 14	0x0000 to 0xFFFF	-	0	Unmodifiable	33836
n1-66	Display of process data output 15	0x0000 to 0xFFFF	-	0	Unmodifiable	33837
n1-67	Display of process data output 16	0x0000 to 0xFFFF	-	0	Unmodifiable	33838
n1-68	Display of process data input 1	0x0000 to 0xFFFF	-	0	Unmodifiable	33807
n1-69	Display of process data input 2	0x0000 to 0xFFFF	-	0	Unmodifiable	33808
n1-70	Display of process data input 3	0x0000 to 0xFFFF	-	0	Unmodifiable	33809
n1-71	Display of process data input 4	0x0000 to 0xFFFF	-	0	Unmodifiable	33810
n1-72	Display of process data input 5	0x0000 to 0xFFFF	-	0	Unmodifiable	33811
n1-73	Display of process data input 6	0x0000 to 0xFFFF	-	0	Unmodifiable	33812
n1-74	Display of process data input 7	0x0000 to 0xFFFF	-	0	Unmodifiable	33813
n1-75	Display of process data input 8	0x0000 to 0xFFFF	-	0	Unmodifiable	33814
n1-76	Display of process data input 9	0x0000 to 0xFFFF	-	0	Unmodifiable	33815
n1-77	Display of process data input 10	0x0000 to 0xFFFF	-	0	Unmodifiable	33816
n1-78	Display of process data input 11	0x0000 to 0xFFFF	-	0	Unmodifiable	33817
n1-79	Display of process data input 12	0x0000 to 0xFFFF	-	0	Unmodifiable	33818
n1-80	Display of process data input 13	0x0000 to 0xFFFF	-	0	Unmodifiable	33819

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n1-81	Display of process data input 14	0x0000 to 0xFFFF	-	0	Unmodifiable	33820
n1-82	Display of process data input 15	0x0000 to 0xFFFF	-	0	Unmodifiable	33821
n1-83	Display of process data input 16	0x0000 to 0xFFFF	-	0	Unmodifiable	33822
n1-90	Adapter A mail box write data save selection	0: Do not save to EEPROM 1: Save to EEPROM	-	0	At once	4189
n1-91	Upload of device diagnosis information for adapter A	0: Enabled 1: Disabled	-	1	At once	1809
Group n2: Fieldbus adapter B						
n2-00	Bus type for fieldbus adapter	0: None 1: Modbus RTU module 2: CANlink module 3: CANopen module 4: Ethernet module 5: EtherCAT module 6: DeviceNet module 7: PROFIBUS DP module 8: PROFINET IO module 9: Customized communication module 10: Reserved 11: Customized communication module 2	-	0	At once	1455
n2-01	Communication disconnection detection delay	0.00 to 60.00	s	1	At once	1456
n2-02	Communication mode for fieldbus adapter	0: Standard mode 1: No fault information Other: B connector	-	0	At once	3908
n2-03	Continuous CRC error detection setting	0 to 5000	-	0	At once	1458
n2-04	Process data output 1	0: 0 Other: K connector	-	0	At once	1459

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n2-05	Process data output 2	0: 0 Other: K connector	-	0	At once	1460
n2-06	Process data output 3	0: 0 Other: K connector	-	0	At once	1461
n2-07	Process data output 4	0: 0 Other: K connector	-	0	At once	1462
n2-08	Process data output 5	0: 0 Other: K connector	-	0	At once	1463
n2-09	Process data output 6	0: 0 Other: K connector	-	0	At once	1464
n2-10	Process data output 7	0: 0 Other: K connector	-	0	At once	1465
n2-11	Process data output 8	0: 0 Other: K connector	-	0	At once	1466
n2-12	Process data output 9	0: 0 Other: K connector	-	0	At once	1467
n2-13	Process data output 10	0: 0 Other: K connector	-	0	At once	1468
n2-14	Process data output 11	0: 0 Other: K connector	-	0	At once	1469
n2-15	Process data output 12	0: 0 Other: K connector	-	0	At once	1470
n2-16	Process data output 13	0: 0 Other: K connector	-	0	At once	1471
n2-17	Process data output 14	0: 0 Other: K connector	-	0	At once	1472
n2-18	Process data output 15	0: 0 Other: K connector	-	0	At once	1473
n2-19	Process data output 16	0: 0 Other: K connector	-	0	At once	1474
n2-20	Communication base value for process data output 1	0 to 65535	-	0	At once	1491
n2-21	Communication base value for process data output 2	0 to 65535	-	0	At once	1492
n2-22	Communication base value for process data output 3	0 to 65535	-	0	At once	1493
n2-23	Communication base value for process data output 4	0 to 65535	-	0	At once	1494

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n2-24	Communication base value for process data output 5	0 to 65535	-	0	At once	1495
n2-25	Communication base value for process data output 6	0 to 65535	-	0	At once	1496
n2-26	Communication base value for process data output 7	0 to 65535	-	0	At once	1497
n2-27	Communication base value for process data output 8	0 to 65535	-	0	At once	1498
n2-28	Communication base value for process data output 9	0 to 65535	-	0	At once	1499
n2-29	Communication base value for process data output 10	0 to 65535	-	0	At once	1500
n2-30	Communication base value for process data output 11	0 to 65535	-	0	At once	1501
n2-31	Communication base value for process data output 12	0 to 65535	-	0	At once	1502
n2-32	Communication base value for process data output 13	0 to 65535	-	0	At once	1503
n2-33	Communication base value for process data output 14	0 to 65535	-	0	At once	1504
n2-34	Communication base value for process data output 15	0 to 65535	-	0	At once	1505
n2-35	Communication base value for process data output 16	0 to 65535	-	0	At once	1506
n2-36	Communication base value for process data input 1	0 to 65535	-	0	At once	1475
n2-37	Communication base value for process data input 2	0 to 65535	-	0	At once	1476

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n2-38	Communication base value for process data input 3	0 to 65535	-	0	At once	1477
n2-39	Communication base value for process data input 4	0 to 65535	-	0	At once	1478
n2-40	Communication base value for process data input 5	0 to 65535	-	0	At once	1479
n2-41	Communication base value for process data input 6	0 to 65535	-	0	At once	1480
n2-42	Communication base value for process data input 7	0 to 65535	-	0	At once	1481
n2-43	Communication base value for process data input 8	0 to 65535	-	0	At once	1482
n2-44	Communication base value for process data input 9	0 to 65535	-	0	At once	1483
n2-45	Communication base value for process data input 10	0 to 65535	-	0	At once	1484
n2-46	Communication base value for process data input 11	0 to 65535	-	0	At once	1485
n2-47	Communication base value for process data input 12	0 to 65535	-	0	At once	1486
n2-48	Communication base value for process data input 13	0 to 65535	-	0	At once	1487
n2-49	Communication base value for process data input 14	0 to 65535	-	0	At once	1488
n2-50	Communication base value for process data input 15	0 to 65535	-	0	At once	1489
n2-51	Communication base value for process data input 16	0 to 65535	-	0	At once	1490

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n2-52	Display of process data output 1	0x0000 to 0xFFFF	-	0	Unmodifiable	33855
n2-53	Display of process data output 2	0x0000 to 0xFFFF	-	0	Unmodifiable	33856
n2-54	Display of process data output 3	0x0000 to 0xFFFF	-	0	Unmodifiable	33857
n2-55	Display of process data output 4	0x0000 to 0xFFFF	-	0	Unmodifiable	33858
n2-56	Display of process data output 5	0x0000 to 0xFFFF	-	0	Unmodifiable	33859
n2-57	Display of process data output 6	0x0000 to 0xFFFF	-	0	Unmodifiable	33860
n2-58	Display of process data output 7	0x0000 to 0xFFFF	-	0	Unmodifiable	33861
n2-59	Display of process data output 8	0x0000 to 0xFFFF	-	0	Unmodifiable	33862
n2-60	Display of process data output 9	0x0000 to 0xFFFF	-	0	Unmodifiable	33863
n2-61	Display of process data output 10	0x0000 to 0xFFFF	-	0	Unmodifiable	33864
n2-62	Display of process data output 11	0x0000 to 0xFFFF	-	0	Unmodifiable	33865
n2-63	Display of process data output 12	0x0000 to 0xFFFF	-	0	Unmodifiable	33866
n2-64	Display of process data output 13	0x0000 to 0xFFFF	-	0	Unmodifiable	33867
n2-65	Display of process data output 14	0x0000 to 0xFFFF	-	0	Unmodifiable	33868
n2-66	Display of process data output 15	0x0000 to 0xFFFF	-	0	Unmodifiable	33869
n2-67	Display of process data output 16	0x0000 to 0xFFFF	-	0	Unmodifiable	33870
n2-68	Display of process data input 1	0x0000 to 0xFFFF	-	0	Unmodifiable	33839
n2-69	Display of process data input 2	0x0000 to 0xFFFF	-	0	Unmodifiable	33840
n2-70	Display of process data input 3	0x0000 to 0xFFFF	-	0	Unmodifiable	33841
n2-71	Display of process data input 4	0x0000 to 0xFFFF	-	0	Unmodifiable	33842
n2-72	Display of process data input 5	0x0000 to 0xFFFF	-	0	Unmodifiable	33843

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n2-73	Display of process data input 6	0x0000 to 0xFFFF	-	0	Unmodifiable	33844
n2-74	Display of process data input 7	0x0000 to 0xFFFF	-	0	Unmodifiable	33845
n2-75	Display of process data input 8	0x0000 to 0xFFFF	-	0	Unmodifiable	33846
n2-76	Display of process data input 9	0x0000 to 0xFFFF	-	0	Unmodifiable	33847
n2-77	Display of process data input 10	0x0000 to 0xFFFF	-	0	Unmodifiable	33848
n2-78	Display of process data input 11	0x0000 to 0xFFFF	-	0	Unmodifiable	33849
n2-79	Display of process data input 12	0x0000 to 0xFFFF	-	0	Unmodifiable	33850
n2-80	Display of process data input 13	0x0000 to 0xFFFF	-	0	Unmodifiable	33851
n2-81	Display of process data input 14	0x0000 to 0xFFFF	-	0	Unmodifiable	33852
n2-82	Display of process data input 15	0x0000 to 0xFFFF	-	0	Unmodifiable	33853
n2-83	Display of process data input 16	0x0000 to 0xFFFF	-	0	Unmodifiable	33854
n2-90	Adapter B mail box write data save selection	0: Do not save to EEPROM 1: Save to EEPROM	-	0	At once	4190
n2-91	Upload of device diagnosis information for adapter B	0: Enabled 1: Disabled	-	1	At once	1808
Group n3: Fieldbus adapter C						
n3-00	Function of fieldbus adapter C	0: Bind to HETN-10 1: Bind to fieldbus adapter A 2: Bind to fieldbus adapter B	-	0	At once	1507
n3-03	Adapter C mail box write data save selection	0: Do not save to EEPROM 1: Save to EEPROM	-	0	At once	4191
Group n7: Configuration of HIO module 1						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n7-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	3439
n7-01	Module online/offline state	0: Disabled 1: Expansion module not found 2: Module communication normal	-	0	Unmodifiable	35116
n7-02	Module type	0: Disabled 1: HIO-10 2: HIO-20 3: HIO-30	-	0	At stop	3673
n7-10	Configuration for DIO used as output	0x0000 to 0xFFFF	-	0	Unmodifiable	35167
n7-11	DI/DIO input original status	0x0000 to 0xFFFF	-	0	Unmodifiable	35119
n7-12	DI/DIO input final status	0x0000 to 0xFFFF	-	0	Unmodifiable	35122
n7-13	RO/DIO output set status	0x0000 to 0xFFFF	-	0	Unmodifiable	35290
n7-14	RO/DIO output final status	0x0000 to 0xFFFF	-	0	Unmodifiable	35128
n7-15	AI input status word	0x0000 to 0xFFFF	-	0	Unmodifiable	35125
n7-20	AI1 input value	-327.68 to +327.67	-	0	Unmodifiable	35131
n7-21	AI1 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35245
n7-22	AI2 input value	-327.68 to +327.67	-	0	Unmodifiable	35137
n7-23	AI2 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35248

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n7-24	AI3 input value	-327.68 to +327.67	-	0	Unmodifiable	35143
n7-25	AI3 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35251
n7-30	AO1 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35254
n7-31	Actual AO1 output value	-327.68 to +327.67	-	0	Unmodifiable	35149
n7-32	AO2 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35257
n7-33	Actual AO2 output value	-327.68 to +327.67	-	0	Unmodifiable	35155
n7-34	AO3 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35260
n7-35	Actual AO3 output value	-327.68 to +327.67	-	0	Unmodifiable	35161
Group n8: Configuration of HIO module 2						
n8-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	3440
n8-01	Module online/offline state	0: Disabled 1: Expansion module not found 2: Module communication normal	-	0	Unmodifiable	35117
n8-02	Module type	0: Disabled 1: HIO-10 2: HIO-20 3: HIO-30	-	0	At stop	3674
n8-10	Configuration for DIO used as output	0x0000 to 0xFFFF	-	0	Unmodifiable	35168

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n8-11	DI/DIO input original status	0x0000 to 0xFFFF	-	0	Unmodifiable	35120
n8-12	DI/DIO input final status	0x0000 to 0xFFFF	-	0	Unmodifiable	35123
n8-13	RO/DIO output set status	0x0000 to 0xFFFF	-	0	Unmodifiable	35291
n8-14	RO/DIO output final status	0x0000 to 0xFFFF	-	0	Unmodifiable	35129
n8-15	AI input status word	0x0000 to 0xFFFF	-	0	Unmodifiable	35126
n8-20	AI1 input value	-327.68 to +327.67	-	0	Unmodifiable	35132
n8-21	AI1 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35246
n8-22	AI2 input value	-327.68 to +327.67	-	0	Unmodifiable	35138
n8-23	AI2 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35249
n8-24	AI3 input value	-327.68 to +327.67	-	0	Unmodifiable	35144
n8-25	AI3 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35252
n8-30	AO1 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35255
n8-31	Actual AO1 output value	-327.68 to +327.67	-	0	Unmodifiable	35150
n8-32	AO2 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35258
n8-33	Actual AO2 output value	-327.68 to +327.67	-	0	Unmodifiable	35156
n8-34	AO3 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35261
n8-35	Actual AO3 output value	-327.68 to +327.67	-	0	Unmodifiable	35162
Group n9: Configuration of HIO module 3						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n9-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	3441
n9-01	Module online/offline state	0: Disabled 1: Expansion module not found 2: Module communication normal	-	0	Unmodifiable	35118
n9-02	Module type	0: Disabled 1: HIO-10 2: HIO-20 3: HIO-30	-	0	At stop	3675
n9-10	Configuration for DIO used as output	0x0000 to 0xFFFF	-	0	Unmodifiable	35169
n9-11	DI/DIO input original status	0x0000 to 0xFFFF	-	0	Unmodifiable	35121
n9-12	DI/DIO input final status	0x0000 to 0xFFFF	-	0	Unmodifiable	35124
n9-13	RO/DIO output set status	0x0000 to 0xFFFF	-	0	Unmodifiable	35292
n9-14	RO/DIO output final status	0x0000 to 0xFFFF	-	0	Unmodifiable	35130
n9-15	AI input status word	0x0000 to 0xFFFF	-	0	Unmodifiable	35127
n9-20	AI1 input value	-327.68 to +327.67	-	0	Unmodifiable	35133
n9-21	AI1 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35247
n9-22	AI2 input value	-327.68 to +327.67	-	0	Unmodifiable	35139
n9-23	AI2 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35250

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n9-24	AI3 input value	-327.68 to +327.67	-	0	Unmodifiable	35145
n9-25	AI3 input proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35253
n9-30	AO1 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35256
n9-31	Actual AO1 output value	-327.68 to +327.67	-	0	Unmodifiable	35151
n9-32	AO2 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35259
n9-33	Actual AO2 output value	-327.68 to +327.67	-	0	Unmodifiable	35157
n9-34	AO3 output proportion	-3276.8 to +3276.7	%	0	Unmodifiable	35262
n9-35	Actual AO3 output value	-327.68 to +327.67	-	0	Unmodifiable	35163
n10: Modbus RTU Module						
n10-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1728
n10-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	33882
n10-02	Modbus baud rate	0: 1200 bps 1: 2400 bps 2: 4800 bps 3: 9600 bps 4: 19200 bps 5: 38400 bps 6: 57600 bps 7: 115200 bps	-	7	At stop	1731

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n10-03	Modbus data format	0: Even parity (8-E-1) 1: Odd parity (8-O-1) 2: No check (8-N-2) 3: 8-N-1	-	1	At stop	1732
n10-04	Modbus local address	1 to 255	-	1	At stop	1733
n10-05	Modbus response delay	0 to 20	ms	4	At stop	1734
n10-06	Modbus communication timeout	0.0 to 600.0	s	20	At stop	1735
n10-07	Reserved	0 to 1	-	0	At stop	1736
n10-08	Reserved	0 to 1	-	0	At stop	1737
n10-09	Reserved	0 to 65535	-	0	At stop	1738
n10-10	Reserved	0 to 1	-	0	At stop	1739
Group n11: CANlink module						
n11-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1740
n11-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	33883
n11-02	CANlink slave station No.	0 to 63	-	1	At stop	1743
n11-03	Baud rate of CANlink slave station	0: 20 kbps 1: 50 kbps 2: 100 kbps 3: 125 kbps 4: 250 kbps 5: 500 kbps 6: 1 Mbps	-	5	At stop	1744

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n11-04	Number of CANlink frames received per unit time	1 to 65535	-	1	At stop	1745
n11-05	BMS CAN receiving error count per unit time	0 to 255	-	0	At stop	1746
n11-06	CAN sending error count per unit time	0 to 255	-	0	At stop	1747
n11-07	Times of CAN disconnection from bus (since power-on)	0 to 65535	-	0	At stop	1748
n11-08	Reserved	0 to 1	-	0	At stop	1749
n11-09	Reserved	0 to 65535	-	0	At stop	1750
n11-10	Reserved	0 to 1	-	0	At stop	1751
Group n12: CANopen module						
n12-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1752
n12-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	33884
n12-02	CANopen node address	0 to 63	-	1	At stop	1755
n12-03	CANopen baud rate	0: 20 kbps 1: 50 kbps 2: 100 kbps 3: 125 kbps 4: 250 kbps 5: 500 kbps 6: 1 Mbps	-	5	At stop	1756
n12-04	Max. interval of adjacent RPDO frames	0 to 65535	ms	0	At once	33090

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n12-05	Number of receiving errors per unit time	0 to 255	-	0	At stop	1758
n12-06	Number of sending errors per unit time	0 to 255	-	0	At stop	1759
n12-07	Auto entering OP upon power-on	0: Disable 1: Enable	-	0	At stop	1760
n12-08	Transmitting boot-up upon communication timeout	0: Disable 1: Enable	-	0	At stop	1761
n12-09	Communication time-out time	0.0 to 60.0	s	0	At stop	1762
n12-10	CANopen configuration source	0: Factory settings 1: User-defined configuration	-	0	At stop	1763
n12-11	RPDO1 CAN-ID	0x0180 to 0x057F	-	512	At once	3055
n12-12	RPDO1 mode	0 to 255	-	255	At once	3059
n12-13	Number of RPDO1 mappings	0 to 4	-	4	At once	3063
n12-14	RPDO2 CAN-ID	0x0180 to 0x057F	-	768	At once	3056
n12-15	RPDO2 mode	0 to 255	-	255	At once	3060
n12-16	Number of RPDO2 mappings	0 to 4	-	4	At once	3064
n12-17	RPDO3 CAN-ID	0x0180 to 0x057F	-	1024	At once	3057
n12-18	RPDO3 mode	0 to 255	-	255	At once	3061
n12-19	Number of RPDO3 mappings	0 to 4	-	0	At once	3065
n12-20	RPDO4 CAN-ID	0x0180 to 0x057F	-	1280	At once	3058
n12-21	RPDO4 mode	0 to 255	-	255	At once	3062
n12-22	Number of RPDO4 mappings	0 to 4	-	0	At once	3066
n12-23	TPDO1 CAN-ID	0x0180 to 0x057F	-	384	At once	3039
n12-24	TPDO1 mode	0 to 255	-	255	At once	3043
n12-25	Number of TPDO1 mappings	0 to 4	-	4	At once	3047
n12-26	TPDO1 transmit interval	0 to 65535	ms	50	At once	3051
n12-27	TPDO2 CAN-ID	0x0180 to 0x057F	-	640	At once	3040
n12-28	TPDO2 mode	0 to 255	-	255	At once	3044
n12-29	Number of TPDO2 mappings	0 to 4	-	4	At once	3048

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n12-30	TPDO2 transmit interval	0 to 65535	ms	50	At once	3052
n12-31	TPDO3 CAN-ID	0x0180 to 0x057F	-	896	At once	3041
n12-32	TPDO3 mode	0 to 255	-	255	At once	3045
n12-33	Number of TPDO3 mappings	0 to 4	-	0	At once	3049
n12-34	TPDO3 transmit interval	1 to 65535	ms	1000	At once	3053
n12-35	TPDO4 CAN-ID	0x0180 to 0x057F	-	1152	At once	3042
n12-36	TPDO4 mode	0 to 255	-	255	At once	3046
n12-37	Number of TPDO4 mappings	0 to 4	-	0	At once	3050
n12-38	TPDO4 transmit interval	1 to 65535	ms	1000	At once	3054
Group n13: Ethernet module						
n13-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1764
n13-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	33885
n13-02	IP address automatic assignment	0: Disabled 1: Enabled	-	0	At stop	2122
n13-03	TCP/IP address 1	0 to 255	-	192	At stop	1767
n13-04	TCP/IP address 2	0 to 255	-	168	At stop	1768
n13-05	TCP/IP address 3	0 to 255	-	10	At stop	1769
n13-06	TCP/IP address 4	0 to 255	-	253	At stop	1770
n13-07	TCP/IP subnet mask address 1	0 to 255	-	255	At stop	2114
n13-08	TCP/IP subnet mask address 2	0 to 255	-	255	At stop	2115

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n13-09	TCP/IP subnet mask address 3	0 to 255	-	255	At stop	2116
n13-10	TCP/IP subnet mask address 4	0 to 255	-	0	At stop	2117
n13-11	TCP/IP gateway address 1	0 to 255	-	192	At stop	2118
n13-12	TCP/IP gateway address 2	0 to 255	-	168	At stop	2119
n13-13	TCP/IP gateway address 3	0 to 255	-	10	At stop	2120
n13-14	TCP/IP gateway address 4	0 to 255	-	1	At stop	2121
n13-15	Reserved	0 to 65535	-	0	At stop	1774
Group n14: EtherCAT Module						
n14-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1776
n14-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	33886
n14-02	EtherCAT slave name	0 to 65535	-	1	At stop	1779
n14-03	EtherCAT slave alias	0 to 65535	-	1	At stop	1780
n14-04	Number of synchronization interrupts allowed by EtherCAT	4 to 20	-	4	At stop	1781
n14-05	Reserved	0 to 1	-	0	At stop	1782
n14-06	Alias setup function switch	0: Set by n14-03 1: Set by host controller master station	-	0	At stop	1783
n14-07	Reserved	0 to 65535	-	0	At stop	1784
n14-08	Reserved	0 to 65535	-	0	At stop	1785

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n14-09	Reserved	0 to 65535	-	0	At stop	1786
n14-10	Reserved	0 to 65535	-	0	At stop	1787
n14-11	Port 1_0 receive error count	0 to 65535	-	0	Unmodifiable	33336
n14-12	Port 1_0 invalid frame count	0 to 65535	-	0	Unmodifiable	33337
n14-13	Max. number of forwarding errors for port 1_0	0 to 65535	-	0	Unmodifiable	33338
n14-14	PDI and processing unit error count	0 to 65535	-	0	Unmodifiable	33339
n14-15	Port 1_0 link loss count	0 to 65535	-	0	Unmodifiable	33340
n14-16	Synchronization signal loss count	0 to 65535	-	0	Unmodifiable	33341
n14-17	Application layer fault code	0 to 65535	-	0	Unmodifiable	33342
n14-18	State machine and port link state	0 to 65535	-	0	Unmodifiable	33343
n14-19	Reserved	0 to 65535	-	0	Unmodifiable	33344
n14-20	Reserved	0 to 65535	-	0	Unmodifiable	33345
n14-21	Reserved	0 to 65535	-	0	Unmodifiable	33346
n14-22	InoBus scheduling period	500 to 1000	-	1000	At once	6717
Group n15: HDVN module						
n15-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1788

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n15-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodi- fiable	33887
n15-02	HDEV node address configuration	0 to 63	-	63	At stop	1791
n15-03	Actual HDEV node address	-32768 to +32767	-	0	Unmodi- fiable	35552
n15-04	Baud rate configura- tion of HDEV node	0: 125 kbps 1: 250 kbps 2: 500 kbps 3: Automatic identi- fication	-	0	At stop	1792
n15-05	Actual baud rate of HDEV node	0: 125 kbps 1: 250 kbps 2: 500 kbps 3: Automatic identi- fication	-	0	Unmodi- fiable	35553
n15-06	Configured number of I/O connection input words	0 to 40	-	0	At stop	4185
n15-07	Actual number of I/ O connection input words	-32768 to +32767	-	0	Unmodi- fiable	35554
n15-08	Configured number of I/O connection output words	0 to 40	-	0	At stop	4186
n15-09	Actual number of I/ O connection output words	-32768 to +32767	-	0	Unmodi- fiable	35555
n15-10	HDEV attribute code	0 to 65535	-	0	At stop	4188
n15-11	Explicit information timeout time	0.0 to 60.0	-	0	At once	4187
n15-12	Bus disconnection judgment time threshold	0.0 to 60.0	-	0.3	At once	1793
n15-13	Function after bus disconnection	0: Remain in the disconnection state 1: Reset and contin- ue the communica- tion	-	1	At stop	1794
n15-14	VendorID	1 to 65535	-	1	At stop	1795
n15-15	ProductType	0 to 65535	-	0	At stop	1796
n15-16	ProductCode	0 to 65535	-	0	At stop	1797
n15-17	MajorRevision	0 to 255	-	0	At stop	1798

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n15-18	MinorRevision	0 to 255	-	0	At stop	1799
Group n16: PROFIBUS DP module						
n16-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1800
n16-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	33888
n16-02	Expansion module ID	1 to 125	-	1	At stop	1803
n16-03	Reserved	0 to 1	-	0	At stop	1804
n16-04	Reserved	0 to 1	-	0	At stop	1805
n16-05	Reserved	0 to 1	-	0	At stop	1806
n16-09	Attribute code	0: Default 1: 0806 2: 0956 3: 8045 4: 0812 5: 0815 6: 6012 7: 80b5 8: 4150 9: Reserved 10: Reserved 11: Reserved 12: Reserved	-	0	At stop	1810

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n16-10	DP data check bit	0: Default PZD0. bit10 1: Disabled 2: PZD0.bit0 3: PZD0.bit1 4: PZD0.bit2 5: PZD0.bit3 6: PZD0.bit4 7: PZD0.bit5 8: PZD0.bit6 9: PZD0.bit7 10: PZD0.bit8 11: PZD0.bit9 12: PZD0.bit10 13: PZD0.bit11 14: PZD0.bit12 15: PZD0.bit13 16: PZD0.bit14 17: PZD0.bit15	-	0	At stop	1811
Group n17: PROFINET IO module						
n17-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	1812
n17-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodi- fiable	33889
n17-02	PROFINET slave station No.	0 to 65535	-	1	At stop	1815
n17-03	MAC address word 1	0x0000 to 0xFFFF	-	0	Unmodi- fiable	34833
n17-04	MAC address word 2	0x0000 to 0xFFFF	-	0	Unmodi- fiable	34834
n17-05	MAC address word 3	0x0000 to 0xFFFF	-	0	Unmodi- fiable	34835

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n17-06	Reserved	0 to 65535	-	0	At stop	1819
n17-07	Reserved	0 to 65535	-	0	At stop	1820
n17-08	Reserved	0 to 65535	-	0	At stop	1821
n17-09	Reserved	0 to 65535	-	0	At stop	1822
n17-10	Reserved	0 to 65535	-	0	At stop	1823
Group n18: Customized communication module						
n18-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	2163
n18-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodi- fiable	33925
n18-02	Expansion slot module type	0: No expansion card 17: Input/output module HIO-10 32: Encoder detection module PG-10 35: Encoder detection module PG-40 36: Encoder detection module PG-50 48: Sync voltage detection module HSVM-10 49: Sync voltage detection module HSVM-20	-	0	Unmodi- fiable	33490

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n18-02	Expansion slot module type	64: HINT module (HE200 rectifier) 96: HOFR module 112: PROFIBUS DP module 113: CANopen module 114: CANlink module 115: Modbus RTU module 116: Modbus TCP module 117: PROFINET IO module 118: EtherCAT module 121: Ethernet module 122: DeviceNet module 123: CAN listening module 124: IBA module 125: HYAS module	-	0	Unmodifiable	33490
n18-03	Customized communication module ID reference	0 to 65535	-	0	At stop	2916
n18-11	Customized communication module parameter 1	0 to 65535	-	0	At stop	2166
n18-12	Customized communication module parameter 2	0 to 65535	-	0	At stop	2164
n18-13	Customized communication module parameter 3	0 to 65535	-	0	At stop	2165
n18-14	Customized communication module parameter 4	0 to 65535	-	0	At stop	2167
n18-15	Customized communication module parameter 5	0 to 65535	-	0	At stop	2168
n18-16	Customized communication module parameter 6	0 to 65535	-	0	At stop	2169

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n18-17	Customized communication module parameter 7	0 to 65535	-	0	At stop	2170
n18-18	Customized communication module parameter 8	0 to 65535	-	0	At stop	2171
n18-19	Customized communication module parameter 9	0 to 65535	-	0	At stop	2172
n18-20	Customized communication module parameter 10	0 to 65535	-	0	At stop	2173
n18-21	Customized communication module parameter 11	0 to 65535	-	0	At stop	2174
n18-22	Customized communication module parameter 12	0 to 65535	-	0	At stop	2345
n18-23	Customized communication module parameter 13	0 to 65535	-	0	At stop	2346
n18-24	Customized communication module parameter 14	0 to 65535	-	0	At stop	2347
n18-25	Customized communication module parameter 15	0 to 65535	-	0	At stop	2348
n18-26	Customized communication module parameter 16	0 to 65535	-	0	At stop	2349
n18-27	Customized communication module parameter 17	0 to 65535	-	0	At stop	2350
n18-28	Customized communication module parameter 18	0 to 65535	-	0	At stop	2351
Group n19: Sync voltage detection module						

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n19-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	2	At stop	2236
n19-01	Module type	0: Disabled 1: HSVM-10 2: HSVM-20	-	1	Unmodifiable	1562
n19-02	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	33945
n19-09	Communication heartbeat error detection threshold of HSVM module	0 to 100	-	10	At once	3186
n19-10	[HSVM-10] voltage sampling frequency	0: 40 K 1: 80 K 2: 160 K 3: 320 K	-	0	At stop	2237
n19-11	[HSVM-10] voltage sampling delay selection	0: No delay 1: Delay	-	0	At stop	2238
n19-12	[HSVM-10] data entries received by the module	0 to 65535	-	0	Unmodifiable	34964
n19-13	[HSVM-10] reserved	0 to 65535	-	0	Unmodifiable	34967
n19-14	[HSVM-10] reserved	-32768 to +32767	-	0	Unmodifiable	34970
n19-15	[HSVM-10] module U _{sr} sampling AD	-32768 to +32767	-	0	Unmodifiable	34973
n19-16	[HSVM-10] module U _{st} sampling AD	-32768 to +32767	-	0	Unmodifiable	34976

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n19-17	[HSVM-10] module temperature sampling AD	0 to 65535	-	0	Unmodifiable	34979
n19-18	[HSVM-10] module combination flag word	0 to 65535	-	0	Unmodifiable	33330
n19-19	[HSVM-10] module function flag word	0 to 65535	-	0	Unmodifiable	33333
Group n23: Parameter settings of HIO module 1 (HIO-10)						
n23-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3442

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n23-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3460
n23-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3463
n23-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3466
n23-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3469

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n23-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3472
n23-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3475
n23-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3478
n23-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3493
n23-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3496
n23-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3499
n23-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3502

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n23-35	Setting for AI lower than minimum input	Ones position: Setting for AI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for AI2 lower than minimum input 0: Minimum input proportion 1: 0.0% Hundreds position: Setting for AI3 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At stop	3520
n23-36	AI disconnection monitoring enable	Ones position: AI1 disconnection monitoring enable 0: Disabled 1: Enabled Tens position: AI2 disconnection monitoring enable 0: Disabled 1: Enabled Hundreds position: AI3 disconnection monitoring enable 0: Disabled 1: Enabled	-	0	At stop	3523
n23-37	AI setting zero-crossing threshold	0.0 to 1.0	%	0.0	At stop	3526
n23-40	AI1 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3529
n23-41	AI1 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3532

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n23-42	Min. input value of AI1 curve	-20.000 to +20.000	-	-10.000	At once	3535
n23-43	Min. input proportion of AI1 curve	-600.0 to +600.0	%	-100.0	At once	3538
n23-44	Max. input value of AI1 curve	-20.000 to +20.000	-	10.000	At once	3541
n23-45	Max. input proportion of AI1 curve	-600.0 to +600.0	%	100.0	At once	3544
n23-46	AI1 filter time	0.000 to 10.000	s	0.000	At once	3547
n23-47	AI1 denoising threshold	0.0 to 20.0	%	0.0	At once	3550
n23-48	AI1 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3553
n23-49	AI1 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3556
n23-50	AI2 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3559
n23-51	AI2 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3562
n23-52	Min. input value of AI2 curve	-20.000 to +20.000	-	-10.000	At once	3565
n23-53	Min. input proportion of AI2 curve	-600.0 to +600.0	%	-100.0	At once	3568
n23-54	Max. input value of AI2 curve	-20.000 to +20.000	-	10.000	At once	3571
n23-55	Max. input proportion of AI2 curve	-600.0 to +600.0	%	100.0	At once	3574
n23-56	AI2 filter time	0.000 to 10.000	s	0.000	At once	3577
n23-57	AI2 denoising threshold	0.0 to 20.0	%	0.0	At once	3580
n23-58	AI2 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3583
n23-59	AI2 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3586
n23-70	AO1 signal source	0: 0 Other: K connector	-	0	At stop	3619

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n23-71	AO1 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3622
n23-72	Min. output proportion of AO1 curve	-600.0 to +600.0	%	0.0	At once	3625
n23-73	Min. output value of AO1 curve	0.000 to 20.000	-	0.000	At once	3628
n23-74	Max. output proportion of AO1 curve	-600.0 to +600.0	%	100.0	At once	3631
n23-75	Max. output value of AO1 curve	0.000 to 20.000	-	10.000	At once	3634
n23-80	AO2 signal source	0: 0 Other: K connector	-	0	At stop	3637
n23-81	AO2 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3640
n23-82	Min. output proportion of AO2 curve	-600.0 to +600.0	%	0.0	At once	3643
n23-83	Min. output value of AO2 curve	0.000 to 20.000	-	0.000	At once	3646
n23-84	Max. output proportion of AO2 curve	-600.0 to +600.0	%	100.0	At once	3649
n23-85	Max. output value of AO2 curve	0.000 to 20.000	-	10.000	At once	3652
Group n24: Parameter settings of HIO module 1 (HIO-20)						
n24-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3442

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n24-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3460
n24-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3463

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n24-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3466
n24-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3469
n24-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3472
n24-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3475
n24-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3478
n24-16	DIO3 as DO signal source	0: As DI Other: B connector	-	0	At stop	3481
n24-17	DIO4 as DO signal source	0: As DI Other: B connector	-	0	At stop	3484
n24-18	DIO5 as DO signal source	0: As DI Other: B connector	-	0	At stop	3487
n24-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3493
n24-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3496
n24-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3499
n24-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3502
n24-24	RO2 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3505

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n24-25	RO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3508
n24-26	RO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3511
Group n25: Parameter settings of HIO module 1 (HIO-30)						
n25-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3442
n25-01	DI positive and negative logic	Bit00: DI1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DI2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DI3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DI4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DI5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DI6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3445

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-02	DI1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3448
n25-03	DI1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3451
n25-04	DI2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3454
n25-05	DI2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3457

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3460

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3463
n25-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3466
n25-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3469
n25-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3472
n25-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3475
n25-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3478
n25-16	DIO3 as DO signal source	0: As DI Other: B connector	-	0	At stop	3481
n25-17	DIO4 as DO signal source	0: As DI Other: B connector	-	0	At stop	3484
n25-18	DIO5 as DO signal source	0: As DI Other: B connector	-	0	At stop	3487
n25-19	DIO6 as DO signal source	0: As DI Other: B connector	-	0	At stop	3490
n25-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3493
n25-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3496
n25-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3499

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3502
n25-24	RO2 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3505
n25-25	RO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3508
n25-26	RO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3511
n25-27	RO3 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3514
n25-28	RO4 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3517
n25-35	Setting for AI lower than minimum input	Ones position: Setting for AI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for AI2 lower than minimum input 0: Minimum input proportion 1: 0.0% Hundreds position: Setting for AI3 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At stop	3520

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-36	AI disconnection monitoring enable	Ones position: AI1 disconnection monitoring enable 0: Disabled 1: Enabled Tens position: AI2 disconnection monitoring enable 0: Disabled 1: Enabled Hundreds position: AI3 disconnection monitoring enable 0: Disabled 1: Enabled	-	0	At stop	3523
n25-37	AI setting zero-crossing threshold	0.0 to 1.0	%	0.0	At stop	3526
n25-40	AI1 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3529
n25-41	AI1 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3532
n25-42	Min. input value of AI1 curve	-20.000 to +20.000	-	-10.000	At once	3535
n25-43	Min. input proportion of AI1 curve	-600.0 to +600.0	%	-100.0	At once	3538
n25-44	Max. input value of AI1 curve	-20.000 to +20.000	-	10.000	At once	3541
n25-45	Max. input proportion of AI1 curve	-600.0 to +600.0	%	100.0	At once	3544
n25-46	AI1 filter time	0.000 to 10.000	s	0.000	At once	3547
n25-47	AI1 denoising threshold	0.0 to 20.0	%	0.0	At once	3550
n25-48	AI1 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3553
n25-49	AI1 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3556
n25-50	AI2 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3559

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-51	AI2 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3562
n25-52	Min. input value of AI2 curve	-20.000 to +20.000	-	-10.000	At once	3565
n25-53	Min. input proportion of AI2 curve	-600.0 to +600.0	%	-100.0	At once	3568
n25-54	Max. input value of AI2 curve	-20.000 to +20.000	-	10.000	At once	3571
n25-55	Max. input proportion of AI2 curve	-600.0 to +600.0	%	100.0	At once	3574
n25-56	AI2 filter time	0.000 to 10.000	s	0.000	At once	3577
n25-57	AI2 denoising threshold	0.0 to 20.0	%	0.0	At once	3580
n25-58	AI2 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3583
n25-59	AI2 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3586
n25-60	AI3 enable	0: Disabled 1: Enabled Others: B connector	-	1	At stop	3589
n25-61	AI3 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3592
n25-62	Min. input value of AI3 curve	-20.000 to +20.000	-	-10.000	At once	3595
n25-63	Min. input proportion of AI3 curve	-600.0 to +600.0	%	-100.0	At once	3598
n25-64	Max. input value of AI3 curve	-20.000 to +20.000	-	10.000	At once	3601
n25-65	Max. input proportion of AI3 curve	-600.0 to +600.0	%	100.0	At once	3604
n25-66	AI3 filter time	0.000 to 10.000	s	0.000	At once	3607
n25-67	AI3 denoising threshold	0.0 to 20.0	%	0.0	At once	3610

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-68	AI3 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3613
n25-69	AI3 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3616
n25-70	AO1 signal source	0: 0 Other: K connector	-	0	At stop	3619
n25-71	AO1 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3622
n25-72	Min. output proportion of AO1 curve	-600.0 to +600.0	%	0.0	At once	3625
n25-73	Min. output value of AO1 curve	0.000 to 20.000	-	0.000	At once	3628
n25-74	Max. output proportion of AO1 curve	-600.0 to +600.0	%	100.0	At once	3631
n25-75	Max. output value of AO1 curve	0.000 to 20.000	-	10.000	At once	3634
n25-80	AO2 signal source	0: 0 Other: K connector	-	0	At stop	3637
n25-81	AO2 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3640
n25-82	Min. output proportion of AO2 curve	-600.0 to +600.0	%	0.0	At once	3643
n25-83	Min. output value of AO2 curve	0.000 to 20.000	-	0.000	At once	3646
n25-84	Max. output proportion of AO2 curve	-600.0 to +600.0	%	100.0	At once	3649
n25-85	Max. output value of AO2 curve	0.000 to 20.000	-	10.000	At once	3652
n25-90	AO3 signal source	0: 0 Other: K connector	-	0	At stop	3655
n25-91	AO3 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3658
n25-92	Min. output proportion of AO3 curve	-600.0 to +600.0	%	0.0	At once	3661
n25-93	Min. output value of AO3 curve	0.000 to 20.000	-	0.000	At once	3664
n25-94	Max. output proportion of AO3 curve	-600.0 to +600.0	%	100.0	At once	3667

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n25-95	Max. output value of AO3 curve	0.000 to 20.000	-	10.000	At once	3670
Group n26: Parameter settings of HIO module 2 (HIO-10)						
n26-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3443
n26-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3461

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n26-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3464
n26-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3467
n26-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3470
n26-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3473
n26-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3476
n26-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3479
n26-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3494
n26-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3497
n26-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3500
n26-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3503

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n26-35	Setting for AI lower than minimum input	Ones position: Setting for AI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for AI2 lower than minimum input 0: Minimum input proportion 1: 0.0% Hundreds position: Setting for AI3 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At stop	3521
n26-36	AI disconnection monitoring enable	Ones position: AI1 disconnection monitoring enable 0: Disabled 1: Enabled Tens position: AI2 disconnection monitoring enable 0: Disabled 1: Enabled Hundreds position: AI3 disconnection monitoring enable 0: Disabled 1: Enabled	-	0	At stop	3524
n26-37	AI setting zero-crossing threshold	0.0 to 1.0	%	0.0	At stop	3527
n26-40	AI1 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3530
n26-41	AI1 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3533

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n26-42	Min. input value of AI1 curve	-20.000 to +20.000	-	-10.000	At once	3536
n26-43	Min. input proportion of AI1 curve	-600.0 to +600.0	%	-100.0	At once	3539
n26-44	Max. input value of AI1 curve	-20.000 to +20.000	-	10.000	At once	3542
n26-45	Max. input proportion of AI1 curve	-600.0 to +600.0	%	100.0	At once	3545
n26-46	AI1 filter time	0.000 to 10.000	s	0.000	At once	3548
n26-47	AI1 denoising threshold	0.0 to 20.0	%	0.0	At once	3551
n26-48	AI1 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3554
n26-49	AI1 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3557
n26-50	AI2 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3560
n26-51	AI2 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3563
n26-52	Min. input value of AI2 curve	-20.000 to +20.000	-	-10.000	At once	3566
n26-53	Min. input proportion of AI2 curve	-600.0 to +600.0	%	-100.0	At once	3569
n26-54	Max. input value of AI2 curve	-20.000 to +20.000	-	10.000	At once	3572
n26-55	Max. input proportion of AI2 curve	-600.0 to +600.0	%	100.0	At once	3575
n26-56	AI2 filter time	0.000 to 10.000	s	0.000	At once	3578
n26-57	AI2 denoising threshold	0.0 to 20.0	%	0.0	At once	3581
n26-58	AI2 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3584
n26-59	AI2 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3587
n26-70	AO1 signal source	0: 0 Other: K connector	-	0	At stop	3620

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n26-71	AO1 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3623
n26-72	Min. output proportion of AO1 curve	-600.0 to +600.0	%	0.0	At once	3626
n26-73	Min. output value of AO1 curve	0.000 to 20.000	-	0.000	At once	3629
n26-74	Max. output proportion of AO1 curve	-600.0 to +600.0	%	100.0	At once	3632
n26-75	Max. output value of AO1 curve	0.000 to 20.000	-	10.000	At once	3635
n26-80	AO2 signal source	0: 0 Other: K connector	-	0	At stop	3638
n26-81	AO2 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3641
n26-82	Min. output proportion of AO2 curve	-600.0 to +600.0	%	0.0	At once	3644
n26-83	Min. output value of AO2 curve	0.000 to 20.000	-	0.000	At once	3647
n26-84	Max. output proportion of AO2 curve	-600.0 to +600.0	%	100.0	At once	3650
n26-85	Max. output value of AO2 curve	0.000 to 20.000	-	10.000	At once	3653
Group n27: Parameter settings of HIO module 2 (HIO-20)						
n27-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3443

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n27-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3461
n27-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3464
n27-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3467
n27-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3470

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n27-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3473
n27-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3476
n27-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3479
n27-16	DIO3 as DO signal source	0: As DI Other: B connector	-	0	At stop	3482
n27-17	DIO4 as DO signal source	0: As DI Other: B connector	-	0	At stop	3485
n27-18	DIO5 as DO signal source	0: As DI Other: B connector	-	0	At stop	3488
n27-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3494
n27-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3497
n27-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3500
n27-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3503
n27-24	RO2 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3506
n27-25	RO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3509
n27-26	RO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3512

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group n28: Parameter settings of HIO module 2 (HIO-30)						
n28-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3443
n28-01	DI positive and negative logic	Bit00: DI1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DI2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DI3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DI4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DI5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DI6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3446
n28-02	DI1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3449
n28-03	DI1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3452

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n28-04	DI2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3455
n28-05	DI2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3458
n28-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3461
n28-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3464
n28-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3467

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n28-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3470
n28-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3473
n28-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3476
n28-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3479
n28-16	DIO3 as DO signal source	0: As DI Other: B connector	-	0	At stop	3482
n28-17	DIO4 as DO signal source	0: As DI Other: B connector	-	0	At stop	3485
n28-18	DIO5 as DO signal source	0: As DI Other: B connector	-	0	At stop	3488
n28-19	DIO6 as DO signal source	0: As DI Other: B connector	-	0	At stop	3491
n28-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3494
n28-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3497
n28-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3500
n28-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3503

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n28-24	RO2 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3506
n28-25	RO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3509
n28-26	RO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3512
n28-27	RO3 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3515
n28-28	RO4 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3518
n28-35	Setting for AI lower than minimum input	Ones position: Setting for AI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for AI2 lower than minimum input 0: Minimum input proportion 1: 0.0% Hundreds position: Setting for AI3 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At stop	3521

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n28-36	AI disconnection monitoring enable	Ones position: AI1 disconnection monitoring enable 0: Disabled 1: Enabled Tens position: AI2 disconnection monitoring enable 0: Disabled 1: Enabled Hundreds position: AI3 disconnection monitoring enable 0: Disabled 1: Enabled	-	0	At stop	3524
n28-37	AI setting zero-crossing threshold	0.0 to 1.0	%	0.0	At stop	3527
n28-40	AI1 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3530
n28-41	AI1 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3533
n28-42	Min. input value of AI1 curve	-20.000 to +20.000	-	-10.000	At once	3536
n28-43	Min. input proportion of AI1 curve	-600.0 to +600.0	%	-100.0	At once	3539
n28-44	Max. input value of AI1 curve	-20.000 to +20.000	-	10.000	At once	3542
n28-45	Max. input proportion of AI1 curve	-600.0 to +600.0	%	100.0	At once	3545
n28-46	AI1 filter time	0.000 to 10.000	s	0.000	At once	3548
n28-47	AI1 denoising threshold	0.0 to 20.0	%	0.0	At once	3551
n28-48	AI1 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3554
n28-49	AI1 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3557
n28-50	AI2 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3560

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n28-51	AI2 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3563
n28-52	Min. input value of AI2 curve	-20.000 to +20.000	-	-10.000	At once	3566
n28-53	Min. input proportion of AI2 curve	-600.0 to +600.0	%	-100.0	At once	3569
n28-54	Max. input value of AI2 curve	-20.000 to +20.000	-	10.000	At once	3572
n28-55	Max. input proportion of AI2 curve	-600.0 to +600.0	%	100.0	At once	3575
n28-56	AI2 filter time	0.000 to 10.000	s	0.000	At once	3578
n28-57	AI2 denoising threshold	0.0 to 20.0	%	0.0	At once	3581
n28-58	AI2 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3584
n28-59	AI2 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3587
n28-60	AI3 enable	0: Disabled 1: Enabled Others: B connector	-	1	At stop	3590
n28-61	AI3 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3593
n28-62	Min. input value of AI3 curve	-20.000 to +20.000	-	-10.000	At once	3596
n28-63	Min. input proportion of AI3 curve	-600.0 to +600.0	%	-100.0	At once	3599
n28-64	Max. input value of AI3 curve	-20.000 to +20.000	-	10.000	At once	3602
n28-65	Max. input proportion of AI3 curve	-600.0 to +600.0	%	100.0	At once	3605
n28-66	AI3 filter time	0.000 to 10.000	s	0.000	At once	3608
n28-67	AI3 denoising threshold	0.0 to 20.0	%	0.0	At once	3611

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n28-68	AI3 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3614
n28-69	AI3 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3617
n28-70	AO1 signal source	0: 0 Other: K connector	-	0	At stop	3620
n28-71	AO1 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3623
n28-72	Min. output proportion of AO1 curve	-600.0 to +600.0	%	0.0	At once	3626
n28-73	Min. output value of AO1 curve	0.000 to 20.000	-	0.000	At once	3629
n28-74	Max. output proportion of AO1 curve	-600.0 to +600.0	%	100.0	At once	3632
n28-75	Max. output value of AO1 curve	0.000 to 20.000	-	10.000	At once	3635
n28-80	AO2 signal source	0: 0 Other: K connector	-	0	At stop	3638
n28-81	AO2 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3641
n28-82	Min. output proportion of AO2 curve	-600.0 to +600.0	%	0.0	At once	3644
n28-83	Min. output value of AO2 curve	0.000 to 20.000	-	0.000	At once	3647
n28-84	Max. output proportion of AO2 curve	-600.0 to +600.0	%	100.0	At once	3650
n28-85	Max. output value of AO2 curve	0.000 to 20.000	-	10.000	At once	3653
n28-90	AO3 signal source	0: 0 Other: K connector	-	0	At stop	3656
n28-91	AO3 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3659
n28-92	Min. output proportion of AO3 curve	-600.0 to +600.0	%	0.0	At once	3662
n28-93	Min. output value of AO3 curve	0.000 to 20.000	-	0.000	At once	3665
n28-94	Max. output proportion of AO3 curve	-600.0 to +600.0	%	100.0	At once	3668

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n28-95	Max. output value of AO3 curve	0.000 to 20.000	-	10.000	At once	3671
Group n29: Parameter settings of HIO module 3 (HIO-10)						
n29-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3443
n29-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3461

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n29-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3464
n29-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3467
n29-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3470
n29-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3473
n29-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3476
n29-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3479
n29-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3494
n29-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3497
n29-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3500
n29-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3503

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n29-35	Setting for AI lower than minimum input	Ones position: Setting for AI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for AI2 lower than minimum input 0: Minimum input proportion 1: 0.0% Hundreds position: Setting for AI3 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At stop	3521
n29-36	AI disconnection monitoring enable	Ones position: AI1 disconnection monitoring enable 0: Disabled 1: Enabled Tens position: AI2 disconnection monitoring enable 0: Disabled 1: Enabled Hundreds position: AI3 disconnection monitoring enable 0: Disabled 1: Enabled	-	0	At stop	3524
n29-37	AI setting zero-crossing threshold	0.0 to 1.0	%	0.0	At stop	3527
n29-40	AI1 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3530
n29-41	AI1 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3533

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n29-42	Min. input value of AI1 curve	-20.000 to +20.000	-	-10.000	At once	3536
n29-43	Min. input proportion of AI1 curve	-600.0 to +600.0	%	-100.0	At once	3539
n29-44	Max. input value of AI1 curve	-20.000 to +20.000	-	10.000	At once	3542
n29-45	Max. input proportion of AI1 curve	-600.0 to +600.0	%	100.0	At once	3545
n29-46	AI1 filter time	0.000 to 10.000	s	0.000	At once	3548
n29-47	AI1 denoising threshold	0.0 to 20.0	%	0.0	At once	3551
n29-48	AI1 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3554
n29-49	AI1 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3557
n29-50	AI2 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3560
n29-51	AI2 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3563
n29-52	Min. input value of AI2 curve	-20.000 to +20.000	-	-10.000	At once	3566
n29-53	Min. input proportion of AI2 curve	-600.0 to +600.0	%	-100.0	At once	3569
n29-54	Max. input value of AI2 curve	-20.000 to +20.000	-	10.000	At once	3572
n29-55	Max. input proportion of AI2 curve	-600.0 to +600.0	%	100.0	At once	3575
n29-56	AI2 filter time	0.000 to 10.000	s	0.000	At once	3578
n29-57	AI2 denoising threshold	0.0 to 20.0	%	0.0	At once	3581
n29-58	AI2 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3584
n29-59	AI2 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3587
n29-70	AO1 signal source	0: 0 Other: K connector	-	0	At stop	3620

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n29-71	AO1 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3623
n29-72	Min. output proportion of AO1 curve	-600.0 to +600.0	%	0.0	At once	3626
n29-73	Min. output value of AO1 curve	0.000 to 20.000	-	0.000	At once	3629
n29-74	Max. output proportion of AO1 curve	-600.0 to +600.0	%	100.0	At once	3632
n29-75	Max. output value of AO1 curve	0.000 to 20.000	-	10.000	At once	3635
n29-80	AO2 signal source	0: 0 Other: K connector	-	0	At stop	3638
n29-81	AO2 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3641
n29-82	Min. output proportion of AO2 curve	-600.0 to +600.0	%	0.0	At once	3644
n29-83	Min. output value of AO2 curve	0.000 to 20.000	-	0.000	At once	3647
n29-84	Max. output proportion of AO2 curve	-600.0 to +600.0	%	100.0	At once	3650
n29-85	Max. output value of AO2 curve	0.000 to 20.000	-	10.000	At once	3653
Group n30: Parameter settings of HIO module 3 (HIO-20)						
n30-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3444

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n30-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3462
n30-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3465
n30-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3468
n30-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3471

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n30-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3474
n30-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3477
n30-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3480
n30-16	DIO3 as DO signal source	0: As DI Other: B connector	-	0	At stop	3483
n30-17	DIO4 as DO signal source	0: As DI Other: B connector	-	0	At stop	3486
n30-18	DIO5 as DO signal source	0: As DI Other: B connector	-	0	At stop	3489
n30-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3495
n30-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3498
n30-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3501
n30-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3504
n30-24	RO2 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3507
n30-25	RO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3510
n30-26	RO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3513

Para.	Name	Value Range	Unit	Default	Change Mode	Address
Group n31: Parameter settings of HIO module 3 (HIO-30)						
n31-00	DI/DIO input filter time	0.001 to 1.000	s	0.001	At stop	3444
n31-01	DI positive and negative logic	Bit00: DI1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DI2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DI3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DI4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DI5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DI6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3447
n31-02	DI1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3450
n31-03	DI1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3453

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n31-04	DI2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3456
n31-05	DI2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3459
n31-09	DIO positive and negative logic	Bit00: DIO1 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit01: DIO2 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit02: DIO3 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit03: DIO4 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit04: DIO5 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level Bit05: DIO6 positive and negative logic 0: Logic 1 corresponds to high level 1: Logic 1 corresponds to low level	-	0x0000	At stop	3462
n31-10	DIO1 as DO signal source	0: As DI Other: B connector	-	0	At stop	3465
n31-11	DIO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3468

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n31-12	DIO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3471
n31-13	DIO2 as DO signal source	0: As DI Other: B connector	-	0	At stop	3474
n31-14	DIO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3477
n31-15	DIO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3480
n31-16	DIO3 as DO signal source	0: As DI Other: B connector	-	0	At stop	3483
n31-17	DIO4 as DO signal source	0: As DI Other: B connector	-	0	At stop	3486
n31-18	DIO5 as DO signal source	0: As DI Other: B connector	-	0	At stop	3489
n31-19	DIO6 as DO signal source	0: As DI Other: B connector	-	0	At stop	3492
n31-20	RO positive and negative logic	Bit00: RO1 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit01: RO2 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit02: RO3 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level Bit03: RO4 positive and negative logic 0: Logic 1 outputs high level 1: Logic 1 outputs low level	-	0x0000	At stop	3495
n31-21	RO1 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3498
n31-22	RO1 switch-on delay	0.00 to 360.00	s	0.00	At stop	3501
n31-23	RO1 switch-off delay	0.00 to 360.00	s	0.00	At stop	3504

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n31-24	RO2 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3507
n31-25	RO2 switch-on delay	0.00 to 360.00	s	0.00	At stop	3510
n31-26	RO2 switch-off delay	0.00 to 360.00	s	0.00	At stop	3513
n31-27	RO3 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3516
n31-28	RO4 signal source	0: Low level 1: High level Other: B connector	-	0	At stop	3519
n31-35	Setting for AI lower than minimum input	Ones position: Setting for AI1 lower than minimum input 0: Minimum input proportion 1: 0.0% Tens position: Setting for AI2 lower than minimum input 0: Minimum input proportion 1: 0.0% Hundreds position: Setting for AI3 lower than minimum input 0: Minimum input proportion 1: 0.0%	-	0	At stop	3522

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n31-36	AI disconnection monitoring enable	Ones position: AI1 disconnection monitoring enable 0: Disabled 1: Enabled Tens position: AI2 disconnection monitoring enable 0: Disabled 1: Enabled Hundreds position: AI3 disconnection monitoring enable 0: Disabled 1: Enabled	-	0	At stop	3525
n31-37	AI setting zero-crossing threshold	0.0 to 1.0	%	0.0	At stop	3528
n31-40	AI1 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3531
n31-41	AI1 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3534
n31-42	Min. input value of AI1 curve	-20.000 to +20.000	-	-10.000	At once	3537
n31-43	Min. input proportion of AI1 curve	-600.0 to +600.0	%	-100.0	At once	3540
n31-44	Max. input value of AI1 curve	-20.000 to +20.000	-	10.000	At once	3543
n31-45	Max. input proportion of AI1 curve	-600.0 to +600.0	%	100.0	At once	3546
n31-46	AI1 filter time	0.000 to 10.000	s	0.000	At once	3549
n31-47	AI1 denoising threshold	0.0 to 20.0	%	0.0	At once	3552
n31-48	AI1 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3555
n31-49	AI1 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3558
n31-50	AI2 enable	0: Disabled 1: Enabled Other: B connector	-	1	At stop	3561

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n31-51	AI2 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3564
n31-52	Min. input value of AI2 curve	-20.000 to +20.000	-	-10.000	At once	3567
n31-53	Min. input proportion of AI2 curve	-600.0 to +600.0	%	-100.0	At once	3570
n31-54	Max. input value of AI2 curve	-20.000 to +20.000	-	10.000	At once	3573
n31-55	Max. input proportion of AI2 curve	-600.0 to +600.0	%	100.0	At once	3576
n31-56	AI2 filter time	0.000 to 10.000	s	0.000	At once	3579
n31-57	AI2 denoising threshold	0.0 to 20.0	%	0.0	At once	3582
n31-58	AI2 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3585
n31-59	AI2 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3588
n31-60	AI3 enable	0: Disabled 1: Enabled Others: B connector	-	1	At stop	3591
n31-61	AI3 type	0: -10 V to +10 V 1: 0 V to 10 V 2: -20 mA to +20 mA 3: 0 mA to 20 mA 4: 4 mA to 20 mA	-	0	At stop	3594
n31-62	Min. input value of AI3 curve	-20.000 to +20.000	-	-10.000	At once	3597
n31-63	Min. input proportion of AI3 curve	-600.0 to +600.0	%	-100.0	At once	3600
n31-64	Max. input value of AI3 curve	-20.000 to +20.000	-	10.000	At once	3603
n31-65	Max. input proportion of AI3 curve	-600.0 to +600.0	%	100.0	At once	3606
n31-66	AI3 filter time	0.000 to 10.000	s	0.000	At once	3609
n31-67	AI3 denoising threshold	0.0 to 20.0	%	0.0	At once	3612

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n31-68	AI3 disconnection monitoring threshold	0.000 to 4.000	mA	2.000	At once	3615
n31-69	AI3 disconnection monitoring delay	0.00 to 10.00	s	1.00	At once	3618
n31-70	AO1 signal source	0: 0 Other: K connector	-	0	At stop	3621
n31-71	AO1 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3624
n31-72	Min. output proportion of AO1 curve	-600.0 to +600.0	%	0.0	At once	3627
n31-73	Min. output value of AO1 curve	0.000 to 20.000	-	0.000	At once	3630
n31-74	Max. output proportion of AO1 curve	-600.0 to +600.0	%	100.0	At once	3633
n31-75	Max. output value of AO1 curve	0.000 to 20.000	-	10.000	At once	3636
n31-80	AO2 signal source	0: 0 Other: K connector	-	0	At stop	3639
n31-81	AO2 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3642
n31-82	Min. output proportion of AO2 curve	-600.0 to +600.0	%	0.0	At once	3645
n31-83	Min. output value of AO2 curve	0.000 to 20.000	-	0.000	At once	3648
n31-84	Max. output proportion of AO2 curve	-600.0 to +600.0	%	100.0	At once	3651
n31-85	Max. output value of AO2 curve	0.000 to 20.000	-	10.000	At once	3654
n31-90	AO3 signal source	0: 0 Other: K connector	-	0	At stop	3657
n31-91	AO3 type	0: 0 V to 10 V 1: 0 mA to 20 mA 2: 4 mA to 20 mA	-	0	At stop	3660
n31-92	Min. output proportion of AO3 curve	-600.0 to +600.0	%	0.0	At once	3663
n31-93	Min. output value of AO3 curve	0.000 to 20.000	-	0.000	At once	3666
n31-94	Max. output proportion of AO3 curve	-600.0 to +600.0	%	100.0	At once	3669

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n31-95	Max. output value of AO3 curve	0.000 to 20.000	-	10.000	At once	3672
Group n37: Customized communication module 2						
n37-00	Expansion slot	0: Disabled 1: Expansion slot 1_1 2: Expansion slot 1_2 3: Expansion slot 1_3 4: Expansion slot 2_1 5: Expansion slot 2_2 6: Expansion slot 2_3 7: Expansion slot 3_1	-	0	At stop	5050
n37-01	Module online/offline state	0: Offline 1: Online	-	0	Unmodifiable	35303

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n37-02	Expansion slot module type	0: No expansion module 17: Input/output module HIO-10 32: Encoder detection module PG-10 35: Encoder detection module PG-40 36: Encoder detection module PG-50 48: Sync voltage detection module HSVM-10 49: Sync voltage detection module HSVM-20 64: HINT module (HE200 rectifier) 96: HOFR module 112: PROFIBUS DP module 113: CANopen module 114: CANlink module 115: Modbus RTU module 116: Modbus TCP module 117: PROFINET IO module 118: EtherCAT module 121: Ethernet module 122: DeviceNet module 123: CAN listening module 124: IBA module 125: HYAS module	-	0	Unmodifiable	35304
n37-03	Customized communication module ID reference	0 to 65535	-	0	At stop	5098
n37-11	Parameter 1 of customized communication module 2	0 to 65535	-	0	At stop	5032

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n37-12	Parameter 2 of customized communication module 2	0 to 65535	-	0	At stop	5033
n37-13	Parameter 3 of customized communication module 2	0 to 65535	-	0	At stop	5034
n37-14	Parameter 4 of customized communication module 2	0 to 65535	-	0	At stop	5035
n37-15	Parameter 5 of customized communication module 2	0 to 65535	-	0	At stop	5036
n37-16	Parameter 6 of customized communication module 2	0 to 65535	-	0	At stop	5037
n37-17	Parameter 7 of customized communication module 2	0 to 65535	-	0	At stop	5038
n37-18	Parameter 8 of customized communication module 2	0 to 65535	-	0	At stop	5039
n37-19	Parameter 9 of customized communication module 2	0 to 65535	-	0	At stop	5040
n37-20	Parameter 10 of customized communication module 2	0 to 65535	-	0	At stop	5041
n37-21	Parameter 11 of customized communication module 2	0 to 65535	-	0	At stop	5042
n37-22	Parameter 12 of customized communication module 2	0 to 65535	-	0	At stop	5043
n37-23	Parameter 13 of customized communication module 2	0 to 65535	-	0	At stop	5044
n37-24	Parameter 14 of customized communication module 2	0 to 65535	-	0	At stop	5045
n37-25	Parameter 15 of customized communication module 2	0 to 65535	-	0	At stop	5046

Para.	Name	Value Range	Unit	Default	Change Mode	Address
n37-26	Parameter 16 of customized communication module 2	0 to 65535	-	0	At stop	5047
n37-27	Parameter 17 of customized communication module 2	0 to 65535	-	0	At stop	5048
n37-28	Parameter 18 of customized communication module 2	0 to 65535	-	0	At stop	5049

Chapter 6 Connectors.

6.1 Common Connectors

Connectors are indicated by parameters in group U, which store and display the states or variables of system running. Connectors are divided by data type into digital connectors (also named as bit connectors (B connectors), corresponding to U0.00 to U4.99) and analog connectors (also named as work connectors (K connectors), corresponding to U5.00 to U9.99).

K connectors are further divided into single word-connectors (16 bits, occupying one storage address, corresponding to U5.00 to U8.99) and double-word connectors (32 bits, occupying two storage addresses, corresponding to U9.00 to U9.99). A double-word connector can indicate more valid digits, improving the numerical value accuracy.

B connectors are divided by unit into three types: per-unit value, actual value, and unit-less value.

- Per-unit values are expressed as a percentage relative to a base value, indicating voltage, current, and power.
- Actual values are in the unit such as V, A, and kW and have actual physical meaning.
- Unitless values generally refer to communication receiving data or the value of some specific options.
- The per-unit value system is expressed based on the following rules:
 - For single-word connectors, 0x1000 (decimal 4096) indicates 100%, which can be displayed as Value (actual value) or Percent (per-unit value). The conversion formula is as follows: $\text{Percent} = \text{Value}/4096$.
 - For double-word connectors, 0x1000 0000 (4096 x 65536) indicates 100%, which can be displayed as Value (actual value) or Percent (per-unit value). The conversion formula is as follows: $\text{Percent} = \text{Value}/4096/65536$.
- Per-unit values expressed by single-word connectors and double-word connects both range from -800.00% to +799.99%.
- Single-word connectors and double-word connectors can be converted to each other. When a single-word connector is granted to a double-word connector, the low word is 0 and the high word is the value of the single-word connector. When a double-word connector is granted to a single-word connector, the low word is discarded and the high word is granted to the single-word connector, indicating that the number of valid bits for the numerical value is reduced but the value range does not change.

6.1.1 Common Monitoring Parameters

Para.	Name	Description
U5-02	Bus voltage	Actual value, in the unit of V
U5-03	Grid voltage	Actual value, in the unit of V
U5-04	Grid frequency	Actual value, in the unit of Hz
U5-05	Grid current	Actual value, in the unit of A
U5-06	Power	Actual value, in the unit of kVA
U5-07	Power factor	Actual value
U5-08	Three-phase unbalance factor	Actual value, in the unit of %
U5-09	Max. power unit temperature	Actual value, in the unit of °C
U5-11	Measured module temperature	Actual value, in the unit of °C
U5-16	Active power	Actual value, in the unit of kW
U5-17	Active current	Actual value, in the unit of A
U6-01	Actual valid current setpoint	Actual value, in the unit of V
U6-02	Actual valid voltage setpoint	Actual value, in the unit of A
U6-05	Input current percentage	Percentage, in the unit of %
U6-07	Actual valid current setpoint (%)	Per-unit value. 4096 indicates 100%
U6-08	Actual valid voltage setpoint (%)	Per-unit value. 4096 indicates 100%

6.1.2 Common Status Connector

Para.	Name	Description
U1-00	Ready to switch on	1: No emergency stop or fault occurs in the system
U1-01	Ready to run	1: The device receives the OFF1 command and is pre-charged
U1-02	Started	1: The device receives the OFF1 command, is pre-charged, and runs normally
U1-03	OFF1 active	1: OFF1 is 1
U1-04	OFF2 inactive	1: OFF2 is 1
U1-05	Switch-on inhibited	1: OFF2 is 0 or the system is in the S4 state and OFF1 is 1
U1-06	Not started	1. The device is not started
U1-07	Wait for pre-charge	Reserved
U1-08	Pre-charging	1. The device is being pre-charged and the state machine is S6
U1-09	Pre-charge completed	1. The device has been pre-charged
U1-10	Auxiliary contactor control command	1: The control signal of auxiliary contactor is active

Para.	Name	Description
U1-11	Control command of main circuit breaker	1: The control signal of main circuit breaker is active
U1-12	Start completed	1: The device has been started
U1-13	Start not completed	1: The device is not started
U1-14	Fault activation	1: The current fault of the device is activated
U1-15	Alarm/Active limit activation	1: The current alarm or active limit of the device is activated
U1-16	OFF2 active	1: OFF2 is 0
U1-17	Auto-tuning in progress	1: Auto-tuning is in progress
U1-18	Self-test in progress	1: Self-test is in progress
U1-19	No fault	1: The device has no fault
U1-20	No alarm/active limit	1: The device has no alarm or active limit
U1-22	Main circuit breaker feedback status	1: The feedback signal of the main circuit breaker is active
U1-25	Running	1: The device is running normally
U1-26	Operation enable	1: The running permission command is active
U1-27	Fault reset command status	1: The fault reset command is active
U1-28	Current terminal start/stop module	0: Terminal start/stop module 1 1: Terminal start/stop module 2
U1-29	Terminal start/stop module OFF1 status	1: The OFF1 output by the selected terminal start/stop module is 1
U1-30	[Module 1] OFF1 status	1: The OFF1 output by terminal start/stop module 1 is 1
U1-31	[Module 2] OFF1 status	1: The OFF1 output by terminal start/stop module 2 is 1
U1-32	Factory settings active	0: Inactive 1: Active
U1-78	Remote control enable	0: Local control 1: Remote control

6.1.3 Common Status Word Connectors

Para.	Name	Description
U5-00	Current state machine	Status machine of the current system
U8-07	Control word 1	A word composed of bit 0 to bit 15 of control word 1
U8-08	Control word 2	A word composed of bit 0 to bit 15 of control word 2
U8-09	Status word 1	A word composed of bit 0 to bit 15 of status word 1

Para.	Name	Description
U8-10	Status word 2	A word composed of bit 0 to bit 15 of status word 2

6.1.4 Fault Status Bit Connectors

Para.	Name	Description
U3-40	Hardware fault	0: No fault present 1: Fault present
U3-41	SD card fault	Ditto
U3-42	Low RTC battery voltage	Ditto
U3-43	Local control fault	Ditto
U3-44	Drive communication fault	Ditto
U3-45	Expansion module offline	Ditto
U3-46	Expansion module slot address conflict	Ditto
U3-47	Fieldbus adapter fault	Ditto
U3-49	IGBT drive fault	Ditto
U3-50	Overcurrent	Ditto
U3-51	Overvoltage	Ditto
U3-52	Undervoltage	Ditto
U3-56	Drive overload	Ditto
U3-57	Short circuit to ground	Ditto
U3-58	Module overtemperature	Ditto
U3-59	Low module temperature	Ditto
U3-60	Ambient temperature too high	Ditto
U3-61	Incorrect parameter setting	Ditto
U3-62	External fault activation	Ditto
U3-63	External alarm activation	Ditto
U3-64	EEPROM power failure	Ditto
U3-65	Excessive leakage current	Ditto
U3-66	Master-slave communication error (InoLink)	Ditto
U3-67	Incorrect model parameter	Ditto
U3-68	Rectifier self-test error	Ditto
U3-69	Pre-charge error	Ditto
U3-70	External hardware fault	Ditto
U3-71	Reactor temperature error	Ditto
U3-72	Module connection error	Ditto

Para.	Name	Description
U3-73	Grid error	Ditto
U3-74	Input current unbalance	Ditto
U3-75	Parameter auto-tuning error	Ditto
U3-76	Fieldbus adapter alarm	Ditto
U3-77	Internal fault	Ditto
U3-78	Error	Ditto
U3-79	24 V voltage is too low	Ditto
U3-80	Parallel module alarm	Ditto
U3-81	Parallel module fault	Ditto
U3-82	Parallel module current unbalance alarm	Ditto
U3-88	Module pre-overtemperature	Ditto

6.1.5 Input/output Bit Connectors

Para.	Name	Description
U0-00	Logic 0	Constant 0
U0-01	Logic 1	Constant 1
U0-02	DI1	DI status The status after delay and force processing
U0-03	DI2	
U0-04	DI3	
U0-05	DI4	
U0-06	DI5	
U0-07	DI6	
U0-08	DIL	
U0-09	HDI1	
U0-10	HDI2	
U0-12	DI1 inversion	DI state inversion The status after delay, force processing, and inversion
U0-13	DI2 inversion	
U0-14	DI3 inversion	
U0-15	DI4 inversion	
U0-16	DI5 inversion	
U0-17	DI6 inversion	
U0-18	DIL inversion	
U0-19	HDI1 inversion	
U0-20	HDI2 inversion	
U0-21	DO1	0: NO contact opened 1: NC contact closed

Para.	Name	Description
U0-22	DO2	0: NO contact opened 1: NC contact closed
U0-23	DO3	0: NO contact opened 1: NC contact closed
U0-24	HDO1	0: Open 1: Closed
U0-25	HDO2	0: Open 1: Closed

6.1.6 Application Function Connectors

Para.	Name	Description
U2-48 U2-63	Output of word-to-bit conversion function 1	The word selected in L0-00 corresponds to a 16-bit output
U2-64 U2-79	Output of word-to-bit conversion function 2	The word selected in L0-01 corresponds to a 16-bit output
U2-80 U2-95	Output of word-to-bit conversion function 3	The word selected in L0-02 corresponds to a 16-bit output
U4-39 U4-54	Output of word-to-bit conversion function 4	The word selected in L0-03 corresponds to a 16-bit output
U5-86	Output of bit-to-word function 1	Output of bit-to-word function 1 in L0-10 to L0-25
U5-87	Output of bit-to-word function 2	Output of bit-to-word function 2 in L0-26 to L0-41
U5-88	Output of bit-to-word function 3	Output of bit-to-word function 3 in L0-42 to L0-57
U5-89	Output of bit-to-word function 4	Output of bit-to-word function 3 in L0-58 to L0-73
U3-00	Output of logic AND module A	Output of each AND logic block in group L2
U3-01	Output of logic AND module B	
U3-02	Output of logic AND module C	
U3-03	Output of logic AND module D	
U3-04	Output of logic NOT module A	Output of each NOT logic block in group L2
U3-05	Output of logic NOT module B	
U3-06	Output of logic NOT module C	
U3-07	Output of logic NOT module D	
U3-08	Output of logic NOT module E	
U3-09	Output of logic NOT module F	
U3-10	Output of logic NOT module G	
U3-11	Output of logic NOT module H	

Para.	Name	Description
U3-12	Output of logic OR module A	Output of each OR logic block in group L2
U3-13	Output of logic OR module B	
U3-14	Output of logic OR module C	
U3-15	Output of logic OR module D	
U3-16	Output of logic delay module A	Output of each logic delay module in group L6
U3-17	Output of logic delay module B	
U3-18	Output of logic delay module C	
U3-19	Output of logic delay module D	
U4-00	Output of logic XOR/XNOR module A	Output of each XOR/XNOR logic block in group L2
U4-01	Output of logic XOR/XNOR module B	
U4-02	Output of logic XOR/XNOR module C	
U4-03	Output of logic XOR/XNOR module C	
U4-31	Output of logic AND-OR module A	Output of each AND-OR logic block in group L2
U4-32	Output of logic AND-OR module B	
U4-33	Output of logic AND-OR module C	
U4-34	Output of logic AND-OR module D	
U4-35	Output of logic AND-OR module E	
U4-36	Output of logic AND-OR module F	
U4-37	Output of logic AND-OR module G	
U4-38	Output of logic AND-OR module H	
U9-47	Output of W-DW 1	Output of W-DW 1 in L3-00, L3-01, and L3-02
U9-48	Output of W-DW 2	Output of W-DW 2 in L3-03, L3-04, and L3-05
U9-49	Output of W-DW 3	Output of W-DW 3 in L3-06, L3-07, and L3-08
U5-76	Output high word of DW-W 1	Output high word of DW-W 1 in L3-09 and L3-10
U5-77	Output low word of DW-W 1	
U5-78	Output high word of DW-W 2	Output high word of DW-W 2 in L3-11 and L3-12
U5-79	Output low word of DW-W 2	
U5-80	Output high word of DW-W 3	Output high word of DW-W 3 in L3-13 and L3-14
U5-81	Output low word of DW-W 3	

Para.	Name	Description
U4-04	Output of binary selector module 1	Output of each binary selector module in group L5
U4-05	Output of binary selector module 2	
U4-06	Output of binary selector module 3	
U4-07	Output of binary selector module 4	
U3-24	Output of binary selector module 1	
U3-25	Output of binary selector module 2	
U3-26	Output of binary selector module 3	
U3-27	Output of binary selector module 4	
U9-56	Output of numeric switch module 1	Output of each numeric switch module in group L5
U9-57	Output of numeric switch module 2	
U9-58	Output of numeric switch module 3	
U9-59	Output of numeric switch module 4	
U9-60	Output of numeric switch module 5	
U9-61	Output of numeric switch module 6	
U9-62	Output of numeric switch module 7	
U9-63	Output of numeric switch module 8	
U9-64	Output of numeric switch module 9	Output of each numeric switch module in group L5
U9-65	Output of numeric switch module 10	
U9-66	Output of numeric switch module 11	
U9-67	Output of numeric switch module 12	
U9-15	Output of numeric switch module 13	
U9-16	Output of numeric switch module 14	
U9-17	Output of numeric switch module 15	
U9-18	Output of numeric switch module 16	
U9-69	Output of filter module A	Output of each filter module in group L6
U9-70	Output of filter module B	
U9-71	Output of filter module C	
U9-72	Output of filter module D	

Para.	Name	Description
U4-08	Output of level-to-pulse conversion module	Output of each level-to-pulse conversion module in group L6
U4-09	Output of level-to-pulse conversion module B	
U4-10	Output of level-to-pulse conversion module C	
U4-11	Output of level-to-pulse conversion module D	
U3-16	Output of logic delay module A	Output of each logic delay module in group L6
U3-17	Output of logic delay module B	
U3-18	Output of logic delay module C	
U3-19	Output of logic delay module D	
U9-73	Output of absolute value module A	Output of each absolute value module in group L7
U9-74	Output of absolute value module B	
U9-75	Output of absolute value module C	
U9-76	Output of absolute value module D	
U4-12	Negative number input flag of absolute value module A	Negative number input flag of each absolute value module in group L7
U4-13	Negative number input flag of absolute value module B	
U4-14	Negative number input flag of absolute value module C	
U4-15	Negative number input flag of absolute value module D	
U9-77	Output of addition and subtraction module A	Output of each addition and subtraction module in group L7
U9-78	Output of addition and subtraction module B	
U9-79	Output of addition and subtraction module C	
U9-80	Output of addition and subtraction module D	

Para.	Name	Description
U9-81	Output of multiplication and division module A	Output of each multiplication and division module in group L7
U9-82	Output of multiplication and division module B	
U9-83	Output of multiplication and division module C	
U9-84	Output of multiplication and division module D	
U4-16	Flag indicating whether divisor of multiplication and division module A is 0	Flag indicating whether divisor of a multiplication and division module in group L7 is 0
U4-17	Flag indicating whether divisor of multiplication and division module B is 0	
U4-18	Flag indicating whether divisor of multiplication and division module C is 0	
U4-19	Flag indicating whether divisor of multiplication and division module D is 0	
U4-20	Output of comparison module A	Output of each comparison in group L7
U4-21	Output of comparison module B	
U4-22	Output of comparison module C	
U4-23	Output of comparison module D	
U9-19	Output of limiting module A	Output of each limiting module in group L7
U9-20	Output of limiting module B	
U9-21	Output of limiting module C	
U9-22	Output of limiting module D	
U4-25	Limit flag of limiting module A	Limit flag of each limiting module in group L7
U4-26	Limit flag of limiting module B	
U4-27	Limit flag of limiting module C	
U4-28	Limit flag of limiting module D	
U9-85	Output of multi-point curve module A	Output of each multi-point curve module in group L7
U9-86	Output of multi-point curve module B	

Para.	Name	Description
U7-85	Output of constant setpoint 1	Output of each constant setting module in group L9
U7-86	Output of constant setpoint 2	
U7-87	Output of constant setpoint 3	
U7-88	Output of constant setpoint 4	
U7-89	Output of constant setpoint 5	
U9-51	Output of constant setpoint 6	
U9-52	Output of constant setpoint 7	
U9-53	Output of constant setpoint 8	
U9-54	Output of constant setpoint 9	
U9-55	Output of constant setpoint 10	
U7-65	Value of parameter monitoring parameter 1	Output of each parameter monitoring module in group L10
U7-66	Value of parameter monitoring parameter 2	
U7-67	Value of parameter monitoring parameter 3	
U7-68	Value of parameter monitoring parameter 4	
U7-69	Value of parameter monitoring parameter 5	
U7-70	Value of parameter monitoring parameter 6	
U7-71	Value of parameter monitoring parameter 7	
U7-72	Value of parameter monitoring parameter 8	
U7-73	Value of parameter monitoring parameter 9	
U7-74	Value of parameter monitoring parameter 10	

Para.	Name	Description
U15-10	Output of proportion module 1	Output of each proportion module in group L11
U15-11	Output of proportion module 2	
U15-12	Output of proportion module 3	
U15-13	Output of proportion module 4	
U15-14	Output of proportion module 5	
U15-15	Output of proportion module 6	
U15-16	Output of proportion module 7	
U15-17	Output of proportion module 8	
U15-18	Output of proportion module 9	
U15-19	Output of proportion module 10	
U19-95	Output of proportion module 11	
U19-96	Output of proportion module 12	
U19-97	Output of proportion module 13	
U19-98	Output of proportion module 14	
U19-99	Output of proportion module 15	

6.1.7 Communication Data Word Connectors

Para.	Name	Description
U5-32	InoLink.PZD1	Eight pieces of data received by InoLink
U5-33	InoLink.PZD2	
U5-34	InoLink.PZD3	
U5-35	InoLink.PZD4	
U5-36	InoLink.PZD5	
U5-37	InoLink.PZD6	
U5-38	InoLink.PZD7	
U5-39	InoLink.PZD8	
U5-40	Modbus communication setpoint 1	Communication address: 34320
U5-41	Modbus communication setpoint 2	Communication address: 34321

Para.	Name	Description
U5-44	Fieldbus adapter A.PZD1	16 pieces of process data received by fieldbus adapter A
U5-45	Fieldbus adapter A.PZD2	
U5-46	Fieldbus adapter A.PZD3	
U5-47	Fieldbus adapter A.PZD4	
U5-48	Fieldbus adapter A.PZD5	
U5-49	Fieldbus adapter A.PZD6	
U5-50	Fieldbus adapter A.PZD7	
U5-51	Fieldbus adapter A.PZD8	
U5-52	Fieldbus adapter A.PZD9	
U5-53	Fieldbus adapter A.PZD10	
U5-54	Fieldbus adapter A.PZD11	
U5-55	Fieldbus adapter A.PZD12	
U5-56	Fieldbus adapter A.PZD13	
U5-57	Fieldbus adapter A.PZD14	
U5-58	Fieldbus adapter A.PZD15	
U5-59	Fieldbus adapter A.PZD16	
U5-60	Fieldbus adapter B.PZD1	16 pieces of process data received by fieldbus adapter B
U5-61	Fieldbus adapter B.PZD2	
U5-62	Fieldbus adapter B.PZD3	
U5-63	Fieldbus adapter B.PZD4	
U5-64	Fieldbus adapter B.PZD5	
U5-65	Fieldbus adapter B.PZD6	
U5-66	Fieldbus adapter B.PZD7	
U5-67	Fieldbus adapter B.PZD8	
U5-68	Fieldbus adapter B.PZD9	
U5-69	Fieldbus adapter B.PZD10	
U5-70	Fieldbus adapter B.PZD11	
U5-71	Fieldbus adapter B.PZD12	
U5-72	Fieldbus adapter B.PZD13	
U5-73	Fieldbus adapter B.PZD14	
U5-74	Fieldbus adapter B.PZD15	
U5-75	Fieldbus adapter B.PZD16	

6.2 Table of Connectors

Para.	Name	Unit	Address
Group U0: Bit connector 1			

Para.	Name	Unit	Address
U0-00	Logic 0	-	32896
U0-01	Logic 1	-	32897
U0-02	DI1	-	32898
U0-03	DI2	-	32899
U0-04	DI3	-	32900
U0-05	DI4	-	32901
U0-06	DI5	-	32902
U0-07	DI6	-	32903
U0-08	DIL	-	32904
U0-09	HDI1	-	32905
U0-10	HDI2	-	32906
U0-11	STO status	-	32907
U0-12	DI1 inversion	-	32908
U0-13	DI2 inversion	-	32909
U0-14	DI3 inversion	-	32910
U0-15	DI4 inversion	-	32911
U0-16	DI5 inversion	-	32912
U0-17	DI6 inversion	-	32913
U0-18	DIL inversion	-	32914
U0-19	HDI1 inversion	-	32915
U0-20	HDI2 inversion	-	32916
U0-21	DO1	-	32917
U0-22	DO2	-	32918
U0-23	DO3	-	32919
U0-24	HDO1	-	32920
U0-25	HDO2	-	32921
U0-26	Current command channel	-	32922
U0-27	Setpoint channel	-	34255
U0-31	Multi-reference selection 1	-	32927
U0-32	Multi-reference selection 2	-	32928
U0-33	Multi-reference selection 3	-	32929
U0-34	Multi-reference selection 4	-	32930
U0-35	AI1 disconnection monitoring	-	32931
U0-36	AI2 disconnection monitoring	-	32932
U0-41	Status of expansion slot 1_1	-	32937
U0-42	Status of expansion slot 1_2	-	32938

Para.	Name	Unit	Address
U0-43	Status of expansion slot 1_3	-	32939
U0-44	Status of expansion slot 2_1	-	32940
U0-45	Status of expansion slot 2_2	-	32941
U0-46	Status of expansion slot 2_3	-	32942
U0-47	Status of expansion slot 3_1	-	32943
U0-53	Trigger oscilloscope status	-	33784
U0-54	Current module STO1 feedback status	-	36286
U0-55	Current module STO2 feedback status	-	36287
Group U1: Bit connector 2			
U1-00	Ready to switch on	-	34002
U1-01	Ready to run	-	34003
U1-02	Started	-	34001
U1-03	OFF1 active	-	34004
U1-04	OFF2 inactive	-	34005
U1-05	Switch-on inhibited	-	34012
U1-06	Not started	-	33998
U1-07	Wait for pre-charge	-	34010
U1-08	Pre-charging	-	34011
U1-09	Pre-charge completed	-	34009
U1-10	Auxiliary contactor control command	-	34013
U1-11	Control command of main circuit breaker	-	34014
U1-12	Start completed	-	34007
U1-13	Start not completed	-	34008
U1-14	Fault activation	-	32999
U1-15	Alarm/Active limit activation	-	33003
U1-16	OFF2 active	-	33020
U1-17	Auto-tuning in progress	-	34016
U1-18	Self-test in progress	-	34015
U1-19	There is no fault.	-	33019
U1-20	No alarm/active limit	-	33023
U1-21	Auxiliary contactor feedback status	-	33986
U1-22	Main circuit breaker feedback status	-	33987
U1-24	Run command	-	33985

Para.	Name	Unit	Address
U1-25	Running	-	34006
U1-27	Fault reset command status	-	34029
U1-28	Enabled terminal start/stop module	-	33958
U1-29	Terminal start/stop module OFF1 status	-	33959
U1-30	[Module 1] OFF1 status	-	33960
U1-31	[Module 2] OFF1 status	-	33961
U1-32	Factory settings active	-	33968
U1-33	IGBT trigger enable	-	34051
U1-78	Remote control enable	-	33074
Group U2: Bit connector 3			
U2-00	Fieldbus adapter A.PZD1.0	-	33096
U2-01	Fieldbus adapter A.PZD1.1	-	33097
U2-02	Fieldbus adapter A.PZD1.2	-	33098
U2-03	Fieldbus adapter A.PZD1.3	-	33099
U2-04	Fieldbus adapter A.PZD1.4	-	33100
U2-05	Fieldbus adapter A.PZD1.5	-	33101
U2-06	Fieldbus adapter A.PZD1.6	-	33102
U2-07	Fieldbus adapter A.PZD1.7	-	33103
U2-08	Fieldbus adapter A.PZD1.8	-	33104
U2-09	Fieldbus adapter A.PZD1.9	-	33105
U2-10	Fieldbus adapter A.PZD1.10	-	33106
U2-11	Fieldbus adapter A.PZD1.11	-	33107
U2-12	Fieldbus adapter A.PZD1.12	-	33108
U2-13	Fieldbus adapter A.PZD1.13	-	33109
U2-14	Fieldbus adapter A.PZD1.14	-	33110
U2-15	Fieldbus adapter A.PZD1.15	-	33111
U2-16	Fieldbus adapter B.PZD1.0	-	33144
U2-17	Fieldbus adapter B.PZD1.1	-	33145
U2-18	Fieldbus adapter B.PZD1.2	-	33146
U2-19	Fieldbus adapter B.PZD1.3	-	33147
U2-20	Fieldbus adapter B.PZD1.4	-	33148
U2-21	Fieldbus adapter B.PZD1.5	-	33149
U2-22	Fieldbus adapter B.PZD1.6	-	33150
U2-23	Fieldbus adapter B.PZD1.7	-	33151
U2-24	Fieldbus adapter B.PZD1.8	-	33152
U2-25	Fieldbus adapter B.PZD1.9	-	33153

Para.	Name	Unit	Address
U2-26	Fieldbus adapter B.PZD1.10	-	33154
U2-27	Fieldbus adapter B.PZD1.11	-	33155
U2-28	Fieldbus adapter B.PZD1.12	-	33156
U2-29	Fieldbus adapter B.PZD1.13	-	33157
U2-30	Fieldbus adapter B.PZD1.14	-	33158
U2-31	Fieldbus adapter B.PZD1.15	-	33159
U2-32	InoLink.PZD1.0	-	33176
U2-33	InoLink.PZD1.1	-	33177
U2-34	InoLink.PZD1.2	-	33178
U2-35	InoLink.PZD1.3	-	33179
U2-36	InoLink.PZD1.4	-	33180
U2-37	InoLink.PZD1.5	-	33181
U2-38	InoLink.PZD1.6	-	33182
U2-39	InoLink.PZD1.7	-	33183
U2-40	InoLink.PZD1.8	-	33184
U2-41	InoLink.PZD1.9	-	33185
U2-42	InoLink.PZD1.10	-	33186
U2-43	InoLink.PZD1.11	-	33187
U2-44	InoLink.PZD1.12	-	33188
U2-45	InoLink.PZD1.13	-	33189
U2-46	InoLink.PZD1.14	-	33190
U2-47	InoLink.PZD1.15	-	33191
U2-48	Output bit0 of word-to-bit conversion function 1	-	33112
U2-49	Output bit1 of word-to-bit conversion function 1	-	33113
U2-50	Output bit2 of word-to-bit conversion function 1	-	33114
U2-51	Output bit3 of word-to-bit conversion function 1	-	33115
U2-52	Output bit4 of word-to-bit conversion function 1	-	33116
U2-53	Output bit5 of word-to-bit conversion function 1	-	33117
U2-54	Output bit6 of word-to-bit conversion function 1	-	33118
U2-55	Output bit7 of word-to-bit conversion function 1	-	33119

Para.	Name	Unit	Address
U2-56	Output bit8 of word-to-bit conversion function 1	-	33120
U2-57	Output bit9 of word-to-bit conversion function 1	-	33121
U2-58	Output bit10 of word-to-bit conversion function 1	-	33122
U2-59	Output bit11 of word-to-bit conversion function 1	-	33123
U2-60	Output bit12 of word-to-bit conversion function 1	-	33124
U2-61	Output bit13 of word-to-bit conversion function 1	-	33125
U2-62	Output bit14 of word-to-bit conversion function 1	-	33126
U2-63	Output bit15 of word-to-bit conversion function 1	-	33127
U2-64	Output bit0 of word-to-bit conversion function 2	-	33128
U2-65	Output bit1 of word-to-bit conversion function 2	-	33129
U2-66	Output bit2 of word-to-bit conversion function 2	-	33130
U2-67	Output bit3 of word-to-bit conversion function 2	-	33131
U2-68	Output bit4 of word-to-bit conversion function 2	-	33132
U2-69	Output bit5 of word-to-bit conversion function 2	-	33133
U2-70	Output bit6 of word-to-bit conversion function 2	-	33134
U2-71	Output bit7 of word-to-bit conversion function 2	-	33135
U2-72	Output bit8 of word-to-bit conversion function 2	-	33136
U2-73	Output bit9 of word-to-bit conversion function 2	-	33137
U2-74	Output bit10 of word-to-bit conversion function 2	-	33138
U2-75	Output bit11 of word-to-bit conversion function 2	-	33139

Para.	Name	Unit	Address
U2-76	Output bit12 of word-to-bit conversion function 2	-	33140
U2-77	Output bit13 of word-to-bit conversion function 2	-	33141
U2-78	Output bit14 of word-to-bit conversion function 2	-	33142
U2-79	Output bit15 of word-to-bit conversion function 2	-	33143
U2-80	Output bit0 of word-to-bit conversion function 3	-	33160
U2-81	Output bit1 of word-to-bit conversion function 3	-	33161
U2-82	Output bit2 of word-to-bit conversion function 3	-	33162
U2-83	Output bit3 of word-to-bit conversion function 3	-	33163
U2-84	Output bit4 of word-to-bit conversion function 3	-	33164
U2-85	Output bit5 of word-to-bit conversion function 3	-	33165
U2-86	Output bit6 of word-to-bit conversion function 3	-	33166
U2-87	Output bit7 of word-to-bit conversion function 3	-	33167
U2-88	Output bit8 of word-to-bit conversion function 3	-	33168
U2-89	Output bit9 of word-to-bit conversion function 3	-	33169
U2-90	Output bit10 of word-to-bit conversion function 3	-	33170
U2-91	Output bit11 of word-to-bit conversion function 3	-	33171
U2-92	Output bit12 of word-to-bit conversion function 3	-	33172
U2-93	Output bit13 of word-to-bit conversion function 3	-	33173
U2-94	Output bit14 of word-to-bit conversion function 3	-	33174
U2-95	Output bit15 of word-to-bit conversion function 3	-	33175
Group U3: Bit connector 4			
U3-00	Output of logic AND module A	-	33196

Para.	Name	Unit	Address
U3-01	Output of logic AND module B	-	33197
U3-02	Output of logic AND module C	-	33198
U3-03	Output of logic AND module D	-	33199
U3-04	Output of logic NOT module A	-	33200
U3-05	Output of logic NOT module B	-	33201
U3-06	Output of logic NOT module C	-	33202
U3-07	Output of logic NOT module D	-	33203
U3-08	Output of logic NOT module E	-	33204
U3-09	Output of logic NOT module F	-	33205
U3-10	Output of logic NOT module G	-	33206
U3-11	Output of logic NOT module H	-	33207
U3-12	Output of logic OR module A	-	33208
U3-13	Output of logic OR module B	-	33209
U3-14	Output of logic OR module C	-	33210
U3-15	Output of logic OR module D	-	33211
U3-16	Output of logic delay module A	-	33212
U3-17	Output of logic delay module B	-	33213
U3-18	Output of logic delay module C	-	33214
U3-19	Output of logic delay module D	-	33215
U3-24	Output of binary selector module 5	-	35067
U3-25	Output of binary selector module 6	-	35068
U3-26	Output of binary selector module 7	-	35069
U3-27	Output of binary selector module 8	-	35042
U3-40	Hardware fault	-	33236
U3-41	SD card fault	-	33237
U3-42	Low RTC battery voltage	-	33238
U3-43	Local control fault	-	33239
U3-44	Drive communication fault	-	33240
U3-45	Expansion module offline	-	33241
U3-46	Expansion module slot address conflict	-	33242
U3-47	Fieldbus adapter fault	-	33243
U3-49	IGBT drive fault	-	33245
U3-50	Overcurrent	-	33246
U3-51	Overvoltage	-	33247
U3-52	Undervoltage	-	33248
U3-56	Drive overload	-	33252

Para.	Name	Unit	Address
U3-57	Short circuit to ground	-	33253
U3-58	Module overtemperature	-	33254
U3-59	Low module temperature	-	33255
U3-60	The ambient temperature is too high.	-	33256
U3-61	Incorrect parameter setting	-	33257
U3-62	External fault activation	-	33266
U3-63	External alarm activation	-	33267
U3-64	EEPROM power failure	-	33269
U3-65	Excessive leakage current	-	33270
U3-66	Master-slave communication error (InoLink and FO synchronization)	-	33274
U3-67	Incorrect model parameter	-	33276
U3-68	Rectifier self-test error	-	33988
U3-69	Pre-charge error	-	33989
U3-70	External hardware fault	-	33990
U3-71	Reactor temperature error	-	33994
U3-72	Module connection error	-	33996
U3-73	Grid error	-	33997
U3-74	Input current unbalance	-	33999
U3-75	Parameter auto-tuning error	-	34000
U3-76	Fieldbus adapter alarm	-	33284
U3-77	Internal fault	-	33277
U3-78	Error	-	33278
U3-79	24 V voltage is too low	-	33279
U3-80	Parallel module alarm	-	33281
U3-81	Parallel module fault	-	33282
U3-82	Parallel module current unbalance alarm	-	34080
U3-88	Module pre-overtemperature	-	33289
Group U4: Bit connector 5			
U4-00	Output of logic XOR/XNOR module A	-	33216
U4-01	Output of logic XOR/XNOR module B	-	33217
U4-02	Output of logic XOR/XNOR module C	-	33218
U4-03	Output of logic XOR/XNOR module D	-	33219

Para.	Name	Unit	Address
U4-04	Output of binary selector module 1	-	33220
U4-05	Output of binary selector module 2	-	33221
U4-06	Output of binary selector module 3	-	34866
U4-07	Output of binary selector module 4	-	34867
U4-08	Output of level-to-pulse conversion module A	-	33222
U4-09	Output of level-to-pulse conversion module B	-	33223
U4-10	Output of level-to-pulse conversion module C	-	33224
U4-11	Output of level-to-pulse conversion module D	-	33225
U4-12	Negative number input flag of absolute value module A	-	33226
U4-13	Negative number input flag of absolute value module B	-	33227
U4-14	Negative number input flag of absolute value module C	-	33228
U4-15	Negative number input flag of absolute value module D	-	33229
U4-16	Flag indicating whether divisor of multiplication and division module A is 0	-	33230
U4-17	Flag indicating whether divisor of multiplication and division module B is 0	-	33231
U4-18	Flag indicating whether divisor of multiplication and division module C is 0	-	33232
U4-19	Flag indicating whether divisor of multiplication and division module D is 0	-	33233
U4-20	Output of comparison module A	-	33234
U4-21	Output of comparison module B	-	33235
U4-22	Output of comparison module C	-	34872
U4-23	Output of comparison module D	-	34873
U4-24	Output of comparison module E	-	35106
U4-25	Limit flag of limiting module A	-	35102
U4-26	Limit flag of limiting module B	-	35103
U4-27	Limit flag of limiting module C	-	35104
U4-28	Limit flag of limiting module D	-	35105

Para.	Name	Unit	Address
U4-31	Output of logic AND-OR module A	-	35094
U4-32	Output of logic AND-OR module B	-	35095
U4-33	Output of logic AND-OR module C	-	35096
U4-34	Output of logic AND-OR module D	-	35097
U4-35	Output of logic AND-OR module E	-	35098
U4-36	Output of logic AND-OR module F	-	35099
U4-37	Output of logic AND-OR module G	-	35100
U4-38	Output of logic AND-OR module H	-	35101
U4-39	Output bit0 of word-to-bit conversion function 4	-	35070
U4-40	Output bit1 of word-to-bit conversion function 4	-	35071
U4-41	Output bit2 of word-to-bit conversion function 4	-	35072
U4-42	Output bit3 of word-to-bit conversion function 4	-	35073
U4-43	Output bit4 of word-to-bit conversion function 4	-	35074
U4-44	Output bit5 of word-to-bit conversion function 4	-	35075
U4-45	Output bit6 of word-to-bit conversion function 4	-	35076
U4-46	Output bit7 of word-to-bit conversion function 4	-	35077
U4-47	Output bit8 of word-to-bit conversion function 4	-	35078
U4-48	Output bit9 of word-to-bit conversion function 4	-	35079
U4-49	Output bit10 of word-to-bit conversion function 4	-	35080
U4-50	Output bit11 of word-to-bit conversion function 4	-	35081
U4-51	Output bit12 of word-to-bit conversion function 4	-	35082
U4-52	Output bit13 of word-to-bit conversion function 4	-	35083
U4-53	Output bit14 of word-to-bit conversion function 4	-	35084
U4-54	Output bit15 of word-to-bit conversion function 4	-	35085
U4-55	<I/O module 1> DI1 input	-	35263

Para.	Name	Unit	Address
U4-56	<I/O module 1> DI2 input	-	35264
U4-57	<I/O module 1> DI3 input	-	35265
U4-58	<I/O module 1> DI4 input	-	35266
U4-59	<I/O module 1> DI5 input	-	35267
U4-60	<I/O module 1> DI6 input	-	35268
U4-61	<I/O module 1> DIO1 input	-	32946
U4-62	<I/O module 1> DIO2 input	-	32947
U4-63	<I/O module 1> DIO3 input	-	32948
U4-64	<I/O module 1> DIO4 input	-	32949
U4-65	<I/O module 1> DIO5 input	-	32950
U4-66	<I/O module 1> DIO6 input	-	32951
U4-67	<I/O module 2> DI1 input	-	35269
U4-68	<I/O module 2> DI2 input	-	35270
U4-69	<I/O module 2> DI3 input	-	35271
U4-70	<I/O module 2> DI4 input	-	35272
U4-71	<I/O module 2> DI5 input	-	35273
U4-72	<I/O module 2> DI6 input	-	35274
U4-73	<I/O module 2> DIO1 input	-	32952
U4-74	<I/O module 2> DIO2 input	-	32953
U4-75	<I/O module 2> DIO3 input	-	32954
U4-76	<I/O module 2> DIO4 input	-	32955
U4-77	<I/O module 2> DIO5 input	-	32956
U4-78	<I/O module 2> DIO6 input	-	32957
U4-79	<I/O module 3> DI1 input	-	35275
U4-80	<I/O module 3> DI2 input	-	35276
U4-81	<I/O module 3> DI3 input	-	35277
U4-82	<I/O module 3> DI4 input	-	35278
U4-83	<I/O module 3> DI5 input	-	35279
U4-84	<I/O module 3> DI6 input	-	35280
U4-85	<I/O module 3> DIO1 input	-	32958
U4-86	<I/O module 3> DIO2 input	-	32959
U4-87	<I/O module 3> DIO3 input	-	32960
U4-88	<I/O module 3> DIO4 input	-	32961
U4-89	<I/O module 3> DIO5 input	-	32962
U4-90	<I/O module 3> DIO6 input	-	32963
U4-91	<I/O module 1> AI1 wire breakage	-	35281
U4-92	<I/O module 1> AI2 wire breakage	-	35282

Para.	Name	Unit	Address
U4-93	<I/O module 1> AI3 wire breakage	-	35283
U4-94	<I/O module 2> AI1 wire breakage	-	35284
U4-95	<I/O module 2> AI2 wire breakage	-	35285
U4-96	<I/O module 2> AI3 wire breakage	-	35286
U4-97	<I/O module 3> AI1 wire breakage	-	35287
U4-98	<I/O module 3> AI2 wire breakage	-	35288
U4-99	<I/O module 3> AI3 wire breakage	-	35289
Group U5: Word connector 1			
U5-00	Current state machine	-	32768
U5-01	Pre-charge state	-	33935
U5-02	Bus voltage	V	33936
U5-03	Grid voltage	V	33929
U5-04	Grid frequency	Hz	33930
U5-05	Grid current	A	33932
U5-06	Power	kVA	33931
U5-07	Power factor	-	33933
U5-08	Three-phase unbalance factor	%	33934
U5-09	Max. power unit temperature	°C	32776
U5-11	Measured module temperature	°C	33397
U5-16	Active power	kW	33953
U5-17	Active current	A	33967
U5-18	AI1 input proportion	%	33401
U5-19	AI2 input proportion	%	33402
U5-20	HDI1 input proportion	%	33403
U5-21	HDI2 input proportion	%	33404
U5-22	AO1 output proportion	%	33405
U5-23	AO2 output proportion	%	33406
U5-24	HDO1 output proportion	%	33407
U5-25	HDO2 output proportion	%	33408
U5-32	InoLink.PZD1	-	33409
U5-33	InoLink.PZD2	-	33410
U5-34	InoLink.PZD3	-	33411
U5-35	InoLink.PZD4	-	33412
U5-36	InoLink.PZD5	-	33413
U5-37	InoLink.PZD6	-	33414
U5-38	InoLink.PZD7	-	33415
U5-39	InoLink.PZD8	-	33416

Para.	Name	Unit	Address
U5-40	Modbus communication setpoint 1	-	33449
U5-41	Modbus communication setpoint 2	-	33450
U5-44	Fieldbus adapter A.PZD1	-	33417
U5-45	Fieldbus adapter A.PZD2	-	33418
U5-46	Fieldbus adapter A.PZD3	-	33419
U5-47	Fieldbus adapter A.PZD4	-	33420
U5-48	Fieldbus adapter A.PZD5	-	33421
U5-49	Fieldbus adapter A.PZD6	-	33422
U5-50	Fieldbus adapter A.PZD7	-	33423
U5-51	Fieldbus adapter A.PZD8	-	33424
U5-52	Fieldbus adapter A.PZD9	-	33425
U5-53	Fieldbus adapter A.PZD10	-	33426
U5-54	Fieldbus adapter A.PZD11	-	33427
U5-55	Fieldbus adapter A.PZD12	-	33428
U5-56	Fieldbus adapter A.PZD13	-	33429
U5-57	Fieldbus adapter A.PZD14	-	33430
U5-58	Fieldbus adapter A.PZD15	-	33431
U5-59	Fieldbus adapter A.PZD16	-	33432
U5-60	Fieldbus adapter B.PZD1	-	33433
U5-61	Fieldbus adapter B.PZD2	-	33434
U5-62	Fieldbus adapter B.PZD3	-	33435
U5-63	Fieldbus adapter B.PZD4	-	33436
U5-64	Fieldbus adapter B.PZD5	-	33437
U5-65	Fieldbus adapter B.PZD6	-	33438
U5-66	Fieldbus adapter B.PZD7	-	33439
U5-67	Fieldbus adapter B.PZD8	-	33440
U5-68	Fieldbus adapter B.PZD9	-	33441
U5-69	Fieldbus adapter B.PZD10	-	33442
U5-70	Fieldbus adapter B.PZD11	-	33443
U5-71	Fieldbus adapter B.PZD12	-	33444
U5-72	Fieldbus adapter B.PZD13	-	33445
U5-73	Fieldbus adapter B.PZD14	-	33446
U5-74	Fieldbus adapter B.PZD15	-	33447
U5-75	Fieldbus adapter B.PZD16	-	33448
U5-76	Output high word of DW-W 1	-	33453
U5-77	Output low word of DW-W 1	-	33454
U5-78	Output high word of DW-W 2	-	33455

Para.	Name	Unit	Address
U5-79	Output low word of DW-W 2	-	33456
U5-80	Output high word of DW-W 3	-	33457
U5-81	Output low word of DW-W 3	-	33458
U5-86	Output of bit-to-word function 1	-	33463
U5-87	Output of bit-to-word function 2	-	33464
U5-88	Output of bit-to-word function 3	-	33465
U5-89	Output of bit-to-word function 4	-	33466
U5-91	<I/O module 1> AI1 input proportion	%	33467
U5-92	<I/O module 1> AI2 input proportion	%	33468
U5-93	<I/O module 1> AI3 input proportion	%	33469
U5-94	<I/O module 2> AI1 input proportion	%	33470
U5-95	<I/O module 2> AI2 input proportion	%	33471
U5-96	<I/O module 2> AI3 input proportion	%	33472
U5-97	<I/O module 3> AI1 input proportion	%	33473
U5-98	<I/O module 3> AI2 input proportion	%	33474
U5-99	<I/O module 3> AI3 input proportion	%	33475
Group U6: Word connector 2			
U6-00	Operation Mode	-	34032
U6-01	Actual valid current setpoint	A	33963
U6-02	Actual valid voltage setpoint (before ramp)	V	33962
U6-05	Input current percentage	%	33979
U6-07	Actual valid current setpoint (%)	%	33965
U6-08	Actual valid voltage setpoint (%)	%	33964
U6-11	Bus voltage (%)	%	34908
U6-24	Forward current limit (sourced from current limit setpoint)	A	34982
U6-25	Reverse current limit (sourced from current limit setpoint)	A	34983
U6-26	Forward power limit	kW	34984
U6-27	Reverse power limit	kW	34985

Para.	Name	Unit	Address
U6-44	[HSVM-10] data entries received by the module	-	33946
U6-45	[HSVM-10] reserved	-	33947
U6-46	[HSVM-10] reserved	-	33948
U6-47	[HSVM-10] module U _{sr} sampling AD	-	33949
U6-48	[HSVM-10] module U _{st} sampling AD	-	33950
U6-49	[HSVM-10] module temperature sampling AD	-	33951
U6-59	R phase current	%	34655
U6-60	S phase current	%	34656
U6-61	T phase current	%	34657
U6-68	RS line voltage	%	34664
U6-69	ST line voltage	%	34665
U6-70	TR line voltage	%	34666
Group U7: Word connector 3			
U7-00	Fixed value 0%	%	33520
U7-01	Fixed value 100%	%	33521
U7-02	Fixed value 200%	%	33522
U7-03	Fixed value 400%	%	33523
U7-04	Fixed value 600%	%	33524
U7-05	Fixed value -100%	%	33525
U7-06	Fixed value -200%	%	33526
U7-07	Fixed value -400%	%	33527
U7-08	Fixed value -600%	%	33528
U7-09	Module R phase temperature	°C	33529
U7-10	Module S phase temperature	°C	33530
U7-11	Module T phase temperature	°C	33531
U7-12	Current state machine	-	33532
U7-13	Latest state machine	-	33533
U7-14	Second latest state machine	-	33534
U7-15	Third latest state machine	-	33535
U7-16	Fourth latest state machine	-	33536
U7-17	Fifth latest state machine	-	33537
U7-18	Sixth latest state machine	-	33538
U7-19	Seventh latest state machine	-	33539
U7-20	Eighth latest state machine	-	33540
U7-21	Ninth latest state machine	-	33541

Para.	Name	Unit	Address
U7-24	[HSVM-10] module combination flag word	-	34088
U7-25	[HSVM-10] module function flag word	-	34089
U7-26	Single model code	-	33546
U7-27	Module that is processing the model parameter	-	33547
U7-28	Model code of module 01	-	33548
U7-29	Model code of module 02	-	33549
U7-30	Model code of module 03	-	33550
U7-31	Model code of module 04	-	33551
U7-32	Model code of module 05	-	33552
U7-33	Model code of module 06	-	33553
U7-34	Model code of module 07	-	33554
U7-35	Model code of module 08	-	33555
U7-36	Model code of module 09	-	33556
U7-37	Model code of module 10	-	33557
U7-38	InoLink status word	-	36297
U7-39	InoLink node status word	-	36298
U7-40	InoLink control word 1	-	36299
U7-41	InoLink control word 2	-	36300
U7-65	Value of parameter monitoring parameter 1	-	34816
U7-66	Value of parameter monitoring parameter 2	-	34817
U7-67	Value of parameter monitoring parameter 3	-	34818
U7-68	Value of parameter monitoring parameter 4	-	34819
U7-69	Value of parameter monitoring parameter 5	-	34820
U7-70	Value of parameter monitoring parameter 6	-	34821
U7-71	Value of parameter monitoring parameter 7	-	34822
U7-72	Value of parameter monitoring parameter 8	-	34823
U7-73	Value of parameter monitoring parameter 9	-	34824

Para.	Name	Unit	Address
U7-74	Value of parameter monitoring parameter 10	-	34825
U7-85	Output of constant setpoint 1	%	33514
U7-86	Output of constant setpoint 2	%	33515
U7-87	Output of constant setpoint 3	%	33516
U7-88	Output of constant setpoint 4	%	35316
U7-89	Output of constant setpoint 5	%	35317
U7-90	Memory variable 1	-	33508
U7-91	Memory variable 2	-	33509
U7-92	Memory variable 3	-	33510
U7-96	STO-enabled online module	-	33772
U7-97	Online module with activated STO	-	33773
U7-98	STO input terminal status of current module	-	33480
Group U8: Word connector 4			
U8-03	Factory settings start/stop control word	-	34052
U8-04	Current fault	-	33571
U8-05	Active Limit	-	33572
U8-06	Current alarms	-	33573
U8-07	Control word 1	-	33574
U8-08	Control word 2	-	33575
U8-09	Status word 1	-	33576
U8-10	Status word 2	-	33577
U8-11	Terminal start/stop control word	-	33578
U8-12	SOP-20 start/stop control word	-	33579
U8-13	PC start/stop control word	-	33580
U8-14	User-defined start/stop control word	-	33581
U8-15	Status word 3	-	33981
U8-16	Status word 4	-	33982
U8-17	DI status	-	33584
U8-18	DO status	-	33585
U8-19	DI status (raw value)	-	34894
U8-22	AI1 input value	-	33589

Para.	Name	Unit	Address
U8-23	AI2 input value	-	33590
U8-24	HDI1 input value	-	33591
U8-25	HDI2 input value	-	33592
U8-26	AO1 output value	-	33593
U8-27	AO2 output value	-	33594
U8-28	HDO1 output value	-	33595
U8-29	HDO2 output value	-	33596
U8-39	Single module HINT status word 1/ Parallel module master fault word 1	-	33606
U8-40	Single module HINT status word 2/ Parallel module master fault word 2	-	33607
U8-41	Fieldbus adapter A communication error count	-	33608
U8-42	Fieldbus adapter B communication error count	-	33609
U8-43	Fieldbus adapter C communication error count	-	33610
U8-44	Parameter setting error code	-	33614
U8-47	Port 24 V detection voltage of the HCU control board	V	34831
U8-48	Internal 15 V detection voltage of the HCU control board	V	34832
U8-50	Actual valid voltage setpoint (after ramp)	V	34084
U8-71	Fieldbus adapter A communication status	-	33611
U8-72	Fieldbus adapter B communication status	-	33612
U8-73	Fieldbus adapter C communication status	-	33613
U8-74	Status word of FPGA main control operation status control	-	33615
U8-75	Fault word 1 of FPGA main control operation status control	-	33616
U8-76	Fault word 2 of FPGA main control operation status control	-	33617
U8-77	Control unit FPGA auxiliary status word	-	33621
U8-78	Low word of FPGA time	-	33619

Para.	Name	Unit	Address
U8-79	High word of FPGA time	-	33620
U8-80	Subcode of current fault	-	36303
U8-81	Subcode of current active limit	-	36304
U8-82	Subcode of current alarm	-	36305
U8-90	Monitoring variable 1	-	34696
U8-91	Monitoring variable 2	-	34697
U8-92	Monitoring variable 3	-	34698
U8-93	Monitoring variable 4	-	34699
U8-94	Monitoring variable 5	-	34700
U8-95	Monitoring variable 6	-	34701
U8-96	Monitoring variable 7	-	34702
U8-97	Monitoring variable 8	-	34703
U8-98	Monitoring variable 9	-	34704
U8-99	Monitoring variable 10	-	34705
Group U9: Double-word connectors			
U9-00	Input consumed energy	kWh	34243
U9-01	Input feedback energy	kWh	34245
U9-15	Output of numeric switch module 13	%	33304
U9-16	Output of numeric switch module 14	%	33306
U9-17	Output of numeric switch module 15	%	33308
U9-18	Output of numeric switch module 16	%	33310
U9-19	Output of limiting module A	%	35086
U9-20	Output of limiting module B	%	35088
U9-21	Output of limiting module C	%	35090
U9-22	Output of limiting module D	%	35092
U9-25	Current power-on duration	s	33764
U9-26	Current running duration	s	33766
U9-27	Accumulative power-on duration	s	33768
U9-28	Accumulative running duration	s	33770
U9-29	Motor-driven potentiometer output	%	33658
U9-30	Multi-reference selection output	%	33660
U9-31	Multi-reference value 1	%	33662
U9-32	Multi-reference value 2	%	33664
U9-33	Multi-reference value 3	%	33666

Para.	Name	Unit	Address
U9-34	Multi-reference value 4	%	33668
U9-35	Multi-reference value 5	%	33670
U9-36	Multi-reference value 6	%	33672
U9-37	Multi-reference value 7	%	33674
U9-38	Multi-reference value 8	%	33676
U9-39	Multi-reference value 9	%	33678
U9-40	Multi-reference value 10	%	33680
U9-41	Multi-reference value 11	%	33682
U9-42	Multi-reference value 12	%	33684
U9-43	Multi-reference value 13	%	33686
U9-44	Multi-reference value 14	%	33688
U9-45	Multi-reference value 15	%	33690
U9-46	Multi-reference value 16	%	33692
U9-47	Output of W-DW 1	%	33694
U9-48	Output of W-DW 2	%	33696
U9-49	Output of W-DW 3	%	33698
U9-50	Modbus communication double word setpoint	%	33700
U9-51	Output of constant setpoint 6	%	35318
U9-52	Output of constant setpoint 7	%	35320
U9-53	Output of constant setpoint 8	%	35322
U9-54	Output of constant setpoint 9	%	35324
U9-55	Output of constant setpoint 10	%	35326
U9-56	Output of numeric switch module 1	%	33716
U9-57	Output of numeric switch module 2	%	33718
U9-58	Output of numeric switch module 3	%	34868
U9-59	Output of numeric switch module 4	%	34870
U9-60	Output of numeric switch module 5	%	35110
U9-61	Output of numeric switch module 6	%	35112
U9-62	Output of numeric switch module 7	%	35114
U9-63	Output of numeric switch module 8	%	35043
U9-64	Output of numeric switch module 9	%	33296
U9-65	Output of numeric switch module 10	%	33298
U9-66	Output of numeric switch module 11	%	33300
U9-67	Output of numeric switch module 12	%	33302

Para.	Name	Unit	Address
U9-69	Output of filter module A	%	33720
U9-70	Output of filter module B	%	33722
U9-71	Output of filter module C	%	33724
U9-72	Output of filter module D	%	33726
U9-73	Output of absolute value module A	%	33728
U9-74	Output of absolute value module B	%	33730
U9-75	Output of absolute value module C	%	33732
U9-76	Output of absolute value module D	%	33734
U9-77	Output of addition and subtraction module A	%	33736
U9-78	Output of addition and subtraction module B	%	33738
U9-79	Output of addition and subtraction module C	%	33740
U9-80	Output of addition and subtraction module D	%	33742
U9-81	Output of multiplication and division module A	%	33744
U9-82	Output of multiplication and division module B	%	33746
U9-83	Output of multiplication and division module C	%	33748
U9-84	Output of multiplication and division module D	%	33750
U9-85	Output of multi-point curve module A	%	33752
U9-86	Output of multi-point curve module B	%	33754
U9-98	Double-word memory variable 1	-	33756
U9-99	Double-word memory variable 2	-	33758
Group U15: Word connector 5			
U15-10	Output of proportion module 1	%	35293
U15-11	Output of proportion module 2	%	35294
U15-12	Output of proportion module 3	%	35295
U15-13	Output of proportion module 4	%	35296
U15-14	Output of proportion module 5	%	35297
U15-15	Output of proportion module 6	%	35298
U15-16	Output of proportion module 7	%	35299
U15-17	Output of proportion module 8	%	35300
U15-18	Output of proportion module 9	%	35301

Para.	Name	Unit	Address
U15-19	Output of proportion module 10	%	35302
U15-70	Output of constant setpoint 31	-	35305
U15-71	Output of constant setpoint 32	-	35306
U15-72	Output of constant setpoint 33	-	35307
U15-73	Output of constant setpoint 34	-	35308
U15-74	Output of constant setpoint 35	-	35309
U15-75	Output of constant setpoint 36	-	35310
U15-76	Output of constant setpoint 37	-	35311
U15-77	Output of constant setpoint 38	-	35312
U15-78	Output of constant setpoint 39	-	35313
U15-79	Output of constant setpoint 40	-	35314
U15-80	Output of constant setpoint 11	-	34986
U15-81	Output of constant setpoint 12	-	34987
U15-82	Output of constant setpoint 13	-	34988
U15-83	Output of constant setpoint 14	-	34989
U15-84	Output of constant setpoint 15	-	34990
U15-85	Output of constant setpoint 16	-	34991
U15-86	Output of constant setpoint 17	-	34992
U15-87	Output of constant setpoint 18	-	34993
U15-88	Output of constant setpoint 19	-	34994
U15-89	Output of constant setpoint 20	-	34995
U15-90	Output of constant setpoint 21	-	34996
U15-91	Output of constant setpoint 22	-	34997
U15-92	Output of constant setpoint 23	-	34998
U15-93	Output of constant setpoint 24	-	34999
U15-94	Output of constant setpoint 25	-	35000
U15-95	Output of constant setpoint 26	-	35001
U15-96	Output of constant setpoint 27	-	35002
U15-97	Output of constant setpoint 28	-	35003
U15-98	Output of constant setpoint 29	-	35004
U15-99	Output of constant setpoint 30	-	35005
Group U16: Word connector 6			
U16-00	Status word of current node in droop control mode	-	34714
U16-01	Power per-unit value of current node in droop control mode	-	34715

Para.	Name	Unit	Address
U16-02	Target voltage of current node in droop control mode (adjustment parameter)	V	34716
U16-03	Average power after power sharing in droop control mode (adjustment parameter)	-	34717
U16-04	Power sharing online count in droop control mode (adjustment parameter)	-	34718
U16-05	Power sharing adjustment amount in droop control mode (adjustment parameter)	V	34719
U16-06	Droop power sharing status word	-	33329
Group U19: Double-word connector 2			
U19-95	Output of proportion module 11	%	34854
U19-96	Output of proportion module 12	%	34856
U19-97	Output of proportion module 13	%	34858
U19-98	Output of proportion module 14	%	34860
U19-99	Output of proportion module 15	%	34862

Chapter 7 Troubleshooting

7.1 Viewing Faults

7.1.1 Fault Classification

Faults can be divided into the following three categories based on severity:

- **Fault:** The system incurs major faults or errors and immediately stops running, waiting for troubleshooting.
- **Limit:** A fault has occurred in the system. Switch-on is allowed, but IGBT is not energized.
- **Alarm:** A minor error which does not affect operation has occurred, and the user decides the subsequent handling.

A fault code consists of three parts. In terms of fault levels, F indicates fault, L indicates limit, and A indicates alarm, as shown in the following figure.

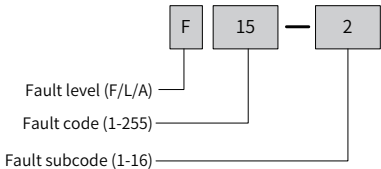


Figure 7-1 Fault code

7.1.2 Viewing Fault Information

Faults are represented by fault codes and subcodes. Fault codes indicate the fault classification and subcodes indicate specific faults. For example, in ERR15-2, 15 indicates an external fault and 2 indicates the external fault 2.

1) Current fault

HCU-40 can record up to six faults occurring at a time. Additional faults are not recorded. You can view currently activated faults in group A1.

Table 7-1 Current faults

Current Fault		Active Limit		Current Alarm	
Fault Code	Subcode	Fault Code	Subcode	Fault Code	Subcode
A1-00	A1-01	A1-12	A1-13	A1-24	A1-25
A1-02	A1-03	A1-14	A1-15	A1-26	A1-27
A1-04	A1-05	A1-16	A1-17	A1-28	A1-29

Current Fault		Active Limit		Current Alarm	
Fault Code	Subcode	Fault Code	Subcode	Fault Code	Subcode
A1-06	A1-07	A1-18	A1-19	A1-30	A1-31
A1-08	A1-09	A1-20	A1-21	A1-32	A1-33
A1-10	A1-11	A1-22	A1-23	A1-34	A1-35

2) Historical fault

HCU-40 can record latest five faults, one latest limit, and one latest alarm.

Table 7-2 Fault Query

Latest Fault		Second Latest Fault		Third Latest Fault		Fourth Latest Fault	
Fault Code	Subcode	Fault Code	Subcode	Fault Code	Subcode	Fault Code	Subcode
H2-00	H2-01	H3-00	H3-01	H4-00	H4-01	H5-00	H5-01
H2-02	H2-03	H3-02	H3-03	H4-02	H4-03	H5-02	H5-03
H2-04	H2-05	H3-04	H3-05	H4-04	H4-05	H5-04	H5-05
H2-06	H2-07	H3-06	H3-07	H4-06	H4-07	H5-06	H5-07
H2-08	H2-09	H3-08	H3-09	H4-08	H4-09	H5-08	H5-09
H2-10	H2-11	H3-10	H3-11	H4-10	H4-11	H5-10	H5-11

Fifth Latest Fault		Latest Limit		Latest Alarm	
Fault Code	Subcode	Fault Code	Subcode	Fault Code	Subcode
H6-00	H6-01	H7-00	H7-01	H8-00	H8-01
H6-02	H6-03	H7-02	H7-03	H8-02	H8-03
H6-04	H6-05	H7-04	H7-05	H8-04	H8-05
H6-06	H6-07	H7-06	H7-07	H8-06	H8-07
H6-08	H6-09	H7-08	H7-09	H8-08	H8-09
H6-10	H6-11	H7-10	H7-11	H8-10	H8-11

3) Fault data records

In addition to the fault code and subcode, HCU-40 also records the data upon the occurrence of the fault. It can record up to the latest three faults in group H1.

Table 7-3 Fault data record

Recorded Item	Data of Latest Fault	Data of Second Latest Fault	Data of Third Latest Fault	Data of Fourth Latest Fault	Data of Fifth Latest Fault
Bus voltage upon fault occurrence	H2-12	H3-12	H4-12	H5-12	H6-12

Recorded Item	Data of Latest Fault	Data of Second Latest Fault	Data of Third Latest Fault	Data of Fourth Latest Fault	Data of Fifth Latest Fault
Grid voltage upon fault occurrence	H2-13	H3-13	H4-13	H5-13	H6-13
Grid current upon fault occurrence	H2-14	H3-14	H4-14	H5-14	H6-14
Grid frequency upon fault occurrence	H2-15	H3-15	H4-15	H5-15	H6-15
Control word 1 upon fault occurrence	H2-26	H3-26	H4-26	H5-26	H6-26
Control word 2 upon fault occurrence	H2-27	H3-27	H4-27	H5-27	H6-27
Fault status word	H2-28	H3-28	H4-28	H5-28	H6-28
Fault state machine	H2-29	H3-29	H4-29	H5-29	H6-29
Fault occurrence time	H2-30	H3-30	H4-30	H5-30	H6-30
Fault occurrence date	H2-31	H3-31	H4-31	H5-31	H6-31

4) Viewing faults through SOP-20-880

SOP-20-880 allows you to directly view fault information using the above-mentioned parameters or view fault information in the fault menu.

Table 7-4 Viewing faults through SOP-20-880

Function	Key	Description
View the current fault	Key operation	Choose Menu > Fault Status > Active Fault.
View the active limit	Key operation	Choose Menu > Fault Status > Active Limit.
View the current alarm	Key operation	Choose Menu > Fault Status > Current Alarm.
View fault-related help information		Select a fault and press this key, the help information related to the fault will be displayed.

Function	Key	Description
View history faults	Key operation	Choose Menu > Fault Status > History Faults .

It is recommended to use the fault menu to view fault information. The fault menu presents all the recorded faults with fault descriptions and help information in text.

5) Viewing faults through InoDriveStudio

When using InoDriveStudio, you can access the **Fault alarm list** to view faults. For details, see "[1.2.3 Basic Operations](#)".

The **Fault alarm list** provides the fault descriptions, causes, and solutions, and allows you to view relevant data upon occurrence of a fault.

7.1.3 Fault Reset Mode

HCU-40 supports the following modes for reset upon fault: SOP-20-880 reset, InoDriveStudio reset, control channel reset, auto reset by parameter setting, and reset by re-power-on.

Table 7-5 Fault reset modes

Mode	Description
SOP-20-880	After successful connection, press STOP on any screen to reset upon fault.
InoDriveStudio	After successful connection, click the reset button on the control panel to reset upon fault.
Control channel	Reset the fault through parameter configuration.
Setting parameters	Set H0-07 to 1 to set a proper reset interval. Then fault is automatically reset.
Re-power-on	Power on HCU-40 again to reset upon fault.



NOTE

- ◆ The reset command from SOP-20-880 or InoDriveStudio is always active once connected, regardless of control sources.
- ◆ The reset signal is always triggered on the rising edge.
- ◆ When factory settings are enabled, the reset commands corresponding to other control words in the control channel are still active.
- ◆ When factory settings are disabled, the reset command corresponding to the control channel is active.

7.1.4 Fault Level Change and Auto Reset

1) Fault level change

The system can prompt faults, limits, and alarms, which are divided into 7 levels. Users can set fault prompts to different levels based on actual conditions. The following table lists the 10 user-definable fault levels.

Table 7-6 Fault levels

Para.	Value
Level change error codes 1 to 10 (such as H0-33)	Fault display code
Levels of error codes 1 to 10 (such as H0-34)	0: Switch off 2: Stop running 6: Display alarm only 7: No handling

Table 7-7 Fault level description

Fault Level	Meaning	Remarks
0: Switch off	The output is inhibited and switched off.	Fault
2: Stop running	The system cannot run if the conditions are not met.	Limit
6: Display alarm only	Only alarms are displayed.	Alarm
7: No handling	The system does not generate prompts.	Normal

**NOTE**

- ◆ Fault display code: It is the fault code prompted upon a system fault. For example, the fault display code of the external fault 1 ERR15-1 is 15.
- ◆ Fault level change is not applicable to every fault. The system automatically determines the allowed range according to different fault levels.

Table 7-8 List of faults with changeable levels

Fault Code Name	Default Level	Max.	Min.
15: External fault	0: Switch off	0: Switch off	6: Display alarm only
44: Expansion module offline	0: Switch off	0: Switch off	6: Display alarm only
45: Expansion module slot address conflict	0: Switch off	0: Switch off	6: Display alarm only
50: SD card error	6: Display alarm only	6: Display alarm only	7: No handling
51: RTC error	6: Display alarm only	6: Display alarm only	7: No handling
54: Expansion module offline fault	0: Switch off	0: Switch off	6: Display alarm only
59: Low module temperature	0: Switch off	0: Switch off	6: Display alarm only
66: Leakage current fault	0: Switch off	0: Switch off	6: Display alarm only
71: Rectifier self-test fault	0: Switch off	0: Switch off	2: Stop running
83: Master-slave communication error	0: Switch off	0: Switch off	6: Display alarm only
170: I/O expansion module wiring error	0: Switch off	0: Switch off	6: Display alarm only

2) Auto reset

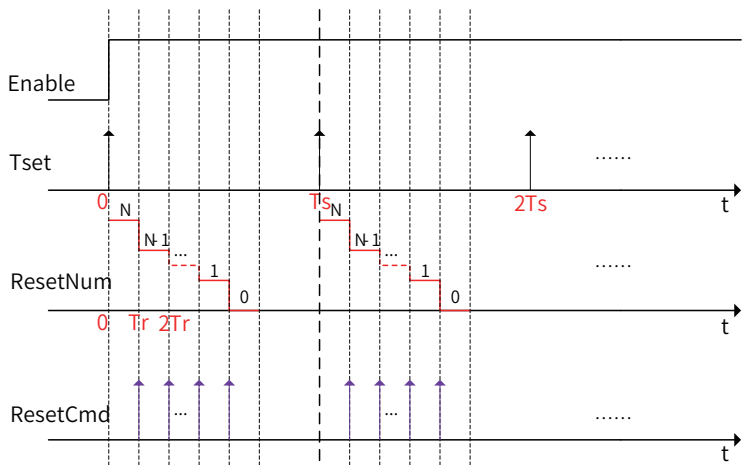
In specific application scenarios, the system can be set to allow a limited number of attempts in auto resetting upon a fault to ensure continuous working. The system allows you to set a fault reset interval (T_r), number of reset attempts (ResetNum), time (T_s) for clearing reset attempts, and up to three non-auto resettable fault codes.

- T_r : Upon a system fault, reset commands (ResetCmd) are generated at an interval of T_r .
- ResetNum: indicates the number of auto reset attempts. Upon generation of each reset command (ResetCmd), the remaining number of auto reset attempts becomes ResetNum – 1. When the remaining number of auto reset attempts reaches 0, the auto fault reset function of the system is disabled.
- T_s : indicates the time for resetting the number of reset attempts. After T_s elapses, the remaining number of reset attempts is restored to the original value of ResetNum.

Non-auto resettable error code: When the system fault list contains non-auto resettable error codes, the system will not generate auto reset commands. In this case, users must manually reset the faults. The following table lists the details.

Table 7-9 Auto fault reset settings

Para.	Name	Value Range	Remarks
H0-07	Auto fault reset	0: Disabled 1: Enabled	Enabled
H0-08	Time for clearing reset attempts	0.0s to 3600.0s	T_{set}
H0-09	Interval of reset attempts	0.0s to 600.0s	T_r
H0-10	Fault reset attempts	0 to 5	ResetNum
H0-11	Code of non-resettable error 1	Fault display code	-
H0-12	Code of non-resettable error 2	Fault display code	-
H0-13	Code of non-resettable error 3	Fault display code	-



NOTE

- ◆ The Enable signal is active when the auto fault reset function is enabled and ResetNum is set to a value other than 0.
- ◆ If the fault reset interval is greater than the fault reset attempts, this function is invalid.

7.2 User-defined External Faults and Alarms

7.2.1 External Faults

H0-00 and H0-01 provide two ways to trigger user-defined external faults and inhibit drive output upon faults. You can select a B connector from U0-00 to U4-99 as the user-defined fault trigger source. When the connector is 0, the system runs as normal. When the connector is 1, the external fault ERR15-1 or ERR15-2 is triggered.

Para.	Name	Description
H0-00	Source of external fault 1	ERR15-1 external fault 1 is triggered when active.
H0-01	Source of external fault 2	ERR15-2 external fault 2 is triggered when active.

7.2.2 External Alarms

H0-02 and H0-03 provide two ways to trigger user-defined external alarms. When an alarm is triggered, the drive continues running. You can select a B connector from U0-00 to U4-99 as the user-defined alarm trigger source. When the connector is 0, the system runs as normal. When the connector is 1, the external alarm ERR63-1 or ERR63-2 is triggered.

Para.	Name	Description
H0-02	Source of external alarm 1	ERR63-1 external alarm 1 is triggered when active.

Para.	Name	Description
H0-03	Source of external alarm 2	ERR63-2 external alarm 2 is triggered when active.

7.3 User-defined Error Words

Group H10 contains two sets of user-defined error words, including fault word 1 from H10-02 to H10-33 and fault word 2 from H10-34 to H10-65.

You can set fault codes and subcodes through group H10. When the faults occurring on the drive are the same as the fault codes and subcodes set by users,

the fault error bits of H10-00 to H10-01 are high. When the error code is set to 0 [All error subcodes],

if the code of the faults that occur are the same as the fault codes set by users, the corresponding error word bits are high.

For example, when [H10-02] is set to 15 and [H10-03] is set to 1, bit00 of [H10-00] indicates the fault state of ERR15-1 external fault 1.

When you set [H0-00] to 1 and manually activate ERR15-1 external fault 1, H10-00 displays 0x0001.

Then, set [H0-00] to 0 to cancel the trigger source of ERR15-1 external fault 1, H10-00 still displays 0x0001. Reset the fault, and then

H10-00 displays 0x0000. The faults that have occurred still can be indicated before reset when the fault trigger signal is inactive.

Para.	Name	Function Description	Value
H10-00	User-defined error word 1	Fault code corresponding to fault word 1	-
H10-01	User-defined error word 2	Fault code corresponding to fault word 2	-
H10-2	Fault word 1 - BIT00 error code	Fault code that can be set by users	0 to 65535

Para.	Name	Function Description	Value
H10-03	Fault word 1 - BIT00 error subcode	Error subcode that can be set by users, which corresponds to the code in H10-02	0: All error subcodes 1: Error subcode 1 2: Error subcode 2 3: Error subcode 3 4: Error subcode 4 5: Error subcode 5 6: Error subcode 6 7: Error subcode 7 8: Error subcode 8 9: Error subcode 9 10: Error subcode 10 11: Error subcode 11 12: Error subcode 12 13: Error subcode 13 14: Error subcode 14 15: Error subcode 15 16: Error subcode 16
...	...	...	...
H10-32	Fault word 1 - BIT15 error code	Error code that can be set by users	0 to 65535
H10-33	Fault word 1 - BIT15 error subcode	Error subcode that can be set by users, which corresponds to the code in H10-32	Same as H10-03
H10-34	Fault word 2 - BIT00 error code	Error code that can be set by users	0 to 65535
H10-35	Fault word 2 - BIT00 error subcode	Error subcode that can be set by users, which corresponds to the code in H10-34	Same as H10-03
...	...	...	...
H10-64	Fault word 2 - BIT15 error code	Error code that can be set by users	0 to 65535
H10-65	Fault word 2 - BIT15 error subcode	Error subcode that can be set by users, which corresponds to the code in H10-64	Same as H10-03
U8-20	User-defined error word 1	Corresponding to H10-00	
U8-21	User-defined error word 2	Corresponding to H10-01	

7.4 Troubleshooting for Common Problems

7.4.1 Switch-on Inhibited and Ready to Run

- 1) Switch-on inhibited and ready-to-run are two state machines for the system, which are respectively indicated by S4 and S7.
- 2) When the system is in the switch-on inhibited or ready-to-run state for a long time, it is generally because signal states such as OFF1, OFF2, OFF3, or running permission are abnormal. For example, OFF2 signal activation causes the switch-on-inhibited state of the system.
- 3) Troubleshooting: Check A0-16 and A0-17 to quickly find the fault causes. See the following table for details.



NOTE

- ◆ The system may encounter errors of various categories or from different sources at the same time. Locate and resolve the errors one by one as prompted.

Para.	Value	Description	Remarks
A0-16 error prompt type	0	None	Normal
	1	The OFF1, fault default, or terminal start/stop command is not reset, causing switch-on inhibited.	Switch-on inhibited: The command for the current control channel is activated.
	2	OFF2 is activated, causing switch-on inhibited.	
	4	Operation is not allowed to be activated, causing ready-to-run	Ready to run: The command for the current control channel is activated.
	10	DP bus-data right release, PZD1. check bit is not set to 1	The source of the start/stop control is the fieldbus adapter, but the check bit of the PZD1 data received by the adapter is not 1.

Para.	Value	Description	Remarks
A0-17 error prompt source	0	None	Normal
	1	It is set to normally active. Check the parameter settings.	The corresponding channel command of group b is set to a constant value of 1.
	2	DI1	The terminal signal is active.
	3	DI2	
	4	DI3	
	5	DI4	
	6	DI5	
	7	DI6	
	8	DIL	
	9	HDI1	
	10	HDI2	
	23	PC background control bit active	The background has acquired the control right and the corresponding bit is active.
	24	Fieldbus adapter A.PZD.1 check bit	The start/stop source is the adapter A and the check bit of the received PDZ1 is not 1.
	25	Fieldbus adapter B.PZD.1 check bit	The start/stop source is the adapter B and the check bit of the received PDZ1 is not 1.
	28	HINT is not ready due to reasons such as model parameter error	
	Other	B connector	The corresponding command of the current control channel is selected as the B connector which is active.

7.4.2 System initialization Errors

Symptom:

After the HCU-40 control power is powered on, the state machine (A0-00) is always "0 System initializing".

Measure:

- ① Check whether the voltage of the 24 VDC power supply of HCU-40 is too low.
- ② Check whether the detection circuits of the 24 VDC and 15 VDC power supplies of HCU-40 are abnormal.
- ③ Check whether EEPROM of HCU-40 is abnormal.
- ④ Contact the agent or Inovance for technical support.

7.4.3 Parameter Setting Errors

In case of conflicts between parameters set by users, HCU-40 restricts the internal values to ensure proper functioning of the system. In addition, alarm 46-1 is reported to prompt users of parameter input errors. The system working status may be different from the expected status.

U8-44 indicates the causes of parameter setting errors. When no error occurs, [U8-44] is 0. The following table lists details of U8-44.

Displayed Code	Description
0	Parameter settings are correct.
2	The minimum and maximum values of the motor-driven potentiometer conflict.
20	The minimum and maximum input values of AI1 curve conflict.
21	The minimum and maximum input values of AI2 curve conflict.
22	The minimum and maximum output proportions of AO1 curve conflict.
23	The minimum and maximum output proportions of AO2 curve conflict.
24	The minimum and maximum input frequencies of HDI1 curve conflict.
25	The minimum and maximum input frequencies of HDI2 curve conflict.
26	The minimum and maximum output proportions of HDO1 curve conflict.
27	The minimum and maximum output proportions of HDO2 curve conflict.
28	The slot number of the communication module selected for fieldbus adapter A is not set.
29	The slot number of the communication module selected for fieldbus adapter B is not set.
31	The fault reset interval is greater than the time for clearing reset attempts.
34	The fault error processing level setting conflicts.
36	The AX point of the multi-point curve module A is not incremental.
37	The BX point of the multi-point curve module A is not incremental.
39	The number of channels of the trigger oscilloscope (A12-20) is more than 8 during ADC cycle operation.
46	The parallel function is enabled (A15-00) but the number of enabled unit modules is 0.
47	Parameter settings of the I/O expansion module 1 (min. input of AI curve > max. input of AI curve, or) min. output proportion of AO curve > max. output proportion of AO curve) conflict.
48	Parameter settings of the I/O expansion module 2 (min. input of AI curve > max. input of AI curve, or) min. output proportion of AO curve > max. output proportion of AO curve) conflict.
49	Parameter settings of the I/O expansion module 3 (min. input of AI curve > max. input of AI curve, or) min. output proportion of AO curve > max. output proportion of AO curve) conflict.

Displayed Code	Description
77	The upper and lower limit settings of the limit module A conflict.
78	The upper and lower limit settings of the limit module B conflict.
79	The upper and lower limit settings of the limit module C conflict.
80	The upper and lower limit settings of the limit module D conflict.

7.5 Fault List

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
1	Hardware fault	2	15 V power supply error	The 15 V power supply of the HCU is abnormal.	Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Power-off and restart
		4	Failed to download the model several times	HINT is abnormal of there is too much interference.	Contact the agent or Inovance for technical support.			
		5	HCU-FPGA software upgrade failure	An error occurred in the HCU-FPGA program.	Contact the agent or Inovance for technical support.			
		6	HINT software upgrade failure	An error occurred in the HINT program.	Contact the agent or Inovance for technical support.			
		8	EEPROM parameter reading timeout	Reading parameters from EEPROM times out.	Contact the agent or Inovance for technical support.			
		9	EEPROM parameter storage timeout	Storing parameters to EEPROM times out.	Contact the agent or Inovance for technical support.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Con- tinued	Continued	11	R phase current detection circuit error	The detected zero drift of the R phase output current is too large.	1. Check whether the Hall sensor of the R phase output works properly. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		12	S phase current detection circuit error	The detected zero drift of the S phase output current is too large.	1. Check whether the Hall sensor of the S phase output works properly. 2. Contact the agent or Inovance for technical support.			
		13	T phase current detection circuit error	The detected zero drift of the T phase output current is too large.	1. Check whether the Hall sensor of the T phase output works properly. 2. Contact the agent or Inovance for technical support.			
2	Overcurrent	3	Hardware overcurrent	The transient current of a phase exceeds the hardware overcurrent threshold, and the hardware overcurrent signal lasts for more than 2 μ s.	1. Check whether the drive output circuit is grounded or short-circuited. 2. Check whether the load is too large. 3. Check whether the parameters are set correctly. 4. If an active rectifier is used, check whether the application method is set correctly.	Switch-off	Level cannot be changed	Manual reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	4	Software overcurrent	The transient current of a phase exceeds the software overcurrent threshold.	1. Check whether the input circuit of the AC drive is grounded or short-circuited. 2. Adjust the software overcurrent threshold. 3. Check whether the load is too large. 4. Check whether the parameters are set correctly. 5. If an active rectifier is used, check whether its operating mode is correct.	Continued	Continued	Continued
2	Overcurrent	6	R phase hardware overcurrent	The transient current of the R phase exceeds the hardware overcurrent threshold, and the hardware overcurrent signal lasts for more than 2 μ s.	1. Check whether the drive output circuit is grounded or short-circuited. 2. Adjust the acceleration/deceleration time. 3. Check whether the motor parameters are set correctly.	Switch-off	Level cannot be changed	Manual reset
Continued	Continued	7	S phase hardware overcurrent	The transient current of the S phase exceeds the hardware overcurrent threshold, and the hardware overcurrent signal lasts for more than 2 μ s.	1. Check whether the drive output circuit is grounded or short-circuited. 2. Adjust the acceleration/deceleration time. 3. Check whether the motor parameters are set correctly.	Continued	Continued	Continued
Continued	Continued	8	T phase hardware overcurrent	The transient current of the T phase exceeds the hardware overcurrent threshold, and the hardware overcurrent signal lasts for more than 2 μ s.	1. Check whether the drive output circuit is grounded or short-circuited. 2. Adjust the acceleration/deceleration time. 3. Check whether the motor parameters are set correctly.	Continued	Continued	Continued
10	Drive overload	1	Drive overload	The power rating of the drive is too low.	1. Reduce the load. 2. Use a drive with higher power rating.	Switch-off	Level cannot be changed	Manual reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
14	Module over-temperature	1	R phase module over-temperature	The temperature of the R phase exceeds the over-temperature threshold.	1. Check whether the R phase temperature detection circuit works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Switch-off	Level cannot be changed	Manual reset
Continued	Continued	2	S phase module over-temperature	The temperature of the S phase exceeds the over-temperature threshold.	1. Check whether the S phase temperature detection circuit works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Continued	Continued	Continued
Continued	Continued	3	T phase module over-temperature	The temperature of the T phase exceeds the over-temperature threshold.	1. Check whether the T phase temperature detection circuit works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Continued	Continued	Continued
Continued	Continued	6	Power module over-temperature	The temperature of the power module exceeds the over-temperature threshold.	1. Check whether the module temperature detection circuit works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Continued	Continued	Continued
Continued	Continued	7	Control cavity over-temperature	The temperature of the control cavity exceeds the over-temperature threshold.	1. Check whether the cooling fan of the control cavity works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio. 4. Check whether the module temperature detection circuit works properly.	Continued	Continued	Continued
15	External fault	1	External fault 1	The input signal is activated. For details, see parameter H0-00.	Check whether the external device is faulty.	Switch-off	Level cannot be changed	Manual reset
		2	External fault 2	The input signal is activated. For details, see parameter H0-01.	Check whether the external device is faulty.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
27	User-defined fault	1	User-defined fault 1	1. H11-00 is set incorrectly. 2. The setting source of H11-00 is active.	1. Set H11-00 to 0. 2. Set H11-00 correctly. 3. Check whether the setting source is active.	Switch-off	Level cannot be changed	Manual reset
Continued	Continued	2	User-defined fault 2	1. H11-01 is set incorrectly. 2. The setting source of H11-01 is active.	1. Set H11-01 to 0. 2. Set H11-01 correctly. 3. Check whether the setting source is active.		Continued	Continued
Continued	Continued	3	User-defined fault 3	1. H11-02 is set incorrectly. 2. The setting source of H11-02 is active.	1. Set H11-02 to 0. 2. Set H11-02 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
Continued	Continued	4	User-defined fault 4	1. H11-03 is set incorrectly. 2. The setting source of H11-03 is active.	1. Set H11-03 to 0. 2. Set H11-03 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
Continued	Continued	5	User-defined fault 5	1. H11-04 is set incorrectly. 2. The setting source of H11-04 is active.	1. Set H11-04 to 0. 2. Set H11-04 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
Continued	Continued	6	User-defined fault 6	1. H11-05 is set incorrectly. 2. The setting source of H11-05 is active.	1. Set H11-05 to 0. 2. Set H11-05 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
Continued	Continued	7	User-defined fault 7	1. H11-06 is set incorrectly. 2. The setting source of H11-06 is active.	1. Set H11-06 to 0. 2. Set H11-06 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
27	User-defined fault	8	User-defined fault 8	1. H11-07 is set incorrectly. 2. The setting source of H11-07 is active.	1. Set H11-07 to 0. 2. Set H11-07 correctly. 3. Check whether the setting source is active.	Switch-off	Level cannot be changed	Manual reset
		9	User-defined fault 9	1. H11-08 is set incorrectly. 2. The setting source of H11-08 is active.	1. Set H11-08 to 0. 2. Set H11-08 correctly. 3. Check whether the setting source is active.			
		10	User-defined fault 10	1. H11-09 is set incorrectly. 2. The setting source of H11-09 is active.	1. Set H11-09 to 0. 2. Set H11-09 correctly. 3. Check whether the setting source is active.			
		11	User-defined fault 11	1. H11-10 is set incorrectly. 2. The setting source of H11-10 is active.	1. Set H11-10 to 0. 2. Set H11-10 correctly. 3. Check whether the setting source is active.			
Continued	Continued	12	User-defined fault 12	1. H11-11 is set incorrectly. 2. The setting source of H11-11 is active.	1. Set H11-11 to 0. 2. Set H11-11 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
		13	User-defined fault 13	1. H11-12 is set incorrectly. 2. The setting source of H11-12 is active.	1. Set H11-12 to 0. 2. Set H11-12 correctly. 3. Check whether the setting source is active.			
		14	User-defined fault 14	1. H11-13 is set incorrectly. 2. The setting source of H11-13 is active.	1. Set H11-13 to 0. 2. Set H11-13 correctly. 3. Check whether the setting source is active.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	15	User-defined fault 15	1. H11-14 is set incorrectly. 2. The setting source of H11-14 is active.	1. Set H11-14 to 0. 2. Set H11-14 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
		16	User-defined fault 16	1. H11-15 is set incorrectly. 2. The setting source of H11-15 is active.	1. Set H11-15 to 0. 2. Set H11-15 correctly. 3. Check whether the setting source is active.			
28	User-defined alarm	1	User-defined alarm 1	1. H11-16 is set incorrectly. 2. The setting source of H11-16 is active.	1. Set H11-16 to 0. 2. Set H11-16 correctly. 3. Check whether the setting source is active.	Alarm	Level cannot be changed	Auto reset
		2	User-defined alarm 2	1. H11-17 is set incorrectly. 2. The setting source of H11-17 is active.	1. Set H11-17 to 0. 2. Set H11-17 correctly. 4. Check whether the setting source is active.			
		3	User-defined alarm 3	1. H11-18 is set incorrectly. 2. The setting source of H11-18 is active.	1. Set H11-18 to 0. 2. Set H11-18 correctly. 4. Check whether the setting source is active.			
Continued	Continued	4	User-defined alarm 4	1. H11-19 is set incorrectly. 2. The setting source of H11-19 is active.	1. Set H11-19 to 0. 2. Set H11-19 correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
		5	User-defined alarm 5	1. H11-20 is set incorrectly. 2. The setting source of H11-20 is active.	1. Set H11-20 to 0. 2. Set H11-20 correctly. 3. Check whether the setting source is active.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	6	User-defined alarm 6	1. H11-21 is set incorrectly. 2. The setting source of H11-21 is active.	1. Set H11-21 to 0. 2. Set H11-21 correctly. 3. Check whether the setting source is active.	Continued	Continued	
		7	User-defined alarm 7	1. H11-22 is set incorrectly. 2. The setting source of H11-22 is active.	1. Set H11-22 to 0. 2. Set H11-22 correctly. 3. Check whether the setting source is active.			
		8	User-defined alarm 8	1. H11-23 is set incorrectly. 2. The setting source of H11-23 is active.	1. Set H11-23 to 0. 2. Set H11-23 correctly. 3. Check whether the setting source is active.			
28	User-defined alarm	9	User-defined alarm 9	1. H11-24 is set incorrectly. 2. The setting source of H11-24 is active.	1. Set H11-24 to 0. 2. Set H11-24 parameter correctly. 3. Check whether the setting source is active.	Alarm	Level cannot be changed	Auto reset
		10	User-defined alarm 10	1. H11-25 is set incorrectly. 2. The setting source of H11-25 is active.	1. Set H11-25 to 0. 2. Set H11-25 parameter correctly. 3. Check whether the setting source is active.			
		11	User-defined alarm 11	1. H11-26 is set incorrectly. 2. The setting source of H11-26 is active.	1. Set H11-26 to 0. 2. Set H11-26 parameter correctly. 3. Check whether the setting source is active.			
Continued	Continued	12	User-defined alarm 12	1. H11-27 is set incorrectly. 2. The setting source of H11-27 is active.	1. Set H11-27 to 0. 2. Set H11-27 parameter correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
		13	User-defined alarm 13	1. H11-28 is set incorrectly. 2. The setting source of H11-28 is active.	1. Set H11-28 to 0. 2. Set H11-28 parameter correctly. 3. Check whether the setting source is active.			
		14	User-defined alarm 14	1. H11-29 is set incorrectly. 2. The setting source of H11-29 is active.	1. Set H11-29 to 0. 2. Set H11-29 parameter correctly. 3. Check whether the setting source is active.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	15	User-defined alarm 15	1. H11-30 is set incorrectly. 2. The setting source of H11-30 is active.	1. Set H11-30 to 0. 2. Set H11-30 parameter correctly. 3. Check whether the setting source is active.	Continued	Continued	Continued
		16	User-defined alarm 16	1. H11-31 is set incorrectly. 2. The setting source of H11-31 is active.	1. Set H11-31 to 0. 2. Set H11-31 parameter correctly. 3. Check whether the setting source is active.			
32	Fan error 2	3	Module fan status error	The fan does not run or the feedback is abnormal.	1. Check whether the fan status is normal. 2. Check whether the fan wiring is normal.	Alarm	Level cannot be changed	Auto reset
		4	Module fan status error	The fan does not run or the feedback is abnormal.	1. Check whether the fan status is normal. 2. Check whether the fan wiring is normal.			
44	Expansion module offline	4	I/O module 1 activated but offline	The slot is activated but no data is received in 0.5s.	1. Check whether the expansion module slot or type is set correctly. 2. Reinstall the expansion module.	Switch-off	Switch-off - alarm	Manual reset
		5	I/O module 2 activated but offline	The slot is activated but no data is received in 0.5s.	1. Check whether the expansion module slot or type is set correctly. 2. Reinstall the expansion module.			
		6	I/O module 3 activated but offline	The slot is activated but no data is received in 0.5s.	1. Check whether the expansion module slot or type is set correctly. 2. Reinstall the expansion module.			
Continued	Continued	7	Fieldbus adapter A activated but offline, configured communication module offline	The slot is activated but no data is received in 1s.	1. Check the expansion slot settings. 2. Reinstall the expansion module.	Continued	Continued	Continued
		8	Fieldbus adapter B activated but offline, configured communication module offline	The slot is activated but no data is received in 1s.	1. Check the expansion slot settings. 2. Reinstall the expansion module.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	9	Redundant adapter activated but offline, configured communication module offline	The slot is activated but no data is received in 1s.	1. Check the expansion slot settings. 2. Reinstall the expansion module.	Continued	Continued	Continued
		10	Sync voltage detection module activated but offline	The slot is activated but no data is received.	1. Check the expansion slot settings. 2. Reinstall the expansion module.			
45	Expansion module slot address conflict	4	Slot address conflict between I/O module 1 and I/O module 2	The slot addresses conflict. n7-00 and n8-00 may set the same slot number.	Check and reset n7-00 and n8-00.	Switch-off	Switch-off - alarm	Manual reset
		5	Slot address conflict between I/O module 1 and I/O module 3	The slot addresses conflict. n7-00 and n9-00 may set the same slot number.	Check and reset n7-00 and n9-00.			
		6	Slot address conflict between I/O module 2 and I/O module 3	The slot addresses conflict. n8-00 and n9-00 may set the same slot number.	Check and reset n8-00 and n9-00.			
Continued	Continued	7	Conflict between slot address ranges of fieldbus adapters A and B	The slot address ranges conflict. 1. The slot numbers of two communication modules conflict with each other. 2. The slot number of the communication module specified by the fieldbus adapter A or B is incorrect.	1. Run one communication module in either one HCU slot or the slot expanded through HESD. 2. Check whether the slot number of the communication module is set correctly.	Continued	Continued	Continued

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	8	Conflict between slot address ranges of fieldbus adapter A and redundant adapter	The slot address ranges conflict. 1. The slot numbers of two communication modules conflict. 2. The slot number of the communication module specified by the fieldbus adapter A or B is incorrect.	1. Run one communication module in either one HCU slot or the slot expanded through HESD. 2. Check whether the slot number of the communication module is set correctly.	Continued	Continued	Continued
Continued	Continued	9	Conflict between slot address ranges of fieldbus adapter B and redundant adapter	The slot address ranges conflict. 1. The slot numbers of two communication modules conflict. 2. The slot number of the communication module specified by the fieldbus adapter A or B is incorrect.	1. Run one communication module in either one HCU slot or the slot expanded through HESD. 2. Check whether the slot number of the communication card is set correctly.	Continued	Continued	Continued
46	Incorrect parameter setting	1	Incorrect parameter setting	For details, see parameter U8-44.	Check whether the parameters are set correctly. The error is automatically reset after parameters are set correctly.	Alarm	Level cannot be changed	Auto reset
47	STO activation	1	STO1 input activation	The STO action signal is inactive.	Check the wiring or power supply of the STO input circuit.	Switch-off	Switch-off - alarm	Manual reset
		2	STO2 input activation	The STO action signal is inactive.	Check the wiring or power supply of the STO input circuit.			
		4	STO power supply fault	The detected STO supply voltage is abnormal.	Check the wiring or power supply of the STO input circuit.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	5	STO1 pulse self-test error	The STO action signal is inactive.	Check the wiring or power supply of the STO input circuit.	Continued	Continued	Continued
		6	STO2 pulse self-test error	The STO action signal is inactive.	Check the wiring or power supply of the STO input circuit.			
		7	STO1 buffer error	The STO action signal is inactive.	Check the wiring or power supply of the STO input circuit.			
		8	STO2 buffer error	The STO action signal is inactive.	Check the wiring or power supply of the STO input circuit.			
50	SD card error	1	SD card not detected	No SD card is inserted in the slot.	1. Reinstall the SD card. 2. Replace the SD card.	Alarm	Alarm - no handling	Auto reset
		2	SD card error	No data is exchanged during communication for a period of time.	1. Reinstall the SD card. 2. Replace the SD card.			
51	RTC error	1	Insufficient power supply for the HCU-RTC unit	The battery voltage is lower than 2.2 V.	Replace the RTC battery.	Alarm	Alarm - no handling	Auto reset
		2	HCU-RTC read/write timeout	The RTC read/write time exceeds the preset value (1.6s).	Contact the agent or Inovance for technical support.	Alarm	Alarm - no handling	Power-off and restart
52	Local control error	1	IDS communication fault	Communication failure is detected after the drive is started by InoDriveStudio.	Check the communication connection between InoDriveStudio and the controller.	Switch-off	Level cannot be changed	Manual reset
		2	SOP-20 communication Fault	SOP-20 disconnection is detected after the drive is started by SOP-20.	Check the communication connection between SOP-20 and the controller.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
53	Drive communication error	1	HINT Rx CRC error	A CRC error occurred in the data the HINT receives from the HCU or HPCU.	1. Check whether the HINT Rx optical fiber is properly connected. 2. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		2	HINT authentication error	The ID of the HINT board is incorrect.	1. Check whether the HINT matches with the HCU. 2. Contact the agent or Inovance for technical support.			
53	Drive communication error	3	HCU Rx disconnection	The HCU fails to receive data from the HINT or HPCU.	1. Check whether the HCU Rx optical fiber is properly connected. 2. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		4	HCU Rx CRC error	A CRC error occurred in the data the HCU receives from the HINT or HPCU.	1. Check whether the HCU Rx optical fiber is properly connected. 2. Contact the agent or Inovance for technical support.			
		5	HINT sync fault	A HINT carrier synchronization fault occurred.	Contact the agent or Inovance for technical support.			
Continued	Continued	6	PWM data write timeout	A timeout error occurred during real-time downstream data exchange of DSP and FPGA of the control board.	Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		7	HINT Rx disconnection	The HINT fails to receive data from the HCU or HPCU.	1. Check whether the HINT Rx optical fiber is properly connected. 2. Contact the agent or Inovance for technical support.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	8	CRC error in data received by HPCU from HCU	A CRC error occurred in the data the HPCU receives from the HCU.	1. Check whether the optical fiber connection between HPCU and HCU is normal. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		9	HPCU Rx disconnection from HCU	The HPCU fails to receive data from the HCU.	1. Check whether the optical fiber connection between HPCU and HCU is normal. 2. Contact the agent or Inovance for technical support.			
Continued	Continued	10	CRC error in data received by HPCU from HINT	A CRC error occurred in the data the HPCU receives from the HINT.	1. Check whether the optical fiber connection between HPCU and HINT is normal. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		11	HPCU Rx disconnection from HINT	The HPCU fails to receive data from the HINT.	1. Check whether the optical fiber connection between HPCU and HINT is normal. 2. Contact the agent or Inovance for technical support.			
		12	HPCU sync fault	An error occurred during HPCU carrier synchronization.	Contact the agent or Inovance for technical support.			
		13	HINT not ready	The HINT is not ready.	1. Reset to clear the fault.			
54	Expansion module offline fault	1	Slot 1_1 offline	The slot is activated but no data is received in 1s.	Reinstall the expansion module.	Switch-off	Switch-off - alarm	Manual reset
		2	Slot 1_2 offline	The slot is activated but no data is received in 1s.	Reinstall the expansion module.			
		3	Slot 1_3 offline	The slot is activated but no data is received in 1s.	Reinstall the expansion module.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
54	Expansion module offline fault	4	Slot 1_4 offline	The slot is activated but no data is received in 1s.	Reinstall the expansion module.	Switch-off	Switch-off - alarm	Manual reset
		5	Slot 1_5 offline	The slot is activated but no data is received in 1s.	Reinstall the expansion module.			
		6	Slot 1_6 offline	The slot is activated but no data is received in 1s.	Reinstall the expansion module.			
		7	Slot 1_7 offline	The slot is activated but no data is received in 1s.	Reinstall the expansion module.			
56	Communication error	1	Communication of fieldbus adapter A disconnected	The fieldbus adapter A does not receive data within the specified time.	1. Modify the set time. 2. Check the connection of the communication cable.	Switch-off	Level cannot be changed	Manual reset
		2	Communication of fieldbus adapter B disconnected	The fieldbus adapter B does not receive data within the specified time.	1. Modify the set time. 2. Check the connection of the communication cable.			
		3	Communication of redundant adapter B disconnected	The redundant adapter does not receive data within the specified time.	1. Modify the set time. 2. Check the connection of the communication cable.			
Continued	Continued	4	Fieldbus adapter A check error	The number of consecutive CRC errors of the data received by the fieldbus adapter reaches the set limit.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.	Continued	Continued	
		5	Fieldbus adapter B check error	The number of consecutive CRC errors of the data received by the fieldbus adapter reaches the set limit.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	6	Redundant adapter check error	The number of consecutive CRC errors of the data received by the redundant adapter reaches the set limit.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		7	Fieldbus adapter A slot conflict	The slot set for the fieldbus adapter B or redundant adapter conflicts with that set for the fieldbus adapter A.	Modify the slot number of the communication module.			
		8	Fieldbus adapter B slot conflict	The slot set for the fieldbus adapter B conflicts with that set for the redundant adapter.	Modify the slot number of the communication module.			
57	IGBT drive error	1	R phase upper bridge fault	1. No cable is connected. 2. The drive circuit is damaged. 3. The module is damaged. 4. The bridge IGBT is short-circuited (in this case the fault is reported during the VI self-test).	1. Connect the cable. 2. Replace the driver board or module.	Switch-off	Level cannot be changed	Manual reset
57	IGBT drive error	2	R phase lower bridge fault	1. No cable is connected. 2. The drive circuit is damaged. 3. The module is damaged. 4. The bridge IGBT is short-circuited (in this case the fault is reported during the VI self-test).	1. Connect the cable. 2. Replace the driver board or module.	Switch-off	Level cannot be changed	Manual reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	3	S phase upper bridge fault	1. No cable is connected. 2. The drive circuit is damaged. 3. The module is damaged. 4. The bridge IGBT is short-circuited (in this case the fault is reported during the VI self-test).	1. Connect the cable. 2. Replace the driver board or module.	Continued	Continued	Continued
Continued	Continued	4	S phase lower bridge fault	1. No cable is connected. 2. The drive circuit is damaged. 3. The module is damaged. 4. The bridge IGBT is short-circuited (in this case the fault is reported during the VI self-test).	1. Connect the cable. 2. Replace the driver board or module.	Continued	Continued	Continued
Continued	Continued	5	T phase upper bridge fault	1. No cable is connected. 2. The drive circuit is damaged. 3. The module is damaged. 4. The bridge IGBT is short-circuited (in this case the fault is reported during the VI self-test).	1. Connect the cable. 2. Replace the driver board or module.	Continued	Continued	Continued
Continued	Continued	6	T phase lower bridge fault	1. No cable is connected. 2. The drive circuit is damaged. 3. The module is damaged. 4. The bridge IGBT is short-circuited (in this case the fault is reported during the VI self-test).	1. Connect the cable. 2. Replace the driver board or module.	Continued	Continued	Continued

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	7	IGBT module fault	1. No cable is connected. 2. The drive circuit is damaged. 3. The module is damaged. 4. The bridge IGBT is short-circuited (in this case the fault is reported during the VI self-test).	1. Connect the cable. 2. Replace the driver board or module.	Continued	Continued	Continued
59	Low module temperature	1	R phase module low temperature	The module temperature is below -15°C .	Increase the temperature of the module.	Switch-off	Switch-off - alarm	Manual reset
		2	S phase module low temperature	The module temperature is below -15°C .	Increase the temperature of the module.			
		3	T phase module low temperature	The module temperature is below -15°C .	Increase the temperature of the module.			
		5	Power module low temperature	The power module temperature is lower than the preset low temperature detection threshold (-15°C by default).	1. Check whether the module temperature detection circuit works properly. 2. Increase the temperature of the module.			
60	Ambient temperature error	1	Ambient temperature too high	The ambient temperature is above 65°C .	1. Check whether the ambient temperature detection circuit works properly. 2. Reduce the ambient temperature.	Alarm	Level cannot be changed	Auto reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
63	External alarm	1	External alarm 1	The input signal is activated. For details, see parameter H0-02.	1. Check whether the external device is faulty. 2. Check whether the parameter is set correctly.	Alarm	Level cannot be changed	Auto reset
		2	External alarm 2	The input signal is activated. For details, see parameter H0-03.	Check whether the external device is faulty.			
		4	OFF2 shutdown	The OFF2 input signal is activated. For details, see A0-16, A0-17, and relevant parameters in group B.	1. Check whether the status of the external signal is normal. 2. Check whether the parameter is set correctly.			
65	Parameter processing error	1	Factory settings restoration interrupted	HCU encounters a power failure when factory settings are restored.	Restore settings defaults again.	Switch-off	Level cannot be changed	Manual reset
		2	Parameter downloading interrupted (restoring from the SD card)	HCU encounters a power failure or the SD card is faulty during parameter downloading.	Restore the factory settings again or restore parameter backups from the SD card.			
		3	Parameter cache capacity exceeded	The preset parameter storage cache capacity is exceeded due to massive abnormal storage operations.	Contact the agent or Inovance for technical support.			
		4	Parameter storage timeout during parameter downloading	Parameter storage timeout during parameter downloading	Restore factory settings again after power-on.			
66	Leakage current fault	2	Excessive leakage current (software detection)	The detected leakage current is greater than the permissible value.	1. Check whether the positive and negative buses are properly grounded. 2. Check whether the leakage current detection circuit is normal. 3. Check and set the leakage current detection threshold.	Switch-off	Switch-off - alarm	Manual reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
67	Fieldbus adapter A communication module error	1	External bus timeout	The communication between the communication module and host controller times out.	Check the cable connection between the communication module and host controller.	Switch-off	Level cannot be changed	Manual reset
		2	Incorrect communication parameter setting (address or baud rate)	The address or baud rate is incorrectly configured.	Check and set the communication address or baud rate.			
67	Fieldbus adapter A communication module error	3	Bus address conflict	The address settings of slave stations conflict with each other.	Reset the slave station addresses.	Switch-off	Level cannot be changed	Manual reset
		4	DP parameter error	The DP communication parameter is set incorrectly.	Check the DP communication configuration.			
		5	DP configuration error	The DP communication configuration is incorrect.	Check the DP communication configuration.			
Continued	Continued	6	Mismatch between PDO transmission length and configured length	The process data length is different from the setting.	Check the DP communication configuration.	Continued	Continued	Continued
		7	EtherCAT EEPROM load error	An EEPROM load error occurs on the EtherCAT module.	1. Perform the EEPROM write operation again. 2. Contact the agent or Inovance for technical support.			
		8	EtherCAT initialization error	The initialization communication parameters of the EtherCAT module are set incorrectly.	Check the initialization parameters.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	9	EtherCAT master station switchover error	The master station switchover fails.	Switchover fails due to incorrect slave station configuration. Reconfigure the slave station according to the ESC feedback error reference and then switch the status.	Continued	Continued	Continued
		15	Communication module Rx CRC error	The number of CRC errors in the data transmitted by the fieldbus adapter reaches the threshold.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.			
Continued	Continued	16	Communication module Tx CRC error	The number of CRC errors in the data received by the fieldbus adapter reaches the threshold.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
68	Fieldbus adapter B communication module error	1	External bus timeout	The communication between the communication module and host controller times out.	Check the cable connection between the communication module and host controller.	Switch-off	Level cannot be changed	Manual reset
		2	Incorrect communication parameter setting (address or baud rate)	The address or baud rate is incorrectly configured.	Check and set the communication address or baud rate.			
		3	Bus address conflict	The address settings of slave stations conflict with each other.	Reset the slave station addresses.			
Continued	Continued	4	DP parameter error	The DP communication parameter is set incorrectly.	Check the DP communication configuration.	Continued	Continued	Continued
		5	DP configuration error	The DP communication configuration is incorrect.	Check the DP communication configuration.			
		6	Mismatch between PDO transmission length and configured length	The process data length is different from the setting.	Check the DP communication configuration.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
68	Fieldbus adapter B communication module error	7	EtherCAT EEPROM load error	An EEPROM load error occurs on the EtherCAT module.	1. Perform the EEPROM write operation again. 2. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		8	EtherCAT initialization error	The initialization communication parameters of the EtherCAT module are set incorrectly.	Check the initialization parameters.			
		9	EtherCAT master station switchover error	The master station switchover fails.	Switchover fails due to incorrect slave station configuration. Reconfigure the slave station according to the ESC feedback error reference and then switch the status.			
Continued	Continued	15	Communication module Rx CRC error	The number of CRC errors in the data transmitted by the fieldbus adapter reaches the threshold.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		16	Communication module Tx CRC error	The number of CRC errors in the data received by the fieldbus adapter reaches the threshold.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.			
69	Redundant adapter communication module error	1	External bus timeout	The communication between the communication module and host controller times out.	Check the cable connection between the communication module and host controller.	Switch-off	Level cannot be changed	Manual reset
		2	Incorrect communication parameter setting (address or baud rate)	The address or baud rate is incorrectly configured.	Check and set the communication address or baud rate.			
		3	Bus address conflict	The address settings of slave stations conflict with each other.	Reset the slave station addresses.			
		4	DP parameter error	The DP communication parameter is set incorrectly.	Check the DP communication configuration.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	5	DP configuration error	The DP communication configuration is incorrect.	Check the DP communication configuration.	Continued	Continued	Continued
		6	Mismatch between PDO transmission length and configured length	The process data length is different from the setting.	Check the DP communication configuration.			
		7	EtherCAT EEPROM load error	An EEPROM load error occurs on the EtherCAT module.	1. Perform the EEPROM write operation again. 2. Contact the agent or Inovance for technical support.			
		8	EtherCAT initialization error	The initialization communication parameters of the EtherCAT module are set incorrectly.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.			
69	Redundant adapter communication module error	9	EtherCAT master station switchover error	The master station switchover fails.	1. Switchover fails due to incorrect slave station configuration. 2. Reconfigure the slave station according to the ESC feedback error reference and then switch the status.	Switch-off	Level cannot be changed	Manual reset
		15	Communication card Rx CRC error	The number of CRC errors in the data transmitted by the fieldbus adapter reaches the threshold.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.			
		16	Communication card Tx CRC error	The number of CRC errors in the data received by the fieldbus adapter reaches the threshold.	1. Change the check error setpoint. 2. Contact the agent or Inovance for technical support.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
71	Rectifier self-test fault	2	Grid phase sequence self-test error	The grid phase sequence detection failed.	1. Check whether the three-phase current Hall sensor works properly. 2. Check the main circuit for phase loss. 3. Contact the agent or Inovance for technical support.	Switch-off	Switch-off - stop running	Manual reset
		3	Grid phase lock error	Following the grid phase sequence fails.	1. Check whether the grid voltage sampling is normal. 2. Check the input grid for phase loss. 3. Contact the agent or Inovance for technical support.			
		4	Auto-tuning/self-test time-out	Auto-tuning/self-test times out.	Contact the agent or Inovance for technical support.			
72	Pre-charge error	1	Pre-charge timeout	The total pre-charge time of the device exceeds the setting of E7-10.	1. Check whether E7-10 is set to a too small value. 2. Check whether the feedback signal (DI3) of the main circuit breaker is normal. 3. Check whether the main circuit breaker detection time (E7-08 and E7-09) is set to a too large value. 4. Check whether the grid input is normal. 5. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
73	Pre-charge hardware error	1	Main circuit breaker feed-back error	The main circuit breaker feedback status does not match that of the control signal.	1. Check whether the feedback signal (DI3) of the main circuit breaker is normal. 2. Check whether the main circuit breaker detection time (E7-08 and E7-09) is set to a too large value. 3. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
77	Reactor temperature error	2	Reactor over-temperature	The HDI1 temperature switch signal is inactive.	1. Check whether the fan works properly. 2. Check whether the temperature switch signal is properly connected. 3. Check whether the ambient temperature is too high. 4. Check whether the HDI1 signal is forced (F0-02 and F0-03). 5. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
79	DC voltage error	2	High voltage	The software determines that the bus voltage exceeds the over-voltage threshold.	1. Check whether the voltage at the input side is too high. 2. Check whether the post-load is too large. 3. Check the current limit setpoint. 4. Check whether the voltage class of the model is set correctly. 5. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		3	Low voltage	The software detects that the bus voltage is below the overvoltage threshold.	1. Check whether the voltage at the input side is too low. 2. Check whether the post-load is too large. 3. Check the current limit setpoint. 4. Check whether the voltage class of the model is set correctly. 5. Contact the agent or Inovance for technical support.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
81	Grid error	1	High grid voltage	The grid voltage is higher than the threshold.	1. Check whether the voltage of the input grid is too high. 2. Check whether the grid voltage sampling is normal. 3. Check whether the voltage class of the model is set correctly. 4. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		2	Low grid voltage	The grid voltage is lower than the threshold.	1. Check whether the voltage of the input grid is too low. 2. Check whether the grid voltage sampling is normal. 3. Check whether the voltage class of the model is set correctly. 4. Check the grid for phase loss. 5. Contact the agent or Inovance for technical support.			
81	Grid error	3	Three-phase unbalance	The grid three-phase unbalance is higher than the threshold.	1. Check the grid for phase loss. 2. Check the grid for excessive unbalanced load. 3. Check whether the grid voltage sampling is normal. 4. Check whether the unbalance factor is too small. 5. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	5	High grid frequency	The grid frequency is higher than the threshold.	1. Check whether the frequency of the input grid is too high. 2. Check whether the grid voltage sampling is normal. 3. Check whether the rated grid frequency is set correctly. 4. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
Continued	Continued	6	Low grid frequency	The grid frequency is lower than the threshold.	1. Check whether the frequency of the input grid is too low. 2. Check whether the grid voltage sampling is normal. 3. Check whether the rated grid frequency is set correctly. 4. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
Continued	Continued	7	R phase loss	The grid voltage of the R phase is lower than those of the S phase and T phase.	1. Check whether the grid voltage sampling is normal. 2. Check the grid for R phase loss. 3. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
Continued	Continued	8	S phase loss	The grid voltage of the S phase is lower than those of the R phase and T phase.	1. Check whether the grid voltage sampling is normal. 2. Check the grid for S phase loss. 3. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		9	T phase loss	The grid voltage of the T phase is lower than those of the R phase and S phase.	1. Check whether the grid voltage sampling is normal. 2. Check the grid for T phase loss.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	10	Three-phase input not connected	The grid voltage of R/S/T phase is far lower than the rated value.	1. Check whether the voltage of the input grid is too low. 2. Check whether the grid voltage sampling is normal. 3. Check whether the voltage class of the model is set correctly. 4. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
81	Grid error	11	HSVM data error	The HSVM online flag is not received.	1. Check whether the power supply of the HSVM module is normal. 2. Check whether the optical fiber of the HSVM module is properly connected. 3. Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
83	Master-slave communication fault	1	InoLink communication: address conflict	The node address settings conflict.	Correct the node addresses.	Switch-off	Switch-off alarm	Manual reset
		2	InoLink communication: communication offline	The node cannot receive any data.	Check the connection of the communication cable.			
		3	InoLink communication: receiver offline	The node cannot receive the required data.	Check whether the node that stores the required data is correctly connected.			
		4	InoLink communication: data receiving node address being the local address	The node cannot receive the data from itself.	Check the settings of the node that receives the data.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
85	Internal fault	1	HCU internal data exchange error	The content data exchange in the DSP of the HCU module is abnormal.	Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		3	State machine out of range	The state machine is out of the predefined range.	Contact the agent or Inovance for technical support.			
		4	Abnormal interrupt generation	The HCU module generates an abnormal interrupt.	Contact the agent or Inovance for technical support.			
		5	HCU internal data synchronization error	Data synchronization between DSP and FPGA of the HCU module is abnormal.	Contact the agent or Inovance for technical support.			
86	Input current unbalance	1	R phase current too small	The current of the R phase is much smaller than those of the S phase and T phase.	Check the grid power for R phase loss.	Switch-off	Level cannot be changed	Manual reset
		2	S phase current too small	The current of the S phase is much smaller than those of the R phase and T phase.	Check the grid power for S phase loss.			
		3	T phase current too small	The current of the T phase is much smaller than those of the R phase and S phase.	Check the grid power for T phase loss.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
87	Rectifier auto-tuning error	1	DC bus capacitance auto-tuning failure		Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		3	DC bus capacitance out-of-range	The DC bus capacitance (d2-01) is over 5 times the rated bus capacitance (d2-00) or below 0.5 times the rated bus capacitance.	1. Perform capacitance auto-tuning again. 2. Check whether the load bus capacitance is too large. 3. Check whether the number of parallel modules is normal. 4. Check whether the model setting is correct. 5. Contact the agent or Inovance for technical support.			
88 ^{<2>}	Model parameter error	1	Model not existing	1. HINT is abnormal. 2. The model displayed on HINT does not exist. 3. The model set by the parameter does not exist.	1. Power on the device and replace the HINT board. 2. Set the model again and download it to the HINT board. 3. Set the correct model and download it to the HINT board.	Stop running	Level cannot be changed	Auto reset
		2	Model parameter changed	The model parameters are modified but the modifications are not downloaded.	Download the modifications to the HINT board.			
		3	Model parameter mismatch	The model parameters saved on the controller do not match that read from the HINT board.	Wait until model parameter check is completed.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	4	Model code mismatch	Model codes of units are different.	Download the specified models to each HINT board one by one.	Continued	Continued	Continued
		7	Model code not recognized	HCU cannot recognize the model code read from HINT.	Set A3-00 correctly and download the setting.			
		8	Set model code not recognized	HCU does not support the model code set in A3-00.	Set A3-00 correctly and download the setting.			
		9	Correction coefficient out-of-range	The correction coefficient read from HINT is out of the normal range.	Set the correction coefficient correctly and download the setting.			
89 ^{<3>}	24 V power supply error	1	Low 24 V power supply voltage	The voltage of the 24 V power supply is below 20 V.	Check whether the power supply voltage of HCU is too low.	Alarm	Level cannot be changed	Auto reset
91 ^{<1>}	Parallel mode error	1	Single mode setting conflict	1. The parameter is set to single mode, but the HPCU is connected. 2. The parameter is set to parallel mode, but the HPCU is not connected.	1. Check whether the HINT and HPCU are properly connected. 2. Set parameters correctly for single and parallel modes.	Switch-off	Level cannot be changed	Manual reset
		2	Enabled units and online units mismatch	Enabled units and online units do not match.	1. Check the cable connection of each unit. 2. Check the settings of each enabled unit.			
Continued	Continued	3	HINT type conflict	1. The HINT types are inconsistent. 2. The HINT software versions are inconsistent.	1. Check whether the correct HINT is installed. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		4	HPCU offline	The HCU fails to receive data from the HPCU in parallel mode.	1. Check the HPCU power supply is normal. 2. Check whether the HPCU and HCU are properly connected.			
91 ^{<1>}	Parallel mode error	5	HINT not ready	The HINT is not ready.	Reset to clear the fault.	Switch-off	Level cannot be changed	Manual reset
		6	HPCU not ready	The HPCU is not ready.	Reset to clear the fault.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
92	Parallel module fault	2	Parallel module R phase loss	During operation, the current of the R phase is significantly smaller than the currents of the other two phases in multiple current cycles.	1. Check the output wiring. 2. Check whether the driver board works properly.	Switch-off	Level cannot be changed	Manual reset
		3	Parallel module S phase loss	During operation, the current of the S phase is significantly smaller than the currents of the other two phases in multiple current cycles.	1. Check the output wiring. 2. Check whether the driver board works properly.			
Continued	Continued	4	Parallel module T phase loss	During operation, the current of the T phase is significantly smaller than the currents of the other two phases in multiple current cycles.	1. Check the output wiring. 2. Check whether the driver board works properly.	Continued	Continued	Continued
		5	Parallel unit bus voltage detection error	The bus voltage sampling value of the parallel unit is abnormal.	1. Check the bus wiring. 2. Contact the agent or Inovance for technical support.			
99	Parallel module current unbalance alarm	1	Parallel module R phase current unbalance	1. An error occurred in phase R current circuit detection. 2. The phase R module is faulty.	1. Check the actual output current for deviation to determine whether the sampling circuit works properly. 2. Contact the agent or Inovance for technical support.	Alarm	Level cannot be changed	Auto reset
Continued	Continued	2	Parallel module S phase current unbalance	1. An error occurred in phase S current circuit detection. 2. The phase S module is faulty.	1. Check the actual output current for deviation to determine whether the sampling circuit works properly. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	3	Parallel module T phase current unbalance	1. An error occurred in phase T current circuit detection. 2. The phase T module is faulty.	1. Check the actual output current for deviation to determine whether the sampling circuit works properly. 2. Contact the agent or Inovance for technical support.	Continued	Continued	Continued
100	Fault information	1	Fault information causing errors	The generated drive fault is out of range.	Contact the agent or Inovance for technical support.	Switch-off	Level cannot be changed	Manual reset
		2	Subcode error	The generated fault subcode is out of range.	Contact the agent or Inovance for technical support.			
		3	Code error	The generated fault code is out of range.	Contact the agent or Inovance for technical support.			
		4	Interactive data error	The interactive data table version is incorrect.	Contact the agent or Inovance for technical support.			
101	HINT error	1	HINT type not matching HCU	The HINT type does not match the HCU.	1. Check whether the correct HINT is installed. 2. Contact the agent or Inovance for technical support.	Stop running	Level cannot be changed	Auto reset
101	HINT error	2	Mismatch of HINT software versions	In the parallel mode, the HINT modules are inconsistent in software version.	1. Check whether a correct HINT is installed. 2. Upgrade the HINT software to ensure version consistency. 3. Contact the agent or Inovance for technical support.	Stop running	Level cannot be changed	Auto reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
102	HINT alarm	1	HINT model parameter check not completed	In the ready-to-run state, the HINT model parameter check is not completed.	1. Wait until the HINT model read operation is completed. 2. Set the model parameters correctly and download the settings. 3. Power on the HCU again. 4. Power on the HINT again. 5. Contact the agent or Inovance for technical support.	Alarm	Level cannot be changed	Auto reset
144	Expansion module offline alarm	4	Sync voltage detection module activated but offline	The slot is activated but no data is received.	1. Check whether the expansion module slot or type is set correctly. 2. Reinstall the expansion module.	Alarm	Level cannot be changed	Auto reset
156	Fieldbus adapter communication error	1	Communication error between fieldbus adapter A and host controller	The fieldbus adapter receives no valid data in 200 ms due to, for example, disconnection.	1. Modify the time setting of the communication card. 2. Check the communication wiring.	Alarm	Level cannot be changed	Auto reset
		2	Communication error between fieldbus adapter B and host controller	The fieldbus adapter receives no valid data in 200 ms due to, for example, disconnection.	1. Modify the time setting of the communication card. 2. Check the communication wiring.			
		3	Communication error between the redundant fieldbus adapter and host controller	The fieldbus adapter receives no valid data in 200 ms due to, for example, disconnection.	1. Modify the time setting of the communication card. 2. Check the communication wiring.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	4	Fieldbus adapter A data CRC error	The number of consecutive CRC errors in the data received by the fieldbus adapter reaches 10.	Contact the agent or Inovance for technical support.	Continued	Continued	Continued
		5	Fieldbus adapter B data CRC error	The number of consecutive CRC errors in the data received by the fieldbus adapter reaches 10.	Contact the agent or Inovance for technical support.			
		6	Redundant fieldbus adapter B data CRC error	The number of consecutive CRC errors in the data received by the fieldbus adapter reaches 10.	Contact the agent or Inovance for technical support.			
170	I/O expansion module wiring error	1	<I/O expansion module 1> DIO output cable short circuit	When DIO is used for output, the output cable is short-circuited.	Check each DIO pin used for output for short circuit.	Alarm	Switch-off - alarm	Auto reset
		2	<I/O expansion module 2> DIO output cable short circuit	When DIO is used for output, the output cable is short-circuited.	Check each DIO pin used for output for short circuit.			
		3	<I/O expansion module 3> DIO output cable short circuit	When DIO is used for output, the output cable is short-circuited.	Check each DIO pin used for output for short circuit.			
		4	<I/O expansion module 1> AI input disconnected	When a 4.20 mA current signal is selected for AI, the input current is lower than the minimum threshold.	1. Check whether the AI input voltage/current of the I/O expansion module is correct. 2. Check whether the AI input current is normal.			

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	5	<I/O expansion module 2> AI input disconnected	When a 4.20 mA current signal is selected for AI, the input current is lower than the minimum threshold.	1. Check whether the AI input voltage/current of the I/O expansion module is correct. 2. Check whether the AI input current is normal.	Continued	Continued	Continued
		6	<I/O expansion module 3> AI input disconnected	When a 4.20 mA current signal is selected for AI, the input current is lower than the minimum threshold.	1. Check whether the AI input voltage/current of the I/O expansion module is correct. 2. Check whether the AI input current is normal.			
Continued	Continued	7	<I/O expansion module 1> EEPROM operation error	Writing data to EEPROM fails possibly because the EEPROM is damaged, which leads to failure in storing the correction parameters.	Rewrite the correction parameter to the EEPROM. If the fault persists, replace the I/O expansion module.	Continued	Continued	Continued
		8	<I/O expansion module 2> EEPROM operation error	Writing data to EEPROM fails possibly because the EEPROM is damaged, which leads to failure in storing the correction parameters.	Rewrite the correction parameter to the EEPROM. If the fault persists, replace the I/O expansion module.			
Continued	Continued	9	<I/O expansion module 3> EEPROM operation error	Writing data to EEPROM fails possibly because the EEPROM is damaged, which leads to failure in storing the correction parameters.	Rewrite the correction parameter to the EEPROM. If the fault persists, replace the I/O expansion module.	Continued	Continued	Continued

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
170	I/O expansion module wiring error	10	<I/O expansion module 1> correction coefficient error	1. Correction is canceled because the factory correction parameter of AI is incorrect. 2. Correction is canceled because the factory correction parameter of AO is incorrect.	Check n7-15 (Expansion module feedback status) and correct the corresponding correction coefficient. 1. When bits 3, 7, and 11 of [n7-15] are 1, the correction parameters of channels AI1, AI2, and AI3 are incorrect, respectively. 2. When bits 13, 14, and 15 of [n7-15] are 1, the correction parameters of channels AO1, AO2, and AO3 are incorrect, respectively.	Alarm	Switch-off - alarm	Auto reset
Continued	Continued	11	<I/O expansion module 2> correction coefficient error	1. Correction is canceled because the factory correction parameter of AI is incorrect. 2. Correction is canceled because the factory correction parameter of AO is incorrect.	Check n8-15 (Expansion module feedback status) and correct the corresponding correction coefficient. 1. When bits 3, 7, and 11 of [n8-15] are 1, the correction parameters of channels AI1, AI2, and AI3 are incorrect, respectively. 2. When bits 13, 14, and 15 of [n8-15] are 1, the correction parameters of channels AO1, AO2, and AO3 are incorrect, respectively.	Continued	Continued	Continued

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	12	<I/O expansion module 3> correction coefficient error	1. Correction is canceled because the factory correction parameter of AI is incorrect. 2. Correction is canceled because the factory correction parameter of AO is incorrect.	Check n9-15 (Expansion module feedback status) and correct the corresponding correction coefficient. 1. When bits 3, 7, and 11 of [n9-15] are 1, the correction parameters of channels AI1, AI2, and AI3 are incorrect, respectively. 2. When bits 13, 14, and 15 of [n9-15] are 1, the correction parameters of channels AO1, AO2, and AO3 are incorrect, respectively.	Continued	Continued	Continued
172	Module pre-over-temperature	1	R phase module pre-overtemperature	Temperature of the R phase is greater than or equal to (Over-temperature threshold – Module pre-overtemperature threshold) (parameters in group A4, 5° C by default).	1. Check whether the R phase temperature detection circuit works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Alarm	Level cannot be changed	Auto reset
172	Module pre-over-temperature	2	S phase module pre-overtemperature	Temperature of the S phase is greater than or equal to (Over-temperature threshold – Module pre-overtemperature threshold) (parameters in group A4, 5° C by default).	1. Check whether the S phase temperature detection circuit works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Alarm	Level cannot be changed	Auto reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
Continued	Continued	3	T phase module pre-overflow temperature	Temperature of the T phase is greater than or equal to (Over-temperature threshold – Module pre-overflow temperature threshold) (parameters in group A4, 5° C by default).	1. Check whether the T phase temperature detection circuit works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Continued	Continued	Continued
Continued	Continued	5	Power module pre-overflow temperature	Temperature of the power module is greater than or equal to (Over-temperature threshold – Module pre-overflow temperature threshold) (parameters in group A4, 5° C by default).	1. Check whether the module temperature is normal. 2. Reduce the ambient temperature. 3. Reduce the load ratio.	Continued	Continued	Continued
Continued	Continued	7	Control cavity temperature error	The temperature in the control cavity is too high. Check whether the cooling fan of the control cavity works properly.	1. Check whether the cooling fan of the control cavity works properly. 2. Reduce the ambient temperature. 3. Reduce the load ratio. 4. Check whether the module temperature detection circuit works properly.	Continued	Continued	Continued
183	Master-slave communication error alarm	4	InoLink communication: data receiving node address being the local address	The node cannot receive the data from itself.	Check the settings of the node that receives the data.	Alarm	Level cannot be changed	Auto reset

No.	Fault Name	Subcode	Subcode Name	Possible Cause	Solution	Default Fault Level	Fault Level Range	Default Reset Method
185	Droop function error	1	Communication heartbeat error of droop receiving node 1	The communication of the droop receiving node is disconnected or the data is not incorrectly.	1. Check whether the communication of the droop receiving node is normal. 2. Check whether the data of the droop receiving node is set correctly.	Alarm	Alarm - no handling	Auto reset
		2	Communication heartbeat error of droop receiving node 2	The communication of the droop receiving node is disconnected or the data is not incorrectly.	1. Check whether the communication of the droop receiving node is normal. 2. Check whether the data of the droop receiving node is set correctly.			
		3	Communication heartbeat error of droop receiving node 3	The communication of the droop receiving node is disconnected or the data is not incorrectly.	1. Check whether the communication of the droop receiving node is normal. 2. Check whether the data of the droop receiving node is set correctly.			
		4	Communication heartbeat error of droop receiving node 4	The communication of the droop receiving node is disconnected or the data is not incorrectly.	1. Check whether the communication of the droop receiving node is normal. 2. Check whether the data of the droop receiving node is set correctly.			



NOTE

- ◆ <1>: The default fault level of ERR53, ERR91, and ERR92 is switch-off, which is automatically switched to alarm upon stop. The fault level is automatically switched to switch-off when the switch-on pre-charge is completed and the running permission command is active.
- ◆ <2>: The default fault level of ERR88 is stop running. If ERR88-1 or ERR88-7 is activated, the fault level of ERR88 is automatically switched to switch-off.
- ◆ <3>: The default fault level of ERR89 is alarm. If the HCU_24V input voltage low alarm detection function of E8-01 is enabled, the fault level is alarm when the input voltage is higher than 18.5 V but lower than 21 V, and is switch-off when the input voltage is lower than 18.5 V.



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