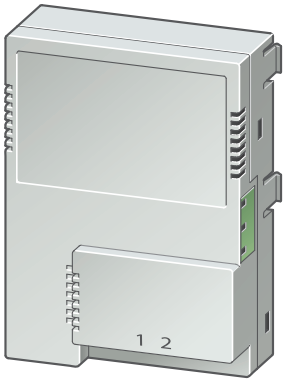
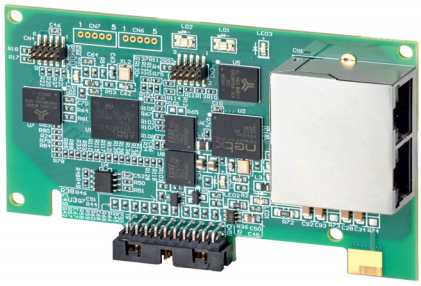
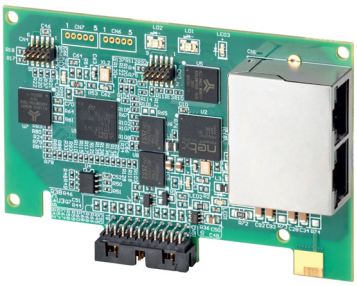
DX-NET-PROFINET2-2
DX-NET-PROFINET-2
DXG-NET-PROFINET
DXM-NET-PROFINET
DXX-NET-PROFINET

PowerXL™ PROFINET communication interface for PowerXL™ DE1 Variable Speed Starter and DC1, DA1, DG1, DM1, DX1 Variable Frequency Drives







Powering Business Worldwide

Service

For service and support, please contact your local sales organization.

Eaton.com/contacts

Eaton.com/aftersales

For customers in US/Canada contact:

EatonCare Customer Support Center

Call the EatonCare Support Center if you need assistance with placing an order, stock availability or proof of shipment, expediting an existing order, emergency shipments, product price information, returns other than warranty returns, and information on local distributors or sales offices.

Voice: 877-ETN-CARE (386-2273) (8:00 a.m. – 6:00 p.m. EST)
After-Hours Emergency: 800-543-7038 (6:00 p.m. – 8:00 a.m. EST)

Drives Technical Resource Center

Voice: 877-ETN-CARE (386-2273) option 2, option 6
(8:00 a.m. – 5:00 p.m. Central Time U.S. [UTC-6])
email: TRCDrives@Eaton.com
page: Eaton.com/drives

Original operating manual
The German-language edition of this document is the original operating manual.

Translation of the original operating manual
All editions of this document other than those in German language are translations of the original operating manual.

1. Edition 2022, publication date 01/22
2. Edition 2022, publication date 04/22
3. Edition 2025, publication date 04/25

See revision protocol in the "About this manual" chapter.

Danger!
Dangerous electrical voltage!

Before commencing the installation

- Disconnect the power supply of the device.
- Ensure that devices cannot be accidentally retriggered.
- Verify isolation from the supply.
- Ground and short-circuit.
- Cover or enclose neighbouring units that are live.
- Follow the engineering instructions (IL) of the device concerned.
- Only suitably qualified personnel in accordance with EN 50110-1/-2 (VDE 0105 Part 100) may work on this device/system.
- Before installation and before touching the device ensure that you are free of electrostatic charge.
- The functional earth (FE) must be connected to the protective earth (PE) or to the potential equalizing. The system installer is responsible for implementing this connection.
- Connecting cables and signal lines should be installed so that inductive or capacitive interference do not impair the automation functions.
- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.
- Suitable safety hardware and software measures should be implemented for the I/O connection so that a cable or wire breakage on the signal side does not result in undefined states in the automation device.
- Ensure a reliable electrical isolation of the low voltage for the 24 V supply. Only use power supply units complying with IEC 60364-4-41 or HD 384.4.41 S2 (VDE 0100 part 410).
- Deviations of the mains voltage from the nominal value must not exceed the tolerance limits given in the technical data, otherwise this may cause malfunction and dangerous operation.
- Emergency-Stop devices complying with IEC/EN 60204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency switching off devices must not cause restart.
- Built-in devices for enclosures or cabinets must only be run and operated in an installed state, desk-top devices or portable devices only when the housing is closed.
- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency switching off devices should be implemented.
- Wherever faults in the automation system may cause damage to persons or property, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (for example, by means of separate limit switches, mechanical interlocks, etc.).
- During operation, and depending on their degree of protection, variable frequency drives may have live, uninsulated, moving, and/or rotating parts, as well as hot surfaces.
- The impermissible removal of the required cover, improper installation or incorrect operation of the motor or variable frequency drive can cause the failure of the device and serious injury and/or material damage.
- Comply with all applicable national accident prevention regulations (e.g. BGV A3) when working with energized variable frequency drives.
- The electrical installation must be carried out in accordance with the relevant regulations (e.g. with regard to cable cross sections, fuses, PE).
- All transport, installation, commissioning and maintenance work must only be carried out by trained personnel (observe IEC 60364, HD 384 or DIN VDE 0100 and national accident prevention regulations).
- If applicable, systems in which variable frequency drives are installed must be equipped with additional monitoring and protective devices in accordance with the applicable safety regulations, e.g., the German Equipment and Product Safety Act, accident prevention regulations, etc. Making changes to the variable frequency drives by using the operating software is allowed.
- Keep all covers and doors closed during operation.
- When designing the machine, the user must incorporate mechanisms and measures that limit the consequences of a drive controller malfunction or failure (an increase in motor speed or the motor?9s sudden stop) so as to prevent hazards to people and property, e.g.:
  - Additional stand-alone devices for monitoring parameters that are relevant to safety (speed, travel, end positions, etc.)
  - Electrical and non-electrical safety devices (interlocks or mechanical locks) for mechanisms that protect the entire system
  - Due to the possibility of there being capacitors that are still holding a charge, do not touch live device parts or terminals immediately after disconnecting the variable frequency drives from the supply voltage. Heed the corresponding labels on the variable frequency drives

Content

0 About this manual

0.1 Subject

This manual MN040062EN ("DX-NET-PROFINET2-2 • DX-NET-PROFINET-2 • DXG-NET-PROFINET • DXM-NET-PROFINET • DXX-NET-PROFINET PowerXL™ PROFINET Communication interface for PowerXL™ DE1 variable speed starter and DC1, DA1, DG1, DM1, DX1 variable frequency drive") is the original operating manual and describes the communication interface (hereinafter referred to as PowerXL PROFINET communication interface for short)

- **DX-NET-PROFINET2-2** for DE1 variable speed starter and DC1 variable frequency drive,
- **DX-NET-PROFINET-2** for DA1 variable frequency drive
- **DXG-NET-PROFINET** for DG1 variable frequency drive,
- **DXM-NET-PROFINET** for DM1 variable frequency drive.
- **DXX-NET-PROFINET** for DX1 variable frequency drive.

The following chapters describe special information for project planning, installation, and operation of the communication interfaces DX-NET-ROFINET2-2, DX-NET- ROFINET-2, DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET.

Special functions such as "Access to cyclic and acyclic data of the variable frequency drive and variable speed starter" are also described.

→ Unless otherwise described, DE1 is also used below as a proxy for DE11.

0.2 Target audience

This manual, MN040062EN, is intended for engineers, electricians, and automation technicians.

A thorough knowledge of the ProfiNet communication system and the programming of a ProfiNet master is required.
In addition, knowledge of handling the DE1 variable speed starter and the DC1, DA1, DG1, DM1 or DX1 variable frequency drive is required.

Please read this manual carefully before running the communication interface DX-NET-PROFINET2-2 or DX-NET-PROFINET-2 or DXG-NET-PROFINET or DXM-NET-PROFINET or DXX-NET-PROFINET.

We assume that you have a good knowledge of engineering fundamentals, and that you are familiar with handling electrical systems and machines, as well as with reading technical drawings.

CAUTION

Installation requires qualified electrician

0.3 List of revisions

The following significant amendments have been introduced since previous issues:

MODIFICATION OF THE MANUAL TITLE

Due to the admission of the additional DA1 and DX1 instrument series, the title of the manual in version 04/25 has been changed

from

DX-NET-PROFINET2-2
DXG-NET-PROFINET
DXM-NET-PROFINET

PROFINET communication interface for PowerXL™ DE1 variable speed starter and DC1 variable frequency drive

to

DX-NET-PROFINET2-2
DX-NET-PROFINET-2
DXG-NET-PROFINET
DXM-NET-PROFINET
DXX-NET-PROFINET

PowerXL™ PROFINET communication interface for PowerXL™ DE1 variable speed starter and DC1, DA1, DG1, DM1, DX1 Variable Frequency Drive

in version 04/25

Protocol

Publication date	Page	Keyword	new	modified	deleted
04/25		Title (see special note above)	✓		
	Various	Sections on DA1 and DX1	✓		
	Various	Profidrive Profile for DG1 and DM1 device series	✓		
04/22	various	Sections on DG1 and DM1 device series	✓		
	15	EMC standard EN 61800-3:2018-09		✓	
	15	Approbations / approvals	✓		
	–	Notes on mechanical surface mounting			✓
01/22		First edition	–	–	–

0.4 Writing conventions

0.4.1 Safety warning concerning property damage

WARNING

Indicates a potentially hazardous situation that may result in property damage.

0.4.2 Safety warning concerning personal injury hazards

CAUTION

Warns of hazardous situations that may cause slight injury.

WARNING

Warns of hazardous situations that could result in serious injury or death.

DANGER

Warns of hazardous situations that result in serious injury or death.

0.4.3 Hints

Indicates useful tips.

The housing, as well as other safety-relevant parts, has been left out in some of the figures in this manual in order to make the figures easier to understand. However, it is important to note that the components described in this manual must always be operated with their housing installed properly, as well as with all required safety-relevant parts.

Follow the installation instructions in the relevant instruction leaflets.

All the specifications in this manual refer to the hardware and software versions documented in it.

0.5 Additional information and documents

For more information on the series described in this manual, please visit the Eaton website.

www.eaton.com/Drives

Additional information can be found in the following documents:

Document	Type	Subject
Manuals		
MN040059EN	Manual	DC1…20… and DC1…OE1 variable frequency drives
MN040058EN	Manual (Installation and parameter manual)	Variable frequency drive DC1-S...20, DC1-S...OE1
MN040063EN	Manual	DA1-…20…, DA1-…55… and DA1-…O Variable frequency drive
MN040011EN	Manual	DE1 variable speed starter Variable Speed Starter VSS DXE-EXT-SET configuration module
MN040002EN	Manual (Installation manual)	DG1 variable frequency drive
MN040004EN	Manual (Application manual)	DG1 variable frequency drive
MN040060EN	Manual (Installation manual)	DM1 variable frequency drive
MN040049EN	Manual (Application manual)	DM1 variable frequency drive
MN040068EN	Manual (Installation manual)	DX1 variable frequency drive
MN040069EN	Manual (Application manual)	DX1 variable frequency drive
MN040013EN	Manual	Software "InControl"

0.6 Terminology

The following abbreviations are used in this manual.

Abbreviations
When we refer to the **PowerXL PROFINET communication interface** as an abbreviation, this means the five variants

- DX-NET-PROFINET2-2
- DX-NET-PROFINET-2
- DXG-NET-PROFINET
- DXM-NET-PROFINET
- DXX-NET-PROFINET

0.7 Abbreviations and symbols

The following abbreviations are used in this manual:

dec	decimal (number system based on 10)
EMC	Electromagnetic compatibility
FB	Field bus
FS	Frame size
GND	Ground (0 V potential)
GSD	Generic Station Description (electronic data sheet)
HEX	hexadecimal (number system based on 16)
LED	Light emitting diode (LED)
PC	Personal computer
PD	Process Data
PROFINET	Process Field Network
PLC	programmable logic controller
SW	Status Word
UL	Underwriters Laboratories

Symbols used in this manual have the following meanings:

▶ Indicates instructions to be followed.

Note on the application area

0.8 Units of measurement

Every physical dimension included in this manual uses international metric system units, otherwise known as SI (Système International d'Unités) units. For the purpose of the equipment's UL certification, some of these dimensions are accompanied by their equivalents in imperial units.

Table 1: Unit conversion examples

Designation	US-American Designation	Anglo American value	SI value	Conversion value
Length	inch	1 inch (")	25.4 mm	0.0394
Output	horsepower	1 HP = 1.014 PS	0.7457 kW	1.341
Torque	pound-force inches	1 lbf in	0.113 Nm	8.851
Temperature	Fahrenheit	1 °F (T_F)	-17.222 °C (T_C)	$T_F = T_C \times 9/5 + 32$
Speed	revolutions per minute	1 rpm	1 min^{-1}	1
Weight	pound	1 lb	0.4536 kg	2.205

1 Series

1.1 Checking the delivery

Before opening the package, please check the nameplate on it to make sure that you received the correct connection.

The DX-NET-PROFINET2-2 or DX-NET-PROFINET-2 or DXG-NET-PROFINET or DXM-NET-PROFINET or DXX-NET-PROFINET communication interface is carefully packaged and shipped. The devices should be shipped only in their original packaging and using a suitable means of transportation.

Please take note of the labels and instructions on the packaging, as well as the manual for the unpacked device.

Open the packaging with suitable tools and inspect the contents immediately after receipt in order to ensure that they are complete and undamaged.

1.2 Equipment supplied

1.2.1 DX-NET-PROFINET2-2

The packaging must contain the following parts:

- A DX-NET-PROFINET2-2 communication interface
- an Instructional Leaflet IL040045ZU

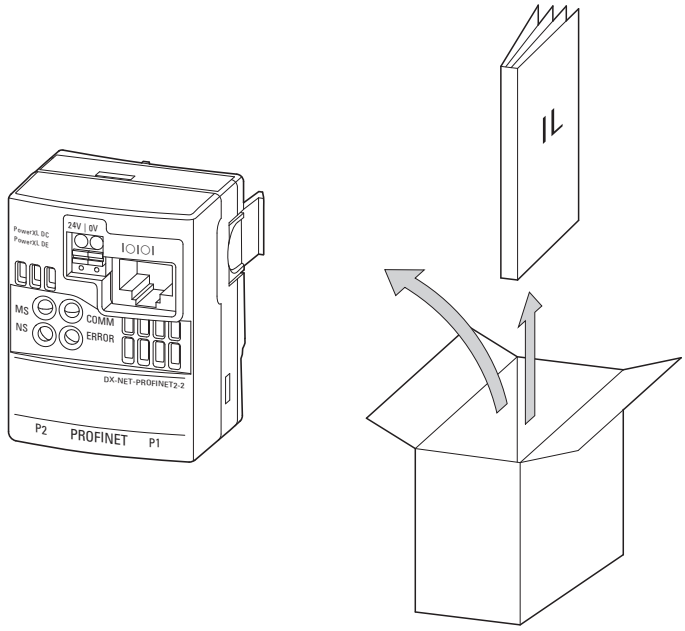


Figure 1: Scope of delivery for the DX-NET-PROFINET2-2 communication interface

1.2.2 DX-NET-PROFINET-2

The packaging must contain the following parts:

- a DXG-NET-PROFINET communication interface
- an instructional leaflet IL040062ZU

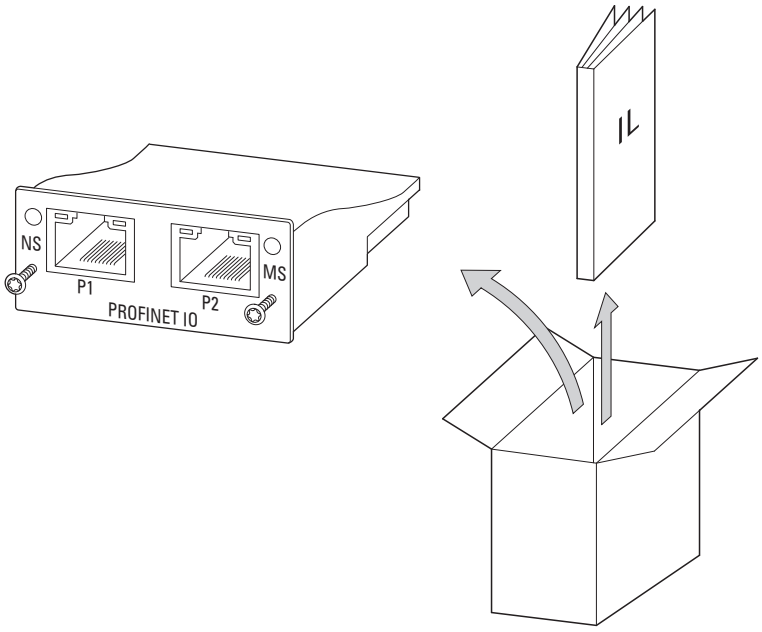


Figure 2: Scope of delivery for the DX-NET-PROFINET-2 communication interface

1.2.3 DXG-NET-PROFINET / DXX-NET-PROFINET

The packaging must contain the following parts:

- a DXG-NET-PROFINET / DXX-NET-PROFINET communication interface
- an Instruction Leaflet IL040062ZU

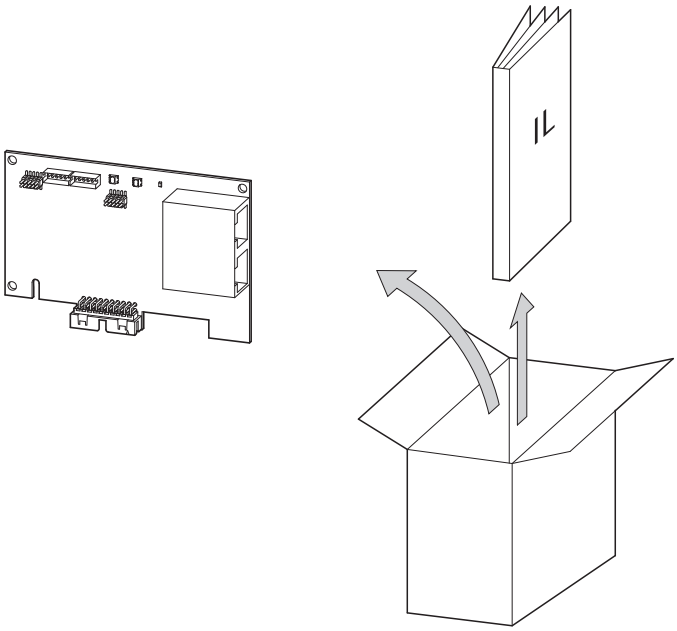


Figure 3: Scope of delivery for the DXG-NET-PROFINET / DXX-NET-PROFINET communication interface

1.2.4 DXM-NET-PROFINET

The packaging must contain the following parts:

- a DXM-NET-PROFINET communication interface
- an Instruction Leaflet IL040062ZU

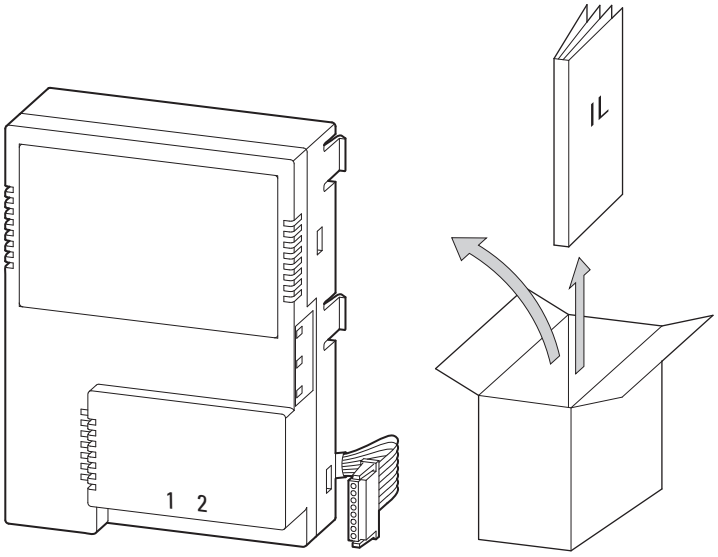


Figure 4: Scope of delivery for the DXM-NET-PROFINET communication interface

1.3 Type code

1.3.1 DX-NET-PROFINET2-2 and DX-NET-PROFINET-2

The type code and type designation of the DX-NET-PROFINET2-2 and DX-NET-PROFINET-2 communication interface are structured as follows:

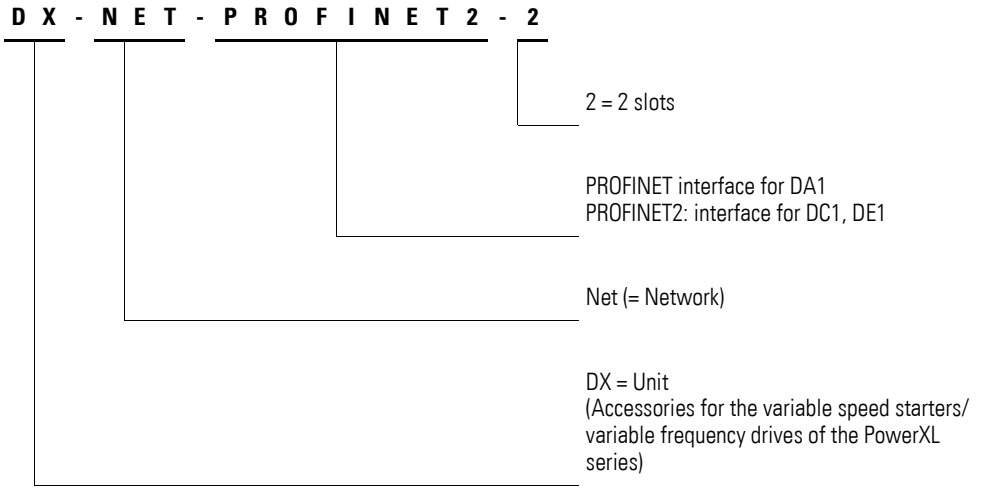


Figure 5: Type code of the DX-NET-PROFINET-2 and DX-NET-PROFINET2-2 communication interface

1.3.2 DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET

The type code and type designation of the DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET communication interface are structured as follows:

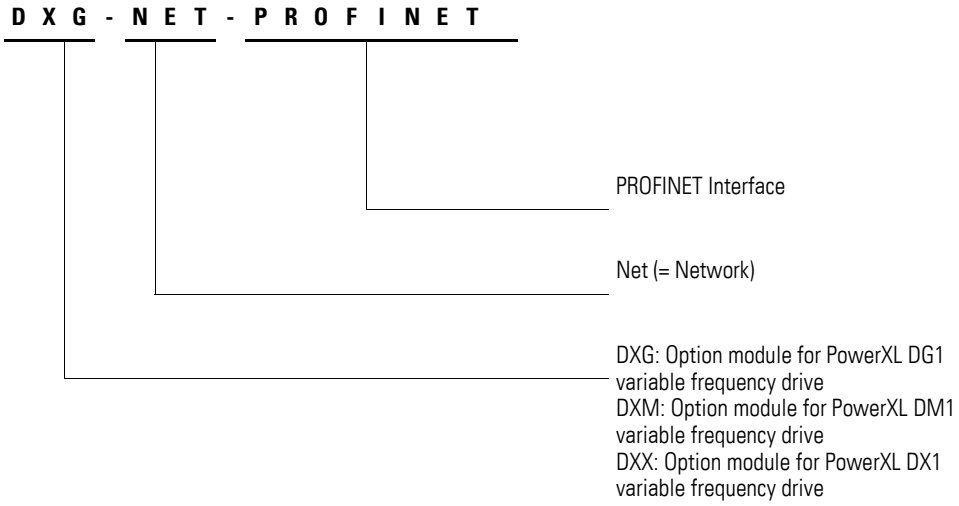


Figure 6: Type code of the DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET communication interface

1.4 General rated data for DX-NET-PROFINET2-2; DXG-NET-PROFINET; DXM-NET-PROFINET and DXX-NET-PROFINET

Technical data	Value
Approbations / Approvals	
General information	The variable frequency drive/variable speed starter complies with the EMC standard EN 61800-3:2018-09
CE	• IEC/EN 61131-2 • IEC/EN 61800
UL/CSA	UL61800; CSA
PROFINET certification PROFIdrive certification	IEC/EN 61800-7, PNO documentation
RoHS	2011/65/EU
Reach	EG 1907/2006
WEEE	2012/19/EU
Installation	In RJ45 slot on the drive
Degree of protection	IP20
Connections	• RJ45 plug for variable frequency drive/variable speed starter • RJ45 plug for Ethernet
Power supply	• 20 - 28 V DC • 24 V DC 110 mA
Ethernet connection	
Compatible devices	Devices according to Ethernet standards IEEE 802.3 and IEEE 802.3u
Media	10BASE-TX or 100Base-TX with auto-negotiation and auto-MDIX (auto-crossover)
Cabling	• CAT5 UTP, CAT6 UTP • CAT5 FTP, CAT6 FTP • CAT5 STP, CAT6 STP
Terminals	RJ45
Termination	internal
Maximum segment length	100 m
Topology	Star or bus or ring (for DG1, DM1 and DX1)
Maximum number of nodes allowed	255
Data transfer rate	• 10 Mbps • 100 Mbps
Protocol	PROFINET IO

1.5 General rated data for DX-NET-PROFINET-2

Technical Data	Symbol	Unit	&Value
General			
Standards			meets the requirements of the EN 50178 (standard for electrical safety)
Production quality			RoHS, ISO 9001
Environmental conditions			
Operation temperature	ϑ	°C	-40 (no hoarfrost) up to +70
Storage temperature	ϑ	°C	-40 - +85
Climatic proofing	p_w	%	< 95, relative humidity, no condensation permitted
Altitude	H	m	max. 1000
Vibration	g	m/s^2	5 – according to IEC 68-2-6; 10 - 500 Hz; 0.35 mm
PROFINET connections			
Interface			RJ45 plug
Data transfer			100 Mbit/s full-duplex
Transfer cable			Twisted two-pair balanced cable (screened)
Communication protocol			
PROFINET			IEC 61158
Baud rate		MBit/s	100

1.6 Pin assignment

1.6.1 PROFINET connection

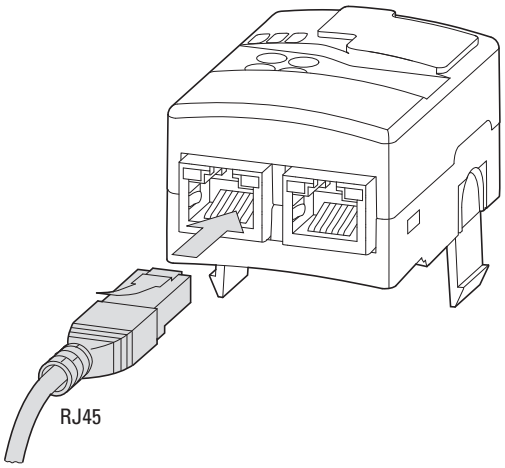


Figure 7: Connection of the RJ45 plug - for DX-NET-PROFINET2-2

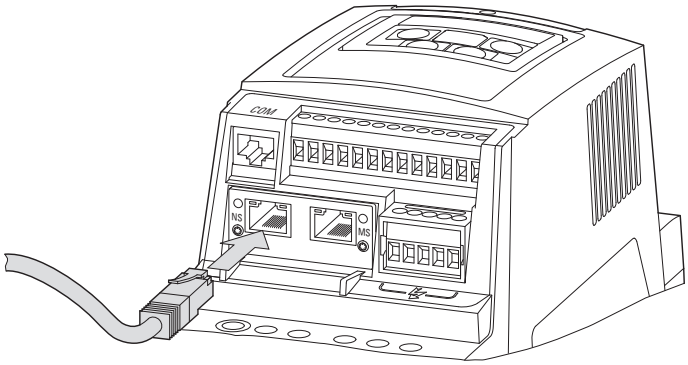


Figure 8: Connection of the RJ45 plug - for DX-NET-PROFINET-2

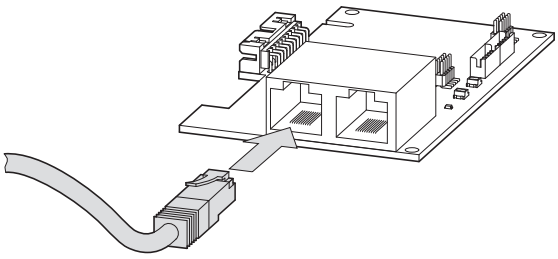


Figure 9: Connection of the RJ45 plug - for DXG-NET-PROFINET and DXX-NET-PROFINET

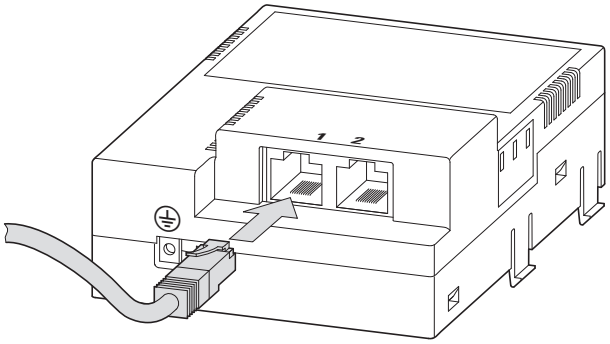


Figure 10: Connection of the RJ45 plug - for DXM-NET-PROFINET

RJ45 plug is used in order to establish a connection to the PROFINET field bus. Generally, connection cables with RJ45 plugs for PROFINET are available as standard ready-to-use cables. They can also be prepared individually. This will require the connections shown below (pin assignment).

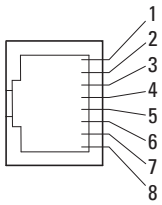
	PIN	Meaning
	1	TD+
	2	TD-
	3	RD+
	4	To GND via RC circuit
	5	To GND via RC circuit
	6	RD-
	7	To GND via RC circuit
	8	To GND via RC circuit

Figure 11: Pin assignment for RJ45 plugs (PROFINET connection)

1.6.2 Serial interface

1.6.2.1 DX-NET-PROFINET2-2, DX-NET-PROFINET-2

Changing the parameter values via drivesConnect or the control unit requires a connection to the RJ45 socket.
This is located on the front of the DX-NET-PROFINET2-2 communication interface.

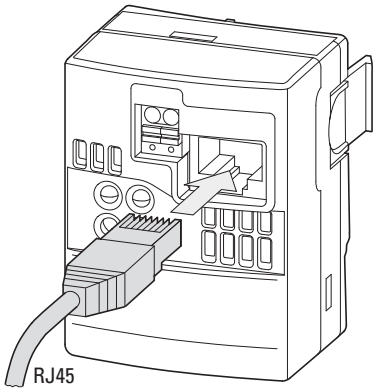


Figure 12: RJ45 interface

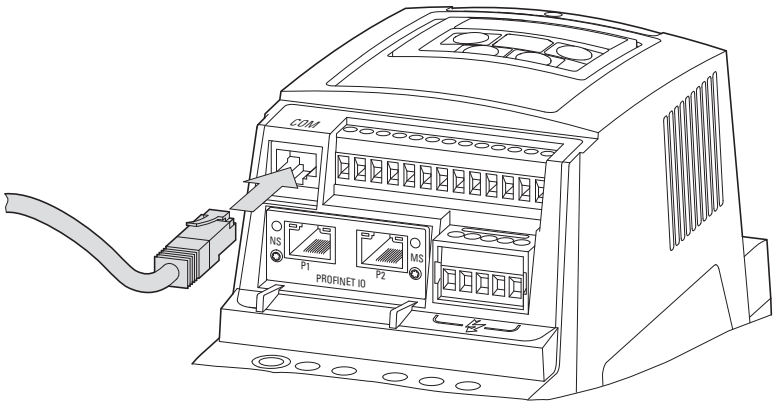
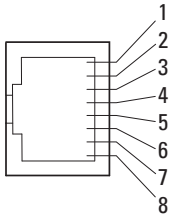


Figure 13: RJ45 socket (sierial Port on DA1)

Table 2: Pin assignment for RJ45 socket (serial port on DA1, DC1 and DE1)

	PIN	Meaning
	1	CAN- **Note**: Not used in DE1 variable speed starters (with the exception of DE11)
	2	CAN+ **Note**: Not used in DE1 variable speed starters (with the exception of DE11)
	3	0 V
	4	OP bus (operation bus) / External keypad / PC connection -
	5	OP bus (operation bus) / External keypad / PC connection +
	6	24 V DC power supply
	7	RS485- Modbus RTU
	8	RS485+ Modbus RTU

1.6.2.2 DXG-NET-PROFINET

A modification of the parameter values via the "InControl" software or the operating unit requires a connection to the RJ45 socket of the DG1 basic device. This is located behind the keypad.

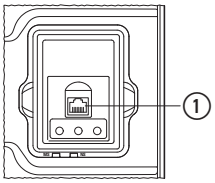


Figure 14: Interface

① RJ45 socket (serial Port on DG1)

Alternatively, the serial connection can be realized via terminals.

→ Further details on PIN assignment and addressing can be found in MN040010EN manual.

1.6.2.3 DXM-NET-PROFINET

A modification of the parameter values via the "InControl" software or the operating unit requires a connection to the RJ45 socket of the DM1 basic device. This is located under the cover housing.

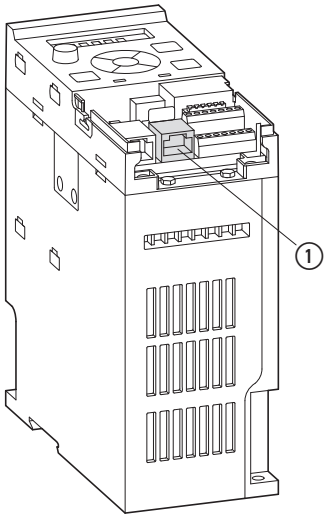


Figure 15: RJ45 socket (serial Port on DM1)

Alternatively, the serial connection can be realized via terminals.

→ Further details on PIN assignment and addressing can be found in the MN040051EN manual.

1.6.2.4 DXX-NET-PROFINET

A modification of the parameter values via the "InControl" software or the operating unit requires a connection to the RJ45 socket of the DX1 basic device. This is located under the cover housing.

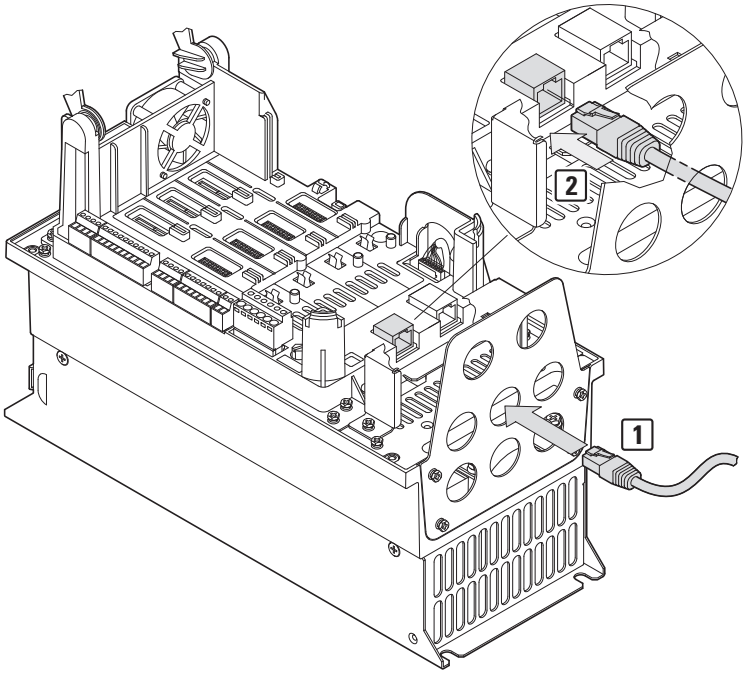


Figure 16: RJ45 socket (serial Port on DX1)

Alternatively, the serial connection can be made via terminals.

1.6.3 External 24-V DC control voltage

If no mains supply is available, using an external 24 VDC voltage,

- communication to the PLC can be established,
- an IP address assigned,
- PROFINET network name assigned.

1.6.3.1 DX-NET-PROFINET2-2

The control section of the DX-NET-PROFINET2-2 communication interface must be supplied with an external voltage of 24 VDC via an external power supply unit.

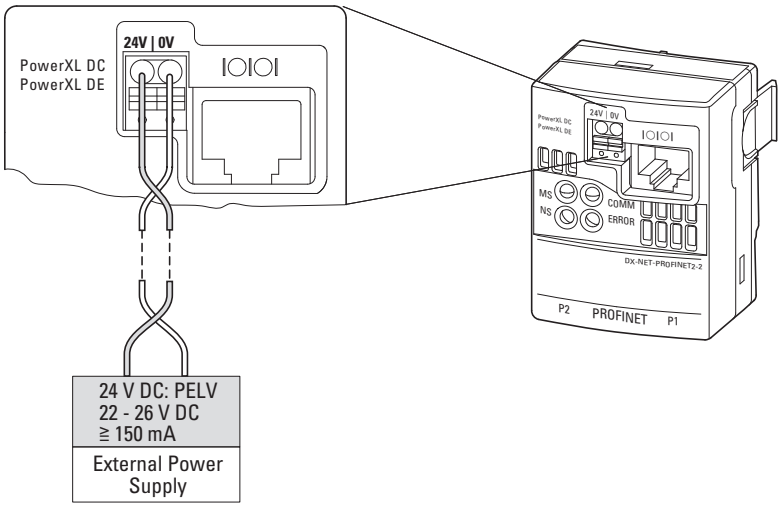


Figure 17: External power supply

→ The external control voltage (+24 VDC) must be able to handle a load of at least 150 mA.
The residual ripple of this external control voltage must be less than ±5 % $\Delta U_a/U_a$.

→ Parameterization of the basic device is not possible, since only the communication interface is supplied with voltage.

1.6.3.2 DX-NET-PROFINET-2

The control section of the DA1 basic unit must be supplied with an external voltage of 24 V DC via an external power supply unit.

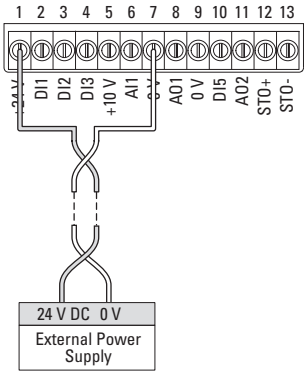


Figure 18: External power supply

The external control voltage (+24 V) should be able to handle a load of at least 100 mA.

This external control voltage's residual ripple must be smaller than ±5 % of $\triangle U_a/U_a$.

1.6.3.3 DXG-NET-PROFINET

The control section of the DG1 basic unit must be supplied with an external voltage of 24 VDC via an external power supply unit.

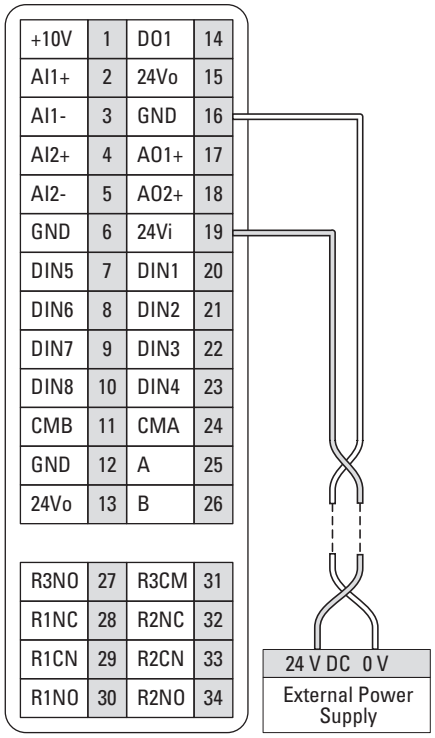


Figure 19: External power supply

1.6.3.4 DXM-NET-PROFINET

The control section of the DM1 basic unit must be supplied with an external voltage of 24 V DC via an external power supply unit.

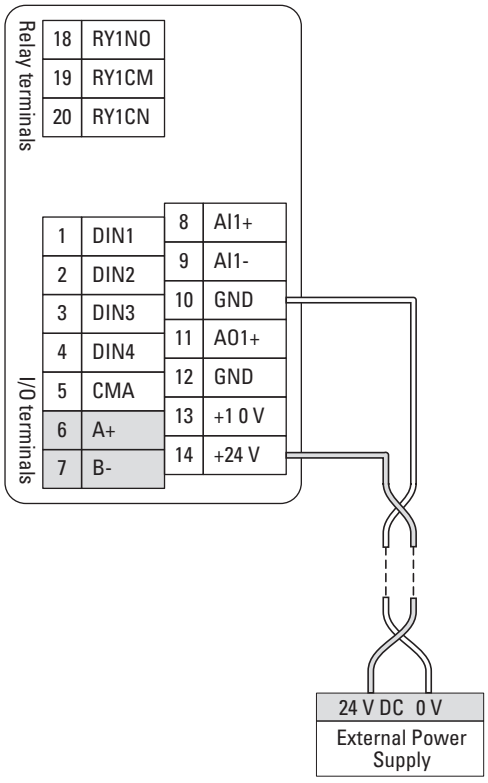


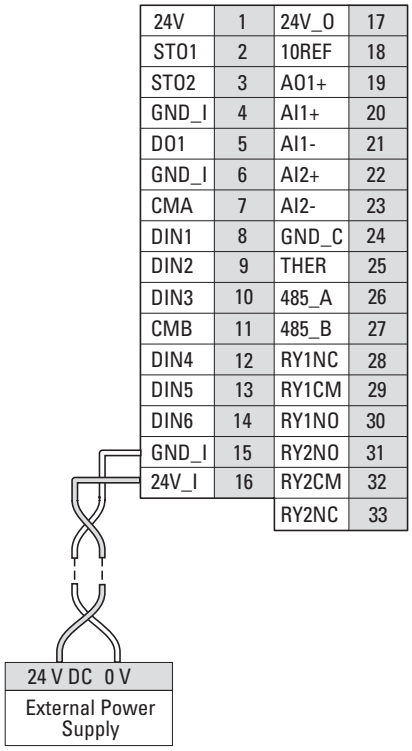
Figure 20: External power supply

Further details on the external 24 V DC supply can be found in the manuals:

DG1: Manual MN040002EN
DM1: Manual MN040060EN

1.6.3.5 DXX-NET-PROFINET

The control section of the DX1 basic unit must be supplied with an external voltage of 24 V DC via an external power supply unit.



1.7 Proper use

The PowerXL PROFINET communication interface is an electrical device for controlling and connecting the DA1, DC1, DG1, DM1, DX1 variable frequency drives or DE1 variable speed starter of the PowerXL product family to the standardized PROFINET field bus system.

It is intended to be installed in a machine or assembled with other components to form a machine or system.

The PowerXL PROFINET communication interface is not a household appliance, but is intended as a component exclusively for use for commercial purposes.

> *WARNING*
>
> Observe the technical data and connection requirements described in this manual.
> Any other usage constitutes improper use.

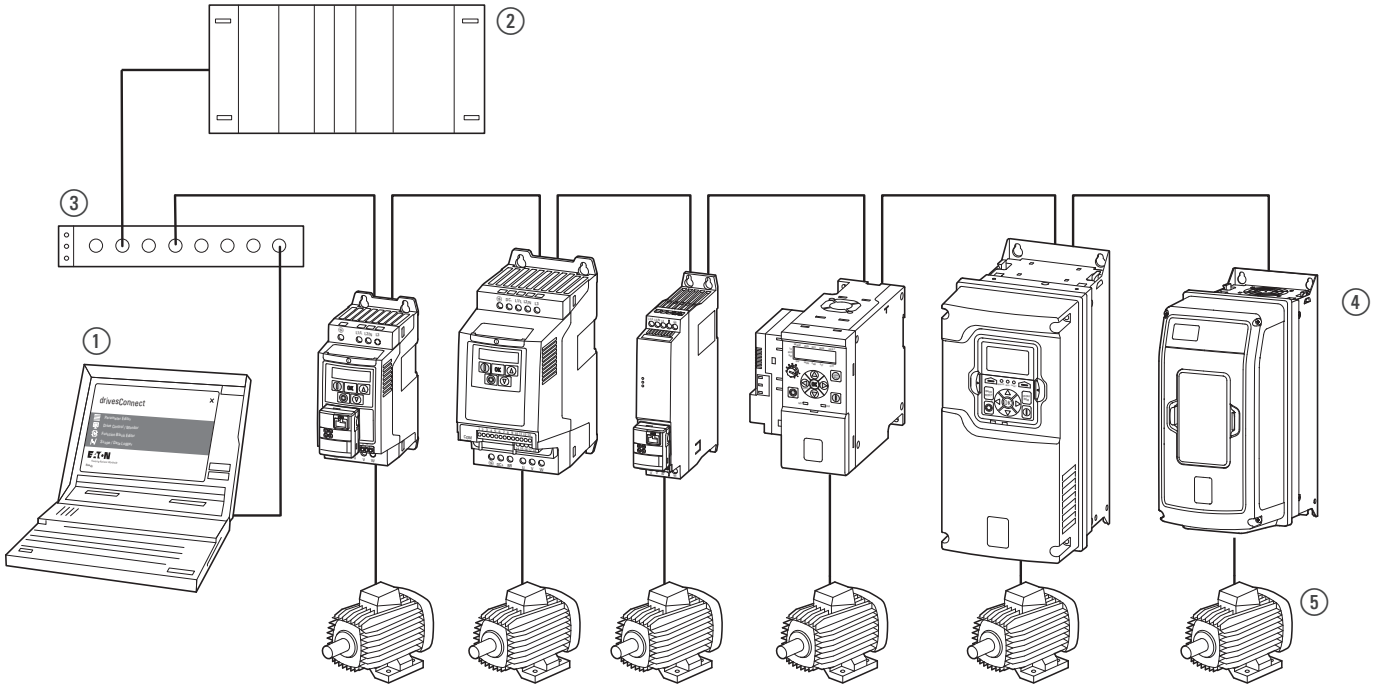


Figure 21: Integration of the PowerXL PROFINET communication interface into a PROFINET network

① PC
② Head-end controller (PLC)
③ Switch
④ Basic device:
DC1 variable frequency drive or DE1 variable speed starter with DX-NET-PROFINET2-2
DA1 variable frequency drive with DX-NET-PROFINET-2
DG1 variable frequency drive with DXG-NET-PROFINET
DM1 variable frequency drive with DXM-NET-PROFINET
DX1 variable frequency drive with DXX-NET-PROFINET
⑤ Motor(s)

1.8 Maintenance and inspection

The PowerXL PROFINET communication interface is maintenance-free if the general rated operational data is observed and the technical data specific to PROFINET are taken into account.
However, external factors can influence the components's lifespan and function. We therefore recommend that you check the device regularly.

If the communication interface is damaged by external influences, repair is not possible. Replacement or repair of individual components of the communication interface is not intended.

1.9 Storage

If the PowerXL PROFINET communication interface is stored before use, the following ambient conditions must prevail at the storage location:

- Storage temperature: -40 °C to +85 °C
- relative average air humidity: < 95 %
- No condensation allowed

1.10 Service and warranty

If you have a problem with your PowerXL PROFINET device, please contact your local sales organization.

When you call, have following data ready:

- the exact type designation (e.g. DX-NET-PROFINET2-2),
- the date of purchase,
- a detailed description of the problem that occurred in connection with the device (e.g. DX-NET-PROFINET2-2).

Information concerning the warranty can be found in the Eaton Industries GmbH Terms and Conditions.

For service and support, please contact your local sales organization.

Contact info. Eaton.com/contacts

Service page: Eaton.com/aftersales

1.11 Disposal

The PowerXL PROFINET communication interface can be disposed of as electronic waste in accordance with the currently applicable national regulations. Dispose of the device according to the applicable environmental laws and provisions for the disposal of electrical or electronic devices.

2 Configuration

DANGER – CONTROL FAILURE

When engineering your control diagram, make sure to take all potential control path faults into account.

When it comes to critical control functions, make sure that a safe state can be reached after a control path fails.

Critical control function examples include:
- Emergency shutdown (emergency stop),
- Overtravel stop
- Power supply failure
- Restart.

Provide separate or redundant control paths.

Make sure that system control paths include communication connections.

Take the effect of unforeseen transmission delays and connection problems into account.

Carefully and individually test every implementation of a product before putting it into operation.

Observe all general accident prevention and local safety regulations.

Information for the USA:
For more information, please refer to the latest issue of NEMA ICS 1.1, "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control", and the latest issue of NEMA ICS 7.1, "Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable-Speed Drive Systems."

In addition to property damage, failure to observe the above instructions may result in serious bodily injury or even death.

2.1 Compatibility overview – hardware and firmware

The following shows the versions of the hardware and firmware with which the PowerXL PROFINET communication interface is compatible with the DC1, DG1, and DM1 variable frequency drives or DE1 variable speed starters.

Firmware

The PowerXL PROFINET communication interface can be used with firmware in the following cases:

Basic device	DC1	DE1, DE11	DG1	DM1
Firmware version	from V 2.10	from V 2.11	from V 37.2	from V 1.09

→ The firmware version of the DX-NET-PROFINET2-2 and the DX-NET-PROFINET-2 communication interface cannot be updated.

→ An update of the firmware version of the communication interface DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET can be done via the Firmware Upgrade Tool (part of the software "InControl").

→ The firmware version of the basic device can be updated for the DC1 and DA1 variable frequency drives or DE1 speed controller via the "drivesConnect" program or for the DG1, DM1 and DX1 variable frequency drives via the "InControl" software.
Upgrade of DG1 to V37.2 or higher is only supported from V36 or higher. Control board must be replaced if firmware version is lower than V36.

→ In order to use ProfiDrive Profile, DG1 Firmware Version V37.05 or higher and DM1 Firmware Version V2.04 or higher is required.

→ The software "drivesConnect" and "InControl" as well as the necessary firmware versions are available free of charge on the Eaton website at the following address:

Eaton.com/software

2.2 LEDs

The LEDs on the PowerXL PROFINET communication interface are used to indicate operating and network statuses and to allow rapid diagnostics of problems.

2.2.1 DX-NET-PROFINET2-2

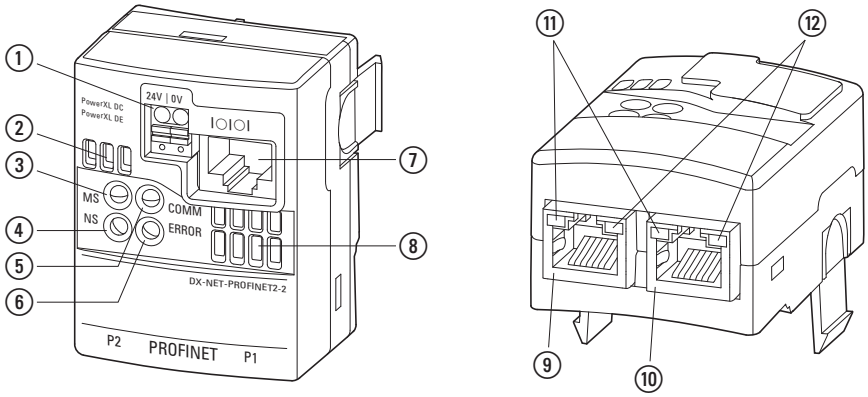


Figure 22: LEDs

① External 24-VDC supply voltage
② Air vents
③ "MS" LED - LED to indicate module status
④ "NS" LED - LED to indicate network status
⑤ "COMM" LED - LED to indicate the communication status to the basic unit (DC1/DE1)
⑥ "ERROR" LED - LED to indicate faults or error messages
⑦ RJ45 connection: Serial interface to the basic unit
⑧ Air vents
⑨ RJ45 connection – PROFINET
⑩ RJ45 connection – PROFINET
⑪ P1 LED – to indicate the Ethernet status
⑫ P2 LED – to indicate the Ethernet status

The following tables show the meaning of the LED indicators for communication via PROFINET.

NS

The **NS** LED (network status) is used to indicate network statuses.

LED status	Description
off	No supply voltage or no connection to the IO controller available
green flashing	Online, but no communication present
green illuminating	The connection to the PROFINET network has been established.
red flashing	Fault detected Flashes once: No station name assigned Flashes twice: No IP address assigned Flashes three times: Configuration error: Offline and online configurations do not match
illuminated red	Fatal error detected

MS

The MS LED (module status) indicates the status of the DX-NET-PROFINET2-2 communication interface.

LED status	Description
off	No supply voltage or device not turned on.
green flashing	Configuration error or module in standby mode.
green illuminating	The connection to the PROFINET controller has been established.
red flashing	A reversible error has occurred.
illuminated red	A fatal error has been detected.
green/red flashing	A firmware update is in progress. Do not switch off the device!

Reversible vs. non-reversible error

A reversible error can be cleared by a reset or by switching the supply voltage off and on.
In contrast, fatal errors can only be reset by power cycling the supply voltage or by changing the hardware configuration while the supply voltage is off.

P1, P2

The **P1** and **P2** LEDs indicate the status of general communication.

LED status	Description
off (green)	Port not connected
green flashing	Data transfer in progress and communication active
illuminated yellow	An Ethernet connection has been established and a data transfer is taking place. Port connected but no communication present.

COMM

The **COMM** LED indicates the communication status between the variable frequency drive and the communication interface.

LED status	Description
off (orange)	There is no communication with the basic unit.
orange illuminating	Communication is actively taking place with the basic unit.

ERROR

The **ERROR** LED indicates the internal communication status with the basic unit.

LED status	Description
off (red)	No communication with the basic unit
on (red)	Communication error with the basic unit

2.2.2 DX-NET-PROFINET-2

The module's LED indicators are used to indicate operating and network statuses, making quick diagnostics possible.

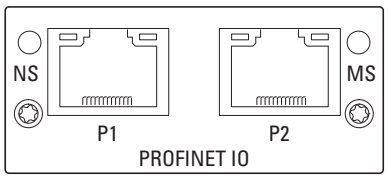


Figure 23: NS and MS LED indicators

2.2.3 DXG-NET-PROFINET / DXX-NET-PROFINET

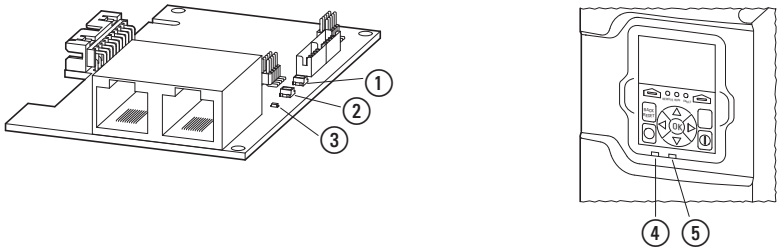


Figure 24: LEDs

① Bus Fault Status (MLED1)
② System Fault Status (MLED0)
③ Power Status (MCU_LED)
④ LED for displaying the module status (DG1/DX1)
⑤ LED for displaying the network status (DG1/DX1)

The following tables show the meaning of the LED indicators for communication via PROFINET.

MLED0

LED status	Description
Off	No diagnostic data. Device functions properly
On	Diagnostic data available
Flashing cyclic at 2 Hz (for 3 sec.)	DCP signal service is initiated via the bus

MLED1

LED status	Description
Off	Network communications in order
On	Bus error
Flashing cyclic at 2 Hz	No data exchange

Module status LED

The module status LED indicates the status of the DXG-NET-PROFINET communication interface.

LED status	Description
off	**No power** The variable frequency drive is not supplied with power.
green illuminating	**Device pre-operational** The variable frequency drive is functioning properly.
green flashing (The display flashes once per second).	**Standby** The variable frequency drive has not been configured.
red flashing (The display flashes once per second).	**Minor fault** The variable frequency drive has detected a recoverable minor fault. **Note:** An incorrect or inconsistent configuration is considered a minor fault. Also check if the error is no longer displayed after troubleshooting.
illuminated red	**Serious fault** The variable frequency drive has detected an unrecoverable serious error.
green/red flashing	**Self-test** The variable frequency drive performs a self-test when it is powered up.

Network status LED

The network status LED indicates the network status.

LED status	Description
off	**Not switched on, no IP address** The variable frequency drive is switched off or on, but no IP address is configured (Interface configuration attribute of the TCP/IP interface object).
green illuminating	**Connected** At least one CIP connection (any transport class) has been made. The connection to the controller is not broken.
green flashing (The display flashes once per second).	**No connections** An IP address is configured, but no CIP connections have been established. The connection to the controller is not broken.
red flashing (The display flashes once per second).	**Connection time out** The variable frequency drive is switched on and the connection to the control is broken. Only lights up continuously green again when all broken connections to the controller have been restored.
illuminated red	**Duplicate IP address** The variable frequency drive has detected a duplicate IP address.
green/red flashing	**Self-test** The variable frequency drive performs a self-test when it is powered up.

2.2.4 DXM-NET-PROFINET

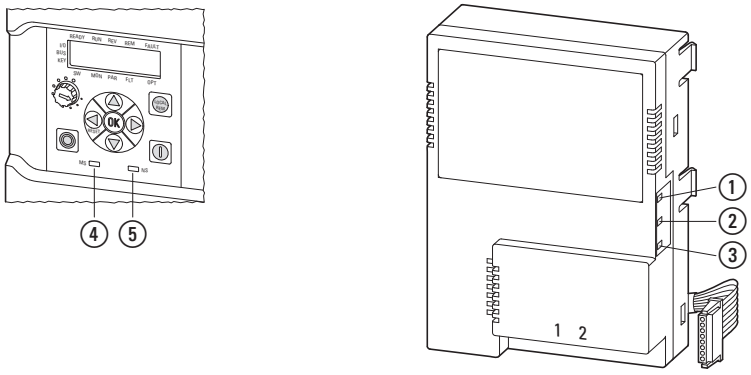


Figure 25: LEDs

① Bus Fault Status (MLED1)
② System Fault Status (MLED0)
③ Power Status (MCU_LED)
④ LED for displaying the module status (DM1)
⑤ LED for displaying the network status (DM1)

The following tables show the meaning of the LED indicators for communication via PROFINET.

MLED0

LED status	Description
Off	No diagnostic data. Device functions properly
On	Diagnostic data available
Flashing cyclic at 2 Hz (For 3 sec.)	DCP signal service is initiated via the bus

MLED1

LED status	Description
Off	Network communications in order
On	Bus error
Flashing cyclic at 2 Hz (For 3 sec.)	No data exchange

Module status LED

The module status LED indicates the status of the DXM-NET-PROFINET communication interface.

LED status	Description
0ff	**No power** The variable frequency drive is not supplied with power.
green illuminating	**Device pre-operational** The variable frequency drive is functioning properly.
green flashing (The display flashes once per second).	**Standby** The variable frequency drive has not been configured.
red flashing (The display flashes once per second).	**Minor fault** The variable frequency drive has detected a recoverable minor fault. **Note:** An incorrect or inconsistent configuration is considered a minor fault. Also check if the error is no longer displayed after troubleshooting.
illuminated red	**Serious fault** The variable frequency drive has detected an unrecoverable serious error.
green/red flashing	**Self-test** The variable frequency drive performs a self-test when it is powered up.

Network status LED

The network status LED indicates the network status.

LED status	Description
off	**Not switched on, no IP address** The variable frequency drive is switched off or on, but no IP address is configured (Interface configuration attribute of the TCP/IP interface object).
green illuminating	**Connected** At least one CIP connection (any transport class) has been made. The connection to the controller is not broken.
green flashing (The display flashes once per second).	**No connections** An IP address is configured, but no CIP connections have been established. The connection to the controller is not broken.
red flashing (The display flashes once per second).	**Connection time out** The variable frequency drive is switched on and the connection to the control is broken. Only lights up continuously green again when all broken connections to the controller have been restored.
illuminated red	**Duplicate IP address** The variable frequency drive has detected a duplicate IP address.
green/red flashing	**Self-test** The variable frequency drive performs a self-test when it is powered up.

3 Installation

3.1 Introduction

This chapter provides a description of the mounting and the electrical connection for the PowerXL PROFINET communication interface.

Perform all installation work only with the indicated, appropriate tools and do not apply any force.

Observe the following information when setting up the system.

DANGER

All handling and installation work relating to the mechanical surface mounting and installation of the PowerXL PROFINET communication interface may only be carried out in a voltage-free state.

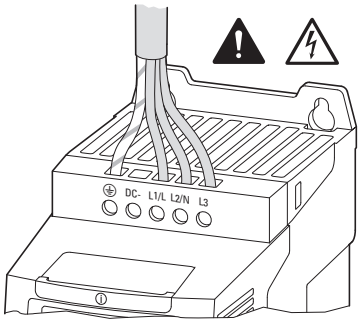


Figure 26: Only carry out installation work in a voltage-free state

3.2 Installation documents

The following documents provide information on installing a DC1, DA1, DG1, DM1 and DX1 variable frequency drives (with degree of protection IP20) or a DE1 variable speed starter:

Series	Document
DC1 variable frequency drive with degree of protection IP20	Instruction leaflet IL04020009Z
DC1 variable frequency drive with degree of protection IP20, frame size FS4	Instruction leaflet IL040024ZU
DE1 variable speed starter	Instruction leaflet IL040005ZU
DA1 variable frequency drive, frame size FS2-FS3	Instruction leaflet IL4020010Z
DA1 variable frequency drive, frame size FS4	Instruction leaflet IL4020011Z
DG1 variable frequency drive	Manual MN040002EN (Installation Manual)
DG1 variable frequency drive (PowerXL DG1 Option Cards)	Instruction leaflet IL040022EN
DM1 variable frequency drive	MN040060EN (Installation Manual)
DM1 variable frequency drive	Instruction leaflet PUB53683
DX1 variable frequency drive	Manual MN040068EN (Installation Manual)
DX1 variable frequency drive	Instruction leaflet IL040072ZU

3.3 Assembly

3.3.1 DX-NET-PROFINET2-2

The connection from the DX-NET-PROFINET2-2 communication interface to the PROFINET field bus is established via an RJ45 plug (see also → Section "1.6.1 PROFINET connection", Page 17).

The DX-NET-PROFINET2-2 communication interface is connected to the front of the DC1 variable frequency drive or DE1 variable speed starter.

To do this, remove the two cover plugs from the DC1 variable frequency drive using a flat-blade screwdriver.

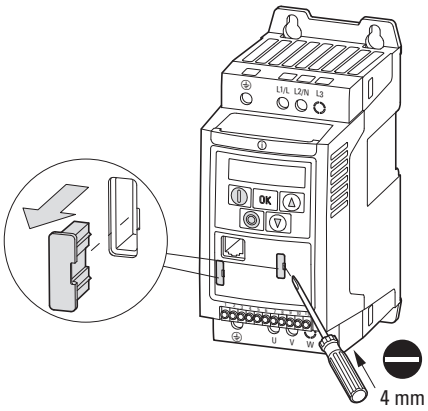


Figure 27: Removing the cover plugs

Surface mounting

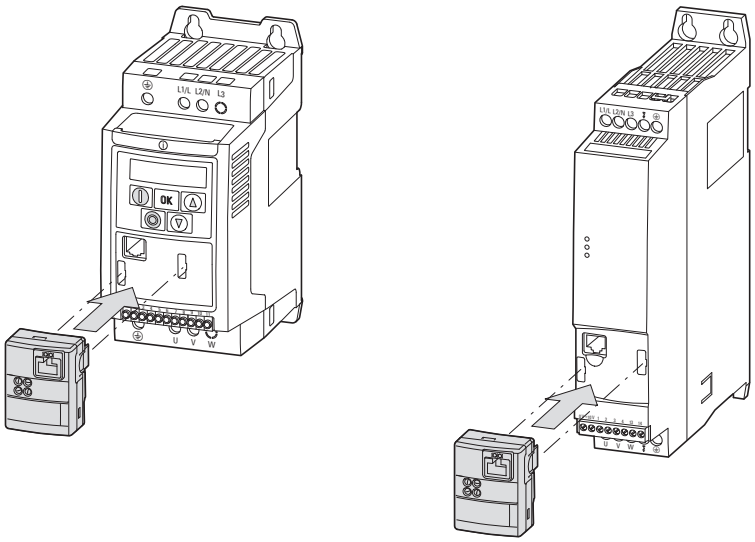


Figure 28: Surface mounting of the DX-NET-PROFINET2-2 communication interface on a DC1 variable frequency drive (left) or on a DE1 variable speed starter (right)

The DX-NET-PROFINET2-2 communication interface can be mounted on all DC1 variable frequency drives with degree of protection IP20 as well as on all DE1 variable speed starters.

The DX-NET-PROFINET2-2 communication interface **cannot**, however, be used for DC1 variable frequency drives with degree of protection IP66.

3.3.2 DX-NET-PROFINET-2

3.3.2.1 Mounting for frame sizes FS2 and FS3

For DA1 variable frequency drives with sizes FS2 and FS3, DX-NET-PROFINET-2 slot is located under the variable frequency drive. Use a flat-blade screwdriver to lift off the cover at the marked cutout (without forcing it) and then remove the cover by hand.

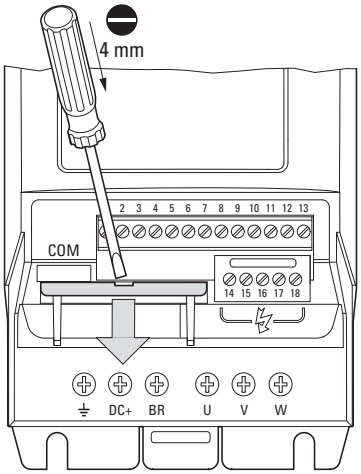


Figure 29: Opening the interface cover

NOTICE

Do not insert tools or other objects into the opened variable frequency drive.
Ensure that foreign bodies do not enter the opened housing wall.

After doing so, you can insert the connection and secure it with the two screws.

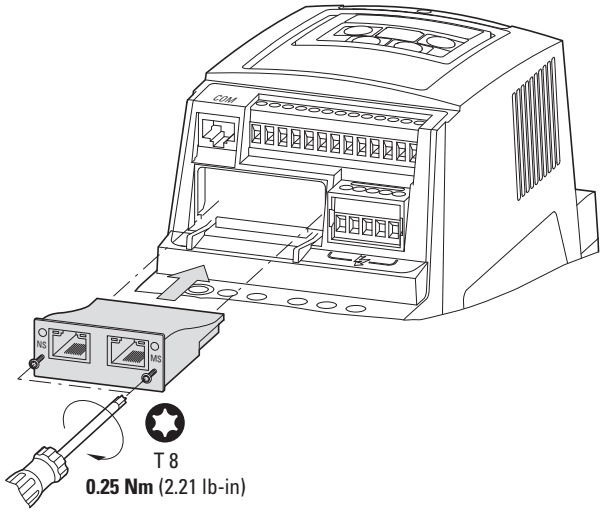


Figure 30: Inserting the field bus connection

3.3.2.2 Mounting from construction size FS4

When working with DA1 variable frequency drives of size FS4 or larger, the DX-NET-PROFINET-2 field bus connection must be installed inside the variable frequency drive. To do so, use a standard screwdriver to turn the two screws on the front cover 90°. Then proceed to remove the cover.

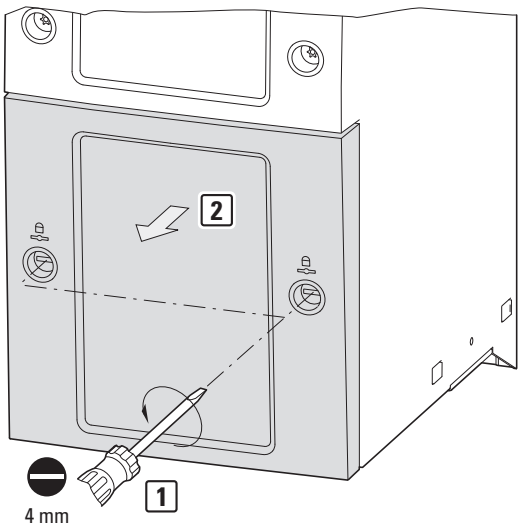


Figure 31: Opening the enclosure of DA1 variable frequency drives with size FS4 and up

NOTICE

Do not insert tools or other objects into the opened variable frequency drive.
Ensure that foreign bodies do not enter the opened housing wall.

After doing so, you can insert the connection on the right-hand side and use the screws to secure it.

Then put the cover back on and use the two screws (turn them 90°) to secure it.

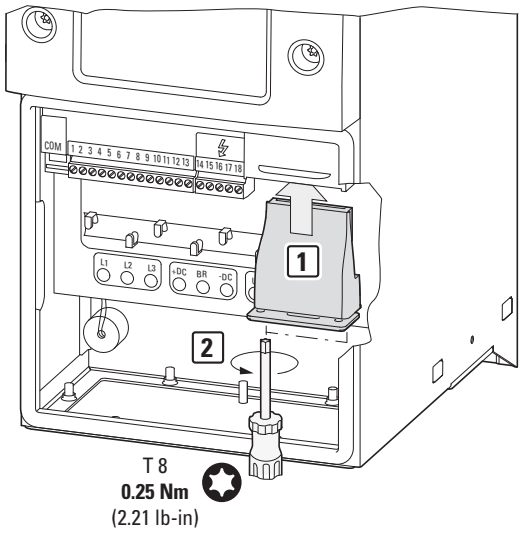


Figure 32: Inserting the field bus connection

3.3.3 DXG-NET-PROFINET

The connection from the DXG-NET-PROFINET communication interface to the PROFINET field bus is made via an RJ45 plug.

The DXG-NET-PROFINET communication interface is plugged into an option slot on the front of the DG1 variable frequency drive. The option slots are located under the cover case.

To do this, the 4 or 6 screws (depending on the frame size) on the variable frequency drive must be opened using a screwdriver.

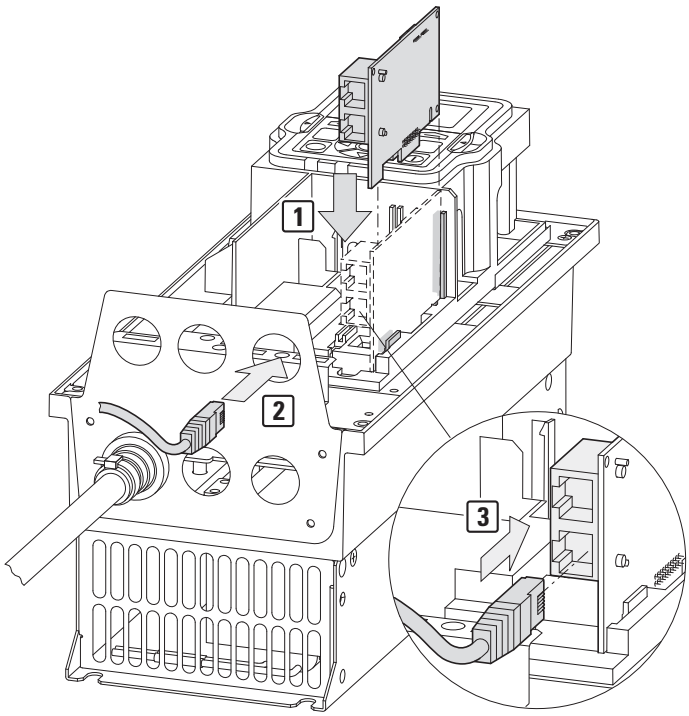


Figure 33: Plugging in the communication interface

→ Further details on installation and cable routing can be found in the MN040002EN manual (installation manual) and in the IL040022EN instruction leaflet.

3.3.4 DXM-NET-PROFINET

The connection from the DXM-NET-PROFINET communication interface to the PROFINET field bus is made via an RJ45 plug.

The DXM-NET-PROFINET interface is plugged in on the right side of the DM1 variable frequency drive.

The DXG-NET-PROFINET communication interface has an underground cable on the backside. The underground cable is plugged into an option slot on the front of the variable frequency drive DM1. To do this, the lower cover must be opened.

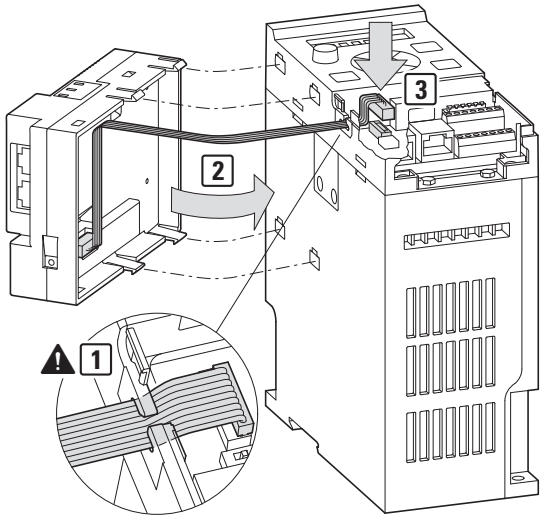


Figure 34: Plugging in the communication interface

Further details on installation and cable routing can be found in the MN040060EN manual (installation manual) and in the PUB53683 instruction leaflet.

3.3.5 DXX-NET-PROFINET

The connection from the DXX-NET-PROFINET communication interface to the PROFINET field bus is made via an RJ45 plug.

The DXX-NET-PROFINET communication interface needs to be plugged into option slot D only on the front of the DX1 variable frequency drive. The option slots are located under the cover case.

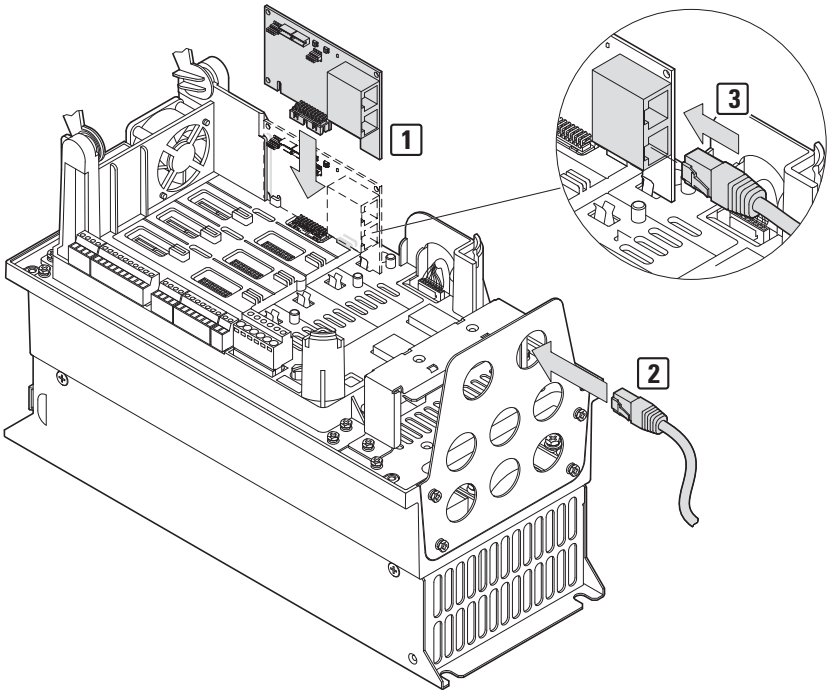


Figure 35: Plugging the communication interface

→ Further details on installation and cable routing can be found in the MN040068EN manual (installation manual) and in the IL040072ZU instruction leaflet.

3.4 Installing the field bus

→ Never lay the cable of a field bus system directly parallel to the energy carrying cables.

When installing the connection, make sure that the control and signal cables (0–10 V, 4–20 mA, 24 VDC, etc.), as well as the communication system's (PROFINET) connection cables, are not routed directly parallel to mains connection or motor connection cables conveying power.

With parallel cable routing, the clearances between control, signal and field bus cables ② and energy-carrying mains and motor cables ① must be greater than 30 cm.
All cables should always intersect at right angles.

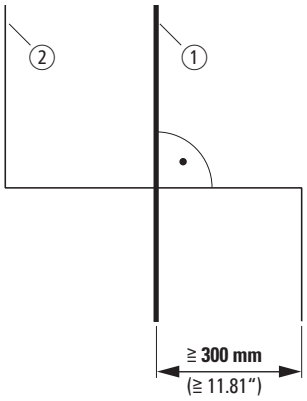


Figure 36: Routing cables for PROFINET ② and mains/motor cables ①

If the system requires a parallel routing in cable ducts, a partition must be installed between the fieldbus cable ② and the mains and motor cable ①, in order to prevent electromagnetic interference with the fieldbus cable.

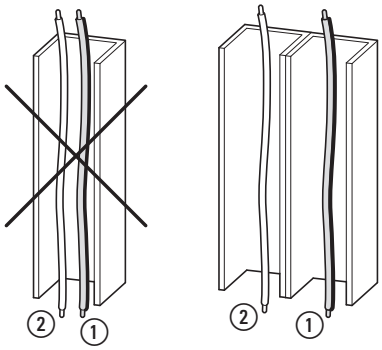


Figure 37: Separate routing in the cable duct
① Mains and motor connection cable
② PROFINET cable

→ In all cases only use approved PROFINET cables.

4 Commissioning

→ First, carry out all the measures for commissioning the variable frequency drive or variable speed starter as described in the relevant manual for the device.

→ Check the settings and installations for the switching on the PROFINET communication system that are described in this manual.

> *WARNING*
>
> Ensure that no danger will be caused by starting the motor. Disconnect the driven machine if there is a danger in an incorrect operating state.

4.1 GSDML file

The properties of a PROFINET card are described in a so-called GSDML file. This is required in order to integrate the PowerXL PROFINET communication interface into a PROFINET network.

→ You will find a suitable GSDML file on the Internet at:

Eaton.com/software

Enter the search term "PROFINET".

4.2 Addressing

Each device has a globally unique MAC address (6-byte Ethernet address): The first three bytes specify the ID, while the other three bytes specify the device's serial number, which is consecutive.

The MAC address will be printed on the name plate.
The DHCP function is disabled by default.

The PowerXL PROFINET communication interface has specific names so that each I/O device can be uniquely assigned/configured within a project.

A connection to the PLC configuration is only possible if a correct name assignment exists, as the PLC recognizes the I/O device in the network via its name.

The IP address can be configured using a network tool (e.g. STEP 7/HW configuration or IPconfig from HMS). For DX…-NET-PROFINET the IP address can be configured via Parameters in the drive.

The configuration of the IP address for DX-NET-PROFINET2 in this manual is done with the help of the software "IPconfig".

The "IPconfig" software can be downloaded free of charge from the internet at the following address:

www.anybus.com

The communication interfaces DXG-NET..., DXM-NET... ... and DXX-NET... cannot be addressed via "IPconfig".

The default IP address at DX-NET-PROFINET2-2: and DX-NET-PROFINET-2 is: 0.0.0.0.
The default IP address at DXG-NET-PROFINET, and DXM-NET-PROFINET and DXX-NET-PROFINET is: 192.168.1.253

4.2.1 Configuration of the IP address of the communication interface DX-NET-PROFINET2-2 and DX-NET-PROFINET-2

The following example explain how to configure the IP address for DX-NET-PROFINET2-2 communication interface.

- ▶ Connect the communication interface to the basic unit on both the PC and network side.
- ▶ Switch on the basic unit (i.e. the variable frequency drive).
  The LED **MS** of the communication interface DX-NET-PROFINET2-2 must then light up.
- ▶ Open the **IPconfig** program and click on **Settings**.

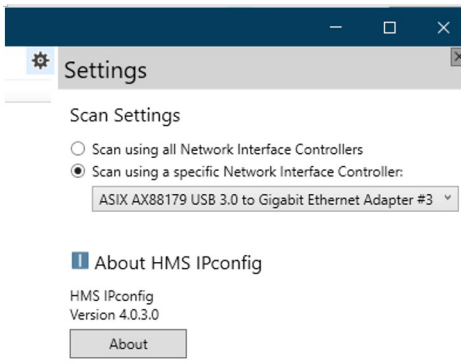


Figure 38: "Settings" Tab

- ▶ Select the computer network adapter from the drop-down menu of the network interface.

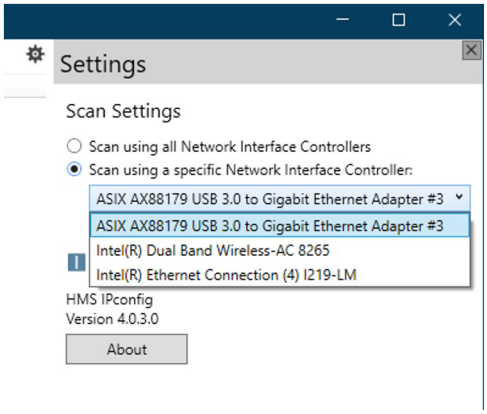


Figure 39: Select the network adapter

The program then displays all available communication interfaces.

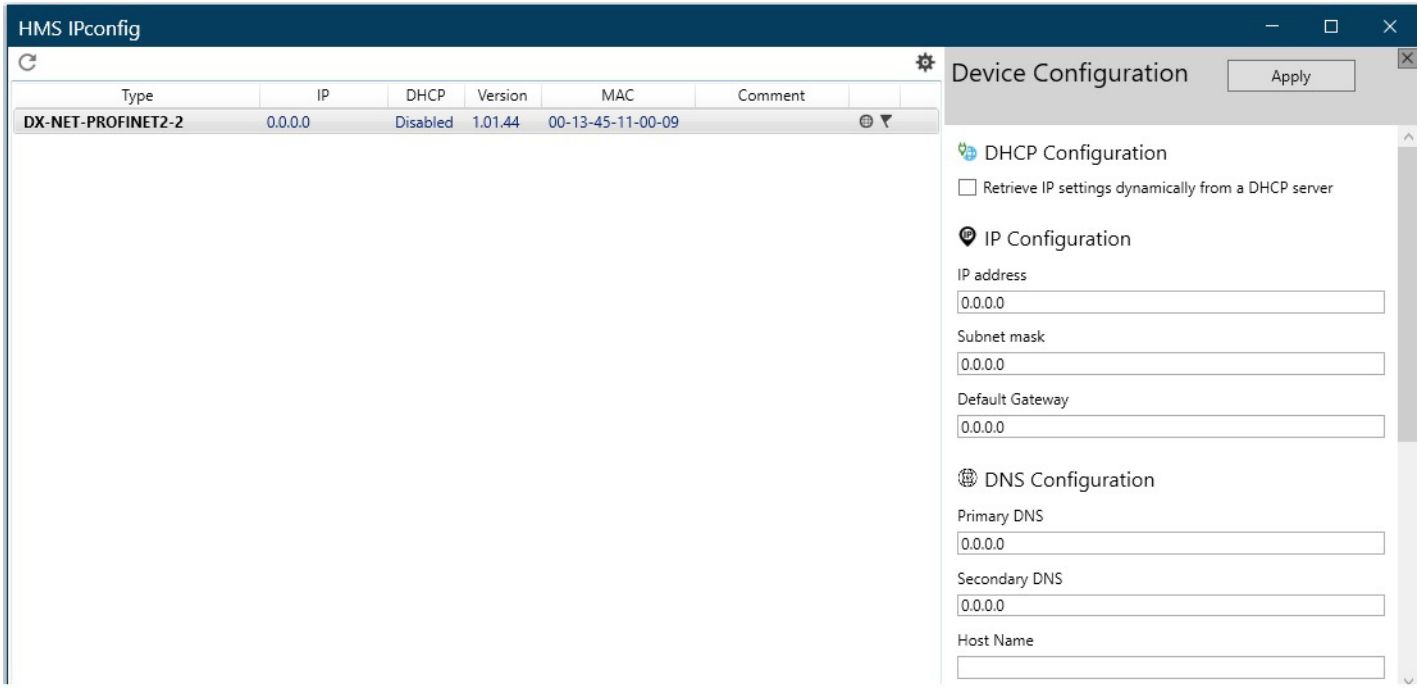


Figure 40: View of the available communication interfaces

- ▶ Select the **DX-NET-PROFINET2-2** interface and set the desired IP address on the right side.
- ▶ Click on **Apply**.

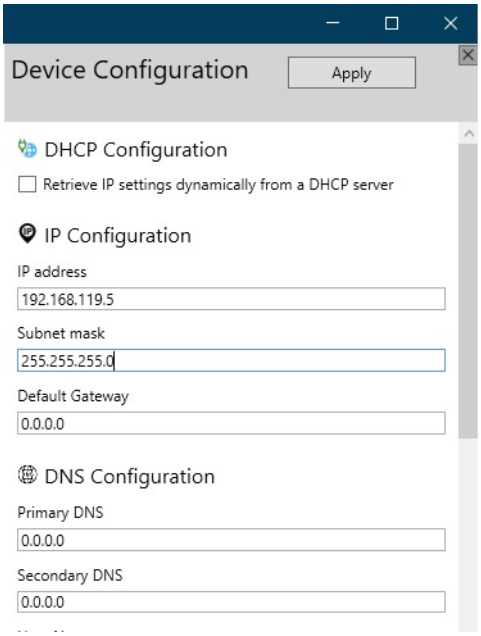


Figure 41: Setting the IP address

You will then see the assigned IP address under **IP**.

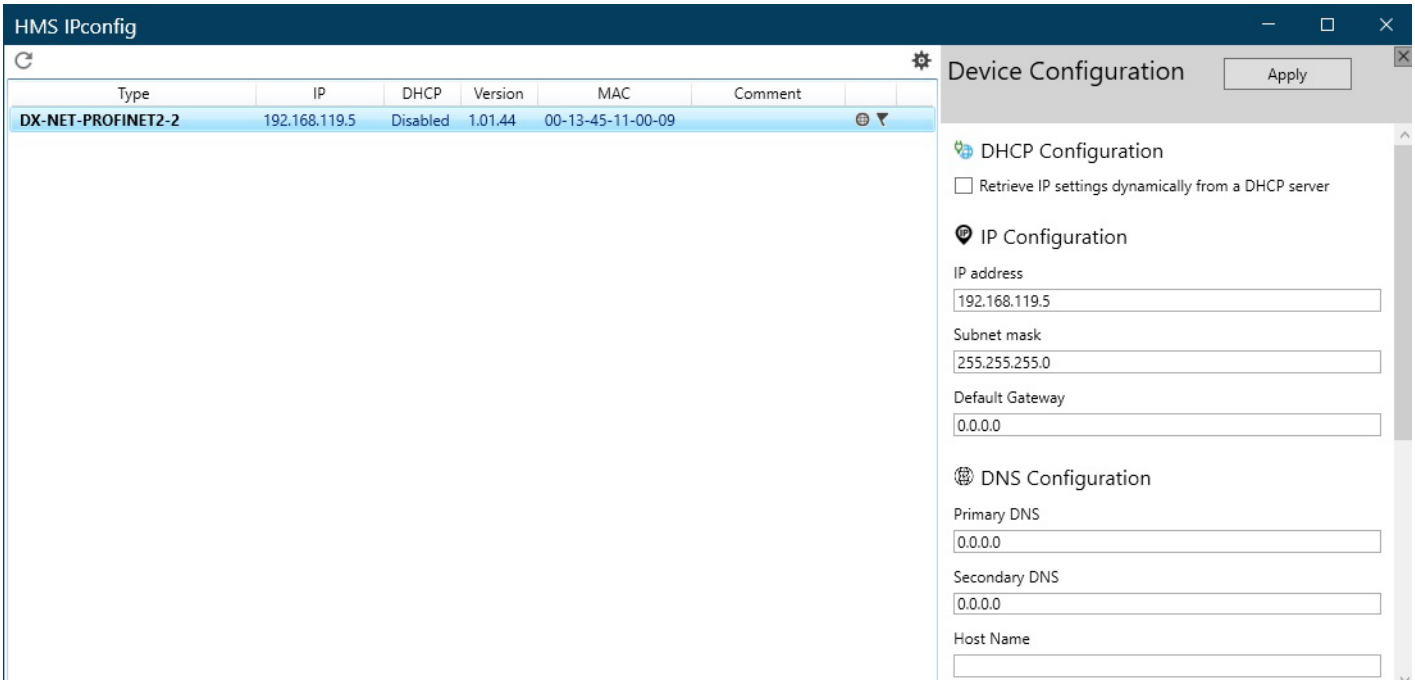


Figure 42: The DX-NET-PROFINET2-2 communication interface now has an IP address assigned.

Addressing is now complete.

4.2.2 Configuration of the IP address of the communication interface DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET

The configuration of the IP address of the PowerXL PROFINET communication interfaces DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET is done via board parameters.
The parameters can be accessed via the operating unit (keypad), WEB UI (Web User Interface), or via the InControl software.

The board parameters are divided into two groups

PROFINET

- Profinet monitor
- Profinet parameters

Part 1 PROFINET contains general communication settings like the IP address, the device name, and monitor values that represent the run status of the general communication.

Profile-specific information can be viewed under monitor parameters.

DM1

The IP address of the communication interface can be set in the parameter group B4 - B4.1.2.3.

In the following, you will find the board parameters if a communication interface DXM-NET-PROFINET is connected to the basic device.

If no DXM-NET-PROFINET communication interface is connected, these parameters will not be displayed in the InControl software or on the keypad.

Table 3: Parameter group B4 - B4.1.2.3

Parameter Number	Parameter Name	Meaning
B4.1.2.2	IP Address Mode	Defines the IP address configuration mode for the communication interface. 0 = Static IP 1 = DHCP
B4.1.2.3	Static IP Address	static IP address of the communication interface
B4.1.2.4	Static Subnet Mask	static subnet mask
B4.1.2.5	Static Default Gateway	static gateway address

The basic device DM1 has only one card slot (slot A).

The static IP address mode must be selected for PLC communication. The parameter B4.1.2.2 IP address mode is set to the value “Static IP”.

The IP address of the basic device must not be identical to that of the communication interface. The IP address of the basic device must be set under parameter group P12 Ethernet communication (DM1).

DG1

The IP address of the communication interface can be set in the parameter group B10 - B10.1.2.3 (Slot A) or under B20 - B20.1.2.3 (Slot B).

In the following, you will find the board parameters if a communication interface DXG-NET-PROFINET is connected to the basic device.

If no DXG-NET-PROFINET communication interface is connected, these parameters will not be displayed in the InControl software or on the keypad.

Table 4: Parameters for slot A

Parameter Number	Parameter Name	Meaning
B10.1.2.2	IP Address Mode	Defines the IP address configuration mode for the communication interface 0 = Static IP 1 = DHCP
B10.1.2.3	Static IP Address	static IP address of the communication interface
B10.1.2.4	Static Subnet Mask	static subnet mask
B10.1.2.5	Static Default Gateway	static gateway address

Table 5: Parameters for slot B

Parameter Number	Parameter Name	Meaning
B20.1.2.2	IP Address Mode	Defines the IP address configuration mode for the communication interface 0 = Static IP 1 = DHCP
B20.1.2.3	Static IP Address	Static IP address of the communication interface
B20.1.2.4	Static Subnet Mask	Static subnet mask
B20.1.2.5	Static Default Gateway	Static gateway address

The static IP address mode must be selected for PLC communication.
The parameter B10.1.2.2 or B20.1.2.2 IP address mode is set to the value "Static IP".

The DG1 basic device has two card slots: Slot A and slot B. Depending on the slot, the parameter numbers may vary. For example, if the interface is plugged into slot A, the parameter number starts with B10.

The IP address of the basic device must not be identical to that of the communication interface. The IP address of the basic device must be set under parameter group P20 communication (DG1).

The communication interfaces DXG-NET-PROFINET, DXM- NET-PROFINET and DXX-NET-PROFINET have two ports (dual port), which have an internal switch function.
The Ethernet interfaces of the basic device (DM1, DG1 and DX1) do not have PROFINET functionality.
The DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET communication interfaces and the basic devices (DM1, DG1 and DX1) can be networked together or connected to a switch.

The DXG-NET-PROFINET, DXM-NET-PROFINET and DXX-NET-PROFINET communication interfaces cannot be used for general parameterization of the basic device via InControl or WUI (web interface).

DX1

The IP address of the communication interface can be set in the parameter group B27 - B27.1.2.3.

In the following, you will find the board parameters if a communication interface DXX-NET-PROFINET is connected to the basic device.

If no DXX-NET-PROFINET communication interface is connected, these parameters will not be displayed in the InControl software or on the keypad

Table 6: Parameter group B27.1.2,

Parameter Number	Parameter Name	Meaning
B27.1.2.2	IP Address Mode	Defines the IP address configuration mode for the communication interface 0 = Static IP 1 = DHCP
B27.1.2.3	Static IP Address	static IP address of the communication interface
B27.1.2.4	Static Subnet Mask	static subnet mask
B27.1.2.5	Static Default Gateway	static gateway address

The static IP address mode must be selected for PLC communication.
The parameter B27.1.2.2 IP address mode is set to the value 0 "Static IP".

The IP address of the basic device must not be identical to that of the communication interface. The IP address of the basic device must be set under parameter group P96 communication.

The communication interface DXX-NET-PROFINET has two ports (dual port), which have an internal switch function.
The Ethernet interface of the basic device does not have PROFINET functionality.

The DXX-NET-PROFINET communication interfaces cannot be used for general parameterization of the basic device via InControl or WUI (web interface).

4.3 Parameter settings

The following parameter settings are required for cyclic operation with the PROFINET communication system.

→ For detailed information on the configuration of the parameters, please refer to the user manual of the respective basic device (variable frequency drive).

4.3.1 DX-NET-PROFINET2-2

Table 7: Parameter P-12

PNU 928 Subindex 0	P-12	Description
0	0	Local: Control and reference via terminals If the default settings are used, the DC1 variable frequency drive or DE1 variable speed starter reacts directly to signals that are applied at the control signal terminals. It is still possible to read out the data via the network.
1	9	Network: Control and reference via the network If parameter P-12 is set to 9, the system can only be operated via the network. The system is controlled and referenced only via the network. It is not possible to switch to another control level.
2	10	Control via PROFIdrive telegram – local setpoint If parameter P-12 is set to 10, the system can only be controlled via the network. The setpoint is specified via control terminals P-15.
3	11	Control via terminals – reference via PROFIdrive telegram If parameter P-12 is set to 11, the system can only be controlled via terminals (P-15). The setpoint is specified via the network.
4	12	Control and reference via PROFIdrive telegram If communication is interrupted, the system automatically switches to local control (P-12 = 0). If parameter P-12 is set to 12, the system can only be operated via the network. In the event of a loss of communication, there is an automatic switch to local control (P-15). As soon as communication is available again, a change back to the networked control system takes place.
5	13	Dual mode – Control and reference via PROFIdrive telegram – Enable via control signal terminal 1.

→ PNU 928 parameter does not exist in the display of the basic devices (keypad or drivesConnect).
The parameter PNU 928 can be reached under the acyclic services (→ Section “4.12.2 PNU 928”, Page 202).

4.3.2 DX-NET-PROFINET-2

The abbreviations used in the parameter lists below have the following meaning:

PNU	Parameter number
ID	Identification number of the parameter
RUN	Access rights to the parameters during operation (RUN): / = Modification permissible - = Modification only possible in STOP
ro/rw	Parameter read and write permissions via a field bus connection: ro = read only rw = read and write (read and write)
Value	Setting of the parameter
DS	Default setting: (P1.1 = 1) base parameter

Access rights are not shown in drivesConnect software.

Manual

PNU	ID	Access right		Value	Description		DS
		RUN	ro/rw				
①				②	③		④

PC Software

PNU	Description	&Value	Range	Default	Visible
①	③	②		④	

figure 43: How the parameters are shown in the manual and in the software

PNU	ID	Access right		Designation	Value range	DS	Value that must be configured
		RUN	ro/rw				
P1-12	112	–	rw	Control level	0 = Control signal terminals (I/O) 1 = Keypad (KEYPAD FWD) 2 = Keypad (KEYPAD FWD/REV) 3 = PID control 4 = field bus system (PROFINET-2, Modbus RTU, etc.) 5 = Slave mode 6 = field bus CANopen	0	4

The Baud rate will automatically be set to match the master.

4.3.3 DXG-NET-PROFINET

PNU 928 Subindex 0 (PNU 928.0)

For process data level, modifications are only possible when the variable frequency drive is stopped.

PNU928 can be accessed via Profinet Parameter B10.2.2.2 or B20.2.2.2 "ProcessDataAccess".

PNU 928.0 = 0 – Local: Control and reference freely selectable

If the parameter PNU 928.0 is set to the value 0 (factory setting), operation via a parameterized source is possible.

If the default settings are used, variable frequency drive DG1 reacts directly to signals that are applied at the control signal terminals.

It is still possible to read out the data via the network.

Table 8: PNU 928.0 = 0

PNU 928.0 = 0	Parameter Number	Description
	P1.11	freely selectable
	P1.12	freely selectable
	P1.14	freely selectable
	P1.15	freely selectable

PNU 928.0 = 1 – Network: Control and reference via the network

If the parameter PNU 928.0 is set to 1, the system must be operated via the network. The system is controlled and referenced only via the network.

It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 9: PNU 928.0 = 1

PNU 928.0 = 1	Parameter Number	Description
	P1.11	Network
	P1.12	no function
	P1.14	no function
	P1.15	Network
	Remote Key	locked
	P3.23	locked

PNU 928.0 = 2 - Control via network - setpoint local

If the parameter PNU 928.0 is set to 2, the system must be controlled via the network. The setpoint is specified via control terminals, keypad, or the network.

Table 10: PNU 928.0 = 2

PNU 928.0 = 2	Parameter Number	Description
	P1.11	Network
	P1.12	no function
	P1.14	no function
	P1.15	freely selectable
	Remote Key	locked
	P3.23	locked

PNU 928.0 = 4 Control and setpoint via network - automatic change to local control in case of communication loss

If the parameter PNU 928.0 is set to 4, the system must be operated via the network.

If communication is interrupted, the system automatically switches to local control (PNU 928.0 = 0).

As soon as communication is available again, the system switches back to setting 4 (PNU 928.0 = 4).

For normal operation:

- The system is controlled and referenced only via the network.
- It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 11: PNU 928.0 = 4 - for normal operation

PNU 928.0 = 4	Parameter Number	Description
	P1.11	Network
	P1.12	no function
	P1.14	no function
	P1.15	Network
	Remote Key	locked
	P3.23	locked

In the event of a loss of communication:

- The system automatically switches to local control.

Table 12: PNU 928.0 = 4 - in case of communication loss

PNU 928.0 = 4	Parameter Number	Description
	P1.11	Terminal start 1
	P1.12	freely selectable
	P1.14	freely selectable
	P1.15	freely selectable
	Remote Key	locked
	P3.23	freely selectable

PNU 928.0 = 5 Dual Mode - Control and setpoint via network - Enable via control terminals

If the parameter PNU 928.0 is set to 5, the system can only be operated via the network if there is a control signal from the terminals.

To start the variable frequency drive, a start signal must be sent via the network and digital input 1 (Factory default for P3.2) must be enabled. As soon as this signal is withdrawn, the variable frequency drive switches off.

It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 13: PNU 928.0 = 5

PNU 928.0 = 5	Parameter Number	Description
	P1.11	Network
	P1.12	I/O Terminal Start 1/2
	P1.14	locked
	P1.15	Network
	Remote Key	locked
	P3.2	freely selectable
	P3.23	locked

Note:

Select Operate Mode (B10.1.2.1 or B20.1.2.1) under "Optional Boards Parameters".

For Transparent Mode (Eaton Telegram 999) the Operate Mode “Bypass” must be selected.

Board Parameters

Table 14: B10 Slot A: ProfiNet

Parameter	Meaning
B10.1 ProfiNet	
B10.1.1 Monitor	
B10.1.1.1 Board Status	Status of the communication interface: B0: DCOM Comm. Malfunction B1: Board HW fault B2: IO1 24Volt overload fault B3: Profibus communication failure B4: Fieldbus fault
B10.1.1.2 Firmware Version	This parameter specifies the firmware version of the installed communication interface in the slot.
B10.1.1.3 Protocol Status	Protocol Status. 0 = Waiting for Connection 1 = Connection In Progress 2 = Data Exchange 3 = Connection Lost
B10.1.1.4 PDP Telegram Selection	PNU 922 specifies the telegram selection for the application class
B10.1.1.5 MAC Address	MAC address of the communication interface
B10.1.1.6 Active IP Address	Active IP address of the communication interface
B10.1.1.7 Active Subnet Mask	Subnet mask of the communication interface
B10.1.1.8 Active Default Gateway	Default gateway of the communication interface
B10.1.2 Parameters	
B10.1.2.1 Operate Mode	Operating mode of PROFINET communication 0 = PROFIdrive 1 = Echo 2 = Bypass
B10.1.2.2 IP Address Mode	IP address configuration mode for the communication interface 0 = Static IP 1 = DCP
B10.1.2.3 Static IP Address	Static IP address of the communication interface
B10.1.2.4 Static Subnet Mask	Static subnet mask
B10.1.2.5 Static Default Gateway	Static default gateway
B10.1.2.6 Station Name	PROFINET communication interface station name in the network
B4.2 Profidrive	
B4.2.1 Monitor	
B10.2.1.1 Fault Counter PDP	PNU944 which specifies the Fault Message Counter in Fault Buffer.
B10.2.1.2 Fault Situations Max	PNU950 which specifies the Scaling of the Fault Buffer.
B10.2.1.3 PDP-Profil Number	PNU965 which specifies the Profile and Version.
B10.2.1.4 PDP-Control Word	PNU967 which specifies the Control Word received from PLC.
B10.2.1.5 PDP-Status Word	PNU968 which specifies the Status Word sent to PLC.
B10.2.1.6 PDP-MaxBlockLength	PNU974.0 which specifies the Maximum block length in byte, for the parameter request and response block, which is supported by the parameter manager.

Parameter	Meaning
B10.2.1.7 PDP-NoOfMultiparameter	PNU974.1 which specifies the Max number of parameter requests per multi-parameter request: 0 = reserved. 1 = the parameter manager doesn't support multi parameter access service.
B10.2.1.8 PDP-MaxLatency	PNU974.2 which specifies the Maximum latency time for the processing of a parameter request (time between request and response without time consumed on the communication line for a worst case scenario). The latency time is calculated by multiplication of the value in this subindex with 10ms.
B10.2.1.9 PDP-DO Manufacturer	PNU975.0 which specifies the Manufacturer Code.
B10.2.1.10 PDP-DO Device Type	PNU975.1 which specifies the Manufacturer Product Code.
B10.2.1.11 PDP-DO NoOfDOs	PNU975.5 which specifies the PROFIdrive DO type class: Bit:0 - Axis Type Implemention
B10.2.1.12 PDP-DO Subclass	PNU975.6 which specifies the PROFIdrive DO sub class 1: Bit:0 - Application Class 1 supported
B10.2.1 Parameters	
B10.2.2.1 Parameter Access	PNU927 which specifies the Operation priority of parameters for Acyclic communication: 0 = No permission to read/write on Acyclic channel 1 = Acyclic read/write are allowed on Profinet
B10.2.2.2 Process Data Access	PNU928 which specifies the Control priority of the device for Cyclic communication: 0 = Local Control; 1 = Fieldbus; 2 = Mixed Interface; 4 = Local on Fault; 5 = Dual Mode
B10.2.2.3 Fault Situation Counter	PNU952 which specifies the Fault situation counter. When it is written to 0, the complete fault buffer and the fault message counter are erased.
B10.2.3 Telegram0 Config	
B10.2.3.1 ReceivePZD3 Dest	PNU915.2 to configure Telegram 0 PLC to Inverter Parameter 01
B10.2.3.2 ReceivePZD4 Dest	PNU915.3 to configure Telegram 0 PLC to Inverter Parameter 02
B10.2.3.3 ReceivePZD5 Dest	PNU915.4 to configure Telegram 0 PLC to Inverter Parameter 03
B10.2.3.4 ReceivePZD6 Dest	PNU915.5 to configure Telegram 0 PLC to Inverter Parameter 04
B10.2.3.5 ReceivePZD7 Dest	PNU915.6 to configure Telegram 0 PLC to Inverter Parameter 05
B10.2.3.6 SendPZD3 Source	PNU916.2 to configure Telegram 0 Inverter to PLC Parameter 01
B10.2.3.7 SendPZD4 Source	PNU916.3 to configure Telegram 0 Inverter to PLC Parameter 02
B10.2.3.8 SendPZD5 Source	PNU916.4 to configure Telegram 0 Inverter to PLC Parameter 03
B10.2.3.9 SendPZD6 Source	PNU916.5 to configure Telegram 0 Inverter to PLC Parameter 04
B10.2.3.10 SendPZD7 Source	PNU916.6 to configure Telegram 0 Inverter to PLC Parameter 05

4.3.4 DXM-NET-PROFINET

PNU 928 Subindex 0 (PNU 928.0)

For the process data level, modifications are only possible when the variable frequency drive is stopped.

PNU928 can be accessed via Profinet Parameter B4.2.2.2 "ProcessDataAccess".

PNU 928.0 = 0 – Local: Control and reference freely selectable

If the parameter PNU 928.0 is set to the value 0 (factory setting), operation via a parameterized source is possible.

If the default settings are used, variable frequency drive DM1 reacts directly to signals that are applied at the control signal terminals.

It is still possible to read out the data via the network.

Table 15: PNU 928.0 = 0

PNU 928.0 = 0	Parameter Number	Description
	P1.11	freely selectable
	P1.12	freely selectable
	P1.13	freely selectable
	P1.14	freely selectable

PNU 928.0 = 1 – Network: Control and reference via the network

If the parameter PNU 928.0 is set to 1, the system must be operated via the network. The system is controlled and referenced only via the network.

It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 16: PNU 928.0 = 1

PNU 928.0 = 1	Parameter Number	Description
	P1.11	no function
	P1.12	no function
	P1.13	Network
	P1.14	Network
	Remote Key	locked
	P3.23	locked

PNU 928.0 = 2 - Control via network - setpoint local

If the parameter PNU 928.0 is set to 2, the system must be controlled via the network. The setpoint is specified via control terminals, keypad, or the network.

Table 17: PNU 928.0 = 2

PNU 928.0 = 2	Parameter Number	Description
	P1.11	no function
	P1.12	no function
	P1.13	Network
	P1.14	freely selectable
	Remote Key	locked
	P3.23	locked

PNU 928.0 = 4 -Control and setpoint via network - automatic change to local control in case of communication loss

If the parameter PNU 928.0 is set to 4, the system must be operated via the network.

If communication is interrupted, the system automatically switches to local control (PNU 928.0 = 0).

As soon as communication is available again, the system switches back to setting 4 (PNU 928.0 = 4).

For normal operation:

- The system is controlled and referenced only via the network.
- It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 18: PNU 928.0 = 4 - for normal operation

PNU 928.0 = 4	Parameter Number	Description
	P1.11	no function
	P1.12	no function
	P1.13	Network
	P1.14	Network
	Remote Key	locked
	P3.23	locked

In the event of a loss of communication:

The system automatically switches to local control.

Table 19: PNU 928.0 = 4 - in case of communication loss

PNU 928.0 = 4	Parameter Number	Description
	P1.11	freely selectable
	P1.12	freely selectable
	P1.13	Network
	P1.14	Network
	Remote Key	locked
	P3.23	freely selectable

PNU 928.0 = 5 - Dual Mode - Control and setpoint via network - Enable via control terminals

If the parameter PNU 928.0 is set to 5, the system can only be operated via the network if there is a control signal from the terminals.

To start the variable frequency drive, there must be a start signal from the network and digital input 1 (default setting for P3.2) must be enabled. As soon as this signal is withdrawn, the variable frequency drive switches off.

It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 20: PNU 928.0 = 5

PNU 928.0 = 5	Parameter Number	Description
	P1.11	Network
	P1.12	Network
	P1.13	locked
	P1.14	Network
	Remote Key	locked
	P3.2	freely selectable
	P3.23	locked

The PNU 928 parameter does not exist in the display of the basic devices (keypad or inControl Software). The parameter PNU 928 can be reached under the acyclic services (→ Section “4.12.2 PNU 928”, Page 202).

Select Operate Mode under "Optional Boards Parameters".

For Transparent Mode (Eaton Telegram 999) the Operate Mode “Bypass” must be selected.

Board Parameters

Table 21: B4 Slot A: ProfiNet

Parameter	Meaning
B4.1 ProfiNet	
B4.1.1 Monitor	
B4.1.1.1 Board Status	Status of the communication interface: B0: DCOM Comm. Malfunction B1: Board HW fault B2: IO1 24Volt overload fault B3: Profibus communication failure B4: Fieldbus fault
B4.1.1.2 Firmware Version	This parameter specifies the firmware version of the installed communication interface in the slot.
B4.1.1.3 Protocol Status	Protocol Status 0 = Waiting for Connection 1 = Connection In Progress 2 = Data Exchange 3 = Connection Lost
B4.1.1.4 PDP Telegram Selection	PNU 922 specifies the telegram selection for the application class
B4.1.1.5 MAC Address	MAC address of the communication interface
B4.1.1.6 Active IP Address	Active IP address of the communication interface
B4.1.1.7 Active Subnet Mask	Subnet mask of the communication interface
B4.1.1.8 Active Default Gateway	Default gateway of the communication interface
B4.1.2 Parameters	
B4.1.2.1 Operate Mode	Operating mode of PROFINET communication 0 = PROFIdrive 1 = Echo 2 = Bypass
B4.1.2.2 IP Address Mode	Defines the IP address configuration mode for the communication interface 0 = Static IP 1 = DCP
B4.1.2.3 Static IP Address	Static IP address of the communication interface
B4.1.2.4 Static Subnet Mask	Static subnet mask
B4.1.2.5 Static Default Gateway	Static default gateway
B4.1.2.6 Station Name	PROFINET communication interface station name in the network
B4.2 Profidrive	
B4.2.1 Monitor	
B4.2.1.1 Fault Counter PDP	PNU944 which specifies the Fault Message Counter in Fault Buffer.
B4.2.1.2 Fault Situations Max	PNU950 which specifies the Scaling of the Fault Buffer.
B4.2.1.3 PDP-Profil Number	PNU965 which specifies the Profile and Version.
B4.2.1.4 PDP-Control Word	PNU967 which specifies the Control Word received from PLC.
B4.2.1.5 PDP-Status Word	PNU968 which specifies the Status Word sent to PLC.

Parameter	Meaning
B4.2.1.6 PDP-MaxBlockLength	PNU974.0 which specifies the Maximum block length in byte, for the parameter request and response block, which is supported by the parameter manager.
B4.2.1.7 PDP-NoOfMultiparameter	PNU974.1 which specifies the Max number of parameter requests per multi-parameter request: 0 = reserved. 1 = the parameter manager doesn't support multi parameter access service.
B4.2.1.8 PDP-MaxLatency	PNU974.2 which specifies the Maximum latency time for the processing of a parameter request (time between request and response without time consumed on the communication line for a worst case scenario). The latency time is calculated by multiplication of the value in this subindex with 10ms.
B4.2.1.9 PDP-DO Manufacturer	PNU975.0 which specifies the Manufacturer Code.
B4.2.1.10 PDP-DO Device Type	PNU975.1 which specifies the Manufacturer Product Code.
B4.2.1.11 PDP-DO NoOfDOs	PNU975.5 which specifies the PROFIdrive DO type class: Bit:0 - Axis Type Implemention
B4.2.1.12 PDP-DO Subclass	PNU975.6 which specifies the PROFIdrive DO sub class 1: Bit:0 - Application Class 1 supported
B4.2.1 Parameters	
B4.2.2.1 Parameter Access	PNU927 which specifies the Operation priority of parameters for Acyclic communication: 0 = No permission to read/write on Acyclic channel 1 = Acyclic read/write are allowed on Profinet
B4.2.2.2 Process Data Access	PNU928 which specifies the Control priority of the device for Cyclic communication: 0 = Local Control; 1 = Fieldbus; 2 = Mixed Interface; 4 = Local on Fault; 5 = Dual Mode
B4.2.2.3 Fault Situation Counter	PNU952 which specifies the Fault situation counter. When it is written to 0, the complete fault buffer and the fault message counter are erased.
B4.2.3 Telegram0 Config	
B4.2.3.1 ReceivePZD3 Dest	PNU915.2 to configure Telegram 0 PLC to Inverter Parameter 01
B4.2.3.2 ReceivePZD4 Dest	PNU915.3 to configure Telegram 0 PLC to Inverter Parameter 02
B4.2.3.3 ReceivePZD5 Dest	PNU915.4 to configure Telegram 0 PLC to Inverter Parameter 03
B4.2.3.4 ReceivePZD6 Dest	PNU915.5 to configure Telegram 0 PLC to Inverter Parameter 04
B4.2.3.5 ReceivePZD7 Dest	PNU915.6 to configure Telegram 0 PLC to Inverter Parameter 05
B4.2.3.6 SendPZD3 Source	PNU916.2 to configure Telegram 0 Inverter to PLC Parameter 01
B4.2.3.7 SendPZD4 Source	PNU916.3 to configure Telegram 0 Inverter to PLC Parameter 02
B4.2.3.8 SendPZD5 Source	PNU916.4 to configure Telegram 0 Inverter to PLC Parameter 03
B4.2.3.9 SendPZD6 Source	PNU916.5 to configure Telegram 0 Inverter to PLC Parameter 04
B4.2.3.10 SendPZD7 Source	PNU916.6 to configure Telegram 0 Inverter to PLC Parameter 05

4.3.5 DXX-NET-PROFINET

PNU 928 Subindex 0 (PNU 928.0)

For the process data level, modifications are only possible when the variable frequency drive is stopped.

PNU928 can be accessed via Profinet Parameter B27.2.2.2 "PB400 Control Priority".

PNU 928.0 = 0 - Local: Control and reference freely selectable

If the parameter PNU 928.0 is set to the value 0 (factory setting), operation via a parameterized source is possible.

If the default settings are used, variable frequency drive DX1 reacts directly to signals that are applied at the control signal terminals.

It is still possible to read out the data via the network.

PNU 928.0 = 1 - Network: Control and reference via the network

If the parameter PNU 928.0 is set to 1, the system must be operated via the network. The system is controlled and referenced only via the network.

It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 22: PNU 928.0 = 1

Pre-condition	Parameter ID	Description
P7.3.2 = 0	P7.3.10	= 6 (PROFINET)
	P7.3.11	= 7 (Fieldbus Ref)
P7.3.2 ≠ 0	P7.3.10	no change (last value holds)
	P7.3.11	no change (last value holds)

PNU 928.0 = 2 - Control via network - setpoint local

If the parameter PNU 928.0 is set to 2, the system must be controlled via the network. The setpoint is specified via control terminals, keypad, or the network.

Table 23: PNU 928.0 = 2

Pre-condition	Parameter ID	Description
P7.3.2 = 0	P7.3.10	= 6 (PROFINET)
	P7.3.11	no change (last value holds)
P7.3.2 ≠ 0	P7.3.10	no change (last value holds)
	P7.3.11	no change (last value holds)

PNU 928.0 = 4 Control and setpoint via network - automatic change to local control in case of communication loss

If the parameter PNU 928.0 is set to 4, the system must be operated via the network.

If communication is interrupted, the system automatically switches to local control (PNU 928.0 = 0).

As soon as communication is available again, the system switches back to setting 4 (PNU 928.0 = 4).

For normal operation:

- The system is controlled and referenced only via the network.
- It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 24: PNU 928.0 = 4

Pre-condition	Parameter ID	Description
P7.3.2 = 0	P7.3.10	= 6 (PROFINET)
	P7.3.11	= 7 (Fieldbus Ref)
P7.3.2 ≠ 0	P7.3.10	no change (last value holds)
	P7.3.11	no change (last value holds)

In the event of a loss of communication:

- The system automatically switches to local control.

PNU 928.0 = 5 Dual Mode - Control and setpoint via network - Enable via control terminals

If the parameter PNU 928.0 is set to 5, the system can only be operated via the network if there is a control signal from the terminals.

To start the variable frequency drive, a start signal must be sent via the network and digital input 1 must be enabled. As soon as this signal is withdrawn, the variable frequency drive switches off.

It is not possible to switch to another control level. The switching parameters and the remote button on the keypad are locked.

Table 25: PNU 928.0 = 5 in dual mode

Pre-condition	Parameter ID	Description
P7.3.2 = 0	P7.3.10	= 6 (PROFINET)
	P7.3.11	= 7 (Fieldbus Ref)
P7.3.2 ≠ 0	P7.3.10	no change (last value holds)
	P7.3.11	no change (last value holds)

Select Operate Mode (B27.1.2.1) under "Optional Boards Parameters".
For Transparent Mode (Eaton Telegram 999), Operate Mode "Bypass" must be selected.

Board Parameters

Table 26: B27 Slot D: ProfiNet

Parameter	Meaning
B27.1 ProfiNet	
B27.1.1 Monitor	
B27.1.1.1 Slot D: Board Status	Status of the communication interface: B0: DCOM Comm. Malfunction B1: Board HW fault B2: IO1 24Volt overload fault B3: Profibus communication failure B4: Fieldbus fault
B27.1.1.2 Slot D: FW Version	This parameter specifies the firmware version of the installed communication interface in the slot.
B27.1.1.3 PN400 ProtocolStatus	Protocol Status: 0 = Waiting for Connection 1 = Connection In Progress 2 = Data Exchange 3 = Connection Lost
B27.1.1.4 PB400 Telegram	PNU 922 specifies the telegram selection for the application class: 0 = Telegram 0 1 = Standard Telegram 1 2 = Telegram 999 3 = Telegram 1000 4 = Process Data Module 1 5 = Process Data Module 2 6 = Process Data Module 3 7 = Process Data Module 4
B27.1.1.5 PB400 MAC Address	MAC address of the communication interface.
B27.1.1.6 PB400 Active IP Address	Active IP address of the communication interface.
B27.1.1.7 PB400 Active Subnet Mask	Subnet mask of the communication interface.
B27.1.1.8 PB400 Active Default Gateway	Default gateway of the communication interface.
B27.1.2 Parameters	
B27.1.2.1 PB400 COM Mode	Operating mode of PROFINET communication: 0 = EatonDrive 1 = Echo 2 = Bypass
B27.1.2.2 IP Address Mode	Defines the IP address configuration mode for the communication interface: 0 = Static IP 1 = DCP
B27.1.2.3 Static IP Address	Static IP address of the communication interface.
B27.1.2.4 Static Subnet Mask	Static subnet mask.
B27.1.2.5 Static Default Gateway	Static default gateway.
B27.1.2.6 Station Name	PROFINET communication interface Station Name in the network:

Parameter	Meaning
B27.1.2.7 SlotD Fieldbus Fault Response	This sets the response mode for the fieldbus fault on communication loss between the PLC and the card that plugged in Slot D: 0 = No Action 1 = Warning 2 = Fault 3 = Fault, Coast 4 = Warning, Coast (not applicable to Profinet) 5 = Warning, Auto Switch to Local (not applicable to Profinet) 6 = Warning, Auto Switch to Preset Speed 1 (not applicable to Profinet)
B27.2 Profidrive	
B27.2.1 Monitor	
B27.2.1.1 FaultCounter Profibus Fault Slot D	Count number of Faults at Profibus Fault Slot D.
B27.2.1.2 PB400 Fault Situations Max	Specifies the Scaling of the Fault Buffer (PNU 950 Profidrive).
B27.2.1.3 PB400 PDP-ProfilNumber	Specifies the Profile and Version (PNU 965 Profidrive).
B27.2.1.4 PB400 PDP-Controlword	Specifies the Control Word received form PLC (PNU 967 Profidrive).
B27.2.1.5 PB400 PDP-Statusword	Specifies the Status Word sent to PLC (PNU 968 Profidrive).
B27.2.1.6 PDP-MaxBlockLength	PNU974.0 which specifies the Maximum block length in byte, for the parameter request and response block, which is supported by the parameter manager.
B27.2.1.7 PDP-NoOfMultiparameter	Specifies the Max number of parameter requests per multi-parameter request.
B27.2.1.8 PDP-MaxLatency	PNU974.2 which specifies the Maximum latency time for the processing of a parameter request (time between request and response without time consumed on the communication line for a worst case scenario). The latency time is calculated by multiplication of the value in this subindex with 10ms.
B27.2.1.9 PDP-DO Manufacturer	PNU975.0 which specifies the Manufacturer Code.
B27.2.1.10 PDP-DO Device Type	PDP PNU975.1 displays the manufacturer's product code.
B27.2.1.11 PDP-DO NoOfDOs	PDPD PNU975.5 displays the ProfiDrive DO type class: Bit:0 = axis type implementation.
B27.2.1.12 PDP-DO Subclass	PNU975.6 which specifies the ProfiDrive DO sub class 1: Bit:0 - Application Class 1 supported
B27.2.2 Parameters	
B27.2.2.1 PB400 Parameter Access	Specifies the Operation priority of parameters for Acyclic communication (PNU 927 Profidrive): 0 = No permission to read/write on Acyclic channel 1 = Acyclic read/write are allowed on ProfiBus.
B27.2.2.2 PB400 Control Priority	Specifies the Control priority of the device for Cyclic communication (PNU 928 Profidrive): 0 = Local Control; 1 = Fieldbus; 2 = Mixed Interface; 4 = Local on Fault; 5 = Dual Mode.
B27.2.2.3 PB400 Fault Situation Counter	Specifies the Fault situation counter (PNU 952 Profidrive) When it is written to 0, the complete fault buffer (actual fault situation and all other fault situations) and the fault message counter (PNU 944) are erased.

4.3.6 Assignment of the control signal terminals

4.3.6.1 DX-NET-PROFINET2-2

The following control signal terminal configuration tables use the abbreviations and acronyms listed below:

Table 27: Abbreviations and acronyms for control signal terminals

Abbreviation	Meaning
AI1 REF	Analog input AI1 Used as a speed setpoint input
AI2 REF	Analog input AI2 Used as a speed setpoint input.
AI2 Torque REF	Analog input AI2 Used as a torque setpoint input.
DIR	Used to select an operating direction Used together with the START command. • Low = Forward (FWD) • High = Reverse (REV) **Note:** If there is a wire breakage and the REV operating direction is selected, this will cause the drive to reverse! Alternative: Use configuration with FWD/REV.
DOWN	Used to reduce the speed if a digital setpoint value is selected. Used together with the UP command.
ENA	Variable frequency drive enable signal (ENA = Enable) A start signal (START, FWD, REV) is additionally required for starting. If ENA is removed, the drive will coast.
EXTFLT	External fault
FWD	Used to start the drive in the forward direction (FWD = Forward)
INV	Change of rotation (INV = Inverse) The operating direction will be reversed as per the configured ramps. • High = invert • Low = Do not reverse
Pulse FWD (NO) Pulse REV (NO) Pulse STOP (NC)	Pulse control
REV	Used to start the drive in the reverse direction (REV = Reverse)
Select Quick-Dec	Quick stop
Select AI1 REF/AI2 REF	Used to select between the analog setpoint values on AI1 and AI2 • AI1 = Low • AI2 = High
Select AI1 REF/f-Fix	Used to select between analog speed reference values at analog input 1
Select AI1 REF/f-Fix1	Used to select between analog speed reference values at analog input 1
Select BUS REF/AI2 REF	Used to select between setpoint values
Select BUS REF/f-Fix	Used to select between setpoint values
Select BUS REF/f-Fix1	Used to select between setpoint values
Select DIG REF/AI2 REF	Used to select between the digital speed reference value (set with the keypad or with the UP and DOWN commands) and analog setpoint value AI2 REF

Abbreviation	Meaning
Select f-Fix Bit0 Select f-Fix Bit1 Select f-Fix Bit2	Used to select a fixed frequency with digital commands The fixed frequencies f-Fix1, ..., f-Fix4 are defined with the parameters P-20, ..., P-23. **Fixed** / **Bit 2** / **Bit 1** / **Bit 0** f-Fix1 (P-20) / 0 / 0 / 0 f-Fix2 (P-21) / 0 / 0 / 1 f-Fix3 (P-22) / 0 / 1 / 0 f-Fix4 (P-23) / 0 / 1 / 1 0 = Low; 1 = High
START	Used to start/stop the drive
UP	Used to increase the speed if a digital setpoint is selected Used together with the DOWN command.

Table 28: Parameter P-15 - for DC1

P-15	DI1 (Terminal 2)	DI2 (Terminal 3)	DI3/AI2 (Terminal 4)	DI4/AI1 (Terminal 6)
0	ENA	No function	No function	No function
1	ENA	No function	No function	No function
2	ENA	No function	No function	No function
3	ENA	Select BUS REF/f-Fix	EXTFLT	AI1 REF
4	ENA	No function	No function	No function
5	ENA	No function	Select f-Fix1 / f-Fix2	No function
6	ENA	Select BUS REF/AI REF	EXTFLT	AI1 REF
7	ENA	Select BUS REF/Keypad REF	EXTFLT	AI1 REF
8	ENA	No function	No function	No function
9	ENA	No function	No function	No function
10	ENA	No function	No function	No function
11	ENA	No function	No function	No function
12	ENA	No function	No function	No function
13	ENA	No function	EXTFLT	No function
14	ENA	No function	No function	No function
15	ENA	f-Fix1/Select BUS REF	Select Fire Mode/Normal OP	Pre-set speed 4/2
16	ENA	f-Fix4/Select BUS REF	Select Fire Mode/Normal OP	No function
17	ENA	Keypad REF/Select BUS REF	Select Fire Mode/Normal OP	No function

Table 29: Parameter P-15 - for DE1

P-15	DI1 (Terminal 2)	DI2 (Terminal 3)	DI3/AI2 (Terminal 4)	DI4/AI1 (Terminal 6)
0	ENA	ENA DIR	FF1	No function
1	ENA	ENA DIR	EXTFLT	No function
2	ENA	ENA DIR	FF1	FF2
3	ENA	FF1	EXTFLT	No function
4	ENA	UP	FF1	No function
5	ENA	UP	EXTFLT	DOWN
6	ENA	ENA DIR	UP	DOWN
7	ENA	FF1	EXTFLT	FF2
8	ENA	DIR	FF1	No function
9	ENA	DIR	EXTFLT	No function
10	ENA	TEM CTR	FF1	Ref

4.3.6.2 DX-NET-PROFINET-2

The following control signal terminal configuration tables use the abbreviations and acronyms listed below

Table 30: P1-12 = 4: Control via field bus

P1-13	DI1 (terminal 2)	DI2 (terminal 3)	DI3 (terminal 4)	DI4/AI1 (terminal 6)	DI5/AI2 (terminal 10)
0	user-definable	user-definable	user-definable	user-definable	user-definable
1	START	INV	Select BUS REF/f-Fix	No function	Select f-Fix Bit0
2	Not permissible				
3	Not permissible				
4	START	INV	Select BUS REF/f-Fix1	No function	Select t-dec/t-dec2
5	START	INV	Select BUS REF/AI2 REF	No function	AI2 REF
6	START	INV	Select BUS REF/f-Fix1	No function	EXTFLT
7	Not permissible				
8	Not permissible				
9	START	INV	Select f-Fix Bit0	Select f-Fix Bit1	Select BUS REF/f-Fix
10	START	INV	No function	No function	Select BUS REF/f-Fix1
11	Select Quick-dec	Select Quick-dec	Select BUS REF/f-Fix	No function	Select f-Fix Bit0
12	Not permissible				
13	Not permissible				
14	Select Quick-dec	Select Quick-dec	Select BUS REF/f-Fix1	No function	Select t-dec/t-dec2
15	Select Quick-dec	Select Quick-dec	Select BUS REF/AI2 REF	No function	AI2 REF
16	Select Quick-dec	Select Quick-dec	Select BUS REF/f-Fix1	No function	EXTFLT
17	Not permissible				
18	Not permissible				
19	Select Quick-dec	Select Quick-dec	Select f-Fix Bit0	Select f-Fix Bit1	Select BUS REF/f-Fix
20	Select Quick-dec	Select Quick-dec	No function	No function	Select BUS REF/f-Fix1
21	Not permissible				

- P1-13 = 1, …,10:
  An enable signal is required at DI1 in order to run the drive. The drive is started through the bus.
- P1-13 = 11, …, 20:
  The enable signal for the drive is issued exclusively through the bus. Simultaneously applying a signal at DI1 and DI2 will result in a quick stop.

4.3.6.3 DXG-NET-PROFINET

The assignment of the control terminals can be freely defined in the variable frequency drive. The individual terminal assignments can be defined under parameter group P3.

Parameter PNU 928 defines under which conditions the terminals are active.

For a detailed description of PNU 928, refer to
→ Section “4.3.3 DXG-NET-PROFINET”, Page 62.

4.3.6.4 DXM-NET-PROFINET

The assignment of the control terminals can be freely defined in the variable frequency drive. The individual terminal assignments can be defined under parameter group P2.2.

Parameter PNU 928 defines under which conditions the terminals are active.

A detailed description of PNU 928 can be found in
→ Section “4.3.4 DXM-NET-PROFINET”, Page 66.

4.3.6.5 DXX-NET-PROFINET

The assignment of the control terminals can be freely defined in the variable frequency drive. The individual terminal assignments can be defined under parameter group P7.

4.4 Operation

Please observe the following notes.

DANGER

Commissioning must only be carried out by qualified technicians.

DANGER – DANGEROUS ELECTRICAL VOLTAGE

The safety instructions on pages I and II of this manual must be followed.

4.4.1 Hardware enable

For PROFINET operation, STO input must always be enabled. Parameterization of the basic device is also possible when STO is triggered.

4.4.1.1 DX-NET-PROFINET2-2

DC1

For PROFINET operation, a high signal must always be present at DI1.

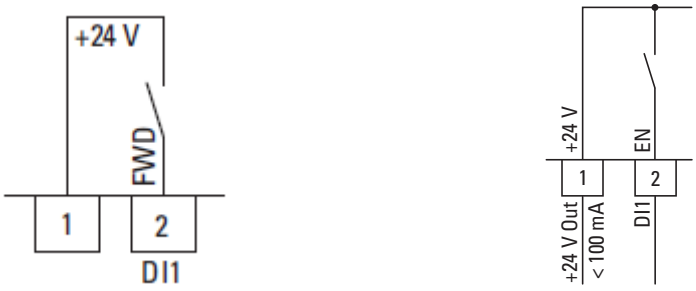


Figure 44: Enable signal for bus mode in DC1 variable frequency drives

DE1

For PROFINET operation, a high signal must always be present at DI1.

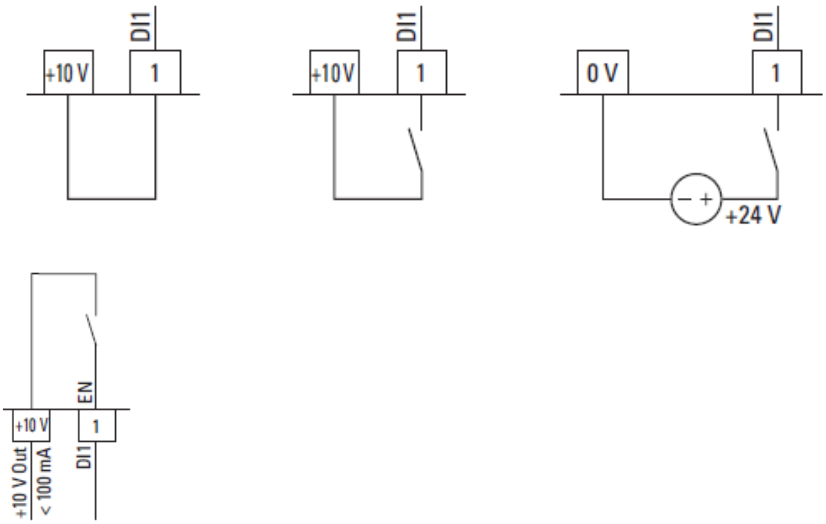


Figure 45: Enable signal for bus mode in DE1 variable speed starters

4.4.1.2 DX-NET-PROFINET-2

For PROFINET operation, STO input must always be enabled.

24 V DC power supply for STO inputs can be supplied from DA1's internal 24 V DC voltage or from an external 24 V DC power supply.

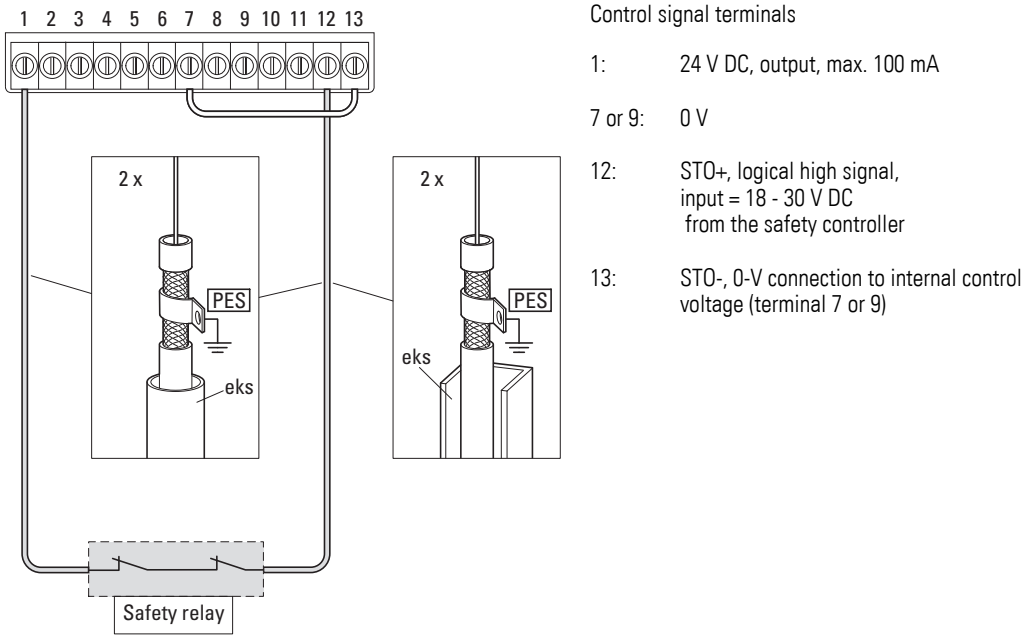
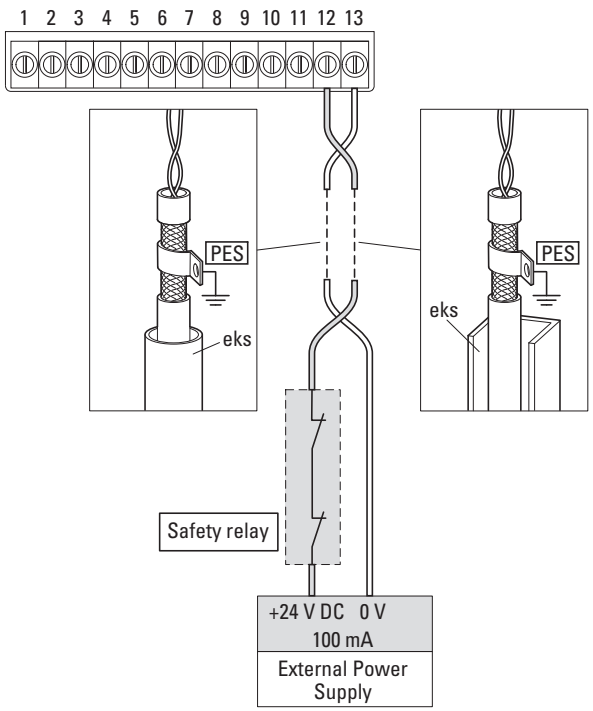


Figure 46: STO installation with internal DA1 supply voltage

The connecting cable from control signal terminal 1 (+24 V) to the safety relay's contact and the connecting cable from the safety relay's contact to control signal terminal 12 (STO+) must be wired individually and installed separately (eks, separate mechanical protection with two closed cable ducts or two conduits). These two separately wired single cables must be screened, and the corresponding cable screen must be earthed (PES).



Control signal terminals

12: STO+, logical high signal, input = 18 - 30 V DC

13: STO-, 0-V connection to internal control voltage (terminal 7 or 9)

Figure 47: STO installation with external control voltage

The two connecting cables going from the external control voltage and the safety relay to control signal terminals 12 (STO+) and 13 (STO-) must be twisted.

This twisted pair must be routed inside a closed cable duct or conduit (eks) and must also be screened, with the corresponding cable screen being earthed (PES).

The external control voltage should meet the following specifications:

Rated control voltage	24 V DC
Voltage for the logical STO high signal	18 - 30 V DC
Current carrying capacity	100 mA

→ Further details on STO circuitry can be found in manual MN04020005Z-EN.

4.4.1.3 DXG-NET-PROFINET

For PROFINET operation, the STO input must always be enabled.

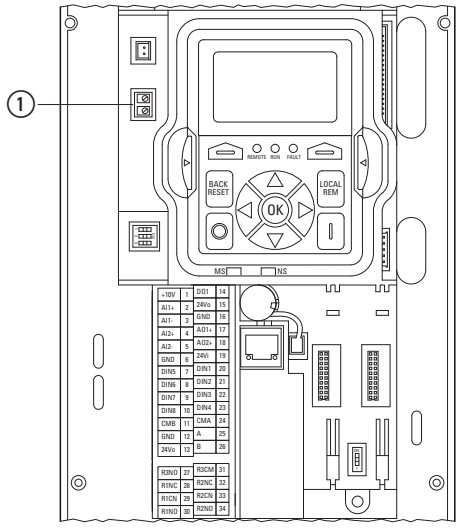


Figure 48: DXG-NET-PROFINET
① STO input

The STO terminal strip must be short-circuited by a jumper if the STO function is not required.

When the function is used, the STO terminal block must be connected to the emergency power-off switch, safety relay or PLC, etc.

The STO function must always be switched on in order to apply the closed-circuit principle.

Without the connection of a control voltage STO terminal block, the control section remains locked.

→ Further details on STO circuitry can be found in manual MN040002EN.

4.4.1.4 DXM-NET-PROFINET

For PROFINET operation, the STO input must always be enabled.

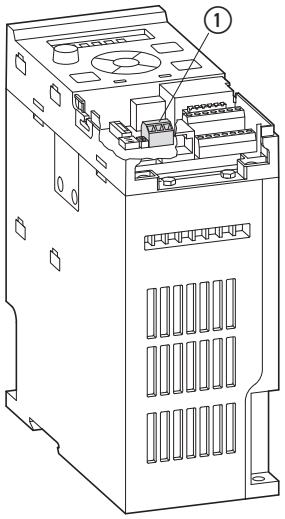


Figure 49: DXM-NET-PROFINET
① STO input

The STO terminal strip (15, 16, 17) must be short-circuited by a jumper if the STO function is not required.

When the function is used, the STO terminal block (15, 16, 17) must be connected to the emergency power-off switch, safety relay or PLC, etc.

The STO function must always be switched on in order to apply the closed-circuit principle.

Without the connection of a control voltage STO terminal block, the control section remains locked.

4.4.1.5 DXX-NET-PROFINET

For PROFINET operation, the STO input must always be enabled.

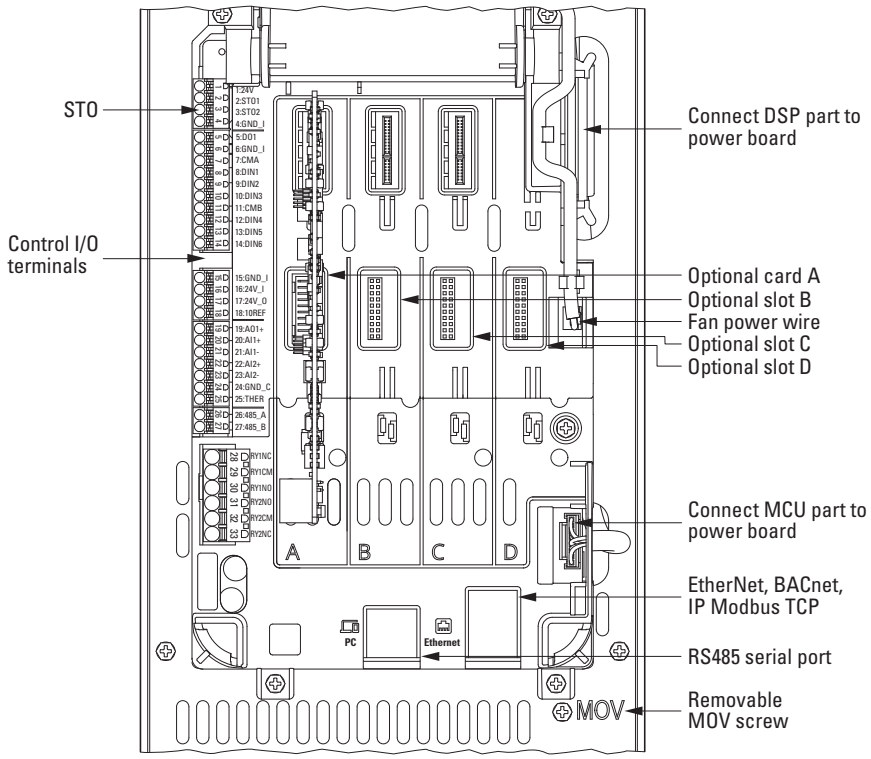


Figure 50: DX1 STO

The STO terminal strip must be short-circuited by a jumper if the STO function is not required.

When the function is used, the STO terminal block must be connected to the emergency power-off switch, safety relay or PLC, etc.

The STO function must always be switched on in order to apply the closed-circuit principle.

Without the connection of a control voltage STO terminal block, the control section remains locked.

→ Further details on STO circuitry can be found in manual MN040002EN.

DANGER

In certain applications, additional measuring and monitoring equipment may be needed in order to meet the requirements of the system's safety function.
The STO function does not provide motor braking, and the inverter braking function alone cannot be claimed as a fail-safe method.
If a motor braking function is required, an appropriate safety relay and/or a mechanical braking system or a similar method must be used.

DANGER

The "STO wiring" must be protected against unintended short-circuits and unintended tampering and modifications.
It must be ensured that the STO input signal is in a safe operating state.

DANGER

Ensure proper grounding and select cables according to local legislation or regulations.
For application examples, refer to the Eaton Safety Manual PU05907001Z.

4.4.2 Specific settings for bus operation

4.4.2.1 DX-NET-PROFINET2-2

For full operation with PROFINET for the DC1 variable frequency drive and DE1 variable speed starter, parameter P-12 must be set to 9.

For more information on parameter P-12, see → Table 7, Page 60.

All other communication-specific parameters such as ModbusRTU are locked.

Changing the parameter values via drivesConnect or the control unit requires a connection to the RJ45 socket. This is located on the front of the communication interface.

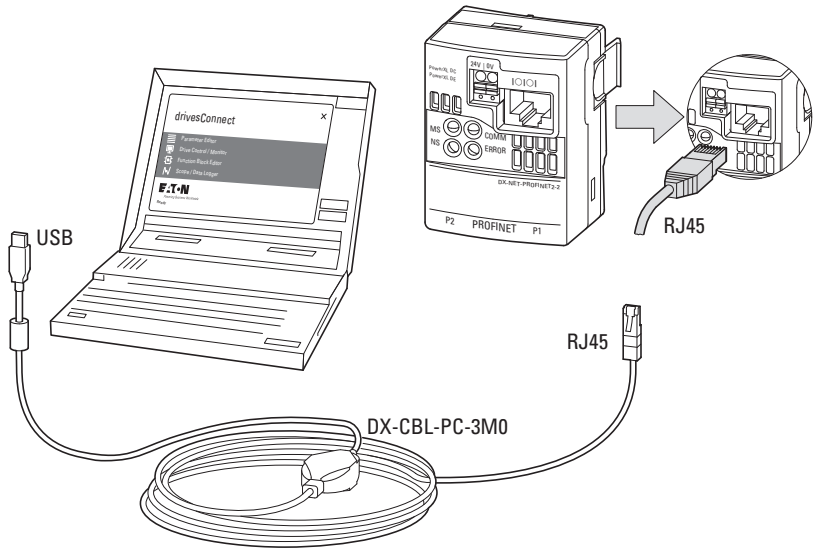


Figure 51: Parameterization via drivesConnect

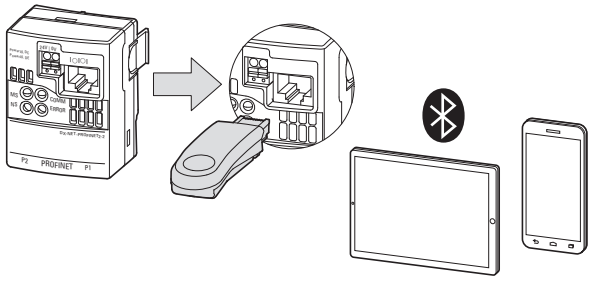


Figure 52: Parameterization via the operating unit

The value of parameter P-12 can also be changed via acyclic data.

For more information on acyclic data, see → Section “4.10 Acyclic data”, Page 124.

Parallel communication via PROFINET, keypad, DX-COM-STICK3, or a PC cable connection is always possible.

A real-time processing mode via drivesConnect is not, however, recommended, as this would overload the processor.

4.4.2.2 DX-NET-PROFINET-2

For full operation with PROFINET for the DA1 variable frequency drive parameter P1-12 must be set to 4.

Changing the parameter values via drivesConnect or the control unit requires a connection to the RJ45 socket. This is located on the front of the basic device.

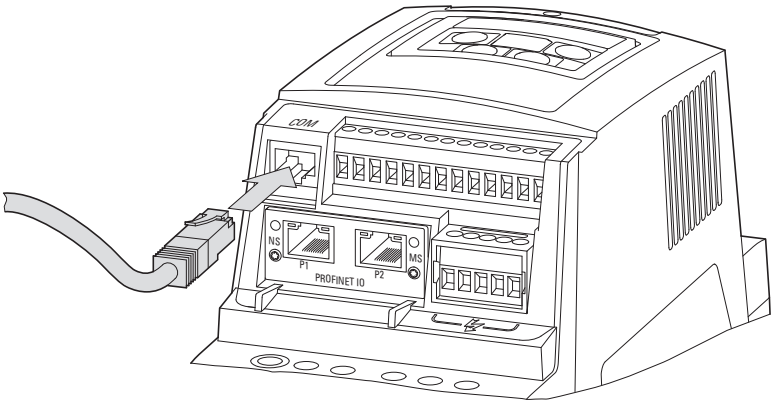


Figure 53: RJ45 connection

The value of parameter P1-12 can also be changed via acyclic data.

Parallel communication via PROFINET, keypad, DX-COM-STICK3, or a PC cable connection is always possible.

A real-time processing mode via drivesConnect is not, however, recommended, as this would overload the processor.

4.4.2.3 DXG-NET-PROFINET

For complete operation with PROFINET on the DG1 variable frequency drive, parameter P1.11 must be set to the value 1 (Fieldbus), parameter P1.15 must be set to the value 7 (Fieldbus Ref) and the DG1 variable frequency drive must be set to remote operation.

Parallel communication via PROFINET, keypad, or a PC cable connection is always possible.

A modification of parameter values via InControl Software requires a serial (RS-485) or Modbus TCP connection.

4.4.2.4 DXM-NET-PROFINET

For complete operation with PROFINET on the DM1 variable frequency drive, parameter P1.13 must be set to the value 1 (Fieldbus), parameter P1.14 must be set to the value 7 (Fieldbus Ref) and the DM1 variable frequency drive must be set to remote operation.

Parallel communication via PROFINET, keypad, or a PC cable connection is always possible.

A modification of the parameter values via InControl Software requires a serial connection(RS-485) or a Modbus TCP connection.

Parameter PNU 928 has an important function with regard to the control and command signals.

Detailed description of PNU 928 → Section “4.3 Parameter settings”, Page 60.

4.4.2.5 DXX-NET-PROFINET

For complete operation with PROFINET on the DX1 variable frequency drive, parameter P1.13 must be set to the value 6 (PROFINET), parameter P1.14 must be set to the value 7 (Fieldbus Ref) and the DX1 variable frequency drive must be set to remote operation.

Parallel communication via PROFINET, keypad, or a PC cable connection is always possible.

A modification of parameter values via InControl Software requires a serial (RS-485) or Modbus TCP connection.

4.5 Programming

4.5.1 Introduction

Cyclic and acyclic data as well as diagnostic data can be transferred via the PROFINET communication system.

The number of cyclic data is variable and is defined with the aid of profiles.

The cyclic and acyclic data have been designed in such a way as to match the following profiles and meet the following standards:

- Telegram 0 = "PROFIdrive"(1)
- Standard Telegram 1 = "PROFIdrive" (2)
- Vendor specific 1000 = "PDShort" (3)
- Vendor specific 999 = "Transparent Mode"

1) Only for DXM-NET-PROFINET and DXG-NET-PROFINET
2) Only for DX-NET-PROFINET2-2, DXM-NET-PROFINET and DXG-NET-PROFINET
3) Not in DX-NET-PROFINET2

The appropriate profile can be selected by the user in the PLC.

Below is a brief description of the individual profiles.

4.5.2 Telegram description

Telegram 0 = "PROFIdrive"

Telegram 0 is a free mappable telegram in the PROFIdrive Profile Specification. Eaton uses this telegram to extend the functionality of the PROFIdrive Standard Telegram 1 by 5 user-mappable data inputs and outputs, that can be assigned to predefined Monitor values or Parameters.

Standard Telegram 1 = "PROFIdrive"

The profile corresponds to the PROFIdrive profile Specification version 4.2.

This group supplements the variable frequency drive profiles with the PROFIdrive profile, as defined by the PROFIBUS Nutzerorganisation e.V. (PNO) for cyclic data exchange with a drive. Control and status data will be processed as per the PROFIdrive profile.

The Standard Telegram 1 offers the following cyclic Input and Output Data: Control Word, Status Word, Setpoint and Actual value.

Vendor specific 1000 = “PDShort”

Control and status data are processed as per the profile defined by the manufacturer (Eaton).

The profile corresponds to the standardized PROFIdrive profile version 4.2 with the difference that 8 + 2 x 16-bits of additional data are supplied in cyclic communication and the PROFIdrive mechanism for the control and status words is processed internally. This means the user does not have to carry out the process. The control word and status word are processed internally according to the PROFIdrive profile.

Vendor specific 999 = “Transparent Mode”

This is an Eaton-specific profile (manufacturer-specific telegram).

The internal communication is converted to PROFINET IO data.
Control and status data are processed as per the profile defined by the manufacturer (Eaton)

4.5.3 Acyclic communication

In addition to the cyclic data exchange, there is also an acyclic parameter channel for the exchange of parameters between the control/controller and drive units. Access to this data is not time critical.

Acyclic communication takes place via the PROFIdrive profile version 4.2.

4.5.4 Status diagrams for the PROFIdrive profile "Telegram 0" and "Standard Telegram 1"

The status diagrams used below correspond to the PROFIdrive profile 4.2.

The grey boxes in the figures represent the current state (S = State) with the help of the input bytes.

The white boxes represent the transition conditions with the help of the relevant output byte bits.

Dots are used to indicate priority levels. The more dots a transition has, the higher its priority.

Status of the variable frequency drive/variable speed starter

Command issued to variable frequency drive/variable speed starter

Figure 54: Displays in the status diagrams

PROFIdrive – network status diagram

If PROFIdrive with PNU 928.0 = 1, …, 5 is used, the general status diagram shown below will apply.

In addition to the transition conditions shown below, the Ctl_PLC bit needs to be set in the output byte.

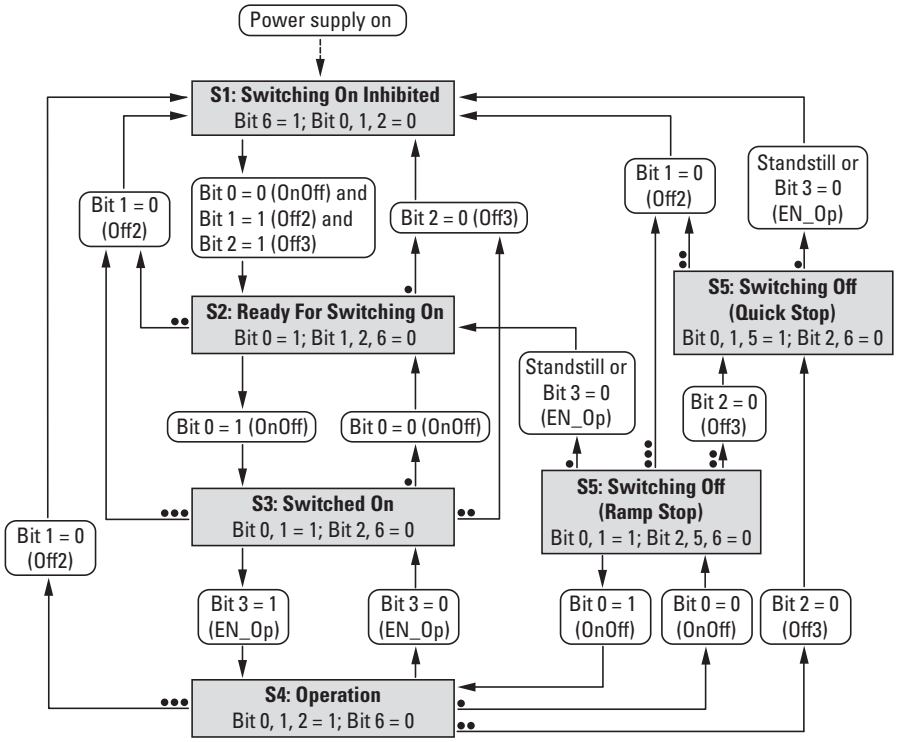


Figure 55: Network status diagram: PROFIdrive

4.6 Cyclic data

4.6.1 Introduction

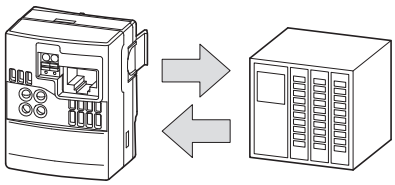


Figure 56: Data exchange of process data

The amount of cyclical input and output data (process data) for the variable frequency drive/variable speed starter can be adjusted as necessary for the application at hand by using the various profiles. The profiles are selected in the hardware/control configuration (e.g. in the TIA Portal program).

Table 31: Profile Overview

Telegram	Profile name	Data length
Telegram 0 [3]	PROFIdrive	2 x 16-bit + 4 x 32-bit
Standard Telegram 1 [1, 3]	PROFIdrive	2 x 16bit
Eaton Telegram 1000 [1], [3], [4]	PDShort	8-bit + 2 x 16-bit
Vendor specific 999 [1], [2]	Transparent Mode	4 x 16-bit
Transparent Mode 999 [3] [4]	Transparent Mode	11 x 16-bit
Process Data Module 1 [3] [4]	Transparent Mode	4 x 16-bit
Process Data Module 2 [3] [4]	Transparent Mode	6 x 16-bit
Process Data Module 3 [3] [4]	Transparent Mode	8 x 16-bit
Process Data Module 4 [3] [4]	Transparent Mode	10 x 16-bit

1) Only for DXG-NET-PROFINET2-2
2) Only for DX-NET-PROFINET-2
3) Only for DXG-NET-PROFINET/ DXM-NET-PROFINET
4) Only for DXX-NET-PROFINET

Note the following special note to the terms “input data” and “output data”.

NOTES ON NAMING CONVENTION USED THROUGHOUT THE PROGRAM

Input data are data that come from the control/PLC and enter the device, i.e. the variable frequency drive.
Specifically setpoints.

“Input…”: PLC -> variable frequency drive/variable speed starter

Output data are data that come from the device, i.e. from the variable frequency drive (are “read out”) and enter the control/PLC.
Specifically actual values and status values.
The same applies to input bytes or output bytes.

“Output…”: Variable frequency drive/variable speed starter -> PLC

4.7 Input and output data of the cyclic profiles

4.7.1 Input data

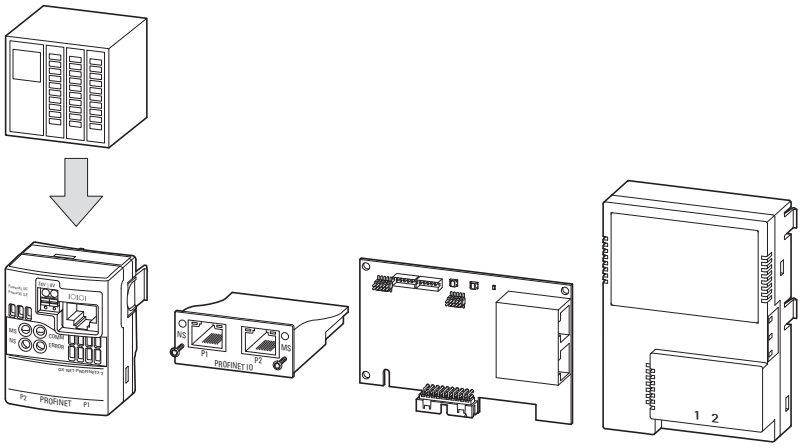


Figure 57: Input data (from the PLC to the variable frequency drive/variable speed starter)

Table 32: Cyclic Input Data for the profiles

Telegram	**Profile name / data length**	**Cyclic Input Data (control) of PLC -> variable frequency drive/variable speed starter**										
Telegram 0 3)	PROFIdrive 2x 16bit + 5x 32bit	Control Word	Frequency setpoint value	Mappable_ Data_IN_1	Mappable_ Data_IN_2	Mappable_ Data_IN_3	Mappable_ Data_IN_4	Mappable_ Data_IN_5	–	–	–	–
Standard Telegram 1 1, 3)	PROFIdrive 2x 16bit	Control Word	Frequency setpoint value	–	–	–	–	–	–	–	–	–
Eaton Telegram 1000 1, 3, 4)	PDShort 8bit + 2x 16bit	Control Byte	Frequency setpoint value	(reserved)	–	–	–	–	–	–	–	–
Vendor specific 999 1)	Transparent Mode 4x 16bit	Control Word	Frequency setpoint value	(reserved)	Ramp time	–	–	–	–	–	–	–
Control Data 4 word 2)	Transparent Mode 4x 16bit	Control Word	Frequency setpoint value	PDI 3 (P5-14)	PDI 4 (P5-13)	–	–	–	–	–	–	–
Eaton Telegram 999 3, 4)	Transparent Mode 11x 16bit	Control Word	General Control Word	Frequency setpoint value	FBData _In_1	FBData _In_2	FBData _In_3	FBData _In_4	FBData, _In_5	FBData _In_6	FBData _In_7	FBData _In_8
Process Data Module 1 3, 4)	Transparent Mode 4x 16bit	Control Word	Frequency setpoint value	FBData _In_1	FBData _In_2	–	–	–	–	–	–	–
Process Data Module 2 3, 4)	Transparent Mode 6x 16bit	Control Word	Frequency setpoint value	FBData_In _1	FBData _In_2	FBData _In_3	FBData_In _4	–	–	–	–	–
Process Data Module 3 3, 4)	Transparent Mode 8x 16bit	Control Word	Frequency setpoint value	FBData _In_1	FBData _In_2	FBData _In_3	FBData _In_4	FBData _In_5	FBData _In_6	–	–	–
Process Data Module 4 3, 4)	Transparent Mode 10x 16bit	Control Word	Frequency setpoint value	FBData _In_1	FBData _In_2	FBData _In_3	FBData _In_4	FBData _In_5	FBData _In_6	FBData _In_7	FBData _In_8	–

1) Only for DXG-NET-PROFINET2-2
2) Only for DX-NET-PROFINET-2
3) Only for DXG-NET-PROFINET/ DXM-NET-PROFINET
4) Only for DXX-NET-PROFINET

4.7.2 Output data

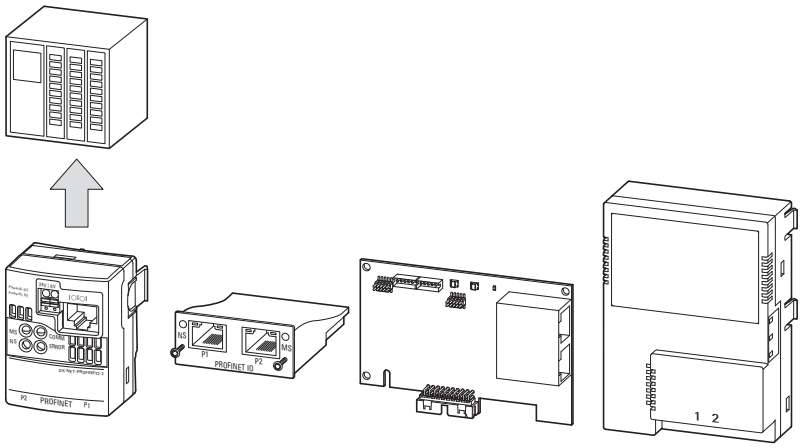


Figure 58: Output data (from the variable frequency drive/variable speed starter to the PLC)

Table 33: Cyclic Output Data for the profiles

Telegram	Profile name / data length	Cyclic Output Data (status) of variable frequency drive/variable speed starter -> PLC										
Telegram 0 3)	PROFIdrive 2x16bits + 5x 32bit	Status Word	Frequency actual value	Mappable _Data_OUT_1	Mappable _Data_OUT_2	Mappable _Data_OUT_3	Mappable _Data_OUT_4	Mappable _Data_OUT_5	–	–	–	–
Standard Telegram 1 1)	PROFIdrive 2x16bits	Status Word	Frequency actual value	–	–	–	–	–	–	–	–	–
Eaton Telegram 1000 1) 3) 4)	PDShort 8bit + 2x 16bit	Status Byte	Frequency actual value	Motor Current	–	–	–	–	–	–	–	–
Vendor specific 999 1)	Transparent Mode 4x 16bits	Status Word	Frequency actual value	Motor Current	Motor Torque	–	–	–	–	–	–	–
Status Data 4 word 2)	Transparent Mode 4x 16bits	Status Word	Frequency actual value	PDO 3 (P5-12)	PDO 4 (P5-08)	–	–	–	–	–	–	–
Eaton Telegram 999 3) 4)	Transparent Mode 11x 16bit	Status Word	General Status Word	Frequency actual value	FBData_Out_1	FBData_Out_2	FBData_Out_3	FBData_Out_4	FBData_Out_5	FBData_Out_6	FBData_Out_7	FBData_Out_8
Process Data Module 1 3) 4)	Transparent Mode 4x 16bit	Status Word	Frequency actual value	FBData_Out_1	FBData_Out_2	–	–	–	–	–	–	–
Process Data Module 2 3) 4)	Transparent Mode 6x 16bit	Status Word	Frequency actual value	FBData_Out_1	FBData_Out_2	FBData_Out_3	FBData_Out_4	–	–	–	–	–
Process Data Module 3 3) 4)	Transparent Mode 8x 16bit	Status Word	Frequency actual value	FBData_Out_1	FBData_Out_2	FBData_Out_3	FBData_Out_4	FBData_Out_5	FBData_Out_6	–	–	–
Process Data Module 4 3) 4)	Transparent Mode 10x 16bit	Status Word	Frequency actual value	FBData_Out_1	FBData_Out_2	FBData_Out_3	FBData_Out_4	FBData_Out_5	FBData_Out_6	FBData_Out_7	FBData_Out_8	–

1) Only for DXG-NET-PROFINET2-2
2) Only for DX-NET-PROFINET-2
3) Only for DXG-NET-PROFINET/ DXM-NET-PROFINET
4) Only for DXX-NET-PROFINET

The individual parts of the words are explained below.

4.8 Input and output data of the profile

4.8.1 “PDShort” profile

4.8.1.1 Cyclic Input Data

This cyclic Input Data is available in the "PDShort" profile.

Table 34: Control words for the “PDShort” profile

Telegram	**Profile name/ data length**	**Output Data (control) of PLC -> Input Data of variable frequency drive/variable speed starter**		
Eaton Telegram 1000	PDShort 8 bit + 2 x 16-bit	Control Byte	Frequency Setpoint value	(reserved)

The data is described in detail below.

Table 35: Control byte 1 – "PDShort" profile

<table>
<tr><th>Byte</th><th>Bit</th><th>Designation</th><th>Meaning</th></tr>
<tr><td>0</td><td>0</td><td>Start</td><td>Start
A value of 1 will start the variable frequency drive/variable speed starter.</td></tr>
<tr><td></td><td>1</td><td>EN_OP</td><td>Enable operation
0: Stop (immediate disconnection of the output)
1: Operation
With a value of 0, the output of the variable frequency drive/variable speed starter is immediately switched off. To start the device, the bit must be set to 1 and bit 0 must also be set.</td></tr>
<tr><td></td><td>2</td><td>2nd ramp</td><td>Activate 2nd Ramp
0: 1. ramp active
1: 2. ramp active
DC1 uses Quick Stop Ramp (P-24) as second Ramp.
Not available in DE1/DE11!</td></tr>
<tr><td></td><td>3</td><td>FaultAck</td><td>Fault Acknowledge
0: Do not acknowledge current fault
1: Acknowledge current fault (rising edge: 0 → 1)
This bit can be used to reset a fault in the variable frequency drive/ variable speed starter. The fault acknowledge function will only respond to a rising edge, i.e., to the value changing from 0 to 1.</td></tr>
<tr><td></td><td>4</td><td rowspan="2">f-Source</td><td rowspan="2">Setpoint source
The source for setpoint specification can be defined in binary code.
<table><tr><td>Bit 4</td><td>Bit 5</td><td>Setpoint source</td></tr><tr><td>0</td><td>0</td><td>Network speed</td></tr><tr><td>1</td><td>0</td><td>Analog input</td></tr><tr><td>0</td><td>1</td><td>f-fix3 / Preset Speed 3</td></tr><tr><td>1</td><td>1</td><td>f-fix4 / Preset Speed 4</td></tr></table>The direction of the Analog and Preset Speed reference is defined by the direction of the Network speed.</td></tr>
<tr><td></td><td>5</td></tr>
<tr><td></td><td>6</td><td>Remote Output 0</td><td>Remote controlled Relay output
0: Remote Output 0 not active
1: Remote Output 0 active
DC1: To use this function P-18 must be set to 12
DG1, DM1, DX1: To use this function Output (DOx, ROx, Virtual ROx) must be set to 32 "FB Digital Input 1"
Not available in DE1/DE11!</td></tr>
<tr><td></td><td>7</td><td>Ext Fault</td><td>External Fault
If the bit is set, the variable frequency drive/variable speed starter stops with a selected function for PNU 840.29952.
The behavior corresponds to a transition of 1 → 0 of the enable signal with the difference that the variable frequency drive goes into the "Error" status.
The external fault can be reset just like any other fault (with Fault acknowledge (bit 7) or by switching the supply voltage off and back on).
0: no external fault
1: external fault</td></tr>
</table>

CAUTION

When bit 0 and bit 1 are activated in input byte 0, the output of the variable frequency drive/variable speed starter is activated.

Table 36: Speed Setpoint – "PDShort" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 High	Setpoint	Frequency/Speed setpoint value in %. The setpoint is specified as an normalized value between -100 % and 100 %: 100 % ≙ 4000_{hex} 0 % ≙ $0x0000_{hex}$ -100 % ≙ $C000_{hex}$ Examples: 1. Min frequency (f-min = 0 Hz) -> 0_{dec} = $0x0000_{hex}$ = 0 % -> The inverter moves to the value set under min frequency. 2. Max frequency (f-max = 50 Hz) -> 16384_{dec} = $0x4000_{hex}$ = 100 % -> The inverter moves to the value set under min frequency. 3. -100 % ≙ $C000_{hex}$ -> Reverse operation with 100 % Data type N2
2	0, …, 7 Low		

Setpoints are transferred as normalized Data.

100 % ≙ 4000_{hex}.

The direction of rotation is specified with a negative setpoint:

Example: -100 % ≙ $C000_{hex}$

4.8.1.2 Cyclic Input Data

This cyclic Output Data is available in the "PDShort" profile.

Table 37: Cyclic Output Data for the "PDShort" profile

Telegram	Profile name / data length	Status of variable frequency drive/variable speed starter -> PLC		
Eaton Telegram	"PDShort" 8 bit + 2 x16 bit	Status Byte	Frequency actual value	Motor current

The data are described in detail below.

Table 38: Status Byte – "PDShort" profile

Byte	Bit	Designation	Meaning
0	0	ERR	An error occurred 0: no error 1: Fault Indicates whether there is a variable frequency drive/variable speed starter fault. If this is the case, the device will respond as configured in PNU 362.0.
	1	RUN	Operation (output enabled) 0: Error present or no start signal generated 1: A start signal is present and there is no error. The output of the variable frequency drive/variable speed starter is active.
	2	RDY	Ready, switched on 0: Not switched on; mains voltage is missing or there is an error 1: Switched on and no error present Indicates whether the variable frequency drive/variable speed starter is switched on (mains side).
	3	FWD/REV	Direction of rotation 0: Clockwise rotating field (FWD) 1: Anticlockwise rotating field (REV)
	4	f_Limit	Actual speed is greater than the signaling threshold 0: Actual speed is less than or equal to the signaling threshold 1: Actual speed is greater than the signaling threshold Threshold value: DC1: P-19 DE1: P-52 DG1, DM1, DX1: ID155 ("Freq Limit Supv Val")
	5	I > Limit	Current Limit exceeded The bit will have a value of 1 if the condition below is met; otherwise, it will have a value of 0. The Motor Current is greater than the limiting value. DC1: comparable to the relay function of P-18 = 5 DE11: comparable to the relay function of P-51 = 5 DG1, DM1, DX1: ID107 "Current Limit" is used
	6	f = f-ref	Operation at reference frequency in stationary state 0: Ref. frequency not reached 1: Ref. Frequency reached
	7	Remote Input 1	Status of digital input 3 0: No voltage at DI3 1: 24 V DC present at DI3 Not in DG1, DM1, DX1!

Table 39: Frequency actual value – "PDShort" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 High	ActSpeed	Frequency actual value (current speed in percent) 100 % ≙ 4000_{hex} 0% ≙ $0x0000_{hex}$ Examples: 1. Min frequency (f-min = 0 Hz) -> 0_{dec} = $0x0000_{hex}$ = 0 % 2. Max frequency (f-max = 50 Hz) - > 16384_{dec} = $0x4000_{hex}$ = 100 % 3. -100 % ≙ $C000_{hex}$ -> Reverse operation with 100 % Data type N2
2	0, …, 7 Low		

Table 40: Motor Current – "PDShort" profile

Byte	Bit	Designation	Meaning
2	0, …, 7 High	Motor Current	Motor Current in Ampere $100_{hex} \triangleq 2,56A$ Data typetype : N2
3	0, …, 7 Low		

4.8.2 "PROFIdrive" profile

4.8.2.1 Cyclic Output Data

This cyclic Input Data is available in the "PROFIdrive" profile.

Table 41: Cyclic Input Data for the "PROFIdrive" profile

Telegram	Profile name / data length	Input word (control) of PLC -> variable frequency drive/variable speed starter	
Standard Telegram 1	"PROFIdrive" 2 x 16 bit	Control Word	Frequency setpoint value

Table 42: Cyclic Input Data for the "PROFIdrive" profile

Telegram	Profile name data length	Output Data (control) of PLC -> Input Data of variable frequency drive/variable speed starter						
Standard Telegram 1	"PROFIdrive" 2 x 16-bit + 5 x 32-bit	Control Word	Frequency setpoint value	Mappable_ Data_IN_1	Mappable_ Data_IN_2	Mappable_ Data_IN_3	Mappable_ Data_IN_4	Mappable_ Data_IN_5

The data are described in more detail below.

Table 43: Control Word, Byte 0 – "PROFIdrive" profile

Byte	Bit	Designation	Meaning
0	0	OnOff	Switch on/off 0: Normal stop (with configured ramp time) 1: ready for operation In the case of a High signal, the variable frequency drive enables the output if the PROFIdrive mechanism is executed correctly.
	1	Off2	Coast Stop (Coast Stop: Off 2) 0: Coast stop (switch off output voltage) 1: no coast stop
	2	Off3	Quick Stop: Off3 0: Quick stop (shortest ramp) 1: no quick stop With a value of 0, a quick stop with ramp is performed.
	3	EN_Op	Operation released 0: Stop 1: Operation With a value of 0, the variable frequency drive/variable speed starter will stop.
	4	EN_Ramp	Release ramp (Enable Ramp Generator) 0: Reset ramp (setpoint = 0) 1: Enable ramp generator With a value of 0, the variable frequency drive/variable speed starter will remain stopped; the output will not be switched off. With a value of 1, the ramp enable is activated and the variable frequency drive/variable speed starter moves up with the set ramp.
	5	Unfreeze	Unfreeze ramp 0: Freeze ramp (the ramp generator's current output value will be frozen) 1: Unfreeze ramp With a value of 0, the variable frequency drive/variable speed starter will continue running with the most recently set frequency; the output will not be switched off. If this occurs after the ramp time elapses, this will have no effect until the next setpoint change. With a value of 1, the device will continue running along the set ramp all the way to the frequency setpoint.
	6	EN_Set	Enable Setpoint EN_Set enables the setpoint value and starts or stops the motor with the ramp function. 0: Do not activate the setpoint 1: Activate the setpoint With a value of 0, the variable frequency drive/variable speed starter will not receive a setpoint and will remain at the minimum frequency; the output will not be switched off. With a value of 1, the setpoint is activated.
	7	FaultAck	Fault Acknowledge 0: Do not acknowledge current fault 1: Acknowledge current fault (rising edge: 0 → 1) This bit can be used to reset a fault in the variable frequency drive/variable speed starter. The fault acknowledge function will only respond to a rising edge, i.e., to the value changing from 0 to 1.

Table 44: Control Word, Byte 1 – "PROFIdrive" profile

Byte	Bit	Designation	Meaning
1	0	Jog 1	Setpoint 1 If this bit and byte 1 bit 0 OnOff is activated after byte 0 bit 2 Ctl_PLC, byte 1 bit 1 Off2, byte 1 bit 2 Off3, byte 1 bit 3 EN_OP have been activated, the variable frequency drive/variable speed starter starts up with fixed frequency 1 forward.
	1	Jog 2	Setpoint 2 If this bit and byte 1 bit 0 OnOff is activated after byte 0 bit 2 Ctl_PLC, byte 1 bit 1 Off2, byte 1 bit 2 Off3, byte 1 bit 3 EN_OP have been activated, the variable frequency drive/variable speed starter starts up with fixed frequency 2 forward.
	2	Ctl_PLC	The PLC assumes control (Control by PLC). 0: no control via PLC 1: Control via PLC With a value of 0, the PLC does not control the variable frequency drive. With a value of 1, the controller assumes control of the variable frequency drive/variable speed starter. Until then, no commands that the variable frequency drive/variable speed starter receives from the PLC are accepted.
	3	f-Source	Setpoint source The source for the setpoint can be defined in binary code. Bit 4 / Bit 5 / Setpoint source 0 / 0 / Network speed 1 / 0 / Analog input 0 / 1 / f-fix3 / Preset Speed 3 1 / 1 / f-fix4 / Preset Speed 4 The direction of the Analog and Preset Speed reference is defined by the direction of the Network speed.
	4		
	5	Remote Output 0	Remote controlled Relay output 0: Remote Output 0 not active 1: Remote Output 0 active DC1: To use this function P-18 must be set to 12 DG1, DM1, DX1: To use this function Output (DOx, ROx, Virtual ROx) must be set to 32 "FB Digital Input 1" Not available in DE1/DE11!
	6	2nd ramp	Activate 2nd Ramp 0: 1. ramp active 1: 2. ramp active DC1 uses Quick Stop Ramp (P-24) as second Ramp. Not available in DE1/DE11!
	7	ExtFault	External Fault 0: no external fault 1: external fault If the bit is set, the variable frequency drive/variable speed starter stops with a selected PNU 840.29952 function. The behavior corresponds to a transition of 1 → 0 of the enable signal with the difference that the variable frequency drive goes into the Error status. The external fault can be reset just like any other fault (with Fault acknowledge (bit 7) or by switching the supply voltage off and on).

Table 45: Frequency setpoint value – "PROFIdrive" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 High	Setpoint	Frequency/Speed setpoint value in %. The setpoint is specified as an normalized value between -100 % and 100 %: 100 % ≙ 4000hex 0% ≙ 0x0000hex -100 % ≙ C000hex Examples: 1.Min frequency (f-min = 0 Hz) -> 0_{dec} = $0x0000_{hex}$ = 0 % -> The inverter moves to the value set under min frequency. 2.Max frequency (f-max = 50 Hz) -> 16384_{dec} = $0x4000_{hex}$ = 100 % -> The inverter moves to the value set under min frequency. 3.-100 ≙ ? $C000_{hex}$ -> Reverse operation with -100% Data type: N2
2	0, …, 7 Low		

Setpoints are transferred as normalized Data.

100 % ≙ 4000_{hex}.

The direction of rotation is specified with a negative setpoint:

Example: -100 % ≙ $C000_{hex}$

Table 46: Mappable_Data_IN_1 - "PROFIdrive" profile Telegram 0

DWord	Bit	Designation	Meaning
1	0, …, 31	Mappable_Data_IN_1	Can be mapped to a predefined list of Parameters to write information to the VFD (For DG1 and DM1 only). These Parameters can be mapped via Keypad or inControl Software with Parameters "ReceivePZD3 Dest" (ID3287) to "ReceivePZD7 Dest" (ID3291), see also Parameter List in Chapter 4.11.2. These PNUs are available for selection: 3904.0 f-min 3905.0 f-max 4207.0 M-NET Set Point (DG1 only) 5152.0 Heatsink Temperature 5360.0 t-acc1 5369.0 t-dec1 16221.0 n-ref1 FireMode 16494.0 PID1 NET Set Point 1 16500.0 PID1 NET Set Point 2 (DG1 only)
2	0, …, 31	Mappable_Data_IN_2	
3	0, …, 31	Mappable_Data_IN_3	
4	0, …, 31	Mappable_Data_IN_4	
5	0, …, 31	Mappable_Data_IN_5	

4.8.2.2 Cyclic Output Data

This cyclic Output Data is available in the "PROFIdrive" profile.

Table 47: Cyclic Output Data for the "PROFIdrive" profile

Telegram	**Profile name / data length**	**Output Data (Status) Variable frequency drive/variable speed starter -> PLC**	
Standard Telegram 1	"PROFIdrive" 2 x16 bit	Status Word	Frequency actual value

Table 48: Cyclic Output Data for the "PROFIdrive" profile

Telegram	**Profile name data length**	**Output Data (control) of PLC -> variable frequency drive/variable speed starter**						
Standard Telegram 0	"PROFIdrive" 2 x 16-bit + 5 x 32-bit	Status Word	Frequency actual value	Mappable_ Data_OUT _1	Mappable_ Data_OUT _2	Mappable_ Data_OUT _3	Mappable_ Data_OUT _4	Mappable_ Data_OUT _5

The data is described in detail below.

Status Word

Table 49: Status Word – "PROFIdrive" profile

Byte	Bit	Designation	Meaning
0	0	RSO	Ready For Switching On: S2 0: Not ready for switching on 1: Ready for switching on If this bit has a value of 1, the variable frequency drive/variable speed starter is ready to be switched on and has status 2. If the bit is not active, check the mains voltage. If no mains voltage is present, the bit is equal to 0.
	1	RDY	Ready to operate; switched on: S3 0: not ready for operation 1: ready for operation With a value of 1, the variable frequency drive/variable speed starter is ready for operation and has status 3. It can now be switched on. If the bit is not active, check the mains voltage. If no mains voltage is present, the bit is equal to 0.
	2	EN	Enabled; operation: S4 0: Stop 1: Operation If this bit has a value of 1, the variable frequency drive's/variable speed starter's power section (IGBTs) is active.
	3	ERR	Error present 0: no error 1: Fault Indicates whether there is a variable frequency drive/variable speed starter fault. If this is the case, the variable frequency drive/variable speed starter will respond as configured in PNU 362.0.
	4	C_Stop	coast stop, output de-energized (coast stop) 0: no coast stop 1: coast stop With a value of 1, the variable frequency drive/variable speed starter is coasting and the output is de-energized.
	5	Q_Stop	Quick stop, shortest ramp 0: Quick Stop not active 1: Quick Stop active With a value of 1, the variable frequency drive/variable speed starter stops with the shortest ramp and the output is not de-energized.
	6	SOI	Switching on inhibited: S1 0: No switching on inhibited 1: switching on inhibited With a value of 1, the variable frequency drive/variable speed starter is in switching on inhibited mode and cannot be started.
	7	WARN	Warning present 0: no warning 1: Warning Indicates whether there is a variable frequency drive/variable speed starter warning.

Table 50: Status Word – "PROFIdrive" profile

Byte	Bit	Designation	Meaning
1	0	f_Level	Operation at setpoint 0: The variable frequency drive does not follow the speed setpoint during the ramp 1: The variable frequency drive follows the speed setpoint during the ramp As long as the difference between the setpoint and actual value is less than 5 %, this parameter is equal to 1. For values greater than 5 %, the value of the bit is equal to 0.
	1	Ctl_Req	Control requested to PLC is set if PNU 928.0 = 1, …, 5. 0: Not ready for remote control 1: Ready for remote control With a value of 1, the variable frequency drive/variable speed starter can be controlled with the help of a PLC. If the value is 0, the variable frequency drive/variable speed starter is not ready to be controlled by a PLC. The variable frequency drive/variable speed starter may be in terminal mode.
	2	f-Limit	Actual speed is greater than the signaling threshold 0: Actual speed is less than or equal to the signaling threshold 1: Actual speed is greater than the signaling threshold Threshold value: DC1: P-19 DE1: P-52 DG1, DM1, DX1: ID155 ("Freq Limit Supv Val")
	3	I > Limit	Current Limit exceeded The bit will have a value of 1 if the condition below is met; otherwise, it will have a value of 0. The Motor Current is greater than the limit value - comparable to the relay function if P-18 = 5 (DC1) P-51 (DE1).
	4	f = f-ref	Operation at reference frequency in stationary state 0: Ref. frequency not reached 1. Ref. Frequency reached
	5	Remote Input 1	Status of digital input 3 0: No voltage at DI3 1: 24 V DC present at DI3 Not in DG1, DM1, DX1!
	6	Remote Input 2	Status of digital input 4 0: No voltage at DI4 1: 24 VDC present at DI4 **Note:** Only DC1!
	7	–	reserved

Frequency actual value 2

Table 51: Frequency actual value – "PROFIdrive" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 High	ActSpeed	Frequency actual value (current speed in percent) 100 % ≙ 4000_{hex} 0% ≙ $0x0000_{hex}$ Examples: 1. Min frequency (f-min = 0 Hz) -> 0_{dec} = $0x0000_{hex}$ = 0 % 2. Max frequency (f-max = 50 Hz) - > 16384_{dec} = $0x4000_{hex}$ = 100 % 3. -100 % ≙ $C000_{hex}$ -> Reverse operation with 100% Data type: N2
2	0, …, 7 Low		

Mappable_Data_OUT

Table 52: Mappable_Data_OUT - "PROFIdrive" profile Telegram 0

Byte	Bit	Designation	Meaning
1	0, …, 31	Mappable_Data_OUT_1	Can be mapped to a predefined list of Monitor values to read information from the VFD (For DG1 and DM1 only). These Parameters can be mapped via Keypad or inControl Software with Parameters "SendPZD3 Source" (ID3292) to "SendPZD7 Source" (ID3296), see → Section "4.11.2 Parameter list for DA1", Page 128. These PNUs are available for selection: 2938.0 Motor Voltage 2941.0 Motor Speed 2945.0 Motor Current 2947.0 Motor Torque 2951.0 Motor Power Rel 2953.0 Motor Temperature 4567.0 t-Run (DG1 only) 4758.0 DC-Link Voltage 6034.0 Analog Input1 6035.0 Analog Input2 (DG1 only) 7026.0 Analog Output1 7027.0 Analog Output2 (DG1 only) 8032.0 Control board DI status 10016.0 DO201-203 Status (IO1 - 3DI/3DO/1Th) (DG1 only) 12032.0 RO1-2 Status 16482.0 PID1 Set Point 16483.0 PID2 Set Point (DG1 only) 16598.0 PID1 Feedback 16599.0 PID2 Feedback (DG1 only) 23710.0 Output Frequency 23718.0 MWh Meter 24044.0 Last Active Fault 10015.0 DO101-103 Status (IO1 - 3DI/3DO/1Th) (DG1 only)
2	0, …, 31	Mappable_Data_OUT_2	
3	0, …, 31	Mappable_Data_OUT_3	
4	0, …, 31	Mappable_Data_OUT_4	
5	0, …, 31	Mappable_Data_OUT_5	

4.8.2.3 Simplified start with the "PROFIdrive" profile

Use the following settings (as hexadecimal values) for the control word (output bytes 0 and 1):

Table 53: Starting

Value	Description
16#0000	Voltage present on device and connection.
16#047E	The variable frequency drive/variable speed starter switches to the "ready" status, however it is still stationary.
16#047F	The variable frequency drive/variable speed starter switches from the "ready" status to the RUN status and starts if a setpoint has been specified.

Table 54: Stop with ramp

Value	Description
16#047F	The variable frequency drive/variable speed starter is in operation.
16#046F	The variable frequency drive/variable speed starter executes the ramp stop.
16#047F	The ramp stop is canceled and the variable frequency drive/variable speed starter continues to run.

Table 55: Quick stop

Value	Description
16#047F	The variable frequency drive/variable speed starter is in operation.
16#047E	The variable frequency drive/variable speed starter executes the quick stop.
16#047F	The quick stop is canceled and the variable frequency drive/variable speed starter continues to run.

Table 56: Coast stop

Value	Description
16#047F	The variable frequency drive/variable speed starter is in operation.
16#047C	The variable frequency drive/variable speed starter executes the coast stop.
16#047F	The coast stop is canceled and the variable frequency drive/variable speed starter continues to run.

Table 57: Fault scenario

Value	Description
16#047F	A fault occurs during ongoing operation.
16#04FE	The variable frequency drive/variable speed starter will reset.
16#047F	The variable frequency drive/variable speed starter starts after troubleshooting.

4.8.2.4 Overview of "Simplified start with PROFIdrive"

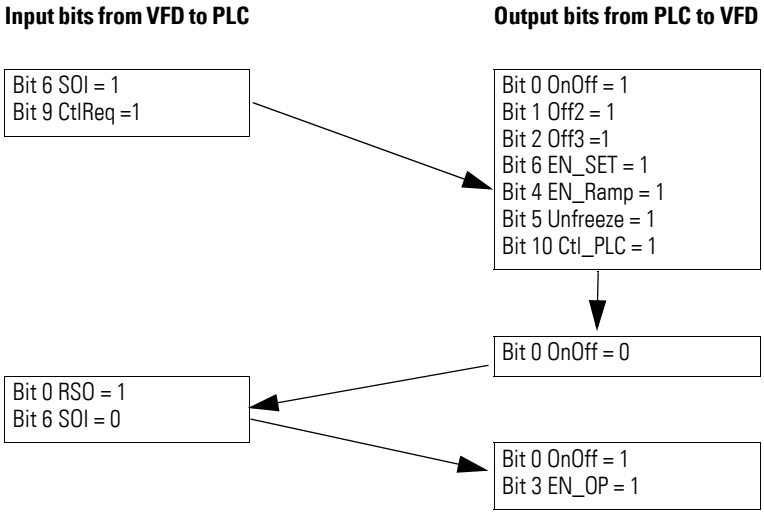


Figure 59: Sequence for simplified start

In normal operation, a start is executed with bit 3 EN_OP.

In the event of a fault, the variable frequency drive/variable speed starter will be set back two steps.
Once the fault is eliminated, it needs to be reset (Fault Ack).
The step sequence must then be repeated starting from there.

Setpoints via input bytes 2 and 3 are displayed as integer values.

100 % ≙ 4000_{hex}.

The direction of rotation is specified with a negative setpoint:

Example: -100 % ≙ $C000_{hex}$

Actual values are returned in the same format via output bytes 2 and 3.

4.8.3 "Transparent Mode" profile

Cyclic Input and Output Data in Transparent Mode are manufacturer specific and also depending on the selected Profinet communication card.

The individual data are listed separately below.

4.8.3.1 DX-NET-PROFINET2...-2

Cyclic Input Data

There are four Input Data Words available for DX-NET-PROFINET2 and DX-NET-PROFINET2-2.

These Input data are used to control the variable frequency drive/variable speed starter.

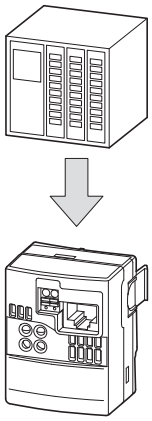


Figure 60: Input Data

Table 58: Cyclic Input Data for the "Transparent Mode" profile

Telegram	**Profile name data length**	**Output Data (control) of PLC -> Input Data of variable frequency drive/variable speed starter**			
Vendor specific 999	"Transparent Mode" 4 x 16-bit	Control Word	Frequency setpoint value	(reserved)	Ramp time (only in DC1)
Control Data 4 word	"Transparent Mode" 4 x 16 bit	Control Word	Frequency setpoint value	PDI3 (only in DA1)	PDI4 (only in DA1)

Control Word

These bits are used to control the variable frequency drive/variable speed starter.

The content can be adapted to your application and then sent as a control word to the variable frequency drive/variable speed starter.

Table 59: Control Word – "Transparent Mode" profile

Bit	Description	
	Value = 0	**Value = 1**
0	Stop	Operation
1	Clockwise rotating field (FWD)	Anticlockwise rotating field (REV)
2	No action	Fault Reset
3	No action	Coasting
4	Not used	Not used
5	No action	Quick stop (ramp 2)
6	No action	Fixed frequency FF1
7	No action	Overwrite setpoint value with 0

Bits 8 to 15 are not used.

CAUTION

When bit 0 and bit 1 are activated in input byte 0, the output of the variable frequency drive/variable speed starter is activated.

Frequency setpoint value

Table 60: Frequency setpoint value – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 Low	Setpoint	Setpoint input The permissible values fall within a range of P-02 (minimum frequency) to P-01 (maximum frequency) In the application, the values will be scaled by a factor of 0.1.
2	8, …, 15 High		

Ramp time

Table 61: Ramp time – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 Low	Ramp time	Ramp time The permissible values range from 0 to 60000. In the application, the values will be scaled by a factor of 0.01, i.e., 300 ≙ 3 s. In this case, parameter P-12 must be set to 4 (only for the DC1 variable frequency drive).
2	8, …, 15 High		

Process data input 3 (PDI 3)

Configured with parameter P5-14 (DA1 only).

The following settings can also be modified during operation:

Table 62: Process data input 3 - "Transparent Mode" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 Low	Field bus module PDI-3 input	Depending on Parameter P5-14 ("NETReceivePZD3") 0 = Torque limit / reference 1 = User PID reference register 2 = User register 3
2	8, …, 15 High		

Process data input 4 (PDI 4)

Configured with parameter P5-13 (DA1 only).

The following settings can also be modified during operation:

Table 63: Process data input 4 – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 Low	Field bus module PDI-4 input	Depending on Parameter P5-13 ("NETReceivePZD4") 0 = Ramp control field bus 1 = User register 4
2	8, …, 15 High		

4.8.3.2 Cyclic Input Data

This cyclic Output Data is transferred from Drive to DX-NET-PROFINET2-2.

Table 64: Cyclic Output Data for the "Transparent Mode" profile

Telegram	Profile name / data length	Output Data (status) of variable frequency drive/variable speed starter -> PLC			
Vendor specific 999	"Transparent Mode" 4 x 16-bit	Status Word 1 (VFD Status and active faults)	Frequency actual value	Motor Current	Motor Torque
Status Data 4 word	"Transparent Mode" 4 x 16-bit	Status Word (VFD Status and active faults)	Frequency actual value	PDO3 (only in DA1)	PDO4 (only in DA1)

Status Word

Status Word – "Transparent Mode" – contains general Status Information and active fault codes.

Device status information is provided in Status Word Byte 1 (bit 0 to bit 7) and active fault code in Byte 2 (bit 8 to bit 15).

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MSB															LSB
Active fault code								Status Information							

→ The fault codes can be found in → Section "Errors and diagnostics".

The following table shows the structure of Byte 1 from the Status Word.

Status Word

Table 65: Status Word – "Transparent Mode" profile

Bit	Description	
	Value = 0	**Value = 1**
0	Drive not ready	Ready for operation (READY)
1	Stop	Running operation message (RUN)
2	Clockwise rotating field (FWD)	Anticlockwise rotating field (REV)
3	No fault	Fault detected (FAULT)
4	Acceleration ramp	Frequency actual value equals setpoint
5	–	Zero speed
6	Speed control deactivated	Speed control activated
7	Hardware enable signal not present	Hardware enable signal present

If bit 0 is not active, check the mains voltage.
If no mains voltage is present, the bit = 0.

Frequency actual value

Table 66: Frequency actual value – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
0		Frequency actual value	The actual speed of the variable frequency drive/variable speed starter ranges between P-02 (minimum frequency) and P-01 (maximum frequency). In the application, the values will be scaled by a factor of 0.1.
1			

Motor Current

Table 67: Motor Current – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
0	0, …, 7 Low	Motor Current	Motor Current in ampere The Motor Current is specified with one decimal place. Example: 34 ≙ 3.4 A
1	8, …, 15 High		

Motor torque

Table 68: Motor torque – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
0	0, …, 7 Low	Motor torque	Motor Torque in % The motor torque is specified with one decimal place. Example: 1,000 ≙ 100.0 %
1	8, …, 15 High		

Process data output 3 (PDO 3)

Configured with parameter P5-12 (DA1 only).

The following settings can also be modified during operation:

Table 69: Process data output 3 – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 Low	Field bus module PDO-3 output	Depending on Parameter P5-12 ("NETSendPZD3") 0 = Output current 1 = Output power 2 = DI status 3 = AI2 signal level 4 = Heat sink temperature 5 = User register 1 6 = User register 2 7 = P0-80
2	8, …, 15 High		

Process data output 4 (PDO 4)

Configured with parameter P5-12 (DA1 only).

The following settings can also be modified during operation:

Table 70: Process data output 3 – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
1	0, …, 7 Low	Field bus module PDO-4 output	Depending on Parameter P5-08 ("NETSendPZD4") 0 = Motor torque 1 = Output power 2 = DI status 3 = AI2 signal level 4 = Heat sink temperature
2	8, …, 15 High		

4.8.3.3 DX...-NET-PROFINET

To operate the VFD in transparent mode, the drive must be switched to bypass mode. The setting can be made under "Card settings -> Operation mode", → Table 14 for DG1, → Table 21 for DM1 and → Table 26 for DX1.

The control and status words used in transparent mode with one of the four modules follow the surface mounting defined in Modbus communication. Control Word, Status Word, Current Speed, Speed reference, and 8 Process Data are used for the input and output data respectively..

Table 71: Cyclic Output Data for Transparent Mode

Telegram	Profile name / data length	Status words			Module 1		Module 2		Module 3		Module 4	
Eaton Telegram 999	"Transparent Mode"	Status Word	reserved	Actual Value	DataOut 1	DataOut 2	DataOut 3	DataOut 4	DataOut 5	DataOut 6	DataOut 7	DataOut 8
	6 Bytes + 4 Bytes per module	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes

Four modules are available for free use; they must be selected in the PLC program. The data to be supplied by the modules can be defined by the user in the VFD under parameter group "process data input".

Status Word

Status Word contains general status information.

Table 72: Status word 1 – "Transparent Mode" profile

Bit	Description	
	Value = 0	Value = 1
0	Drive not ready	Ready for operation (READY)
1	Stop	Running operation message (RUN)
2	Clockwise rotating field (FWD)	Anticlockwise rotating field (REV)
3	No fault	Fault detected (FAULT)
4	no warning	Warning detected (WARNING)
5	Acceleration ramp	Frequency actual value equals setpoint
6	Bypass not enabled	Bypass enabled (Bypass RUN)
7	Speed control deactivated	Speed control activated
8	reserved	reserved
9	reserved	reserved
10	reserved	reserved
11	reserved	reserved
12	reserved	reserved
13	reserved	reserved
14	reserved	reserved
15	reserved	reserved

Frequency actual value

"Transparent mode" contains the actual speed of variable frequency drive.

Table 73: Frequency actual value – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
0		Frequency actual value	The actual speed of the variable frequency drive is in the value range between "minimum frequency" and "maximum frequency". In the application, the values will be scaled by a factor of 0.1.
1			

Process data outputs

8 process data outputs are available, which can be selected under parameter group P20.2 in DG1; P10.2 in DM1; P96.2 in DX1.

Cyclic Input Data

Table 74: Cyclic Input Data for Transparent mode

Telegram	Profile name / data length	Control words			Module 1		Module 2		Module 3		Module 4	
Eaton Telegram 999	"Transparent Mode"	Control word 1	reserved	Frequency Setpoint	DataIn 1	DataIn 2	DataIn 3	DataIn 4	DataIn 5	DataIn 6	DataIn 7	DataIn 8
	6 Bytes + 4 Bytes per module	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes	2 Bytes

Four modules are available for free use; they must be selected in the PLC program. The data to be supplied by the modules can be defined by the user in variable frequency drive under parameter group "process data input".

Control Word

The following bits are used to control variable frequency drive.

Table 75: Control Word – "Transparent Mode" profile

Bit	Description	
	Value = 0	**Value = 1**
0	Stop	Operation
1	Clockwise rotating field (FWD)	Anticlockwise rotating field (REV)
2	No action	Fault Reset
3	FB DataIn 1 Off	FB DataIn 1 On
4	FB DataIn 2 Off	FB DataIn 2 On
5	FB DataIn 3 Off	FB DataIn 3 On
6	FB DataIn 4 Off	FB DataIn 4 On
7	Bypass Relay Disable	Bypass Relay Enable
8	Field bus control OFF	Field bus control ON
9	Field bus speed OFF	Field bus speed ON
10	reserved	reserved
11	reserved	reserved
12	reserved	reserved
13	reserved	reserved
14	reserved	reserved
15	reserved	reserved

FB DataIn 1 to FB DataIn 4 are the Fieldbus Process Data Inputs.

To be able to control the variable frequency drive, bit 8 and bit 9 must be enabled.

Table 76: Frequency Setpoin – "Transparent Mode" profile

Byte	Bit	Designation	Meaning
0		Frequency Setpoint	Setpoint input The permissible values are in the range of f-min (minimum frequency) and f-max (maximum frequency). In the application, the values will be scaled by a factor of 0.1.
1			

Process data inputs

Eight process data inputs are available, which can be selected under parameter group: P20.1 in DG1; P10.1 in DM1; P96.1 in DX1.

4.9 Special features of the DG1, DM1 and DX1

4.9.1 Operating Mode

- 0 = EatonDrive (DX1) / ProfiDrive (DG1, DM1)
- 1 = Echo
- 2 = Bypass

The "BX.1.2.1 Operate Mode" parameter above defines how the input/ output data is handled on the option card.

4.9.2 EatonDrive/ProfiDrive

This Mode is used for ProfiDrive specific telegrams :

- Standard Telegram 1 (DG1 and DM1 only)
- Telegram 0 (DG1 and DM1 only)
- PD Short (Telegram 1000).

4.9.3 Echo

The OUTPUT data written by the master is echoed back to the master in the INPUT field.

The data is not reflected in the variable frequency drive, but on the option card. This mode can be used to test the ProfiDrive specific telegrams.

4.9.4 Bypass

The information of the process data field is transferred to the application interface without processing. The desired modules define the amount of data that will be transferred. As soon as the variable frequency drive is switched to bypass mode, it offers the possibility to set the desired module.

This mode is used for Eaton specific telegrams:

- Transparent Mode (Eaton Telegram 999)
- Process Data Module 1-4

4.10 Acyclic data

This section is intended for programming experts.

In order for acyclic data to be transmitted and diagnostic activities to be performed, the higher-level PLC must feature acyclic services.

4.10.1 Introduction

Acyclic communications are used to read and write parameters and diagnostic data in the variable frequency drive/variable speed starter; they can take place at the same time as cyclical data is being transferred. This means that acyclic communications are independent from the selected profile.

In order for acyclic data to be transmitted and diagnostic activities to be performed, the higher-level PLC must feature acyclic services.

Thus, the parameter access consists of two elements.

- Write job ("Write data record")
- Read request ("Read data record")

The job can be sent via DPV1 master class 1 or master class 2.

For a DPV1 write job, slot 0, index 47 is used on the data block.

4.10.2 Data types

Several data types are defined for using PROFIdrive communication: PROFIdrive-specific data types as well as standard data types.

4.10.2.1 PROFIdrive-specific data types

The PROFIdrive-specific data types are defined in PROFIdrive Profile Specification.

TimeDifference

The value used for TimeDifference is stored in the "Sampling Time" (PNU 962) parameter.

Table 77: TimeDifference

Data type	Code [dec]	Code [hex]	Bytes	Value range	Resolution
TimeDifference	13	D	2	$0 \leq i \leq 4294967295$	$2^{-31} \triangleq 0.021$ ms

Example:

100 ms $\triangleq 4971_{dec} \triangleq 136B_{hex}$

86400000 ms (= 1 day) ≙ 4294967295_{dec} ≙ $FFFFFFFF_{hex}$

Normalized value N2

N2 is a normalized 16-bit value for relative scaling.
N2 falls within a range of -200 % to +200 %.

Table 78: Normalized value N2

Data type	Code [dec]	Code [hex]	Bytes	Value range	Resolution
Normalized value N2	113	71	2	$-200\ \% \le i \le (200 - 2^{-14})\ \%$	$2^{-14} \triangleq 0.0061\ \%$

Conversion examples

Without sign bit:

$0_{dec} = 0x0000_{hex} \triangleq 0\ \%$
$1_{dec} = 0x0001_{hex} \triangleq 0.0061\ \%$
$16384_{dec} = 0x4000_{hex} \triangleq 100\ \%$
$32767_{dec} = 0x7FFF_{hex} \triangleq 199.99\ \%$

With sign bit (bit 15):

$-1_{dec} = 0xFFF_{hex} \triangleq -0.0061\ \%$
$-16384_{dec} = 0xC000_{hex} \triangleq -100\ \%$
$-32768_{dec} = 0x8000_{hex} \triangleq -200\ \%$

For coding, the most significant bit (MSB) comes directly after the SN bit (sign bit) in the first octet:
SN = 0: Positive numbers, including 0
SN = 1: Negative numbers

Table 79: Octet structure

Octet	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1
1	SN	2^{-0}	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}
2	2^{-7}	2^{-8}	2^{-9}	2^{-10}	2^{-11}	2^{-12}	2^{-13}	2^{-14}
3	2^{-15}	2^{-16}	2^{-17}	2^{-18}	2^{-19}	2^{-20}	2^{-21}	2^{-22}
4	2^{-23}	2^{-24}	2^{-25}	2^{-26}	2^{-27}	2^{-28}	2^{-29}	2^{-30}

Bit sequence V2

In this bit string, 16 variables of type BOOLEAN are represented in two octets.

Code: $115_{dec} = 73_{hex}$

Table 80: Bit sequence V2

Octet	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1
1	15	14	13	12	11	10	9	8
2	7	6	5	4	3	2	1	0

Time constant D2

The values of the time data type D2 always refer to a specific, constant sampling time T_a. This time T_a is the smallest sampling time (defined in PNU 962) and is required here to evaluate D2.

The value for D2 can be calculated as follows: $D2 = i \times T_a/16384$

Table 81: Time constant D2

Data type	Code [dec]	Code [hex]	Byte	Value range	Resolution
Time constant D2	120	78	1	$0 \leqq i \leqq (2 - 2^{-14}) \times T_a$	$2^{-14} \times T_a$

Time constant T2

The values of the time data type T2 always refer to a specific, constant sampling time T_a. T_a is the smallest sampling time (defined in PNU 962).

It is required here to calculate T2. The following applies: $T2 = i \times T_a$

Table 82: Time constant T2

Data type	Code [dec]	Code [hex]	Byte	Value range	Resolution
Time constant T2 (16 bits)	118	76	1	$0 \leqq i \leqq 32767 \times T_a$	T_a
Time constant T2 (32 bits)	119	77	2	$0 \leqq i \leqq 4294967295 \times T_a$	T_a

4.10.2.2 Standard data types

The standard data types are defined in IEC 61158-5-19 where you can also find more information about them.

4.11 Parameter list

The following table lists all parameters that must be processed acyclicly via PROFINET.

The abbreviations and acronyms used in the overview are defined below:

Table 83: Abbreviations

Abbreviation	Meaning
PNU	Parameter number, designation of the parameter in the parameter software and in the displays of the external operating unit.
PNU Subindex	Parameter number subindex
RUN	The parameter can be accessed during operation (Run signal)
STOP	The parameter can only be accessed in STOP mode
ro/rw	Parameter read and write permissions: ro = read only rw = read and write
Name	Short parameter name
Value	• Setting value of the parameter • Value range • Display value
Default	Default setting (the parameter's value when using the device's factory settings) The values in parentheses are the default settings when using a frequency of 60 Hz.

The column "Parameter number in the respective device" is divided into three sub-columns for the respective PowerXL devices.

When there is a parameter number in the sub-column for a device, this means that the parameter is available on that device. The parameter will have the exact same function on all device types.

A check mark ✓ indicates that this parameter is present in the device but does not have a parameter number.

A minus sign (–) means that the parameter is not available on the device.

For more detailed information on the individual parameters, please refer to the manuals for the corresponding basic devices:

4.11.1 Parameters of DC1 and DE1

Table 84: Parameter list - parameters for DC1 and DE1

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
1	0	P00-03	P00-03	STOP	ro	N2	Frequency Reference	4000_{hex} ≙ 100 % 100 % ≙ 20.1
5	1	P-20	P-20	RUN	rw	N2	f-Fix1	Fixed frequency 1 4000_{hex} ≙ 100 % 100 % ≙ 20.1
	2	P-21	P-21	RUN	rw	N2	f-Fix2	Fixed frequency 2 4000_{hex} ≙ 100 % 100 % ≙ 20.1
	3	P-22	P-22	RUN	rw	N2	f-Fix3	Fixed frequency 3 4000_{hex} ≙ 100 % 100 % ≙ 20.1
	4	P-23	P-23	RUN	rw	N2	f-Fix4	Fixed frequency 4 4000_{hex} ≙ 100 % 100 % ≙ 20.1
20	0	P-02	P-02	STOP	rw	U16	f-min	Used to set the minimum output frequency; can be set to any value between 0 and f-max 3000 ≙ 50 Hz
	1	P-01	P-01	STOP	rw	U16	f-max	Used to set the maximum output frequency; can be set to any value between f-min and five times the motor's rated frequency 3000 ≙ 50 Hz
21	0	P-27	P-43	STOP	rw	U16	f-Skip1	3000 ≙ 50 Hz
22	0	P-26	P-42	STOP	rw	U16	f-SkipBand1	3000 ≙ 50 Hz
23	1	P-29	–	STOP	rw	U16		Details in Hz
24	1	P-28	–	STOP	rw	U16		Details in Volt
27	0	P-11	P-11	STOP	rw	U16	V-Boost	Motor voltage boost at low output frequencies in order to improve the starting torque and runout characteristics at low speeds. 100 ≙ 10 % The setting range will depend on the device type.
111	0	P-03	P-03	RUN	rw	T2	t-acc	Sets the acceleration ramp time in seconds. The time set here is the time for accelerating from a latching to the rated motor frequency set in P-09. 300 ≙ 3.00 s
114	0	P-04	P-04	RUN	rw	T2	t-dec	Sets the deceleration ramp time in seconds. The time set here is the time for decelerating from the motor's rated frequency to a full stop. 300 ≙ 3.00 s

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
116	0	P-24	–	RUN	rw	U16	t-QuickDec	Quick stop ramp In default the second deceleration ramp is activated by applying voltage to DI1 and DI2 (terminals 2 and 3) at the same time. 250 ≙ 2.50 s
202	0	P00-29	P00-20	STOP	ro	U16	DeviceType	String: e.g., "DC1"
203	0	✓	✓	STOP	ro	UInt16	HW Version Device	Variable frequency drive hardware version
	1	✓	✓	STOP	ro	UInt16	HW Version Interface	Hardware version of the interface
206	0	P00-28	P00-18	STOP	ro	S16	System Version	103 ≙ 1.03
	1	P00-28	P00-18	STOP	ro	U16	Application Version	103 ≙ 1.03
207	0	P00-50	–	STOP	ro	–	System Software Version	Version of the system software
	1	P00-50	–	STOP	ro	–	Application Software Version	Version of the application software
209	0	P00-30	P00-19	STOP	ro	Octet[11]	Serial Number	11 byte ASCII code
210	0	P-08	P-08	STOP	rw	U16	Motor Nom Current	By setting the "Motor Nom Current" in the drive, the motor overload protection is configured to match the motor rating. The maximum value will depend on the basic device and is always specified with one decimal place. Example: 14 ≙ 1.4 A
211	0	P-07	P-07	STOP	rw	U16	Motor Nom Voltage	Used to define the motor's rated operating voltage, e.g., the voltage on the motor when it is running at the rated frequency. Details in Volt
216	0	P-09	P-09	-	rw	U16	Motor Nom Frequency	The rated frequency of the motor. This is the frequency at which "Motor Nom Voltage" is applied to the motor. Details in Hz
217	0	P-10	P-10	STOP	rw	U16	Motor Nom Speed	Details in rpm
218	0	P-64	P-46	STOP	rw	U16	Motor Stator Resistance R1	Motor stator resistance
219	0	P-65	–	STOP	rw	U16	Motor Stator Inductance d-Axis	Motor leakage inductance (d)
220	0	P-66	–	STOP	rw	U16	Motor Stator Inductance q-Axis	Motor leakage inductance (q)
250	0	P00-29	P00-20	STOP	ro	UInt8	FrameSize	Specification of the frame size of the basic device
	1	P00-29	P00-20	STOP	ro	UInt8	NoOfInputPhases	Number of input phases of the basic device
	2	P00-29	P00-20	STOP	ro	UInt8	kW/HP	1: kW 2: HP
251	0	P00-29	P00-20	STOP	ro	U32	Device Voltage	Device input voltage Value in volts
252	0	P00-29	P00-20	STOP	ro	U16	Power@Ue	18500 ≙ 18.50
255	0	P-60	–	STOP	rw	U16	Motor Control Mode	Used to select the motor control mode.

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
260	0	P-16	P-16	RUN	rw	U16	AI1 Signal Range	Signal range for analog input, value range between 0 and 7. For more information, please refer to the manual for the basic device.
	1	P-47	–	RUN	rw	U16	AI2 Signal Range	Signal range for analog input, value range between 0 and 7. For more information, please refer to the manual for the basic device.
261	0	P-35	P-17	RUN	rw	U16	AI1 Gain	Analog input scaling Output value = Input value * Scaling. 100 ≙ 10.0 %
262	0	P-39	P-44	RUN	rw	U16	AI1 Offset	300 ≙ 30.0 %
267	0	–	P-18	RUN	rw		AI1 Invert	If this parameter is set to 1, the analog input will be inverted.
281	0	P-63	–				I-CurrentLimit	Current Limit
310	0	✓	✓	STOP	ro	UInt16	UsedStateMachine	0: Communication lost 10: PROFIdrive profile 11: 8-bit profile
320	0	P-14	P-14	RUN	rw	U16	Access Key	This parameter provides access to the extended parameter set.
	1	P-37	P-38	RUN	rw	U16	Access Key Level2	Used to define the access code that must be entered in P-14 or P1-14 in order to get access to the extended parameter set.
331	0	P-48	–	RUN	rw	U16	t-Standby	Standby-time 0 is disabled 150 ≙ 15.0 s
340	0	P-61	–	RUN	rw	WORD	Motor Identification	Auto-tune enable
381	0	P-40	–	RUN	rw	U16	Display Scale	Speed display scaling factor 1000 ≙ 0.100
390	0	P-17	P-29	STOP	rw	U16	Switching Frequency	Power stage switching frequency. Higher frequency reduces the audible 'ringing' noise from the motor, and improves the output current waveform. Disadvantage: Higher loss in the device
	1	P00-32	P00-14	STOP	ro	U16	Actual Switching Frequency	Current switching frequency. If the auto temperature management function is enabled, this value may be lower than the value set.
423	0	P-15	P-15	STOP	rw	U16	DI Config Select	The setting determines the configuration of the control signal terminals depending on the setting with 928.0. For more information, please refer to the manual for the basic device.
440	0	P00-21		–			Input Data1 Value	Value InputData1
	1	P00-21		–			Input Data2 Value	Value InputData2
	2	P00-21		–			Input Data3 Value	Value InputData3
	3	P00-21		–			Input Data4 Value	Value InputData4

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
451	0	P-18	P-51 (DE11)	RUN	rw	U16	RO1 Function	Selection of the relay output function For more information on the available settings, please refer to the manual for the basic device.
452	0	P-19	P-52 (DE11)	RUN	rw	U16	RO1 upper Limit	Limit value for relay output 1 For more information on the available settings, please refer to the manual for the basic device.
454	0	P-54	P-53 (DE11)	RUN	rw	U16	RO1 Hysteresis	Relay hysteresis band
457	0	P-55	P-54 (DE11)				RO1 Switch-On Delay	
460	0	P-25	–	RUN	rw	U16	AO1 Function	Used to select the analog output function For more information on the available settings, please refer to the manual for the basic device.
501	0	P00-07	P00-07	STOP	ro	U16	Motor Voltage	Current output voltage, in volts
	1	P00-08	P00-08	STOP	ro	U16	DC-Link Voltage	Current DC link voltage, in volts
502	0	–	P00-06	STOP	ro		Output Frequency	Current output frequency, in Hz
503	0	P00-25	–	STOP	ro	U16	Motor Speed	Calculated rotor speed
504	0	✓	P00-05	STOP	ro		Motor Current	Current motor current, in amperes
505	0	P00-31	–	STOP	ro	S16	Magnetizing current Id	Magnetizing current I_d
	1	P00-31	–	STOP	ro	S16	Torque current Iq	Rotor current I_q
520	2	P00-26	–	STOP	ro	U16	MWh Meter	MWh counter total since initial commissioning
550	0	P00-04	P00-04	STOP	ro	Int8	DI1 Status	Digital input states
	1	P00-04	P00-04	STOP	ro	Int8	DI2 Status	
	2	P00-04	P00-04	STOP	ro	Int8	DI3 Status	
	3	P00-04	P00-04	STOP	ro	Int8	DI4 Status	
560	0	P00-01	P00-01	-	ro	U16	Analog Input1	Level of the signal applied to analog input 1 after scaling and offsets have been applied.
	1	P0-02	–	STOP	ro	U16	Analog Input2	500 ≙ 50.0%

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
620	0	P-30	P-30	STOP	rw	U16	Start Mode	Defines the behavior of the drive relating to the enable and also configures the automatic restart after a fault. For more information, please refer to the manual for the basic device.
	1	P-05	P-05	STOP	rw	U16	Stop Mode	Determines the action taken by the drive in the event of the drive enable signal being removed. For more information, please refer to the manual for the basic device.
	3	P-31	P-24	RUN	rw	U16	Digital Reference Reset Mode	Used to define the drive's behavior when it is started and controlled using the keypad (P-12/P1-12 = 1 or 2) or when it is controlled using the UP and DOWN signals on the terminals.
624	0	–	P-32	RUN	rw	WORD	Auto Thermal Management	If this function is disabled, the drive will switch off when there is an overtemperature signal instead of automatically reducing the switching frequency when the heat sink becomes too hot.
625	0	P-38	P-39	RUN	rw	WORD	Parameter Lock	Determines whether to lock the parameters 0: Not locked. All parameters can be changed. 1: Locked. Parameter values can be displayed, but cannot be changed. If a remote keypad is connected, parameters cannot be accessed by the remote keypad if they are locked
626	1	P-06	P-06	RUN	rw	WORD	EnergyOptimizer	When energy optimization is activated, the motor voltage is dynamically varied, dependent on load. This results in reduced voltage being applied to the motor on light load, significantly reduce energy consumption. This mode of operation is less suitable for dynamic applications where the load conditions can suddenly increase significantly.
	3	–	P-31	RUN	rw		Overvoltage Control	"The over voltage control prevents the drive from tripping in case of regenerative energy feedback from the motor to the DC link. When disabled, the drive will trip "Over Voltage" instead of automatically increasing the motor ramp times when the drive is decelerating the motor too quickly.
635	0	P-33	–	RUN	rw	U16	Spin Start Enable	Rotary start enable/DC injection at enable 0: deactivated 1: activated
640	0	–	P-45				FireMode Function	
650	2	–	P-19	RUN	rw		DI3 Logic	DE1 only: This parameter defines the logic for input 3 when parameter P-27 is set to 1, 3, 5, 7, or 9 (external fault).

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
682	0	P-51	P-33	RUN	rw	U16	T-Memory Enable	When enabled, the motor thermal memory retention function will save the calculated motor thermal history on drive power down, using this saved value as the starting value on next power up. If this function is disabled, the motor thermal history is reset to zero on every power up.
821	0	P00-10	P00-10	STOP	ro	U32	t-Run	The drive's total operating time since the date of manufacture, in hours, minutes and seconds.
	3	P00-14	P00-14	STOP	ro	U32	t-HoursRun Enable	The drive's operating time since the most recent enable signal, in hours, minutes, and seconds.
	4	P00-27	–	STOP	ro		Fan Runtime	Total fan operating time
	5	P00-11	P00-12	STOP	ro	U32	t-Run since Trip	The drive's operating time since the most recent fault, in hours, minutes, and seconds.
	6	P00-24	–	STOP	ro	U16	t-Run PCB in OT	The drive's operating hours at a temperature higher than 80 °C inside the housing
	7	P00-23	–	STOP	ro	U16	t-Run IGBT in OT	The drive's operating hours at a heat sink temperature higher than 85 °C
	8	P00-43	–	STOP	ro		t-PowerOn	The drive's operating time
	11	P00-47	P00-22				t-FireMode Active	Run time in Fire Mode
822	0	P00-09	P00-09		ro	S16	Heatsink Temperature	Current heat sink temperature, in °C
	2	P00-20	–				T-Controlboard	Internal ambient temperature of the device, measured on the control board
831	0	P00-06	–	STOP	ro		DC-Link Voltage Ripple	DC link voltage ripple
840	29952	P-53	P-40	STOP	ro	U16	Action@Communication Loss	Device reaction after occuring of „Communication Loss". Possibilities device dependent

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
841	12816	P00-34	–	STOP	ro		FaultCounter DC-Overvoltage	Shows the number of overvoltage faults since the date of manufacture
	12832	P00-35	–	STOP	ro		FaultCounter DC-Undervoltage	Shows the number of undervoltage faults since the date of manufacture
	16656	P00-38	–	STOP	ro		FaultCounter Over-temperature Ambient	Shows the number of ambient overtemperature faults since the date of manufacture
	16944	P00-36	–	STOP	ro		FaultCounter Over-temperature Heatsink	Shows the number of heat sink overtemperature faults since the date of manufacture
	22017	P00-41	–	STOP	ro		FaultCounter Internal Fault (IO)	Shows the number of internal control board communication faults since the last time the processor was started.
	22018	P00-42	–	STOP	ro		FaultCounter Internal Fault (DSP)	Shows the number of internal power board communication faults since the last time the processor was started.
	28946	P00-37	–	STOP	ro		FaultCounter Overcurrent Brake Chopper	The number of braking chopper overcurrent faults since its date of manufacture
	29952	P00-39	–	STOP	ro		FaultCounter Communication Loss	Number of Modbus RTU communication faults since the last time the processor was started.
	30000	P00-40	–	STOP	ro		FaultCounter CANopen COM Loss	Number of CANopen communication faults since the last time the processor was started.
	8736	P00-33	–	STOP	ro		FaultCounter Overcurrent	Overcurrent counter since the date of manufacture
851	0	P00-16	P00-16	STOP	ro	U16	Heatsink0 Log	Displays the most recent 8 samples of the heat sink temperature prior to a drive trip condition occurring. The sample interval is 500 ms.
	1	P00-16	P00-16	STOP	ro	U16	Heatsink1 Log	
	2	P00-16	P00-16	STOP	ro	U16	Heatsink2 Log	
	3	P00-16	P00-16	STOP	ro	U16	Heatsink3 Log	
	4	P00-16	P00-16	STOP	ro	U16	Heatsink4 Log	
	5	P00-16	P00-16	STOP	ro	U16	Heatsink5 Log	
	6	P00-16	P00-16	STOP	ro	U16	Heatsink6 Log	
	7	P00-16	P00-16	STOP	ro	U16	Heatsink7 Log	
852	0	P00-15	P00-15	STOP	ro	U16	DC-Link0 Log	Displays the most recent 8 samples of the DC bus voltage prior to a drive trip condition occurring. The sample interval is 256 ms.
	1	P00-15	P00-15	STOP	ro	U16	DC-Link1 Log	
	2	P00-15	P00-15	STOP	ro	U16	DC-Link2 Log	
	3	P00-15	P00-15	STOP	ro	U16	DC-Link3 Log	
	4	P00-15	P00-15	STOP	ro	U16	DC-Link4 Log	
	5	P00-15	P00-15	STOP	ro	U16	DC-Link5 Log	
	6	P00-15	P00-15	STOP	ro	U16	DC-Link6 Log	
	7	P00-15	P00-15	STOP	ro	U16	DC-Link7 Log	

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
853	0	P00-18	–	STOP	ro	U16	DC-Link V-Ripple0 Log	Shows the last eight DC link ripple values before the device was switched off due to a fault. The sample interval is 20 ms.
	1	P00-18	–	STOP	ro	U16	DC-Link V-Ripple1 Log	
	2	P00-18	–	STOP	ro	U16	DC-Link V-Ripple2 Log	
	3	P00-18	–	STOP	ro	U16	DC-Link V-Ripple3 Log	
	4	P00-18	–	STOP	ro	U16	DC-Link V-Ripple4 Log	
	5	P00-18	–	STOP	ro	U16	DC-Link V-Ripple5 Log	
	6	P00-18	–	STOP	ro	U16	DC-Link V-Ripple6 Log	
	7	P00-18	–	STOP	ro	U16	DC-Link V-Ripple7 Log	
855	0	P00-17	P00-17	STOP	ro	U16	MotorCurrent0 Log	Displays the most recent 8 samples of the Motor current prior to a drive trip condition occurring. The sample interval is 250 ms. 100 ≙ 10.0 A
	1	P00-17	P00-17	STOP	ro	U16	MotorCurrent1 Log	
	2	P00-17	P00-17	STOP	ro	U16	MotorCurrent2 Log	
	3	P00-17	P00-17	STOP	ro	U16	MotorCurrent3 Log	
	4	P00-17	P00-17	STOP	ro	U16	MotorCurrent4 Log	
	5	P00-17	P00-17	STOP	ro	U16	MotorCurrent5 Log	
	6	P00-17	P00-17	STOP	ro	U16	MotorCurrent6 Log	
	7	P00-17	P00-17	STOP	ro	U16	MotorCurrent7 Log	
859	0	P00-19	–	STOP	ro	U16	AmbientTemp0 Log	Shows the last eight ambient temperature values before the device was switched off due to a fault. The sample interval is 30 ms.
	1	P00-19	–	STOP	ro	U16	AmbientTemp1 Log	
	2	P00-19	–	STOP	ro	U16	AmbientTemp2 Log	
	3	P00-19	–	STOP	ro	U16	AmbientTemp3 Log	
	4	P00-19	–	STOP	ro	U16	AmbientTemp4 Log	
	5	P00-19	–	STOP	ro	U16	AmbientTemp5 Log	
	6	P00-19	–	STOP	ro	U16	AmbientTemp6 Log	
	7	P00-19	–	STOP	ro	U16	AmbientTemp7 Log	
860	0	✓	✓	STOP	ro	U32	WarningWord	Shows the current device warning
918	0	P-36	P-34	STOP	rw	U16	PDP-Address	Unique drive address in a communication network.
927	0	P-52	P-41	STOP	rw	U16	ParameterAccess	0: All parameters can be changed by any source. 1: All parameters are locked and can only be changed via PROFINET.
928	0	✓	✓	STOP	rw	U16	ProcessDataAccess	
944	0	✓	✓	STOP	ro	U16	FaultcounterPDP	Total number of errors occurred

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
947	0	P00-13	P-13	STOP	ro	UInt16	Last Fault1 PDP	PROFIDRIVE fault buffer
	1	P00-13	✓	STOP	ro	UInt16	Last Fault2 PDP	
	2	P00-13	✓	STOP	ro	UInt16	Last Fault3 PDP	
	3	P00-13	✓	STOP	ro	UInt16	Last Fault4 PDP	
	4	P00-13	✓	STOP	ro	UInt16	Last Fault5 PDP	
	5	✓	✓	STOP	ro	UInt16	Last Fault6 PDP	
	6	✓	✓	STOP	ro	UInt16	Last Fault7 PDP	
	7	✓	✓	STOP	ro	UInt16	Last Fault8 PDP	
950	0	✓	✓	STOP	ro	UInt16	Fault Situations Max	
	1	✓	✓	STOP	ro	UInt16	Faults per Situation	
952	0	✓	✓	STOP	ro	UInt16	Fault Situation Counter	
962	0	✓	✓	STOP	ro	TimeDiff4	PDP-Cycletime	Fixed to 10 ms Basis for all T parameters
964	0	✓	✓	STOP	ro	UInt16	PDP-Manufacturer	
	1	✓	✓	STOP	ro	UInt16	PDP-Device Type	
	2	✓	✓	STOP	ro	UInt16	PDP-FW-Interface	
	3	✓	✓	STOP	ro	UInt16	PDP-FW-Year	
	4	✓	✓	STOP	ro	UInt16	PDP-FW-DayMonth	In decimal MM TT format
	5	✓	✓	STOP	ro	UInt16	PDP-NoOfDOs	
965	0	✓	✓	STOP	ro	Octet[2]	PDP-ProfilNumber	
974	0	✓	✓	STOP	ro	UInt16	PDP-MaxBlockLength	Parameter channel description
	1	✓	✓	STOP	ro	UInt16	PDP-NoOfMultiparameter	
	2	✓	✓	STOP	ro	UInt16	PDP-MaxLatency	
975	0	✓	✓	STOP	ro	UInt16	PDP-DO Manufacturer	Manufacturer
	1	✓	✓	STOP	ro	UInt16	PDP-DO Device Type	
	2	✓	✓	STOP	ro	UInt16	PDP-DO FW-Interface	xx.yy decimal: Notation: xx.yy
	3	✓	✓	STOP	ro	UInt16	PDP-DO FW-Year	Firmware year in decimal format
	4	✓	✓	STOP	ro	UInt16	PDP-DO FW-DayMonth	In decimal MM TT format
	5	✓	✓	STOP	ro	UInt16	PDP-DO NoOfDOs	1 Do not read-out
	6	✓	✓	STOP	ro	UInt16	PDP-DO Subclass	1
976	0	✓	P-37	STOP	rw	UInt16	Parameter Set	The default settings will be restored if this parameter is set to 1.
980	0	✓	✓	STOP	rw	UInt16	PDP-DefPara0	List of defined parameters
2100	0	P-41	–	RUN	rw	U16	PID1 Kp	The controller's Kp component 10 ≙ 1.0
2101	0	P-42	–	RUN	rw	U16	PID1 Ti	The controller's integral component 10 ≙ 1.0

PNU	PNU	Parameter Number		Access right		Data type	Name	Description
Index	Sub-index	DC1	DE1	RUN/ STOP	ro/rw			
2110	0	P-44	–	RUN	rw	U16	PID1 Set Point 1 Source	Used to select the setpoint source For more information, please refer to the manual for the basic device.
2111	0	P-45	–	RUN	rw	U16	PID1 Set Point Digital	Digital setpoint 10 ≙ 1.0
2112	0	P-46	–	RUN	rw	WORD	PID1 Feedback 1 Source	Selection of actual value source For more information, please refer to the manual for the basic device.
2123	0	P-43	–	RUN	rw	WORD	PID1 Mode	Operation Mode 0: direct operation 1: Inverted operation
2124	0	P00-05	–				PID1 Output	PI(D) controller 1 Output
2131	0	P-49	–	RUN	rw	U16	PID1 WakeUpLevel	Actual value wakeup level for controller 900 ≙ 90.0 %
2204	0	P-34	–	RUN	rw	U16	Brake Chopper	Brake chopper activation For more information, please refer to the manual for the basic device.
2220	0	–	P-27	RUN	rw	U16	DCBrakeVoltage	Used to define the DC voltage, as a percentage of the motor's rated voltage, that will be applied to the motor during DC braking.
2221	0	P-32	P-25	RUN	rw	U16	DCBrake	Used to define the operating states in which DC braking will be activated.
2222	1	P-32	P-26				t-DCBrake@Stop	Duration of DC braking at Stop and before Start. Setting 0 disables DC braking. The braking level is set with P-68.
2223	0	P-67	P-28	RUN	rw		f-DCBrake@Stop	Percentage of the maximum frequency at which DC braking will start during the deceleration phase.
2227	0	P-68	–				DC-Brake Current	
2408	0	P-62	–				MSC Gain	
3221		P-36	P-47				RS485-0 Address	
3222	0	P-36	P-35	RUN	rw		RS485-0 Baudrate	Modbus Baud rate
3224	0	P-56	P-48	RUN	rw		RS485-0 ParityType	Modbus RTU data format
3254	0	P-57	–				TCP Enable Service	
3255	0	P-58	–				TCP0 SecurityTimeout	
3290	0	P-36	P-36	RUN	rw	U16	Modbus RTU0 COM Timeout	Time between the moment communications are lost and the moment the device is switched off as a result.
3302	0	P-50	–	RUN	rw	U16	CAN0 Baudrate	CANopen Baudrate For more information, please refer to the manual for the basic device.
4211	0	P-13	–				Application Mode Macro	Influences multiple parameter values inside the drive and combines them to an application specific configuration.

4.11.2 Parameters of DA1

Table 85: Parameter list - parameters for DA1

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
9			Variable frequency drive ID	ro		
10			Variable frequency drive part no.	ro		
11			Control section software	ro		
12			Control section checksum	ro		
13			Software power section	ro		
14			Power section checksum	ro		
15			Serial number 1	ro		
16			Serial number 2	ro		
17			Serial number 3	ro		
18			Serial number 4	ro		
101	P1-01	U16	maximum frequency / maximum speed	rw	RUN	3000 ≙ 50.0 Hz
102	P1-02	U16	minimum frequency/ minimum speed	rw	RUN	3000 ≙ 50.0 Hz
103	P1-03	U16	Acceleration time (acc1)	rw	RUN	300 ≙ 30.0 s
104	P1-04	U16	Deceleration time (dec1)	rw	RUN	300 ≙ 30.0 s
105	P1-05	U16	Stop Function	rw	RUN	–
106	P1-06	WORD	Energy optimization	rw	RUN	–
107	P1-07	U16	Motor, rated operating voltage	rw	STOP	230 ≙ 230 V
108	P1-08	U16	Motor, rated operational current	rw	STOP	1 ≙ 0.1 A
109	P1-09	U16	Motor, rated frequency	rw	STOP	50 ≙ 50 Hz
110	P1-10	U16	Motor, rated speed	rw	RUN	1500 ≙ 1500 rpm
111	P1-11	S16	Output voltage at zero frequency	rw	STOP	-1 ≙ Auto 0 ≙ Disabled 1 ≙ 0.1 %
112	P1-12	U16	Control level	rw	STOP	–
113	P1-13	U16	Function of the digital input	rw	STOP	–
114	P1-14	U16	Parameter range access code (depends on P2-40 and P6-30)	rw	RUN	–
201	P2-01	U16	Fixed frequency FF1 / speed 1	rw	RUN	3000 ≙ 50.0 Hz
202	P2-02	U16	Fixed frequency FF2 / speed 2	rw	RUN	3000 ≙ 50.0 Hz
203	P2-03	U16	Fixed frequency FF3 / speed 3	rw	RUN	3000 ≙ 50.0 Hz
204	P2-04	U16	Fixed frequency FF4 / speed 4	rw	RUN	3000 ≙ 50.0 Hz
205	P2-05	U16	Fixed frequency FF5 / speed 5	rw	RUN	3000 ≙ 50.0 Hz
206	P2-06	U16	Fixed frequency FF6 / speed 6	rw	RUN	3000 ≙ 50.0 Hz
207	P2-07	U16	Fixed frequency FF7 / speed 7	rw	RUN	3000 ≙ 50.0 Hz
208	P2-08	U16	Fixed frequency FF8 / speed 8	rw	RUN	3000 ≙ 50.0 Hz
209	P2-09	U16	Frequency jump 1, bandwidth	rw	RUN	3000 ≙ 50.0 Hz
210	P2-10	U16	Frequency skip 1, center	rw	RUN	3000 ≙ 50.0 Hz

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
211	P2-11	U16	AO1 signal (Analog Output)	rw	RUN	–
212	P2-12	U16	AO1, signal range	rw	RUN	–
213	P2-13	U16	AO2 signal (Analog Output)	rw	RUN	–
214	P2-14	U16	AO2, signal range	rw	RUN	–
215	P2-15	U16	RO1 Signal (Relay 1 Output)	rw	RUN	1 ≙ 1
216	P2-16	U16	AO1 / RO1 upper limit	rw	RUN	1 ≙ 0.1 %
217	P2-17	U16	AO1 / RO1 lower limit	rw	RUN	1 ≙ 0.1 %
218	P2-18	U16	RO2 Signal (Relay Output)	rw	RUN	1 ≙ 1
219	P2-19	U16	AO2 / RO2 upper limit	rw	RUN	1 ≙ 0.1 %
220	P2-20	U16	AO2 / RO2 lower limit	rw	RUN	1 ≙ 0.1 %
221	P2-21	U16	Scaling factor for value	rw	RUN	1 ≙ 0.001
222	P2-22	U16	scaled display value	rw	RUN	–
223	P2-23	U16	Holding time for speed of zero	rw	RUN	1 ≙ 0.1
224	P2-24	U16	Pulse frequency	rw	RUN	–
225	P2-25	U16	Quick stop deceleration ramp time	rw	RUN	FS2, FS3: 1 ≙ 0.01 s FS4, …,FS7: 1 ≙ 0.1 s
226	P2-26	WORD	Motor flying restart circuit	rw	RUN	1 ≙ 1
227	P2-27	U16	Delay time Standby mode	rw	RUN	1 ≙ 0.01
228	P2-28	U16	Slave speed scaling	rw	RUN	–
229	P2-29	S16	Slave speed scaling factor	rw	RUN	1 ≙ 0.1
230	P2-30	U16	AI1 signal range	rw	RUN	–
231	P2-31	U16	AI1 scaling factor	rw	RUN	1 ≙ 0.1
232	P2-32	S16	AI1 offset	rw	RUN	1 ≙ 0.1
233	P2-33	U16	AI2 signal range	rw	RUN	–
234	P2-34	U16	AI2 scaling factor	rw	RUN	1 ≙ 0.1
235	P2-35	S16	AI2 offset	rw	RUN	1 ≙ 0.1
236	P2-36	U16	REAF, Start function with automatic restart, control signal terminals	rw	RUN	–
237	P2-37	U16	REAF, start function with automatic restart	rw	RUN	–
238	P2-38	U16	Response in the event of a power failure	rw	RUN	–
239	P2-39	WORD	Parameter access lock	rw	RUN	–
240	P2-40	U16	Access codes - menu level 2	rw	RUN	–
301	P3-01	U16	PID controllers, P amplification	rw	RUN	1 ≙ 0.1
302	P3-02	U16	PID controller, I time constant	rw	RUN	1 ≙ 0.1
303	P3-03	U16	PID controller, D time constant	rw	RUN	1 ≙ 0.01
304	P3-04	WORD	PID controller, control deviation	rw	RUN	–
305	P3-05	U16	PID controller, setpoint source	rw	RUN	1 ≙ 1
306	P3-06	U16	PID controller, digital reference value	rw	RUN	1 ≙ 0.1 %

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
307	P3-07	U16	PID controller, actual value limiting, maximum	rw	RUN	1 ≙ 0.1 %
308	P3-08	U16	PID controller, actual value limiting, minimum	rw	RUN	1 ≙ 0.1 %
309	P3-09	U16	PID controller, actual value limiting	rw	RUN	–
310	P3-10	WORD	PID controller, actual value (PV)	rw	RUN	–
311	P3-11	U16	Maximum PID error for enabling the ramps	rw	RUN	1 ≙ 0.1 %
312	P3-12	U16	PID feedback display scaling factor	rw	RUN	0: disabled 1 ≙ 0.001
313	P3-13	U16	PID feedback wake up level	rw	RUN	1 ≙ 0.1 %
314	P3-14	0	reserved	-	-	–
315	P3-15	0	reserved	-	-	–
316	P3-16	0	reserved	-	-	–
317	P3-17	0	reserved	-	-	–
318	P3-18	U16	PID reset control	rw	RUN	1 ≙ 1
401	P4-01	U16	Motor control mode selection	rw	STOP	0
402	P4-02	WORD	Auto-tune enable	rw	STOP	0
403	P4-03	U16	Rotational speed controller P gain	rw	RUN	1 ≙ 0.1 %
404	P4-04	U16	Speed controller integral time	rw	RUN	1 ≙ 0.001 s
405	P4-05	U16	Motor power factor (cos φ)	rw	RUN	99 ≙ 0.99
406	P4-06	U16	Torque setpoint/limit	rw	RUN	1 ≙ 1
407	P4-07	U16	Maximum torque (motor)	rw	RUN	2000 ≙ 200.0 %
408	P4-08	U16	minimum torque	rw	RUN	1 ≙ 0.1 %
409	P4-09	U16	Maximum torque (generator)	rw	RUN	1 ≙ 1%
410	P4-10	U16	V/Hz characteristic curve modification voltage	rw	STOP	1 ≙ 0.1 %
411	P4-11	U16	V/Hz characteristic curve modification frequency	rw	RUN	1 ≙ 0.1 %
412	P4-12	U16	T-Memory Enable	rw	RUN	1 ≙ 1
413	P4-13	U16	Change Phasesequence Motor	rw	RUN	1 ≙ 1
501	P5-01	U16	Variable frequency drive: Slave address	rw	RUN	1 ≙ 1
502	P5-02	U16	CANopen baud rate	rw	RUN	0 ≙ 125 kbps 1 ≙ 250 kbps
503	P5-03	U16	Modbus RTU Baud rate	rw	RUN	0 ≙ 9.6 kbps 1 ≙ 19.2 kpbs
504	P5-04	U16	Modbus RTU data format Parity type	rw	RUN	0 ≙ N-1 1 ≙ N-2
505	P5-05	U16	Timeout: Communications dropout	rw	RUN	1 ≙ 0.1 s
506	P5-06	U16	Response in the event of a communications dropout	rw	RUN	1 ≙ 1

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
507	P5-07	U16	Ramp via field bus	rw	RUN	1 ≙ 1
508	P5-08	U16	Field bus module PDO-4 output	rw	RUN	1 ≙ 1
509	P5-09	U16	reserved	-	–	–
510	P5-10	U16	reserved	-	–	–
511	P5-11	U16	reserved	-	–	–
512	P5-12	U16	Field bus module PDO-3 output	rw	RUN	–
513	P5-13	U16	Field bus module PDI-4 input	rw	RUN	–
514	P5-14	U16	Field bus module PDI-3 input	rw	RUN	–
515	P5-15	U16	ParameterAccess	rw	RUN	1 ≙ 1
516	P5-16	U16	Action@Communication Loss	rw	RUN	1 ≙ 1
517	P5-17	U16	Modbus RTU0 response delay	rw	STOP	1 ≙ 1
601	P6-01	U16	Firmware upgrade enable	rw	STOP	1 ≙ 1
602	P6-02	WORD	Auto temperature management	rw	RUN	1 ≙ 1
603	P6-03	U16	Auto-reset waiting time	rw	RUN	1 ≙ 1
604	P6-04	U16	Relay hysteresis band	rw	RUN	1 ≙ 0.1 %
605	P6-05	WORD	Enable incremental encoder feedback	rw	STOP	1 ≙ 1
606	P6-06	U16	Incremental encoder scale	rw	STOP	–
607	P6-07	U16	Maximum speed error	rw	RUN	1 ≙ 0.1 %
608	P6-08	U16	Input frequency at maximum speed	rw	RUN	–
609	P6-09	U16	Droop speed	rw	RUN	1 ≙ 0.1 %
610	P6-10	WORD	PLC function enable	rw	RUN	1 ≙ 1
611	P6-11	U16	Speed holding time in the event of an enable signal	rw	RUN	1 ≙ 0.1 s
612	P6-12	U16	Speed holding time in the event of a disable signal	rw	RUN	1 ≙ 0.1 s
613	P6-13	U16	Motor brake opening time	rw	RUN	1 ≙ 0.1 s
614	P6-14	U16	Motor brake engagement delay	rw	RUN	1 ≙ 0.1 s
615	P6-15	U16	Minimum torque for brake opening	rw	RUN	1 ≙ 0.1 %
616	P6-16	U16	Minimum torque time limit	rw	RUN	1 ≙ 0.1 s
617	P6-17	U16	Maximum torque time limit	rw	RUN	1 ≙ 0.1 s
618	P6-18	U16	Voltage for DC injection braking	rw	STOP	0 ≙ Auto 1 ≙ 0.1 %
619	P6-19	U16	Brake resistor value	rw	RUN	1 ≙ 1
620	P6-20	U16	Brake resistor power	rw	RUN	1 ≙ 0.01 kW
621	P6-21	U16	Braking chopper cycle in the event of excessively low temperature	rw	RUN	1 ≙ 0.1 %
622	P6-22	WORD	Reset fan run-time	rw	RUN	1 ≙ 1
623	P6-23	WORD	kWh meter reset	rw	RUN	1 ≙ 1
624	P6-24	U16	Service interval	rw	RUN	1 ≙ 1
625	P6-25	WORD	Service interval reset	rw	RUN	1 ≙ 1

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
626	P6-26	U16	Scaling AO1	rw	RUN	1 ≙ 0.1
627	P6-27	S16	Offset AO1	rw	RUN	1 ≙ 0.1 %
628	P6-28	U16	Display index P0-80	rw	RUN	–
629	P6-29	WORD	Save parameters as default	rw	STOP	1 ≙ 1
630	P6-30	U16	Access code for menu level 3	rw	RUN	–
701	P7-01	U16	Motor stator resistance	rw	RUN	1 ≙ 0.001 Ω
702	P7-02	U16	Rotor resistance	rw	RUN	1 ≙ 0.001 Ω
703	P7-03	U16	Motor leakage inductance (d)	rw	RUN	1 ≙ 0.0001 H
704	P7-04	U16	Motor magnetizing current	rw	RUN	1 ≙ 0.1 A
705	P7-05	U16	Motor leakage factor	rw	RUN	1 ≙ 0.001
706	P7-06	U16	Motor leakage inductance (q)	rw	RUN	1 ≙ 0.0001 H
707	P7-07	WORD	Advanced generator control	rw	RUN	1 ≙ 1
708	P7-08	WORD	Enable motor parameter adaptation	rw	RUN	1 ≙ 1
709	P7-09	U16	Overvoltage current limit	rw	RUN	1 ≙ 0.1 %
710	P7-10	U16	Load inertia factor	rw	RUN	1 ≙ 1
711	P7-11	U16	Minimum PWM pulse width	rw	RUN	1 ≙ 1
712	P7-12	U16	Magnetizing time at the V/f method	rw	RUN	–
713	P7-13	U16	Rotational speed controller D gain	rw	RUN	1 ≙ 0.1 %
714	P7-14	U16	Torque boost	rw	RUN	1 ≙ 0.1 %
715	P7-15	U16	Maximum frequency limit for torque boost	rw	RUN	1 ≙ 0.1 %
716	P7-16	U16	Enable, signal injection	rw	RUN	–
717	P7-17	U16	Signal injection level	rw	RUN	–
801	P8-01	U16	Second acceleration time (acc2)	rw	RUN	FS2, FS3: 1 ≙ 0.01 s FS4…: 1 ≙ 0.1 s
802	P8-02	U16	Transition frequency (acc1 - acc2)	rw	RUN	3000 ≙ 50.0 Hz
803	P8-03	U16	Third acceleration time (acc3)	rw	RUN	FS2, FS3: 1 ≙ 0.01 s FS4…: 1 ≙ 0.1 s
804	P8-04	U16	Transition frequency (acc2 - acc3)	rw	RUN	3000 ≙ 50.0 Hz
805	P8-05	U16	Fourth acceleration time (acc4)	rw	RUN	FS2, FS3: 1 ≙ 0.01 s FS4…: 1 ≙ 0.1 s
806	P8-06	U16	Transition frequency (acc3 - acc4)	rw	RUN	3000 ≙ 50.0 Hz
807	P8-07	U16	Fourth deceleration time (dec4)	rw	RUN	FS2, FS3: 1 ≙ 0.01 s FS4…: 1 ≙ 0.1 s
808	P8-08	U16	Transition frequency (dec3 - dec4)	rw	RUN	3000 ≙ 50.0 Hz
809	P8-09	U16	Third deceleration time (dec3)	rw	RUN	FS2, FS3: 1 ≙ 0.01 s FS4…: 1 ≙ 0.1 s
810	P8-10	U16	Transition frequency (dec2 - dec3)	rw	RUN	3000 ≙ 50.0 Hz
811	P8-11	U16	Second deceleration time (dec2)	rw	RUN	FS2, FS3: 1 ≙ 0.01 s FS4…: 1 ≙ 0.1 s
812	P8-12	U16	Transition frequency (dec1 - dec2)	rw	RUN	3000 ≙ 50.0 Hz

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
813	P8-13	WORD	Ramp selection when there is a preset speed	rw	RUN	1 ≙ 1
901	P9-01	U16	Control source - enable	rw	STOP	1 ≙ 1
902	P9-02	U16	Control source - quick stop	rw	STOP	1 ≙ 1
903	P9-03	U16	Control source - start signal 1 (FWD)	rw	STOP	1 ≙ 1
904	P9-04	U16	Control source – start signal 2 (REV)	rw	STOP	1 ≙ 1
905	P9-05	U16	Control source - Stay-put function	rw	STOP	1 ≙ 1
906	P9-06	U16	Control source - enable (REV)	rw	STOP	1 ≙ 1
907	P9-07	U16	Control source - reset	rw	STOP	1 ≙ 1
908	P9-08	U16	Control source – external fault	rw	STOP	1 ≙ 1
909	P9-09	U16	Control source - terminal control	rw	STOP	1 ≙ 1
910	P9-10	U16	Source - speed 1	rw	STOP	1 ≙ 1
911	P9-11	U16	Source - speed 2	rw	STOP	1 ≙ 1
912	P9-12	U16	Source - speed 3	rw	STOP	1 ≙ 1
913	P9-13	U16	Source - speed 4	rw	STOP	1 ≙ 1
914	P9-14	U16	Source - speed 5	rw	STOP	1 ≙ 1
915	P9-15	U16	Source - speed 6	rw	STOP	1 ≙ 1
916	P9-16	U16	Source - speed 7	rw	STOP	1 ≙ 1
917	P9-17	U16	Source - speed 8	rw	STOP	1 ≙ 1
918	P9-18	U16	Speed - input 0	rw	STOP	1 ≙ 1
919	P9-19	U16	Speed - input 1	rw	STOP	1 ≙ 1
920	P9-20	U16	Speed - input 2	rw	STOP	1 ≙ 1
921	P9-21	U16	Fixed frequency 0	rw	STOP	1 ≙ 1
922	P9-22	U16	Fixed frequency 1	rw	STOP	1 ≙ 1
923	P9-23	U16	Fixed frequency 2	rw	STOP	1 ≙ 1
924	P9-24	U16	Acceleration ramp input 0	rw	STOP	1 ≙ 1
925	P9-25	U16	Acceleration ramp input 1	rw	STOP	1 ≙ 1
926	P9-26	U16	Deceleration time input 0	rw	STOP	1 ≙ 1
927	P9-27	U16	Deceleration time input 1	rw	STOP	1 ≙ 1
928	P9-28	U16	Control source - Up-pushbutton	rw	STOP	1 ≙ 1
929	P9-29	U16	Control source - Down-pushbutton	rw	STOP	1 ≙ 1
930	P9-30	U16	FWD limit switch	rw	STOP	1 ≙ 1
931	P9-31	U16	REV limit switch	rw	STOP	1 ≙ 1
932	P9-32	U16	reserved	-	STOP	1 ≙ 1
933	P9-33	U16	Source - analog output 1	rw	STOP	1 ≙ 1
934	P9-34	U16	Source - analog output 2	rw	STOP	1 ≙ 1
935	P9-35	U16	Control source - Relay 1	rw	STOP	1 ≙ 1
936	P9-36	U16	Control source - Relay 2	rw	STOP	1 ≙ 1
937	P9-37	U16	Control source - scaling	rw	STOP	1 ≙ 1

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
938	P9-38	U16	Source - PID setpoint value	rw	STOP	1 ≙ 1
939	P9-39	U16	Source - PID feedback	rw	STOP	1 ≙ 1
940	P9-40	U16	Source - torque control reference	rw	STOP	1 ≙ 1
941	P9-41	U16	Function choices - Relay output 3, 4, 5	rw	STOP	1 ≙ 1
1001			DI 1	ro		
1002			DI 2	ro		
1003			DI 3	ro		
1004			DI 4	ro		
1005			DI 5	ro		
1006			DI 6	ro		
1007			DI 7	ro		
1008			DI 8	ro		
1009			AO 1	ro		
1010			AO 2	ro		
1011			DO 1	ro		
1012			DO 2	ro		
1013			DO 3	ro		
1014			DO 4	ro		
1015			DO 5	ro		
1017			User register 1	rw		
1018			User register 2	rw		
1019			User register 3	rw		
1020			User register 4	rw		
1021			User register 5	rw		
1022			User register 6	rw		
1023			User register 7	rw		
1024			User register 8	rw		
1025			User register 9	rw		
1026			User register 10	rw		
1027			User register 11	rw		
1028			User register 12	rw		
1029			User register 13	rw		
1030			User register 14	rw		
1031			User register 15	rw		
1032			User AO 1	rw		
1033			User AO 2	rw		
1036			User RO 1	rw		
1037			User RO 2	rw		

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
1038			User RO 3	rw		
1039			User RO 4	rw		
1040			User RO 5	rw		
1041			User, scaling value	rw		
1042			User, decimal scaling	rw		
1043			User, speed reference	rw		
1044			User, torque reference	rw		
1045			Field bus / User ramp	rw		
1046			Scope index 1 / 2	rw		
1047			Scope index 3/4	rw		
1048			24hour timer	rw		
1049			User display Ctrl	rw		
1050			User display value	rw		
1061			AI 1 (Q12)	ro		
1062			AI 1 (%)	ro		
1063			AI 2 (Q12)	ro		
1064			AI 2 (%)	ro		
1065			DI status	ro		
1066			Speed reference	ro		
1067			Digital potentiometer value	ro		
1068			Field bus speed reference	ro		
1069			Master speed reference	ro		
1070			Slave speed reference	ro		
1071			Frequency on speed reference input	ro		
1072			Torque reference (Q12)	ro		
1073			Torque reference (%)	ro		
1074			Master torque reference (Q12)	ro		
1075			Field bus torque reference (Q12)	ro		
1076			PID user reference (Q12)	ro		
1077			PID user return value (Q12)	ro		
1078			PID controller reference (Q12)	ro		
1079			PID controller feedback value (Q12)	ro		
1080			PID controller output (Q12)	ro		
1081			Motor velocity	ro		
1082			Motor current	ro		
1083			Motor Torque	ro		
1084			Motor rating	ro		
1085			PID controller starting speed	ro		

Index	Parameter	Data format	Description	Access right		Scaling Value
				rw/ro	RUN/STOP	
1086			DC voltage	ro		
1087			Unit Temperature	ro		
1088			PCB controle temperature	ro		
1089			Drive scaling value 1	ro		
1090			Drive scaling value 2	ro		
1091			Motor, torque (%)	ro		
1093			Expansion, IO input status	ro		
1096			ID, Plug-in module	ro		
1097			ID, field bus boards	ro		
1101			Scope channel 1 - data	ro		
1102			Scope channel 2 - data	ro		
1103			Scope channel 3 - data	ro		
1104			Scope channel 4 - data	ro		
1105			OLED language number	ro		
1106			OLED version	ro		
1107			power section	ro		
1128			Service time	ro		
1129			Fan speed	ro		
1130			User kWh meter	ro		
1131			User, MWh meter	ro		
1132			Complete, KWh meter	ro		
1133			Complete, MWh meter	ro		
1134			Total, operating hours meter	ro		
1135			Total, operating minutes/seconds meter	ro		
1136			User, hours-run meter	ro		
1137			User, operating minutes/seconds meter	ro		

4.11.3 Parameters of DG1, DM1 and DX1

Table 86: DG1, DM1 and DX1 Parameter list

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
11	0	✓	✓	✓	UINT8	Power Board Hardware Version	1
12	0	✓	✓	✓	UINT8	Control Board Hardware Version	1
13	0	✓	✓	✓	UINT8	Keypad Hardware Version	1
14	0	✓	✓	✓	UINT8	Optional board hardware version on Slot A	1
15	0	✓	-	✓	UINT8	Optional board hardware version on Slot B	1
22	0	P21.2.2	P13.4.2	P99.4.2	UINT16	Motor Control Software Version	1
30	0	P21.2.3	P13.4.3	P99.4.3	UINT16	Application Software Version	1
33	0	P21.2.4	P13.4.4	P99.4.4	STRING8	Software Bundle Version	1
37	0	P21.2.1	P13.4.1	P99.4.1	UINT16	Keypad Software Version	1
44	0	B2.1.2 B3.1.2 B5.1.2 B6.1.2 B7.1.1.2 B8.1.2 B9.1.2 B10.1.1.2	B2.1.1.2 B3.1.2 B4.1.1.2	B2.1.2 B3.1.2 B4.1.2 B5.1.2 B6.1.2 B7.1.2 B8.1.2	UINT16	Firmware Version Slot A	1
45	0	B4.1.2 B12.1.2 B13.1.2 B14.1.2 B15.1.2 B16.1.2 B17.1.1.2 B18.1.2 B19.1.2 B20.1.1.2	-	B10.1.2 B11.1.2 B12.1.2 B13.1.2 B14.1.2	UINT16	Firmware Version Slot B	1
46	0	-	-	B16.1.2 B17.1.2 B18.1.2 B19.1.2 B20.1.2	UINT16	Slot C: FW Version	1
47	0	-	-	B22.1.2 B23.1.2 B24.1.2 B25.1.2 B26.1.2 B27.1.1.2 B28.1.7	UINT16	Slot D: FW Version	1
51	0	-	P1.15	-	UINT8	Compressor table version	1
177	0	P21.3.3	P13.5.1	P99.5.1	UINT32	Serial Number	1
178	0	P21.3.5	✓	P99.5.3	UINT32	Control Unit Serial Number	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
180	0	P21.3.4	✓	P99.5.2	UINT32	Power Unit Serial Number	1
202	0	✓	✓	✓	STRING8	Drive Product Name	1
250	0	P21.4.1	✓	P99.3.1	UINT8	Real Time Clock	1
251	0	-	P13.5.4	-	STRING8	Drive Application Name	1
260	0	-	P13.5.5	-	STRING8	Serial Number	1
403	0	P18.1.10	P8.1.3	P40.2.3	UINT16	Damper Delay	1
404	0	P7.23	-	P7.1.17	UINT16	Power Loss Time	0.1
405	0	P21.1.2	P13.1.2	✓	UINT8	Application	1
406	0	P8.2	P5.1.2	P8.1.2	UINT16	Current Limit	0.1 (DM1: 0.01)
407	0	P8.33	P5.2.12	P8.21.8	UINT16	Motoring Power Limit	0.1
408	0	P8.34	P5.2.13	P8.21.9	UINT16	Generator Power Limit	0.1
412	0	P21.1.4	P13.1.4	P99.2.4	BOOL	Up To Keypad	1
413	0	P21.1.5	P13.1.5	P99.2.5	UINT8	Down From Keypad	1
414	0	P21.1.6	P13.1.6	P99.2.6	UINT8	Parameter Comparison	1
415	0	P21.1.15	P13.2.8	P95.1.13	UINT16	Keypad ACK Timeout	1
416	0	P21.1.16	P13.2.9	P95.1.14	UINT8	Keypad Retry Number	1
419	0	P21.1.7	P13.1.7	P99.1.3	UINT16	Password	1
423	0	P21.1.23	P13.5.3	P95.1.15	UINT16	Keypad Lock Password	1
428	0	P21.4.10	P13.6.6	P99.8.2	BOOL (DM1: UINT8)	Clear Trip Power Count	1
429	0	P21.4.7	-	P99.8.1	BOOL	Clear Trip MWh Count	1
430	0	P21.1.1	P13.1.1	P99.1.1	UINT8	Language	1
431	0	-	P13.2.2	-	UINT8	Local Moniter Parameter Set	1
432	0	P21.1.12	P13.2.5	P95.1.10	UINT8	Contrast Adjust	1
433	0	P21.1.17	P13.1.9	P99.1.5	BOOL	Startup Wizard	1
434	0	P21.1.10	P13.2.3	P95.1.7	UINT8	Default Page	1
435	0	P21.1.11	P13.2.4	P95.1.9	UINT16	Timeout Time	1
436	0	P21.1.13	P13.2.6	P95.1.11	UINT16	Backlight Time	1
437	0	P21.1.18	-	P95.1.17	UINT8	Jog Softkey Hidden	1
438	0	P21.1.19	-	P95.1.18	UINT8	Reverse Softkey Hidden	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
439	0	P8.14	P5.1.16	P8.10.8	UINT8	Identification	1
440	0	P8.11	P5.1.11	P7.1.20	UINT8	Sine Filter Enable	1
447	0	P8.10	P5.1.10	P7.1.19	UINT16	Switching Frequency	0.1
456	0	-	-	P15.7	UINT8	Jog 2 Start Source	1
463	0	P3.17	-	P99.2.2	UINT8	No Access To Param	1
465	0	P1.13	P4.1.7	P7.1.18	UINT8	Bumpless Enable	1
468	0	P3.23	-	P7.3.2	UINT8	Remote 1/2 Select	1
469	0	P1.18	-	P7.1.22	UINT8	HOA Source	1
473	0	P1.21	-	P1.16	UINT8	Frequency Reference Upper Limit Source	1
476	0	P1.10	P4.1.6	P7.3.1	UINT8	Power Up Local Remote Select	1
482	0	P9.3	P6.2.5	P26.1.5	UINT8	External Fault	1
483	0	P7.9	P4.1.8	P7.1.13	UINT8	Start Mode	1
484	0	P7.10	P4.1.9	P7.1.14	UINT8	Stop Mode	1
486	0	-	-	✓	UINT8	HOA - Hand Key Enable	1
487	0	P21.1.8	P13.1.8	P99.1.4	BOOL	Parameter Lock	1
492	0	P8.12	P5.1.12	P8.20.8	UINT8	OverVoltage Control	1
493	0	P21.1.14	P13.2.7	P95.1.12	UINT8	Fan Control	1
494	0	P9.59	-	P26.1.19	UINT8	Fan Protection	1
497	0	P7.30	-	P7.1.10	UINT8	Run Remove Stop Mode	1
499	0	P7.22	-	P7.1.16	UINT8	Power Loss Function	1
505	0	P9.12	P6.1.7	P26.2.10	UINT16	Stall Current Limit	0.1 (DM1: 0.01)
506	0	P9.13	P6.1.8	P26.2.11	UINT16	Stall Time Limit	0.1
507	0	P9.14	P6.1.9	P26.2.12	UINT16	Stall Frequency Limit	0.01
508	0	P9.18	P6.1.13 P8.3.4	P26.2.16 P40.1.4	UINT16	Underload Time Limit	0.01
509	0	P9.16	P6.1.11 P8.3.2	P26.2.14 P40.1.2	UINT16	Underload Fnom Torque	0.1
510	0	P9.17	P6.1.12 P8.3.3	P26.2.15 P40.1.3	UINT16	Underload F0 Torque	0.1
511	0	P9.44	P6.1.3	P26.2.3	UINT8	Ground Fault Limit	1
512	0	P9.39	P6.2.8	P7.7.1	UINT8	Cold Weather Mode	1
513	0	P9.40	P6.2.9	P7.7.2	UINT8	Cold Weather Volt. Level	0.1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
514	0	P9.41	P6.2.10	P7.7.3	UINT8	Cold Weather Time Out	1
515	0	P9.42	P6.2.18	P7.7.4	UINT16	Cold Weather Password	1
516	0	P9.46	P6.1.14	P8.3.1	UINT8	Preheat Mode	1
517	0	P9.50	✓	P26.1.17	UINT8	Preheat Output Volt	0.1
518	0	P9.47	P6.1.15	P8.3.2	UINT8	Preheat Control Source	1
519	0	P5.14	P3.2.11	P27.8.27	UINT16	Ref Limit Supv Val	0.01
520	0	P5.8	P3.2.3 P3.4.2	P27.8.19	UINT16	Freq Limit 1 Supv Val	0.01
521	0	P5.10	P3.4.5	P27.8.23	UINT16	Freq Limit 2 Supv Val	0.01
522	0	P5.12	P3.2.7 P3.4.8	P27.8.7	SINT16	Torque Limit Supv Val	0.1
523	0	P5.20	P3.2.19	P27.8.3	SINT16	Power Limit Supv Val	0.1
524	0	P5.13	P3.2.9	P27.8.25	UINT8	Ref Limit Supv	1
525	0	P5.7	P3.2.1 P3.4.1	P27.8.17	UINT8	Freq Limit 1 Supv	1
526	0	P5.9	P3.4.4	P27.8.21	UINT8	Freq Limit 2 Supv	1
527	0	P5.11	P3.2.5 P3.4.7	P27.8.5	UINT8	Torque Limit Supv	1
528	0	P5.19	P3.2.17	P27.8.1	UINT8	Power Limit Supv	1
529	0	P5.53	P3.2.12	P27.8.28	UINT16	Ref Limit Supv Hyst	0.01
530	0	P5.50	P3.2.4 P3.4.3	P27.8.20	UINT16	Freq Limit 1 Supv Hyst	0.01
531	0	P5.51	P3.4.6	P27.8.24	UINT16	Freq Limit 2 Supv Hyst	0.01
532	0	P5.52	P3.2.8 P3.4.9	P27.8.8	UINT16	Torque Limit Supv Hyst	0.1
533	0	P5.55	P3.2.20	P27.8.4	UINT16	Power Limit Supv Hyst	0.1
535	0	P18.5.2	P9.3.4	P41.4.1	UINT8	Regulation Source	1
536	0	P18.5.4	-	P41.7.5	UINT8	Callback Source	1
537	0	P6.2	-	P80.1.2	UINT8	Logic Operation Input A	1
538	0	P6.3	-	P80.1.3	UINT8	Logic Operation Input B	1
539	0	P6.1	-	P80.1.1	UINT8	Logic Function Select	1
547	0	P8.43	P5.1.15	P8.20.11	UINT16	Droop Control Filter Time Constant	1
548	0	P21.4.2	-	P99.3.2	UINT8	Daylight Saving	1
549	0	✓	✓	✓	UINT8	Date Format	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
559	0	P1.12	P1.11	P1.11 P7.3.8	UINT8	Local Control Place	1
560	0	M70	-	M1.1	UINT8	Multi-Monitoring (9 items)	1
562	0	-	-	P15.2	BOOL	Jog Direction	1
563	0	-	-	P16.1	UINT8	Inch Enable	1
564	0	-	-	P16.2	BOOL	Inch Direction	1
565	0	-	-	P16.3	UINT8	Inch 1 Start Source	1
566	0	-	-	P16.4	UINT8	Inch 2 Start Source	1
567	0	-	-	P27.8.29	UINT8	Speed Limit Supervision	1
568	0	-	-	P27.8.30	UINT16	Speed Limit Supervised Value	1
569	0	-	-	P27.8.31	UINT16	Speed Limit Supervised Hysteresis	1
571	0	-	-	P98.1	UINT8	User Access Level	1
572	0	-	-	P98.2	STRING8	Operator Level Password	1
573	0	-	-	P98.3	STRING8	Installer Level Password	1
574	0	-	-	P98.5	UINT8	User Access Level Password Timeout	1
575	0	-	-	P98.6	UINT8	User Access Level Logout	1
576	0	-	-	P95.3.1	UINT8	Touch Screen Backlight Time	0.1
577	0	-	-	P95.3.2	UINT8	Backlight Brightness	1
578	0	-	-	✓	UINT16	Touch keypad software version	1
579	0	-	-	P99.7.2	UINT8	SD Card Download Operation	1
598	0	-	-	P26.2.17	BOOL	Thermistor Check Enable	1
599	0	-	-	P99.7.3	UINT8	SD Card Firmware Upgrade Select	1
600	0	-	-	M14.1	UINT8	SD Card Plug In	1
601	0	-	-	P3.3.1	BOOL	CMA To GND Enable	1
602	0	-	-	P3.3.2	BOOL	CMB To GND Enable	1
606	0	-	-	P99.7.4	UINT8	SD Upgrade language 1 selection	1
607	0	-	-	P99.7.5	UINT8	SD Upgrade language 2 selection	1
915	0	✓	✓	✓	UINT16	PNU915 - Selection of signals for setpoints	1
916	0	✓	✓	✓	UINT16	PNU916 - Selection of signals for actual values	1
919	0	✓	✓	✓	STRING8	PNU919 - Drive Unit system number	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
922	0	P20.3.4.8	✓	✓	UINT16	PNU922 - Telegram Selection Temp	1
923	0	✓	✓	✓	UINT16	PNU923 - List of signals	1
927	0	✓	✓	✓	UINT16	PNU927 - Operation priority of parameters	1
928	0	✓	✓	✓	UINT16	PNU928 - Control priority DO IO Data	1
944	0	✓	✓	✓	UINT16	PNU944 - Fault Message Counter	1
947	0	✓	✓	✓	UINT16	PNU947 - Fault Number	1
949	0	✓	✓	✓	UINT16	PNU949 - Fault value	1
950	0	✓	✓	✓	UINT16	PNU950 - Fault Buffer Scaling	1
952	0	✓	✓	✓	UINT16	PNU952 - Fault Situation Counter	1
964	0	✓	✓	✓	UINT16	PNU964 - Drive Unit Identification	1
965	0	✓	✓	✓	STRING8	PNU965 - Profile Identification Number	1
967	0	✓	✓	✓	UINT16	Control Word 1 - STW1	1
968	0	✓	✓	✓	UINT16	Status Word 1 - ZSW1	1
970	0	B17.2.6 P21.1.3 B7.2.6	P13.1.3 B2.2.6	P99.2.3	UINT8	Parameter sets	1
971	0	✓	✓	✓	UINT16	PNU971 Parameter sets NV	1
974	0	✓	B2.1.2.1 B4.2.1.6	✓	UINT16	PNU974.0 - BMPA Max block length	1
974	1	B7.1.2.2 B10.2.1.7 B17.1.2.2 B20.2.1.7 P20.3.4.15	B2.1.2.2 B4.2.1.7	✓	UINT8	PNU974.1 -PDP-NoOfMultiparameter	1
974	2	B7.1.2.3 B10.2.1.8 B17.1.2.3 B20.2.1.8 P20.3.4.16	B2.1.2.3 B4.2.1.8	✓	UINT8	PNU974.2 -PDP-MaxLatency	1
975	0	✓	B2.1.3.1 B4.2.1.9	✓	UINT16	PNU975.0 - DO Identification	1
975	1	B7.1.3.2 B10.2.1.10 B17.1.3.2 B20.2.1.10 P20.3.4.18	B2.1.3.2 B4.2.1.10	✓	UINT16	PNU-975.1 - PDP-DO Device Type	1
975	2	B7.1.3.3 B17.1.3.3 P20.3.4.19	B2.1.3.3	✓	UINT16	PNU-975.2 - PDP-DO FW-Interface	1
975	3	✓	✓	✓	UINT16	PNU-975.3 - Firmware date (year)	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
975	4	✓	✓	✓	UINT16	PNU-975.4-Firmware date (day/month)	1
975	5	B7.1.3.6 B10.2.1.11 B17.1.3.6 B20.2.1.11 P20.3.4.22	B2.1.3.6 B4.2.1.11	✓	UINT8	PNU-975.5 - PDP-DO NoOfDOs	1
975	6	B7.1.3.7 B10.2.1.12 B17.1.3.7 B20.2.1.12 P20.3.4.23	B2.1.3.7 B4.2.1.12	✓	UINT8	PNU-975.6 - PDP-DO Subclass	1
980	0	✓	✓	-	UINT16	PNU980 - Number list of defined parameter 1	1
981	0	✓	✓	-	UINT16	PNU981 - Number list of defined parameter 2	1
982	0	✓	✓	-	UINT16	PNU982 - Number list of defined parameter 3	1
983	0	✓	✓	-	UINT16	PNU983 - Number list of defined parameter 4	1
984	0	✓	✓	-	UINT16	PNU984 - Number list of defined parameter 5	1
985	0	✓	✓	-	UINT16	PNU985 - Number list of defined parameter 6	1
986	0	✓	✓	-	UINT16	PNU986 - Number list of defined parameter 7	1
987	0	✓	✓	-	UINT16	PNU987 - Number list of defined parameter 8	1
988	0	✓	✓	-	UINT16	PNU988 - Number list of defined parameter 9	1
989	0	✓	✓	-	UINT16	PNU989 - Number list of defined parameter 10	1
1006	0	-	-	P3.4.1.1	UINT8	High Freq Pulse Input 1 Type	1
1007	0	-	-	P3.4.2.1	UINT8	High Freq Pulse Input 1 Func	1
1008	0	-	-	P3.4.2.2	UINT16	High Freq Pulse Input 1 Scale	1
1009	0	-	-	P3.4.2.3	SINT16	High Freq Pulse Input 1 Offset	0.01
1010	0	-	-	P3.4.2.4	UINT16	High Freq Pulse Input 1 Filter Time	1
1011	0	-	-	P3.4.2.5	UINT16	High Freq Pulse Input 1 Min	1
1012	0	-	-	P3.4.2.6	UINT16	High Freq Pulse Input 1 Max	1
1013	0	-	-	P3.4.2.8	UINT16	High Freq Pulse Input 1 Low Limit	1
1014	0	-	-	P3.4.2.9	UINT16	High Freq Pulse Input 1 High Limit	1
1015	0	-	-	P3.4.2.10	UINT16	High Freq Pulse Input 1 Check Delay	1
1016	0	-	-	P3.4.2.11	UINT16	High Freq Pulse Input 1 Hyst Level	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
1017	0	-	-	P3.5.1.1	UINT8	High Freq Pulse Input 2 Type	1
1018	0	-	-	P3.5.2.1	UINT8	High Freq Pulse Input 2 Func	1
1019	0	-	-	P3.5.2.2	UINT16	High Freq Pulse Input 2 Scale	1
1020	0	-	-	P3.5.2.3	SINT16	High Freq Pulse Input 2 Offset	0.01
1021	0	-	-	P3.5.2.4	UINT16	High Freq Pulse Input 2 Filter Time	1
1022	0	-	-	P3.5.2.5	UINT16	High Freq Pulse Input 2 Min	1
1023	0	-	-	P3.5.2.6	UINT16	High Freq Pulse Input 2 Max	1
1024	0	-	-	P3.5.2.8	UINT16	High Freq Pulse Input 2 Low Limit	1
1025	0	-	-	P3.5.2.9	UINT16	High Freq Pulse Input 2 High Limit	1
1026	0	-	-	P3.5.2.10	UINT16	High Freq Pulse Input 2 Check Delay	1
1027	0	-	-	P3.5.2.11	UINT16	High Freq Pulse Input 2 Hyst level	1
1028	0	-	-	B7.1.3 B8.1.3	SINT16	n-Encoder 1 speed	1
1029	0	-	-	B7.2.1 B8.2.1	UINT16	Encoder 1 Pulse Count	1
1030	0	-	-	B7.2.2 B8.2.2	UINT8	Encoder 1 Rotation Reverse	1
1031	0	-	-	B7.1.4 B8.1.4	SINT16	n-Encoder 2 speed	1
1032	0	-	-	B7.2.3 B8.2.3	UINT16	Encoder 2 Pulse Count	1
1033	0	-	-	B7.2.4 B8.2.4	UINT8	Encoder 2 Rotation Reverse	1
1034	0	-	-	M4.8	UINT16	High Freq Pulse Input 1 Value	1
1035	0	-	-	M4.9	UINT16	High Freq Pulse Input 2 Value	1
1036	0	-	-	M4.10	UINT16	High Freq Pulse Output Value	1
1037	0	-	-	P8.1.4	UINT8	Encoder Signal Selection	1
1038	0	-	-	B7.2.7	UINT8	Encoder Output Select	1
1039	0	-	-	B7.2.8	UINT8	Encoder Output Divider	1
1040	0	-	-	B7.2.5 B8.2.5	UINT8	Encoder 1 Type	1
1041	0	-	-	B7.2.6 B8.2.6	UINT8	Encoder 2 Type	1
1042	0	-	-	P8.1.5	UINT16	Encoder 1 Scale	0.001
1043	0	-	-	P8.1.6	UINT16	Encoder 2 Scale	0.001

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
1058	0	-	-	B7.2.9 B8.2.7	UINT16	Encode1 Speed filter Time	1
1059	0	-	-	B7.2.10 B8.2.8	UINT16	Encode2 Speed Filter Time	1
1060	0	-	-	B7.1.5 B8.1.5	UINT8	Encoder Power Supply	1
1250	0	-	-	P7.2.16	UINT8	Speed Trim Setting	1
1251	0	-	-	P7.2.17	UINT8	Torque Trim Setting	1
1252	0	-	-	P8.21.25	UINT16	Speed Reg BW0	0.01
1253	0	-	-	P8.21.26	UINT16	Speed Reg BW1	0.01
1401	0	P8.5	P5.1.5	P8.20.3	UINT16	Field Weakening Point	0.01
1402	0	P8.7	P5.1.7	P8.20.5	UINT16	V/Hz Mid Frequency	0.01
1403	0	P8.6	P5.1.6	P8.20.4	UINT16	Voltage at FWP	0.01
1404	0	P8.8	P5.1.8	P8.20.6	UINT16	V/Hz Mid Voltage	0.01
1406	0	P8.3	P5.1.3	P8.20.1	BOOL	V/Hz Optimization	1
1407	0	P8.4	P5.1.4	P8.20.2	UINT8	V/Hz Ratio	1
1408	0	P8.61	P5.1.29	P8.20.15	UINT8	Overmodulation Enable	1
1409	0	P8.59	P5.1.27	P8.20.13	UINT16	V/F Stable Kd	1
1410	0	P8.60	P5.1.28	P8.20.14	UINT16	V/F Stable Kq	1
1411	0	P8.71	P5.1.26	P8.20.12	UINT16	Slip Compensation Coefficient	1
1502	0	P8.20	P5.2.2	P8.21.2	UINT16	Speed Control Kp0	0.1
1504	0	P8.26	P5.2.6	P8.21.6	UINT16	Speed Control Kp1	0.1
1506	0	P8.21	P5.2.3	P8.21.3	UINT16	Speed Control Ti0	0.1 (DM1: 1)
1508	0	P8.27	P5.2.7	P8.21.7	UINT16	Speed Control Ti1	0.1 (DM1: 1)
1512	0	P8.24	P5.2.4	P8.21.4	UINT16 (DX1: UINT32)	Speed Control F0	0.01
1513	0	P8.25	P5.2.5	P8.21.5	UINT16 (DX1: UINT32)	Speed Control F1	0.01
1518	0	P8.72	P5.2.20	P8.20.16	UINT8	Pulse Off Frequency	1
1520	0	-	-	P8.21.27	UINT16	Id Kp0	0.1
1521	0	-	-	P8.21.28	UINT16	Id Ti0	0.1
1522	0	-	-	P8.21.29	UINT16	Iq Kp0	0.1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
1523	0	-	-	P8.21.30	UINT16	Iq Ti0	0.1
1524	0	-	-	P8.21.31	UINT16	Id Kp1	0.1
1525	0	-	-	P8.21.32	UINT16	Id Ti1	0.1
1526	0	-	-	P8.21.33	UINT16	Iq Kp1	0.1
1527	0	-	-	P8.21.34	UINT16	Iq Ti1	0.1
1528	0	-	-	P8.21.35	UINT16	Current Control F0	0.01
1529	0	-	-	P8.21.36	UINT16	Current Control F1	0.01
1604	0	-	P5.2.8	-	UINT16	Motoring Torque Limit FWD	0.1
1605	0	-	P5.2.10	-	UINT16	Motoring Torque Limit REV	0.1
1609	0	✓	-	✓	UINT16	Torque Limit Control P	0.01
1610	0	✓	-	✓	UINT16	Torque Limit Control I	0.1
1613	0	✓	-	✓	UINT16	Torque Control Freq Min	0.01
1616	0	-	P5.2.9	-	UINT16	Generator Torque Limit FWD	0.1
1617	0	-	P5.2.11	-	UINT16	Generator Torque Limit REV	0.1
2501	0	P19.1	-	P30.5.1	UINT8	Interval 1 On Time	1
2501	1	P19.6	-	P30.5.6	UINT8	Interval 2 On Time	1
2501	2	P19.11	-	P30.5.11	UINT8	Interval 3 On Time	1
2501	3	P19.16	-	P30.5.16	UINT8	Interval 4 On Time	1
2501	4	P19.21	-	P30.5.21	UINT8	Interval 5 On Time	1
2502	0	P19.2	-	P30.5.2	UINT8	Interval 1 Off Time	1
2502	1	P19.7	-	P30.5.7	UINT8	Interval 2 Off Time	1
2502	2	P19.12	-	P30.5.12	UINT8	Interval 3 Off Time	1
2502	3	P19.17	-	P30.5.17	UINT8	Interval 4 Off Time	1
2502	4	P19.22	-	P30.5.22	UINT8	Interval 5 Off Time	1
2503	0	P19.3	-	P30.5.3	UINT8	Interval 1 From Day	1
2503	1	P19.8	-	P30.5.8	UINT8	Interval 2 From Day	1
2503	2	P19.13	-	P30.5.13	UINT8	Interval 3 From Day	1
2503	3	P19.18	-	P30.5.18	UINT8	Interval 4 From Day	1
2503	4	P19.23	-	P30.5.23	UINT8	Interval 5 From Day	1
2504	0	P19.4	-	P30.5.4	UINT8	Interval 1 To Day	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
2504	1	P19.9	-	P30.5.9	UINT8	Interval 2 To Day	1
2504	2	P19.14	-	P30.5.14	UINT8	Interval 3 To Day	1
2504	3	P19.19	-	P30.5.19	UINT8	Interval 4 To Day	1
2504	4	P19.24	-	P30.5.24	UINT8	Interval 5 To Day	1
2505	0	P19.5	-	P30.5.5	UINT8	Interval 1 Channel	1
2505	1	P19.10	-	P30.5.10	UINT8	Interval 2 Channel	1
2505	2	P19.15	-	P30.5.15	UINT8	Interval 3 Channel	1
2505	3	P19.20	-	P30.5.20	UINT8	Interval 4 Channel	1
2505	4	P19.25	-	P30.5.25	UINT8	Interval 5 Channel	1
2506	0	M22	-	P30.3.1	BOOL	Interval 1	1
2506	1	M23	-	P30.3.2	BOOL	Interval 2	1
2506	2	M24	-	P30.3.3	BOOL	Interval 3	1
2506	3	M25	-	P30.3.4	BOOL	Interval 4	1
2506	4	M26	-	P30.3.5	BOOL	Interval 5	1
2507	0	P19.32	-	P30.4.1	UINT8	Interval 1 Setting	1
2507	1	P19.33	-	P30.4.2	UINT8	Interval 2 Setting	1
2507	2	P19.34	-	P30.4.3	UINT8	Interval 3 Setting	1
2507	3	P19.35	-	P30.4.4	UINT8	Interval 4 Setting	1
2507	4	P19.36	-	P30.4.5	UINT8	Interval 5 Setting	1
2602	0	P3.8	-	P7.1.12	UINT8	Fault Reset	1
2603	0	P3.32	-	P15.1	UINT8	Jog Enable	1
2604	0	P3.9	-	P7.1.9	UINT8	Run Enable	1
2606	0	P3.55	-	P99.2.1	UINT8	Parameter Set1/2 Sel	1
2607	0	P3.20	-	P7.2.15	UINT8	Reset Pot Zero	1
2608	0	P3.21	-	P7.3.7	UINT8	Remote Control	1
2609	0	P3.22	-	P7.3.6	UINT8	Local Control	1
2610	0	P1.11	P1.13	P1.13 P7.3.10	UINT8	Remote 1 Control Place	1
2611	0	P7.1	-	P7.3.12	UINT8	Remote 2 Control Place	1
2612	0	P3.2	-	P7.1.2	UINT8	IO Terminal 1 Start Signal 1	1
2613	0	P3.3	-	P7.1.3	UINT8	IO Terminal 1 Start Signal 2	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
2614	0	P3.46	-	P7.1.5	UINT8	IO Terminal 2 Start Signal 1	1
2615	0	P3.47	-	P7.1.6	UINT8	IO Terminal 2 Start Signal 2	1
2616	0	P13.2	-	P8.22.17	UINT8	Torque Ref Select	1
2617	0	P8.44	-	P8.22.5	UINT16	Startup Torque Selection	1
2618	0	P3.5	-	P7.1.7	UINT8	Reverse	1
2620	0	P3.1	P2.1.3	P7.1.1	UINT8	IO Terminal 1 Start Stop Logic	1
2621	0	P3.45	-	P7.1.4	UINT8	IO Terminal 2 Start Stop Logic	1
2622	0	P7.8	P2.1.8	P7.2.11	UINT8	Motor Pot Ref Reset	1
2624	0	P1.14	P1.12	P1.12 P7.3.9	UINT8	Local Reference	1
2625	0	P1.15	P1.14	P1.14 P7.3.11	UINT8	Remote 1 Reference	1
2626	0	P7.2	-	P7.3.13	UINT8	Remote 2 Reference	1
2627	0	P7.4	P4.1.2	P95.1.3	BOOL	Keypad Direction	1
2629	0	P7.5	P4.1.3	P95.1.4	BOOL	Keypad Stop	1
2630	0	P1.16	P4.1.4	P7.1.8	UINT8	Reverse Enable	1
2633	0	P18.1.8	P8.1.1	P40.2.1	UINT8	Damper Start	1
2635	0	P9.20	P6.2.1	P26.1.1	UINT8	Line Start Lockout	1
2636	0	P8.13	P5.1.14	P8.20.10	UINT16	Load Drooping	0.01
2637	0	P3.25	-	P22.1.1	UINT8	Force Bypass	1
2638	0	-	-	P99.7.1	UINT8	SD Card Copy Operation	1
2901	0	P1.5	P1.6	P1.6 P8.10.2	UINT16	Motor Nom Current	0.1
2901	1	P16.1	-	P8.11.2	UINT16	Motor Nom Current 2	0.1
2902	0	P1.8	P1.9	P1.9 P8.10.5	UINT16	Motor Nom Voltage	1
2902	1	P16.4	-	P8.11.5	UINT16	Motor Nom Volt 2	1
2906	0	P1.7	P1.8	P1.8 P8.10.4	UINT16	Motor PF	0.01
2906	1	P16.3	-	P8.11.4	UINT16	Motor PF 2	0.01
2907	0	P1.9	P1.10	P1.10 P8.10.6	UINT16	Motor Nom Frequency	0.01
2907	1	P16.5	-	P8.11.6	UINT16	Motor Nom Freq 2	0.01
2908	0	P1.6	P1.7	P1.7 P8.10.3	UINT16	Motor Nom Speed	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
2908	1	P16.2	-	P8.11.3	UINT16	Motor Nom Speed 2	1
2909	0	P8.50	P5.1.17	P8.10.9	UINT16	Stator Resistor	0.001
2909	1	P16.6	-	P8.11.9	UINT16	Stator Resistor 2	0.001
2910	0	P8.65	P5.1.24	P8.10.18	UINT16	PM d-axis stator inductance	0.01
2910	1	P16.14	-	P8.11.18	UINT16	Second PM d-axis stator inductance	0.01
2911	0	P8.64	P5.1.25	P8.10.17	UINT16	PM q-axis stator inductance	0.01
2911	1	P16.13	-	P8.11.17	UINT16	Second PM q-axis stator inductance	0.01
2912	0	P8.51	P5.1.18	P8.10.10	UINT16	Rotor Resistor	0.001
2912	1	P16.7	-	P8.11.10	UINT16	Rotor Resistor 2	0.001
2914	0	P8.54	P5.1.21	P8.10.15	UINT16	Excitation Current	0.1
2914	1	P16.10	-	P8.11.15	UINT16	Excitation Current 2	0.1
2915	0	P8.52	P5.1.19	P8.10.11	UINT16	Leak Inductance	0.01
2915	1	P16.8	-	P8.11.11	UINT16	Leak Inductance 2	0.01
2916	0	P8.53	P5.1.20	P8.10.14	UINT16	Mutual Inductance	0.1
2916	1	P16.9	-	P8.11.14	UINT16	Mutual Inductance 2	0.1
2920	0	✓	✓	✓	UINT16	Number of Poles of Motor	1
2923	0	P8.63	P5.1.23	P8.10.16	UINT16	PM BEMF Voltage	0.1
2923	1	P16.12	-	P8.11.16	UINT16	Second PM BEMF Voltage	0.1
2927	0	P8.38	-	-	UINT16	Stop State Magnetisation	0.1
2928	0	P8.62	P5.1.22	P8.10.19	UINT16	Motor Inertia	0.001
2928	1	P16.11	-	P8.11.19	UINT16	Motor Inertia2	0.001
2930	0	P8.66	P5.2.15	P8.23.1	UINT8	PM Initial Selection	1
2931	0	P8.68	P5.2.17	P8.23.3	UINT16	PM excited Current	1
2932	0	P8.70	P5.2.19	P8.10.20	UINT16	Observer Kp	1
2933	0	P8.37	P5.2.14	P8.21.10	UINT16	Flux Reference	0.1
2934	0	P8.1	P5.1.1	P8.1.1	UINT8	Motor Control Mode	1
2935	0	P1.22	P1.5	P1.5 P8.10.1	UINT8	Motor Type Selection	1
2936	0	P7.29	P4.1.5	P7.2.12	UINT8	Change PhaseSequence Motor	1
2937	0	P3.24	-	P8.1.3	UINT8	Second Motor Para Select	1
2938	0	M7	M1.7	M2.8	UINT16	Motor Voltage	0.1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
2941	0	M3	M1.3	M2.3	UINT16 (DX1: UINT32)	Motor Speed	1 (DX1: 0.01)
2945	0	M4	M1.4	M2.4	UINT16	Motor Current	0.1 (DM1: 0.01)
2947	0	M5	M1.5	M2.5	SINT16	Motor Torque	0.1
2951	0	M6	M1.6	M2.7	SINT16	Motor Power	0.1
2952	0	M44	M1.12	M2.13	SINT32	Instant Motor Power	0.001
2953	0	M10	M1.10	M2.11	UINT16	Motor Temperature	0.1
2956	0	-	✓	-	UINT8	Motor Thermal Time	1
2957	0	P9.9	P6.1.5	P26.2.5	UINT16	Motor Thermal F0 Current	0.1
2962	0	P5.40	P3.2.28 P3.4.11	P27.8.11	UINT16	Motor Current 1 Supv Value	0.1 (DM1: 0.01)
2963	0	P5.42	P3.4.14	P27.8.15	UINT16	Motor Current 2 Supv Value	0.1 (DM1: 0.01)
2964	0	P5.39	P3.2.26 P3.4.10	P27.8.9	UINT8	Motor Current 1 Supv	1
2965	0	P5.41	P3.4.13	P27.8.13	UINT8	Motor Current 2 Supv	1
2966	0	P5.46	P3.2.29	P27.8.12	UINT8	Motor Current 1 Supv Hyst	0.1
2966	1	P5.47	P3.2.29 P3.4.12	P27.8.16	UINT8	Motor Current 2 Supv Hyst	0.1
2969	0	P8.18	P5.2.1	P8.21.1	UINT16	Speed Error Filter Time Constant	1
2970	0	P13.6	-	P8.22.21	UINT8	Speed Limiter Mode	1
2971	0	✓	-	✓	UINT16	Positive Iq Current Limit	0.1
2972	0	✓	-	✓	UINT16	Negetive Iq Current Limit	0.1
2973	0	-	-	P8.11.1	UINT8	Motor 2 Type Selection	1
3901	0	✓	-	✓	SINT32	Droop Frequency	0.01
3902	1	P12.1	P2.3.1	-	UINT16	Preset Speed 1	0.01
3902	2	P12.2	P2.3.2	-	UINT16	Preset Speed 2	0.01
3902	3	P12.3	P2.3.3	-	UINT16	Preset Speed 3	0.01
3902	4	P12.4	P2.3.4	-	UINT16	Preset Speed 4	0.01
3902	5	P12.5	P2.3.5	-	UINT16	Preset Speed 5	0.01
3902	6	P12.6	P2.3.6	-	UINT16	Preset Speed 6	0.01
3902	7	P12.7	P2.3.7	-	UINT16	Preset Speed 7	0.01
3903	0	-	-	M2.2	UINT32	Speed Reference	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
3904	0	P1.1	P1.1	✓	UINT16	Min Frequency	0.01
3905	0	P1.2	P1.2	✓	UINT16	Max Frequency	0.01
3916	0	P7.15	P4.3.2	P8.2.2	UINT16 (DX1: UINT32)	Skip F1 Low Limit	0.01
3916	1	P7.17	P4.3.4	P8.2.4	UINT16 (DX1: UINT32)	Skip F2 Low Limit	0.01
3916	2	P7.19	P4.3.6	P8.2.6	UINT16 (DX1: UINT32)	Skip F3 Low Limit	0.01
3917	0	P7.16	P4.3.3	P8.2.3	UINT16 (DX1: UINT32)	Skip F1 High Limit	0.01
3917	1	P7.18	P4.3.5	P8.2.5	UINT16 (DX1: UINT32)	Skip F2 High Limit	0.01
3917	2	P7.20	P4.3.7	P8.2.7	UINT16 (DX1: UINT32)	Skip F3 High Limit	0.01
3918	0	P7.21	P4.3.1	P8.2.1	UINT16	Skip Range Ramp Factor	0.1
3921	0	P1.20	-	P1.15	UINT16	Frequency Reference Upper Limit	0.01
3923	0	-	P2.5.1	-	UINT16	Pot Custom Min	0.01
3924	0	-	P2.5.2	-	UINT16	Pot Custom Max	0.01
3927	0	-	P3.2.2	✓	UINT8	Output frequency limit display	1
3928	0	-	-	✓	UINT8	Output frequency 2 limit display	1
3929	0	P8.15	-	P8.21.12	SINT32	Neg Frequency Limit	0.01
3930	0	P8.16	-	P8.21.13	SINT32	Pos Frequency Limit	0.01
3931	0	-	-	P1.2 P7.2.2	UINT32	Max Speed	0.01
3932	1	-	-	P7.5.1	UINT32	Preset Speed 1	0.01
3932	2	-	-	P7.5.2	UINT32	Preset Speed 2	0.01
3932	3	-	-	P7.5.3	UINT32	Preset Speed 3	0.01
3932	4	-	-	P7.5.4	UINT32	Preset Speed 4	0.01
3932	5	-	-	P7.5.5	UINT32	Preset Speed 5	0.01
3932	6	-	-	P7.5.6	UINT32	Preset Speed 6	0.01
3932	7	-	-	P7.5.7	UINT32	Preset Speed 7	0.01
3933	0	-	-	P1.1 P7.2.1	UINT32	Min Speed	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
4101	0	M2	M1.2	-	UINT16	Freq Reference	0.01
4106	0	P9.2	P6.2.4	P26.1.4	UINT16	4mA Fault Frequency	0.01
4107	0	P7.3	P4.1.1	P7.2.3	UINT16 (DX1: UINT32)	Keypad Reference	0.01
4108	0	P7.6	P2.3.8	P15.4	UINT16	Jog Reference	0.01
4109	0	-	-	P15.8	UINT32	Jog2/Inch2 Ref	0.01
4112	0	P3.10	-	P7.2.6	UINT8	Preset Speed B0	1
4113	0	P3.11	-	P7.2.7	UINT8	Preset Speed B1	1
4114	0	P3.12	-	P7.2.8	UINT8	Preset Speed B2	1
4116	0	-	P4.5.5	-	UINT8	Foldback enable	1
4117	0	-	P4.5.8	-	UINT16	Foldback speed reduce rate	1
4119	0	-	-	P26.1.21	UINT16	AI Fault Frequency	0.01
4120	0	-	P3.2.10	✓	UINT8	Reference limit display	1
4121	0	P18.1.14	P9.1.4	P41.2.5	UINT16	Derag Speed	0.01
4202	0	M11	-	M2.6	SINT16	Torque Reference	0.1
4203	0	P13.3	-	P7.2.4	SINT16	Keypad Torque Ref	0.1
4204	0	P8.45	-	P8.22.10	SINT16	Torque Memory Start	0.1
4206	0	P13.12	-	P8.22.16	UINT16	Pull Out Torque	0.1
4207	0	P13.14	-	M96.7	SINT16	FB Torque Ref	0.1
4209	0	P8.29	-	P8.22.6	UINT16	Motoring Torque Limit	0.1
4211	0	P8.30	-	P8.22.7	UINT16	Generator Torque Limit	0.1
4212	0	P8.46	-	P8.22.11	SINT16	Startup Torque Forward	0.1
4213	0	P8.47	-	P8.22.12	SINT16	Startup Torque Reverse	0.1
4214	0	P13.5	-	P8.22.19	SINT16	Torque Ref Min	0.1
4215	0	P13.4	-	P8.22.18	SINT16	Torque Ref Max	0.1
4216	0	P13.1	-	P8.22.15	UINT16	Torque Limit	0.1
4217	0	P8.31	-	P8.22.8	UINT16	Torque Limit Forward	0.1
4218	0	P8.32	-	P8.22.9	UINT16	Torque Limit Reverse	0.1
4221	0	P13.11	-	P8.22.20	UINT16	Torque Reference Filter TC	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
4228	0	P13.7	-	P8.22.22	UINT16 (DX1: UINT32)	Window Pos Width	0.01
4229	0	P13.8	-	P8.22.23	UINT16 (DX1: UINT32)	Window Neg Width	0.01
4230	0	P13.9	-	P8.22.24	UINT16 (DX1: UINT32)	Window Pos Off Limit	0.01
4231	0	P13.10	-	P8.22.25	UINT16 (DX1: UINT32)	Window Neg Off Limit	0.01
4553	0	P13.13	-	P8.22.26	UINT16	Stop State Magnetisation Time	1
4556	0	P18.1.9	P8.1.2	P40.2.2	UINT16	Damper Time Out	1
4559	0	P1.17	P9.2.4	P41.1.4	UINT16	Run Delay Time	1
4561	0	P8.49	-	P8.22.14	UINT16	Startup Torque Time	1
4566	0	M21	-	P30.2.1	BYTE	TC1, TC2, TC3	1
4567	0	M59	-	M99.1	UINT32	Total Run time Count	0.1
4568	0	M55 P21.4.5	P13.6.3	M98.3	UINT32	Total Power Hr Count	1
4570	0	-	P13.6.4	-	UINT32	Total Motor Hr Count	0.1
4572	0	M61	-	M99.2	UINT16	Trip Run Time Count	0.1
4579	0	M54 P21.4.4	P13.6.2	M98.2	UINT16	Total Power Day Count	1
4580	0	M58 P21.4.9	P13.6.8	M98.7	UINT32	Trip Power Hr Count	1
4581	0	M57 P21.4.8	P13.6.7	M98.6	UINT16	Trip Power Day Count	1
4585	0	-	P2.5.3	-	UINT16	Pot Filter Time	0.01
4586	0	P17.1.2	-	P22.1.4	UINT16	Bypass Start Delay	1
4587	0	P17.1.4	-	P22.2.2	UINT16	Auto Bypass Delay	1
4595	0	P19.26	-	P30.2.5	UINT32	Timer 1 Duration	1
4595	1	P19.28	-	P30.2.7	UINT32	Timer 2 Duration	1
4595	2	P19.30	-	P30.2.9	UINT32	Timer 3 Duration	1
4596	0	M27	-	P30.2.2	UINT32	Timer 1	1
4596	1	M28	-	P30.2.3	UINT32	Timer 2	1
4596	2	M29	-	P30.2.4	UINT32	Timer 3	1
4597	0	P19.27	-	P30.2.6	UINT8	Timer 1 Channel	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
4597	1	P19.29	-	P30.2.8	UINT8	Timer 2 Channel	1
4597	2	P19.31	-	P30.2.10	UINT8	Timer 3 Channel	1
4599	0	P3.33	-	P30.1.1	UINT8	Start Timer 1	1
4599	1	P3.34	-	P30.1.2	UINT8	Start Timer 2	1
4599	2	P3.35	-	P30.1.3	UINT8	Start Timer 3	1
4602	0	P18.6.24	-	P41.9.2	UINT16	Lube Pump Time	0.1
4603	0	✓	✓	✓	UINT8	Time Format	1
4604	0	✓	✓	P99.3.4	UINT8	Drive Time Offset	1
4605	0	✓	✓	✓	UINT32	System Time	1
4606	0	✓	✓	✓	UINT32	Unix Epoch Time_64bit	1
4756	0	P8.9	P5.1.9	P8.20.7	UINT16	Zero Frequency Voltage	0.01
4758	0	M8	M1.8	M2.9	UINT16	DC-link Voltage	1
4763	0	-	P5.1.13	P8.20.9	UINT16	Over Voltage Controller Reference	1
4764	0	✓	-	M2.14	UINT16	v- L1/L2	0.1
4765	0	✓	-	M2.15	UINT16	v- L2/L3	0.1
4766	0	✓	-	M2.16	UINT16	v- L3/L1	0.1
4767	0	✓	-	✓	UINT16	AC input voltage RMS	0.1
4957	0	✓	-	✓	UINT16	U phase output current RMS	0.1
4958	0	✓	-	✓	UINT16	V phase output current RMS	0.1
4959	0	✓	-	✓	UINT16	W phase output current RMS	0.1
4961	0	-	-	M2.17	UINT16	I-L1	0.1
4962	0	-	-	M2.18	UINT16	I-L2	0.1
4963	0	-	-	M2.19	UINT16	I-L3	0.1
4975	0	-	P3.2.18	-	UINT8	Power Limit Display	1
4976	0	-	P3.2.6	-	UINT8	Torque Limit Display	1
4977	0	-	P3.2.27	-	UINT8	Motor Current Limit Display	1
4978	0	-	-	✓	UINT8	Motor Current 2 display	1
5152	0	P5.18	P3.2.15	P27.7.3	SINT16	Temp Limit Supv Val	0.1
5154	0	M9	M1.9	M2.10	SINT16	Unit Temperature	0.1
5156	0	P9.48	P6.1.16	P8.3.3	SINT16	Preheat Enter Temp	0.1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
5157	0	P9.49	P6.1.17	P8.3.4	SINT16	Preheat Quit Temp	0.1
5159	0	P5.17	P3.2.13	P27.7.1	UINT8	Temp Limit Supv	1
5161	0	P5.54	P3.2.16	P27.7.4	UINT16	Temp Limit Supv Hyst	0.1
5163	0	-	P4.5.6	-	UINT16	Foldback temperature	1
5164	0	-	P4.5.7	-	UINT16	Recovering temperature	1
5165	0	-	P4.5.1	-	UINT16	IGBT Temperature	1
5166	0	-	P3.2.14	-	UINT8	Temp Limit Display	1
5355	0	P7.11	P4.1.10	P7.4.7	UINT16	Ramp 1 Shape	0.1
5355	1	P7.12	P4.1.11	P7.4.10	UINT16	Ramp 2 Shape	0.1
5360	0	P1.3	P1.3	P1.3 P7.4.5	UINT16	Accel Time 1	0.1
5361	0	P7.13	P4.1.12	P7.4.8	UINT16	Accel Time 2	0.1
5369	0	P1.4	P1.4	P1.4 P7.4.6	UINT16	Decel Time 1	0.1
5370	0	P7.14	P4.1.13	P7.4.9	UINT16	Decel Time 2	0.1
5386	0	P7.28	P4.1.14	P7.4.11	UINT16	2nd Stage Ramp Frequency	0.01
5393	0	P8.17	-	P8.21.14	UINT16	Frequency Ramp Out FilterTime Constant	1
5396	0	-	P9.2.6	-	UINT16	Min Freqeuncy Ramp time	0.1
5408	0	P7.7	P2.1.7	P7.2.10	UINT16	Motor Pot Ramp Time	0.1
5409	0	P3.16	-	P7.4.4	UINT8	Accel/Decel Prohibit	1
5410	0	P3.18	-	P7.2.13	UINT8	Accel Pot Value	1
5411	0	P3.19	-	P7.2.14	UINT8	Decel Pot Value	1
5416	0	P3.15	-	P7.4.1	UINT8	Accel/Decel Time Set	1
5418	0	P8.35	-	-	UINT16	Acc Compensation Time Constant	0.1
5419	0	P8.36	-	-	UINT16	Acc Compensation Filter Time Constant	1
5422	0	-	-	P15.5	UINT16	Jog1/Inch1 Acc time	0.1
5423	0	-	-	P15.6	UINT16	Jog1/Inch1 Dec time	0.1
5424	0	-	-	P15.9	UINT16	Jog2/Inch2 Acc time	0.1
5425	0	-	-	P15.10	UINT16	Jog2/Inch2 Dec time	0.1
6001	0	P2.1.2	P2.1.2	P2.1.2	UINT16	AI Ref Scale Max Value	0.01
6002	0	P2.1.1	P2.1.1	P2.1.1	UINT16	AI Ref Scale Min Value	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
6003	0	P2.2.2	P2.4.2	P2.2.2	UINT8	AI1 Signal Range	1
6003	1	P2.3.2	-	P2.3.2	UINT8	AI2 Signal Range	1
6004	0	B3.2.2	-	B3.2.2	UINT8	AI1 Signal Range Slot A	1
6005	0	B13.2.2	-	B11.2.2	UINT8	AI1 Signal Range Slot B	1
6006	1	-	-	P2.2.11	UINT16	Analog Input 1 scale	1
6009	0	-	-	P2.2.12	SINT16	Analog Input 1 Offset	0.01
6009	1	-	-	P2.3.12	SINT16	Analog Input 2 Offset	0.01
6012	0	P2.2.1	P2.4.1	P2.2.1	UINT8	AI1 Mode	1
6012	1	P2.3.1	-	P2.3.1	UINT8	AI2 Mode	1
6013	0	B3.2.1	-	B3.2.1	UINT8	AI1 Mode Slot A	1
6014	0	B13.2.1	-	B11.2.1	UINT8	AI1 Mode Slot B	1
6015	0	P2.2.3	P2.4.3	P2.2.3	UINT16	AI1 Custom Min	0.01
6015	1	P2.3.3	-	P2.3.3	UINT16	AI2 Custom Min	0.01
6016	0	B3.2.3	-	B3.2.3	UINT16	AI1 Custom Min Slot A	0.01
6017	0	B13.2.3	-	B11.2.3	UINT16	AI1 Custom Min Slot B	0.01
6018	0	P2.2.4	P2.4.4	P2.2.4	UINT16	AI1 Custom Max	0.01
6018	1	P2.3.4	-	P2.3.4	UINT16	AI2 Custom Max	0.01
6019	0	B3.2.4	-	B3.2.4	UINT16	AI1 Custom Max Slot A	0.01
6020	0	B13.2.4	-	B11.2.4	UINT16	AI1 Custom Max Slot B	0.01
6021	0	P2.2.5	P2.4.5	P2.2.5	UINT16	AI1 Filter Time	0.01
6021	1	P2.3.5	-	P2.3.5	UINT16	AI2 Filter Time	0.01
6022	0	B3.2.5	-	B3.2.5	UINT16	AI1 Filter Time Slot A	0.01
6023	0	B13.2.5	-	B11.2.5	UINT16	AI1 Filter Time Slot B	0.01
6024	0	P2.2.6	P2.4.6	P2.2.6	BOOL	AI1 Signal Invert	1
6024	1	P2.3.6	-	P2.3.6	BOOL	AI2 Signal Invert	1
6025	0	B3.2.6	-	B3.2.6	BOOL	AI1 Signal Invert Slot A	1
6026	0	B13.2.6	-	B11.2.6	BOOL	AI1 Signal Invert Slot B	1
6033	0	P3.36	-	P7.2.5	UINT8	AI Ref Source Select	1
6034	0	M12	M2.1	M5.1	SINT16 (DM1: UINT16)	Analog Input 1	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
6035	0	M13	-	M5.2	SINT16	Analog Input 2	0.01
6043	0	P5.23	P3.2.24	P27.1.4	UINT16	AI Limit Supv Val	0.01
6043	1	P5.45	-	P27.1.9	UINT16	Second AI Limit Supv Val	0.01
6044	0	P5.22	P3.2.22	P27.1.2	UINT8	AI Limit Supv	1
6044	1	P5.44	-	P27.1.7	UINT8	Second AI Limit Supv	1
6047	0	P5.21	P3.2.21	P27.1.1	UINT8	AI Supv Select	1
6048	0	P5.43	-	P27.1.6	UINT8	Second AI Supv Select	1
6049	0	P5.48	P3.2.25	P27.1.5	UINT16	AI Supv Hyst	0.01
6049	1	P5.49	-	P27.1.10	UINT16	Second AI Supv Hyst	0.01
6050	0	P2.2.7	P2.4.7	P2.2.7	UINT16	AI1 Joystick Hyst	0.01
6050	1	P2.3.7	-	P2.3.7	UINT16	AI2 Joystick Hyst	0.01
6053	0	P2.2.10	P2.4.10	P2.2.10	SINT16	AI1 Joystick Offset	0.01
6053	1	P2.3.10	-	P2.3.10	SINT16	AI2 Joystick Offset	0.01
6056	0	P2.2.8	P2.4.8	P2.2.8	UINT16	AI1 Sleep Limit	0.01
6056	1	P2.3.8	-	P2.3.8	UINT16	AI2 Sleep Limit	0.01
6059	0	P2.2.9	P2.4.9	P2.2.9	UINT16	AI1 Sleep Delay	0.01
6059	1	P2.3.9	-	P2.3.9	UINT16	AI2 Sleep Delay	0.01
6062	0	P2.4.1	-	P2.1.6	UINT8	Fine Tuning Input	1
6063	0	P2.4.2	-	P2.1.7	UINT16	Fine Tuning Min	0.1
6064	0	P2.4.3	-	P2.1.8	UINT16	Fine Tuning Max	0.1
6065	0	B3.1.3	-	B3.1.3	SINT16	AI1 Value Slot A	0.001
6066	0	-	P3.2.23	-	UINT8	AI Limit Display	1
6069	0	B13.1.3	-	B11.1.3	SINT16	AI1 Value	0.001
6070	0	-	-	B17.2.1	UINT8	AI301 Mode	1
6071	0	-	-	B17.2.2	UINT8	AI301 Signal Range	1
6072	0	-	-	B17.2.3	UINT16	AI301 Min	0.01
6073	0	-	-	B17.2.4	UINT16	AI301 Max	0.01
6074	0	-	-	B17.2.5	UINT16	AI301 t-Filter	0.01
6075	0	-	-	B17.2.6	BOOL	AI301 Invert	1
6076	0	-	-	B23.2.1	UINT8	AI401 Mode	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
6077	0	-	-	B23.2.2	UINT8	AI401 Signal Range	1
6078	0	-	-	B23.2.3	UINT16	AI401 Min	0.01
6079	0	-	-	B23.2.4	UINT16	AI401 Max	0.01
6080	0	-	-	B23.2.5	UINT16	AI401 t-Filter	0.01
6081	0	-	-	B23.2.6	BOOL	AI401 Invert	1
6082	0	-	-	B17.1.3	SINT16	AI301 (I1AI/2AO)	0.001
6083	0	-	-	B23.1.3	SINT16	AI401 (1AI/2AO)	0.001
7004	0	P4.5	✓	P4.2.9	UINT16	AO1 Scale	1
7004	1	P4.12	-	✓	UINT16	AO2 Scale	1
7005	0	B3.2.11	-	B3.2.11	UINT16	AO1 Scale Slot A	1
7005	1	B3.2.18	-	B3.2.18	UINT16	AO2 Scale Slot A	1
7006	0	B13.2.11	-	B11.2.11	UINT16	AO1 Scale Slot B	1
7006	1	B13.2.18	-	B11.2.18	UINT16	AO2 Scale Slot B	1
7007	0	P4.7	-	P4.2.11	SINT16	AO1 Offset	0.01
7007	1	P4.14	-	✓	SINT16	AO2 Offset	0.01
7008	0	B3.2.13	-	B3.2.13	SINT16	AO1 Offset Slot A	0.01
7008	1	B3.2.20	-	B3.2.20	SINT16	AO2 Offset Slot A	0.01
7009	0	B13.2.13	-	B11.2.13	SINT16	AO1 Offset Slot B	0.01
7009	1	B13.2.20	-	B11.2.20	SINT16	AO2 Offset Slot B	0.01
7010	0	P4.1	P3.3.1	P4.2.1	UINT8	AO1 Mode	1
7010	1	P4.8	-	✓	UINT8	AO2 Mode	1
7011	0	B3.2.7	-	B3.2.7	UINT8	AO1 Mode Slot A	1
7011	1	B3.2.14	-	B3.2.14	UINT8	AO2 Mode Slot A	1
7012	0	B13.2.7	-	B11.2.7	UINT8	AO1 Mode Slot B	1
7012	1	B13.2.14	-	B11.2.14	UINT8	AO2 Mode Slot B	1
7013	0	P4.4	P3.3.3	P4.2.3	UINT16	AO1 Filter Time	0.01
7013	1	P4.11	-	✓	UINT16	AO2 Filter Time	0.01
7014	0	B3.2.10	-	B3.2.10	UINT16	AO1 Filter Time Slot A	0.01
7014	1	B3.2.17	-	B3.2.17	UINT16	AO2 Filter Time Slot A	0.01
7015	0	B13.2.10	-	B11.2.10	UINT16	AO1 Filter Time Slot B	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
7015	1	B13.2.17	-	B11.2.17	UINT16	AO2 Filter Time Slot B	0.01
7016	0	P4.6	-	P4.2.10	BOOL	AO1 Inversion	1
7016	1	P4.13	-	✓	BOOL	AO2 Inversion	1
7017	0	B3.2.12	-	B3.2.12	BOOL	AO1 Inversion Slot A	1
7017	1	B3.2.19	-	B3.2.19	BOOL	AO2 Inversion Slot A	1
7018	0	B13.2.12	-	B11.2.12	BOOL	AO1 Inversion Slot B	1
7018	1	B13.2.19	-	B11.2.19	BOOL	AO2 Inversion Slot B	1
7019	0	P4.3	P3.3.6	P4.2.8	UINT8 (DM1: UINT16)	AO1 Minimum	1
7019	1	P4.10	-	✓	UINT8	AO2 Minimum	1
7020	0	B3.2.9	-	B3.2.9	UINT8	AO1 Minimum Slot A	1
7020	1	B3.2.16	-	B3.2.16	UINT8	AO2 Minimum Slot A	1
7021	0	B13.2.9	-	B11.2.9	UINT8	AO1 Minimum Slot B	1
7021	1	B13.2.16	-	B11.2.16	UINT8	AO2 Minimum Slot B	1
7022	0	P4.2	P3.3.2	P4.2.2	UINT8	AO1 Function	1
7022	1	P4.9	-	✓	UINT8	AO2 Function	1
7023	0	B3.2.8	-	B3.2.8	UINT8	AO1 Function Slot A	1
7023	1	B3.2.15	-	B3.2.15	UINT8	AO2 Function Slot A	1
7024	0	B13.2.8	-	B11.2.8	UINT8	AO1 Function Slot B	1
7024	1	B13.2.15	-	B11.2.15	UINT8	AO2 Function Slot B	1
7026	0	M14	M2.3	M6.1	UINT16 (DX1: SINT16)	Analog Output 1	0.01
7027	0	M15	-	✓	UINT16	Analog Output 2	0.01
7032	0	-	P3.3.4	✓	SINT32	AO Custom Min	0.01
7033	0	-	P3.3.5	✓	SINT32	AO Custom Max	0.01
7034	0	-	P3.3.6	✓	UINT16	AO value minimum	0.01
7035	0	-	P3.3.7	✓	UINT16	AO Value Max	0.01
7036	0	B3.1.4	-	B3.1.4	SINT16	AO1 Value	0.001
7036	1	B3.1.5	-	B3.1.5	SINT16	AO2 Value	0.001
7037	0	B13.1.4	-	B11.1.4	SINT16	AO1 Value Slot B	0.001
7037	1	B13.1.5	-	B11.1.5	SINT16	AO2 Value Slot B	0.001

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
7038	0	-	-	B17.1.4	SINT16	AO301 (1AI/2AO)	0.001
7038	1	-	-	B17.1.5	SINT16	AO302 (1AI/2AO)	0.001
7039	0	-	-	B23.1.4	SINT16	AO401 (1AI/2AO)	0.001
7039	1	-	-	B23.1.5	SINT16	AO402 (1AI/2AO)	0.001
7040	0	-	-	B17.2.7	UINT8	AO301 Mode	1
7040	1	-	-	B17.2.14	UINT8	AO302 Mode	1
7041	0	-	-	B17.2.8	UINT8	AO301 Function	1
7041	1	-	-	B17.2.15	UINT8	AO302 Function	1
7042	0	-	-	B17.2.9	UINT8	AO301 Min	1
7042	1	-	-	B17.2.16	UINT8	AO302 Min	1
7043	0	-	-	B17.2.10	UINT16	AO301 t-Filter	0.01
7043	1	-	-	B17.2.17	UINT16	AO302 t-Filter	0.01
7044	0	-	-	B17.2.11	UINT16	AO301 Scale	1
7044	1	-	-	B17.2.18	UINT16	AO302 Scale	1
7045	0	-	-	B17.2.12	BOOL	AO301 Invert	1
7045	1	-	-	B17.2.19	BOOL	AO302 Invert	1
7046	0	-	-	B17.2.13	SINT16	AO301 Offset	0.01
7046	1	-	-	B17.2.20	SINT16	AO302 Offset	0.01
7047	0	-	-	B23.2.7	UINT8	AO401 Mode	1
7048	0	-	-	B23.2.8	UINT8	AO401 Function	1
7049	0	-	-	B23.2.9	UINT8	AO401 Min	1
7050	0	-	-	B23.2.10	UINT16	AO401 t-Filter	0.01
7050	1	-	-	B23.2.17	UINT16	AO402 t-Filter	0.01
7051	0	-	-	B23.2.11	UINT16	AO401 Scale	1
7051	1	-	-	B23.2.18	UINT16	AO402 Scale	1
7052	0	-	-	B23.2.12	BOOL	AO401 Invert	1
7053	0	-	-	B23.2.13	SINT16	AO401 Offset	0.01
7053	1	-	-	B23.2.20	SINT16	AO402 Offset	0.01
8002	0	-	P2.2.1	-	UINT8	DI1 Function	1
8002	1	-	P2.2.3	-	UINT8	DI2 Function	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
8002	2	-	P2.2.5	-	UINT8	DI3 Function	1
8002	3	-	P2.2.7	-	UINT8	DI4 Function	1
8007	0	-	P2.2.2	-	UINT8	DI1 Invert	1
8007	1	-	P2.2.4	-	UINT8	DI2 Invert	1
8007	2	-	P2.2.6	-	UINT8	DI3 Invert	1
8007	3	-	P2.2.8	-	UINT8	DI4 Invert	1
8008	0	M46	M4.1	M96.1	WORD	Control Board DIDO Status	1
8009	0	M47	-	✓	WORD	SlotA DIDO Status	1
8010	0	M48	-	✓	WORD	SlotB DIDO Status	1
8011	0	-	-	✓	WORD	DIDO status on SlotC	1
8015	0	M16	M2.4	M4.1	BYTE	DI1, DI2, DI3	1
8016	0	M17	M2.5	M4.2	BYTE	DI4, DI5, DI6	1
8017	0	M18	-	-	BYTE	DI7, DI8	1
8018	0	B6.1.3	-	B6.1.3	BYTE	AC1, AC2, AC3 Slot A	1
8019	0	B16.1.3	-	B14.1.3	BYTE	AC1, AC2, AC3 Slot B	1
8022	0	B6.1.4	-	B6.1.4	BYTE	AC4, AC5, AC6	1
8023	0	B16.1.4	-	B14.1.4	BYTE	AC4, AC5, AC6 Slot B	1
8026	0	M68	-	M43.1	WORD	SlotA DI status	1
8027	0	M69	-	M43.2	WORD	SlotB DI status	1
8028	0	B2.1.3	-	B2.1.3	BYTE	DI1, DI2, DI3 Slot A	1
8030	0	B12.1.3	-	B10.1.3	BYTE	DI1, DI2, DI3 Slot B	1
8032	0	M67	M2.9	M4.11	WORD	Control board DI status	1
8033	0	-	-	M43.4	WORD	SlotD DI Status	1
8034	0	-	-	M43.3	WORD	SlotC DI Status	1
8036	0	-	-	B16.1.3	BYTE	DI301-303 Status (3DI/3DO/1Th)	1
8037	0	-	-	B20.1.3	BYTE	DI301-303 Status (6DI-240V)	1
8038	0	-	-	B22.1.3	BYTE	DI401-403 Status (3DI/3DO/1Th)	1
8039	0	-	-	B26.1.3	BYTE	DI401-403 Status (6DI-240V)	1
8040	0	-	-	B26.1.4	BYTE	DI404-406 Status (I6DI-240V)	1
8041	0	-	-	B20.1.4	BYTE	DI304-306 Status (I6DI-240V)	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
10001	0	P5.1	-	P5.2.1	UINT8	DO1 Function	1
10002	0	B2.2.1	-	B2.2.1	UINT8	DO1 Function Slot A	1
10002	1	B2.2.2	-	B2.2.2	UINT8	DO2 Function	1
10002	2	B2.2.3	-	B2.2.3	UINT8	DO3 Function	1
10003	0	B12.2.1	-	B10.2.1	UINT8	DO1 Function Slot B	1
10003	1	B12.2.2	-	B10.2.2	UINT8	DO2 Function Slot B	1
10003	2	B12.2.3	-	B10.2.3	UINT8	DO3 Function Slot B	1
10015	0	B2.1.4	-	B2.1.4	BYTE	DO1, DO2, DO3	1
10016	0	B12.1.4	-	B10.1.4	BYTE	DO1, DO2, DO3 Slot B	1
10018	0	M19	-	M4.4	BYTE	DO1,Virtual RO1,Virtual RO2	1
10020	0	-	-	P5.4.1.1	UINT8	High Freq Pulse Output Type	1
10021	0	-	-	P5.4.2.1	UINT8	High Freq Pulse Output Source	1
10022	0	-	-	P5.4.2.2	UINT16	High Freq Pulse Output Scale	1
10023	0	-	-	P5.4.2.3	SINT16	High Freq Pulse Output Offset	0.01
10024	0	-	-	P5.4.2.4	UINT16	High Freq Pulse Output Filter Time	1
10025	0	-	-	P5.4.2.5	UINT16	High Freq Pulse Output Min	1
10026	0	-	-	P5.4.2.6	UINT16	High Freq Pulse Output Max	1
10027	0	-	-	P5.4.2.8	UINT16	High Freq Pulse Output Low Limit	1
10028	0	-	-	P5.4.2.9	UINT16	High Freq Pulse Output High Limit	1
10029	0	-	-	P5.4.2.10	UINT16	High Freq Pulse Output Check Delay	1
10030	0	-	-	P5.4.2.11	UINT16	High Freq Pulse Output Hyst Level	1
10031	0	-	-	B16.1.4	BYTE	DO301-303 Status (3DI/3DO/1Th)	1
10032	0	-	-	B16.2.1	UINT8	DO301 Function	1
10032	1	-	-	B16.2.2	UINT8	DO302 Function	1
10032	2	-	-	B16.2.3	UINT8	DO303 Function	1
10033	0	-	-	B22.1.4	BYTE	DO401-403 Status (3DI/3DO/1Th)	1
10034	0	-	-	B22.2.1	UINT8	DO401 Function	1
10034	1	-	-	B22.2.2	UINT8	DO402 Function	1
10034	2	-	-	B22.2.3	UINT8	DO403 Function	1
12001	0	P5.2	P3.1.1	P5.1.1	UINT8	RO1 Function	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
12001	1	P5.3	P3.1.4	P5.1.4	UINT8	RO2 Function	1
12001	2	P5.4	-	-	UINT8	RO3 Function	1
12002	0	B4.2.1	-	B4.2.1	UINT8	RO1 Function Slot A	1
12002	1	B4.2.2	-	B4.2.2	UINT8	RO2 Function Slot A	1
12002	2	B4.2.3	-	B4.2.3	UINT8	RO3 Function Slot A	1
12003	0	B14.2.1	-	B12.2.1	UINT8	RO1 Function Slot B	1
12003	1	B14.2.2	-	B12.2.2	UINT8	RO2 Function Slot B	1
12003	2	B14.2.3	-	B12.2.3	UINT8	RO3 Function Slot B	1
12012	0	P5.32	P3.1.2	P5.1.2	UINT16	RO1 On Delay	0.1
12012	1	P5.34	P3.1.5	P5.1.5	UINT16	RO2 On Delay	0.1
12012	2	P5.36	-	-	UINT16	RO3 On Delay	0.1
12015	0	P5.33	P3.1.3	P5.1.3	UINT16	RO1 Off Delay	0.1
12015	1	P5.35	P3.1.6	P5.1.6	UINT16	RO2 Off Delay	0.1
12015	2	P5.37	-	-	UINT16	RO3 Off Delay	0.1
12022	2	P5.38	P3.1.7	-	UINT8	RO3 Reverse	1
12029	0	B4.1.3	-	B4.1.3	BYTE	RO1, RO2, RO3 Slot A	1
12030	0	B14.1.3	-	B12.1.3	BYTE	RO1, RO2, RO3 Slot B	1
12032	0	M20	M2.8	M4.7	BYTE	RO1, RO2, RO3	1
12033	0	-	-	B18.1.3	BYTE	RO301-303 Status	1
12034	0	-	-	B18.2.1	UINT8	RO301 Function	1
12034	1	-	-	B18.2.2	UINT8	RO302 Function	1
12034	2	-	-	B18.2.3	UINT8	RO303 Function	1
12035	0	-	-	B24.1.3	BYTE	RO401-403 Status	1
12036	0	-	-	B24.2.1	UINT8	RO401 Function	1
12036	1	-	-	B24.2.2	UINT8	RO402 Function	1
12036	2	-	-	B24.2.3	UINT8	RO403 Function	1
14001	0	-	P2.2.9	-	UINT8	Virtual RO1 input	1
14001	1	-	P2.2.11	-	UINT8	Virtual RO2 input	1
14002	0	-	P2.2.10	-	UINT8	Virtual RO1 invert	1
14003	1	-	P2.2.12	-	UINT8	virtual RO2 invert	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
14004	0	-	M2.6	-	BYTE	Virtual DI1,Virtual DI2	1
15001	0	P5.5	P3.1.8	P5.3.1	UINT8	Virtual RO1 Function	1
15001	1	P5.6	P3.1.9	P5.3.4	UINT8	Virtual RO2 Function	1
15012	0	P5.56	-	P5.3.2	UINT16	Virtual RO1 On Delay	0.1
15012	1	P5.58	-	P5.3.5	UINT16	Virtual RO2 On Delay	0.1
15015	0	P5.57	-	P5.3.3	UINT16	Virtual RO1 Off Delay	0.1
15015	1	P5.59	-	P5.3.6	UINT16	Virtual RO2 Off Delay	0.1
15022	0	-	M2.7	-	BYTE	Virtual RO1,Virtual RO2	1
16001	0	B5.2.1	-	B5.2.1	UINT8	PT100-3,2,1	1
16003	0	B15.2.1	-	B13.2.1	UINT8	PT100-3,2,1 Slot B	1
16005	0	B2.2.4	-	B2.2.4	BOOL	Thermistor Config	1
16006	0	B12.2.4	-	B10.2.4	UINT8	Thermistor Config Slot B	1
16007	0	P3.4	-	-	UINT8	Thermistor Input Select	1
16010	0	M41	-	M42.1	SINT16	PT100 Temperture	0.1
16014	0	B5.2.2	-	B5.2.2	SINT16	PT100 Warning Limit	0.1
16015	0	B15.2.2	-	B13.2.2	SINT16	PT100 Warning Limit Slot B	0.1
16017	0	B5.2.3	-	B5.2.3	SINT16	PT100 Fault Limit	0.1
16018	0	B15.2.3	-	B13.2.3	SINT16	PT100 Fault Limit Slot B	0.1
16029	0	B5.1.4	-	B5.1.4	SINT16	Slot A IO4 PT100 Temperature 1	0.1
16029	1	B5.1.4	-	B5.1.4	SINT16	Slot A IO4 PT100 Temperature 2	0.1
16029	2	B5.1.4	-	B5.1.4	SINT16	Slot A IO4 PT100 Temperature 3	0.1
16030	0	B15.1.4	-	B13.1.4	SINT16	Slot B IO4 PT100 Temperature 1	0.1
16030	1	B15.1.4	-	B13.1.4	SINT16	Slot B IO4 PT100 Temperature 2	0.1
16030	2	B15.1.4	-	B13.1.4	SINT16	Slot B IO4 PT100 Temperature 3	0.1
16035	0	B5.1.4	-	B5.1.4	SINT16	PT100 Values	0.1
16036	0	B15.1.4	-	B13.1.4	SINT16	PT100 Values Slot B	0.1
16044	0	✓	-	✓	UINT32	Thermistor resistor	1
16048	0	B2.1.5	-	B2.1.5	UINT32	Thermistor Resistor Slot A	1
16049	0	B12.1.5	-	B10.1.5	UINT32	Thermistor Resistor Slot B	1
16058	0	B2.1.6	-	B2.1.6	UINT8	Thermistor State Slot A	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
16059	0	B12.1.6	-	B10.1.6	UINT8	Thermistor State Slot B	1
16068	0	-	-	B19.2.1	UINT8	PT100-300 Select	1
16069	0	-	-	B25.2.1	UINT8	PT100-400 Select	1
16070	0	-	-	B16.2.4	BOOL	Thermistor301 Mode	1
16071	0	-	-	B19.1.3	UINT16	PT100-300 Status	1
16072	0	-	-	B22.2.4	BOOL	Thermistor401 Mode	1
16073	0	-	-	B25.1.3	UINT16	PT100-400 Status	1
16074	0	-	-	B16.1.5	UINT32	Thermistor301 Resistance	1
16075	0	-	-	B16.1.6	UINT8	Thermistor301 Status	1
16076	0	-	-	B19.1.4	SINT16	PT100-300 Temperature	0.1
16077	0	-	-	B19.2.2	SINT16	PT100-300 WarnLevel	0.1
16078	0	-	-	B19.2.3	SINT16	PT100-300 FaultLevel	0.1
16079	0	-	-	B22.1.5	UINT32	Thermistor401 Resistance	1
16080	0	-	-	B22.1.6	UINT8	Thermistor401 Status	1
16081	0	-	-	B25.1.4	SINT16	PT100-400 Temperature	0.1
16084	0	B5.1.3	-	B5.1.3	UINT16	PT100 State Slot A	1
16085	0	B15.1.3	-	B13.1.3	UINT16	PT100 State Slot B	1
16208	0	P15.7	P8.2.6	-	BOOL	Fire Mode Test Enable	1
16210	0	P3.27	-	-	UINT8	Smoke Mode	1
16211	0	P3.28	-	-	UINT8	Fire Mode	1
16212	0	P3.29	-	-	UINT8	Fire Mode Ref 1/2 Select	1
16213	0	P15.2	P8.2.2	-	UINT8	Fire Mode Ref Select Function	1
16215	0	P3.44	-	-	UINT8	Fire Mode Direction Invert	1
16217	0	P15.1	P8.2.1	-	BOOL	Fire Mode Function	1
16221	0	P15.4	P8.2.4	-	UINT16	Fire Mode % Speed Ref 1	0.1
16222	0	P15.5	P8.2.5	-	UINT16	Fire Mode % Speed Ref 2	0.1
16223	0	P15.3	P8.2.3	-	UINT16	Fire Mode Frequency	0.01
16224	0	P15.6	P8.2.7	-	UINT16	Smoke Purge Frequency	0.1
16403	0	P3.30	-	P10.1.2	UINT8	PID1 Set Point Select	1
16404	0	P3.31	-	P11.1.2	UINT8	PID2 Set Point Select	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
16409	0	✓	-	✓	UINT16	Bandwidth	0.1
16410	0	P10.1	P7.1.1	P10.2.1	UINT16	PID1 Control Gain	0.01
16411	0	P11.1	-	P11.2.1	UINT16	PID2 Control Gain	0.01
16412	0	P10.2	P7.1.2	P10.2.2	UINT16	PID1 Control ITime	0.01
16413	0	P11.2	-	P11.2.2	UINT16	PID2 Control I Time	0.01
16414	0	P10.3	-	P10.2.3	UINT16	PID1 Control DTime	0.01
16415	0	P11.3	-	P11.2.3	UINT16	PID2 Control D Time	0.01
16418	0	P10.14	P7.2.2.1	P10.4.1	UINT8	PID1 Set Point 1 Source	1
16419	0	P11.14	-	P11.4.1	UINT8	PID2 Set Point 1 Source	1
16422	0	P10.34	P7.3.2.1	P10.8.1	UINT8	PID1 Feedback 1 Source	1
16423	0	P11.34	-	P11.8.1	UINT8	PID2 Feedback 1 Source	1
16426	0	P10.23	P7.2.3.1	P10.5.1	UINT8	PID1 Set Point 2 Source	1
16427	0	P11.23	-	P11.5.1	UINT8	PID2 Set Point 2 Source	1
16428	0	P10.37	-	P10.8.4	UINT8	PID1 Feedback 2 Source	1
16429	0	P11.37	-	P11.8.4	UINT8	PID2 Feedback 2 Source	1
16432	0	-	-	P10.2.12	SINT16	PID1 Output Min	0.01
16433	0	-	-	P11.2.12	SINT16	PID2 Output Min	0.01
16434	0	-	-	P10.2.13	SINT16	PID1 Output Max	0.01
16435	0	-	-	P11.2.13	SINT16	PID2 Output Max	0.01
16440	0	M33	M5.4	M10.4	UINT16	PID1 Output	0.01
16441	0	M38	-	M11.4	UINT16	PID2 Output	0.01
16448	0	M34	M5.5	M10.5	UINT8	PID1 Status	1
16449	0	M39	-	M11.5	UINT8	PID2 Status	1
16450	0	P3.13	-	P10.1.1	UINT8	PID1 Control Enable	1
16451	0	P3.14	-	P11.1.1	UINT8	PID2 Control Enable	1
16454	0	P10.17	P7.2.2.2	P10.4.2	BOOL	PID1 Set Point 1 Sleep Enable	1
16455	0	P11.17	-	P11.4.2	BOOL	PID2 Set Point 1 Sleep Enable	1
16456	0	P10.19	P7.2.2.6	P10.4.6	SINT32	PID1 Set Point 1 Sleep Level	0.01
16457	0	P11.19	-	P11.4.6	SINT32	PID2 Set Point 1 Sleep Level	0.01
16458	0	P10.20	P7.2.2.3	P10.4.3	UINT16	PID1 Set Point 1 Sleep Delay	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
16459	0	P11.20	-	P11.4.3	UINT16	PID2 Set Point 1 Sleep Delay	1
16460	0	P10.21	P7.2.2.4	P10.4.4	SINT32	PID1 Set Point 1 Wake Up Level	0.01
16461	0	P11.21	-	P11.4.4	SINT32	PID2 Set Point 1 WakeUp Level	0.01
16462	0	P10.26	P7.2.3.2	P10.5.2	BOOL	PID1 Set Point 2 Sleep Enable	1
16463	0	P11.26	-	P11.5.2	BOOL	PID2 Set Point 2 Sleep Enable	1
16464	0	P10.28	P7.2.3.6	P10.5.6	SINT32	PID1 Set Point 2 Sleep Level	0.01
16465	0	P11.28	-	P11.5.6	SINT32	PID2 Set Point 2 Sleep Level	0.01
16466	0	P10.29	P7.2.3.3	P10.5.3	UINT16	PID1 Set Point 2 Sleep Delay	1
16467	0	P11.29	-	P11.5.3	UINT16	PID2 Set Point 2 Sleep Delay	1
16468	0	P10.30	P7.2.3.4	P10.5.4	SINT32	PID1 Set Point 2 Wake Up Level	0.01
16469	0	P11.30	-	P11.5.4	SINT32	PID2 Set Point 2 WakeUp Level	0.01
16470	0	P10.18	-	P10.4.11	UINT8	PID1 Set Point 1 Sleep Unit Sel	1
16471	0	P11.18	-	P11.4.11	UINT8	PID2 Set Point 1 Sleep Unit Sel	1
16472	0	P10.27	-	P10.5.11	UINT8	PID1 Set Point 2 Sleep Unit Sel	1
16473	0	P11.27	-	P11.5.11	UINT8	PID2 Set Point 2 Sleep Unit Sel	1
16474	0	P10.52	P7.2.1.3	P10.3.3	UINT8	PID1 Wake Up Action	1
16475	0	P11.52	-	P11.3.3	UINT8	PID2 Wake Up Action	1
16476	0	P10.59	-	P10.3.4	SINT16	PID1 Sleep Boost level	1
16477	0	P11.59	-	P11.3.4	SINT16	PID2 Sleep Boost level	1
16478	0	P10.60	-	P10.3.5	UINT16	PID1 Sleep Boost Max Time	1
16479	0	P11.60	-	P11.3.5	UINT16	PID2 Sleep Boost Max Time	1
16482	0	M30	M5.1	M10.1	SINT32	PID1 Set Point	0.01
16483	0	M35	-	M11.1	SINT32	PID2 Set Point	0.01
16484	0	P10.13	P7.1.9	P10.2.11	UINT16	PID1 Ramp Time	0.01
16485	0	P11.13	-	P11.2.11	UINT16	PID2 Ramp Time	0.01
16488	0	P10.33	P7.3.1.1	P10.7.1	SINT16	PID1 Feedback Gain	0.1
16489	0	P11.33	-	P11.7.1	SINT16	PID2 Feedback Gain	0.1
16490	0	P10.22	P7.2.2.5	P10.4.5	SINT8	PID1 Set Point 1 Boost	0.1
16491	0	P11.22	-	P11.4.5	SINT8	PID2 Set Point 1 Boost	0.1
16494	0	P10.53	M4.4	P10.6.1	SINT32	FB PID1 Set Point 1	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
16495	0	P11.53	-	P11.6.1	SINT32	FB PID2 Set Point 1	0.01
16496	0	P10.31	P7.2.3.5	P10.5.5	SINT8	PID1 Set Point 2 Boost	0.1
16497	0	P11.31	-	P11.5.5	SINT8	PID2 Set Point 2 Boost	0.1
16500	0	P10.54	M4.5	P10.6.2	SINT32	FB PID1 Set Point 2	0.01
16501	0	P11.54	-	P11.6.2	SINT32	FB PID2 Set Point 2	0.01
16502	0	✓	-	✓	SINT32	PID 1 Feedback 1	0.01
16503	0	✓	-	✓	SINT32	PID 2 Feedback 1	0.01
16504	0	P10.55	M4.6	P10.6.3	SINT16	FB PID1 Feedback 1	0.01
16505	0	P11.55	-	P11.6.3	SINT16	FB PID2 Feedback 1	0.01
16506	0	M32	M5.3	M10.3	SINT32	PID1 Error Value	0.01
16507	0	M37	-	M11.3	SINT32	PID2 Error Value	0.01
16508	0	P10.15	-	P10.4.9	SINT16	PID1 Set Point 1 Min	0.01
16509	0	P11.15	-	P11.4.9	SINT16	PID2 Set Point 1 Min	0.01
16510	0	P10.16	-	P10.4.10	SINT16	PID1 Set Point 1 Max	0.01
16511	0	P11.16	-	P11.4.10	SINT16	PID2 Set Point 1 Max	0.01
16512	0	P10.11	P7.2.1.1	P10.3.1	SINT32	PID1 Keypad Set Point 1	0.01
16513	0	P11.11	-	P11.3.1	SINT32	PID2 Keypad Set Point 1	0.01
16514	0	P10.32	-	P10.7.2	UINT8	PID1 Feedback Function	1
16515	0	P11.32	-	P11.7.2	UINT8	PID2 Feedback Func	1
16516	0	P10.35	P7.3.2.2	P10.8.2	SINT16	PID1 Feedback 1 Min	0.01
16517	0	P11.35	-	P11.8.2	SINT16	PID2 Feedback 1 Min	0.01
16518	0	P10.36	P7.3.2.3	P10.8.3	SINT16	PID1 Feedback 1 Max	0.01
16519	0	P11.36	-	P11.8.3	SINT16	PID2 Feedback 1 Max	0.01
16520	0	✓	-	✓	SINT32	PID 1 Feedback 2	0.01
16521	0	✓	-	✓	SINT32	PID 2 Feedback 2	0.01
16522	0	P10.56	-	P10.6.4	SINT16	FB PID1 Feedback 2	0.01
16523	0	P11.56	-	P11.6.4	SINT16	FB PID2 Feedback 2	0.01
16526	0	P10.24	-	P10.5.9	SINT16	PID1 Set Point 2 Min	0.01
16527	0	P11.24	-	P11.5.9	SINT16	PID2 Set Point 2 Min	0.01
16528	0	P10.25	-	P10.5.10	SINT16	PID1 Set Point 2 Max	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
16529	0	P11.25	-	P11.5.10	SINT16	PID2 Set Point 2 Max	0.01
16530	0	P10.12	P7.2.1.2	P10.3.2	SINT32	PID1 Keypad Set Point 2	0.01
16531	0	P11.12	-	P11.3.2	SINT32	PID2 Keypad Set Point 2	0.01
16534	0	P10.38	-	P10.8.5	SINT16	PID1 Feedback 2 Min	0.01
16535	0	P11.38	-	P11.8.5	SINT16	PID2 Feedback 2 Min	0.01
16536	0	P10.39	-	P10.8.6	SINT16	PID1 Feedback 2 Max	0.01
16537	0	P11.39	-	P11.8.6	SINT16	PID2 Feedback 2 Max	0.01
16540	0	P10.40	-	P10.9.1	UINT8	PID1 Feedforward Func	1
16541	0	P11.40	-	P11.9.1	UINT8	PID2 Feedforward Func	1
16542	0	P10.41	-	P10.9.2	SINT16	PID1 Feedforward Gain	0.1
16543	0	P11.41	-	P11.9.2	SINT16	PID2 Feedforward Gain	0.1
16544	0	P10.42	-	P10.9.3	UINT8	PID1 Feedforward 1 Source	1
16545	0	P11.42	-	P11.9.3	UINT8	PID2 Feedforward 1 Source	1
16546	0	P10.43	-	P10.9.4	SINT16	PID1 Feedforward 1 Min	0.01
16547	0	P11.43	-	P11.9.4	SINT16	PID2 Feedforward 1 Min	0.01
16548	0	P10.44	-	P10.9.5	SINT16	PID1 Feedforward 1 Max	0.01
16549	0	P11.44	-	P11.9.5	SINT16	PID2 Feedforward 1 Max	0.01
16552	0	P10.57	-	P10.6.5	SINT16	FB PID1 Feedforward 1	0.01
16553	0	P11.57	-	P11.6.5	SINT16	FB PID2 Feedforward 1	0.01
16554	0	P10.45	-	P10.9.6	UINT8	PID1 Feedforward 2 Source	1
16555	0	P11.45	-	P11.9.6	UINT8	PID2 Feedforward 2 Source	1
16556	0	P10.46	-	P10.9.7	SINT16	PID1 Feedforward 2 Min	0.01
16557	0	P11.46	-	P11.9.7	SINT16	PID2 Feedforward 2 Min	0.01
16558	0	P10.47	-	P10.9.8	SINT16	PID1 Feedforward 2 Max	0.01
16559	0	P11.47	-	P11.9.8	SINT16	PID2 Feedforward 2 Max	0.01
16562	0	P10.58	-	P10.6.6	SINT16	FB PID1 Feedforward 2	0.01
16563	0	P11.58	-	P11.6.6	SINT16	FB PID2 Feedforward 2	0.01
16564	0	P10.48	-	P10.4.12	BOOL	PID1 Set Point 1 Comp Enable	1
16565	0	P11.48	-	P11.5.12	BOOL	PID2 Set Point1 Comp Enable	1
16566	0	P10.49	-	P10.4.13	SINT16	PID1 Set Point 1 Comp Max	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
16567	0	P11.49	-	P11.5.13	SINT16	PID2 Set Point1 Comp Max	0.01
16568	0	P10.50	-	P10.5.12	BOOL	PID1 Set Point 2 Comp Enable	1
16569	0	P11.50	-	P11.4.12	BOOL	PID2 Set Point 2 Comp Enable	1
16570	0	P10.51	-	P10.5.13	SINT16	PID1 Set Point 2 Comp Max	0.01
16571	0	P11.51	-	P11.4.13	SINT16	PID2 Set Point 2 Comp Max	0.01
16572	0	P10.8	P7.1.6	P10.2.8	BOOL	PID1 Error Inversion	1
16573	0	P11.8	-	P11.2.8	BOOL	PID2 Error Inversion	1
16574	0	P10.9	P7.1.7	P10.2.9	SINT32	PID1 Dead Band	0.01
16575	0	P11.9	-	P11.2.9	SINT32	PID2 Dead Band	0.01
16576	0	P10.10	P7.1.8	P10.2.10	UINT16	PID1 Dead Band Delay	0.01
16577	0	P11.10	-	P11.2.10	UINT16	PID2 Dead Band Delay	0.01
16578	0	P10.61	-	P10.7.3	UINT16	PID1 Low Feedback Level	0.1
16579	0	P11.61	-	P11.7.3	UINT16	PID2 Low Feedback Level	0.1
16580	0	P10.62	-	P10.7.4	UINT16	PID1 Low Feedback Time	1
16581	0	P11.62	-	P11.7.4	UINT16	PID2 Low Feedback Time	1
16582	0	P10.64	-	P10.7.6	UINT16	PID1 High Feedback Level	0.1
16583	0	P11.64	-	P11.7.6	UINT16	PID2 High Feedback Level	0.1
16584	0	P10.65	-	P10.7.7	UINT16	PID1 High Feedback Time	1
16585	0	P11.65	-	P11.7.7	UINT16	PID2 High Feedback Time	1
16586	0	P10.67	-	P10.7.9	UINT16	PID1 Hysteresis Level	0.1
16587	0	P11.67	-	P11.7.9	UINT16	PID2 Hysteresis Level	0.1
16588	0	P10.68	-	P10.7.10	UINT8	PID1 Backup Feedback Source	1
16589	0	P11.68	-	P11.7.10	UINT8	PID2 Backup Feedback Source	1
16590	0	P5.24	P3.2.30	P27.10.1	BOOL	PID1 Superv Enable	1
16591	0	P5.28	-	P27.11.1	BOOL	PID2 Superv Enable	1
16592	0	P5.25	P3.2.32	P27.10.3	SINT32	PID1 Superv Upper Limit	0.01
16593	0	P5.29	-	P27.11.3	SINT32	PID2 Superv Upper Limit	0.01
16594	0	P5.26	P3.2.33	P27.10.4	SINT32	PID1 Superv Lower Limit	0.01
16595	0	P5.30	-	P27.11.4	SINT32	PID2 Superv Lower Limit	0.01
16596	0	P5.27	P3.2.34	P27.10.5	UINT16	PID1 Superv Delay	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
16597	0	P5.31	-	P27.11.5	UINT16	PID2 Superv Delay	1
16598	0	M31	M5.2	M10.2	SINT32	PID1 Feedback	0.01
16599	0	M36	-	M11.2	SINT32	PID2 Feedback	0.01
16600	0	P10.4	P7.1.3	P10.2.4	UINT8	PID1 Process Unit	1
16601	0	P11.4	-	P11.2.4	UINT8	PID2 Process Unit	1
16602	0	P10.5	P7.1.4	P10.2.5	SINT32	PID1 Process Unit Min	0.01
16603	0	P11.5	-	P11.2.5	SINT32	PID2 Process Unit Min	0.01
16604	0	P10.6	P7.1.5	P10.2.6	SINT32	PID1 Process Unit Max	0.01
16605	0	P11.6	-	P11.2.6	SINT32	PID2 Process Unit Max	0.01
16606	0	P10.7	-	P10.2.7	UINT8	PID1 Process Unit Decimal	1
16607	0	P11.7	-	P11.2.7	UINT8	PID2 Process Unit Decimal	1
16612	0	P9.52	P6.2.13	P26.10.3	UINT16	PID Feedback AI Loss Pre Freq	0.01
16613	0	P9.53	P6.2.14	P26.10.4	UINT16	PID Feedback AI Loss Pipe Fill Loss Level	0.1
16614	0	P9.54	P6.2.15	P26.10.5	UINT16	PID Feedback AI Loss PreFreq Timeout	1
16617	0	-	P7.2.2.7	-	UINT8	SP1 Sleep Mode Over Cycle Time	1
16618	0	-	P7.2.2.8	-	UINT16	SP1 Sleep Mode Max Cycle Time	1
16619	0	-	P7.2.3.7	-	UINT8	SP2 Sleep Mode Over Cycle Time	1
16620	0	-	P7.2.3.8	-	UINT16	SP2 Sleep Mode Max Cycle Time	1
16621	0	-	-	P26.12.2	UINT8	PID2 Feedback AI Loss Protect	1
16622	0	-	-	P26.12.3	UINT16	PID2 Feedback AI Loss Preset Frequency	0.01
16623	0	-	-	P26.12.4	UINT16	PID2 Feedback AI Loss of Prime Level	0.1
16624	0	-	-	P26.12.5	UINT16	PID2 Feedback AI Loss Preset Frequency Timeout	1
17201	0	P3.26	-	P23.2.1	UINT8	DC Brake Active	1
17205	0	P14.5	P4.2.1	P23.1.2	UINT8	Brake Chopper Mode	1
17206	0	P5.16	P3.4.17	P24.2	UINT16	Ext Brake On Delay	0.1
17207	0	P5.15	P3.4.16	P24.1	UINT16	Ext Brake Off Delay	0.1
17210	0	P14.6	P4.2.6	P23.1.9	BOOL	Flux Brake	1
17211	0	P14.7	P4.2.7	P23.1.10	UINT16	Flux Brake Current	0.1 (DM1: 0.01)
17214	0	P14.2	P4.2.3	P23.1.6	UINT16	Start DC-Brake Time	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
17215	0	P14.4	P4.2.5	P23.1.8	UINT16	Stop DC-Brake Time	0.01
17216	0	P14.3	P4.2.4	P23.1.7	UINT16	Stop DC-Brake Frequency	0.01
17217	0	P14.1	P4.2.2	P23.1.5	UINT16	DC-Brake Current	0.1 (DM1: 0.01)
17351	0	P17.1.1	-	P22.1.3	BOOL	Bypass Enable	1
17352	0	P17.1.3	-	P22.2.1	BOOL	Auto Bypass	1
17353	0	✓	-	✓	UINT8	Bypass Start	1
17355	0	P17.1.6	-	P22.2.4	BOOL	IGBT Fault Bypas Enable	1
17356	0	P17.1.7	-	P22.2.5	BOOL	4mA Fault Bypass Enable	1
17357	0	P17.1.8	-	P22.2.6	BOOL	UnderVoltage Bypass Enable	1
17358	0	P17.1.9	-	P22.2.7	BOOL	OverVoltage Bypass Enable	1
17359	0	P3.43	-	P22.1.2	UINT8	Bypass Overload	1
17504	0	P18.4.4	-	P41.6.4	UINT16	Auto-Change Interval	0.1
17505	0	P3.56	-	P41.2.1	UINT8	Deragging Enable	1
17506	0	P3.58	-	P41.3.3	UINT8	Multi-pump Mode 1/2 Select	1
17507	0	P18.4.3	-	P41.6.3	BOOL	Auto-Change Enable	1
17508	0	P18.4.5	-	P41.6.5	UINT16	Auto-Change Freq Limit	0.01
17509	0	P18.4.6	-	P41.6.6	UINT8	Auto-Change Pump Limit	1
17510	0	P18.4.2	-	P41.6.2	UINT8	Include Freq Converter	1
17511	0	P18.5.5	P9.3.11	P41.4.3	UINT8	Add/Remove Drive Selection	1
17512	0	P18.4.1	-	P41.6.1	UINT8	Number of Pumps	1
17513	0	P18.5.1	P9.3.2	P41.3.4	UINT8	Number of Drives	1
17514	0	P18.1.7	P9.3.9	P41.3.10	UINT8	Interlock Enable	1
17515	0	P3.37	-	P41.3.15	UINT8	Motor Interlock 1	1
17515	1	P3.38	-	P41.3.16	UINT8	Motor Interlock 2	1
17515	2	P3.39	-	P41.3.17	UINT8	Motor Interlock 3	1
17515	3	P3.40	-	P41.3.18	UINT8	Motor Interlock 4	1
17515	4	P3.41	-	P41.3.19	UINT8	Motor Interlock 5	1
17516	0	M40	✓	M41.1.1	UINT8	Running Motors	1
17519	0	P18.1.6	P9.3.8	P41.3.9	UINT16	Add/Remove Delay	1
17520	0	P18.1.4	P9.3.6	P41.3.7	UINT16	Staging Frequency	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
17521	0	P18.1.5	P9.3.7	P41.3.8	UINT16	De-Staging Frequency	0.01
17522	0	P18.5.6	P9.3.12	P41.4.4	UINT8	Run Time Enable	1
17523	0	P18.5.7	P9.3.13	P41.4.5	UINT32	Run Time Limit	0.1
17524	0	P18.5.8	P9.3.14	P41.4.6	UINT8	Run Time Reset	1
17525	0	P18.5.3	P9.3.10	P41.4.2	UINT8	Recovery Method	1
17526	0	P18.1.1	P9.3.1	P41.3.1	UINT8	Multi-pump Mode	1
17526	1	P18.1.16	-	P41.3.2	UINT8	Multi-pump Mode 2	1
17527	0	P17.2.2 P18.1.2	P9.3.3	P41.3.5	UINT8	Drive ID	1
17528	0	P1.19	P9.2.5	P41.1.5	UINT16	Minimum Run Time	1
17529	0	P18.2.1.1	M7.1.1	M41.2.1	UINT8	MPC Drive1 Operate Mode	1
17529	1	P18.2.1.2	M7.1.2	M41.2.2	UINT8	MPC Drive2 Operate Mode	1
17529	2	P18.2.1.3	M7.1.3	M41.2.3	UINT8	MPC Drive3 Operate Mode	1
17529	3	P18.2.1.4	M7.1.4	M41.2.4	UINT8	MPC Drive4 Operate Mode	1
17529	4	P18.2.1.5	M7.1.5	M41.2.5	UINT8	MPC Drive5 Operate Mode	1
17530	0	P18.2.2.1	M7.2.1	M41.3.1	UINT8	MPC Drive1 Status	1
17530	1	P18.2.2.2	M7.2.2	M41.3.2	UINT8	MPC Drive2 Status	1
17530	2	P18.2.2.3	M7.2.3	M41.3.3	UINT8	MPC Drive3 Status	1
17530	3	P18.2.2.4	M7.2.4	M41.3.4	UINT8	MPC Drive4 Status	1
17530	4	P18.2.2.5	M7.2.5	M41.3.5	UINT8	MPC Drive5 Status	1
17531	0	P18.2.3.1	M7.3.1	M41.4.1	UINT8	MPC Drive1 NetworkStatus	1
17531	1	P18.2.3.2	M7.3.2	M41.4.2	UINT8	MPC Drive2 NetworkStatus	1
17531	2	P18.2.3.3	M7.3.3	M41.4.3	UINT8	MPC Drive3 NetworkStatus	1
17531	3	P18.2.3.4	M7.3.4	M41.4.4	UINT8	MPC Drive4 NetworkStatus	1
17531	4	P18.2.3.5	M7.3.5	M41.4.5	UINT8	MPC Drive5 NetworkStatus	1
17532	0	P18.3.1.1	M8.1.1	M41.5.1	UINT8	MPC Drive1 Last Fault Code	1
17532	1	P18.3.1.2	M8.1.2	M41.5.2	UINT8	MPC Drive2 Last Fault Code	1
17532	2	P18.3.1.3	M8.1.3	M41.5.3	UINT8	MPC Drive3 Last Fault Code	1
17532	3	P18.3.1.4	M8.1.4	M41.5.4	UINT8	MPC Drive4 Last Fault Code	1
17532	4	P18.3.1.5	M8.1.5	M41.5.5	UINT8	MPC Drive5 Last Fault Code	1
17533	0	P18.3.2.1	M8.2.1	M41.6.1	UINT16	MPC Drive1 f-Out	0.01

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
17533	1	P18.3.2.2	M8.2.2	M41.6.2	UINT16	MPC Drive2 f-Out	0.01
17533	2	P18.3.2.3	M8.2.3	M41.6.3	UINT16	MPC Drive3 f-Out	0.01
17533	3	P18.3.2.4	M8.2.4	M41.6.4	UINT16	MPC Drive4 f-Out	0.01
17533	4	P18.3.2.5	M8.2.5	M41.6.5	UINT16	MPC Drive5 f-Out	0.01
17534	0	P18.3.4.1	M8.4.1	M41.8.1	UINT16	MPC Drive1 I-Out	0.1 (DM1: 0.01)
17534	1	P18.3.4.2	M8.4.2	M41.8.2	UINT16	MPC Drive2 I-Out	0.1 (DM1: 0.01)
17534	2	P18.3.4.3	M8.4.3	M41.8.3	UINT16	MPC Drive3 I-Out	0.1 (DM1: 0.01)
17534	3	P18.3.4.4	M8.4.4	M41.8.4	UINT16	MPC Drive4 I-Out	0.1 (DM1: 0.01)
17534	4	P18.3.4.5	M8.4.5	M41.8.5	UINT16	MPC Drive5 I-Out	0.1 (DM1: 0.01)
17535	0	P18.3.5.1	M8.5.1	M41.9.1	SINT16	MPC Drive1 M-Out	0.1
17535	1	P18.3.5.2	M8.5.2	M41.9.2	SINT16	MPC Drive2 M-Out	0.1
17535	2	P18.3.5.3	M8.5.3	M41.9.3	SINT16	MPC Drive3 M-Out	0.1
17535	3	P18.3.5.4	M8.5.4	M41.9.4	SINT16	MPC Drive4 M-Out	0.1
17535	4	P18.3.5.5	M8.5.5	M41.9.5	SINT16	MPC Drive5 M-Out	0.1
17536	0	P18.3.6.1	M8.6.1	M41.10.1	SINT16	MPC Drive1 P-Out	0.1
17536	1	P18.3.6.2	M8.6.2	M41.10.2	SINT16	MPC Drive2 P-Out	0.1
17536	2	P18.3.6.3	M8.6.3	M41.10.3	SINT16	MPC Drive3 P-Out	0.1
17536	3	P18.3.6.4	M8.6.4	M41.10.4	SINT16	MPC Drive4 P-Out	0.1
17536	4	P18.3.6.5	M8.6.5	M41.10.5	SINT16	MPC Drive5 P-Out	0.1
17537	0	P18.3.7.1	M8.7.1	M41.11.1	UINT16	MPC Drive1 n-Out	1
17537	1	P18.3.7.2	M8.7.2	M41.11.2	UINT16	MPC Drive2 n-Out	1
17537	2	P18.3.7.3	M8.7.3	M41.11.3	UINT16	MPC Drive3 n-Out	1
17537	3	P18.3.7.4	M8.7.4	M41.11.4	UINT16	MPC Drive4 n-Out	1
17537	4	P18.3.7.5	M8.7.5	M41.11.5	UINT16	MPC Drive5 n-Out	1
17538	0	P18.3.8.1	M8.8.1	M41.12.1	UINT32	MPC Drive1 t-Run	0.1
17538	1	P18.3.8.2	M8.8.2	M41.12.2	UINT32	MPC Drive2 t-Run	0.1
17538	2	P18.3.8.3	M8.8.3	M41.12.3	UINT32	MPC Drive3 t-Run	0.1
17538	3	P18.3.8.4	M8.8.4	M41.12.4	UINT32	MPC Drive4 t-Run	0.1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
17538	4	P18.3.8.5	M8.8.5	M41.12.5	UINT32	MPC Drive5 t-Run	0.1
17539	0	P18.3.3.1	M8.3.1	M41.7.1	UINT16	MPC Drive1 V-Out	0.1
17539	1	P18.3.3.2	M8.3.2	M41.7.2	UINT16	MPC Drive2 V-Out	0.1
17539	2	P18.3.3.3	M8.3.3	M41.7.3	UINT16	MPC Drive3 V-Out	0.1
17539	3	P18.3.3.4	M8.3.4	M41.7.4	UINT16	MPC Drive4 V-Out	0.1
17539	4	P18.3.3.5	M8.3.5	M41.7.5	UINT16	MPC Drive5 V-Out	0.1
17540	0	P3.60	-	P41.3.13	UINT8	OP Cont Interlock NC	1
17541	0	P3.59	-	P41.3.14	UINT8	OP Cont Interlock NO	1
17542	0	P9.61	-	P41.3.11	UINT8	OP Cont Interlock Attempts	1
17543	0	P18.6.7	P9.5.1	P26.20.1	UINT8	Prime Pump Enable	1
17546	0	P18.6.8	P9.5.2	P26.20.2	SINT32	Prime Pump Level	0.01
17547	0	P18.6.12	P9.5.6	P26.20.6	SINT32	Prime Pump Level 2	0.01
17548	0	P18.6.9	P9.5.3	P26.20.3	UINT16	Prime Pump Frequency	0.01
17549	0	P18.6.13	P9.5.7	P26.20.7	UINT16	Prime Pump Frequency 2	0.01
17550	0	P18.6.10	P9.5.4	P26.20.4	UINT16	Prime Pump Delay Time	0.1
17551	0	P18.6.14	P9.5.8	P26.20.8	UINT16	Prime Pump Delay Time 2	0.1
17552	0	P18.6.11	P9.5.5	P26.20.5	UINT16	Prime Pump Loss of Prime Level	0.1
17553	0	P18.6.15	P9.5.9	P26.20.9	UINT16	Prime Pump Loss of Prime Level 2	0.1
17554	0	P18.6.20	-	P41.8.1	UINT8	Jockey Pump Enable	1
17555	0	P18.6.21	-	P41.8.2	SINT32	Jockey Start Level	0.01
17556	0	P18.6.22	-	P41.8.3	SINT32	Jockey Stop Level	0.01
17557	0	P18.6.23	-	P41.9.1	UINT8	Lube Pump Enable	1
17558	0	P18.6.1	P9.4.2	P26.21.2	UINT8	Pipe Fill Loss Detection Method	1
17559	0	P18.6.2	-	P41.7.6	UINT16	Pipe Fill Loss Level	0.1
17560	0	-	P9.4.3	-	UINT16	Pipe Fill Loss Low Level	0.1
17561	0	-	P9.4.5	-	UINT16	Pipe Fill Loss High Level	0.1
17562	0	P18.6.3	P9.4.7	P26.21.7	UINT16	Pipe Fill Loss Time	1
17563	0	P18.6.4	P9.4.4	P26.21.4	UINT16	Pipe Fill Loss Frequency	0.01
17564	0	-	P9.4.6	-	UINT16	Pipe Fill Loss High Frequency	0.01
17565	0	P18.4.7	-	P41.7.1	UINT8	Pipe Fill Aux Pump Select	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
17566	0	P18.4.8	-	P41.7.2	UINT16	Pipe Fill Aux Pump Run Time	0.1
17567	0	P18.4.9	-	P41.7.3	UINT8	Pipe Fill Aux Pump Operation	1
17568	0	P18.4.10	-	P41.7.4	UINT16	Pipe Fill Aux Pump Delay	0.1
17569	0	P18.6.17	P9.6.2	P41.10.2	UINT16	Broken Pipe Level	0.1
17570	0	P18.6.19	P9.6.3	P41.10.4	UINT16	Broken Pipe Frequency	0.01
17571	0	P18.6.18	P9.6.4	P41.10.3	UINT16	Broken Pipe Delay	0.1
17572	0	P18.1.11	P9.1.1	P41.2.2	UINT8	Derag Cycles	1
17573	0	P18.1.12	P9.1.2	P41.2.3	UINT8	Derag at Start/Stop	1
17574	0	P18.1.15	P9.1.5	P41.2.6	UINT16	Derag Off Delay	1
17575	0	P18.1.13	P9.1.3	P41.2.4	UINT16	Deragging Run Time	1
17577	0	P18.5.9	P9.3.15	P41.4.7	UINT8	Master Drive Mode	1
17580	0	P17.2.1	-	P41.5.1	UINT8	Redundant Drive Enable	1
17581	0	P17.2.3	-	P41.5.2	UINT8	Redundant Run Time Enable	1
17582	0	P17.2.4	-	P41.5.3	UINT8	Redundant Run Time Reset	1
17583	0	P17.2.5	-	P41.5.4	UINT32	Redundant RunTime Limit	0.01
17584	0	P3.61	-	P26.1.22	UINT8	CP Interlock NC	1
17585	0	P18.1.3	P9.3.5	P41.3.6	UINT32	PID Bandwidth	0.01
17586	0	P8.67	P5.2.16	P8.23.2	UINT16	PM Initial Time	0.1
17587	0	P8.69	P5.2.18	P8.23.4	UINT16	PM excited Current off frequency	0.01
17588	0	P9.64	-	P26.1.24	UINT8	CP Interlock Stop Protection	1
17589	0	-	P9.1.6	-	UINT16	Derag Current	0.01
17590	0	P9.63	-	P26.1.23	UINT8	CP Interlock Run Protection	1
18000	0	P3.57	-	P7.3.5	UINT8	HOA On/Off	1
18900	0	-	-	P14.1	UINT8	Master Follower Mode	1
18901	0	-	-	P14.2	UINT8	Synchronization Mode	1
18902	0	-	-	P14.3	UINT8	Communication Link	1
18903	0	-	-	P14.4	UINT8	Speed Ratio Refresh Mode	1
18904	0	-	-	P14.5	UINT8	Speed Ratio Refresh Source	1
18905	0	P9.66	P6.2.20	P14.7	UINT16	Speed Error Limit	0.1
18906	0	P9.67	P6.2.21	P14.8	UINT16	Speed Fault Delay	0.1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
18907	0	-	-	P14.9	UINT16	Torque Ratio	0.001
18908	0	-	-	P14.10	UINT8	Follower Incoming Reference	1
18909	0	-	-	P14.11	UINT16	Follower Start Delay	0.1
18910	0	-	-	P14.12	UINT16	Follower Stop Delay	0.1
18911	0	-	-	P14.13	UINT8	Master Outgoing Reference	1
18912	0	-	-	P14.14	UINT16	M/F COMM T-OUT	1
18913	0	-	-	P14.19	UINT8	Follower Stop Mode	1
18914	0	-	-	P14.20	FLOAT	Speed Ratio	1
18915	0	-	-	P14.21	UINT16	Speed Multiplier	0.001
18916	0	-	-	P14.22	UINT32	Speed Ratio Ramp Time	1
18917	0	P18.5.10	P9.3.16	P41.4.8	UINT16	Master Fixed Speed	0.01
18918	0	P18.5.11	P9.3.17	P41.4.9	UINT16	Master Fixed Speed Delay	1
19100	0	-	P4.5.10	-	UINT16	Foldback fault timeout	1
19101	0	-	P4.5.3	-	UINT16	Foldback output frequency	0.01
19102	0	-	P4.5.4	-	UINT16	Foldback output speed	1
19103	0	-	P4.5.9	-	UINT16	Foldback minimum speed	1
19200	0	-	P1.16	-	UINT8	Compressor type selection	1
23503	0	M63	✓	M96.5	WORD	FB Ctrol Word	1
23504	0	M50	M4.3	M96.3	WORD	Standard Status Word	1
23505	0	M49	M4.2	M96.2	WORD	Application Status Word	1
23506	0	-	✓	-	BYTE	Optional board status	1
23507	0	B2.1.1 B3.1.1 B4.1.1 B5.1.1 B6.1.1 B7.1.1.1 B8.1.1 B9.1.1 B10.1.1.1	B2.1.1.1 B3.1.1 B4.1.1.1	B2.1.1 B3.1.1 B4.1.1 B5.1.1 B6.1.1 B7.1.1 B8.1.1	BYTE	Board Status Slot A	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
23508	0	B12.1.1 B13.1.1 B14.1.1 B15.1.1 B16.1.1 B17.1.1.1 B18.1.1 B19.1.1 B20.1.1.1	-	B10.1.1 B11.1.1 B12.1.1 B13.1.1 B14.1.1	BYTE	Board Status Slot B	1
23515	0	M43	-	P99.3.3	UINT8	RTC Battery Status	1
23521	0	P21.3.1	-	P23.1.3	BOOL	Brake Chopper Status	1
23522	0	P21.3.2	-	P23.1.4	BOOL	Brake Resistor Status	1
23523	0	P9.58	-	P26.1.18	UINT8	Warning Operation Mode	1
23525	0	-	P4.5.2	-	UINT8	Foldback status	1
23529	0	-	-	B16.1.1 B17.1.1 B18.1.1 B19.1.1 B20.1.1	BYTE	Slot C: Board Status	1
23530	0	-	-	B22.1.1 B23.1.1 B24.1.1 B25.1.1 B26.1.1 B27.1.1.1 B28.1.5	BYTE	Slot D: Board Status	1
23702	0	P21.1.9	P13.5.2	P95.1.1	BOOL	Multimonitor Set	1
23703	0	✓	M9.1	-	UINT8	Multi-Monitoring	1
23706	0	P21.1.21	P13.3.2	P95.2.2	SINT32	Output Display Unit Min	0.01
23707	0	P21.1.22	P13.3.3	P95.2.3	SINT32	Output Display Unit Max	0.01
23708	0	P21.1.20	P13.3.1	P95.2.1	UINT8	Output Display Unit	1
23710	0	M1	M1.1	M2.1	UINT16	Output Frequency	0.01
23712	0	P8.48	-	P8.22.13	UINT16	Startup Torque Actual	0.1
23713	0	M52	M6.2	M3.2	SINT32	Reference	0.01
23714	0	M51	M6.1	M3.1	SINT32	Output	0.01
23718	0	M53 P21.4.3	P13.6.1	M98.1	UINT32	Total MWh Count	0.0001
23721	0	M56 P21.4.6	P13.6.5	M98.4	UINT32	Trip MWh Count	0.0001
23724	0	M60	-	M99.3	UINT16	Numbers Of Start	1
23726	0	M45	M3.1	M97.1	UINT32	Energy Savings	0.001

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
23727	0	-	M3.2	-	UINT32	CO2 Savings	0.001
23728	0	P7.24	P4.4.1	P99.6.1	UINT8	Currency	1
23729	0	P7.26	P4.4.3	P99.6.3	UINT8	Data Type	1
23730	0	P7.27	P4.4.4	P99.6.4	UINT8	Energy Savings Reset	1
23731	0	P7.25	P4.4.2	P99.6.2	UINT16	Energy Cost	0.01
24001	0	P9.60	-	P26.1.6	UINT16	Under Voltage Trip Level	1
24002	0	P3.6	-	P25.1.2	UINT8	Ext. Fault 1 NO	1
24002	1	P3.48	-	P25.1.4	UINT8	Ext. Fault 2 NO	1
24002	2	P3.50	-	P25.1.6	UINT8	Ext. Fault 3 NO	1
24003	0	P3.7	-	P25.1.1	UINT8	Ext. Fault 1 NC	1
24003	1	P3.49	-	P25.1.3	UINT8	Ext. Fault 2 NC	1
24003	2	P3.51	-	P25.1.5	UINT8	Ext. Fault 3 NC	1
24004	0	P3.52	P2.1.4	P25.2.1	UINT8	Ext. Fault 1 Text	1
24005	0	P3.53	P2.1.5	P25.2.2	UINT8	Ext. Fault 2 Text	1
24006	0	P3.54	P2.1.6	P25.2.3	UINT8	Ext. Fault 3 Text	1
24014	8528	P9.4	P6.2.2	P26.1.2	UINT8	Input Phase Fault	1
24014	8786	-	P6.2.17	✓	UINT8	Overcurrent controller response	1
24014	9008	P9.7	P6.1.2	P26.2.2	UINT8	Ground Fault	1
24014	9040	P9.6	P6.1.1	P26.2.1	UINT8	Output Phase Fault	1
24014	12576	P9.5	P6.2.6	P26.1.7	UINT8	Uvolt Fault Response	1
24014	12817	-	P6.2.16	-	UINT8	OverVoltage Controller Response	1
24014	12849	P17.1.13	-	P22.2.11	UINT8	Charge Switch Fault Bypass Enable	1
24014	16928	P9.43	P6.2.19	P26.1.12	UINT8	Under Temp Fault Override	1
24014	17168	P9.8	P6.1.4	P26.2.4	UINT8	Motor Thermal Protection	1
24014	20486	-	-	P26.3.4	UINT8	Card Plug Slot Error Fault Protection	1
24014	21121	P3.42	-	P7.1.21	UINT8	Ext Fault-AR	1
24014	21264	P9.45	P6.3.4	P95.1.8	UINT8	Keypad Comm Fault Response	1
24014	21578	P9.62	-	P41.3.12	UINT8	OP Cont Interlock Protection	1
24014	21666	P9.56	P6.2.11	P26.1.9	UINT8	STO Fault Response	1
24014	28688	P9.37	-	P26.1.16	UINT8	Replace Fan Fault Response	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
24014	28963	P9.11	P6.1.6	P26.2.9	UINT8	Stall Protection	1
24014	28978	P9.19	-	P26.2.8	UINT8	Thermistor Fault Response	1
24014	28979	P9.15	P6.1.10 P8.3.1	P26.2.13 P40.1.1	UINT8	Underload Protection	1
24014	29456	-	-	P14.6	UINT8	Speed Error Response	1
24014	29520	P9.1	P6.2.3	P26.1.3	UINT8	4mA Input Fault	1
24014	29521	-	-	P26.1.20	UINT8	AI-Fault Protection	1
24014	29536	P9.35	-	P26.1.14	UINT8	PT100 Fault Response	1
24014	29954	-	B3.2.4	-	UINT8	Comm Card FB Fault Response	1
24014	29955	-	-	✓	UINT8	Response to SlotB Fieldbus Fault	1
24014	29956	-	-	✓	UINT8	Response to SlotC Fieldbus Fault	1
24014	29957	-	-	B27.1.2.7 B28.2.6	UINT8	SlotD Fieldbus Fault Response	1
24014	30064	-	P11.2.6	P96.9.5	UINT8	Modbus RTU Fault Response	1
24014	30065	P20.5.5	P12.3.5	P96.13.5	UINT8	Modbus TCP Fault Response	1
24014	30066	-	P11.3.7	-	UINT8	MSTP Fault Response	1
24014	30067	P20.4.10	P12.4.3	-	UINT8	EIP Fault Response	1
24014	30070	P9.38	P6.3.3	P26.3.3	UINT8	IP Address Confliction Resp	1
24014	30073	-	P12.5.8	-	UINT8	BACnet IP Fault Behavior	1
24014	30074	✓	✓	✓	UINT8	SWD Fault Behavior	1
24014	30075	P20.6.2	P12.6.2	P96.16.2	UINT8	Web UI Fault Behavior	1
24014	30076	-	P11.4.6	-	UINT8	SA Bus Fault Response	1
24014	33283	P9.51	P6.2.12	P26.10.2	UINT8	PID Feedback AI Loss Response	1
24014	33285	P10.63	-	P10.7.5	UINT8	PID1 Low Feedback Protection	1
24014	33286	P10.66	-	P10.7.8	UINT8	PID1 High Feedback Protection	1
24014	33287	P11.63	-	P11.7.5	UINT8	PID2 Low Feedback Protection	1
24014	33288	P11.66	-	P11.7.8	UINT8	PID2 High Feedback Protection	1
24014	33330	-	P3.2.31	✓	UINT8	PI Supervision display	1
24014	33334	-	-	P14.17	UINT8	Supervision Response	1
24014	33335	-	-	P14.18	UINT8	Limit Reached Response	1
24014	34564	-	-	P14.15	UINT8	M/F COMM Fault Response	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
24014	34565	-	-	P14.16	UINT8	Follower Error Response	1
24014	35088	P9.22	P6.3.2	P26.3.2	UINT8	OPTCard Fault Response	1
24014	35344	P9.34	-	P26.1.13	UINT8	RTC Fault	1
24014	35345	P9.36	-	P26.1.15	UINT8	Replace Battery Fault Response	1
24014	35588	P18.6.5	P9.4.1	P26.21.1	UINT8	Pipe Fill Loss Response	1
24014	35590	P18.6.16	P9.6.1	P41.10.1	UINT8	Broken Pipe Fault Response	1
24014	41329	-	-	P3.4.2.7	UINT8	High Freq Pulse Input 1 Fault	1
24014	41330	-	-	P3.5.2.7	UINT8	High Freq Pulse Input 2 Fault	1
24014	41331	-	-	P5.4.2.7	UINT8	High Freq Pulse Output Fault	1
24015	30068	-	B2.1.1.5 B4.2.1.1	-	UINT16	Fault Counter PDP	1
24015	30069	B17.1.1.5 B20.2.1.1	-	-	UINT16	Fault Counter PDP	1
24015	33291	-	-	B27.2.1.1	UINT16	FaultCounter Profibus Fault Slot D	1
24016	8976	P17.1.5	-	P22.2.3	BOOL	OverCurrent Bypass Enable	1
24016	16914	P17.1.23	-	P22.2.21	UINT8	Ctrl Board OverTemp Fault Bypass Enable	1
24016	17168	P17.1.10	-	P22.2.8	UINT8	Motor OverTemp Bypass Enable	1
24016	17184	P17.1.15	-	P22.2.13	UINT8	Under Temp Fault Bypass Enable	1
24016	21264	P17.1.20	-	P22.2.18	UINT8	Keypad Com Fault Bypass Enable	1
24016	21578	P17.1.25	-	P22.2.23	UINT8	Op Cont Interlock Fault Bypass Enable	1
24016	21793	P17.1.16	-	P22.2.14	UINT8	EEPROM Fault Bypass Enable	1
24016	21794	P17.1.17	-	P22.2.15	UINT8	Control board EEPROM Fault Bypass Enable	1
24016	24848	P17.1.18	-	P22.2.16	UINT8	Watchdog Fault Bypass Enable	1
24016	28689	P17.1.19	-	P22.2.17	UINT8	Fan Cooling Fault Bypass Enable	1
24016	28979	P17.1.11	-	P22.2.9	UINT8	UnderLoad Bypass Enable	1
24016	29040	P17.1.14	-	P22.2.12	UINT8	Saturation Trip Fault Bypass Enable	1
24016	29953	P17.1.24	-	P22.2.22	UINT8	Fieldbus Fault Bypass Enable	1
24016	35073	P17.1.21	-	P22.2.19	UINT8	Option Card Fault Bypass Enable	1
24016	35344	P17.1.22	-	P22.2.20	UINT8	RTC Clock Fault Bypass Enable	1
24016	36864	P17.1.12	-	P22.2.10	UINT8	External Bypass Enable	1
24017	16928	P9.23	P6.2.7	P26.1.8	UINT8	Unit Under Temp Prot	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
24018	8736	P9.29	P6.4.6	P7.6.6	UINT8	OverCurrent Attempts	1
24018	12816	P9.28	P6.4.5	P7.6.5	UINT8	OverVoltage Attempts	1
24018	12832	P9.27	P6.4.4	P7.6.4	UINT8	Undervoltage Attempts	1
24018	28978	P9.31	P6.4.8	P7.6.8	UINT8	Motor Temp Fault Attempts	1
24018	28979	P9.33	P6.4.10	P7.6.10	UINT8	Underload Attempts	1
24018	29520	P9.30	P6.4.7	P7.6.7	UINT8	4mA Fault Attempts	1
24018	33283	P9.55	P6.4.11	P26.10.1	UINT8	PID Feedback AI Loss Attempts	1
24018	35588	P18.6.6	P9.4.8	P26.21.8	UINT8	Pipe Fill Loss Attempts	1
24018	36864	P9.32	P6.4.9	P7.6.9	UINT8	External Fault Attempts	1
24019	0	P9.24	P6.4.1	P7.6.1	UINT16	AR Wait Time	0.01
24020	0	P9.25	P6.4.2	P7.6.2	UINT16	AR Trail Time	0.01
24021	0	P9.26	P6.4.3	P7.6.3	UINT8	AR Start Function	1
24023	0	P9.57	P4.1.15	P7.1.15	UINT8	Fault Reset Start	1
24028	0	✓	✓	✓	UINT16	Fault time data / Operation days	1
24029	0	✓	✓	✓	UINT32	Fault time data / Operation hours	1
24032	0	✓	✓	✓	UINT16	Fault time data / Output frequency	0.01
24033	0	✓	✓	✓	UINT16	Fault time data / Motor current	0.01
24034	0	✓	✓	✓	UINT16	Fault time data / Motor voltage	0.1
24035	0	✓	✓	✓	SINT16	Fault time data / Motor power	0.1
24036	0	✓	✓	✓	SINT16	Fault time data / Motor torque	0.1
24037	0	✓	✓	✓	UINT16	Fault time data / DC-Link voltage	1
24038	0	✓	✓	✓	SINT16	Fault time data / Unit temperature	0.1
24039	0	✓	✓	✓	UINT8	Fault time data / Direction	1
24040	0	✓	✓	✓	UINT8	Fault time data / Warnings	1
24041	0	✓	✓	✓	UINT8	Fault type	1
24042	0	P9.21	P6.3.1	P26.3.1	UINT8	Fieldbus Fault Response	1
24043	0	P9.65	-	P26.1.25	UINT8	CP Interlock Attempts	1
24044	0	M42	M1.11	M2.12	UINT8	Latest Fault Code	1
24501	0	P20.2.9	P10.3.1	P96.3.1	UINT8	Standard Status Word Bit0 Function Select	1
24501	1	P20.2.10	P10.3.2	P96.3.2	UINT8	Standard Status Word Bit1 Function Select	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
24501	2	P20.2.11	P10.3.3	P96.3.3	UINT8	Standard Status Word Bit2 Function Select	1
24501	3	P20.2.12	P10.3.4	P96.3.4	UINT8	Standard Status Word Bit3 Function Select	1
24501	4	P20.2.13	P10.3.5	P96.3.5	UINT8	Standard Status Word Bit4 Function Select	1
24501	5	P20.2.14	P10.3.6	P96.3.6	UINT8	Standard Status Word Bit5 Function Select	1
24501	6	P20.2.15	P10.3.7	P96.3.7	UINT8	Standard Status Word Bit6 Function Select	1
24501	7	P20.2.16	P10.3.8	P96.3.8	UINT8	Standard Status Word Bit7 Function Select	1
24504	0	P20.2.1	P10.2.1	P96.2.1	UINT16	FB Process Data Output 1 Sel	1
24504	1	P20.2.2	P10.2.2	P96.2.2	UINT16	FB Process Data Output 2 Sel	1
24504	2	P20.2.3	P10.2.3	P96.2.3	UINT16	FB Process Data Output 3 Sel	1
24504	3	P20.2.4	P10.2.4	P96.2.4	UINT16	FB Process Data Output 4 Sel	1
24504	4	P20.2.5	P10.2.5	P96.2.5	UINT16	FB Process Data Output 5 Sel	1
24504	5	P20.2.6	P10.2.6	P96.2.6	UINT16	FB Process Data Output 6 Sel	1
24504	6	P20.2.7	P10.2.7	P96.2.7	UINT16	FB Process Data Output 7 Sel	1
24504	7	P20.2.8	P10.2.8	P96.2.8	UINT16	FB Process Data Output 8 Sel	1
24507	0	✓	✓	✓	WORD	FB General Ctrol Word	1
24508	0	M62	✓	M96.4	WORD	FB Status Word	1
24509	0	M64	✓	M96.6	UINT16	FB Speed Reference	0.01
24510	0	P20.1.1	P10.1.1	P96.1.1	UINT16	FB Process Data Input 1 Sel	1
24510	1	P20.1.2	P10.1.2	P96.1.2	UINT16	FB Process Data Input 2 Sel	1
24510	2	P20.1.3	P10.1.3	P96.1.3	UINT16	FB Process Data Input 3 Sel	1
24510	3	P20.1.4	P10.1.4	P96.1.4	UINT16	FB Process Data Input 4 Sel	1
24510	4	P20.1.5	P10.1.5	P96.1.5	UINT16	FB Process Data Input 5 Sel	1
24510	5	P20.1.6	P10.1.6	P96.1.6	UINT16	FB Process Data Input 6 Sel	1
24510	6	P20.1.7	P10.1.7	P96.1.7	UINT16	FB Process Data Input 7 Sel	1
24510	7	P20.1.8	P10.1.8	P96.1.8	UINT16	FB Process Data Input 8 Sel	1
24511	0	✓	✓	✓	SINT16	FB Process Data Out 1	1
24511	1	✓	✓	✓	SINT16	FB Process Data Out 2	1
24511	2	✓	✓	✓	SINT16	FB Process Data Out 3	1
24511	3	✓	✓	✓	SINT16	FB Process Data Out 4	1
24511	4	✓	✓	✓	SINT16	FB Process Data Out 5	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
24511	5	✓	✓	✓	SINT16	FB Process Data Out 6	1
24511	6	✓	✓	✓	SINT16	FB Process Data Out 7	1
24511	7	✓	✓	✓	SINT16	FB Process Data Out 8	1
24515	0	✓	✓	✓	WORD	FB General Status Word	1
24517	0	✓	✓	✓	UINT16	FB Actual Speed	0.01
24518	0	-	-	✓	UINT8	Fast Channel Enable	1
24519	8	-	-	P96.1.9	UINT16	FB Process Data Input 9 Sel	1
24519	9	-	-	P96.1.10	UINT16	FB Process Data Input 10 Sel	1
24519	10	-	-	P96.1.11	UINT16	FB Process Data Input 11 Sel	1
24519	11	-	-	P96.1.12	UINT16	FB Process Data Input 12 Sel	1
24520	8	-	-	P96.2.9	UINT16	FB Process Data Output 9 Sel	1
24520	9	-	-	P96.2.10	UINT16	FB Process Data Output 10 Sel	1
24520	10	-	-	P96.2.11	UINT16	FB Process Data Output 11 Sel	1
24520	11	-	-	P96.2.12	UINT16	FB Process Data Output 12 Sel	1
25001	0	P20.3.1.1	P11.1.1	P96.4.1	UINT8	RS485 Comm Set	1
25004	0	-	P11.2.1	P96.9.4	UINT8	Modbus RTU Slave Address	1
25007	0	-	P11.2.2	P96.9.1	UINT8	Modbus RTU Baud Rate	1
25013	0	-	P11.2.3	P96.9.2	UINT8	Parity Type And Stop Bit	1
25016	0	-	P11.2.4	P96.4.2	UINT8	Modbus RTU Protocol Status	1
25019	0	✓	-	✓	BOOL	Modbus RTU Slave Device Busy	1
25022	0	✓	-	✓	UINT8	Modbus RTU Memory Parity Error	1
25025	0	✓	-	✓	UINT8	Modbus RTU Slave Device Failure	1
25028	0	✓	-	✓	UINT8	Modbus RTU Last Fault Response	1
25034	0	P20.3.2.5	P11.2.5	P96.9.3	UINT16	Comm Timeout Modbus RTU	1
25042	0	-	-	P96.4.3	BOOL	RS485 Terminal Resistance Connect	1
25763	0	✓	-	✓	UINT8	Modbus TCP Memory Parity Error	1
25766	0	P20.5.4	P12.3.4	P96.13.4	UINT8	Modbus TCP Protocol Status	1
25769	0	✓	-	✓	BOOL	Modbus TCP Slave Device Busy	1
25775	0	✓	-	✓	UINT8	Modbus TCP Slave Device Failure	1
25778	0	✓	-	✓	UINT8	Modbus TCP Last Fault Response	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
25781	0	P20.5.1	P12.3.2	P96.13.1	UINT8	Connection Limit	1
25784	0	P20.5.2	P12.3.3	P96.13.2	UINT8	Modbus TCP Unit ID	1
25787	0	P20.4.5	P12.1.5	P96.5.5	UINT8	MAC Address	1
25790	0	P20.5.3	P12.1.9	P96.13.3	UINT16	Comm Timeout Modbus TCP	1
26503	0	P22.1.2	P12.7.3	P96.8.4	BOOL	Proxy Enable	1
26508	0	P22.2.1	P12.8.3	P96.8.6	UINT8	SNTP Server 1	1
26509	0	P22.2.2	P12.8.4	P96.8.7	UINT8	SNTP Server 2	1
26510	0	P22.2.3	P12.8.5	P96.8.8	UINT8	SNTP Server 3	1
26512	0	M65	P12.7.2	P96.8.2	BOOL	IOT Connection Status	1
26513	0	P20.5.7	P12.2.1	P96.6.2	UINT8	Trusted IP White List	1
26514	0	P20.5.6	P12.2.2	P96.6.4	BOOL (DM1: UINT8)	Modbus TCP Trusted IP Enable	1
26515	0	P20.4.6	P12.1.6	P96.5.6	UINT8	Static IP Address	1
26518	0	P20.4.7	P12.1.7	P96.5.7	UINT8	Static Subnet Mask	1
26521	0	P20.4.8	P12.1.8	P96.5.8	UINT8	Static Default Gateway	1
26524	0	P20.4.2	P12.1.2	P96.5.2	UINT8	Active IP Address	1
26527	0	P20.4.3	P12.1.3	P96.5.3	UINT8	Active Subnet Mask	1
26530	0	P20.4.4	P12.1.4	P96.5.4	UINT8	Active Default Gateway	1
26533	0	P20.4.1	P12.1.1	P96.5.1	BOOL	IP Address Mode	1
26539	0	P20.7.2	P12.3.1	P96.6.5	BOOL	Modbus TCP enable	1
26540	0	P22.1.3	P12.8.1	P96.8.5	UINT8	SNTP Enable	1
26541	0	M66	P12.8.2	P96.8.3	UINT8	SNTP Server Status	1
27254	0	P20.3.3.2	P11.3.2	-	UINT8	MSTP Device Address	1
27257	0	P20.3.3.1	P11.3.1	-	UINT8	MSTP Baud Rate	1
27266	0	P20.3.3.5	P11.3.5	-	UINT8	MSTP Protocol Status	1
27281	0	P20.3.3.3	P11.3.3	-	UINT32	MSTP Instance Number	1
27289	0	P20.3.3.4	P11.3.4	-	UINT16	MSTP Comm Timeout	1
27292	0	P20.3.3.6	P11.3.6	-	UINT8	MSTP Fault Code	1
27298	0	P20.3.3.8	P11.3.8	-	UINT8	MSTP Max Master	1
28016	0	-	P12.5.7	-	UINT8	BACnet IP Protocol Status	1
28031	0	-	P12.5.9	-	UINT32	BACnetIP Instance Number	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
28040	0	-	P12.5.6	-	UINT16	BACnet IP Comm Timeout	1
28097	0	-	P12.5.1	-	UINT16	BACnet IP UDP port number	1
28100	0	-	P12.5.2	-	UINT8	BACnet IP Foreign Device	1
28103	0	-	P12.5.3	-	UINT8	BACnet IP BBMD IP	1
28106	0	-	P12.5.4	-	UINT16	BACnet IP BBMD Port	1
28111	0	-	P12.5.5	-	UINT16	BACnet IP Registration Interval	1
28752	0	B7.2.2	B2.2.2	-	UINT8	Operate Mode Slot A	1
28753	0	B17.2.2	-	-	UINT8	Operate Mode Slot B	1
28758	0	✓	-	✓	UINT8	IO6 Profibus Baud Rate Slot A	1
28759	0	✓	-	✓	UINT8	IO6 Profibus Baud Rate Slot B	1
28764	0	B7.1.1.4 B10.1.1.4	B2.1.1.4 B4.1.1.4	-	UINT16	PDP-Telegram Selection Slot A	1
28765	0	B17.1.1.4 B20.1.1.4	-	-	UINT16	PDP-Telegram Selection Slot B	1
28767	0	B7.1.1.3	B2.1.1.3	-	UINT8	Protocol Status Slot A	1
28768	0	B17.1.1.3	-	-	UINT8	Protocol Status Slot B	1
28769	0	B17.1.3.4	-	-	UINT16	PDP-DO FW-Year Slot B	1
28770	0	B17.1.3.5	-	-	UINT16	PDP-DO FW-DayMonth Slot B	1
28771	0	B7.1.3.4	B2.1.3.4	-	UINT16	PDP-DO FW-Year Slot A	1
28772	0	B7.1.3.5	B2.1.3.5	-	UINT16	PDP-DO FW-DayMonth Slot A	1
28773	0	✓	-	✓	UINT8	IO6 Profibus DO IO Data	1
28774	0	✓	-	✓	UINT8	IO6 Profibus DO IO Data Slot B	1
28775	0	B7.1.1.6 B10.2.1.2	B2.1.1.6 B4.2.1.2	-	UINT16	Fault Situations Max Slot A	1
28776	0	B7.1.1.7 B10.2.1.3	B2.1.1.7 B4.2.1.3	-	UINT16	PDP-Profile Number Slot A	1
28777	0	B7.1.1.8 B10.2.1.4	B2.1.1.8 B4.2.1.4	-	UINT16	PDP-Control Word Slot A	1
28778	0	B7.1.1.9 B10.2.1.5	B2.1.1.9 B4.2.1.5	-	UINT16	PDP-Status Word Slot A	1
28779	0	B7.2.4	B2.2.4 B4.2.2.2	✓	UINT16	SlotA Profibus Parameter Access	1
28781	0	B7.2.5 B10.2.2.3	B2.2.5 B4.2.2.3	-	UINT16	Fault Situation Counter Slot A	1
28782	0	B17.1.1.6 B20.2.1.2	-	-	UINT16	Fault Situations Max Slot B	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
28783	0	B17.1.1.7 B20.2.1.3	-	-	UINT16	PDP-Profile Number Slot B	1
28784	0	B17.1.1.8 B20.2.1.4	-	-	UINT16	PDP-Control Word Slot B	1
28785	0	B17.1.1.9 B20.2.1.5	-	-	UINT16	PDP-Status Word Slot B	1
28786	0	B17.2.4 B20.2.2.2	-	✓	UINT16	SlotB Profibus Parameter Access	1
28788	0	B17.2.5 B20.2.2.3	-	-	UINT16	Fault Situation Counter Slot B	1
28791	0	-	-	✓	UINT16	SlotC Profibus Fault Situations Max	1
28792	0	-	-	✓	UINT16	SlotC Profibus PDP-ProfilNumber	1
28793	0	-	-	✓	UINT16	SlotC Profibus PDP-Controlword	1
28794	0	-	-	✓	UINT16	SlotC Profibus PDP-Statusword	1
28795	0	-	-	✓	UINT16	SlotC PDP-DO FW-Year	1
28796	0	-	-	✓	UINT16	SlotC PDP-DO FW-DayMonth	1
28797	0	-	-	✓	UINT8	IO6 Profibus Slave Address Slot C	1
28798	0	-	-	✓	UINT8	IO6 Profibus Operation Mode	1
28799	0	-	-	✓	UINT16	SlotC Profibus Parameter Access	1
28800	0	-	-	✓	UINT16	SlotC Profibus Control Priority DOIO Data	1
28801	0	-	-	✓	UINT16	SlotC Profibus Fault Situation Counter	1
28802	0	-	-	B27.2.1.2	UINT16	PB400 Fault Situations Max	1
28803	0	-	-	B27.2.1.3	UINT16	PB400 PDP-ProfilNumber	1
28804	0	-	-	B27.2.1.4	UINT16	PB400 PDP-Controlword	1
28805	0	-	-	B27.2.1.5	UINT16	PB400 PDP-Statusword	1
28806	0	-	-	✓	UINT16	SlotD PDP-DO FW-Year	1
28807	0	-	-	✓	UINT16	SlotD PDP-DO FW-DayMonth	1
28808	0	-	-	✓	UINT8	IO6 Profibus Slave Address Slot D	1
28809	0	-	-	B27.1.2.1	UINT8	PB400 COM Mode	1
28810	0	-	-	B27.2.2.1	UINT16	PB400 Parameter Access	1
28811	0	-	-	B27.2.2.2	UINT16	PB400 Control Priority	1
28812	0	-	-	B27.2.2.3	UINT16	PB400 Fault Situation Counter	1
28813	0	-	-	B27.1.1.5 B28.1.4	UINT8	PB400 MAC Address	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
28814	0	-	-	B27.1.1.6 B28.1.1	UINT8	PB400 Active IP Address	1
28815	0	-	-	B27.1.1.7 B28.1.2	UINT8	PB400 Active Subnet Mask	1
28816	0	-	-	B27.1.1.8 B28.1.3	UINT8	PB400 Active Default Gateway	1
28829	0	-	-	✓	UINT8	SlotC Profibus Protocol Status	1
28830	0	-	-	✓	UINT8	SlotD Profibus Protocol Status	1
29505	0	B7.2.1	B2.2.1	-	UINT8	Slave Address	1
29506	0	B17.2.1	-	-	UINT8	Profibus Slave Address	1
29514	0	-	-	✓	UINT16	SlotC Profibus PDP-Telegram Selection	1
29515	0	-	-	B27.1.1.4	UINT16	PB400 Telegram	1
29520	0	B10.1.2.2 B20.1.2.2	B4.1.2.2	B27.1.2.2	BOOL	ProfiNet IP Address Mode	1
29521	0	B10.1.2.3 B20.1.2.3	B4.1.2.3	B27.1.2.3 B28.2.2	UINT8	ProfiNet Static IP Address	1
29522	0	B10.1.2.4 B20.1.2.4	B4.1.2.4	B27.1.2.4 B28.2.3	UINT8	ProfiNet Static Subnet Mask	1
29523	0	B10.1.2.5 B20.1.2.5	B4.1.2.5	B27.1.2.5 B28.2.4	UINT8	ProfiNet Static Default Gateway	1
29524	0	-	B4.1.1.6	-	UINT8	Active IP Address	1
29525	0	-	B4.1.1.7	-	UINT8	Active Subnet Mask	1
29526	0	-	B4.1.1.8	-	UINT8	Active Default Gateway	1
29527	0	B20.1.1.5	-	-	UINT8	MAC Address	1
29528	0	B20.1.1.6	-	-	UINT8	Active IP Address	1
29529	0	B20.1.1.7	-	-	UINT8	Active Subnet Mask	1
29530	0	B20.1.1.8	-	-	UINT8	Active Default Gateway	1
29531	0	-	B4.1.1.3	-	UINT8	Protocol Status	1
29532	0	B20.1.1.3	-	-	UINT8	Protocol Status	1
29533	0	B10.1.2.1	B4.1.2.1	-	UINT8	ProfiNet Operate Mode Slot A	1
29534	0	B20.1.2.1	-	-	UINT8	ProfiNet Operate Mode	1
29545	0	-	B4.1.1.5	-	UINT8	MAC Address	1
29560	0	✓	✓	✓	UINT8	ProfiNet Port1 MAC address	1
29561	0	✓	✓	✓	UINT8	ProfiNet Port2 MAC address	1
29581	2	-	B4.2.3.6	-	UINT16	SendPZD3 Source	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
29581	3	-	B4.2.3.7	-	UINT16	SendPZD4 Source	1
29581	4	-	B4.2.3.8	-	UINT16	SendPZD5 Source	1
29581	5	-	B4.2.3.9	-	UINT16	SendPZD6 Source	1
29583	2	B20.2.3.6	-	-	UINT16	SendPZD3 Source	1
29583	3	B20.2.3.7	-	-	UINT16	SendPZD4 Source	1
29583	4	B20.2.3.8	-	-	UINT16	SendPZD5 Source	1
29583	5	B20.2.3.9	-	-	UINT16	SendPZD6 Source	1
29583	6	B20.2.3.10	-	-	UINT16	SendPZD7 Source	1
29589	2	-	B4.2.3.1	-	UINT16	ReceivePZD3 Dest	1
29589	3	-	B4.2.3.2	-	UINT16	ReceivePZD4 Dest	1
29589	4	-	B4.2.3.3	-	UINT16	ReceivePZD5 Dest	1
29589	5	-	B4.2.3.4	-	UINT16	ReceivePZD6 Dest	1
29589	6	-	B4.2.3.5	-	UINT16	ReceivePZD7 Dest	1
29591	2	B20.2.3.1	-	-	UINT16	ReceivePZD3 Dest	1
29591	3	B20.2.3.2	-	-	UINT16	ReceivePZD4 Dest	1
29591	4	B20.2.3.3	-	-	UINT16	ReceivePZD5 Dest	1
29591	5	B20.2.3.4	-	-	UINT16	ReceivePZD6 Dest	1
29591	6	B20.2.3.5	-	-	UINT16	ReceivePZD7 Dest	1
30252	0	B8.2.3	B3.2.3	-	UINT8	CANOpen Operate Mode Slot A	1
30253	0	B18.2.3	-	-	UINT8	CANOpen Operate Mode Slot B	1
30258	0	B8.2.2	B3.2.2	-	UINT8	CANOpen Baud Rate Slot A	1
30259	0	B18.2.2	-	-	UINT8	CANOpen Baud Rate Slot B	1
30264	0	B8.1.3	B3.1.3	-	UINT8	CANOpen Protocol Status	1
30265	0	B8.2.1	B3.2.1	-	UINT8	CANOpen Node ID Slot A	1
30266	0	B18.1.3	-	-	UINT8	CanOpen Protocol Status Slot B	1
30267	0	B18.2.1	-	-	UINT8	CANOpen Node ID Slot B	1
30268	0	-	-	✓	UINT8	SlotC CANOpen Baud Rate	1
30269	0	-	-	✓	UINT8	SlotC CANOpen Operate Mode	1
30271	0	-	-	✓	UINT8	SlotD CANOpen Baud Rate	1
30272	0	-	-	✓	UINT8	SlotD CANOpen Operate Mode	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
30273	0	-	-	✓	UINT8	SlotC CANOpen Protocol Status	1
30274	0	-	-	✓	UINT8	SlotC CANOpen Node ID	1
30275	0	-	-	✓	UINT8	SlotD CANOpen Protocol Status	1
30276	0	-	-	✓	UINT8	SlotD CANOpen Node ID	1
31005	0	B9.2.1	-	-	UINT8	DeviceNet MAC ID Slot A	1
31006	0	B19.2.1	-	-	UINT8	DeviceNet MAC ID Slot B	1
31008	0	B9.2.2	-	-	UINT8	DeviceNet Baud Rate Slot A	1
31009	0	B19.2.2	-	-	UINT8	DeviceNet Baud Rate Slot B	1
31017	0	B9.1.3	-	-	UINT8	DeviceNet Protocol Status Slot A	1
31018	0	B19.1.3	-	-	UINT8	DeviceNet Protocol Status Slot B	1
31040	0	B9.2.4 B19.2.4	-	-	UINT16	Dnet Comm Timeout	1
31050	0	B9.2.3	-	-	UINT8	DeviceNet IO Poll Type Slot A	1
31051	0	B19.2.3	-	-	UINT8	DeviceNet IO Poll Type Slot B	1
31751	0	P20.3.4.7	-	-	UINT8	Operation Mode	1
31053	0	-	-	✓	UINT8	SlotC DeviceNet Slave Address	1
31054	0	-	-	✓	UINT8	SlotD DeviceNet Slave Address	1
31055	0	-	-	✓	UINT8	SlotD DeviceNet Baud Rate	1
31056	0	-	-	✓	UINT8	SlotC DeviceNet Protocol Status	1
31057	0	-	-	✓	UINT8	SlotC DeviceNet IO Poll Type	1
31058	0	-	-	✓	UINT8	SlotD DeviceNet Protocol Status	1
31059	0	-	-	✓	UINT8	SlotD DeviceNet IO Poll Type	1
31766	0	P20.3.4.6	P11.5.6	-	UINT8 (DM1: BYTE)	SWD Protocol Status	1
31793	0	P20.3.4.4	P11.5.4	-	BYTE	SWD Board Status	1
31802	0	P20.3.4.10	-	-	UINT16	SWD Fault Situations Max	1
31803	0	P20.3.4.11	-	-	UINT16	SWD PDP-Profile Number	1
31804	0	P20.3.4.12	-	-	UINT16	SWD PDP-Control Word	1
31805	0	P20.3.4.13	-	-	UINT16	SWD PDP-Status Word	1
31806	0	P20.3.4.1	P11.5.1	-	UINT16	Parameter Access	1
31807	0	P20.3.4.2	P11.5.2	-	UINT16	Process Data Access	1

PNU		Parameter Number			Data type	Name	Scaling Value
Index	Subindex	DG1 V37.5	DM1 V2.04	DX1 V2.00			
31808	0	P20.3.4.3	P11.5.3	-	UINT16	SWD Fault Situation Counter	1
31809	0	P20.3.4.20	-	-	UINT16	SWD PDP-DO FW-Year	1
31810	0	P20.3.4.21	-	-	UINT16	SWD PDP-DO FW-DayMonth	1
32516	0	P20.4.9	P12.4.2	B28.1.6	UINT8	Ethernet IP Protocol Status	1
32558	0	-	-	B28.2.1	BOOL	EIP CtrB IP Address Mode	1
32561	0	-	-	B28.2.5	UINT16	EIP CtrB COM Timeout	1
32566	0	-	P12.4.1	-	UINT8	Ethernet based protocol select	1
34001	0	-	P11.6.2	P96.7.2	UINT8	Bluetooth Broadcast Mode	1
34002	0	-	P11.6.1	P96.7.1	UINT8	Bluetooth Enable	1
34003	0	-	P11.6.3	P96.7.3	UINT8	Bluetooth Pairing Reset	1
34004	0	-	-	P96.7.4	UINT8	Bluetooth Connect Status	1
34754	0	-	P11.4.1	-	UINT8	SA Bus Device Address	1
34757	0	-	P11.4.2	-	UINT8	SA Bus Baud Rate	1
34766	0	-	P11.4.5	-	UINT8	SA Bus Protocol Status	1
34781	0	-	P11.4.3	-	UINT32	SA Bus Instance Number	1
34790	0	-	P11.4.4	-	UINT16	SA Bus Comm Timeout	1
34799	0	P20.6.1	P12.6.1	P96.16.1	UINT8	WebUI Protocol Status	1
34800	0	P20.6.3	P12.6.3	P96.16.3	UINT16	WebUI Communication Timeout	1
34801	0	P20.7.3	P12.6.4	P96.6.3	UINT8	Web Service Enable	1
36251	0	P22.1.1	P12.7.1	P96.8.1	BOOL	IOT Enable	1
59501	0	✓	✓	✓	SINT16	PROFIDrive speed setpoint value	1
59502	0	✓	✓	✓	SINT16	PROFIDrive speed actual value	1
60000	0	✓	✓	✓	FLOAT	Velocity reference value	1
61000	0	B10.1.2.6 B20.1.2.6	B4.1.2.6	B27.1.2.6	STRING8	Station Name	1
61002	0	✓	✓	✓	UINT8	ProfiNet Chassis MAC Address	1

4.12 Further explanations

4.12.1 PNU927

Parameter 927 Subindex 0 defines who has control for the parameter settings.

0: All parameters can be changed by any source.

1: All parameters are locked and can only be changed via PROFINET interface.

An exception here are the parameters 927 and 928.

4.12.2 PNU 928

Parameter 928 Subindex 0 defines who has control priority.

See → Section "4.3 Parameter settings", Page 60 for the settings of the different Profinet Interfaces.

4.12.3 Action at Communication Loss

In the error-free state, the VFD, the interface, and the PLC communicate without errors, as shown in the figure below.

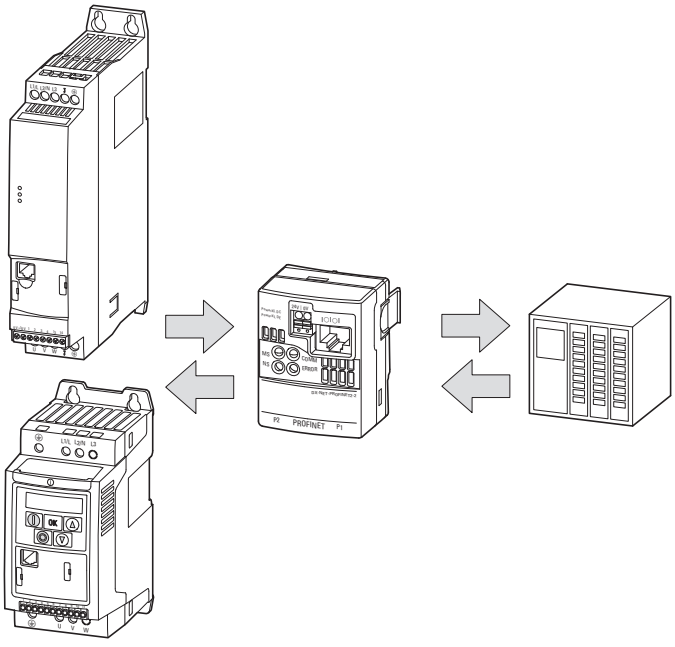


Figure 61: Normal operation

In the error state, no communication takes place between the basic device, interface or PLC. In the event of an error, the reaction can be defined for the different Profinet Interfaces.

→ For all devices, the setting of PNU 928.0 (→ Section "4.3 Parameter settings", Page 60) applies in case of a communication loss.

DX-NET-PROFINET2-2

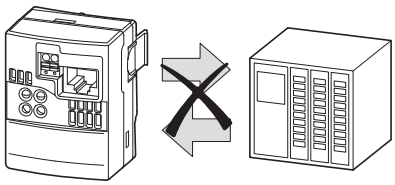


Figure 62: Communication failure between PLC and module

The drive triggers SC-trP when a protection function is enabled. Local control is only possible if:

- The drive was previously under network control,
- The connection to the PROFINET communication network is interrupted during operation,
- The digital input DigIN: 1 remains set to ON.

Network control is automatically restored when the connection is restored, provided DigIN: 1 remains ON

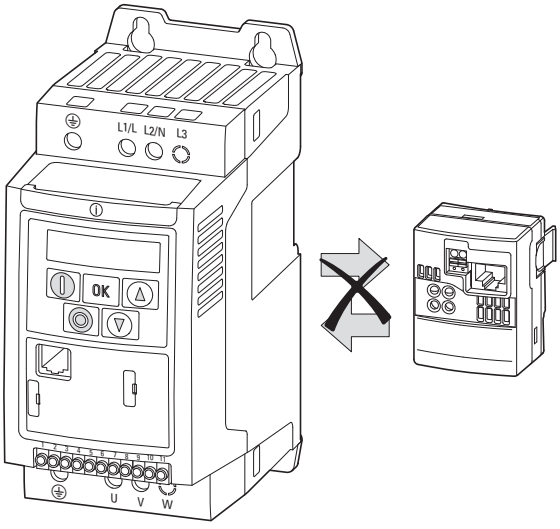


Figure 63: Communication failure between variable frequency drive and module

Response to a loss of communication

The response to a loss of communication is as follows:

DC1

Relevant parameters:

- P-12 - Motor control mode
- P-36 - Timeout
- P-53 - Action@Communication Loss

The default setting of P-53 is 0 (“no response”), so the variable frequency drive does not respond to a loss of communication.

For P-36 = 0, the result is the same as for P-53 = 0: no response.

For the protection to work, P-36 must be greater than 0 and P-53 must be selected to “action”.

If P-12 is set to 12, the variable frequency drive does not switch off and only changes to local control. P-53 has no effect; P-36 determines the reaction time.

DE1

Relevant parameters:

- P-12 - Motor control mode
- P-36 - Timeout
- P-40 - Action@Communication Loss

The default setting of P-40 is 0 (“no action”), i.e., the drive does not react to a loss of communication.

Default setting of P-36 is 0 (“no action”).

Both parameters must be set to a value other than 0 to activate the protection.

For P-36 = 0, the result is the same as for P-40 = 0: no response.

For the protection to work, P-36 must be greater than 0, and action P-40 must be selected.

For P-12 = 12, the variable frequency drive does not switch off and only changes to local control. P-40 has no effect; P-36 determines the response time.

If communication between the PROFINET interface and the DE1 is interrupted (e.g., module DX_PROFINET2-2 removed from the drive), the drive will only respond according to the P-36 setting.

Table 87: Reaction after a loss of communication DX-NET-PROFINET2-2

PNU	Name	Parameter	Explanation	r/w	Data type
840.29952	Action@Communication Loss	P-40 (DE1) P-53 (DC1)	Device-dependent reaction after a "Communication Loss" occurs The delay time after a loss of communication is set using P-36. 0: No reaction, drive continues to run 1: Output warning; drive continues to run 2: Stop if ramp active 3: Quick stop 4: Coast stop (= factory setting)	r/w	UINT16

DX-NET-PROFINET2

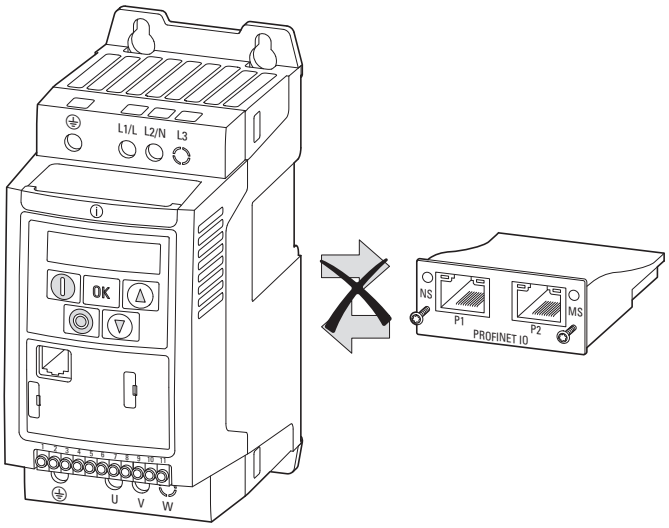


Figure 64: Communication failure between VFD and module

Response to a loss of communication

The response to a loss of communication is as follows:

DA1

Relevant parameters:

- P5-05 - Timeout
- P5-16 - Action@Communication Loss

The default setting of P5-16 is 0 ("no response"), so the variable frequency drive does not respond to a loss of communication.

For P5-05 = 0, the result is the same as for P5-16 = 0: no response.

For the protection to work, P5-05 must be greater than 0 and P5-16 must be selected to "action".

Table 88: Reaction after a loss of communication DX-NET-PROFINET2

PNU	Name	Parameter	Explanation	r/w	Data type
	Action@Communication Loss	P5-16	Device-dependent reaction after a "Communication Loss" occurs The delay time after a loss of communication is set using P-36. 0: No reaction, drive continues to run 1: Output warning; drive continues to run 2: Stop if ramp active 3: Quick stop 4: Coast stop (= factory setting)	r/w	UINT16

DX...-NET-PROFINET

DG1, DX1

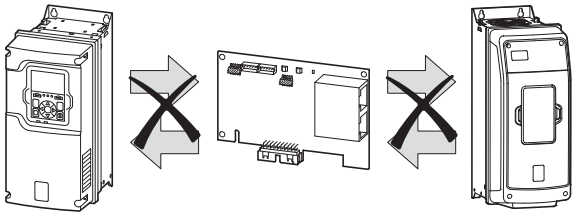


Figure 65: Communication failure between DG1 and the DXG-NET-PROFINET option board or DX1 and DXX-NET-PROFINET option board

DM1

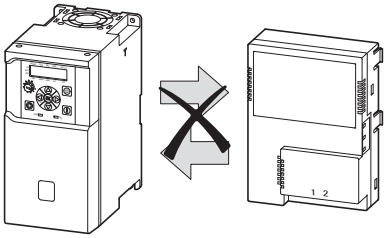


Figure 66: Communication failure between DM1 and the DXM-NET-PROFINET option board

DG1, DM1 and DX1

Relevant parameters:

- P9.21 - Fieldbus Fault response (DG1)
- P6.3.1 - Fieldbus Fault response (DM1)
- P26.3.1 - Fieldbus Fault response (DX1)

The default setting of "Fieldbus Fault response" is 2 ("Fault") for DG1 and DM1 and 1 ("Warning for DX1), so the variable frequency drive responds to a loss of communication with a Fault trip respectively a Warning message:

- DG1: Fault Code 87 (Slot A) or 88 (Slot B) - "Fieldbus Fault"
- DM1: Fault Code 87 - "Fieldbus Fault"
- DX1: Fault Code 146 - "Fieldbus Slot D Fault"

The setting can be changed to 0 ("No Action") to ignore Communication loss between the Profinet Interface and the VFD.

If PNU928 is set to 4 ("Control and setpoint via network - automatic change to local control in case of communication loss") the Fieldbus Fault is not reported for remote control.

Table 89: Reaction after a loss of communication DX…-NET-PROFINET

PNU	Name	Parameter	Explanation	r/w	Data type
24042.0	Fieldbus Fault Response	P9.21 (DG1) P6.3.1 (DM1) P26.3.1 (DX1)	0: no action 1: Warning 2: Fault 3: Fault, Coast 4: Warning, Coast (not in DM1) 5: Warning, Auto Switch To Local (not applicable to Profinet) 6: Warning, Auto Switch To Preset Speed 1 (not applicable to Profinet)	r/w	UINT8

4.12.4 Continue operation

DC1, DE1, DE11: PNU 840.29952 = 0 or 1

DA1: P5-16 = 0 or 1

DG1, DM1, DX1: PNU 24042.0 = 0 or 1

With these settings the variable frequency drive/variable speed starter will continue to run with the last valid command word until communication returns with valid commands.

4.12.5 Stop with error

DC1, DE1, DE11: PNU840.29952 = 2, 3 or 4

DA1: P5-16 = 2, 3 or 4

DG1, DM1, DX1: PNU 24042.0 = 2, 3 or 4

In this case, Control Word bit 10 must be set fault reset command. If not, the reset will not be carried out.

In the event of an internal fault in the variable frequency drive/variable speed starter, the normal fault reaction is executed.

In the error-free state, communication takes place between the basic device, interface, and PLC.

In the error state, no communication takes place between the basic device, interface or PLC. In the event of an error, the reaction is defined via PNU listed above.

4.12.6 Acyclic parameter channel

The acyclic parameter channel is used in order to configure the parameters of the variable frequency drive/variable speed starter; it corresponds to the PROFIdrive profile.

Parameter channel

The parameter channel is embedded as a payload data block in the acyclic PROFINET write/read PDUs.

Acyclic data objects of a server are addressed in PROFINET via slot and index. The parameter channel is always addressed with index 47.

Protocol

The main task of the PowerXL PROFINET communication interface is to map the protocol in such a way that the parameter channel can be operated completely transparently by the PROFINET communication.

Regardless of whether data should be read or written, the first request from the client will always be a write request.

A parameter request will define whether the job is a read job or a write job. After the write request is transmitted (contains read or write job), a write response without data will be expected. Then, prompted by the application of the higher level PLC, the client polls the variable frequency drive with read requests. This keeps acknowledging the read request as negative (Error: State Conflict) until the read response has been completed and a reply (read order: with data / write request: without data) can be sent.

The following figure shows an example of the protocol between a PROFINET client, the PowerXL PROFINET communication interface, and a variable frequency drive/speed starter.

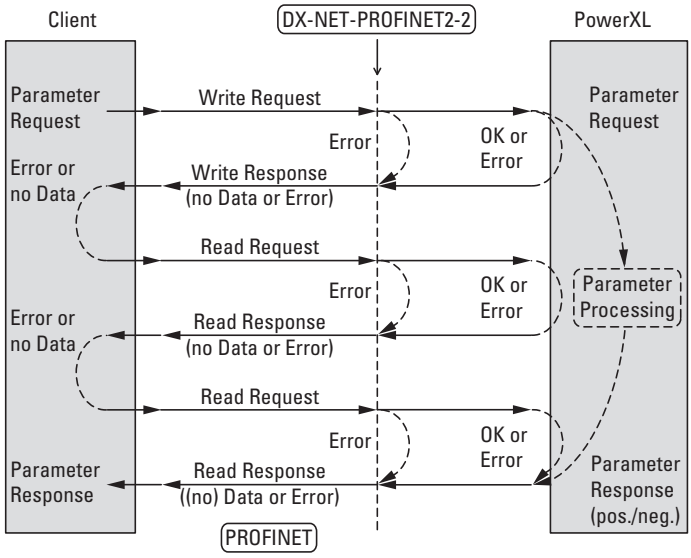


Figure 67: Acyclic parameter channel protocol

4.12.6.1 PROFINET write request/write response

Write request - read job

Various objects can be transmitted in the parameter channel – these objects are identified by what is referred to as a PNU (parameter number) and a subindex. The write request includes a declaration that specifies that the job is a read job.

Table 90: Write request

Byte	Designation	Description
0	Request Reference	Request identification Unique identification for a request/response pair for the master. The master can increment the identification number for each new request in the application. They are then mirrored by variable frequency drive/variable speed starter. 01_{hex} - FF_{hex} (i.e. 1_{dec} - 255_{dec})
1	Request ID	Request ID The type of request is specified here. 01_{hex}: Read job
2	DO-ID	Drive-Object-ID 00_{hex}
3	No. of Paramters	Number of parameters Only individual parameter processing is supported. 01_{hex}.
4	Attribute	Attribute Defines which object type should be accessed. 10_{hex} (16_{dec}): Value
5	No. of Elements	Number of elements Number of vector elements or length of the string being accessed. PNU 0 up to PNU 999: 00hex (only for subindex 0) PNU 0 to PNU 999 (without 202): 01_{hex}
6, 7	Parameter number	Parameter number (PNU) Address of the parameter that should be accessed 0000_{hex} - $FFFF_{hex}$ (i.e. 0_{dec} - 65535_{dec})
8, 9	Subindex	Subindex Address of the parameter's first field element or start of the text 0000_{hex} - $FFFF_{hex}$ (i.e. 0_{dec} - 65535_{dec})

Write request - write job

Only individual parameter writing is supported (i.e., array and multiple parameter writing is not supported). The maximum telegram length of the parameter request is set at 16 bytes. The maximum length of a writable parameter is one double word. Various objects can be transmitted in the parameter channel – these objects are identified by what is referred to as a PNU (parameter number) and a subindex. The write request includes a declaration that specifies that the job is a write job.

Table 91: Write request

Byte	Designation	Description
0	Request Reference	Request identification Unique identification for a request/response pair for the master. The master can increment the identification number for each new request in the application. They are then mirrored by variable frequency drive/variable speed starter. 01_{hex} - FF_{hex} (i.e. 1_{dec} - 255_{dec})
1	Request ID	Request ID Specifies the type of request. 02_{hex}: Write job
2	DO-ID	Drive-Object-ID 00_{hex}
3	No. of Paramters	Number of parameters Only individual parameter processing is supported. 01_{hex}
4	Attribute	Attribute Defines which object type should be accessed. $10h_{ex}$ (16_{dec}): Value
5	No. of Elements	Number of elements Number of vector elements or length of the string being accessed PNU 0 to PNU 999: 00_{hex} (only for subindex 0) PNU 0 to PNU 999: 01_{hex}
6, 7	Parameter number	Parameter number (PNU) Address of the parameter that should be accessed 0000_{hex} - $FFFF_{hex}$ (i.e. 0_{dec} - 65535_{dec})
8, 9	Subindex	Subindex Address of the parameter's first field element or start of the text 0000_{hex} - $FFFF_{hex}$ (i.e. 0_{dec} - 65535_{dec})
10	Format	Format 01_{hex} - $7C_{hex}$ (i.e. 01_{dec} - 124_{dec}): Data types
11	No. of Values	Number of values Number of values being accessed. 01_{hex}
12 - (15)	Value	Value The value of the parameter being accessed The length depends on the format and can be a maximum of 4 bytes. 00000000_{hex} - $FFFFFFFF_{hex}$ (i.e. 0_{dec} - 4294967295_{dec})

In this case, the number of bytes is variable (13, 14, or 16) and will depend on the selected format

Write response

The variable frequency drive/variable speed starter will respond to a received write request with a write response.

The following write responses are possible:

Write response – without data and errors if the write request was understood by the variable frequency drive/variable speed starter.

Write request - error. If an error has occurred, the write response will contain an error.

4.12.6.2 PROFINET read request/read response

Read request

After receiving a positive write response, it is possible to start polling read requests. If a write job has been transmitted previously, information regarding the write status will be requested; in the case of a read job, the data will be requested.

Read response

The read request will be acknowledged until there is a read response.

The following read responses are possible:

Read response - error

- If there is an error related to addressing (index)
- the variable frequency drive/variable speed starter is not available,
- if the response from the variable frequency drive/variable speed starter is still pending.

Read response - parameter channel error

- If the error concerns the PROFIdrive parameter channel

Read response – without data

- if the variable frequency/variable speed starter drive has determined the reply during a write order

Read response – with data

- if the variable frequency drive/variable speed starter has determined the reply during a read order.

The following sections go into the various possible read responses in greater detail.

Read response - error

- If an error has occurred, the read response will contain an error.

Read response - parameter channel error

If there is an error in the parameter channel, a positive read response – parameter channel error will be generated. The error will be contained either in a write job or a read job.

Table 92: Byte allocation

Byte	Designation	Description
0	Request Reference	Request identification: Is mirrored
1	Response-ID	Response ID: 81_{hex}: Read job(-); 82_{hex}: Write job(-)
2	DO-ID	Drive-Object-ID: Is mirrored
3	No. of Parameters	Number of parameters: 01_{hex}
4	Format	Format: 44_{hex}: Fault
5	No. of Values	Number of values: 01_{hex}
6, 7, 8, 9	Error Number	Error number: 00_{hex} - 23_{hex}

The following table lists the parameter channel errors of the PROFIdrive profile.

Table 93: Parameter channel errors with PROFIdrive

Error number [hex]	Designation	Description	Supplementary information
00	Invalid parameter number	Access to an unavailable parameter	0
01	Parameter value cannot be changed	Attempting to have write access to a parameter that cannot be modified	Subindex
02	Value below lower limit or above upper limit	Attempting to have write access with a value out of range	Subindex
03	Bad subindex	Attempting to access to a non-available subindex in a string or array parameter	Subindex
04	Not an array	Attempting to use a subindex in order to access a parameter without index	0
05	Incorrect data type	Attempting to have write access with a value not corresponding to the data type of the parameter	0
06	Setting not allowed	Write access with a non-zero value not allowed	Subindex
07	Description element cannot be modified	Attempting to have write access to a description element that cannot be modified	Subindex
08	reserved	–	–
09	No description data available	Attempting to access a non-available description. The value is not available.	0
0A	reserved	–	–
0B	No usage rights	Attempting to have write access without write permissions	0
0C	reserved	–	–
0D	reserved	–	–
0E	reserved	–	–

Error number [hex]	Designation	Description	Supplementary information
0F	No text array available	Attempting to access a text array that is not available	0
10	reserved	–	–
11	Request cannot be carried out due to operating status	Access is temporarily not possible	0
12	reserved	–	–
13	reserved	–	–
14	Value not permitted	Attempting to have write access with a value that is within the value range, but that is not permitted due to other reasons (parameter with defined values)	Subindex
15	Request too long for acyclic communication channel	The length of the current request exceeds the maximum permitted length of the acyclic communication channel.	0
16	Parameter address not permissible	Not permissible or non-supported value for attribute, No. of elements, parameter number, subindex, or a combination thereof	0
17	Format not permissible	Write request: Invalid format or format not permissible for this parameter	0
18	No. of values are not consistent	Write request: The number of values in the parameter data does not match the number of values for the parameter address.	0
19	DO does not exist	Attempting to access a non-existing drive object	0
20	Parameter text element cannot be changed	Attempting to have write access to a parameter text element without write permissions	Subindex
21	Not permissible request ID	unsupported service	
22	Response too long for parameter manager	The length of the current response exceeds the parameter manager's parameter processing capacity.	
23	Multiple parameter access not permissible	Is not supported.	
24, …, 64	reserved	–	
65, …, FF	manufacturer specific	–	

Read response without data

As soon as the variable frequency drive/variable speed starter has completed the response for a write job, it will send a read response without data.

Table 94: Read response without data

Byte	Designation	Description
0	Request Reference	Request identification: Is mirrored
1	Response-ID	Response ID: 02_{hex}: Write job (+)
2	DO-ID	Drive object ID: Is mirrored
3	No. of Parameters	Number of parameters: 01_{hex}

Read response with data (all PNUs - except PNU 202)

As soon as the variable frequency drive/variable speed starter has completed the response for a read request for the range from PNU 0 to PNU 999 (without PNU 202; see Table 96 below for this), it sends a read response with data.

Table 95: Read response with data

Byte	Designation	Description
0	Request Reference	Request identification: Is mirrored
1	Response-ID	Response ID: 01_{hex}: Read job (+)
2	DO-ID	Drive object ID: Is mirrored
3	No. of Parameters	Number of parameters: 01_{hex}
4	Format	Format: 01_{hex} - $7C_{hex}$ (i.e. 01_{dec} - 124_{dec})
5	No. of Values	Number of values: 01_{hex} : Value
6, 7, 8, 9	Value	Value: Specifies the value of the parameter being accessed. The length depends on the format and can be a maximum of 4 bytes. 00000000_{hex} - $FFFFFFFF_{hex}$ (i.e. 0_{dec} - 4294967295_{dec}) Content of PNU 0 to PNU 999 (without PNU 202)

Read response with data (PNU 202)

As soon as the variable frequency drive/variable speed starter has completed the response for a read job of the PNU 202, it will send a read response with data.

Table 96: Read response with data

Byte	Designation	Description
0	Request Reference	Request identification: Is mirrored
1	Response-ID	Response ID: 01_{hex}: Read job (+)
2	DO-ID	Drive object ID: Is mirrored
3	No. of Parameters	Number of parameters: 01_{hex}
4	Format	Format: $0A_{hex}$ (= 10_{dec})
5	No. of Values	Number of values: 01_{hex}: Value
6, …, 25	Value	Value: Specifies the value of the parameter being accessed The length depends on the format and can be a maximum of 20 bytes. Content of PNU 202

4.12.7 Errors and diagnostics

The variable frequency drive/variable speed starter provides diagnostic messages for itself as well as for the communication interface.

Basically, a distinction must be drawn between:

- basic diagnostics (PROFINET basic diagnostics),
- advanced diagnostics (advanced device diagnostics) and
- PROFIdrive parameter channel diagnostics

PROFIdrive parameter channel diagnostics are shown with error messages or warnings, as applicable, in the cyclic profile.

4.12.7.1 Basic diagnostics

A pending diagnostic alarm from the variable frequency drive/variable speed starter will be signaled as a collective diagnostic in the cyclic profile with input word 0, bit 4 (DIAG). A device response, if any, will be described in the advanced diagnostics.

In addition, in all profiles, the bits ERR (the variable frequency drive stops) or WARN (no response by the variable frequency drive) of the corresponding input bytes indicate whether diagnostic messages (i.e., errors or warnings) are present.

Error acknowledgment

“Transparent Mode” profile

Reset bit 2 (control word 1) error

After the cause of the fault is fixed, you can acknowledge a fault (ERR) as follows:

“PDShort” and “PROFIdrive” profiles

FaultAck (control word 1) = 1,

Basic unit digital input 1 = new edge

Warnings (WARN) cannot be acknowledged, since they are simply messages without an ensuing response from the variable frequency drive/variable speed starter.

The diagnostic data that corresponds to the PROFIdrive profile can be sent at any time regardless of the profile chosen. It is provided via the acyclic services of the relevant bus system.

For available FaultBuffer diagnostic messages: PNU 947 subindex 0 to 7

4.12.7.2 Advanced diagnostics

When there is a collective diagnostic (input byte 0, bit 4 (DIAG)), the variable frequency drive/variable speed starter will provide advanced diagnostic messages.

The following messages are generated by the variable frequency drive/ variable speed starter.

Table 97: Advanced diagnostic data

Value [hex]	Meaning	Corrective action	Note
19	There is a warning at hand on the variable frequency drive/variable speed starter.	Read warning PNU 860.0 and fix the cause.	Corresponds to the WARN bit in the corresponding input byte.
1A	There is a fault at hand on the variable frequency drive/variable speed starter.	• Read fault PNU 944 to PNU 952. • Fix the fault and acknowledge the error message.	Corresponds to the ERR bit in the corresponding input byte.

4.12.7.3 PROFIdrive diagnostics

The diagnostic data that corresponds to the “PROFIdrive” profile can be sent at any time, regardless of the profile chosen. They are made available via the acyclic parameter channel.

The ERR or WARN bits indicate whether diagnostic messages (i.e. errors or warnings) are present.

Error acknowledgment

You can acknowledge faults (ERR) as follows:

FaultAck = 1.

Warnings (WARN) cannot be acknowledged, since they are simply messages without an ensuing response (the variable frequency drives/variable speed starters).

Available diagnostic messages (PNU 860.0 warnings and PNU 944 to PNU 952 errors).

4.12.8 Error numbers

The error numbers are listed in the display with their associated display text.

For a detailed list of errors, refer to the application manual of the respective variable frequency drive.

4.12.8.1 DX-NET-PROFINET2...

In the following the error numbers are listed, which are output by the profile "Tranparent Mode" under input byte (see section "Input data").
The last eight error codes can also be retrieved via PNU 947 subindex 0 to 7.

Table 98: Error numbers

Fault Code		Description			Message (Shown on display)	Possible cause
dez	hex	DA1	DC1	DE1		
	00	✓	✓	✓	Stop	There are no error messages present. There is no drive enable signal present.
0	00	✓	✓		no-Flt	Shown in Trip Log if there are no messages in the error register.
1	01	✓	✓		OI-b	Excessively high braking current
2	02	✓	✓		OL-br	Thermal overload on brake resistor.
3	03	✓	✓	✓	O-I	Overcurrent at variable frequency drive output
4	04	✓	✓	✓	I.t-trP	Thermal Motor overload.
5	05	✓	✓	✓	PS-trp	Overcurrent (Hardware)
6	06	✓	✓	✓	O-Volt (DE1: O.Volt)	Overvoltage in DC link
7	07	✓	✓		U-Volt	Undervoltage in DC link
8	08	✓	✓	✓	O-t	Overtemperature at heat sink
9	09	✓	✓	✓	U-t	Under-temperature
10	0A	✓	✓	✓	P-dEf	The parameters' default settings have been loaded.
11	0B	✓	✓	✓	E-trip	External fault
12	0C	✓	✓	✓	SC-ObS (DE1: SC-trF)	Communication error with an external operating unit or with a PC
13	0D	✓	✓	✓	FIT-dc	Excessively high DC-Link voltage ripple
14	0E	✓	✓		P-LOss	Incoming power phase failure (only for devices with a three-phase power supply)
15	0F	✓	✓		h O-I	Overcurrent at output, DC1 motor pick-up control fault
16	10	✓	✓	✓	Th-flt	Malfunctioning heat sink thermistor.
17	11	✓	✓	✓	dAtA-F	Error in internal memory
18	12	✓	✓	✓	4-20 F	Input current of analog input is not within the specified range.
19	13	✓	✓		dAtA-E	Error in internal memory

Fault Code		Description			Message (Shown on display)	Possible cause
dez	hex	DA1	DC1	DE1		
20	14	✓			U-dEF	User defaults loaded
21	15	✓	✓		F-Ptc	Motor thermistor fault
22	16	✓	✓		FAN-F	Replace device fan
23	17	✓	✓		O-hEAt	Internal overtemperature (DSP)
24	18	✓			O-torq	Maximum Torque Limit Exceed
25	19	✓			U-torq	Undertorque
26	1A	✓	✓		Out-F	Power stage fault
29	1D	✓			STO-F	Internal STO circuit fault
30	1E	✓			Enc-01	Encoder COM interrupted
31	1F	✓			SP-Err	Speed error
32	20	✓			Enc-03	Wrong encoder PPR
33	21	✓			Enc-04	Encoder channel A fault
34	22	✓			Enc-05	Encoder channel B fault
35	23	✓			Enc-06	Encoder channel A&B fault
40	28	✓	✓		AtF-01	Unequal stator resistance
41	29	✓	✓		AtF-02	Stator resistance too high
42	2A	✓	✓		AtF-03	Choke too low
43	2B	✓	✓		AtF-04	Motor tilted
44	2C	✓	✓		AtF-05	Wrong motor data
45	2D	✓			Ph-Seq	Supply Phase Sequence Incorrect (FS8 Only)
48	30	✓			AtF-09	Malfunctioning encoder 1
49	31	✓			OUt-Ph	Phase failure output
50	32	✓	✓		SC-F01	Modbus Communication loss
51	33	✓	✓		SC-F02	CANopen COM interrupted
52	34	✓			SC-F03	Anybus COM interrupted
53	35	✓			SC-F04	Option COM interrupted
54	36	✓			SC-F05	BacNet Com-Loss
55	37	✓			SC-F06	Reserved
56	38	✓			SC-F07	Reserved
57	39	✓			SC-F08	Reserved
58	3A	✓			SC-F09	Reserved
59	3B	✓			SC-F10	Reserved
60	3C	✓			OF-01	Malfunctioning link to option
61	3D	✓			OF-02	Option: Unknown status
70	46	✓			PLC-01	Unknown PLC function
71	47	✓			PLC-02	PLC program too big

Fault Code		Description			Message (Shown on display)	Possible cause
dez	hex	DA1	DC1	DE1		
72	48	✓			PLC-03	PLC division by zero
73	49	✓			PLC-04	Lower limit higher than upper limit
74	4A	✓			PLC-05	Function index too large

4.12.8.2 DX...-NET-PROFINET

The following are the Fault Codes issued per PNU 947 subindex 0 through 7 for the last eight faults.

Table 99: Fault codes

Fault Code		Series			Message (Shown on display)	Possible cause
dez	hex	DG1	DM1	DX1		
1	01	✓	✓	✓	Overcurrent	The inverter has detected too high current
2	02	✓	✓	✓	Overvoltage	The DC link voltage has exceeded the limiting value
3	03	✓	✓	✓	Ground fault	The power measurement has determined that the sum of the motor phase current is not null
5	05	✓	✓	✓	Charging switch	The charging switch is open, when the START command has been given
6	06	✓		✓	Emergency Stop(Ext Fault-AR)	Emergency signal from DI is inactive
7	07	✓		✓	Saturation Trip	IGBT module is damaged
9	09	✓	✓	✓	UnderVoltage Regular	The DC link voltage is below the defined voltage limits
10	0A	✓	✓	✓	Input Phase Superv	Supply line phase failed
11	0B	✓	✓	✓	Output Phase Superv	The power measurement has determined that one motor phase does not carry current
12	0C	✓	✓	✓	Brake chopper	No brake resistor, brake resistor is defective, brake chopper fault
13	0D	✓	✓	✓	Drive Under Temp	Too low measured Temp Limit Supv Val in the power section or card. Temp Limit Supv Val is under -10 °C
14	0E	✓	✓	✓	Drive over temperature	Too high measured Temp Limit Supv Val in the power section or the card. Temp Limit Supv Val is above 90 °C
15	0F	✓	✓	✓	Motor stalled	Motor is stalled
16	10	✓	✓	✓	Motor Over Temp	The motor is too hot; based either on the calculation of the frequency converter or the temperature feedback
17	11	✓	✓	✓	Motor Under Load	The state defined by parameter P9.15 - P9.17 was valid longer than the time defined by P9.18
18	12	✓	✓	✓	IP Address Conflict	Incorrect IP setting
19	13	✓	✓	✓	EEPROM fault power section	EEPROM fault in power section, memory content in EEPROM has been lost
20	14	✓	✓	✓	FRAM Fault	FRAM data fault in FRAM memory.
21	15	✓	✓	✓	S-Flash Fault	Fault in serial flash memory, the memory of the serial flash memory is defective.
22	16	✓	✓	✓	Speed error	The estimated speed is greater than 115 % of the maximum operation frequency.

Fault Code		Series			Message (Shown on display)	Possible cause
dez	hex	DG1	DM1	DX1		
23	17	✓	✓	✓	STO circuit fault	STO switch is defective; STO circuit defective.
25	19	✓	✓	✓	MCU WatchDog Fault	Watchdog register overflows in MCU.
26	1A	✓	✓	✓	Start-up Prevent	The time when the interlock signal was enabled is longer than the set time.
29	1D	✓		✓	Thermistor fault	The thermistor resistance of the control unit or option board is greater than 4.7 k?
32	20	✓		✓	Device fan error	The fan is defective or blocked.
36	24	✓		✓	Compatibility Fault	The controller board does not match the power section.
37	25	✓	✓	✓	Device change	Power unit or option board was changed
38	26	✓	✓	✓	Device added	Power unit or option board added.
39	27	✓	✓	✓	Device removed	The option board has been removed from the slot or the power section has been removed from the controller board
40	28	✓	✓	✓	Device unknown	Unknown device connected (power section/option board)
41	29	✓	✓	✓	IGBT Over Temp	IGBT temperature is too high
50	32	✓	✓	✓	AI < 4 mA	Analog input signal lost, dropped below 4 mA
51	33	✓	✓	✓	External fault	The digital input is enabled as an external error input
52	34	✓	✓	✓	Keypad communication error	The connection between keypad and variable frequency drive is interrupted
54	36	✓	✓	✓	Option board fault	Defective option board or option board slot
55	37	✓		✓	Realtime Clock Fault	RTC chip reacts unexpected
56	38	✓		✓	PT100 Fault	Temperature exceeds the sensitivity capacity of the PT100
57	39	✓	✓	✓	Motor Ident. Fault	The execution of the engine parameters identification was not completed successfully.
58	3A	✓	✓	✓	Current Measure Fault	Power measurement is out of range
60	3C	✓		✓	Control Board Overtemp	The temperature of the control board is above +85 °C or below -30 °C
61	3D	✓		✓	Internal Control Supply	+24V port voltage is over 27 V or under 17 V
64	40	✓		✓	Replace Battery Fault Response	The battery voltage of the real-time clock (RTC) is too low
65	41	✓		✓	Replace Fan Fault Response	Fan life is less than 2 months
66	42	✓	✓	✓	System Stop	STO has been triggered and the STO input is open
67	43	✓	✓	✓	Overcurrent	The output current has reached the current limit value
68	44	✓	✓	✓	Over Voltage	The DC link voltage has reached its voltage limit value
69	45	✓		✓	System fault	Thermistor SPI communication error
70	46	✓	✓	✓	System fault	MCU sent wrong parameters to DSP
71	47	✓		✓	System Fault	MCU and DSP communication error.
80	50	✓	✓	✓	Fieldbus Fault	Transmission failure to BACnet MSTP and the network setpoint is the remote control setpoint OR the network control location is the remote control location.
81	51	✓	✓	✓	Fieldbus Fault	SA bus network error
82	52	✓		✓	Bypass OverLoad	Overload when the motor is in bypass mode

Fault Code		Series			Message (Shown on display)	Possible cause
dez	hex	DG1	DM1	DX1		
83	53	✓	✓	✓	Fieldbus Fault	Transmission failure to Modbus RTU and the network setpoint is the remote control setpoint OR the network control location is the remote control location.
84	54	✓	✓	✓	Fieldbus Fault	Transmission failure to Modbus TCP and the network setpoint is the remote control setpoint OR the network control location is the remote control location
85	55	✓	✓	✓	Fieldbus Fault	Transmission failure to BACnet and the network setpoint is the remote control setpoint OR the network control location is the remote control location and the fault protection is set to NO ACTION
86	56	✓	✓	✓	Fieldbus Fault	Transmission failure to Ethernet/IP and the network setpoint is the remote control setpoint OR the network control location is the remote control location and the error protection is set to NO ACTION
87	57	✓	✓	✓	Fieldbus Fault	Transmission failure to Profibus/CanOpen/Devicenet master at slot A and the network setpoint is the remote control setpoint OR the network control slot is the remote control slot and the fault protection is set to NO ACTION
88	58	✓		✓	Fieldbus Fault	Transmission failure to Profibus/CanOpen/Devicenet master at slot B and the network setpoint is the remote control setpoint OR the network control slot is the remote control slot and the fault protection is set to NO ACTION
89	59	✓		✓	Undervoltage stop	The DC link voltage has reached the undervoltage stop limit of the variable frequency drive
90	5A	✓	✓	✓	Drive Under Temp	Cold weather mode is not activated and the unit temperature is below -10 °C, cold weather mode is activated and the error exceedance for undertemperature is not set, the unit temperature is below -30 °C
91	5B	✓		✓	Option Card Fault	The external supply on the communication link of the DeviceNet is not present
92	5C	✓	✓	✓	External Fault 2	The digital input is enabled as an external error input
93	5D	✓	✓	✓	External Fault 3	The digital input is enabled as an external error input
94	5E	✓		✓	Pump Lost	Interlock signals lost in a Multi Pump application
95	5F	✓		✓	Need Alternation	MPC motor running too long
97	61	✓	✓	✓	Pipe Fill Loss fault	In single drive control mode of the MPFC, FC, interlock enable, and all interlock signals are lost; in single drive control mode of the MPFC, FC, interlock enable, and interlock 1 are lost; in multiple drive network mode of the MPFC, interlock enable and interlock 1 are lost.
98	62		✓		PID feedback AI fault	AI1 settings are outside the limits
99	63	✓		✓	PID2 Feedback AI Loss	PID2 Feedback signal from analog input is lost
100	64	✓	✓	✓	Fieldbus Fault	SWD Bus fault
101	65	✓	✓	✓	Option board fault	SWD hardware fault
102	66	✓	✓	✓	External fault	SWD external fault
103	67	✓	✓	✓	Warning overtemperature variable frequency drive	The temperature of the variable frequency drive is 10 °C away from the trip point of 90 °C
104	68	✓		✓	Compatibility Fault	The DSP firmware is not compatible with the MCB firmware
105	69	✓		✓	Compatibility Fault	The keypad firmware is not compatible with the MCB firmware
106	6A	✓		✓	Compatibility Fault	The I01 card firmware is not compatible with the MCB firmware
107	6B	✓		✓	Compatibility Fault	The I02 card firmware is not compatible with the MCB firmware

Fault Code		Series			Message (Shown on display)	Possible cause
dez	hex	DG1	DM1	DX1		
108	6C	✓		✓	Compatibility Fault	The I03 card firmware is not compatible with the MCB firmware
109	6D	✓		✓	Compatibility Fault	The I04 card firmware is not compatible with the MCB firmware
110	6E	✓		✓	Compatibility Fault	The I05 card firmware is not compatible with the MCB firmware
111	6F	✓	✓	✓	Compatibility Fault	The PROFIBUS card firmware is not compatible with the MCB firmware
112	70	✓		✓	Compatibility Fault	DeviceNet card firmware is not compatible with MCB firmware
113	71	✓	✓	✓	Compatibility Fault	The CANOpen card firmware is not compatible with the MCB firmware
114	72	✓	✓	✓	Compatibility Fault	The SWD card firmware is not compatible with the MCB firmware
115	73	✓	✓	✓	Fieldbus Fault	Ethernet/IP run error
117	75	✓	✓	✓	Pump over cycle	During a given period, the times when the drive sleeps and wakes up exceed a user-configurable value
118	76	✓	✓	✓	Broken Pipe Fault Response	Pipe fault error
120	78	✓		✓	PID1 Low Feedback	PID1 Low feedback function is active and pid feedback is low than set value.
121	79	✓		✓	PID1 High Feedback	PID1 high feedback function is active and pid feedback is high than set value.
122	7A	✓		✓	PID2 Low Feedback	PID2 low feedback function is active and pid feedback is low than set value.
123	7B	✓		✓	PID2 High Feedback	PID2 high feedback function is active and pid feedback is high than set value.
124	7C	✓	✓	✓	OP Cont Interlock Fault	OP Cont Interlock function is active.
125	7D		✓	✓	Freq Limit Supv	The output frequency exceeds the range of frequency supervision limit
126	7E		✓		Torque Limit Supv	The motor torque exceeds the range of torque supervision limit
127	7F		✓		Ref Limit Supv	The frequency reference exceeds the range of freq reference supervision limit
128	80		✓		Power Limit Supv	The motor power exceeds the range of power supervision limit
129	81		✓		Temp Limit Supv	The Unit Temperature exceeds the range of temperature supervision limit
130	82		✓		AI Limit Supv	The AI value exceeds the range of AI supervision limit
131	83		✓		Motor Current Supv	The motor current exceeds the range of current supervision limit
132	84		✓		PI Superv	The PID1 Feedback exceeds the range of PID1 supervision limit
133	85	✓	✓	✓	Fieldbus Fault	WebUI fault
134	86	✓		✓	Bumpless Transfer Fail	bumpless transition from local to remote or vice a versa failed
135	87	✓		✓	CP Interlock Fault Run	CP interlock input open and drive in run status
136	88	✓	✓	✓	CP Interlock Fault Stop	CP interlock input open and drive in stop status
139	8B			✓	M/F Supervision Fault	Master/Follower supervision is active
140	8C			✓	M/F Limit Reached	Master/Follower current or torque limit is active
141	8D			✓	High Pulse DI1 fault	The high frequency pulse input 1 value is out of range
142	8E			✓	High Pulse DI2 fault	The high frequency pulse input 2 value is out of range
143	8F			✓	High Pulse DO fault	The high frequency pulse output value is out of range

Fault Code		Series			Message (Shown on display)	Possible cause
dez	hex	DG1	DM1	DX1		
144	90			✓	Speed Error	Motor encoder speed is out of limit in Master/Follower
145	91			✓	FieldBus SlotC Fault	Loss of communication with Profibus/Canopen/Devicenet master on Slot C
146	92			✓	FieldBus SlotD Fault	Loss of communication with Profibus/Canopen/Devicenet master on Slot D
147	93			✓	AI Fault	Analog input signal(AI1 or AI2) value is out of range
148	94			✓	Card Plug Slot Error	ABZ encoder card is plugged in wrong slot port
149	95			✓	Card Plug Slot Error	FS card is plugged in wrong slot port
150	96			✓	Card Plug Slot Error	Fiber card is plugged in wrong slot port
151	97			✓	Card Plug Slot Error	Profinet card is plugged in wrong slot port
152	98			✓	Card Plug Slot Error	Dual port EIP card is plugged in wrong slot port
153	99			✓	STO Power Fault	The 5V power supply of control board is out of range
154	9A			✓	STO Power Fault	The 5V power supply of control board is out of range
156	9C			✓	M/F Configuer Error	Master/Follower configuration is incorrect
157	9D			✓	FC SPI Comm Fault	Fast Channel Communication Failed
158	9E			✓	FC Version MisMatch	Incompatible Fast Channel Packet Format
159	9F			✓	Encoder1 Signal Missing	encoder1 signal is disconnect
160	A0			✓	Encoder2 Signal Missing	encoder2 signal is disconnect
161	A1			✓	Encoder1 Inverse	Encoder1 phase A or phase B signal is abnormal
162	A2			✓	Encoder2 Inverse	Encoder2 phase A or phase B signal is abnormal
163	A3			✓	ABZ Card Vcc Error	encoder power switch is not match
164	A4			✓	ABZ Card Dcom Error	communication with MCU
165	A5			✓	Motor Direction Error	Motor direction is not match with encoder feedback direction
167	A7			✓	M/F Comm Lost Fault	Mater Follower communication is lost
168	A8			✓	Follower Error	Follower meets errors
200	C8			✓	FS CPU Diagnosis Error	FS card CPU internal diagnostic error
201	C9			✓	FS RAM Diagnosis Error	the SRAM of FS card MCU diagnostic error
202	CA			✓	FS FLASH Diagnosis Error	the flash of FS card MCU diagnostic error
203	CB			✓	FS BUS Diagnosis Error	the bus of FS card MCU diagnostic error
204	CC			✓	FS PC Diagnosis Error	the programe counter of FS card MCU diagnostic error
205	CD			✓	FS Clock Diagnosis Error	the clock of FS card diagnostic error
206	CE			✓	FS EEPROM Diagnosis Error	the EEPROM of FS card diagnostic error
207	CF			✓	FS SCI Diagnosis Error	the communication between FS card and CB_MCU failed
208	D0			✓	FS FSI Diagnosis Error	the communication between FS_MCU1 and FS_MCU2 failed
209	D1			✓	FS SPI Diagnosis Error	the EEPROM of FS card diagnostic error
210	D2			✓	FS Watchdog Diagnosis Error	The execution of interrupt or tasks failed
211	D3			✓	FS Reset Circuit Diagnosis Error	The MCU on FS card reset unintendedly
212	D4			✓	FS MCU1 Power Diagnosis Error1	The 1.2V power supply for FS_MCU1 is undervoltage or overvoltage

Fault Code		Series			Message (Shown on display)	Possible cause
dez	hex	DG1	DM1	DX1		
213	D5			✓	FS MCU1 Power Diagnosis Error2	The 3.3V power supply for FS_MCU1 is undervoltage or overvoltage
214	D6			✓	FS MCU2 Power Diagnosis Error1	The 1.2V power supply for FS_MCU2 is undervoltage or overvoltage
215	D7			✓	FS MCU2 Power Diagnosis Error2	The 3.3V power supply for FS_MCU2 is undervoltage or overvoltage
216	D8			✓	FS SABZ 24V Diagnosis Error	The 24V power supply for S-ABZ is out of range
217	D9			✓	FS SABZ 6V Diagnosis Error	The 6V reference voltage for S-ABZ is out of range
218	DA			✓	FS SABZ 5V Diagnosis Error	The 5V reference voltage for S-ABZ is out of range
219	DB			✓	FS SABZ Power Diagnosis Error	The setting power for S-ABZ is out of range
220	DC			✓	FS DI TP Diagnosis Error	DI self- diagnostic error on FS card
221	DD			✓	FS DI Crossing Diagnosis Error	DI cross- diagnostic error on FS card
222	DE			✓	FS DO TP Diagnosis Error	DO self- diagnostic error on FS card
223	DF			✓	FS DO Crossing Diagnosis Error	DO cross- diagnostic error on FS card
224	E0			✓	FS Speed Self Diagnosis Error	Speed self- diagnostic error on FS card
225	E1			✓	FS Speed Crossing Diagnosis Error	Speed cross- diagnostic error on FS card
226	E2			✓	FS Direction Self Diagnosis Error	Direction self- diagnostic error on FS card
227	E3			✓	FS Direction Crossing Diagnosis Error	Direction cross- diagnostic error on FS card
228	E4			✓	FS Position Diagnosis Error	Relative position diagnostic error on FS card
229	E5			✓	FS Parameter Diagnosis Error	check whether the safety parameters on two MCU are the same
230	E6			✓	SS1 over time fault	Use SS1-t, motor deceleration time is too long.
231	E7			✓	SS1 speed exceed tolerance fault	Use SS1-r, the speed changes greatly during deceleration.
232	E8			✓	SBC relay feedback fault	SBC feedback abnormality triggers STO
233	E9			✓	SBC relay feedback warning	SBC feedback abnormality not triggers STO
234	EA			✓	SLS over time fault	Use SLS-t, motor deceleration time is too long.
235	EB			✓	SLS speed exceed tolerance fault	Use SLS-r, the speed changes greatly during deceleration.
236	EC			✓	SLS trip limit fault	Use SLS, the motor speed is not limited and exceeds the trip limit value.
237	ED			✓	SOS Position exceed tolerance fault	Use SOS, displacement occurs when the motor is stationary
238	EE			✓	SS2 over time fault	Use SS2-t, motor deceleration time is too long.
239	EF			✓	SS2 speed exceed tolerance fault	Use SS2-r, the speed changes greatly during deceleration.
240	F0			✓	SS2 position exceed tolerance fault	Use SS2, displacement occurs when the motor is stationary
241	F1			✓	SDI over time fault	Use SDI-t, motor deceleration time is too long.
242	F2			✓	SDI speed exceed tolerance fault	Use SDI-r, the speed changes greatly during deceleration.
243	F3			✓	SDI position exceed tolerance fault	Use SDI, displacement occurs when the motor is stationary
244	F4			✓	SLA Acceleration exceed tolerance fault	Use SLA, the motor accelerates/deceleration too fast.
245	F5			✓	SSR speed exceed tolerance fault	Use SSR, the motor speed exceeds the monitoring range.
246	F6			✓	SAR Acceleration exceed tolerance fault	Use SAR, the motor accelerates/deceleration exceeds the monitoring range.
247	F7			✓	ABZ tick diagnosis fault	Power supply diagnostics on S-ABZ card not working properly

5 Application example

5.1 General

This chapter describes how communication is established between a Siemens PLC and the DX-NET-PROFINET2-2 via PROFINET.

The main section of this chapter describes how to access the process and parameter data of the variable frequency drive.

→ The description is intended for experienced drive specialists and automation technicians.
Basic knowledge of the PROFINET communication system and the programming of a PROFINET controller is required.
In addition, knowledge of handling the drive is required.
We also assume that you have a good knowledge of the technical basics and are familiar with the handling of electrical equipment and machines as well as reading technical drawings.

Please read this chapter carefully before installing and operating the PROFINET connection.

→ Please also observe the information in the operating instructions for the variable frequency drive/variable speed starter.

5.2 System overview

The following figure shows the DX-NET-PROFINET2-2 communication interface in a PROFINET communication network.

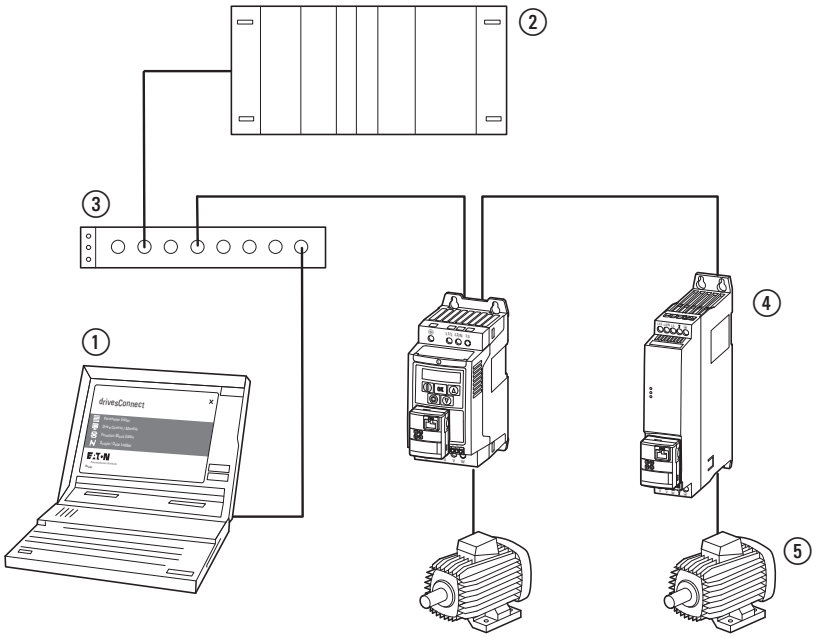


Figure 68: Integration of DX-NET-PROFINET2-2 into a PROFINET network

① PC with engineering tool
② I/O controller
③ Switch
④ DC1 variable frequency drive and DE1 variable speed starter with DX-NET-PROFINET2-2
⑤ Motor

5.3 Cyclic and acyclic communication with TIA Portal

The following Siemens function blocks are used in this chapter:

- SINA_SPEED – for cyclic communication
- FB286 – for acyclic communication

Cyclic communication: SINA_SPEED – process data access

The SINA_SPEED function block is used for cyclic communication with the variable frequency drive.

The SINA_SPEED block can be used to monitor the process data and to control the variable frequency drive. In addition, the communication status between the controller and the variable frequency drive is monitored and checked.

→ The SINA_SPEED function block can be called from a standard library in the TIA Portal.

Acyclic communication: FB286 – read or write several parameters

Function block FB286 is used for parameter access.

The parameters can be read and the values changed using the FB286 function block.

→ Function block FB286 is part of the TIA Portal software and can be called from a standard library in the TIA Portal.

5.4 Configuration of the IP address, peripheral addresses and device names

The TIA Portal software automatically assigns addresses and names for proper communication. These can be changed manually.

IP address

The address in the TIA Portal and the actual IP address of the DX-NET-PROFINET2-2 device must match.

▶ Follow the instructions described in → Section 4.2, "Addressing".

Peripheral addresses

The peripheral address ranges for the data to be exchanged between a Siemens controller and the DX-NET-PROFINET2-2 device are defined in the configuration.

The following section looks at these hardware addresses. If you change them, you will need to adjust the program accordingly.

Device names

If necessary, the device name is adjusted in the PLC configuration.

This is illustrated using the example below in the section "Access to cyclic process data".

5.5 Access to cyclic process data

In this example, "Standard Telegram 1" (PROFIdrive) is selected for cyclic communication between the PLC and the variable frequency drive.

The PLC sends the control word and the speed setpoint to the variable frequency drive using the SINA_SPEED function block. The variable frequency drive then sends the status word and the actual value (frequency) back to the PLC. Control and status data are thereby processed as per the PROFIdrive profile.

The following data exchange takes place in this example:

Input process data

Two input process data are available

- Control word
- Frequency reference

Output process data

Two output process data are available:

- Status word
- Actual frequency

5.6 Access to acyclic process data

In this example, function block FB 286 is used to read or change the parameters.

The corresponding index numbers can be found in
→ Section "4.11 Parameter list", Page 127.

The parameter table contains specific data for each parameter.

5.7 Example program – DX-NET-PROFINET2-2 with TIA Portal

The following chapter explains how to configure a program in the TIA Portal. The hardware and software requirements are listed in detail.
Basic programming and configuration steps are not described in this section. Detailed information can be found in the help tool of the TIA Portal.

5.7.1 Requirements for PLC control

In order to establish proper communication between a master (PLC) and the DX-NET-PROFINET2-2 communication interface (slave), certain hardware and software components are assumed to be present.

In this example, the following components are used:

- Configuration PC with engineering tool (TIA Portal V15.1)
- GSDML file for DX-NET-PROFINET2-2
- PLC – Siemens
- Switch (note: not mandatory)
- PROFINET cable
- DC1 variable frequency drive with DX-NET-PROFINET2-2 communication interface
- Motor

5.7.2 Parameter setting and hardware enable

In order to enable control via PROFINET, the hardware enable and remote access must be carried out via parameter P12.

→ Section 4.4.1, "Hardware enable" describes how to enable the variable frequency drive.

→ Section 4.3, "Parameter settings" describes how to enable the variable frequency drive for network communication.

5.7.3 Setting up the configuration in the TIA Portal

The steps below describe how to create a project for cyclic and acyclic communication.

Hardware configuration

▶1. Start the TIA Portal and create a new project.

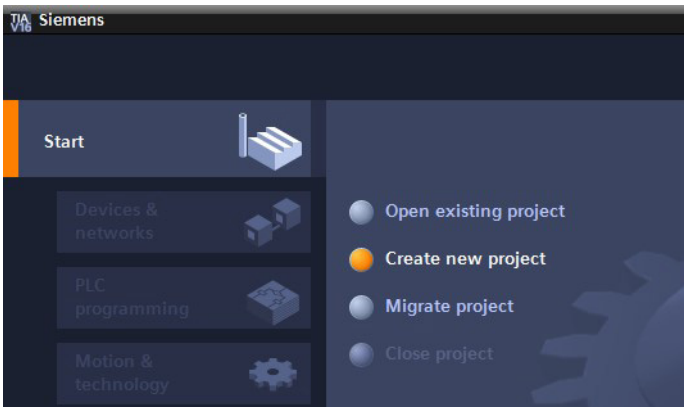


Figure 69: Creating a new project

▶2. Insert a CPU into the project.

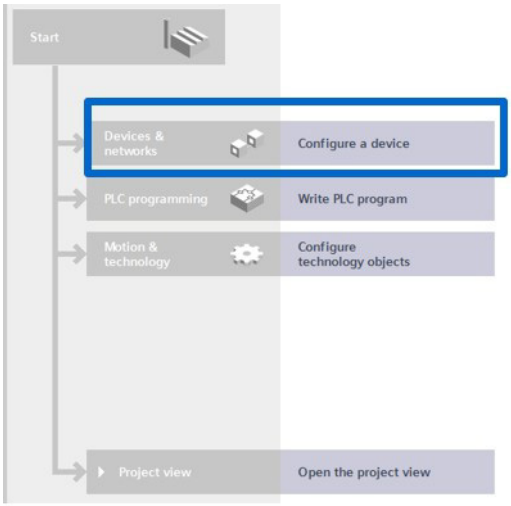


Figure 70: Configuring a device

▶3. Find a suitable CPU.

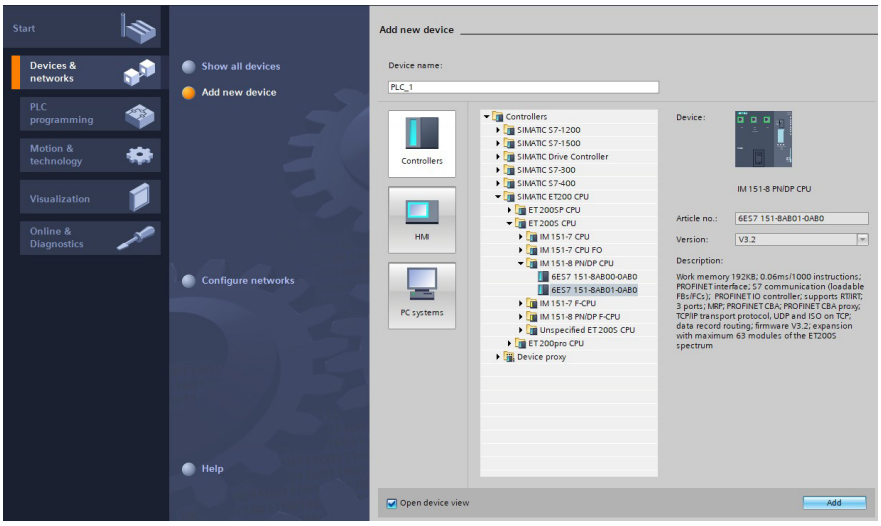


Figure 71: Integrating a CPU

▶4. Locate a device description file (GSDML file) for the DX-NET-PROFINET2-2 device.

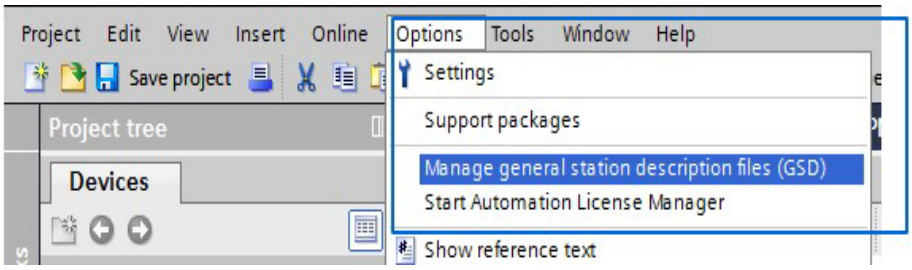


Figure 72: Managing device description files (GSD)

▶5. Install the device description file (GSDML file)

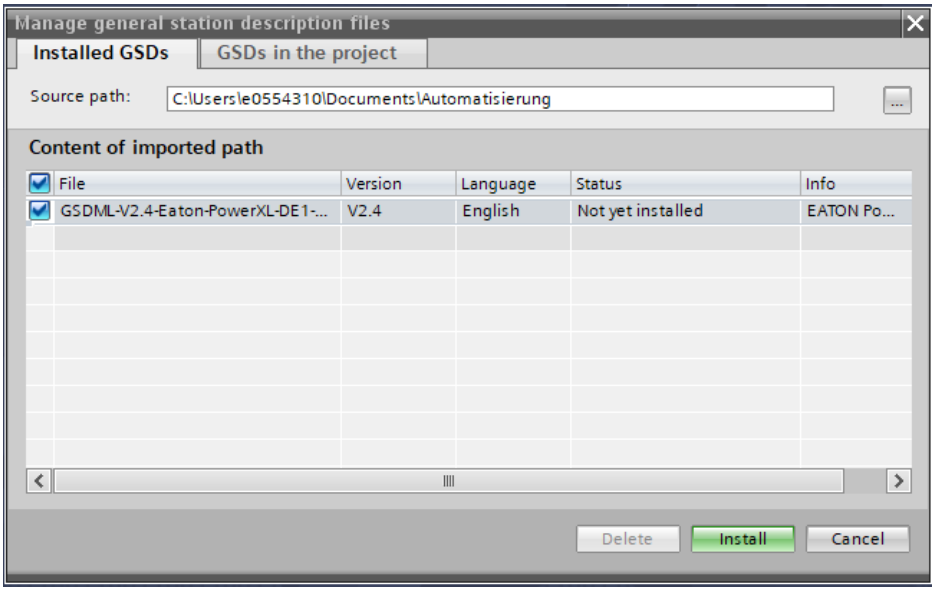


Figure 73: Installing the GSDML file

▶6. Drag and drop the DX-NET-PROFINET2-2 into the network.
Catalog -> Other PROFINET IO field devices -> Drives EATON Industries -> DX-NET-PROFINET2-2

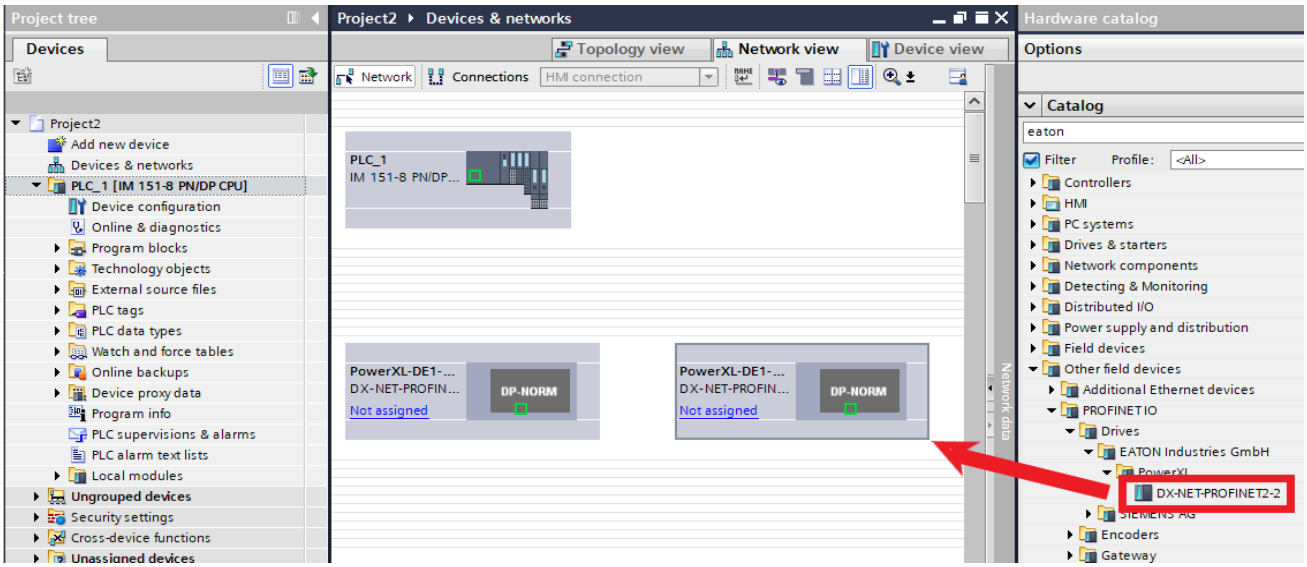


Figure 74: Integrating the DX-NET-PROFINET2-2 device into the network

▶7. Set the IP addresses.

First for the CPU:

- ▶ Open **Properties**.
- ▶ Select **Ethernet addresses**.
- ▶ Insert a new subnet.
- ▶ Enter the desired **IP address** and **subnet mask** in **the IP protocol** area.

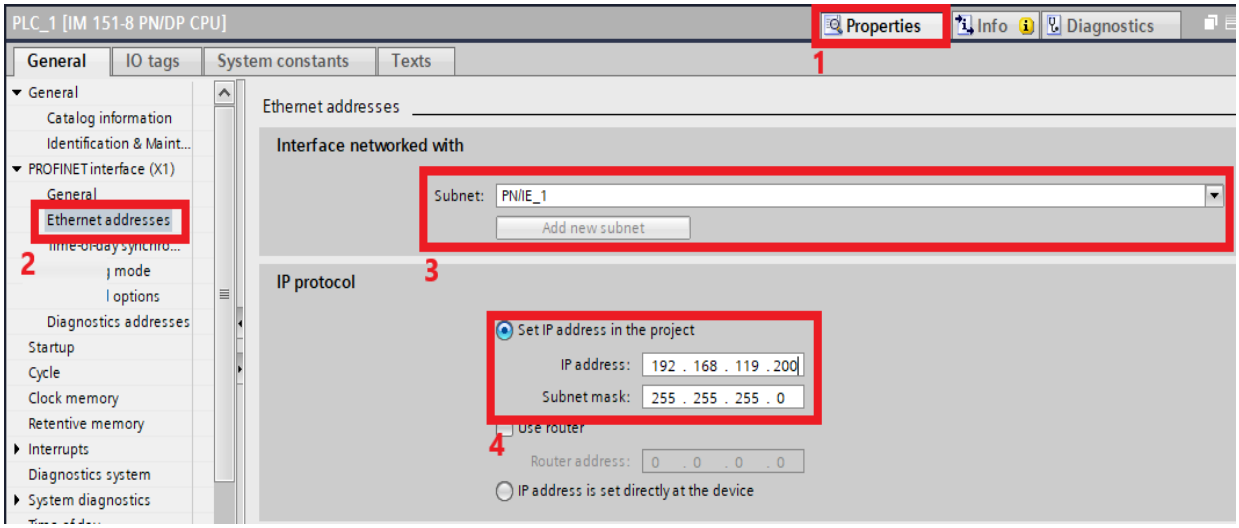


Figure 75: Entering the IP address for the CPU

Now for the DX-NET-ETHERNET2-2 device:

- ▶ Open **Properties**.
- ▶ Select **Ethernet addresses**.
- ▶ Insert a new subnet.
- ▶ Enter the desired **IP address** and **subnet mask** in **the IP protocol** area.

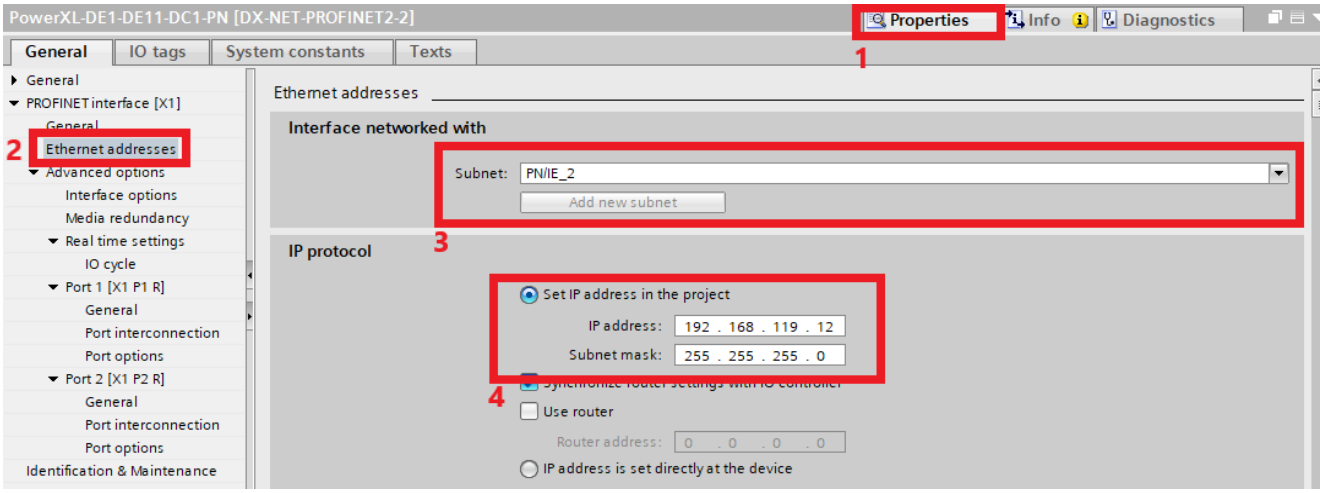


Figure 76: Entering the IP address for the communication interface

▶8. Assign the DX-NET-PROFINET2-2 device to the controller.
To do this, connect the Ethernet ports of the controller and the communication interface to one another.

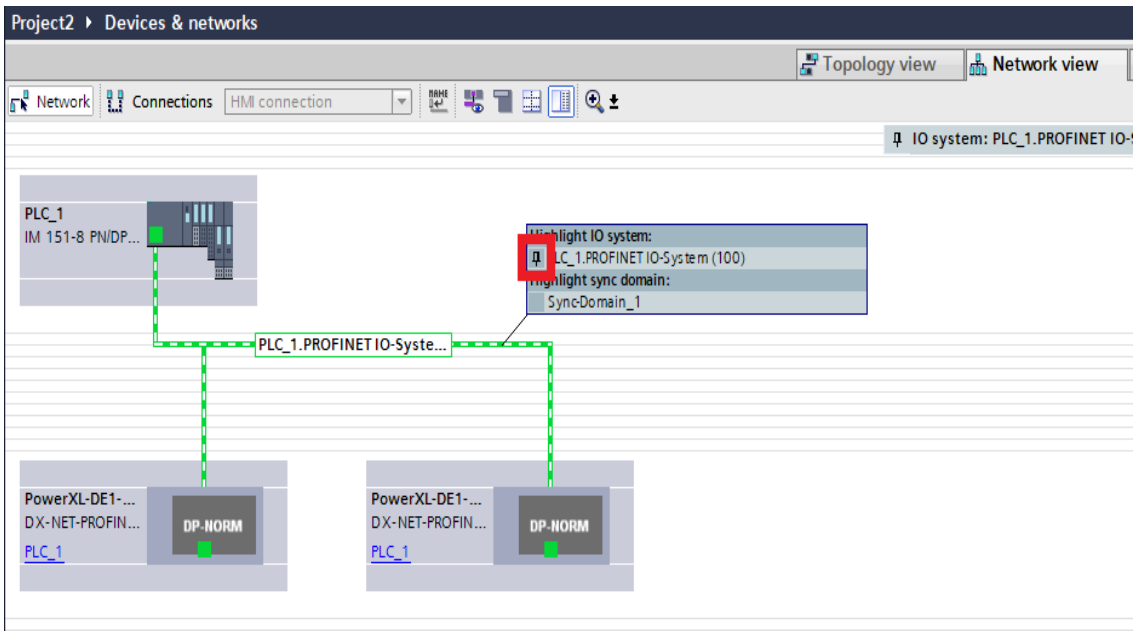


Figure 77: Connecting the ports

▶9. Assign a device name to the DX-NET-PROFINET2-2 communication interface.

The following procedure is used to assign names in this example.

The **Assign device name** option scans devices that are available online and then assigns names.

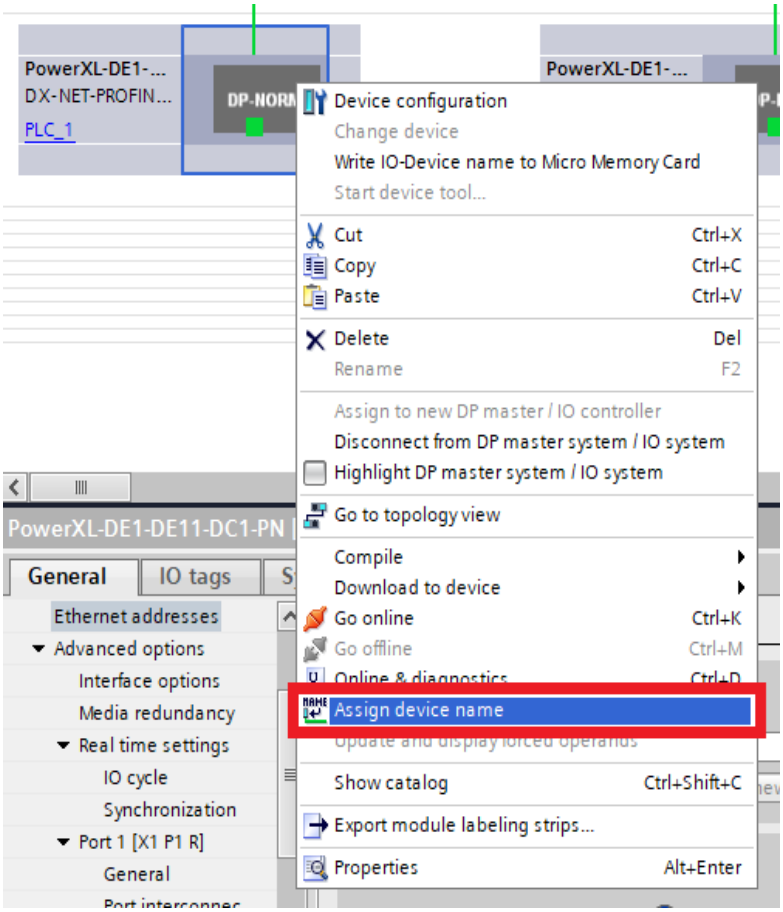


Figure 78: Assigning a device name

▶10. Select the properties of the DX-NET-PROFINET2-2 communication interface.
You can assign the IP address and the device name in the "PROFINET interface" settings. Then click **Assign name**.

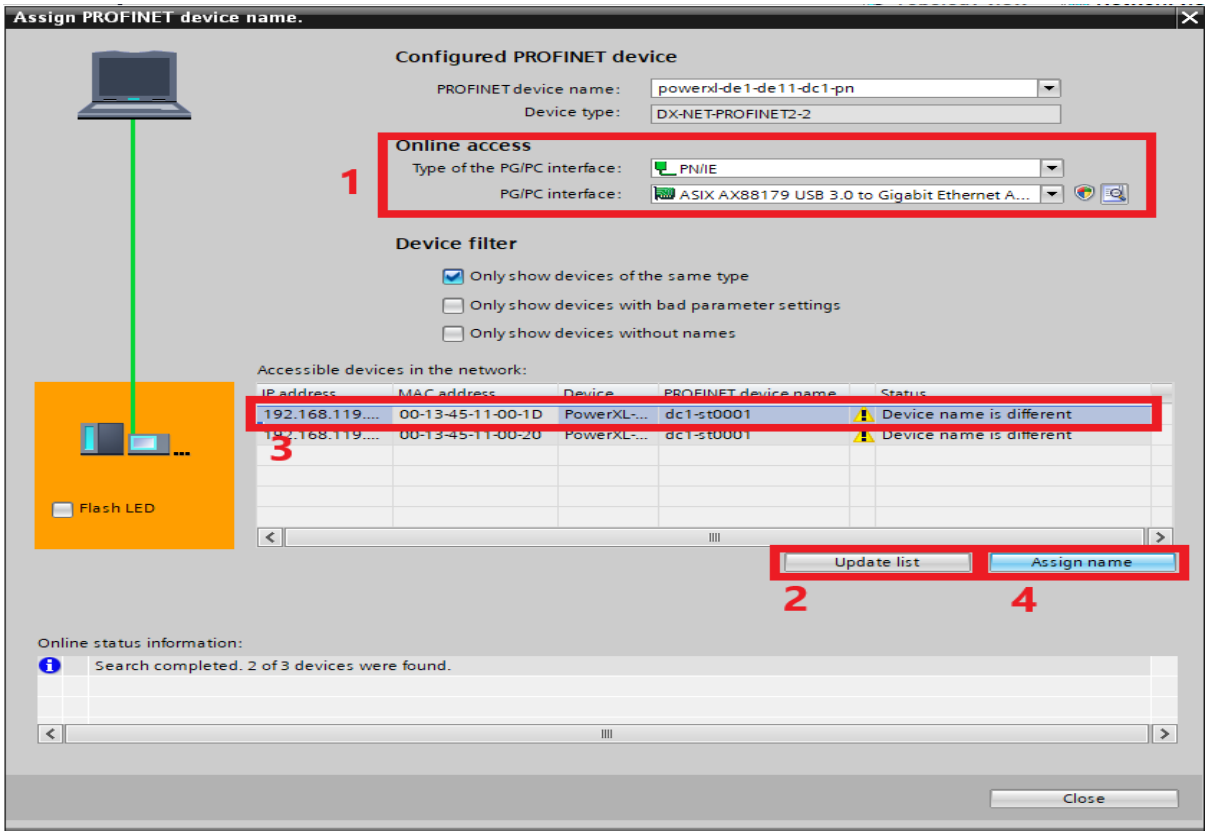


Figure 79: Assigning device names

▶11.Select the required telegram from the hardware catalog.
In this example, "Standard Telegram 1" is used.

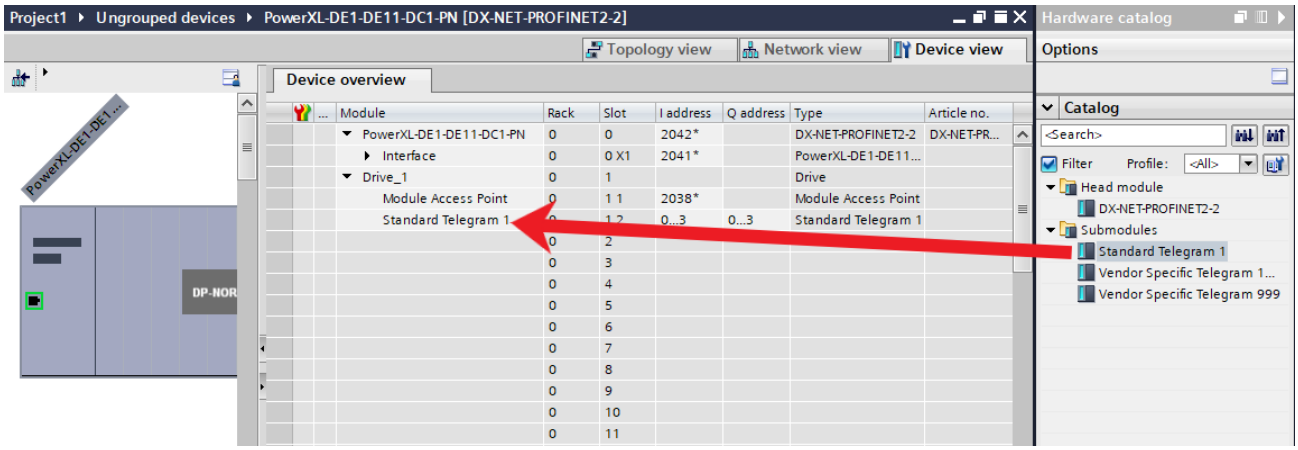


Figure 80: Selecting a telegram

Hardware and I/O address overview

The assignment of inputs and outputs for programming is highlighted below.

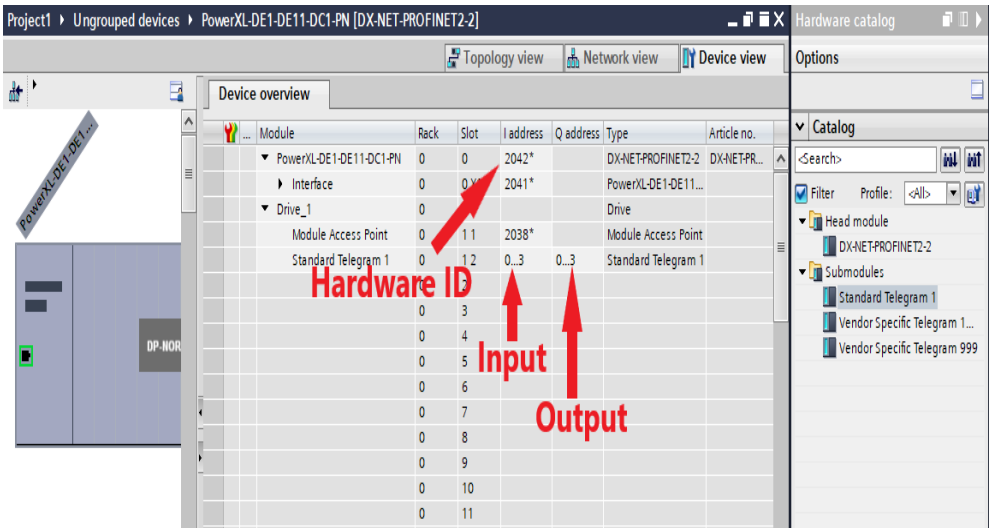


Figure 81: Assigning inputs and outputs

5.7.4 Software configuration – program for cyclic and acyclic communication

5.7.4.1 Acyclic communication

With the help of the Siemens SINA_SPEED block, the variable frequency drive can be controlled cyclically with the "Standard Telegram 1".

The SINA_SPEED function block must be created and then called in OB1.

The SINA_SPEED function block is available in the DriveLib library.

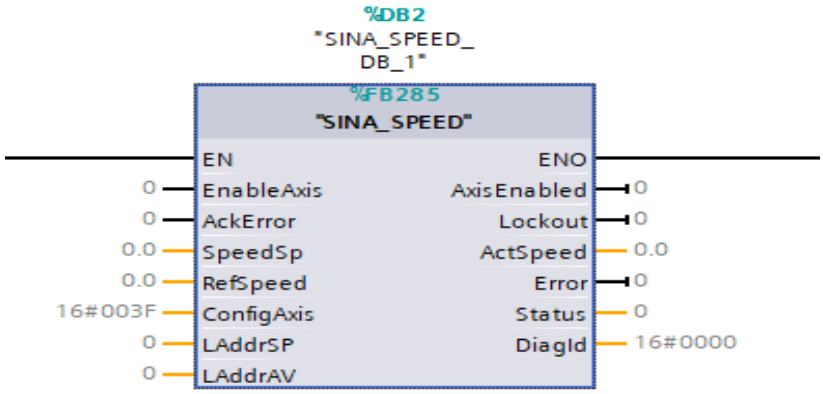


Figure 82: SINA_SPEED function block

For details on how the SINA_SPEED function block works, refer to the online help of the TIA Portal or the documentation for the "DriveLib" library.

Input and output parameters of the SINA_SPEED function block

The following tables list the input and output parameters of the SINA_SPEED function block.

Input parameters of the SINA_SPEED function block

Table 100: SINA_SPEED input parameters

Input signal	Type	Standard value	Description
EnableAxis	BOOL	0	1 = Switch on the drive
AckError	BOOL	FALSE	Acknowledgment of axis error -> AckFlt = 1
SpeedSp	REAL	0.0 [rpm]	Speed reference
RefSpeed		0.0 [rpm]	Rated speed of the drive -> p2000
ConfigAxis	WORD	3	ConfigAxis input
HWIDSTW	HW_IO	0	Symbolic name or HW ID on the SIMATIC S7-1200/1500 of the setpoint slot
HWIDZSW	HW_IO	0	Symbolic name or HW ID on the SIMATIC S7-1200/1500 of the setpoint slot

Table 101: SINA_SPEED output parameters

Output signal	Type	Standard value	Description
AxisEnabled	BOOL	0	Operating mode is executed or enabled
Lockout	BOOL	0	1 = closing lockout active
ActVelocity	REAL	0.0 [rpm]	Current speed (depending on the RefSpeed normalization factor)
Error	BOOL	0	1 = collective fault present
Status	INT	0	16#7002: No error - block is being processed 16#8401: Error in the drive 16#8402: Closing lockout 16#8600: DPRD_DAT error 16#8601: DPWR_DAT error
DiagID	WORD	0	Extended communication failure

Output parameters of the SINA_SPEED function block

The HWIDSTW and HWIDZSW block inputs must reference the hardware ID of "Standard Telegram 1".

Telegram slots

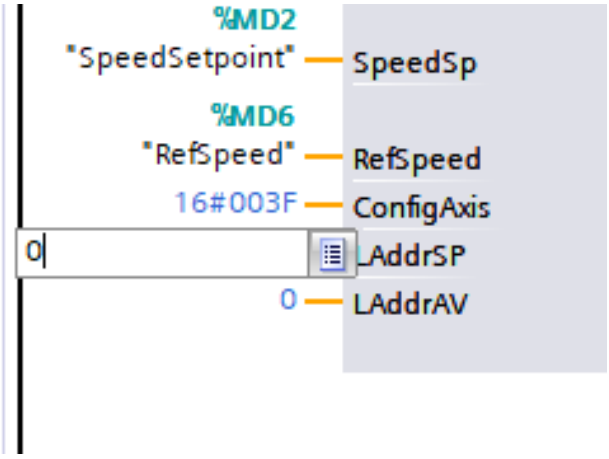


Figure 83: Definition of the slots

When using a PROFINET connection between the CPU and the DX-NET-PROFINET2-2 communication interface, the same hardware ID must be used for inputs HWIDSTW and HWIDZSW.

Specific information about the data block

The inputs of "Standard Telegram 1" can be accessed via the **InstSinaSpeed** data block.

The **InstSinaSpeed** data block contains the following information:

- Inputs of the function block (1)
- Outputs of the function block (2)
- "Standard Telegram 1" structure (3)

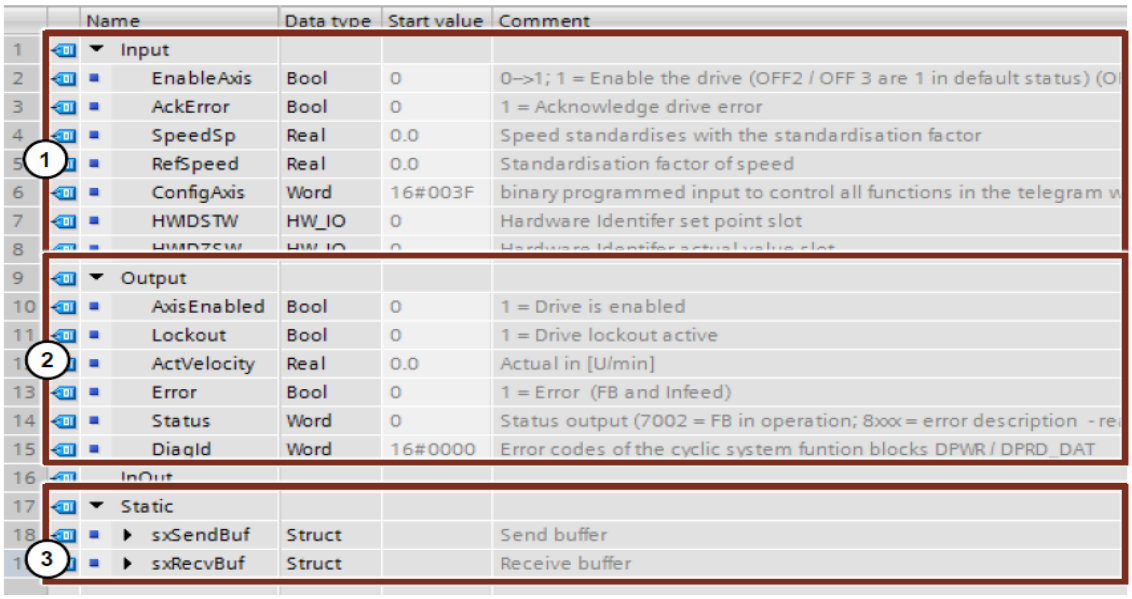


Figure 84: "InstSinaSpeed" data block

Configuration of the block

▶1. Open the SINA_SPEED block from the **Drive_Lib** library.

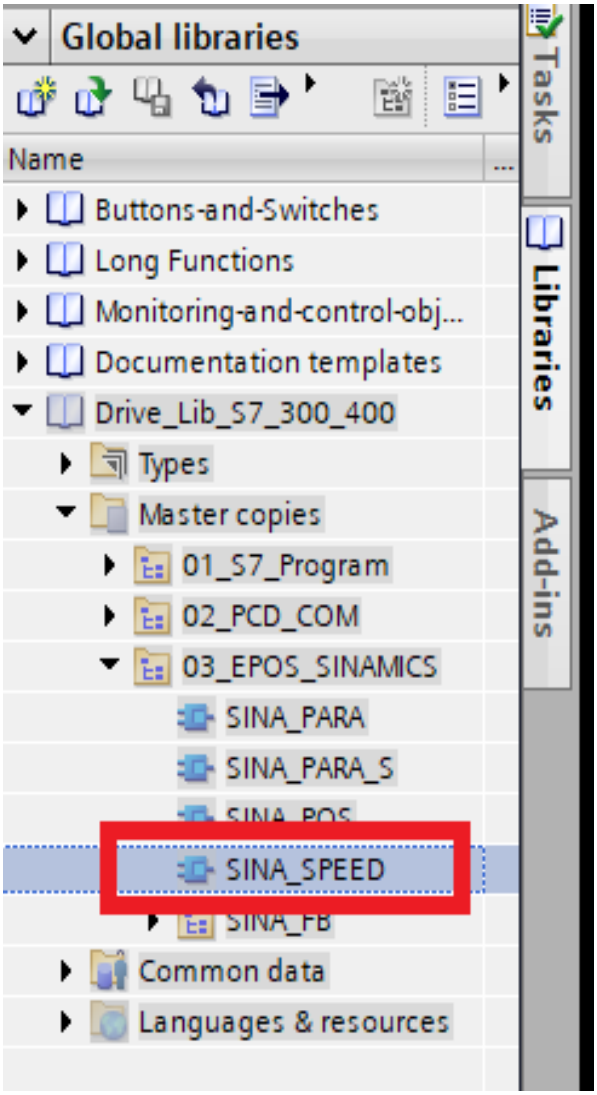


Figure 85: Selecting the SINA_SPEED block from the Drive_Lib library

▶2. Insert the SINA_SPEED block into the "Program blocks" folder.

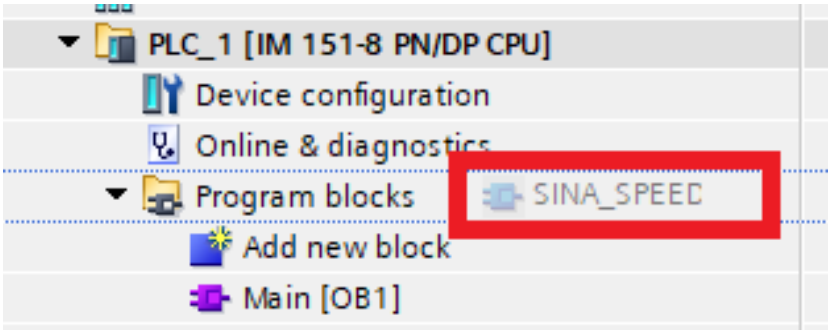


Figure 86: Inserting the SINA_SPEED block into the "Program blocks" folder

▶3. Call the SINA_SPEED block in the Main OB (OB1).
Assign a data block to the block.

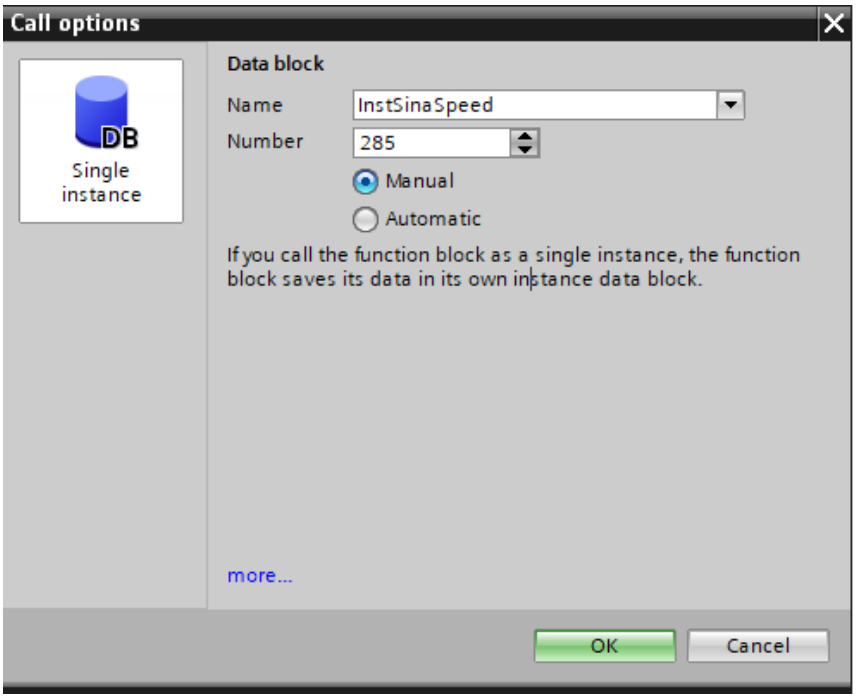


Figure 87: Call options

▶4. Declare inputs and outputs and call up addresses in OB1.

Default tag table

		Name	Data type	Address	Re
1		Enable	Bool	%M0.0	
2		Acknowledge	Bool	%M0.1	
3		SpeedSetpoint	Real	%MD2	
4		RefSpeed	Real	%MD6	
5					
6		AxisEnabled	Bool	%M0.2	
7		AxisLockout	Bool	%M0.3	
8		ActualVelocity	Real	%MD10	
9		Error	Bool	%M0.4	
10		Status	Word	%MW14	
11		DiagID	Word	%MW16	
12		<Add new>			

Figure 88: Standard variable table

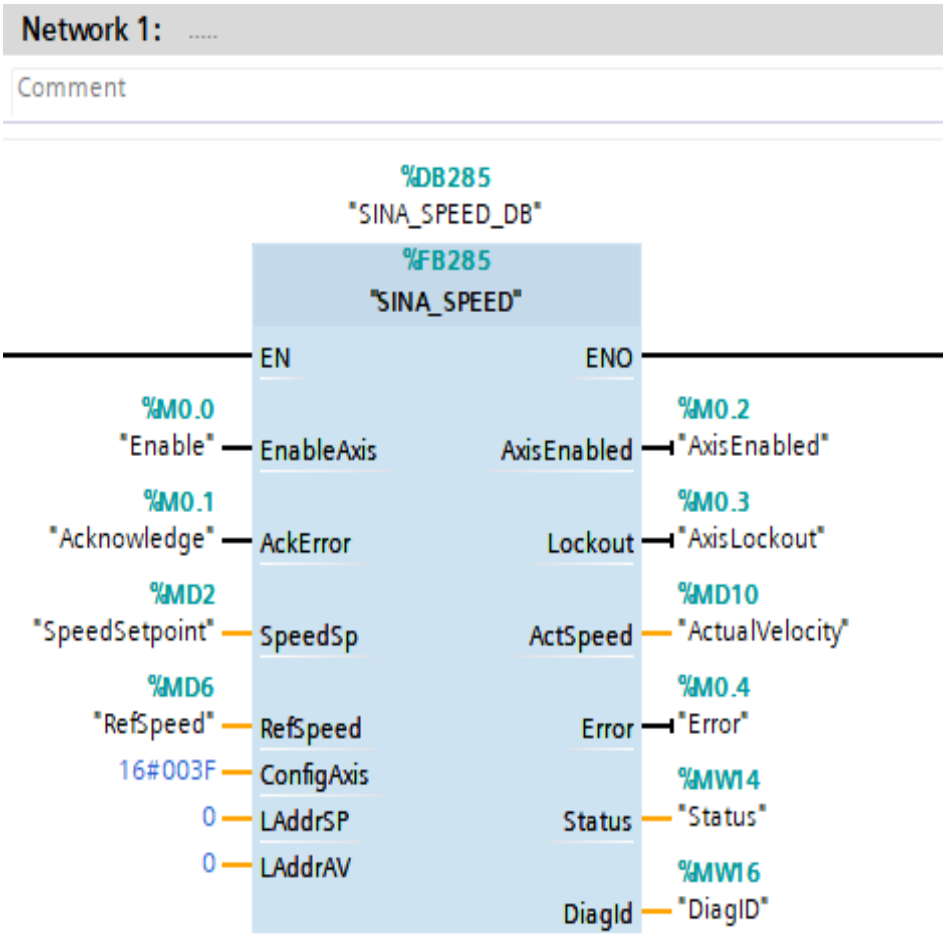


Figure 89: Network 1

Saving the project

▶5. Save the project and download it to the CPU.
To do this, click **Connect online**.

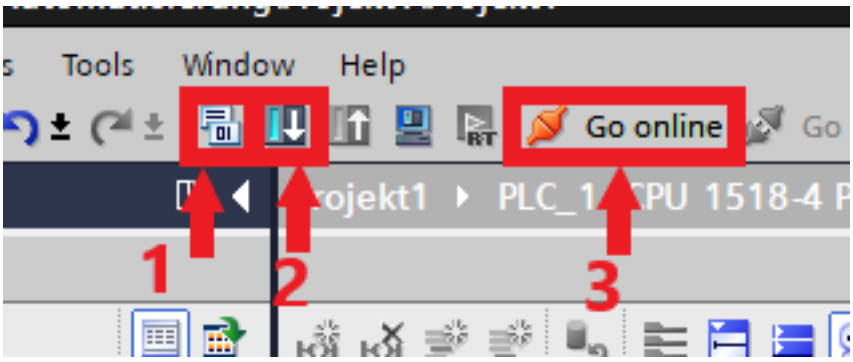


Figure 90: Connect online

Control and monitoring

In order to be able to control the variable frequency drive via the TIA Portal, the variables must be called in the monitoring table.

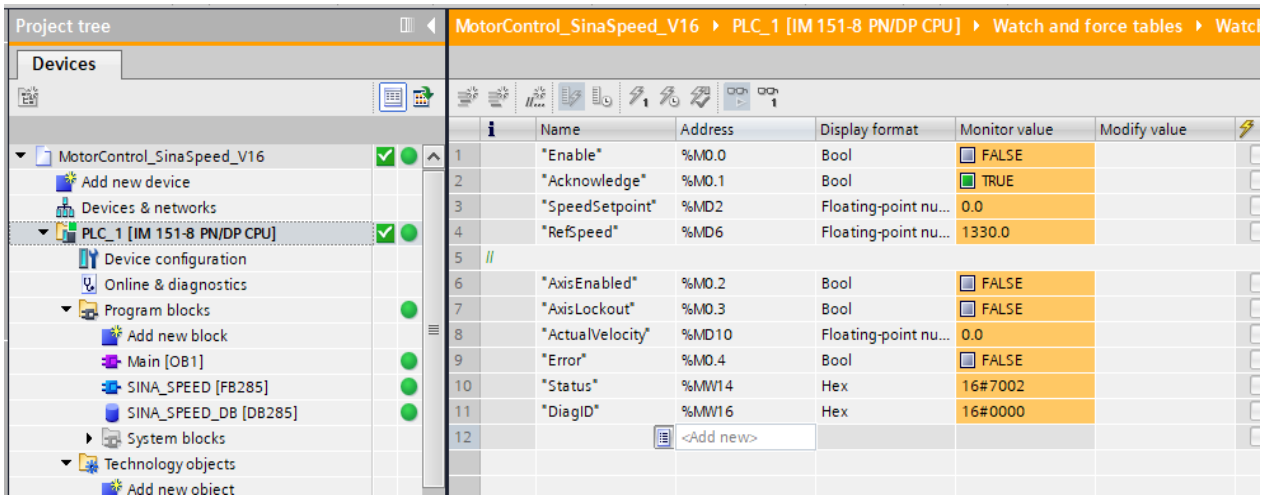


Figure 91: Settings in the monitoring table

The variable frequency drive can be started via the **EnableAxis** input.

The setpoint can be specified via the **xSendBuf.STW1** input.

5.7.4.2 Acyclic communication

For parameter access, an FB286 acyclic communication library must be added to OB1.
The following describes how read and write blocks can be called.

Block FB286 is assigned to SINA_PARA.

Acyclic communication is established according to the PROFIdrive profile via data block 47.

The FB286 acyclic communication block (SINA_PARA) provides the user with an interface for easy reading and writing of any 16 parameters. The user must specify the parameter numbers, an index and (for writing) a parameter value. The job is processed independently after the start of the job.

→ A description of the FB286 function block can be found in the TIA Portal.

The following steps show how to add an FB286 read and write block.

▶1. Add a function block.

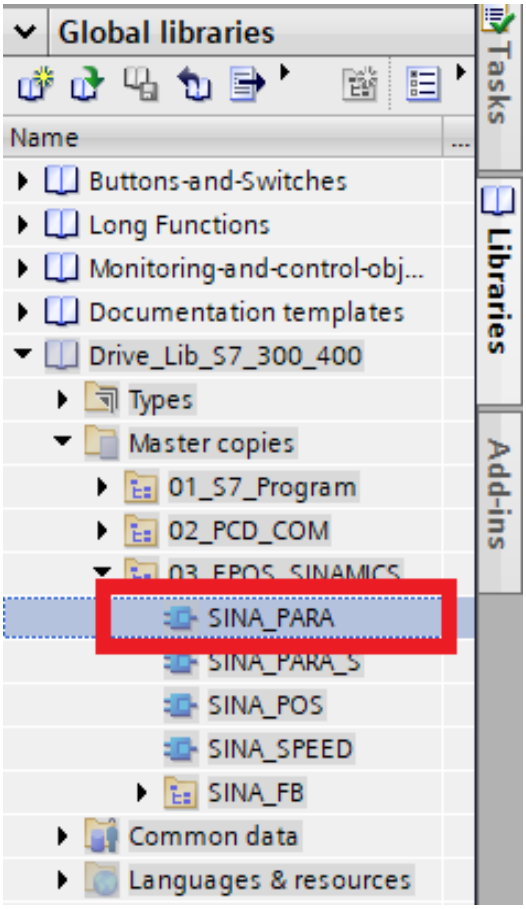


Figure 92: Adding a function block

▶2. Assign a name for the block.

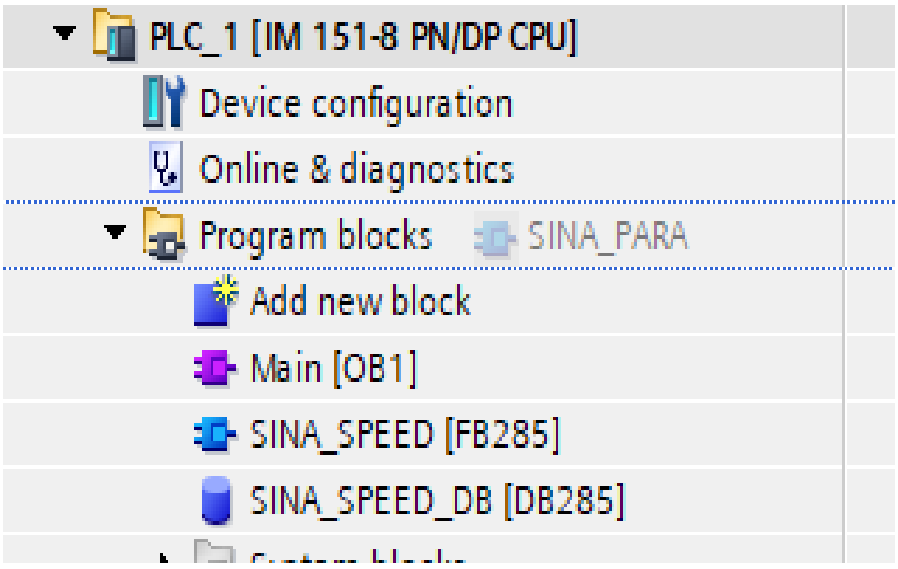


Figure 93: Assigning a name for the block

▶3. Drag and drop function block FB286 into the network.

→ The individual programming steps were skipped here.

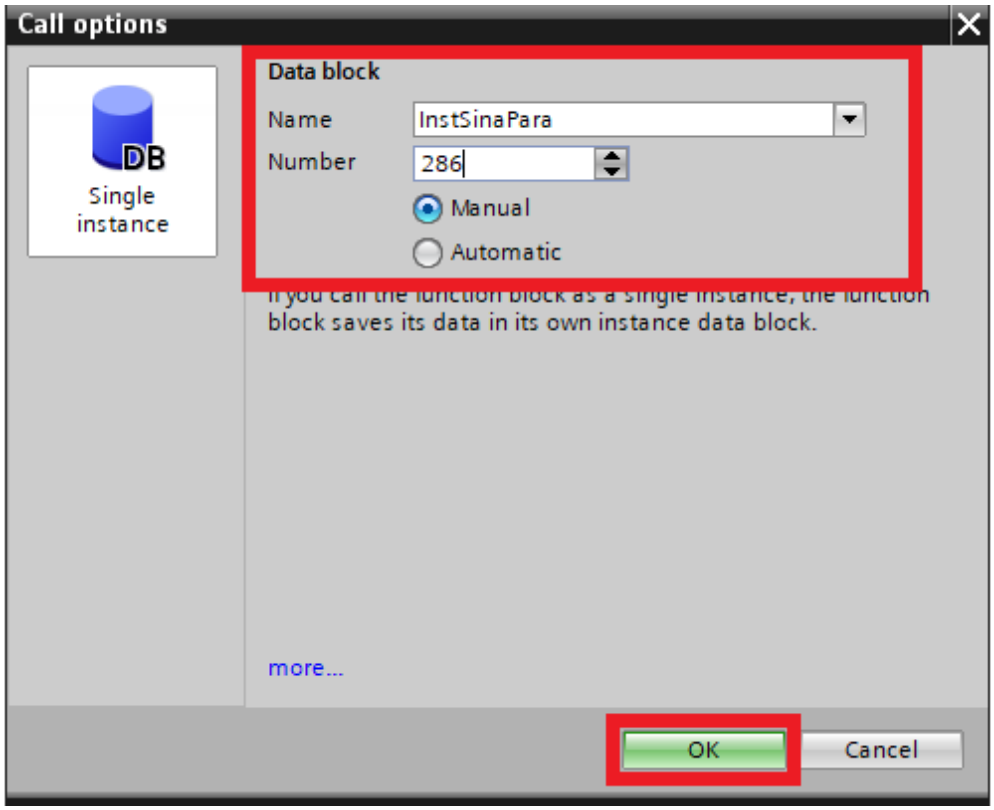


Figure 94: Call options

The following figure shows the FB286 function block with variables.

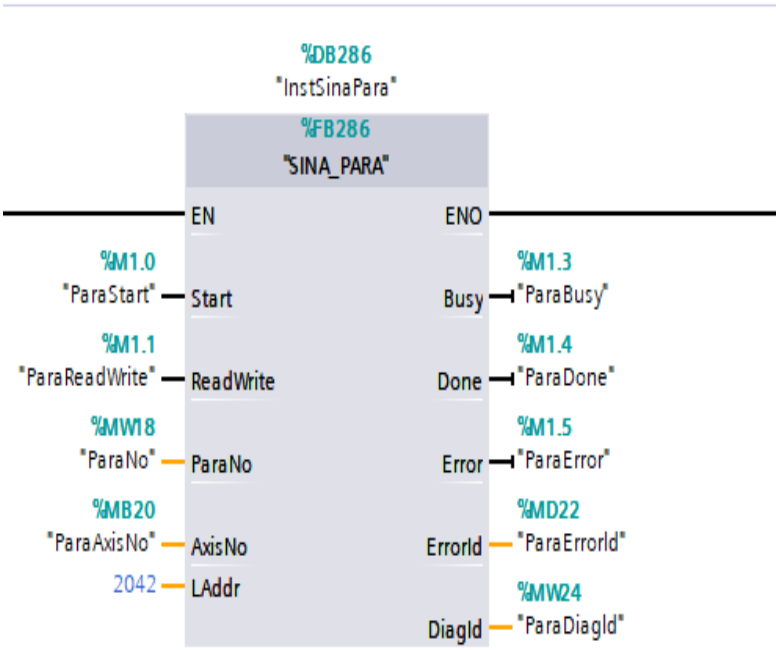


Figure 95: Function block FB286

The following figure shows the entry for the DX-NET-PROFINET2-2 communication interface

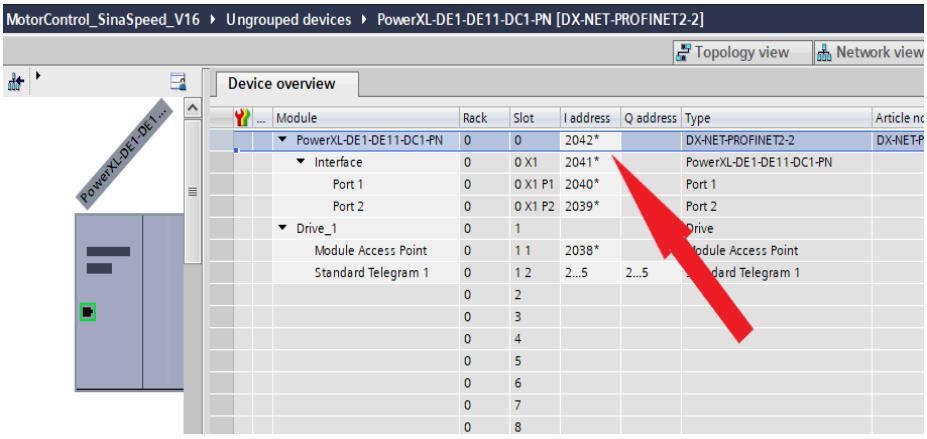


Figure 96: Entry for the DX-NET-PROFINET2-2 communication interface

Loading a project

▶4. Select the appropriate controller in the project tree.

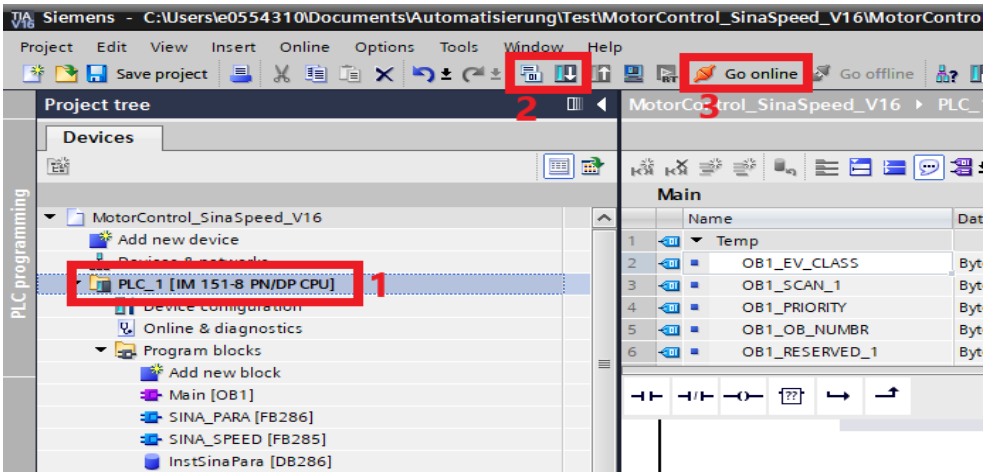


Figure 97: Selecting the controller

▶5. Then load the project.

5.7.4.3 Reading/writing parameters in online mode

Now you switch to online mode to record and write the parameter values.

→ You can find a description of the inputs and outputs of the block and how to fill in information about the data block in
→ Section “5.7.4.4 Input/output of the block”, Page 253.

Read

MotorControl_SinaSpeed_V16 ▸ PLC_1 [IM 151-8 PN/DP CPU] ▸ Watch and force tables ▸ Watch table 1

	Name	Address	Display format	Monitor value	Modify value
10	"Error"	%M0.4	Bool	FALSE	
11	"Status"	%MW14	Hex	16#7002	
12	"DiagID"	%MW16	Hex	16#0000	
13	// Sina Para				
14	"ParaStart"	%M1.0	Bool	FALSE	TRUE
15	"ParaReadWrite"	%M1.1	Bool	FALSE	FALSE
16	"ParaNo"	%MW18	DEC+/-	0	4
17	"ParaAxisNo"	%MB20	Hex	16#01	16#01
18					
19	"ParaBusy"	%M1.3	Bool	FALSE	
20	"ParaDone"	%M1.4	Bool	FALSE	
21	"ParaError"	%M1.5	Bool	TRUE	
22	"ParaErrorId"	%MD22	DEC	131072	
23	"ParaDiagId"	%MW24	Hex	16#0000	
24					
25	"InstSinaPara".sxParameter[1].siParaNo	%DB286.DBW430	DEC+/-	0	1
26	"InstSinaPara".sxParameter[1].siIndex	%DB286.DBW432	DEC+/-	0	0
27	"InstSinaPara".sxParameter[1].srValue	%DB286.DBD434	Floating-point nu...	0.0	
28	"InstSinaPara".sxParameter[2].siParaNo	%DB286.DBW446	DEC+/-	0	0
29	"InstSinaPara".sxParameter[2].siIndex	%DB286.DBW448	DEC+/-	0	1
30	"InstSinaPara".sxParameter[2].srValue	%DB286.DBD450	Floating-point nu...	0.0	
31	"InstSinaPara".sxParameter[3].siParaNo	%DB286.DBW462	DEC+/-	0	
32	"InstSinaPara".sxParameter[3].siIndex	%DB286.DBW464	DEC+/-	0	
33	"InstSinaPara".sxParameter[3].srValue	%DB286.DBD466	Floating-point nu...	0.0	
34	"InstSinaPara".sxParameter[4].siParaNo	%DB286.DBW478	DEC+/-	0	
35	"InstSinaPara".sxParameter[4].siIndex	%DB286.DBW480	DEC+/-	0	
36	"InstSinaPara".sxParameter[4].srValue	%DB286.DBD482	Floating-point nu...	0.0	
37		<Add new>			

Figure 98: Monitoring table for read parameters

Set the following data for the variables on the channels of function block FB286:

ReadWrite = 0, read request
ParaNo = 4, 4 parameters to be read

Set the following values for the variables of the instance database of function block FB286:

Frequency reference

SINA_PARA_DB.sxParameter\[1].siParaNo=1, (index number)
SINA_PARA_DB.sxParameter\[1].siIndex=0, (subindex)

Speed reference

SINA_PARA_DB.sxParameter\[2].siParaNo=0
SINA_PARA_DB.sxParameter\[2].siIndex=1

A rising edge at the start starts the read job.
As soon as the read job is completed, the "Done" bit is set.
The parameter values are displayed in .sxParameter\[x].srValue.

Write

To write parameters, set the following values for the variables in function block FB286.

P-02 (f-max)

ReadWrite = 1, write request
ParaNo = 4, 4 parameters to be written

Set the following values for the variables of the instance database of function block FB286:

SINA_PARA_DB.sxParameter\[1].siParaNo=20 (index number)
SINA_PARA_DB.sxParameter\[1].siIndex=1 (subindex)
SINA_PARA_DB.sxParameter\[1].srValue=700 (parameter is changed to 70 Hz)

P-01 (f-min)

SINA_PARA_DB.sxParameter\[2].siParaNo=20
SINA_PARA_DB.sxParameter\[2].siIndex=0
SINA_PARA_DB.sxParameter\[2].srValue=100, (parameter is changed to 10 Hz)

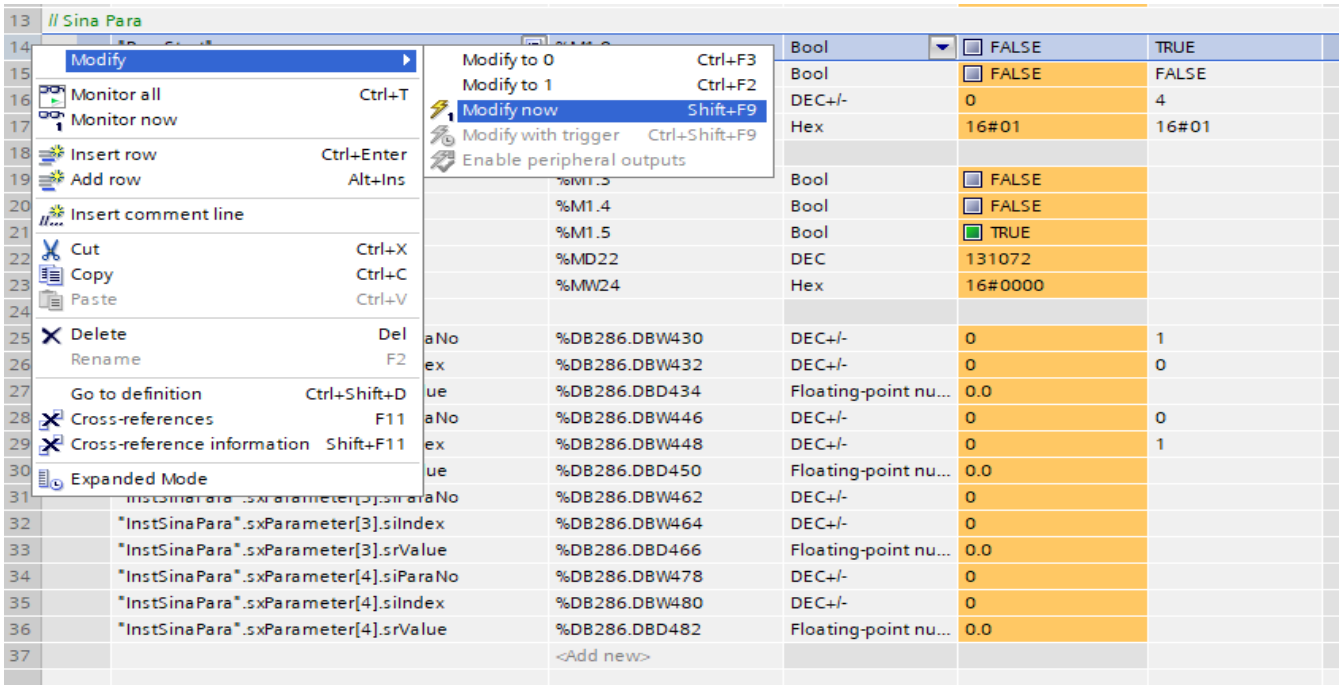


Figure 99: Monitoring table for write parameters.

A rising edge at the start input starts the write job.
When the write job is complete, the Done bit is set.
The changed parameter values are saved in the variable frequency drive.

Changed parameter values

The changed parameter values are shown below.

19	// Sina Para					
20		"ParaStart"	%M100.0	Bool	TRUE	TRUE
21		"ParaReadWrite"	%M100.1	Bool	TRUE	TRUE
22		"ParaNo"	%MW16	DEC	4	4
23						
24		"ParaReady"	%M100.5	Bool	FALSE	
25		"ParaError"	%M100.2	Bool	TRUE	
26		"ParaErrorId"	%MD18	Floating-point nu...	16#0001_0000	
27		"ParaBusy"	%M100.3	Bool	FALSE	
28		"ParaDone"	%M100.4	Bool	FALSE	
29		"ParaDiagId"	%MW20	Hex	16#0000	
30						
31		"InstSinaPara".sxParameter[1].siParaNo		DEC+/-	20	20
32		"InstSinaPara".sxParameter[1].siIndex		DEC+/-	1	1
33		"InstSinaPara".sxParameter[1].srValue		Floating-point nu...	700.0	700.0
34						
35		"InstSinaPara".sxParameter[2].siParaNo		DEC+/-	20	20
36		"InstSinaPara".sxParameter[2].siIndex		DEC+/-	0	0
37		"InstSinaPara".sxParameter[2].srValue		Floating-point nu...	100.0	100.0
38						
39		"InstSinaPara".sxParameter[3].siParaNo		DEC+/-	0	
40		"InstSinaPara".sxParameter[3].siIndex		DEC+/-	0	

Figure 100:Changed parameter values

To change an individual parameter, the parameter value is written in the block in online mode.

The block data record is explained in the following section.

5.7.4.4 Input/output of the block

Inputs

Parameter	Type	Default setting	Description
Start	BOOL	0	Start of the job 0 = No job or cancel job 1 = Start and execute the job
ReadWrite	BOOL	0	Type of job 0 = Read 1 = Write
ParaNo	INT	1	Number of parameters (1 to 16)
AxisNo	BYTE	16#01	Axis number/axis ID in the case of a multiple system
HardwareId	HW IO	0	Hardware ID of the module access point/actual value telegram slot of the axis or drive

Outputs

Parameter	Type	Default setting	Description
Ready	BOOL	0	Feedback signal for connection in LacyCom environment 1 = Job completed or job aborted (one cycle)
Busy	BOOL	0	Job in progress if "Busy" = 1
Done	BOOL	0	Job completed: Edge change from 0 to 1
Error	BOOL	0	Collective fault active: "Error" = 1
Status	DWORD	0	1. word: binary-coded specification of the parameter access that has been disturbed 2. word: Type of fault
DiagId	WORD	0	Extended communication failure -> Error during SFB call

Source: DriveLib – Siemens: Post ID: 109475044
Version dated 10/2021

Hardware ID for LAddr: The hardware ID of the drive must be assigned to the LAddr input.

REQ activates the read block, then the value appears in Value.

A detailed description of the programming steps is not provided at this point.
You can find further information in the help for the TIA Portal.

The **Write** action first reads the parameter value and format of the set parameter from the variable frequency drive and writes it to the parameter structure. After successful reading, the parameter value of the corresponding job field set by the user is then transferred to the variable frequency drive. During this process the Busy bit is set to the value 1.

The **Read** action reads the parameter value and format of the set parameter from the SINAMICS drive and writes it to the parameter structure. The value of the corresponding job field to be read is then stored in the structure.

5.7.4.5 General information about the data block

Data structure of **sxParameter**:

sxParameter[x].siParaNo := parameter number
sxParameter[x1].siIndex := parameter index
sxParameter[x].srValue := (value range ±1.175 495 x 10^{-38} to ±3.402823 x 10^{38}) – is filled when the block is read
sxParameter[x].sdValue := (value range -214748364810 (= -2^{31}) to +214748364710 (= 2^{31})
sxParameter[x].syFormat := parameter format
sxParameter[x].swErrorNo := parameter error number

→ The above job fields are automatically assigned by the block.

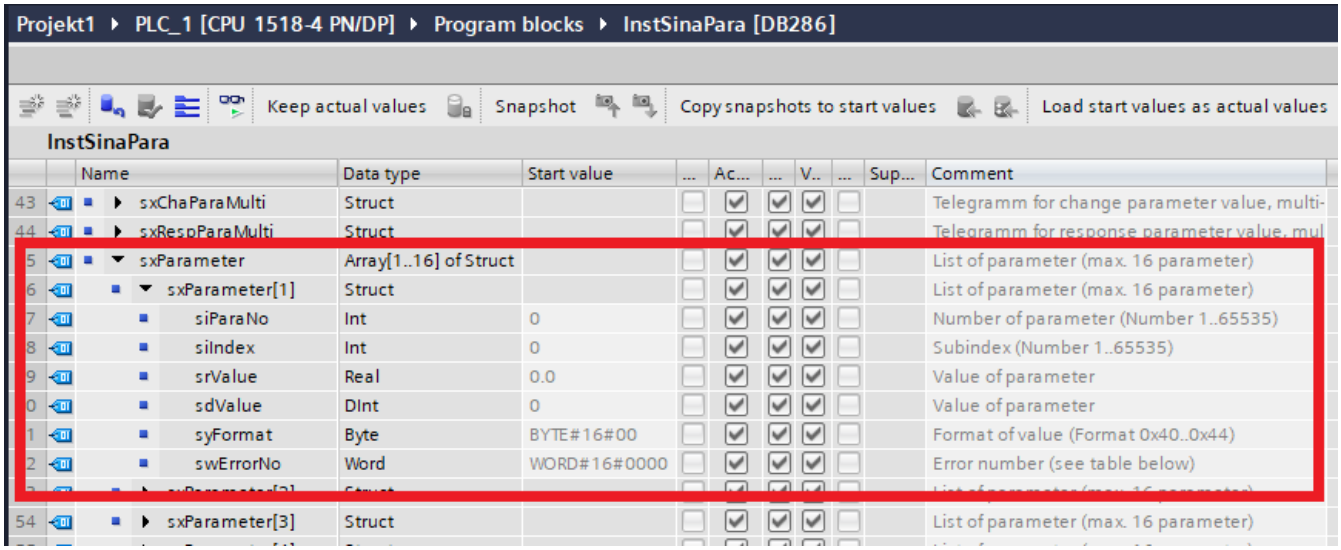


Figure 101: InstSinaPara program block

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By capitalizing on the global growth trends of electrification and digitalization, we're accelerating the planet's transition to renewable energy sources, helping to solve the world's most urgent power management challenges, and building a more sustainable society for people today and generations to come.

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