Accessories

PROFINET

E84AYCER

Inverter Drives 8400 _____

13564915

Lenze

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1 About this documentation

Contents

This documentation exclusively describes the E84AYCER communication module (PROFINET).

> **Note!**
>
> This documentation supplements the **mounting instructions** supplied with the communication module and the **hardware manual "Inverter Drives 8400"**.

The features and functions of the communication module are described in detail.

Examples illustrate typical applications.

This documentation also contains...

- Safety instructions that must be observed
- The most important technical data of the communication module
- Information about the versions of the Lenze standard devices to be used
- Notes on troubleshooting and fault elimination

The theoretical context is only explained as far as it is required for understanding the function of the communication module.

Depending on the software version of the inverter and the »Engineer« software installed, the screenshots in this documentation may deviate from the »Engineer« representation.

This documentation does not describe the software of other manufacturers. No responsibility is taken for corresponding information given in this documentation. Information on how to use the software can be obtained from the documents of the host system (master).

All brand names mentioned in this documentation are trademarks of their corresponding owners.

> **Tip!**
>
> Detailed information on PROFINET can be found on the homepage of the PROFIBUS user organisation which also develops the PROFINET communication technology:
>
> www.profibus.com

About this documentation

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Target group

This documentation addresses to persons who configure, install, commission, and maintain the networking and remote maintenance of a machine.

Tip!

Information and software updates for Lenze products can be found in the download area at:

www.Lenze.com

Information regarding the validity

The information given in this documentation is valid for the following devices:

Extension module	Type designation	From hardware version	From software version
PROFINET communication module	E84AYCER	VA	02.00

About this documentation

Document history

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1.1   Document history

Version			Description
3.0	02/2019	TD23	General revision
2.0	11/2010	TD17	• General revision • Update for SW version 02.00
1.0	04/2010	TD17	First edition

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1.2 Conventions used

This documentation uses the following conventions to distinguish between different types of information:

Type of information	Highlighting	Examples/notes
Spelling of numbers		
Decimal	Normal spelling	Example: 1234
Hexadecimal	0x[0 … 9, A … F]	Example: 0x60F4
Binary • Nibble	In inverted commas Point	Example: '100' Example: '0110.0100'
Decimal separator	Point	The decimal point is always used. For example: 1234.56
Text		
Program name	» «	PC software Example: Lenze »Engineer«
Control element	**Bold**	The **OK** button… / The **Copy** command… / The **Properties** tab… / The **Name** input field…
Hyperlink	<u>Underlined</u>	Optically highlighted reference to another topic. Can be activated with a mouse-click in this documentation.
Icons		
Page reference	(📖 8)	Optically highlighted reference to another page. Can be activated with a mouse-click in this documentation.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

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1.3 Terminology used

Term	Meaning
Inverter Standard device	Lenze inverters of the "Inverter Drives 8400" product series for which the communication module can be used. ▸ Application as directed (🕮 12)
»Engineer«	Lenze PC software which supports you during the "Engineering" process (parameterisation, diagnostics, and configuration) throughout the whole life cycle, i. e. from planning to maintenance of the machine commissioned.
Code	Parameter which serves to parameterise and monitor the inverter. In normal usage, the term is usually referred to as "Index".
Subcode	If a code contains several parameters, they are stored in "subcodes". This manual uses a slash "/" as a separator between code and subcode (e.g. "C00118/3"). This term is also referred to as "subindex" in common parlance.
Lenze setting Basic setting	This setting is the default factory setting of the device.
HW	Hardware
SW	Software
I/O controller	PROFINET master The I/O controller takes over the master function for data communication of the decentralised field devices. The I/O controller usually is the communication interface of a PLC.
I/O device	PROFINET slave
IO supervisor	Engineering and diagnostics tools The IO supervisor can access process data, diagnostic data, and alarm data.

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1.4   Notes used

The following signal words and symbols are used in this documentation to indicate dangers and important information:

Safety instructions

Layout of the safety instructions:

⚠ **Pictograph and signal word!**

(characterise the type and severity of danger)

Note

(describes the danger and gives information about how to prevent dangerous situations)

Pictograph	Signal word	Meaning
⚠	**Danger!**	**Danger of personal injury through dangerous electrical voltage** Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
⚠	**Danger!**	**Danger of personal injury through a general source of danger** Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
🛑	**Stop!**	**Danger of property damage** Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

Application notes

Pictograph	Signal word	Meaning
ℹ	**Note!**	Important note to ensure trouble-free operation
💡	**Tip!**	Useful tip for easy handling
🖉		Reference to another document

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2   Safety instructions

> **Note!**
>
> It is absolutely vital that the stated safety measures are implemented in order to prevent serious injury to persons and damage to material assets.
>
> Always keep this documentation to hand in the vicinity of the product during operation.

2.1   General safety and application notes

> ⚠ **Danger!**
>
> If the following basic safety measures are disregarded, severe injuries to persons and damage to material assets may result.

- Lenze drive and automation components ...
  - must only be used as directed.
    - ▸ Application as directed (🕮 12)
  - must never be commissioned if they display signs of damage.
  - must never be technically modified.
  - must never be commissioned if they are not fully mounted.
  - must never be operated without required covers.
  - during and after operation can have live, moving and rotating parts, depending on their degree of protection. Surfaces can be hot.
- The following applies to Lenze drive components ...
  - only use the accessories approved.
  - Only use original manufacturer spare parts.
- Observe all specifications contained in the enclosed documentation and related documentation.
  - This is the precondition for safe and trouble-free operation and for obtaining the product features specified.
    - ▸ Product features (🕮 13)
  - The specifications, processes, and circuitry described in this document are for guidance only and must be adapted to your own specific application. Lenze does not take responsibility for the suitability of the process and circuit proposals.
- All works on and with Lenze drive and automation components must only be carried out by qualified personnel. According to IEC 60364 or CENELEC HD 384 these are persons who ...
  - are familiar with installing, mounting, commissioning, and operating the product.
  - who have the corresponding qualifications for their work.
  - who know and can apply all regulations for the prevention of accidents, directives, and laws applicable at the place of use.

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2.2 Device and application-specific safety instructions

- During operation, the communication module must be securely connected to the standard device.

- Always use a separate power supply unit safely separated according to EN 61800-5-1 ("SELV/ PELV") in every control cabinet for external voltage supply.

- Only use cables corresponding to the given specifications.
  ▸ Ethernet cable specification (📖 30)

> **Documentation for the standard device, control system, system/machine**
>
> All the other measures prescribed in this documentation must also be implemented. Observe the safety instructions and application notes contained in this manual.

2.3 Residual hazards

Protection of persons

- If the Inverter Drives 8400 are operated on a phase-earthed mains with a rated mains voltage of ≥ 400 V, external measures need to be implemented in order to ensure protection against accidental contact.
  ▸ Protective insulation (📖 16)

Device protection

- The communication module contains electronic components which may be damaged or destroyed by electrostatic discharge.
  ▸ Installation (📖 22)

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3 Product description

3.1 Application as directed

The communication module …

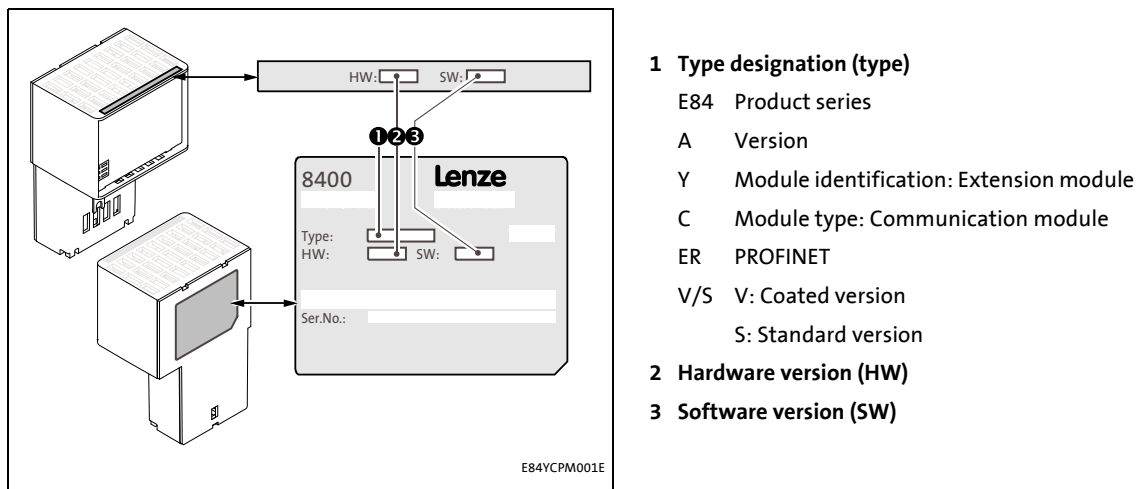- is an accessory module that can be used in conjunction with the following standard devices:

Product series	Type designation	From software version
Inverter Drives 8400 StateLine	E84AVSCxxxxx	05.00
Inverter Drives 8400 HighLine	E84AVHCxxxxx	05.00
Inverter Drives 8400 TopLine	E84AVTCxxxxx	01.00

- is a device intended for use in industrial power systems.
- should only be used under the operating conditions prescribed in this documentation.
- should only be used in PROFINET networks.

Any other use shall be deemed inappropriate!

3.2 Identification

Type designation and hardware and software version of the communication module are indicated on the nameplate:

1	**Type designation (type)**
E84	Product series
A	Version
Y	Module identification: Extension module
C	Module type: Communication module
ER	PROFINET
V/S	V: Coated version
	S: Standard version
2	**Hardware version (HW)**
3	**Software version (SW)**

[3-1] Identification data

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### 3.3   Product features

- Interface module for the PROFINET IO communication system to the expansion slots of the Inverter Drives 8400
- The communication module can either be supplied internally by the standard device or externally by a separate voltage source.
- Support of the I&M0...4 functionality for the identification of the standard device
- Automatic detection of the baud rate 100 Mbps
- A line topology is enabled by the integrated 2-port switch.
- Support of the LLDP protocol for the topology recognition
- Support of the SNMP protocol for diagnostic purposes
- Support of the MRP (Media Redundancy Protocol)
  The Inverter Drive 8400 can be integrated into a ring topology as a client node.
- Access to all Lenze parameters
- An online connection via PROFINET can be established using the Lenze »Engineer«.

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3.4 Connections and interfaces

- 2 RJ45 sockets for the PROFINET connection
- 2-pole plug connector for the external voltage supply of the communication module.
- Front LEDs for diagnosing the ...
  - voltage supply of the communication module;
  - connection to the standard device;
  - PROFINET connection;
  - PROFINET activity.
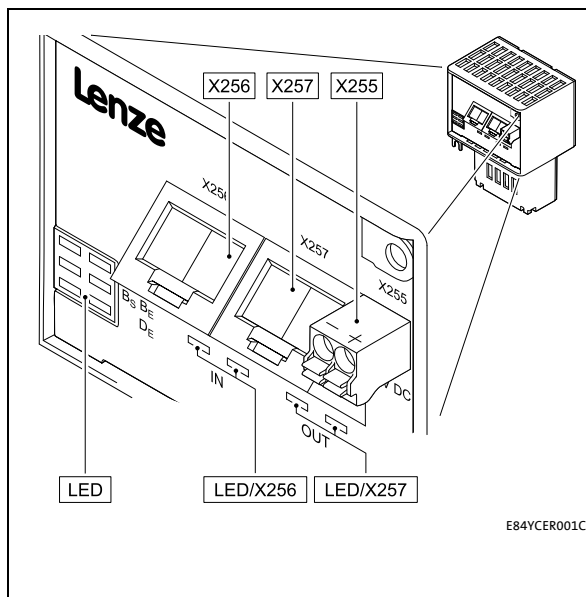
X255 External voltage supply of the communication module
- 2-pin plug connector with spring connection
▶ External voltage supply (🕮 32)

X256 PROFINET input (IN)
X257 PROFINET output (OUT)
- RJ45-sockets
- each with 2 LED status displays for diagnostics
▶ Network topology (🕮 26)
▶ PROFINET connection (🕮 28)
▶ Status displays at X256 and X257 (🕮 76)

MS 5 LED status displays for diagnostics
ME ▶ Module status displays (🕮 74)
BS ▶ Fieldbus status displays (🕮 75)
BE
EN

E84YCER001C

[3-2]   E84AYCER communication module (PROFINET)

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4 Technical data

4.1 General data and operating conditions

Range	Values		
Order designation	E84AYCER		
Communication profile	PROFINET		
Communication medium	S/FTP (Screened Foiled Twisted Pair, ISO/IEC 11801 or EN 50173), CAT 5e		
Interface for communication	RJ45: Standard Ethernet (in accordance with IEEE 802.3), 100Base-TX (Fast Ethernet)		
Network topology	Tree, star, and line		
Type of node	I/O device with real time (RT) communication properties		
Number of device nodes	Max. 255 in the subnetwork		
Max. cable length	100 m		
PNO identification number	0x0106		
Device identification (Device ID)	0x8400		
TCP port	8410		
Baud rate	100 Mbps		
Switching method	"Store and forward"		
Switch latency	Approx. 125 µs at max. frame length		
Voltage supply	External supply via separate power supply unit • "+": U = 24 V DC (20.4 V - 0 % ... 28.8 V + 0 %), I = 140 mA • "-": Reference potential for external voltage supply		
Conformities, approvals	CE	2004/108/EC, EMC Directive 2006/95/EC, Low-Voltage Directive	
	EAC	Eurasian conformity TR CU: Technical Regulations of Customs Union	
		TP TC 004/2011 (TR CU 004/2011) About the safety of low voltage equipment	
		TP TC 020/2011 (TR CU 020/2011) Electromagnetic compatibility of technical means	
	UL	UL 508C / C22.2 No. 14, Power Conversion Equipment (File-No. E132659)	

> **Hardware manual "Inverter Drives 8400"**
>
> Here you can find the **ambient conditions** and data on the **electromagnetic compatibility (EMC)**, which also apply to the communication module.

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4.2   Protective insulation

> ⚡ **Danger!**
>
> **Dangerous voltage**
>
> If the Inverter Drives 8400 are operated on a phase-earthed mains with a rated mains voltage of ≥ 400 V, external measures need to be implemented in order to ensure protection against accidental contact.
>
> **Possible consequences:**
> - Death or severe injuries
>
> **Protective measures:**
> - If protection against accidental contact is required for the control terminals of the inverter and the connections of the device modules plugged, …
>   - a double isolating distance must exist.
>   - the components to be connected must be provided with the second isolating distance.

> ℹ️ **Note!**
>
> The existing protective insulation in the Inverter Drives 8400 is implemented according to EN 61800-5-1.

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The following illustration ...

- shows the arrangement of the terminal strips and the separate potential areas of the Inverter Drive 8400.

- serves to determine the decisive protective insulation between two terminals located in differently insulated separate potential areas.
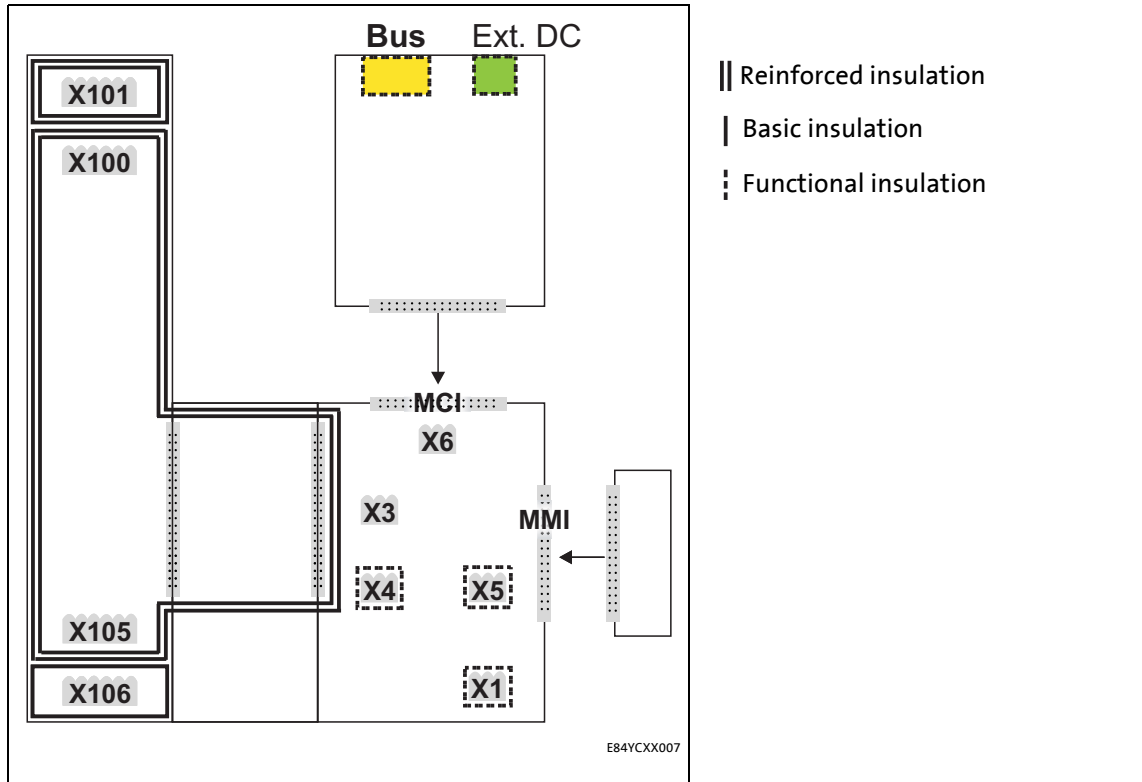
[4-1]   Protective insulation in accordance with EN61800-5-1

Terminal strip	Connection
X100	Mains/DC-bus connection
X101	Relay contact
X105	Motor/brake resistor
X106	Motor PTC
X1	System bus (CANopen)
X3	Analog inputs/outputs
X4	Digital outputs
X5	Digital inputs
X6	Diagnostics
MCI	Slot for the communication module
MMI	Slot for the memory module

Technical data

Protective insulation

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Example

Which type of protective insulation is used between the bus terminal of the device module in slot MCI and the X100 mains terminal?

- The separate potential area with the better protective insulation is decisive.
  - The separate potential area of the bus terminal of the device module has a "functional insulation".
  - The separate potential area of the mains terminal has a "reinforced insulation".
- Result: The insulation between mains terminal X100 and the bus terminal is of the "reinforced insulation" type.

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4.3 Protocol data

Range	Values
Process data words (PCD)	Max. 16 process data words (max. 32 bytes)
Acyclic parameter data channel	Limited by the PROFINET frame size

4.4 Communication time

The communication time is the time between the start of a request and the arrival of the corresponding response.

The communication times in the PROFINET network depend on the …

- processing time in the inverter;
- frame runtime (baud rate / frame length);
- nesting depth of the network.

Processing time inside the inverter

Data	Processing time	
Process data	Approx. 2 ms	Update cycle
	+ 0 … 1 ms	Processing time in the module
	+ 1 … x ms	Runtime of the application task of the technology application used (tolerance)
Parameter data	Approx. 30 ms + a tolerance of 20 ms (typically)	
	• For some codes, the processing time may be longer (see software manual/»Engineer« online help for the Inverter Drive 8400).	

There are no interdependencies between parameter data and process data.

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4.5 Internal switch latency

The integrated 2-port switch causes runtime delays which can be calculated as follows:

Runtime delay = ((36 permanent bytes + process data in bytes) x 8 x 10 nsec) + 4 μsec

Example :

20 process data words + 4 PROFIsafe words => 48 bytes

- ((36 permanent bytes + 48 bytes) x 8 x 10 nsec) + 4 μsec

- (84 bytes x 8 x 10 nsec) + 4 μsec

- 6.72 μsec + 4 μsec = **10.72 μsec**

In accordance with the PROFINET specification, the shortest PROFINET I/O frame must have a data length of 72 bytes. If the 36 permanent bytes are subtracted from the 72 bytes, 36 bytes are available for process data. If now less than 36 bytes of process data are used, the PROFINET I/O frame is filled with "zero bytes" until it can be transmitted. As a consequence for the calculation formula, the shortest PROFINET I/O frame with 18 process data words (36 bytes) has always the same length and thus the runtime delay is the same, too.

| **Note!** |

The use of external switches can also lead to runtime delays. Depending on the system constellation, it may be useful to create a star topology or a line/mix topology.

▸ Network topology (📖 26)

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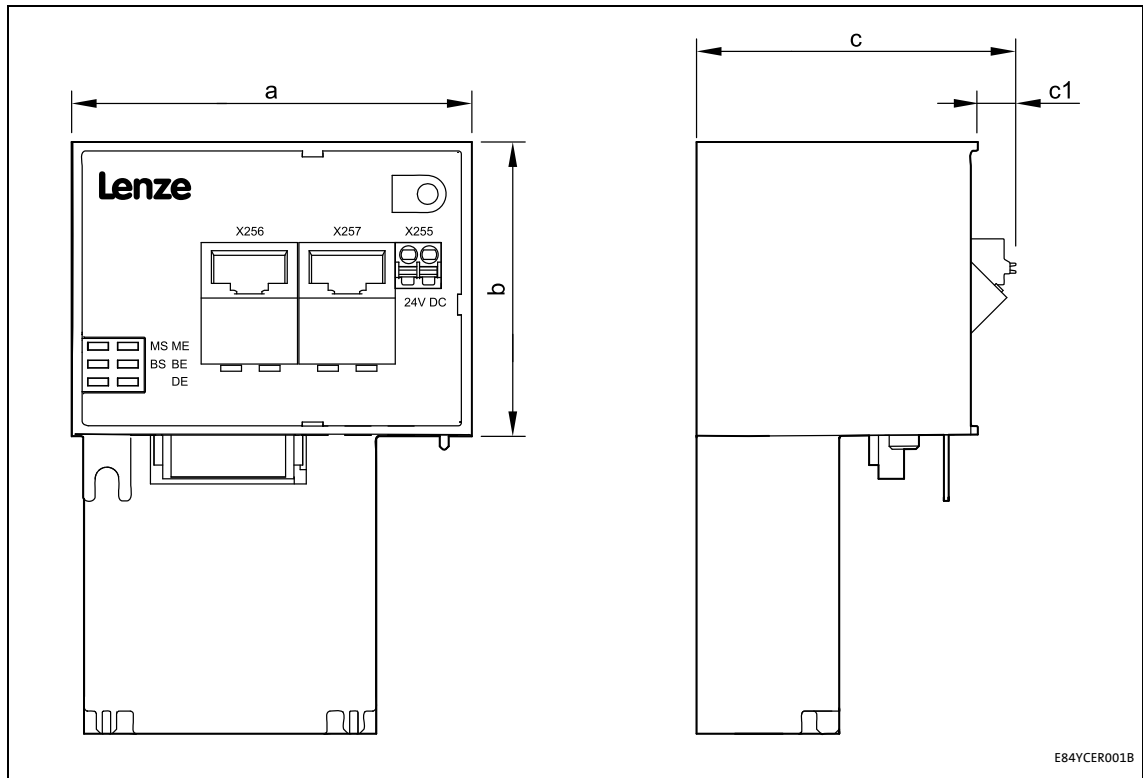
4.6 Dimensions

[4-2]   Dimensions

Type	Dimensions [mm]			
	a	b	c	c1
E84AYCER	67	50	57	8

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5   Installation

> **Stop!**
>
> **Electrostatic discharge**
>
> Electronic components within the communication module can be damaged or destroyed by electrostatic discharge.
>
> **Possible consequences:**
> - The communication module is defective.
> - Fieldbus communication is not possible or faulty.
>
> **Protective measures**
> - Before touching the module, be sure that you are free of electrostatic charge.

_ _

5.1 Mechanical installation

The communication module can be plugged in or unplugged from the MCI slot when the inverter is switched on. When the module is plugged in, it is detected automatically, and a function and version plausibility check is executed.

5.1.1 Mounting for standard devices of 0.25 kW and 0.37 kW
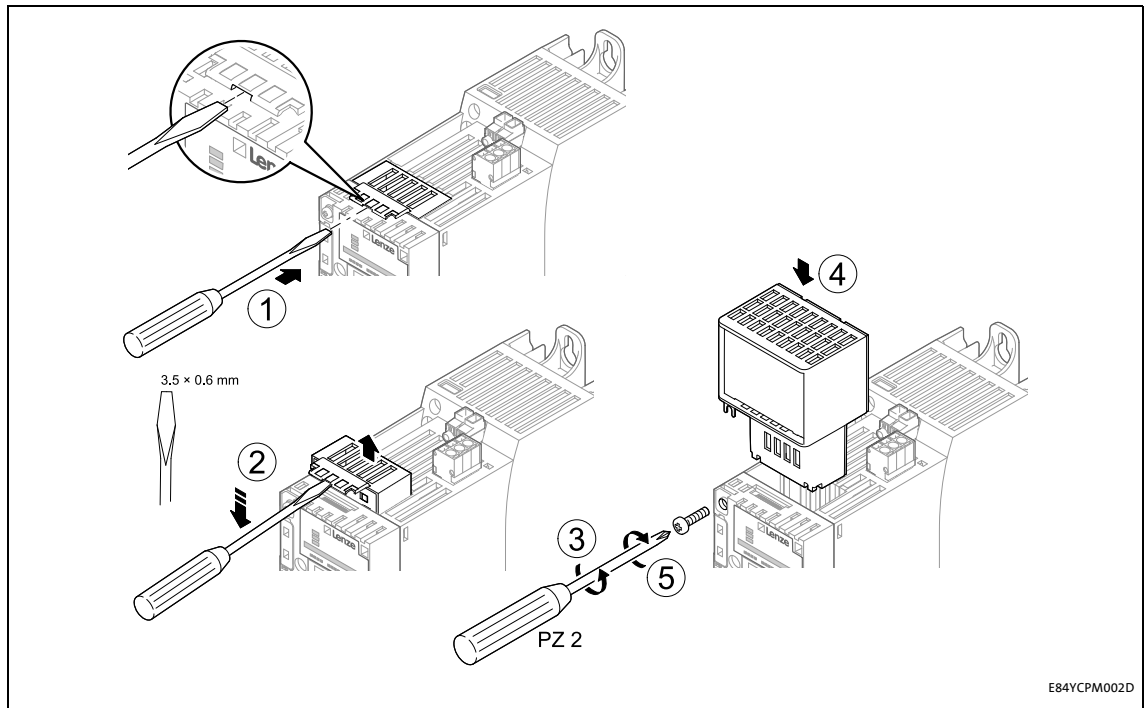
[5-1] Mounting for standard devices of 0.25 kW and 0.37 kW

Mounting steps

1. Use a screwdriver to lever out the cover of the MCI slot of the standard device and remove it (1, 2).

2. Loosen the securing screw for the communication module at the standard device (3).

3. Insert the communication module into the MCI slot of the standard device (4).

4. Tighten the securing screw again (5).

_ _

5.1.2 Mounting for standard devices of 0.55 kW or more

[5-2]   Mounting for standard devices of 0.55 kW or more

Mounting steps

1. Slightly press on the marked spot on the top of the MCI slot cover of the standard device (1).

2. Tilt the cover forward and remove it from the standard device (2).

3. Loosen the securing screw for the communication module at the standard device (3).

4. Insert the communication module into the MCI slot of the standard device (4).

5. Tighten the securing screw again (5).

_ _

5.1.3 Exchanging the communication module

[5-3]   Exchanging the communication module

Mounting steps

1. Loosen the securing screw for the communication module at the standard device (1).

2. Pull the communication module out of the MCI slot of the standard device (2).

3. Insert the new communication module into the MCI slot of the standard device (3).

4. Tighten the securing screw again (4).

_ _

5.2 Electrical installation

🖐 **Documentation for the standard device, control system, system/machine**
Observe the notes and wiring instructions contained in this documentation.

5.2.1 Wiring according to EMC guidelines

In typical systems, standard shielding is sufficient for Ethernet cables.

However, in environments with a very high level of interference, EMC resistance can be improved by additionally earthing the cable shield on both sides.

For this observe the following notes:

1. Remove the plastic sheath of the cable at a length of 2 cm.

2. Fasten the cable shield to the shield support of the standard device.

5.2.2 Network topology

It is typical of PROFINET to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

▸ Internal switch latency (📖 20)

The combination of a line and a stub is useful for system wiring.

PROFINET supports the following topologies:

• Switch / star

E94YCER005
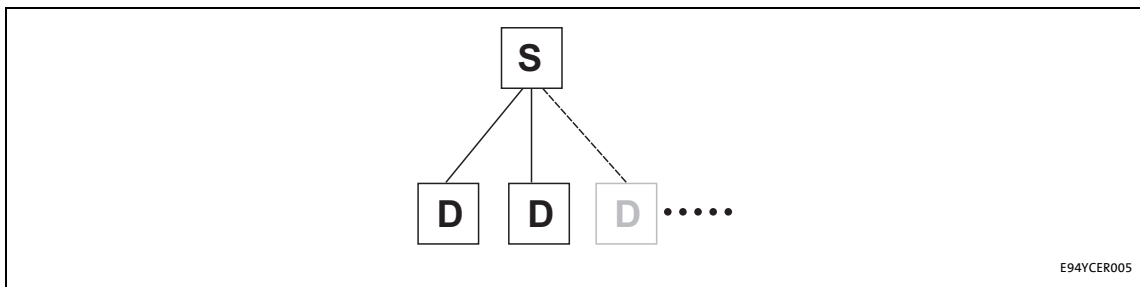
[5-4]   Switch / star topology (S = switch, D = I/O device)

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• Tree via switches
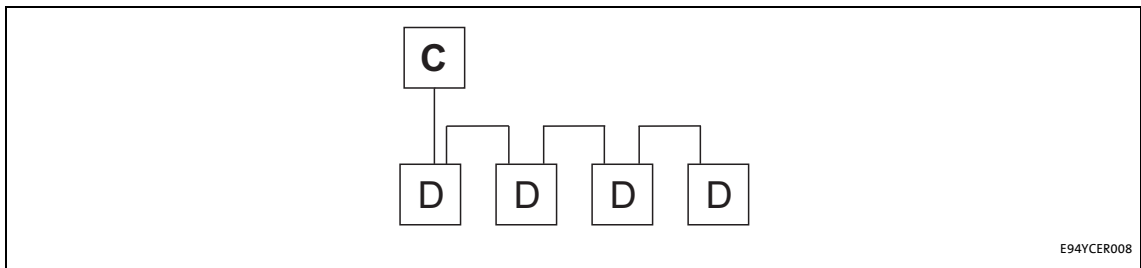

E94YCER006

[5-5]   Tree topology (C =I/O controller, S = switch)

• Switch / switch

E94YCER007
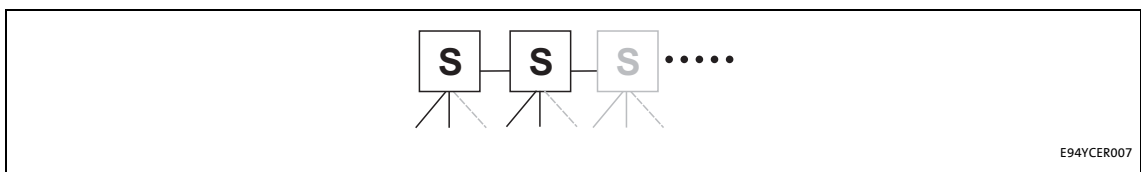
[5-6]   Switch/switch topology (S = switch)
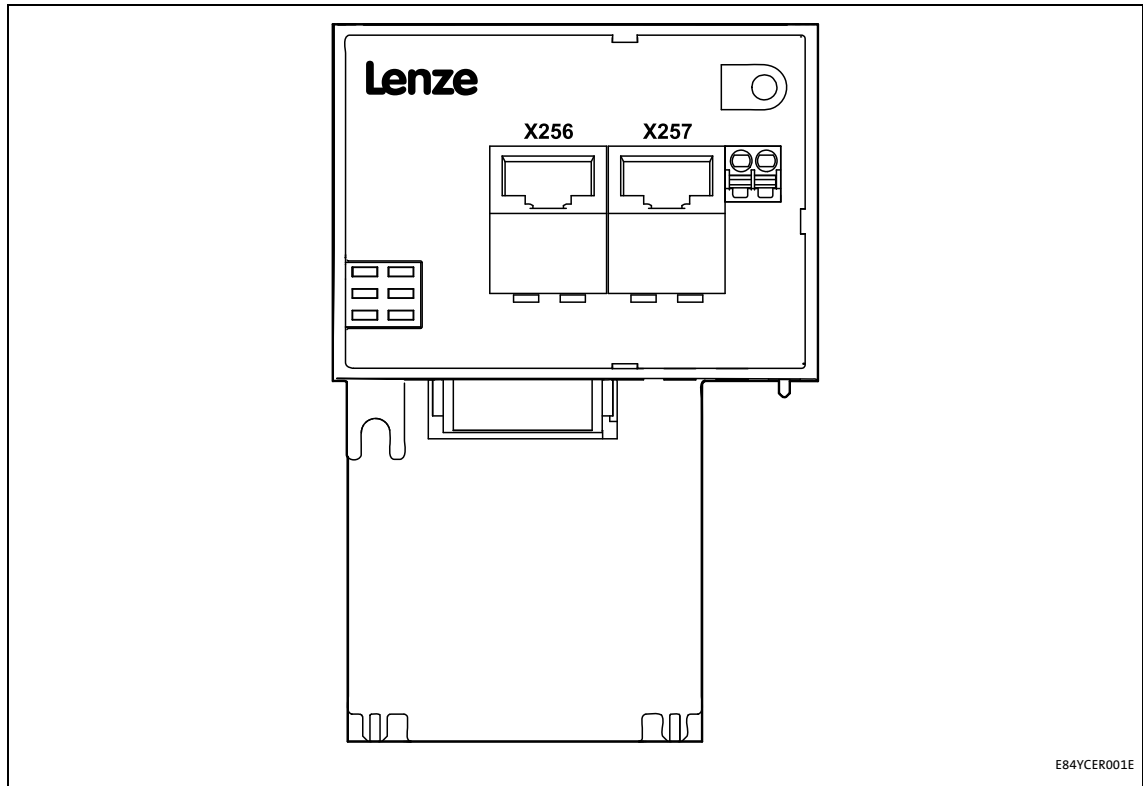
• I/O controller / I/O device

E94YCER008

[5-7]   Line topology (C = I/O controller, D = I/O device)

Installation

Electrical installation

- -

5.2.3   PROFINET connection

PROFINET is connected via the RJ45 sockets **X256** (IN) and **X257** (OUT).

[5-8]   PROFINET connections X256 (IN) and X257 (OUT)

For connection of the communication module to the PROFINET fieldbus, a standard Ethernet patch cable is suitable.

▸ Ethernet cable specification (🕮 30)

The installation and removal of the Ethernet cables is optimised for the use of connectors in accordance with the "Automation Initiative of German Domestic Automobile Manufacturers" (AIDA).
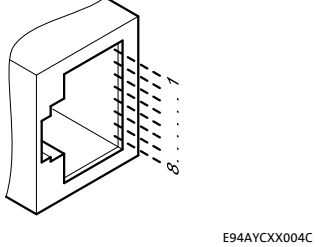
🛈 Note!

To prevent the RJ45 socket from being damaged, insert or remove the Ethernet cable connector straight (at a right angle) into or from the socket.

Pin assignment of the RJ45 sockets

RJ45 socket	Pin	Signal
E94AYCXX004C	1	Tx +
	2	Tx -
	3	Rx +
	4	-
	5	-
	6	Rx -
	7	-
	8	-

Tip!

The PROFINET interfaces feature an auto-MDIX function. This function adjusts the polarity of the RJ45 interfaces so that a connection can be established irrespective of the polarity of the opposite PROFINET interface and irrespective of the type of cable used (standard patch cable or crossover cable).

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5.2.4 Ethernet cable specification

> ### 🛈 Note!
>
> Only use cables that meet the listed specifications.

Ethernet cable specification	
Ethernet standard	Standard Ethernet (in accordance with IEEE 802.3), 100Base-TX (Fast Ethernet)
Cable type	S/FTP (Screened Foiled Twisted Pair), ISO/IEC 11801 or EN 50173, CAT 5e
Damping	23.2 dB (for 100 MHz and 100 m each)
Crosstalk damping	24 dB (at 100 MHz and per 100 m)
Return loss	10 dB (per 100 m)
Surge impedance	100 Ω

Structure of the Ethernet cable
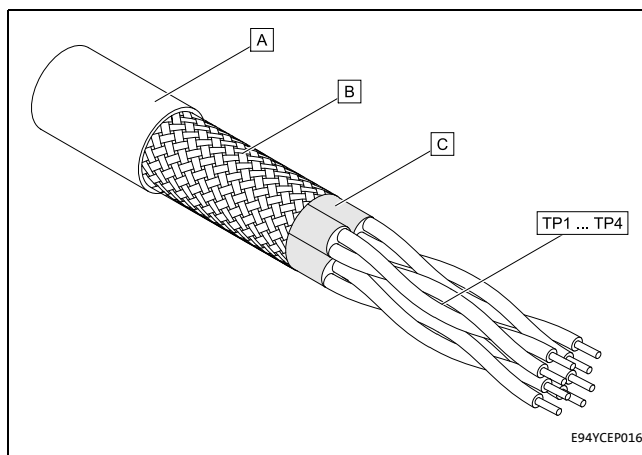
A Cable insulation

B Braid

C Foil shielding

TP1 ... TP4 Twisted core pairs 1 ... 4
▸ Colour code of the Ethernet cable (📖 31)

[5-9]   Structure of the Ethernet cable (S/FTP, CAT 5e)

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Colour code of the Ethernet cable

> ## ℹ Note!
>
> Wiring and colour code are standardised in EIA/TIA 568A/568B.
>
> In accordance with the industrial standard, the use of 4-pin Ethernet cables is permissible. The cable type only connects the assigned pins 1, 2, 3 and 6 to one another.
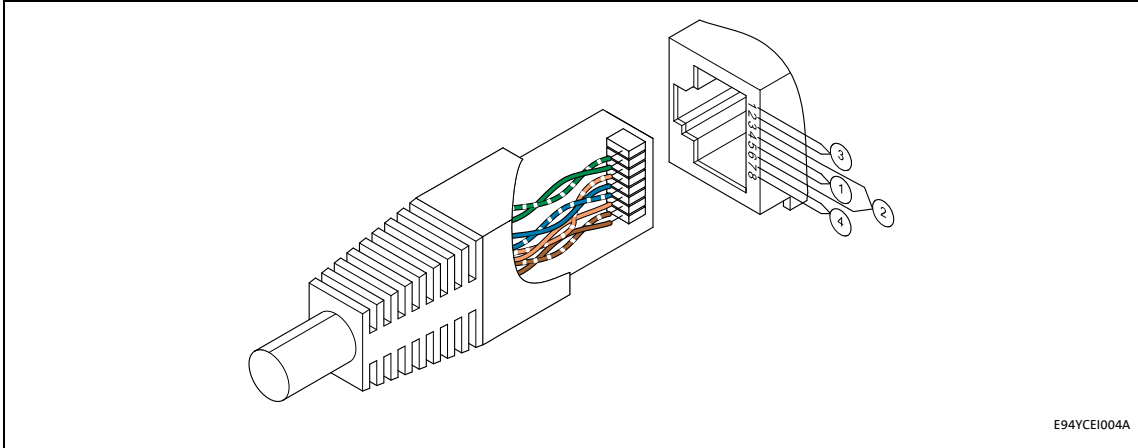
E94YCEI004A

[5-10]   Ethernet plug in accordance with EIA/TIA 568A/568B

Pair	Pin	Signal	EIA/TIA 568A	EIA/TIA 568B
3	1	Tx +	White / Green	White / Orange
	2	Tx -	green	orange
2	3	Rx +	White / Orange	White / Green
1	4		blue	blue
	5		White / Blue	Blue / White
2	6	Rx -	orange	green
4	7		White / Brown	White / Brown
	8		brown	brown

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5.2.5 External voltage supply

The communication module can be externally supplied with voltage via separate supply cables at the 2-pin plug connector **X255**.

> ### ⓘ Note!
>
> Always use a separate power supply unit safely separated according to EN 61800-5-1 ("SELV/PELV") in every control cabinet for external voltage supply.

- External voltage supply of the communication module is required if the communication via the bus should be maintained when the supply of the standard device fails.
- Access to parameters of a standard device disconnected from the mains is not possible.

Wiring of the X255 plug connector

> ### 🛑 Stop!
>
> Only wire the plug connector if the standard device is disconnected from the mains.

E84AYCXX010
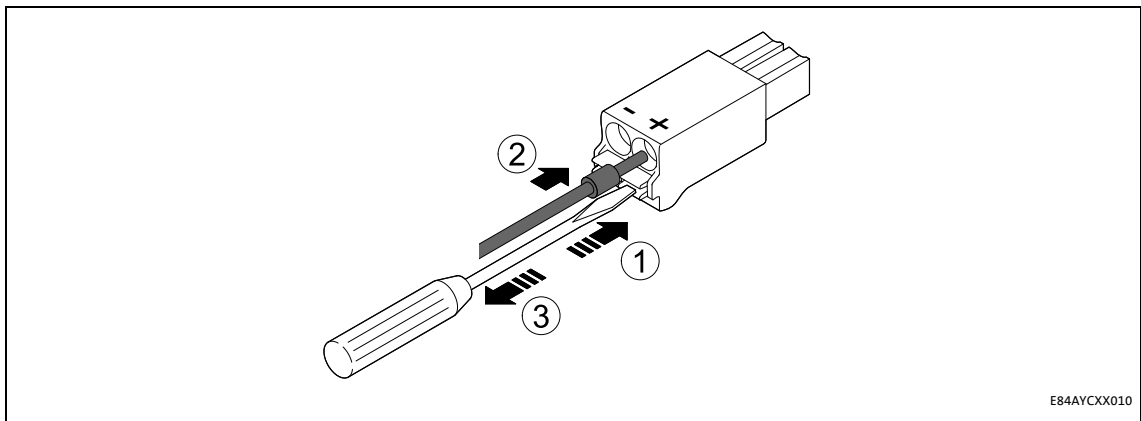
[5-11]   Wiring of the 2-pin plug connector with spring connection

How to wire the plug connector with spring connection:

1. Press a screwdriver into the notch below the terminal and keep it pressed.
2. Place the supply cable in the terminal.
3. Remove the screwdriver from the notch.

‒ ‒
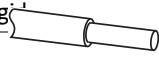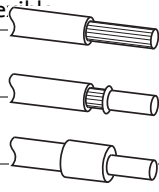
Assignment of the X255 plug connector

Name	Description
+	U = 24 V DC (20.4 V - 0 % ... 28.8 V + 0 %) I = 140 mA
-	Reference potential for the external voltage supply

Terminal data

Range	Values	
Electrical connection	2-pin plug connector with spring connection	
Possible connections	Rigid	
		0.2 ... 1.5 mm² (AWG 24 ... 16)
	Flexible	
		Without wire end ferrule 0.2 ... 1.5 mm² (AWG 24 ... 16)
		With wire end ferrule, without plastic sleeve 0.2 ... 1.5 mm² (AWG 24 ... 16)
		With wire end ferrule, with plastic sleeve 0.2 ... 1.5 mm² (AWG 24 ... 16)
Stripping length	10 mm	

_ _

6 Commissioning

During commissioning, system-related data such as motor parameters, operating parameters, responses, and parameters for fieldbus communication are defined for the inverter. For Lenze devices, this is done via the codes.

The codes of the inverter and communication are saved non-volatilely as a data set in the memory module.

In addition, there are codes for diagnosing and monitoring the stations.

▸ Parameter reference (🕮 85)

6.1 Before initial switch-on

> 🛑 **Stop!**
>
> Before switching on the standard device together with the communication module, check the entire wiring for completeness, short-circuit, and earth fault.

_____

6.2 Configuring the PROFINET IO controller

To enable communication with the inverter, you have to configure the IO controller first.

Configuration for device control

For the configuration of PROFINET, the current PROFINET device description file (XML) of the E84AYCER communication module (PROFINET) has to be imported in the IO controller.

You can find the **GSDML-Vx.z-Lenze-8400PNabb-yyyymmdd.xml** device description file in the Download area at:

www.Lenze.com

Wildcards in the "GSDML-Vx.z-Lenze-8400PN100-yyyymmdd.xml" file name	
x	Main version of the GSDML scheme used
z	Subversion of the GSDML scheme used
a	Major version of the software version
bb	Minor version of the software version
yyyy	Year
mm	Month
dd	Day

Defining the user data length

The user data length is defined during the initialisation phase of the I/O controller.

The Inverter Drives 8400 support the configuration of max. 16 process data words (max. 32 bytes).

Description of the device data base file

Selection text	Parameter data (with consistency)	Process data (with consistency)	Assigned I/O memory
PCD (**n**W) AR cons.	-	**n** words	**n** words
n = 1 … 16 process data words			

Example of selecting the device data base file

- "PCD (8W) AR cons." = 8 process data words (only in slot 1 of the PROFINET telegram)

🔆 **Tip!**

A detailed description of consistency is given in the chapter "Consistent parameter data" (📖 70).

_ _

6.3 Setting the station name

> **ℹ Note!**
>
> - The "Node blinking test" PROFINET function by means of which an accessible device can be identified is supported. During execution of the function, the red LED **ME** (Module status displays (📖 74)) blinks.
> - Operation on the PROFINET requires a valid station name.
> - In the case of impermissible settings, the red **BE** (Fieldbus status displays (📖 75)) blinks and the error message PROFINET: Station name error [0x01bc6532] (📖 83) is output. The communication module then continues to work internally with the name deleted.
> - If the station name is assigned by the IO controller via PROFINET or the PROFINET configurator of the »Engineer«, changes will be effective immediately.

The station name currently used is shown in code C13864.

The station name …

- is required for unambiguous addressing of the Inverter Drive 8400 by the I/O controller.

- can either be assigned by the I/O controller via PROFINET or set manually in the »Engineer«.

- has to be allocated in accordance with the PROFINET specification:
  - 1 or several labels separated by ".".
  - Max. length per label: 63 characters
  - Max. total length: 240 characters
  - Permissible characters: [a … z], [0 … 9], [.], [-]
  - Labels must not begin or end with [-].

- Prohibited syntax:
  - "n.n.n.n" (n = 0 … 999)
  - "port-xyz" (x, y, z = 0 … 9)
  - "port-xyz-abcde" (a, b, c, d, e, x, y, z = 0 … 9)

Commissioning

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In the »Engineer« the station name is set under the **Settings** tab.
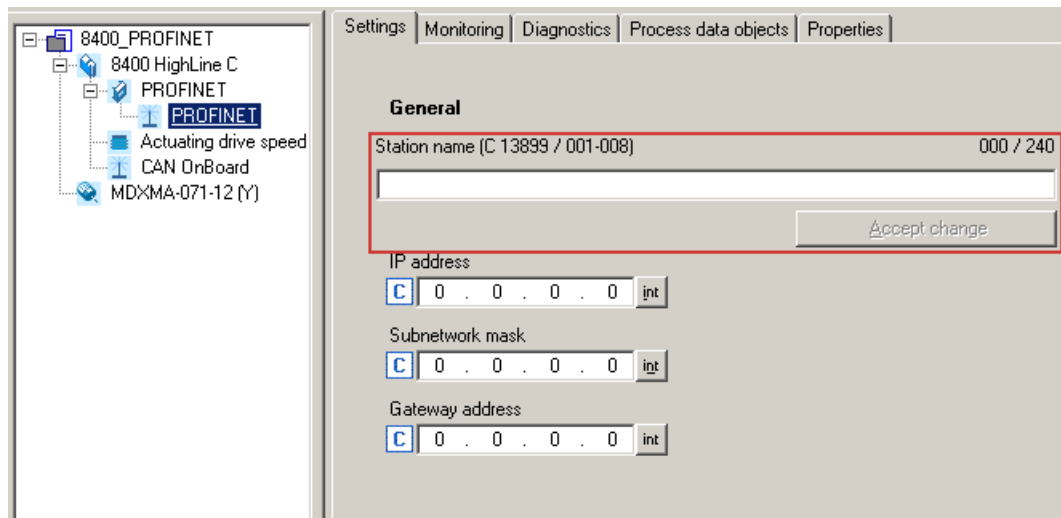
- Then click **Accept change**. The station name is saved and written to code C13899.
- In the Lenze setting a deleted name is displayed. The name is also deleted if the "Reset to factory defaults" command is executed by an IO supervisor or an I/O controller.

How to activate changed settings in the »Engineer«:

1. Execute device command **C00002 = "11: Save all parameter sets"**.

2. Carry out a "reset node" of the node, or switch the voltage supply of the communication module off and on again

_ _

6.4 Setting the IP configuration

The IP configuration is required for addressing the Inverter Drive 8400 if communication between the PC/»Engineer« or the IO controller and the inverter is to be established via PROFINET. This requires the allocation of an IP address, subnet mask, and gateway address.

If no PROFINET network or IO controller is available yet, you can allocate the IP address, subnet mask, and gateway address for the communication module by using the following options:

- Settings via the PROFINET configurator of the »Engineer« (📖 40)
- Setting via codes in the »Engineer« (📖 42)

> **ℹ️ Note!**
>
> - If the IP parameters are assigned by the IO controller via PROFINET or the PROFINET configurator of the »Engineer«, changes become effective immediately and are saved with mains failure protection.
> - The assignment of invalid combinations of IP address, subnet mask, and gateway address can have the consequence that no connection to the PROFINET can be established.
> - In the case of impermissible settings, the red LED **BE** (Fieldbus status displays (📖 75)) blinks and the error message PROFINET: IP address error [0x01bc6533] (📖 84) is output.

6.4.1 Settings via the PROFINET configurator of the »Engineer«

> ### ℹ️ Note!
>
> - The IP address must only be allocated manually in the »Engineer« if the PROFINET network is not actuated on the IO controller yet (IP address was not allocated by the IO controller yet).
> - During the IP parameters are set in the »Engineer«, PROFINET communication with the IO controller must not take place at the same time.
> - Changes will be effective immediately and are saved with mains failure protection.
> - The parameter values currently used are shown in codes C13010 (IP address), C13011 (subnet mask), and C13012 (gateway address).

⌨🖱 **How to set the IP parameters via the PROFINET configurator:**

1. Execute the menu command **Online → Profinet configurator addresses…**.
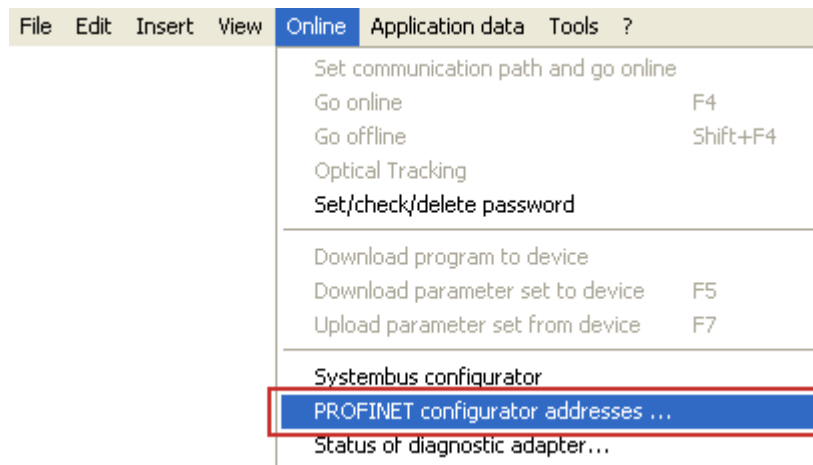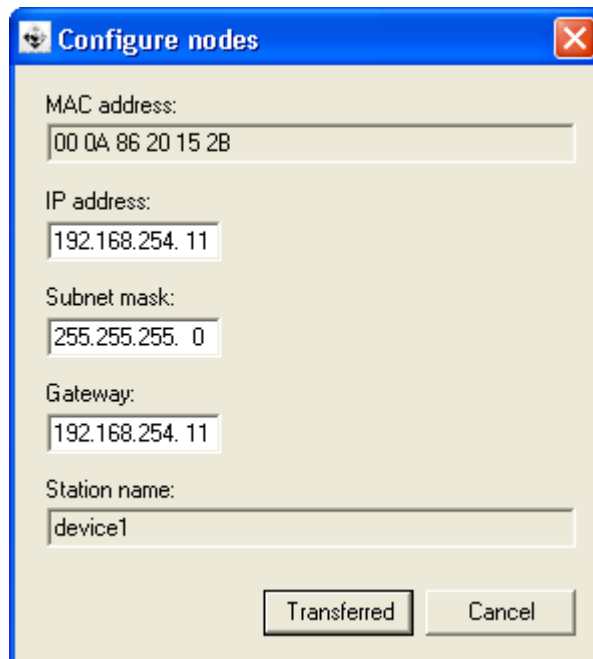
The **Assign IP addresses** dialog window is opened, and all Lenze PROFINET devices connected are listed.

_ _
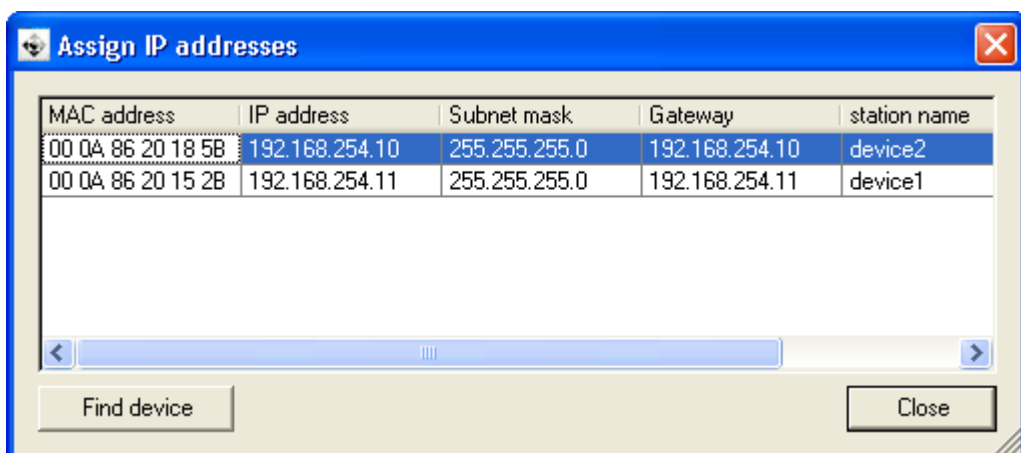
2. By double-clicking on the individual IP parameters, you can set the IP configuration for each PROFINET node in the **Configure nodes** dialog window.

Configure nodes
MAC address:
00 0A 86 20 15 2B
IP address:
192.168.254. 11
Subnet mask:
255.255.255. 0
Gateway:
192.168.254. 11
Station name:
device1
[Transferred]   [Cancel]

3. Click **Transferred**.
   - The IP configuration is transferred to the corresponding PROFINET node.
   - Changes in the IP parameters will become effective immediately.
   - The IP parameters are written to codes C13000 (IP address), C13001 (subnet mask) and C13002 (gateway address) of the communication module.

   -☼- **Tip!**

   By clicking the **Find device** button in the **Assign IP addresses** dialog window (see step 1), you can check whether the configuration was transferred successfully.

   With device command **C00002 = "11: Save all parameter sets",** the current IP configuration is saved non-volatilely in the memory module.

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6.4.2   Setting via codes in the »Engineer«

> **ℹ️ Note!**
>
> - The IP address must only be allocated manually in the »Engineer« if the PROFINET net-work is not operated on the IO controller yet (IP address has not been allocated by the IO controller yet).
> - While setting the IP parameters in the »Engineer«, PROFINET communication with the IO controller must not take place at the same time.
> - The parameter values currently used are shown in codes C13010 (IP address), C13011 (subnet mask), and C13012 (gateway address).

In the »Engineer« under the **Settings** tab you can set the IP parameters manually via code.
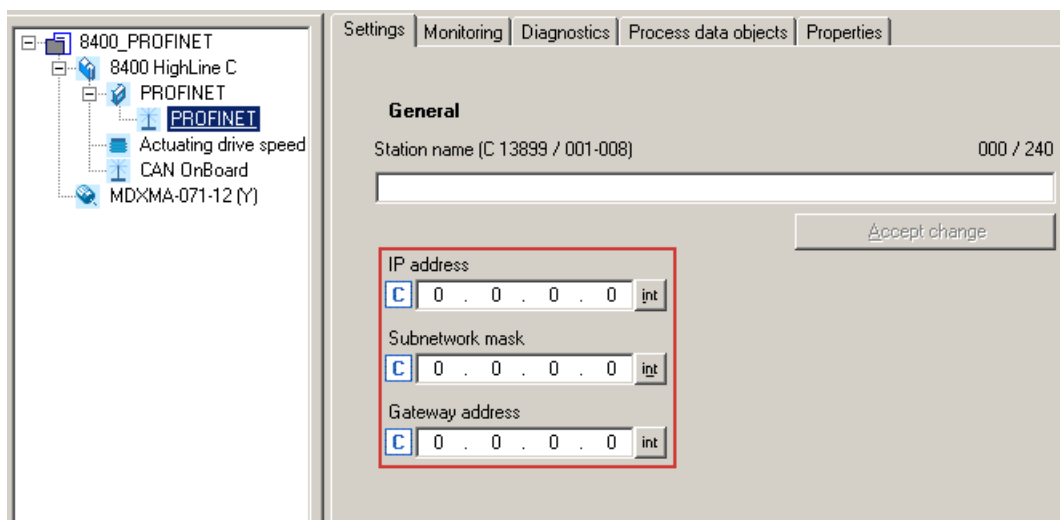
The IP parameters are written to codes C13000 (IP address), C13001 (subnet mask), and C13002 (gateway address).

⌨️🖱️ **How to activate changed settings in the »Engineer«:**

1. Execute the device command **C00002 = "11: Save start parameters"**.

2. Carry out a "reset node" of the node, <u>or</u> switch the voltage supply of the communication module off and on again

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Decimal representation of the IP parameters

By clicking the **[int]** buttons on the right next to the input fields, the IP parameters are represented as decimal values.

In the case of the decimal representation, the byte sequence is inverted.

Example: IP address 192.168.0.1

- C13000 = 16820416 [$00000001.00000000.10101000.11000000_{bin}$]

Byte 3	Byte 2	Byte 1	Byte 0
1	0	168	192
0 0 0 0 0 0 0 1	0 0 0 0 0 0 0 0	1 0 1 0 1 0 0 0	1 1 0 0 0 0 0 0
C13010/4	C13010/3	C13010/2	C13010/1

IP address

- Valid IP addresses are defined in accordance with RFC 3330.
- The IP address is set/changed in C13000.
- In C13010/1…4 the IP address currently used is shown.

Example: Display of the IP address 192.168.0.1			
Code	C13010/1	C13010/2	C13010/3	C13010/4
Value	192	168	0	1

Subnet Mask

- The subnet mask indicates which part of the IP address is evaluated as net ID or host ID.
- Valid subnet masks are defined in accordance with RFC 1878
- The subnet mask is set/changed in C13001.
- In C13011/1…4 the subnet mask currently used is shown.

Example: Display of the subnet mask 255.255.255.0			
Code	C13011/1	C13011/2	C13011/3	C13011/4
Value	255	255	255	0

Gateway address

- The gateway address is valid if the network address of the IP address and the gateway address are identical.
- If the gateway address and the IP address are identical, gateway functionality is not used.
- DHCP is not supported.
- The gateway address is set/changed in C13002.
- In C13012/1…4 the gateway address currently used is shown.

Example: Display of the gateway address 192.168.0.1			
Code	C13012/1	C13012/2	C13012/3	C13012/4
Value	192	168	0	1

_ _

6.5   Establishing an online connection via PROFINET with the Lenze »Engineer«

This functionality is only supported **from software version V01.30.05**.

🛈	**Note!**

To ensure perfect operation of cyclic PROFINET communication, online access with the »Engineer« must be effected via a PROFINET switch.

The PROFINET switch integrated in the communication module can execute cyclic PRO-FINET communication prior to normal TCP/IP communication. In the case of PROFINET this is effected via the VLAN identification in the Ethernet frame.
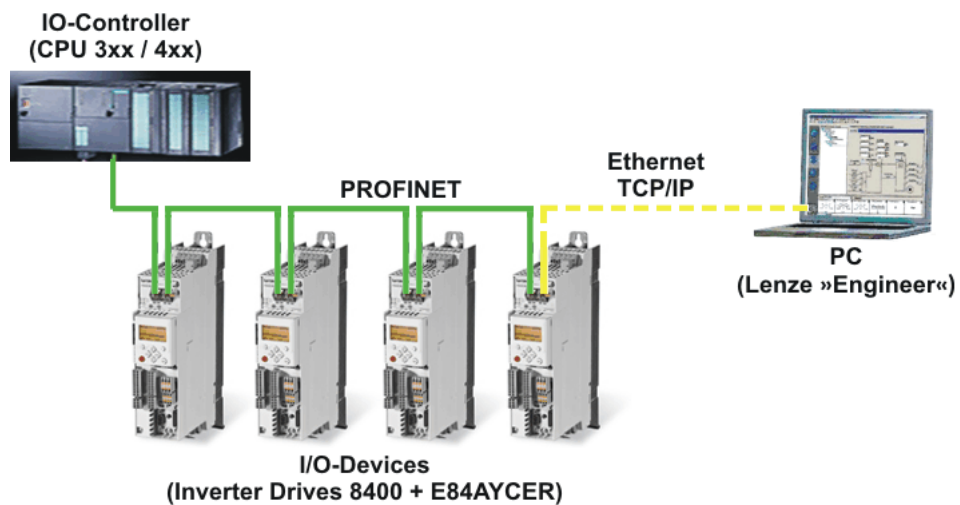
For an online connection between the »Engineer« and the inverter, the inverter must have an IP address (see Setting the IP configuration (🕮 39)).

Commissioning

Establishing an online connection via PROFINET with the Lenze »Engineer«

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In the »Engineer« via the menu command **Online → Set communication path and go online**, you can select the PROFINET communication path. The PROFINET nodes previously configured are shown in the *Communication path* dialog window:
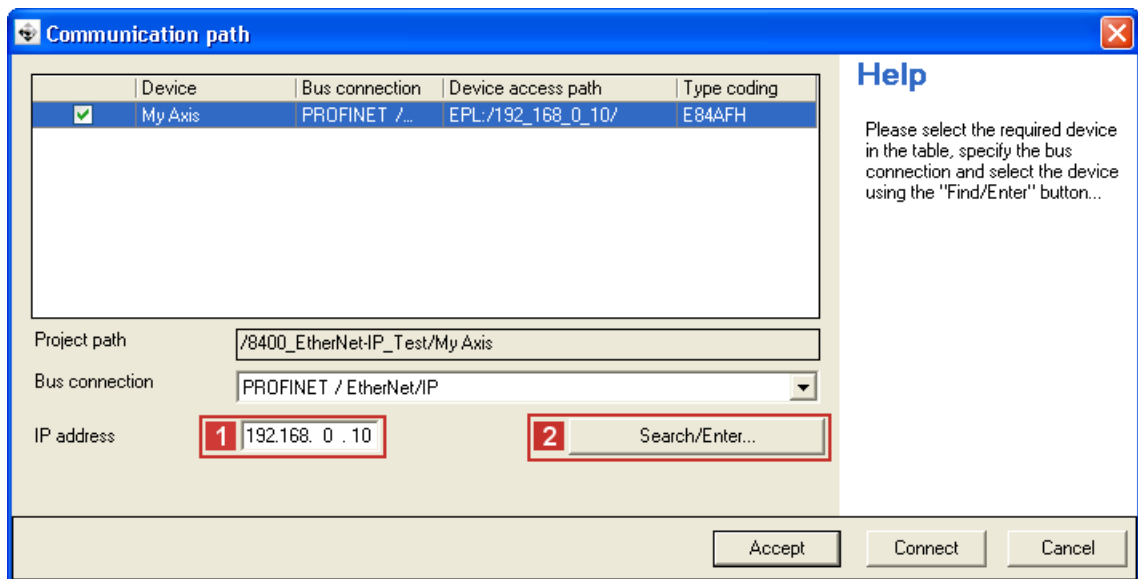
If the device access path is not configured correctly, the **1** IP address of the inverter selected in the display field can be entered manually here.

Via **2** **Search/Enter** you can establish a connection to devices which have not appeared in the display field. Corresponding settings for this can be made in the dialog window *Enter IP address*, which is shown:

Here you can enter an **3** **IP address** manually or execute the following actions using the buttons:

• Execute the console command **4** **Ping**.

• Assign the IP address via the **5** **Configurator**.
  ▶ Settings via the PROFINET configurator of the »Engineer« (🕮 40)

• Select the device access path to the desired inverter by clicking **6** **Find**.

After having established the online connection, you can continue work with the »Engineer« as usual.

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6.6 Initial switch-on

Documentation for the standard device

Observe the safety instructions and information on residual hazards.

Note!

Establishing communication

In order to establish communication via an externally supplied communication module, the standard device must be switched on as well.

For further communication of the externally supplied module it is not relevant whether the standard device is switched on or not.

Protection against uncontrolled restart

After a fault (e.g. short-term mains failure), it is sometimes undesirable or even impermissible for the drive to restart.

The restart protection is activated in the Lenze setting of the Inverter Drives 8400.

The restart behaviour of the inverter can be set via **C00142** ("auto-start option"):
- **C00142 = 9** (Lenze setting)
  - The inverter remains inhibited (even if the fault is no longer active).
  - Bit 0 (inhibit at power-on) and bit 3 (inhibit in the case of undervoltage) are set.
  - The drive restarts in a controlled mode through explicit controller enable: LOW-HIGH edge at digital input X4/RFR.
- **C00142 = 8** (Enabled)
  - In order to enable the device directly when switching it on, set bit 0 to zero (FALSE).
  - An uncontrolled restart of the drive is possible.

_____

7 Data transfer

PROFINET transmits parameter data, configuration data, diagnostic data, alarm messages, and process data between the host system (IO controller) and the inverters that are part of the fieldbus (I/O devices). As a function of their time-critical behaviour, the data are transmitted via corresponding communication channels.

Communication channels

- The process data channel transmits process data.
  - The process data serve to control the inverter.
  - The transmission of process data is time-critical.
  - Process data are transmitted cyclically between the I/O controller and the I/O devices that are part of the fieldbus according to the Provider/Consumer model (continuous exchange of current input and output data).
  - The I/O controller can directly access the process data. In the PLC, for instance, the data are directly assigned to the I/O area.
  - Inverter Drives 8400 allow for a maximum of 16 process data words (16 bits/word) to be exchanged for each direction.
  - Process data are not saved in the inverter.
  - Process data are e.g. setpoints, actual values, control words, and status words.

> ## Note!
>
> Please observe the direction of the flow of information!
> - Process input data (Rx data):
>   - Process data from the inverter (IO device) to the IO controller
> - Process output data (Tx data):
>   - Process data from the IO controller to the inverter (IO device)

- Parameter data are transmitted via the acyclic channel.
  - The transmission of parameter data is usually not time-critical.
  - The access to the parameter data depends on the PROFIdrive profile.
  - Examples of parameter data are operating parameters, motor data, and diagnostic information.
  - The acyclic channel provides access to all Lenze codes.
  - Parameter data changes must be saved via code **C00002** of the Inverter Drives 8400.

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8 Process data transfer

8.1 Access to process data / PDO mapping

Process data (MCI-PDOs) are transferred via the MCI interface.

- A maximum of 16 words are exchanged per direction.
- The process data are accessed via the port blocks **LP_MciIn** and **LP_MciOut**. The port blocks are also called process data channels.
- The port block **LP_MciIn** maps the received MCI-PDOs.
- The port block **LP_MciOut** maps the MCI-PDOs to be sent.
- The port/function block interconnection of the process data objects (PDO) takes place via the Lenze »Engineer«.
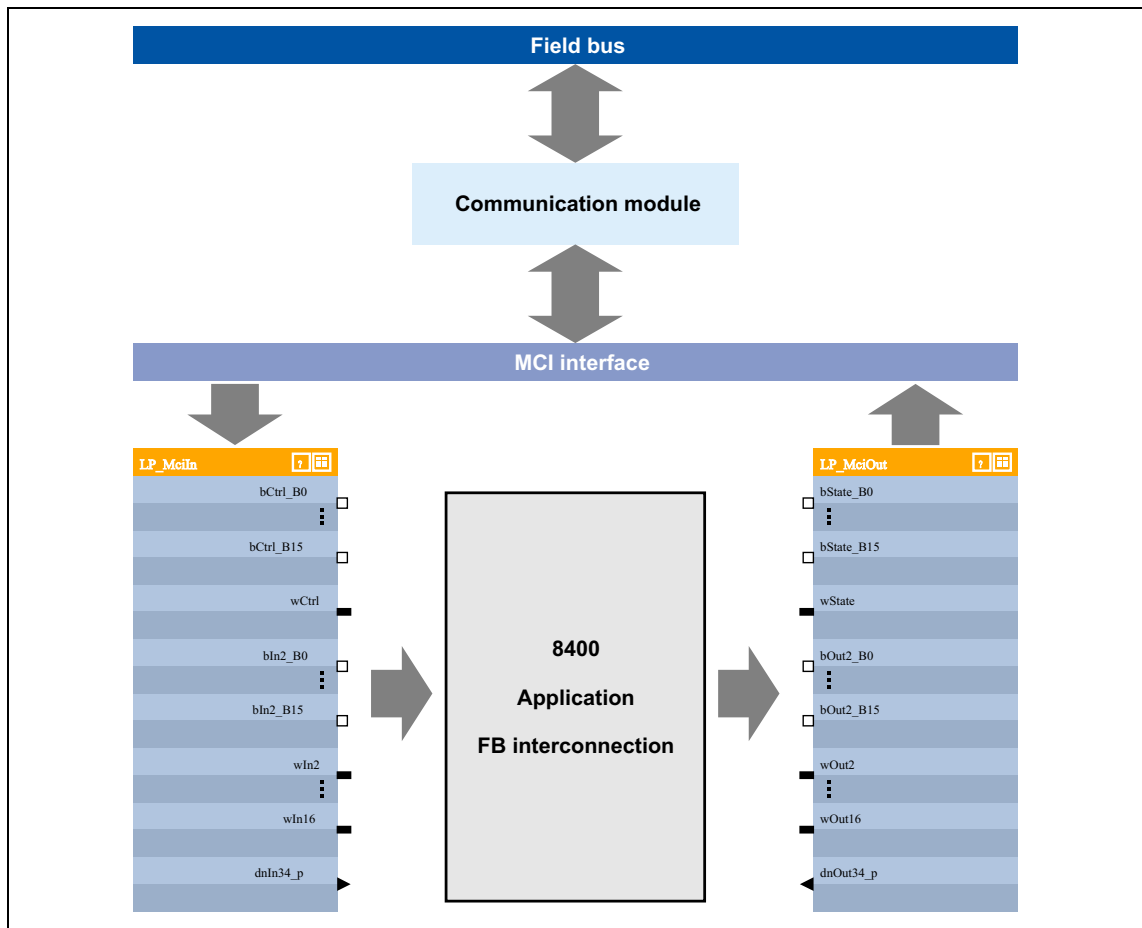
[8-1]   External and internal data transfer between the bus system, inverter, and application

> 🖐 **Software manual / »Engineer« online help for the Inverter Drive 8400**
>
> Here you will find detailed information on the port/function block interconnection in the »Engineer« and the port blocks.

Process data transfer

Preconfigured port interconnection of the process data objects (PDO)

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> **ℹ Note!**
>
> The »Engineer« screenshots shown on the following pages are only <u>examples</u> of the setting sequence and the resulting screens.
>
> The data in the display fields may differ from the ones of your project.

8.2 Preconfigured port interconnection of the process data objects (PDO)

The preconfigured port interconnection of the process data objects can be activated by setting standard device code **C00007 = "40: MCI"**.

The function block editor (FB Editor) serves to display the port blocks "LP_MciIn" and "LP_MciOut" with the preconfigured interconnections:
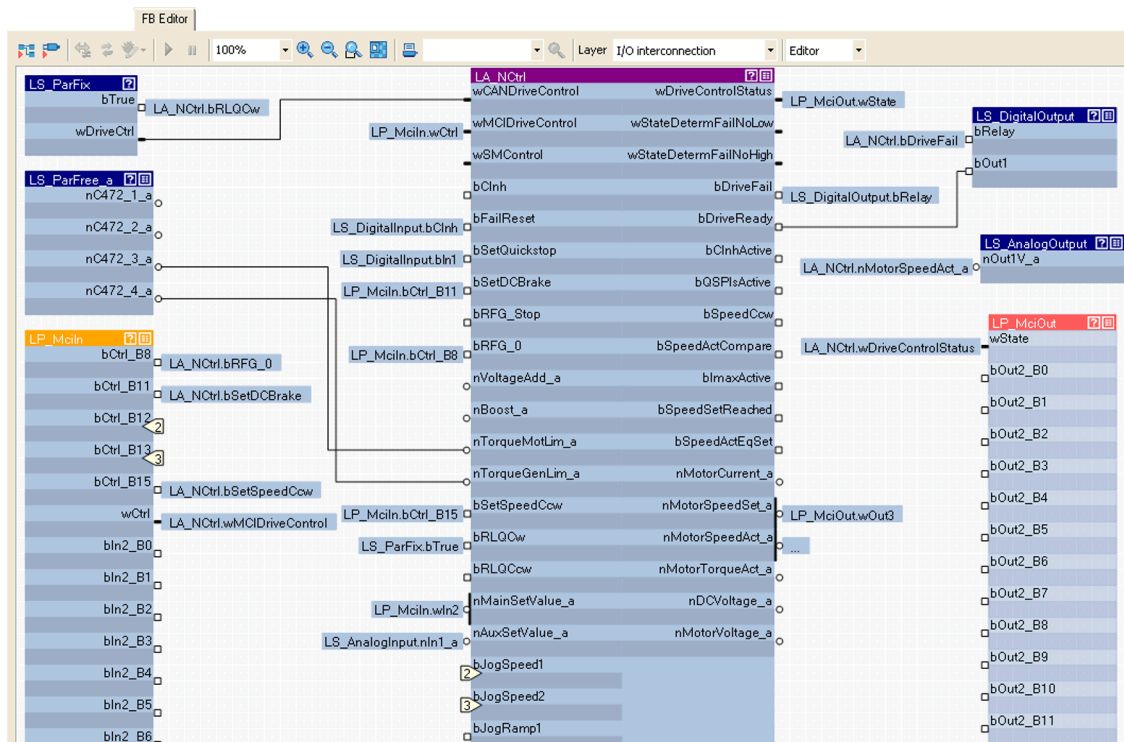
8.3 Freely configuring the port interconnection of the process data objects (PDO)

How to freely configure the port interconnection in the »Engineer«:

1. Go to the **Process data objects** tab and click **Go to application**.
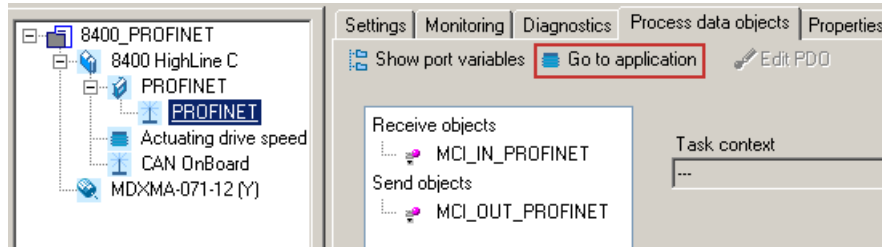
2. Go to the **Ports** tab, select the port blocks "MCI_IN" or "MCI_OUT" and click **Activate** to activate them.
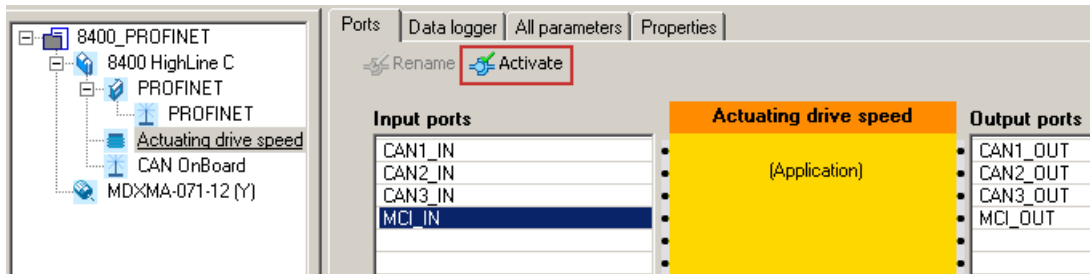
3. Click the **Change Variable ...** button.
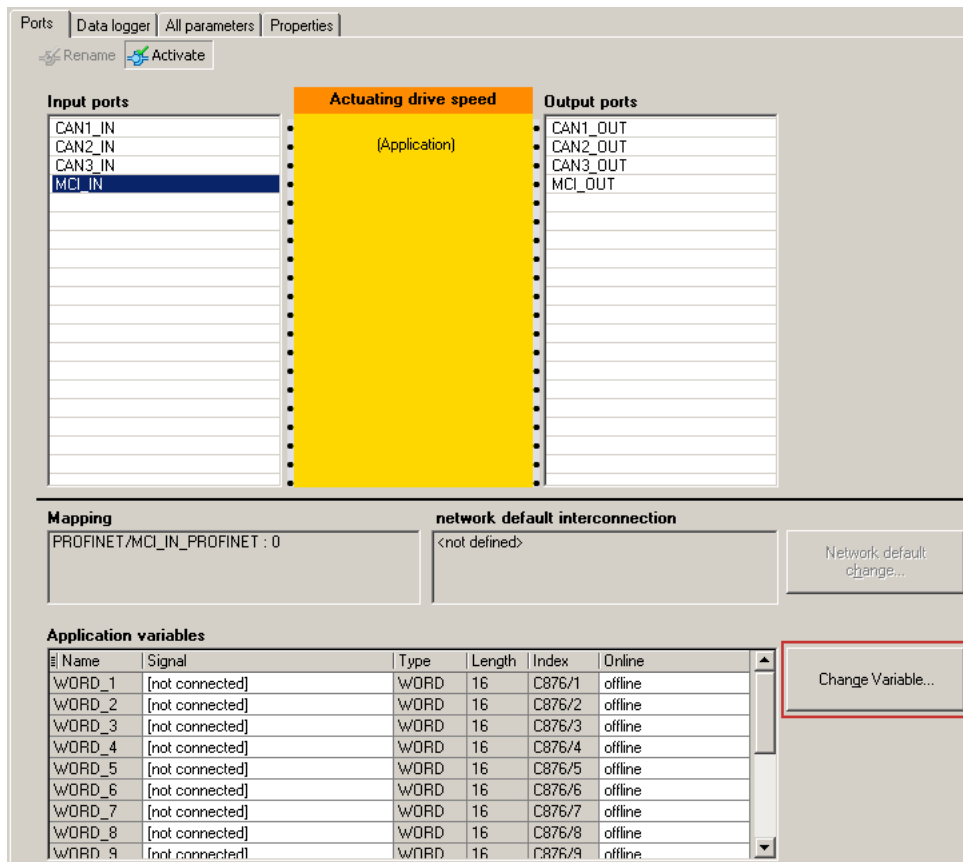
Process data transfer

Freely configuring the port interconnection of the process data objects (PDO)

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4. Via the [...] button, you can assign signals to the process data words in the _Assignment Signal --> Function Block_ dialog window.
   → Select the signals and then confirm the selection with **OK**.
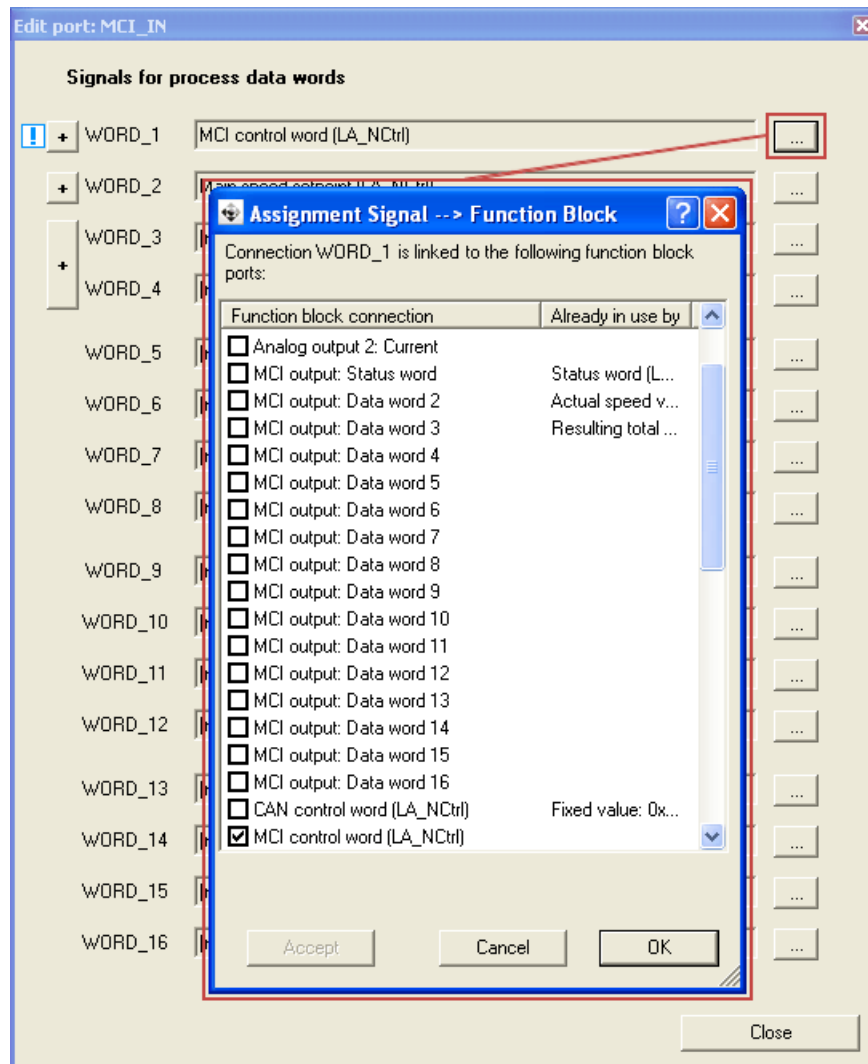
Process data transfer

Freely configuring the port interconnection of the process data objects (PDO)

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Moreover you can assign signals to the individual control and status bits at the WORD_1 and WORD_2 process data words via the ⊞ and ⊡ buttons.

➔ Select the signals and then click **OK**.
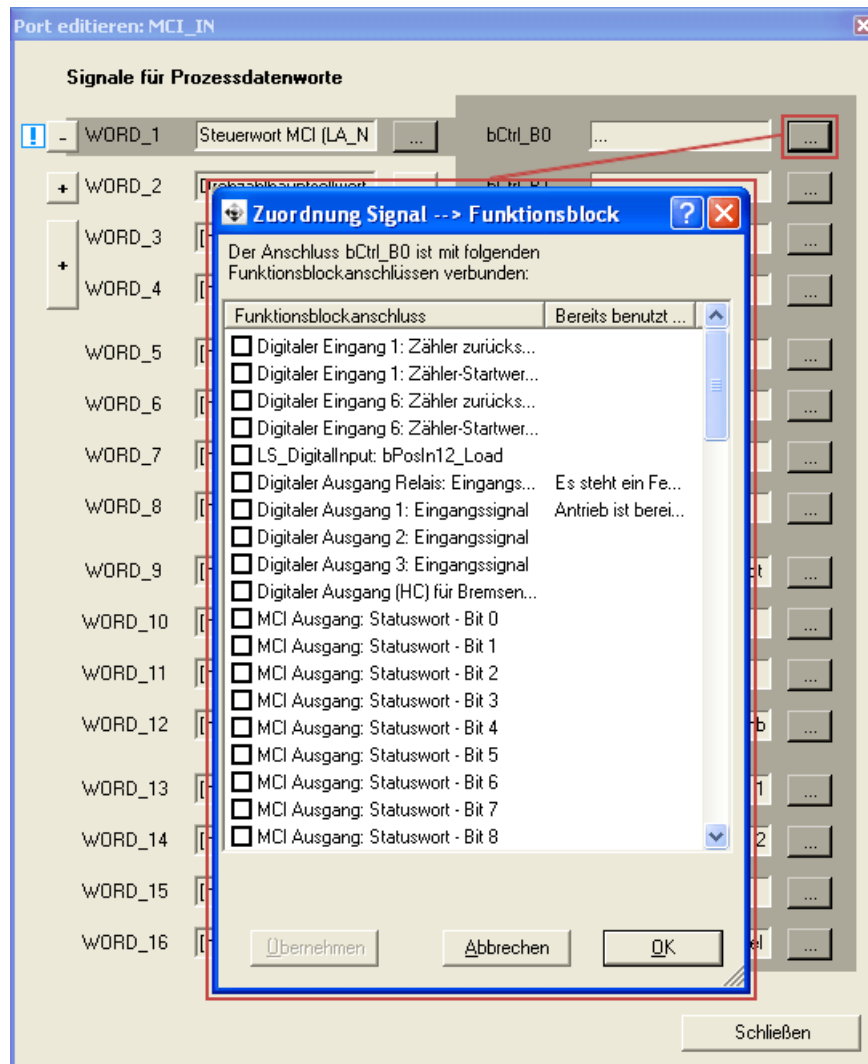
Process data transfer

Freely configuring the port interconnection of the process data objects (PDO)

💡 **Tip!**

When the port blocks "LP_MciIn" and "LP_MciOut" are activated (see 1.), they will be visible in the FB Editor. Here you can also assign signals to the process data words.

_____
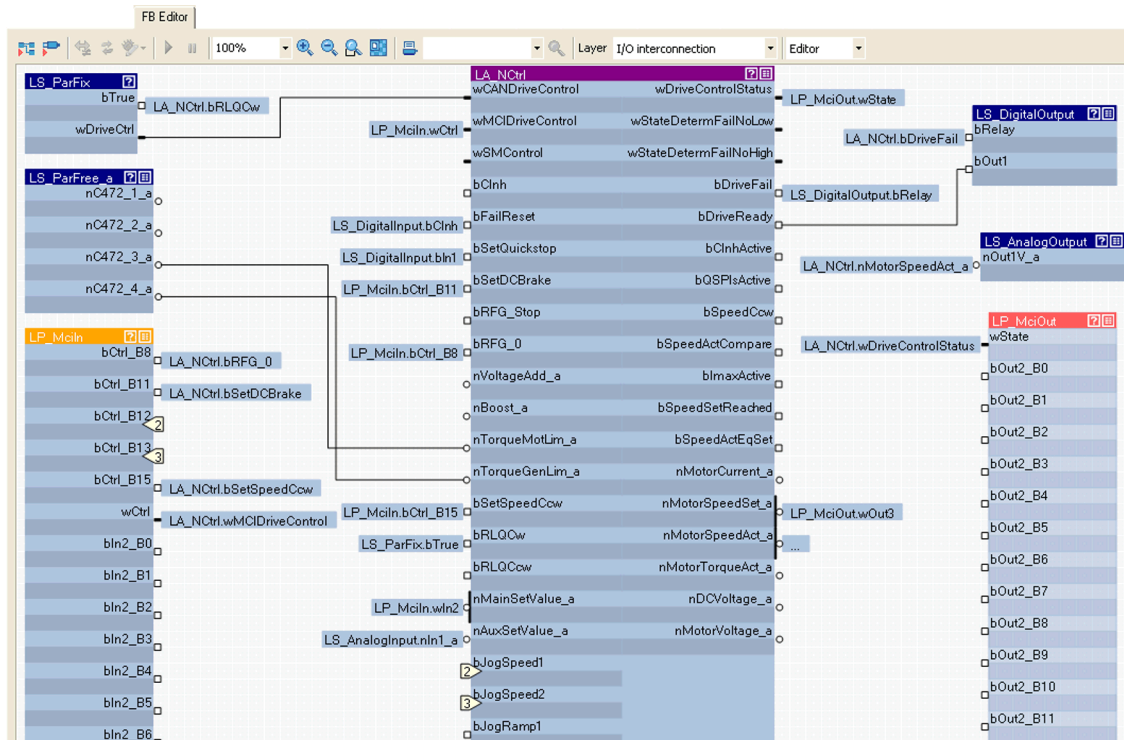
9 Parameter data transfer

9.1 The acyclic channel (PROFIdrive profile)

An optional service extension is the acyclic parameter data transfer.

Cyclic and acyclic PROFINET services can be operated simultaneously in the network.

Product features

- There is always only one parameter request in process (no pipelining).
- No spontaneous messages are transferred.
- There are only acyclic parameter requests.
- Profile-specific parameters can be read independently of the I/O device state.

9.1.1 Connection establishment of an I/O controller to an I/O device

An I/O controller can always be used to request parameters from an I/O device if the I/O device is in the "DATA_EXCHANGE" state.
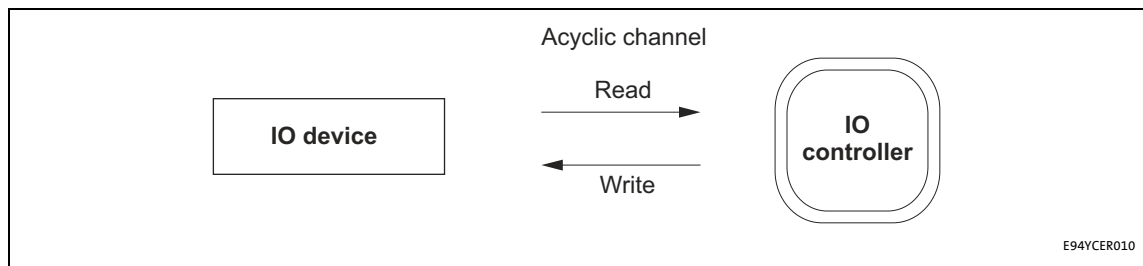
[9-1]   Data communication via the acyclic channel

Parameter data transfer

The acyclic channel (PROFIdrive profile)

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9.1.2   Acyclic data transmission process
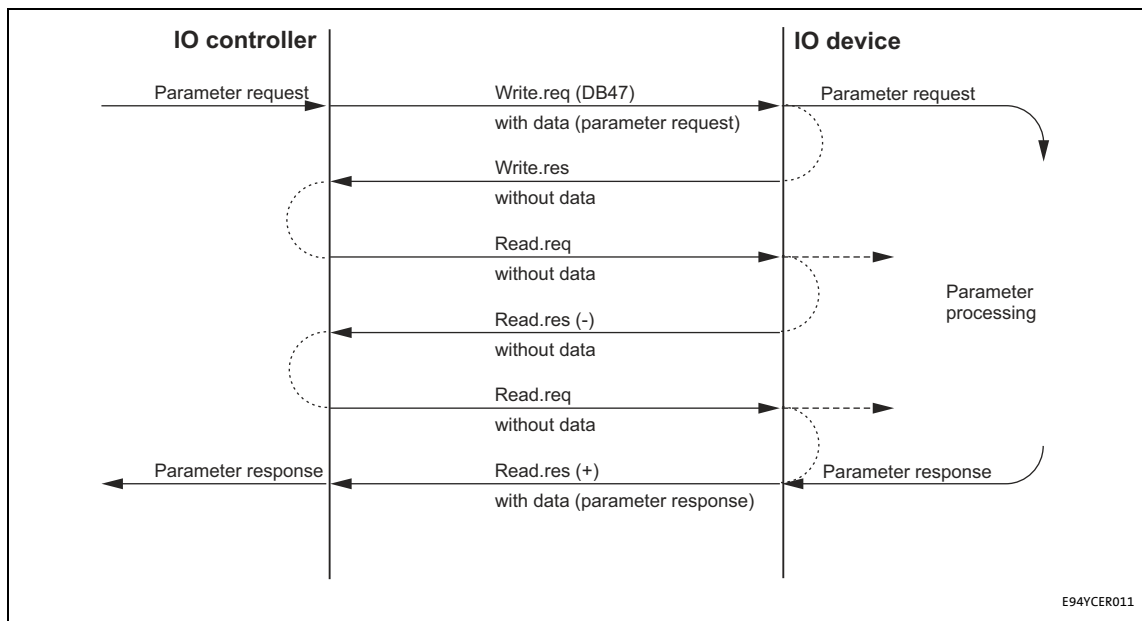
[9-2]   Data communication via the acyclic channel

- A "Write.req" is used to transmit the data set (DB47) in the form of a parameter request to the I/O device.
- "Write.res" confirms the receipt of the message by the I/O controller.
- The I/O controller requests the response of the I/O device with "Read.req".
- The I/O device responds with a "Read.res (-)" if processing is not yet completed.
- After parameter processing, the parameter request is completed by transmitting the parameter response in the form of a "Read.res (+)" to the I/O controller.

Parameter data transfer

The acyclic channel (PROFIdrive profile)

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9.1.3   Structure of the PROFINET data frame

Dest Addr	Scr Addr	VLAN Day	Type 0800H	RPC	NDR	Read/Write Block	Data	FSC
6 bytes	6 bytes	4 bytes	4 bytes	80 bytes	64 bytes	64 bytes	0 ... 240 bytes	4 bytes

[9-3]   PROFINET data telegram

In the "Read/Write Block", the initiator specifies the access to data set "DB47". The data which are written to this index or read by it contain a header and the parameter request or the parameter response. The read data or the data to be written are contained in the "Data" field.

The following subchapters describe the parameter request and the parameter response in detail.

> **PROFINET specification**
>
> Here you will find detailed information on the PROFINET data telegram.

Assignment of the user data depending on the data type

Depending on the data type used, the user data are assigned as follows:

Data type	Length	User data assignment				
		Byte 1	Byte 2	Byte 3	Byte 4	Byte ...
String	x bytes					
U8	1 byte		00			
U16	2 bytes	High byte	Low byte			
U32	4 bytes	High word		Low word		
		High byte	Low byte	High byte	Low byte	

_ _

9.2 Reading parameters from the inverter

> **Note!**
> - When a read request is processed, no parameter value is written to the I/O device.
> - In the case of a multi-parameter read request, parameter attribute, index, and subindex are repeated "n" times, "n" being the number of parameters requested.

Request header

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Request identification	Axis	Number of indices

Field	Data type	Values
Request reference	U8	This value is specified by the I/O controller.
Request identification	U8	0x01: Request parameters for reading
Axis	U8	0x00 or 0x01
Number of indices	U8	0x"n" (n = number of parameters requested)

Parameter attribute

Byte 5	Byte 6
Attribute	Number of subindices

Field	Data type	Values
Attribute	U8	0x10: Value
Number of subindices	U8	0x00 or 0x01

Index and subindex

Byte 7	Byte 8	Byte 9	Byte 10
Index		Subindex	
High byte	Low byte	High byte	Low byte

Field	Data type	Values
Index	U16	0x0001 ... 0xFFFF (1 ... 65535)
Subindex	U16	0x0001 ... 0xFFFF (1 ... 65535)

_ _

9.2.1 Response to a correctly executed read request

> 🛈 **Note!**
>
> - Responses to read requests do not contain parameter attributes and indices/subindices.
> - When a multi-parameter read request is transmitted, the parameter format and the parameter value are repeated "n" times, "n" being the number of parameters requested.

Response header

Byte 1	Byte 2	Byte 3	Byte 4
Request reference (mirrored)	Response identification	Axis (mirrored)	Number of indices

Field	Data type	Values
Request reference	U8	Mirrored value of the parameter request
Response identification	U8	0x01: Parameter has been read
Axis	U8	0x00 or 0x01
Number of indices	U8	0x"n" (n = number of parameters requested)

Parameter format

Byte 5	Byte 6
Format	Number of values

Field	Data type	Values
Format	U8	0x02: Integer8 0x03: Integer16 0x04: Integer32 0x05: Unsigned8 0x06: Unsigned16 0x07: Unsigned32 0x09: Visible string 0x0A: Octet string 0x40: Zero 0x41: Byte 0x42: Word 0x43: Double word
Number of values	U8	• 0x01 • Number of requested subindices. (If there is more than one subindex, only the parameter value is repeated.) • In the case of string codes, the number of characters is entered here.

_ _

Parameter value

Byte 7	Byte 8	Byte 9	Byte 10
Value			

Field	Data type	Values
Value	String	Any
	U8	0x00 .... 0xFF
	U16	0x0000 .... 0xFFFF
	U32	0x0000 0000 .... 0xFFFF FFFF

9.2.2 Response to a read error

Response header

Byte 1	Byte 2	Byte 3	Byte 4
Request reference (mirrored)	Response identification	Axis (mirrored)	Number of indices

Field	Data type	Values
Request reference	U8	Mirrored value of the parameter request
Response identification	U8	0x81: Parameter has not been read • The data in the bytes 7 + 8 must be interpreted as an error code.
Axis	U8	0x00 or 0x01
Number of indices	U8	0x"n" (n = number of parameters requested)

Parameter format

Byte 5	Byte 6
Format	Number of values

Field	Data type	Values
Format	U8	0x44: Error
Number of values	U8	0x01: Error code without additional information 0x02: Error code with additional information

Parameter data transfer

Reading parameters from the inverter

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Error code

Byte 7	Byte 8	Byte 9	Byte 10
Error code		Additional information (if available)	
High byte	Low byte	High byte	Low byte

Field	Data type	Values
Error code	U16	0x0000 .... 0xFFFF ▸ Error information (error) (🕮 68)
Additional information (if available)	U16	

9.2.3 Frame example: Read request

The heatsink temperature of the inverter is to be read.

- Code to be read: C00061
- Heatsink temperature: 43 °C

Parameter request

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Request identification	Axis	Number of indices
0xXX	0x01	0x00	0x01
	Request parameters for reading		

Byte 5	Byte 6
Attribute	Number of subindices
0x10	0x00
Value	No subindex

Byte 7	Byte 8	Byte 9	Byte 10
Index		Subindex	
High byte	Low byte	High byte	Low byte
0x5F	0xC2	0x00	0x00
Index = 24575 - code no. = 24575 - 61 = 24514 = 0x5F C2		No subindex	

Parameter data transfer

Reading parameters from the inverter

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Parameter response to a correctly executed read request

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Response identification	Axis	Number of indices
0xXX	0x01	0x00	0x01
(mirrored)	Parameter has been read	(mirrored)	

Byte 5	Byte 6		
Format	Number of values		
0x43	0x01		
Double word	1 value		

Byte 7	Byte 8	Byte 9	Byte 10
Value			
High word: high byte	High word: low byte	Low- word: high byte	Low word: low byte
0x00	0x00	0x00	0x2B
Read value = 0x00 00 00 2B = 43 x 1 (internal factor) = 43 [°C]			

Parameter response to a read error

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Response identification	Axis	Number of indices
0xXX	0x81	0x00	0x01
(mirrored)	Parameters not read	(mirrored)	

Byte 5	Byte 6
Format	Number of values
0x44	0x01
Error	Error code without additional information

Byte 7	Byte 8
Error code	
High byte	Low byte
For the meaning see the chapter "Error information (error)" (📖 68)	

_ _

9.3 Writing parameters to the inverter

> **Note!**
>
> - When a multi-parameter write request is processed, the parameter attribute, index, subindex, and then the parameter format and parameter value are repeated "n" times, "n" being the number of parameters requested.
> - A parameter request must not exceed the maximum data length of 240 bytes.

Request header

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Request identification	Axis	Number of indices

Field	Data type	Values
Request reference	U8	This value is specified by the I/O controller.
Request identification	U8	0x02: Write parameter
Axis	U8	0x00 or 0x01
Number of indices	U8	0x"n" (n = number of parameters requested)

Parameter attribute

Byte 5	Byte 6
Attribute	Number of subindices

Field	Data type	Values
Attribute	U8	0x10: Value
Number of subindices	U8	0x00 or 0x01

Index and subindex

Byte 7	Byte 8	Byte 9	Byte 10
Index		Subindex	
High byte	Low byte	High byte	Low byte

Field	Data type	Values
Index	U16	0x0001 ... 0xFFFF (1 ... 65535)
Subindex	U16	0x0001 ... 0xFFFF (1 ... 65535)

Parameter data transfer

Writing parameters to the inverter

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Parameter format

Byte 11	Byte 12
Format	Number of values

Field	Data type	Values
Format	U8	0x02: Integer8 0x03: Integer16 0x04: Integer32 0x05: Unsigned8 0x06: Unsigned16 0x07: Unsigned32 0x09: Visible string 0x0A: Octet string 0x40: Zero 0x41: Byte 0x42: Word 0x43: Double word
Number of values	U8	• 0x01 • Number of requested subindices. (If there is more than one subindex, only the parameter value is repeated.) • In the case of string codes, the number of characters is entered here.

Parameter value

Byte 13	Byte 14	Byte 15	Byte 16
Value			

Field	Data type	Values
Value	String	Any
	U8	0x00 .... 0xFF
	U16	0x0000 .... 0xFFFF
	U32	0x0000 0000 .... 0xFFFF FFFF

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9.3.1 Response to a correctly executed write request

Response header

Byte 1	Byte 2	Byte 3	Byte 4
Request reference (mirrored)	Response identification	Axis (mirrored)	Number of indices

Field	Data type	Values
Request reference	U8	Mirrored value of the parameter request
Response identification	U8	0x01: Parameter written
Axis	U8	0x00 or 0x01
Number of indices	U8	0x"n" (n = number of parameters requested)

9.3.2 Response to a write error

> **Note!**
>
> In the case of a multi-parameter request, correct and possible faulty messages are summarised in one frame. They have the following data contents:
> - Correct message
>   - Format: 0x40
>   - Number of values: 0x00
> - Faulty message
>   - Format: 0x44
>   - Number of values: 0x01 or 0x02
>   - Error code without additional information (number of values = 0x01) *or*
>   - Error code with additional information (number of values = 0x02)
>
> A faulty access to a parameter "n" is indicated at the nth position in the response frame of a multi-parameter request.

Parameter data transfer

Writing parameters to the inverter

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Response header

Byte 1	Byte 2	Byte 3	Byte 4
Request reference (mirrored)	Response identification	Axis (mirrored)	Number of indices

Field	Data type	Values
Request reference	U8	Mirrored value of the parameter request
Response identification	U8	0x82: Parameter has not been written • The data in the bytes 7 + 8 must be interpreted as an error code.
Axis	U8	0x00 or 0x01
Number of indices	U8	0x"n" (n = number of parameters requested)

Parameter format

Byte 5	Byte 6
Format	Number of values

Field	Data type	Values
Format	U8	0x44: Error
Number of values	U8	0x01: Error code without additional information 0x02: Error code with additional information

Error code

Byte 7	Byte 8	Byte 9	Byte 10
Error code		Additional information (if available)	
High byte	Low byte	High byte	Low byte

Field	Data type	Values
Error code	U16	0x0000 .... 0xFFFF ▸ Error information (error) (🕮 68)
Additional information (if available)	U16	

Parameter data transfer

Writing parameters to the inverter

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9.3.3   Frame example: Write request

In the inverter, the deceleration time for quick stop is to be set to 50 ms.

- Code to be written: C00105

Parameter request

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Request identification	Axis	Number of indices
0xXX	0x02	0x00	0x01
	Write parameters	Axis 0	1 index

Byte 5	Byte 6
Attribute	Number of subindices
0x10	0x00
Value	No subindex

Byte 7	Byte 8	Byte 9	Byte 10
Index		Subindex	
High byte	Low byte	High byte	Low byte
0x5F	0x96	0x00	0x00
Index = 24575 - code no. = 24575 - 105 = 24470 = 0x5F 96		No subindex	

Byte 11	Byte 12
Format	Number of values
0x43	0x01
Double word	1 value

Byte 13	Byte 14	Byte 15	Byte 16
Value			
High word: high byte	High word: low byte	Low- word: high byte	Low word: low byte
0x00	0x00	0x00	0x32
Value to be written = 0.05 [s] x 1000 (internal factor) = 50 = 0x00 00 00 32			

Parameter response to a correctly executed write request

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Response identification	Axis	Number of indices
0xXX	0x02	0x00	0x01
(mirrored)	Parameter has been written	(mirrored)	1 index

Parameter response after write error

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Response identification	Axis	Number of indices
0xXX	0x82	0x00	0x01
(mirrored)	Parameter has not been written	(mirrored)	1 index

Byte 5	Byte 6
Format	Number of values
0x44	0x01
Error	Error code without additional information

Byte 7	Byte 8
Error code	
High byte	Low byte
For the meaning see the chapter "Error information (error)" (🕮 68)	

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9.4 Error information (error)

Error code	Meaning	Description	Additional information
0x0000	Impermissible parameter number	Access to unavailable parameter	-
0x0001	Parameter value cannot be changed	Change access to a parameter value that cannot be changed	Subindex
0x0002	Lower or upper value limit exceeded	Change access with value beyond the value limits	Subindex
0x0003	Faulty subindex	Access to unavailable subindex	Subindex
0x0004	No array	Access with subindex to non-indicated parameter	-
0x0005	Wrong data type	Change access with value that does not match the data type of the parameter	-
0x0006	No setting permitted (only resettable)	Change access with value unequal to 0 where this is not permitted	Subindex
0x0007	Description element cannot be changed	Change access to a description element that cannot be changed	Subindex
0x0008	Reserved	(PROFIdrive profile V2: PPO-Write requested in the IR is not available)	-
0x0009	Description data not available	Access to unavailable description (parameter value is available)	-
0x000A	Reserved	(PROFIdrive profile V2: Wrong access group)	-
0x000B	No parameter change rights	Change access without parameter change rights	-
0x000C	Reserved	(PROFIdrive profile V2: Wrong password)	-
0x000D	Reserved	(PROFIdrive profile V2: Text in the cyclic traffic cannot be read)	-
0x000E	Reserved	(PROFIdrive profile V2: Name in the cyclic traffic cannot be read)	-
0x000F	No text array available	Access to unavailable text array (parameter value is available)	-
0x0010	Reserved	(PROFIdrive profile V2: Missing PPO-Write)	-
0x0011	Request cannot be executed due to the operating state	Access is not possible due to temporary reasons not specified here	-
0x0012	Reserved	(PROFIdrive profile V2: Other error)	-
0x0013	Reserved	(PROFIdrive profile V2: date in the cyclic traffic cannot be read)	-
0x0014	Value impermissible	Change access with the value that is inside the value limits but not permissible for other permanent reasons (parameters with defined individual values)	Subindex
0x0015	Response too long	The length of the current response exceeds the maximum transmittable length	-
0x0016	Parameter address impermissible	Impermissible or non-supported value for attribute, number of subindices, parameter number, or subindex, or a combination	-
0x0017	Format impermissible	Write request: Impermissible or non-supported format of parameter data	-
0x0018	Number of values not consistent	Write request: Number of values of the parameter data do not match the number of subindices in the parameter address	-
0x0019 ... 0x0064	Reserved	-	-

Error code	Meaning	Description	Additional in-formation
0x0065 ... 0x00FF	Manufacturer-specific	-	-

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9.5 Consistent parameter data

In the PROFINET communication system, data are permanently exchanged between the host (CPU + I/O controller) and the standard device via the plugged-on I/O device interface module. The I/O controller and the CPU (central processing unit) of the host access a joint memory: the dual port memory (DPM).

- The DPM permits a data exchange in both directions (write/read):

| Central processing unit (CPU) | ⬌ | Dual port memory (DPM) | ⬌ | I/O controller |

It could happen that a slower I/O controller writing would be overtaken by a faster CPU reading within a cycle time without any further data organisation.

In order to avoid such an impermissible state, the parameter data to be transmitted must be marked as "consistent".

Data communication with consistent data

With consistency, either "reading" or "writing" is possible when the I/O controller and the CPU simultaneously access the memory:

- The I/O controller transfers data only as a complete data set.
- The CPU can only access completely updated data sets.
- The I/O controller cannot read or write data as long as the CPU accesses consistent data.

The result becomes clear from the example below:

CPU wants to read.   **I/O controller wants to write at the same time.**

| Central processing unit (CPU) | ➡ | Dual port memory (DPM) | ⬅ | I/O controller |
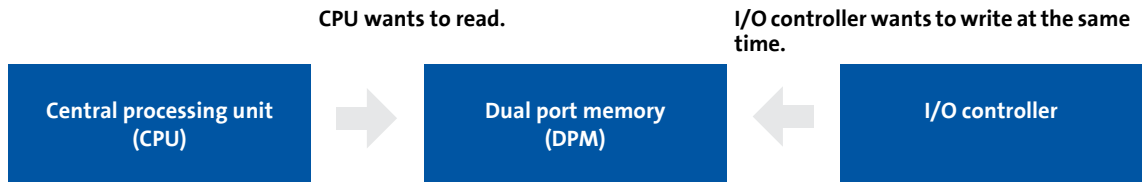
1. As the I/O controller can only write when the CPU does not read, the I/O controller has to wait until the data are completely read by the CPU.
2. The I/O controller only writes a complete data set into the DPM.

Configuring consistent data

> ℹ **Note!**
>
> Consistency is achieved by an appropriate I/O controller configuration (see documentation for the configuring software).

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10 Monitoring

10.1 Interruption of PROFINET communication

An interruption of PROFINET communication in the "Data_Exchange" state, e.g. by cable break or failure of the I/O controller is recognised by the I/O device.

⌨ **The response to the interruption of communication is controlled via the following settings:**

1. During the initialisation of PROFINET communication the watchdog monitoring time specified in the I/O controller (C13882) is transferred to the I/O device.

   If the I/O device does not receive any valid process data in the "Data_Exchange" state, the process data are treated according to the setting in **2** C13885. (Like this the data that were sent last by the I/O controller can be used or set to zero.)

   After the watchdog monitoring time has elapsed, the I/O device changes to the "No_Data_Exchange" status (see C13861), and the red LED **BE** is activated (Fieldbus status displays (☐ 75)).

   There is no response in the I/O device.

2. To trigger a response in the IO device, you additionally have to set a **Response of the Inverter Drive 8400 1** (C13880) under the **Monitoring** tab in the »Engineer«.
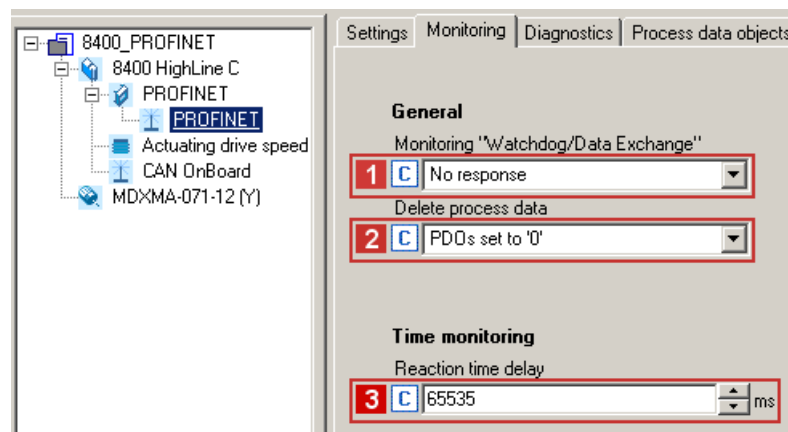
By setting a **Reaction time delay 3** (C13881) you can decelerate this response.
- In the Lenze setting "0 ms", this monitoring is activated.
- With the setting "65535 ms", this monitoring is deactivated.
- A change of monitoring will be effective immediately.
- The monitoring time elapses when the "Data_Exchange" status is exited.

After this response delay has elapsed, the response set is executed with the error message "PROFINET: Data_Exchange status quit [0x01bc6531]" (☐ 83).

10.2 Interruption of internal communication

- The response in the event of a communication error between the communication module and the Inverter Drive 8400 can be set via code **C01501**.
- The communication module reports a connection interruption to the IO controller and changes to the "No_Data_Exchange" state.

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- The error message "PROFINET: Exist. conn. to 8400 lost [0x01bc3100]" (📖 81) is output.

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11 Diagnostics

For purposes of fault diagnostics, the communication module is provided with the LEDs on the front. Furthermore you can carry out the .

11.1 LED status displays

> ℹ️ **Note!**
>
> During normal operation ...
> - only the LEDs **MS** (📖 74) and **BS** (📖 75) should be lit permanently.
> - the green LEDs on the RJ45 sockets X256/X257 must be lit or blinking (📖 76).

The following status displays are distinguished:

- Module status displays (📖 74)
- Fieldbus status displays (📖 75)
- Status displays at X256 and X257 (📖 76)

- -

11.1.1 Module status displays

The LEDs **MS**, **ME** and **DE** indicate the module status.

E84YCER006
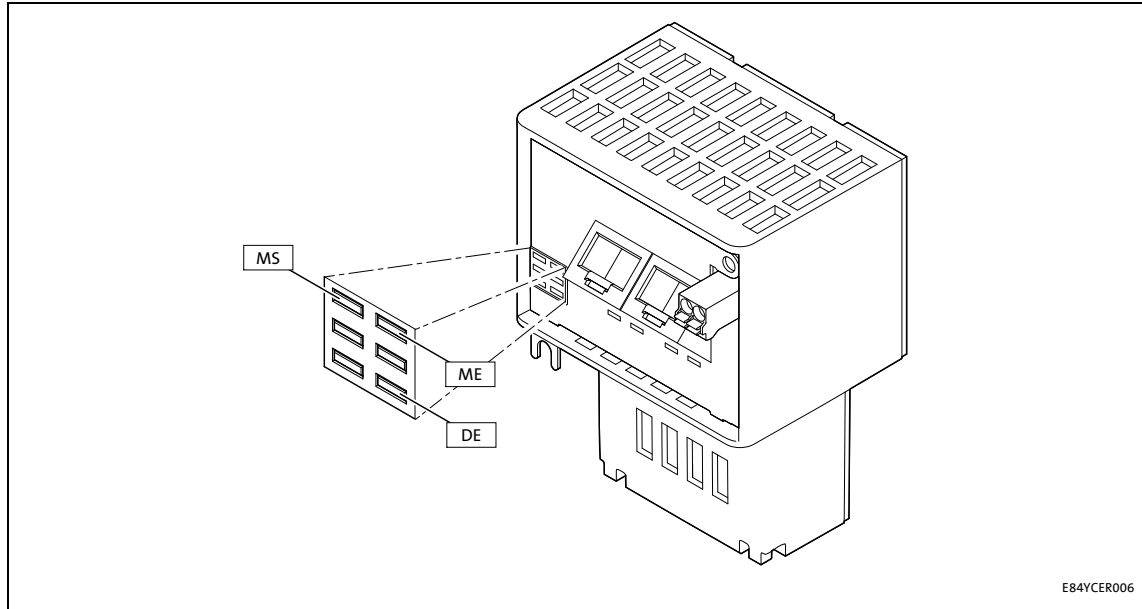
LED	Colour	Status	Description
MS	green	On	 The communication module is supplied with voltage and is connected to the standard device.
		blinking	200 ms / 200 ms The communication module is supplied with voltage, but is not connected to the standard device. (Standard device is switched off, in the initialisation phase, or not available.)
ME	red	On	 An error has occurred in the communication module.
		blinking	200 ms / 200 ms The "Node blinking test" PROFINET function is activated by the I/O controller. The blinking LED serves to identify/localise accessible I/O devices.
EN	red	On	 The communication module is not accepted by the basic device or the basic device is not active (see notes in the documentation relating to the basic device.)

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11.1.2 Fieldbus status displays

The LEDs **BS** and **BE** indicate the fieldbus status.

E84YCER006

LED	Colour	Status	Description
BS	green	Off	The communication module is not active on the fieldbus or is in the INIT state.
		blinking	The communication module is in the DATA _EXCHANGE status.
BE	red	On	Bus error/fault is active (e.g. Ethernet cable not connected). The communication module is in the NO_DATA_EXCHANGE status.
		blinking	Impermissible settings: • Invalid station name • Invalid IP parameters The communication module has been initialised and continues to work internally with the respective standard values.

Diagnostics

LED status displays

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11.1.3   Status displays at X256 and X257

The LEDs below the RJ45 sockets X256 and X257 indicate the PROFINET connection status.

LED/X256

A

B

A   B

LED/X257

E84YCER005
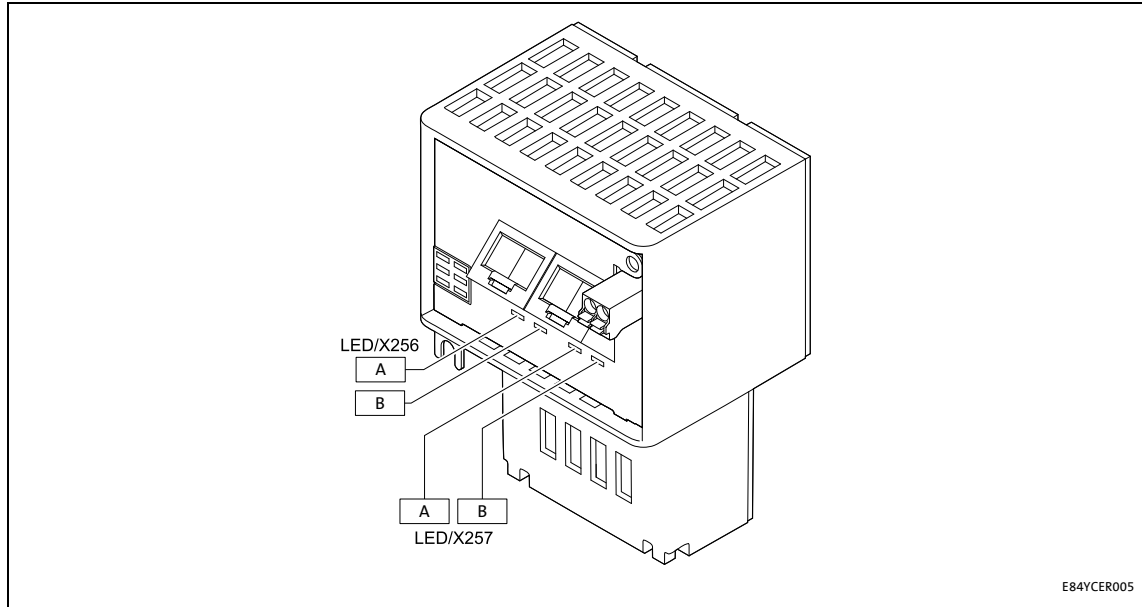
LED	Colour	Status	Description
A	green	Off	No connection to PROFINET
		On	Connection to PROFINET has been established.
B	Yellow	Off	No communication
		On *or* Flickers	50 ms Communication active

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11.2 Diagnostics with the »Engineer«

In the »Engineer« under the **Diagnostics** tab, you will find PROFINET diagnostics information.
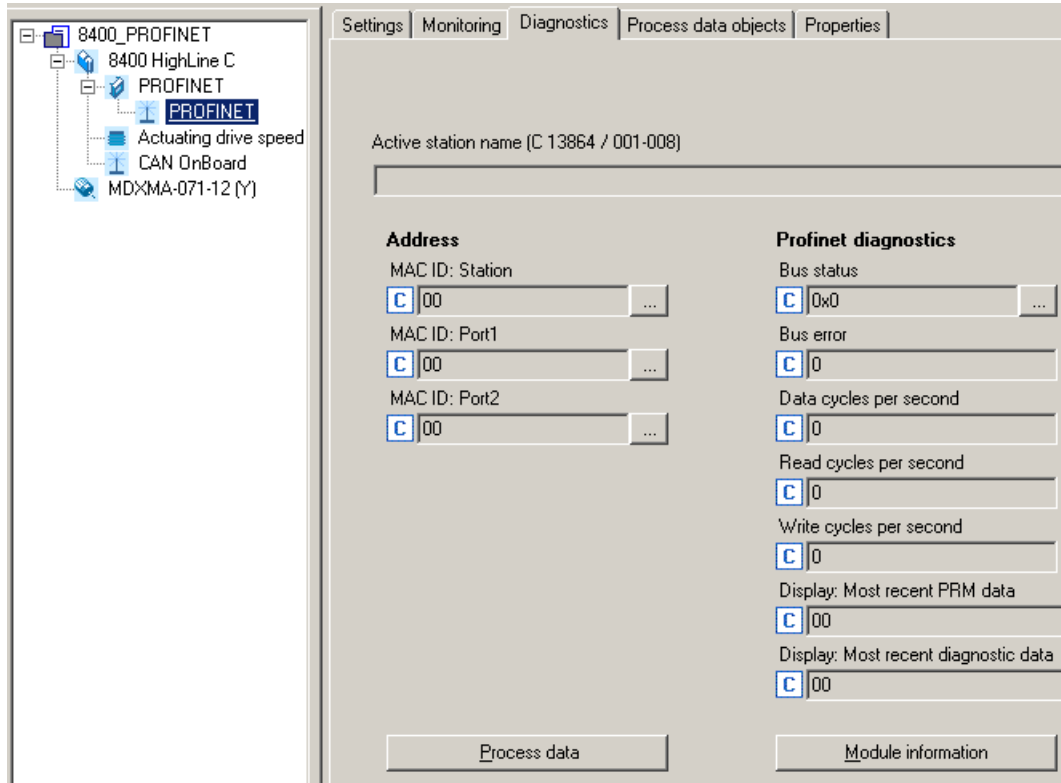
Diagnostics

Diagnostic data

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11.3 Diagnostic data

- The I/O device sends an alarm message to the I/O controller to signalise the diagnostic data below.

- Errors and warnings of the Inverter Drive 8400 and the module connected to it are sent to the IO controller as extended diagnostic messages.

- With code C13887, the transmission of an alarm message can be suppressed for specific error messages.

- The diagnostic data can be displayed using the hexadecimal representation of the Siemens S7 engineering tool.

Bytes	Meaning	Value [hex]
1 ... 6	Diag. block header	0x0010 001C 0100
7 ... 8	Alarm type	0x0001 (diagnosis)
9 ... 12	API	0x0000 0000
13, 14	Slot number	0x0001 / 0x0002
15, 16	Subslot number	0x0001
17 ... 20	Module ID	ID according to module
21 ... 24	Submodule ID	ID according to module
25, 26	Alarm specifier	0xB000
27, 28	User structure identifier	0x0001
29 ... 32	Error code of the Inverter Drive 8400 / E84AYCER	

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Error code of Inverter Drive 8400
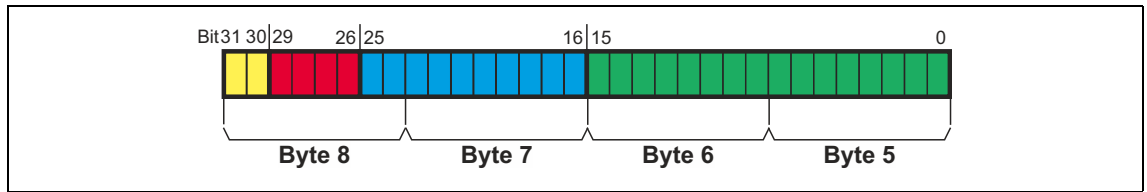
- The error code can be found in bytes 29 ... 32 of the diagnostic message.
- In the logbook and in code **C00165**, the error number is shown in the following syntax in order to facilitate the readability:
  [error type].[error subject area no.].[error ID]

Example: error message "PROFINET: Data_Exchange status quit [0x01bc6531]"

Byte 32		Byte 31	Byte 30	Byte 29
0x01		0xbc	0x65	0x31
0 0	0 0 0 0	0 1 1 0 1 1 1 1 0 0	0 1 1 0 0 1 0 1	0 0 1 1 0 0 0 1
Response	Instance ID	Module ID	Error ID	

> ✋ **Software manual/»Engineer« online help for Inverter Drive 8400**
>
> Detailed information on the error codes is provided here.

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12 Error messages

This chapter supplements the error list in the software manual and the »Engineer« online help for the Inverter Drive 8400 by the error messages of the communication module.

> **Software manual/»Engineer« online help for Inverter Drive 8400**
>
> Here you will find general information on diagnostics & fault analysis and on error messages.

12.1 Short overview of the PROFINET error messages

The following table contains all PROFINET error messages in numerical order of the error number. Furthermore the preset error response and - if applicable – the parameter for setting the error response is specified.

> **Tip!**
>
> If you click on the cross-reference in the first column, you will get a detailed description (causes and remedies) of the corresponding error message.

Error no. [hex]	Subject area no. [dec]	Error no. [dec]	Error text	Error type (Error response)	Adjustable in
0x01bc3100	444	12544	PROFINET: Exist. connect. to 8400 lost	1: No Response	-
0x01bc5531	444	21809	PROFINET: Memory: No access	1: No Response	-
0x01bc5532	444	21810	PROFINET: Memory: Read error	1: No Response	-
0x01bc5533	444	21811	PROFINET: Memory: Write error	1: No Response	-
0x01bc6010	444	24592	PROFINET: Restart by watchdog reset	1: No Response	-
0x01bc6011	444	24593	PROFINET: Internal error	1: No Response	-
0x01bc6100	444	24832	PROFINET: Internal error	1: No Response	-
0x01bc6101	444	24833	PROFINET: Internal error	1: No Response	-
0x01bc641f	444	25631	PROFINET: Invalid parameter set	1: No Response	-
0x01bc6420	444	25632	PROFINET: Error: Lenze setting loaded	1: No Response	-
0x01bc6430	444	25648	PROFINET: Invalid module configuration	1: No Response	-
0x01bc6501	444	25857	PROFINET: Record parameter: Invalid read	4: Warning locked	-
0x01bc6502	444	25858	PROFINET: Record parameter: Invalid write	4: Warning locked	-
0x01bc6503	444	25859	PROFINET: Data output status bad	4: Warning locked	-
0x01bc6531	444	25905	PROFINET: Data_Exchange status quit	0: None	C13880/1
0x01bc6532	444	25906	PROFINET: Station name error	1: No Response	-
0x01bc6533	444	25907	PROFINET: IIP address error	1: No Response	-
0x01bc6534	444	25908	PROFINET: Stack init error	1: No Response	-
0x01bc6650	444	26192	PROFINET: Internal error	1: No Response	-

Error messages

Possible causes and remedies

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12.2 Possible causes and remedies

In this chapter, all error messages of the communication module are listed in numerical order of the error numbers. Possible causes and remedies and responses to the error messages are described in detail.

> **Tip!**
>
> You will find a list of all error messages of the communication module in alphabetical order in the previous chapter "Short overview of the PROFINET error messages" (📖 80).

PROFINET: Exist. conn. to 8400 lost [0x01bc3100]

Response (Lenze setting printed in bold)	**Setting:** not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	**Remedy**
MCI communication to Inverter Drive 8400 is interrupted. • Inverter Drive 8400 is switched off. • The communication module is not connected correctly at the MCI slot of the Inverter Drive 8400.	• Switch on Inverter Drive 8400. • Check screwed connection of the communication module at the MCI slot of the Inverter Drive 8400. • Send the communication module and Inverter Drive 8400 together with a description of the fault to Lenze.

PROFINET: Memory: No access [0x01bc5531]

Response (Lenze setting printed in bold)	**Setting:** not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	**Remedy**
Access to memory was not possible.	Send communication module together with a description of the fault to Lenze.

PROFINET: Memory: Read error [0x01bc5532]

Response (Lenze setting printed in bold)	**Setting:** not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	**Remedy**
Parameter could not be read.	Send communication module together with a description of the fault to Lenze.

PROFINET: Memory: Write error [0x01bc5533]

Response (Lenze setting printed in bold)	**Setting:** not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	**Remedy**
Parameter could not be written.	Send communication module together with a description of the fault to Lenze.

Error messages

Possible causes and remedies

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PROFINET: Restart by watchdog reset [0x01bc6010]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
Communication module is defective.	Send communication module together with a description of the fault to Lenze.

PROFINET: Internal error [0x01bc6011]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
Communication module is defective.	Send communication module together with a description of the fault to Lenze.

PROFINET: Internal error [0x01bc6100]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
Internal error	Send communication module together with a description of the fault to Lenze.

PROFINET: Internal error [0x01bc6101]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
Internal error	Send communication module together with a description of the fault to Lenze.

PROFINET: Invalid parameter set [0x01bc641f]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
No active parameter set could be loaded.	• Download application again (including module). • Send communication module together with a description of the fault to Lenze.

PROFINET: Error: Lenze setting loaded [0x01bc6420]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
Access to parameter set in the memory module was not possible.	• Download application again (including module). • Send device with error description to Lenze.

Error messages
Possible causes and remedies

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PROFINET: Invalid module configuration [0x01bc6430]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
A module or submodule does not comply with the configuration of the Siemens S7 engineering tool.	Check configuration.

PROFINET: Record Parameter: Invalid read [0x01bc6501]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ **Warning locked** ☐ Warning ☐ Information	

Cause	Remedy
Invalid parameter read access	Check configuration.

PROFINET: Record Parameter: Invalid write [0x01bc6502]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ **Warning locked** ☐ Warning ☐ Information	

Cause	Remedy
Invalid parameter write access When reading back the data, the IO Controller has requested a data length (number of data bytes) that is to small.	Check configuration.

PROFINET: Data output status bad [0x01bc6503]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ **Warning locked** ☐ Warning ☐ Information	

Cause	Remedy
• Output data invalid. • Connection to Siemens S7 has been interrupted.	• Check cables and terminals. • Connect network cable to PROFINET connections.

PROFINET: Data_Exchange status quit [0x01bc6531]

Response (Lenze setting printed in bold)	Setting: C13880/1 (☑ Adjustable response)
☒ **None** ☐ System fault ☑ Fault ☐ Trouble ☑ Quick stop by trouble ☑ Warning locked ☐ Warning ☑ Information	

Cause	Remedy
The data exchange via PROFINET has been terminated. • Also see the chapter "Interruption of PROFINET communication" (📖 71).	• Check cables and terminals. • Connect network cable to PROFINET connections.

PROFINET: Station name error [0x01bc6532]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
Station name is not DNS-conform.	Use a DNS-compliant station name. ▶ Setting the station name (📖 36)

Error messages

Possible causes and remedies

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PROFINET: IP address error [0x01bc6533]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
An invalid IP address has been assigned by the I/O controller via PROFINET or has been set in code C13000.	• Make sure that the I/O controller has assigned a valid IP address via PROFINET. • Set a valid IP address. ▸ Setting the IP configuration (🕮 38)

PROFINET: Stack init error [0x01bc6534]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
The stack cannot be initialised with the parameters selected by the user. This may be due to a station name which does not comply with the PROFINET specification.	Check and, if necessary, adapt PROFINET parameters: ▸ Setting the IP configuration (🕮 38) ▸ Setting the station name (🕮 36)

PROFINET: Internal error [0x01bc6650]

Response (Lenze setting printed in bold)	Setting: not possible
☐ No reaction ☐ System fault ☒ **Fault** ☐ Trouble ☐ Quick stop by trouble ☐ WarningLocked ☐ Warning ☐ Information	

Cause	Remedy
Internal error	Send communication module together with a description of the fault to Lenze.

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13 Parameter reference

This chapter supplements the parameter list and the table of attributes for the Inverter Drive 8400 contained in the software manual and in the »Engineer« online help by the parameters of the communication module E84AYCER (PROFINET).

> **Software manual/»Engineer« online help for the Inverter Drive 8400**
>
> Here you will find general information on parameters.

13.1 Parameters of the communication module

This chapter lists the parameters of the E84AYCER communication module (PROFINET) in numerically ascending order.

> **Note!**
>
> **PROFINET command "Reset to Factory Defaults"**
>
> If the "Reset to factory defaults" PROFINET command is executed by an IO supervisor or an I/O controller, the PROFINET-specific parameters will be reset to their standard values:
>
> - C13000 | IP address
> - C13001 | Subnetwork mask
> - C13002 | Gateway address
> - C13010 | Active IP address
> - C13011 | Active subnetwork mask
> - C13012 | Active gateway address
> - C13864 | Active station name
> - C13887 | Suppress signalling diag. mess. upon
> - C13899 | Station name
> - C13910 | I&M1 system designation
> - C13911 | I&M1 installation site
> - C13912 | I&M2 installation date
> - C13913 | I&M3 additional information
> - C13914 | I&M4 signature code

C13000

Parameter | Name:			Data type: UNSIGNED_32
C13000 | IP address			Index: 11575_d = $2D37_h$
Setting of the IP address			
▸ Setting the IP configuration (📖 38)			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		4294967295	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

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C13001

Parameter | Name: **C13001 | Subnetwork mask**			Data type: UNSIGNED_32 Index: 11574_d = $2D36_h$
Setting of the subnet mask ▶ Setting the IP configuration (📖 38)			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		4294967295	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13002

Parameter | Name: **C13002 | Gateway address**			Data type: UNSIGNED_32 Index: 11573_d = $2D35_h$
Setting of the gateway address ▶ Setting the IP configuration (📖 38)			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		4294967295	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13003

Parameter | Name: **C13003 | Physical address**		Data type: OCTET_STRING Index: 11572_d = $2D34_h$
Display of the MAC-ID		
Subcodes	**Info**	
C13003/1	MAC ID: Station	
C13003/2	MAC ID: Port1	
C13003/3	MAC ID: Port2	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

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C13010

Parameter | Name: **C13010 | Active IP address**	Data type: UNSIGNED_8 Index: $11565_d = 2D2D_h$

Display of the active IP address
- The active IP address may differ from the contents of code C13000, depending on whether the station name was changed via the fieldbus or the parameter.

Subcodes	Info
C13010/1	Active IP address.1
C13010/2	Active IP address.2
C13010/3	Active IP address.3
C13010/4	Active IP address.4

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13011

Parameter | Name: **C13011 | Active subnetwork mask**	Data type: UNSIGNED_8 Index: $11564_d = 2D2C_h$

Display of the active subnetwork mask
- The active subnetwork mask may differ from the contents of code C13001, depending on whether the station name was changed via the fieldbus or the parameter.

Display range (min. value | unit | max. value)		
0		255

Subcodes	Info
C13011/1	Active subnetwork mask.1
C13011/2	Active subnetwork mask.2
C13011/3	Active subnetwork mask.3
C13011/4	Active subnetwork mask.4

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13012

Parameter | Name: **C13012 | Active gateway address**	Data type: UNSIGNED_8 Index: $11563_d = 2D2B_h$

Display of the active gateway address
- The active gateway address may differ from the contents of code C13002, depending on whether the station name was changed via the fieldbus or the parameter.

Display range (min. value | unit | max. value)		
0		255

Subcodes	Info
C13012/1	Active gateway address.1
C13012/2	Active gateway address.2
C13012/3	Active gateway address.3
C13012/4	Active gateway address.4

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13850

Parameter	Name:	Data type: UNSIGNED_16
C13850 | All words to master		Index: $10725_d = 29E5_h$

Display of the process data words which are transmitted from the inverter to the IO controller.
In the subcodes 1 to 16, all process data words to the I/O controller are displayed. However, only the configured process data words are valid.

Display range (min. value | unit | max. value)		
0		65535

Subcodes	Info
C13850/1	
...	
C13850/16	

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13851

Parameter	Name:	Data type: UNSIGNED_16
C13851 | All words from master		Index: $10724_d = 29E4_h$

Display of the process data words which are transmitted from the IO controller to the inverter.
In the subcodes 1 to 16, all process data words from the I/O controller are displayed. However, only the configured process data words are valid.

Display range (min. value | unit | max. value)		
0		65535

Subcodes	Info
C13851/1	
...	
C13851/16	

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13852

Parameter	Name:	Data type: UNSIGNED_16
C13852 | All words to standard device		Index: $10723_d = 29E3_h$

Display of the process data words 1 ... 16, which are transmitted from the IO controller to the inverter.

Display range (min. value | unit | max. value)		
0		65535

Subcodes	Info
C13852/1	
...	
C13852/16	

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

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C13853

Parameter	Name: **C13853	All words from standard device**	Data type: UNSIGNED_16 Index: $10722_d = 29E2_h$
Display of the process data words 1 ... 16, which are transmitted from the inverter to the IO controller.	

Display range (min. value | unit | max. value)			
0		65535	
Subcodes		**Info**	
C13853/1			
...			
C13853/16			

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13860

Parameter	Name: **C13860	Settings**	Data type: UNSIGNED_8 Index: $10715_d = 29DB_h$

Display range (min. value | unit | max. value)			
0		255	
Subcodes		**Info**	
C13860/1		Reserved	
C13860/2		Number of process data words	
C13860/3		Reserved	
C13860/4		Reserved	

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13861

Parameter	Name: **C13861	Bus status**	Data type: BITFIELD_16 Index: $10714_d = 29DA_h$
Bit-coded display of current bus status	

Value is bit-coded:		
Bit 0	Initialised	
Bit 1	Online	
Bit 2	Connected	
Bit 3	Address conflict	
Bit 4	Hardware error	
Bit 5	EEPROM error	
Bit 6	Watchdog error	
Bit 7	Protocol error	
Bit 8	Profinet stack ok	
Bit 9	Profinet stack not configured	
Bit 10	Ethernet controller error	
Bit 11	UDP stack error	
Bit 12	Reserved	
Bit 13	Reserved	
Bit 14	Reserved	
Bit 15	Reserved	

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

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C13862

Parameter | Name:	Data type: UNSIGNED_32
C13862 | Bus counter	Index: 10713_d = $29D9_h$

Display of the data cycles per second (independent of data changes)

Display range (min. value | unit | max. value)			
0		4294967295	

Subcodes	Info
C13862/1	Data cycles per second
C13862/2	Read cycles per second
C13862/3	Write cycles per second

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13864

Parameter | Name:	Data type: VISIBLE_STRING
C13864 | Active station name	Index: 10711_d = $29D7_h$

Displays the active station name used by the inverter.
It may differ from the contents of code C13899, depending on whether the station name has been changed via the fieldbus or via C13899.
▸ Setting the station name (🕮 36)

Subcodes	Info
C13864/1	1st ... 30th character
C13864/2	31th ... 60th character
C13864/3	61th ... 90th character
C13864/4	91th ... 120th character
C13864/5	121th ... 150th character
C13864/6	151th ... 180th character
C13864/7	181th ... 210th character
C13864/8	211th ... 240th character

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

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C13867

Parameter | Name: **C13867 | Display: Most recent diagnostic data**	Data type: OCTET_STRING Index: 10708_d = $29D4_h$
Display of the diagnostic data sent by the inverter most recently.	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

Bytes	Information
0	Slot
1	
2	Subslot
3	
4	Error code
...	
7	
8	Slot
9	
10	Subslot
11	
12	Error code
...	
15	

C13877

Parameter | Name: **C13877 | Bus error(1)**	Data type: UNSIGNED_16 Index: 10698_d = $29CA_h$
The code contains the error currently detected on the fieldbus. • The error values can occur in combination with the error values from code C13878.	

Selection list (read only)		Info
0	No error	
1	Internal error	
2	Unit ID unknown	
3	Max. units exceeded	
4	Invalid size	
5	Unit type unknown	
6	Runtime plug	
7	Invalid argument	
8	Service pending	
9	Stack not ready	
10	Command unknown	
11	Invalid address descriptor	
12	Watchdog expired	
13	Protocol not supported	

☑ Read access   ☐ Write access   ☐ CINH   ☐ PLC-STOP   ☐ No transfer   ☐ PDO_MAP_RX   ☐ PDO_MAP_TX   ☐ COM   ☐ MOT

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C13878

Parameter | Name:	Data type: BITFIELD_16
C13878 | Bus error(2)	Index: 10697$_d$ = 29C9$_h$

The code contains the error currently detected on the fieldbus.
  • The error values can occur in combination with the error values from code C13877.

Value is bit-coded:		Info
Bit 0	Reserved	
...	...	
Bit 6	Reserved	
Bit 7	IP address error	
Bit 8	Station name error	
Bit 9	DataExch left	
Bit 10	Stack boot error	
Bit 11	Stack online error	
Bit 12	Stack state error	
Bit 13	Stack revision error	
Bit 14	Stack init error	
Bit 15	Stack CPU boot error	

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13880

Parameter | Name:	Data type: UNSIGNED_8
C13880 | Monitoring Reaction	Index: 10695$_d$ = 29C7$_h$

The action set in subcode 1 of the code is carried out when the node recognises that it is no longer in the DATA_EXCHANGE status.
  • Please also observe the notes provided in code C13881.
  • A change in the monitoring response becomes immediately effective.

Selection list		
0	No response	
1	Error	
3	Quick stop by trouble	
4	Warning Locked	
6	Information	

Subcodes	Lenze setting	Info
C13880/1	0: No Response	"Watchdog/Data Exchange" monitoring

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13881

Parameter | Name:	Data type: UNSIGNED_16
C13881 | Reaction time delay	Index: 10694$_d$ = 29C6$_h$

If the DATA_EXCHANGE status is exited, the response parameterised in C13880 is activated after the time set here has elapsed.
  • A value of "65535" in this code deactivates the monitoring function.
  • A change of monitoring will be effective immediately.

Setting range (min. value | unit | max. value)			Lenze setting
0	ms	65535	**0 ms**

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

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C13885

Parameter | Name:	Data type: UNSIGNED_8
C13885 | Clear process data	Index: 10690$_d$ = 29C2$_h$

This code is used to set the process data that are to be processed by the I/O device in order to maintain the internal communication when the PROFINET has left the DATA_EXCHANGE status.

Selection list (Lenze setting printed in bold)		Info
0	Use of most recent master PDOs	The last data sent by the I/O controller are used.
1	**PDOs are set to the value 0'**	The contents of the process data are set to the value "0".

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13887

Parameter | Name:	Data type: BITFIELD_8
C13887 | Suppress signalling diag. mess. upon	Index: 10688$_d$ = 29C0$_h$

This code serves to inhibit the transmission of alarm messages to the IO controller. By this, errors of a specific type can be systematically suppressed. All errors are furthermore entered in the logbook.
- A change will only be effective immediately if no error number with the error type selected here is active in standard device code **C00165**.

Value is bit-coded:		Info
Bit 0	Error	
Bit 1	Fault	
Bit 2	Quick stop by trouble	
Bit 3	Warning Locked	
Bit 4	Warning	
Bit 5	Information	
Bit 6	Reserved	
Bit 7	Connection to 8400 lost	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13899

Parameter | Name:	Data type: VISIBLE_STRING
C13899 | Station name	Index: 10676$_d$ = 29B4$_h$

The name with a max. length of 240 characters is distributed to the subindices. The name can be entered starting with subindex 1. The following unused subindices are not relevant.
- The station name must be assigned in accordance with the PROFINET specification. In the standard setting a deleted name is displayed. The name is also deleted if the "Reset to factory defaults" command is executed by an IO supervisor or an I/O controller.
- A change of the station name will only become effective by switching the mains of the inverter.

▸ Setting the station name (🕮 36)

Subcodes	Lenze setting	Info
C13899/1		1st ... 30th character
C13899/2		31th ... 60th character
C13899/3		61th ... 90th character
C13899/4		91th ... 120th character
C13899/5		121th ... 150th character
C13899/6		151th ... 180th character
C13899/7		181th ... 210th character
C13899/8		211th ... 240th character

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT

C13900

Parameter | Name: **C13900 | Firmware product type**	Data type: VISIBLE_STRING Index: $10675_d = 29B3_h$
The code contains a string with a length of 8 characters. The "E84DFYER" identification code is output.	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13901

Parameter | Name: **C13901 | Firmware compilation date**	Data type: VISIBLE_STRING Index: $10674_d = 29B2_h$
The code contains a string with a length of 20 characters. The creation date ("MMM DD YYYY") and time ("hh:mm:ss") of the software are displayed, e.g. "Mar 21 2005 12:31:21".	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13902

Parameter | Name: **C13902 | Firmware version**	Data type: VISIBLE_STRING Index: $10673_d = 29B1_h$
The code contains a string with a length of 11 characters. The identification code is displayed (e.g. "01.00.00.00").	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13910

Parameter | Name: **C13910 | I&M1 System designation**	Data type: VISIBLE_STRING Index: $10665_d = 29A9_h$
Input/output of the I&M1 plant identification code • The Lenze setting shows an empty string.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13911

Parameter | Name: **C13911 | I&M1 Installation site**	Data type: VISIBLE_STRING Index: $10664_d = 29A8_h$
Input/output of the I&M1 location identification code • The Lenze setting shows an empty string.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13912

Parameter | Name: **C13912 | I&M2 Installation date**	Data type: VISIBLE_STRING Index: $10663_d = 29A7_h$
Input/output of the I&M2 date of installation • The Lenze setting shows an empty string.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

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C13913

Parameter | Name: **C13913 | I&M3 additional information**		Data type: VISIBLE_STRING Index: 10662_d = $29A6_h$
Input/output if the I&M3 additional information • The Lenze setting shows an empty string.		
Subcodes	**Lenze setting**	**Info**
C13913/1		I&M3 additional information
C13913/2		I&M3 additional information
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13914

Parameter | Name: **C13914 | I&M4 signature code**		Data type: OCTET_STRING Index: 10661_d = $29A5_h$
Input/output of the I&M4 signature		
Subcodes	**Lenze setting**	**Info**
C13914/1	00000000000000000000000000000000000000000000000000000000	I&M4 signature code
C13914/2	00000000000000000000000000000000000000000000000000000000	I&M4 signature code
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

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13.2 Table of attributes

The table of attributes contains information that is required for communication with the inverter via parameters.

How to read the table of attributes:

Column		Meaning	Entry	
Code		Parameter name	Cxxxxx	
Name		Parameter short text (display text)	*Text*	
Index	dec	Index under which the parameter is addressed. The subindex for array variables corresponds to the Lenze subcode number.	24575 - Lenze code number	Is only required for access via a bus system.
	hex		5FFF$_h$ - Lenze code number	
Data	DS	Data structure	E	Single variable (only one parameter element)
			A	Array variable (several parameter elements)
	DA	Number of array elements (subcodes)	*Number*	
	DT	Data type	BITFIELD_8	1 byte, bit-coded
			BITFIELD_16	2 bytes, bit-coded
			BITFIELD_32	4 bytes, bit-coded
			INTEGER_8	1 byte, with sign
			INTEGER_16	2 bytes with sign
			INTEGER_32	4 bytes, with sign
			UNSIGNED_8	1 byte without sign
			UNSIGNED_16	2 bytes without sign
			UNSIGNED_32	4 bytes, without sign
			VISIBLE_STRING	ASCII string
			OCTET_STRING	
	Factor	Factor for data transmission via a bus system, depending on the number of decimal positions	*Factor*	1 ≡ No decimal positions 10 ≡ 1 decimal position 100 ≡ 2 decimal positions 1000 ≡ 3 decimal positions
Access	R	Read access	☑ Reading permitted	
	W	Write access	☑ Writing permitted	
	CINH	Controller inhibit required	☑ Writing is only possible if controller inhibit is set	

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	Data type	Factor	R	W	CINH
C13000	IP address	11575	2D37	E	1	UNSIGNED_32	1	☑	☑	
C13001	Subnet Mask	11574	2D36	E	1	UNSIGNED_32	1	☑	☑	
C13002	Gateway address	11573	2D35	E	1	UNSIGNED_32	1	☑	☑	
C13003	Physical address	11572	2D34	A	3	OCTET_STRING		☑		
C13010	Active IP Address	11565	2D2D	A	4	UNSIGNED_8	1	☑		
C13011	Active Subnetwork Mask	11564	2D2C	A	4	UNSIGNED_8	1	☑		
C13012	Active IP Address	11563	2D2B	A	4	UNSIGNED_8	1	☑		
C13850	All words from drive to master	10725	29E5	A	16	UNSIGNED_16	1	☑		
C13851	All words from master to drive	10724	29E4	A	16	UNSIGNED_16	1	☑		
C13852	All words to the basic device	10723	29E3	A	16	UNSIGNED_16	1	☑		
C13853	All words to the basic device	10722	29E2	A	16	UNSIGNED_16	1	☑		
C13860	Settings	10715	29DB	A	4	UNSIGNED_8	1	☑		
C13861	Bus status	10714	29DA	E	1	BITFIELD_16		☑		
C13862	Bus counter	10713	29D9	A	3	UNSIGNED_32	1	☑		
C13864	Active station name	10711	29D7	A	8	VISIBLE_STRING		☑		
C13867	Display: Most recent diagnostic data	10708	29D4	E	1	OCTET_STRING		☑		
C13877	Bus error(1)	10698	29CA	E	1	UNSIGNED_16	1	☑		
C13878	- Bus error(2)	10697	29C9	E	1	BITFIELD_16		☑		
C13880	Monitoring Reaction	10695	29C7	A	1	UNSIGNED_8	1	☑	☑	
C13881	Reaction time delay	10694	29C6	E	1	UNSIGNED_16	1	☑	☑	
C13885	Delete process data	10690	29C2	E	1	UNSIGNED_8	1	☑	☑	
C13887	Suppress signalling diag. mess. upon	10688	29C0	E	1	BITFIELD_8		☑	☑	
C13899	Station name	10676	29B4	A	8	VISIBLE_STRING		☑	☑	
C13900	Firmware Product Type	10675	29B3	E	1	VISIBLE_STRING		☑		
C13901	Firmware Compilation Date	10674	29B2	E	1	VISIBLE_STRING		☑		
C13902	Firmware Version	10673	29B1	E	1	VISIBLE_STRING		☑		
C13910	I&M1 system designation	10665	29A9	E	1	VISIBLE_STRING		☑	☑	
C13911	I&M1 installation site	10664	29A8	E	1	VISIBLE_STRING		☑	☑	
C13912	I&M2 installation date	10663	29A7	E	1	VISIBLE_STRING		☑	☑	
C13913	I&M3 additional information	10662	29A6	A	2	VISIBLE_STRING		☑	☑	
C13914	I&M4 signature code	10661	29A5	A	2	OCTET_STRING		☑	☑	

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