



E84AYCER

PROFINET®

Inverter Drives 8400 -----

Communication manual EN



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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

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

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

About this documentation

Conventions used

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.

About this documentation

Terminology used

1.3 Terminology used

Term	Meaning
Inverter	Lenze inverters of the "Inverter Drives 8400" product series for which the communication module can be used. ► Application as directed (□ 12)
Standard device	
»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	This setting is the default factory setting of the device.
Basic setting	
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.

About this documentation

Notes used

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
	Note!	Important note to ensure trouble-free operation
	Tip!	Useful tip for easy handling
		Reference to another document

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.

Safety instructions

Device and application-specific safety instructions

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)

Product description

Application as directed

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)**

E84YCPM001E

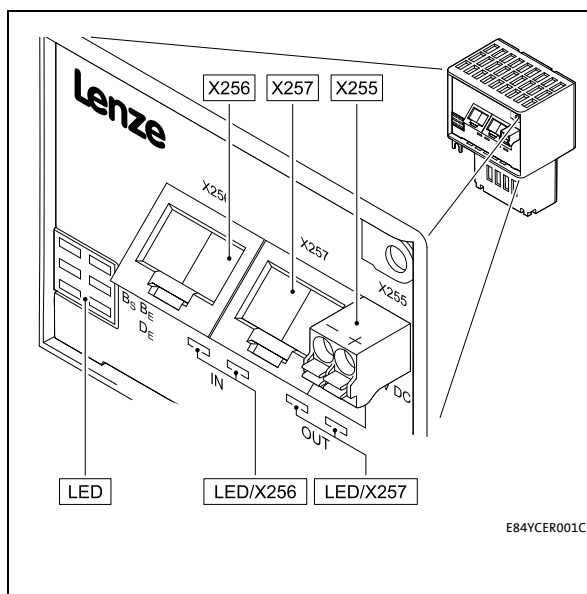
[3-1] Identification data

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«.

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

[3-2] E84AYCER communication module (PROFINET)

Technical data

General data and operating conditions

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.

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.

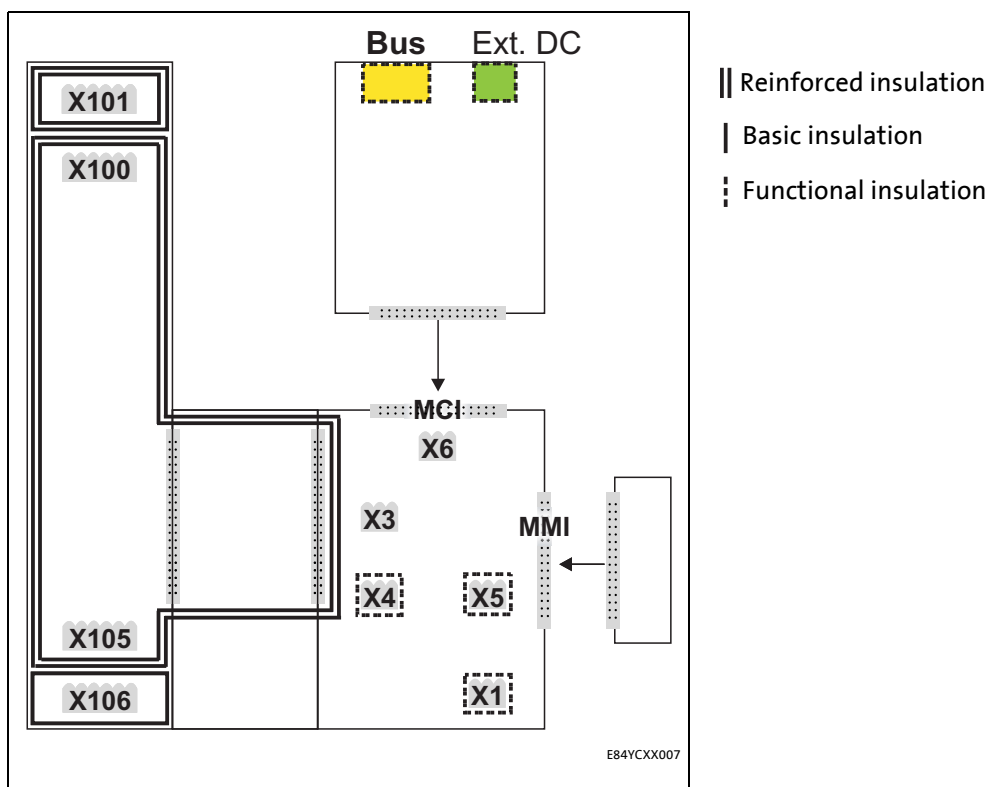


Note!

The existing protective insulation in the Inverter Drives 8400 is implemented according to EN 61800-5-1.

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

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.

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 + 0 ... 1 ms + 1 ... x ms Update cycle Processing time in the module 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.

4.5 Internal switch latency

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

$$\text{Runtime delay} = ((36 \text{ permanent bytes} + \text{process data in bytes}) \times 8 \times 10 \text{ nsec}) + 4 \mu\text{sec}$$

Example :

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

- $((36 \text{ permanent bytes} + 48 \text{ bytes}) \times 8 \times 10 \text{ nsec}) + 4 \mu\text{sec}$
- $(84 \text{ bytes} \times 8 \times 10 \text{ nsec}) + 4 \mu\text{sec}$
- $6.72 \mu\text{sec} + 4 \mu\text{sec} = \mathbf{10.72 \mu\text{sec}}$

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.

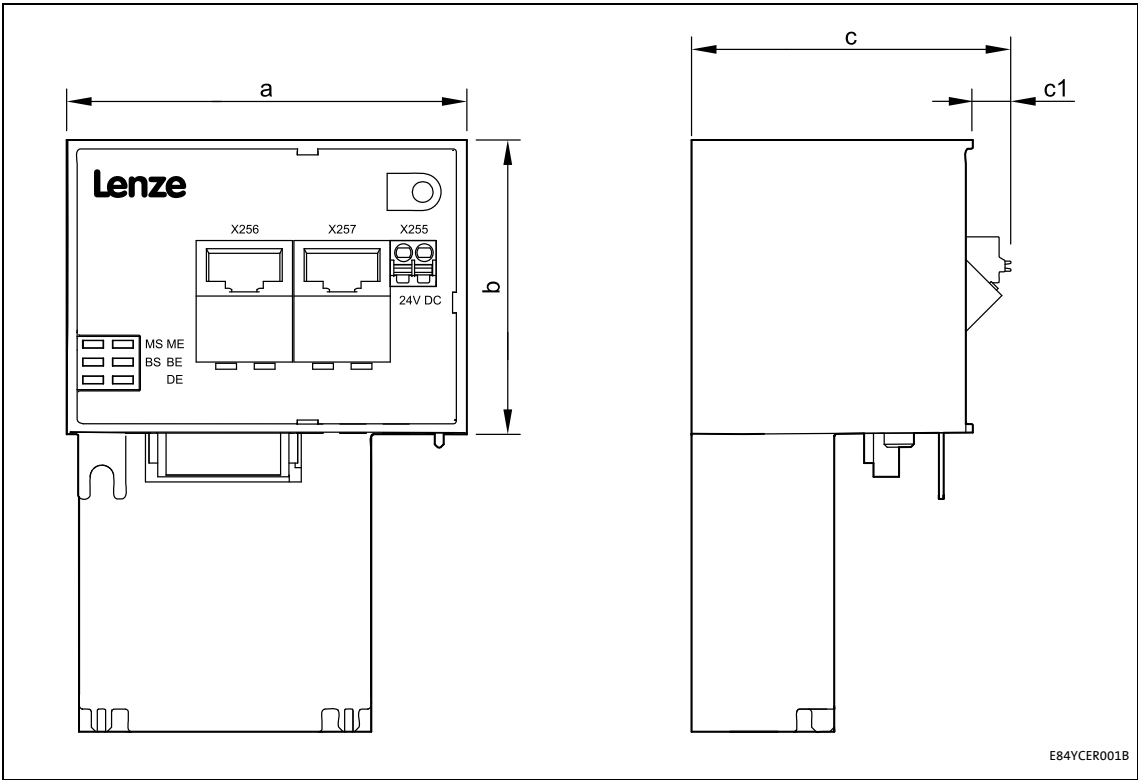


Note!

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)

4.6 Dimensions



[4-2] Dimensions

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

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.

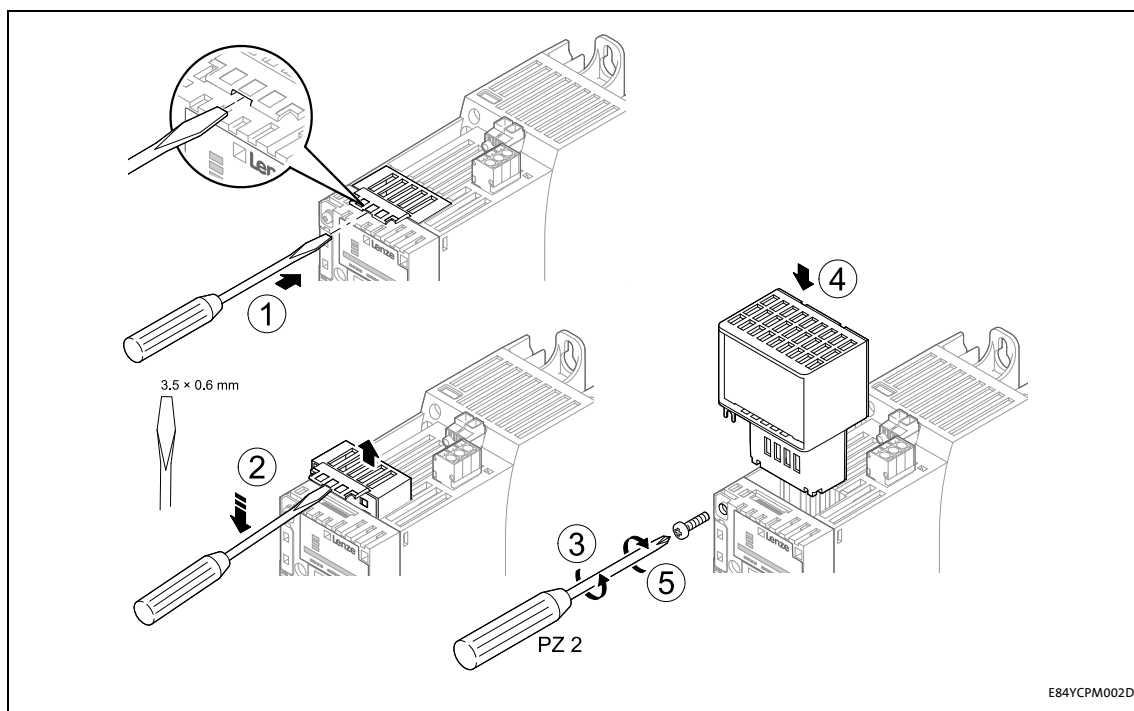
Protective measures

- 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

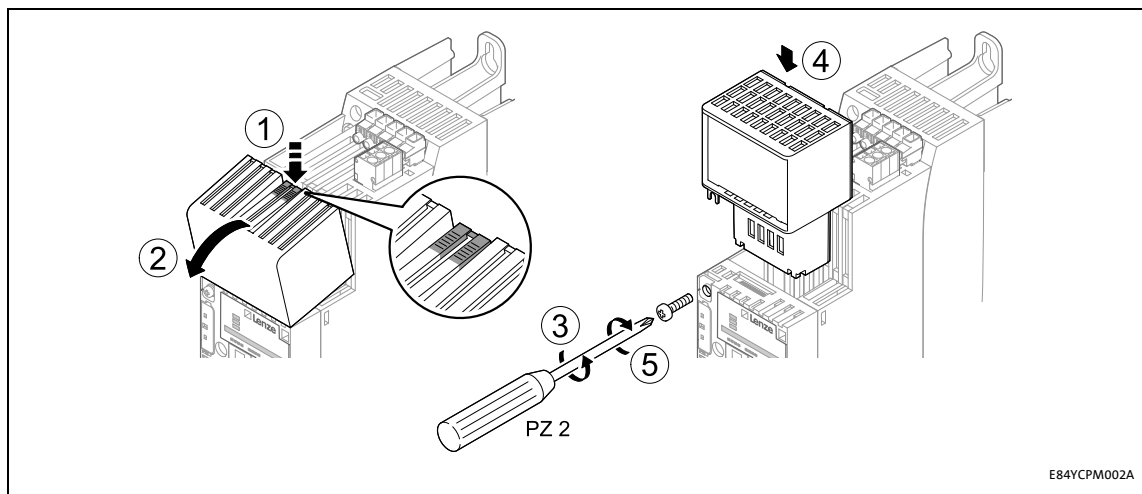


[5-1] Mounting for standard devices of 0.25 kW and 0.37 kW

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

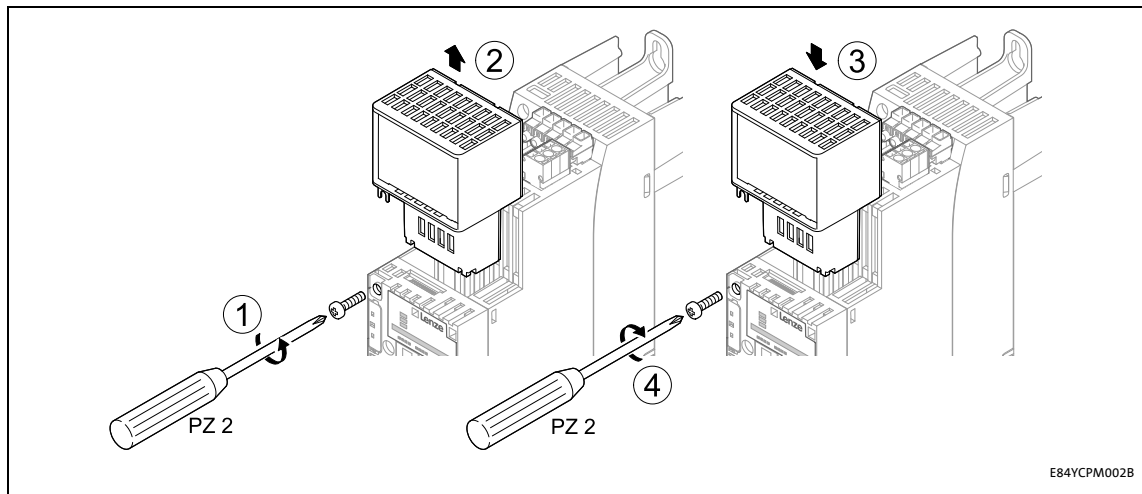


[5-2] Mounting for standard devices of 0.55 kW or more

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

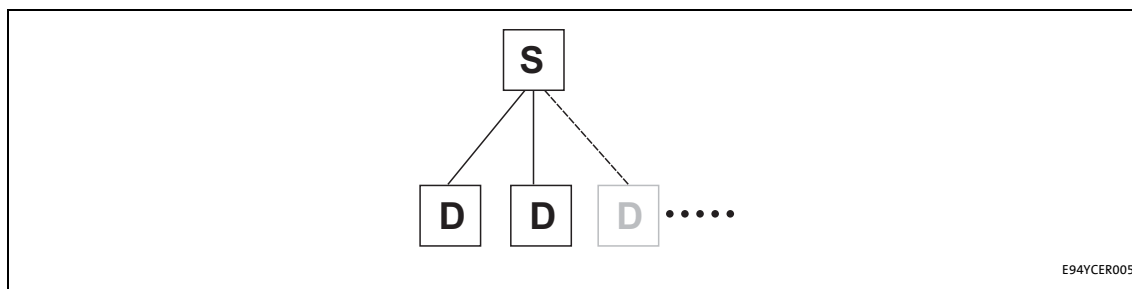
It is typical of PROFINET to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

► [Internal switch latency](#) (p. 20)

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

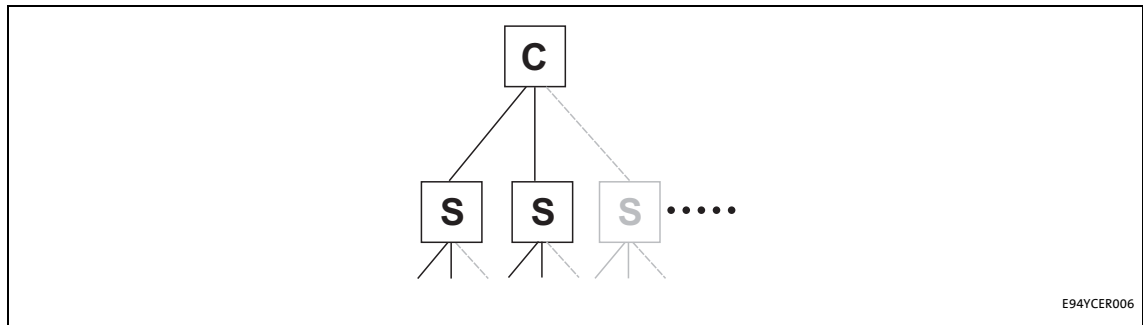
PROFINET supports the following topologies:

- Switch / star



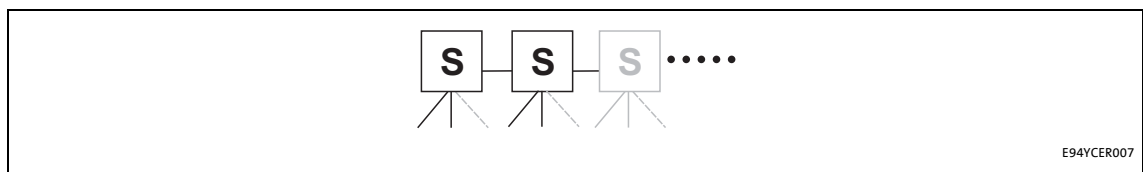
[5-4] Switch / star topology (S = switch, D = I/O device)

- Tree via switches



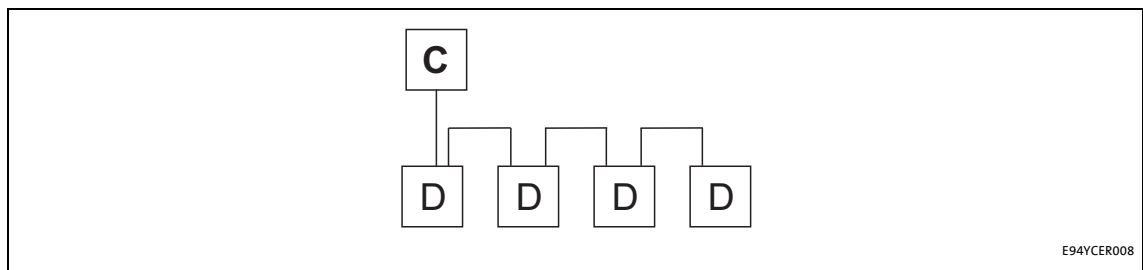
[5-5] Tree topology (C = I/O controller, S = switch)

- Switch / switch



[5-6] Switch/switch topology (S = switch)

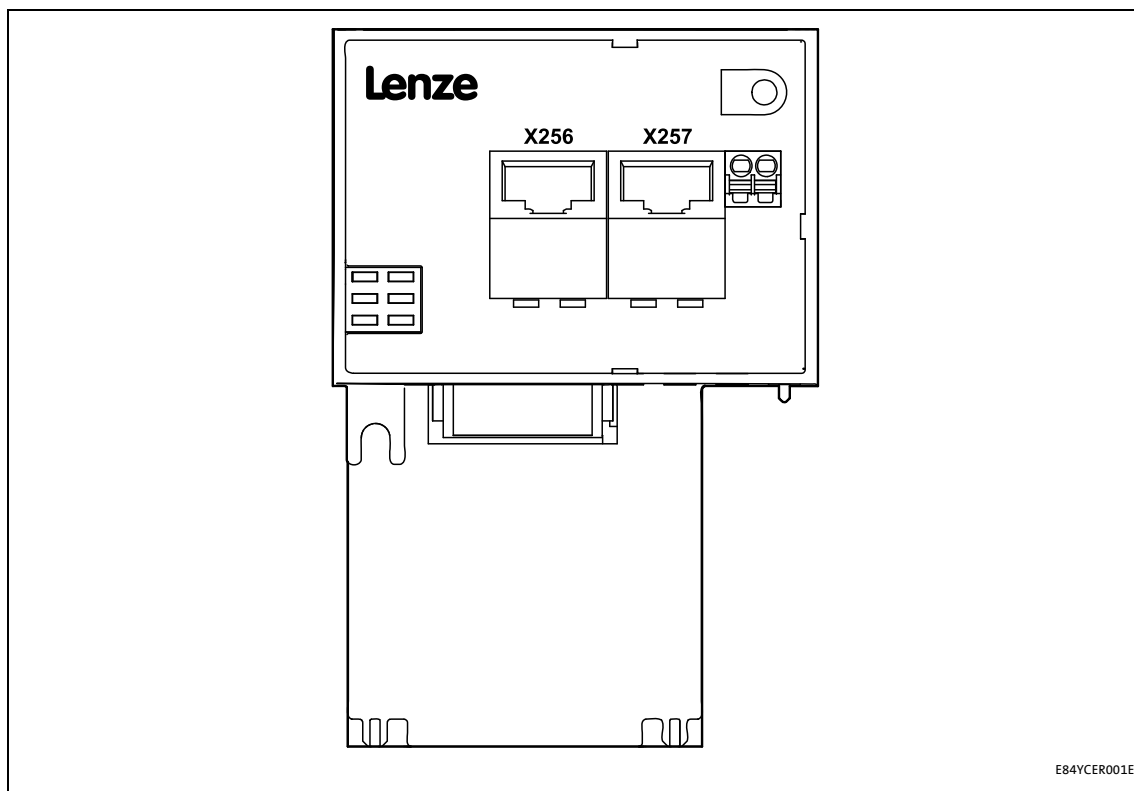
- I/O controller / I/O device



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

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).



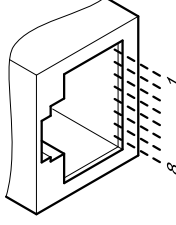
Note!

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.

Installation

Electrical installation

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).

5.2.4 Ethernet cable specification

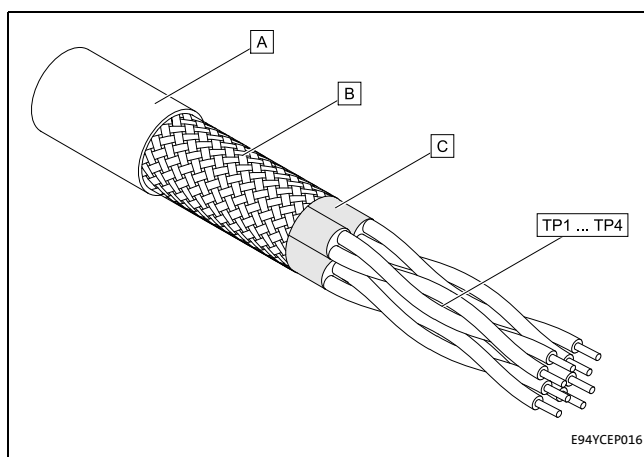


Note!

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 Twisted core pairs 1 ... 4

... [▶ Colour code of the Ethernet cable](#)

TP4 [\(31\)](#)

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

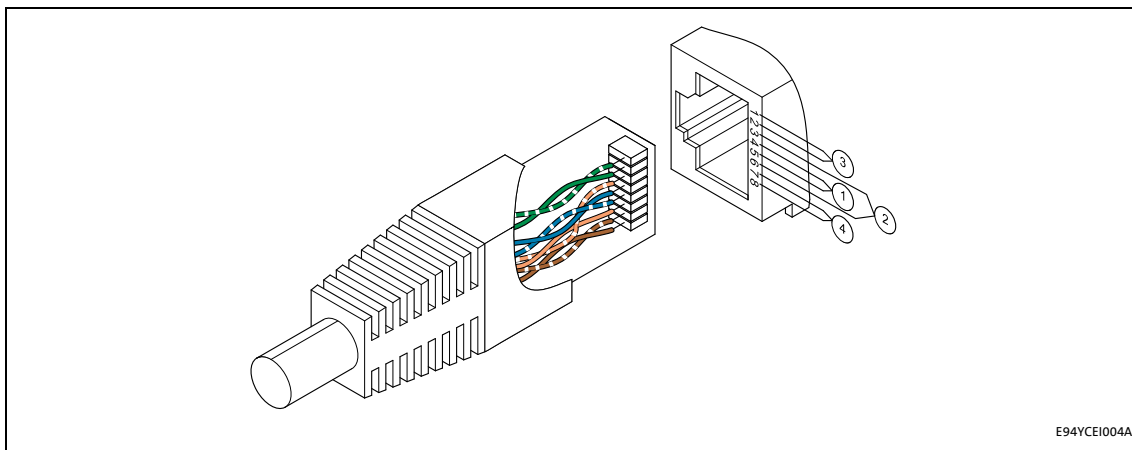
Colour code of the Ethernet cable



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

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.

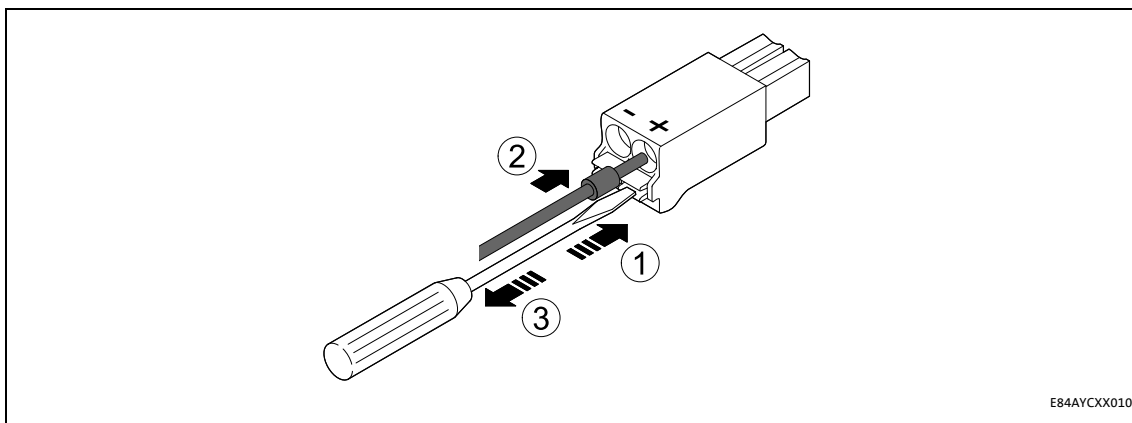
- External voltage supply of the communication module is required if the communication via the bus should be maintained when the supply of the standard device fails.
- Access to parameters of a standard device disconnected from the mains is not possible.

Wiring of the X255 plug connector



Stop!

Only wire the plug connector if the standard device is disconnected from the mains.



[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.

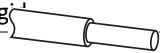
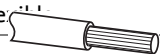
Installation

Electrical installation

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	Rig. 
	0.2 ... 1.5 mm ² (AWG 24 ... 16)
	Fle. 
	Without wire end ferrule 0.2 ... 1.5 mm ² (AWG 24 ... 16)
	With wire end ferrule, without plastic sleeve 0.2 ... 1.5 mm ² (AWG 24 ... 16)
	With wire end ferrule, with plastic sleeve 0.2 ... 1.5 mm ² (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 (nW) 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



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 \(p 74\)](#)) blinks.
- Operation on the PROFINET requires a valid station name.
- In the case of impermissible settings, the red **BE** ([Fieldbus status displays \(p 75\)](#)) blinks and the error message [PROFINET: Station name error \[0x01bc6532\] \(p 83\)](#) 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](#).

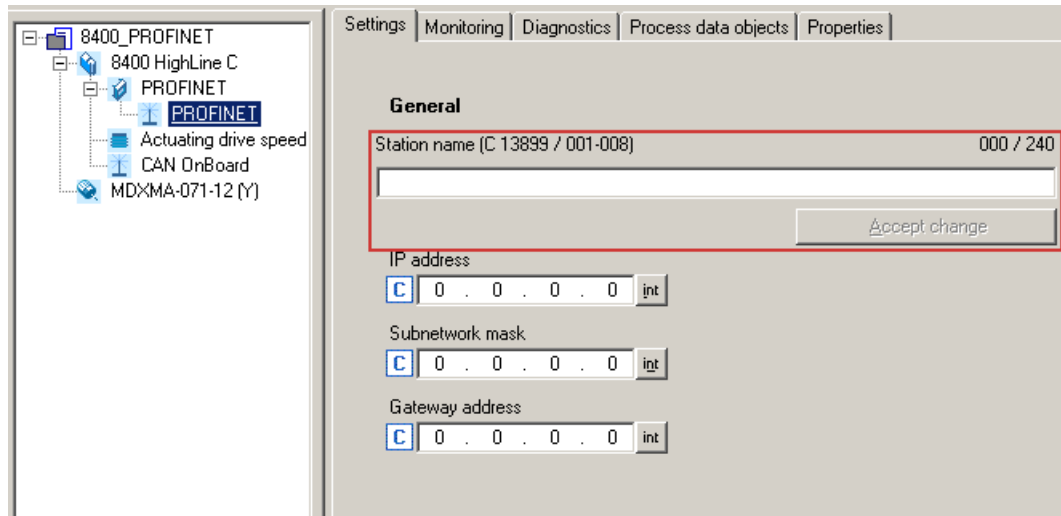
The station name ...

- 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

Setting the station name

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)



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.

Commissioning

Setting the IP configuration

6.4.1 Settings via the PROFINET configurator of the »Engineer«



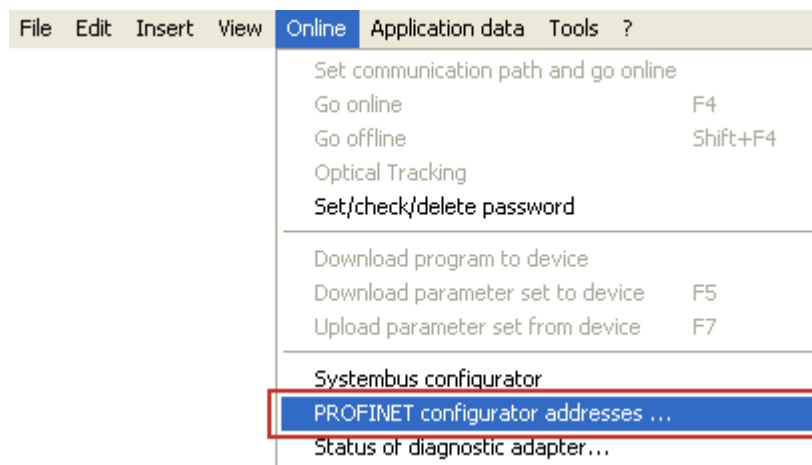
Note!

- 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).

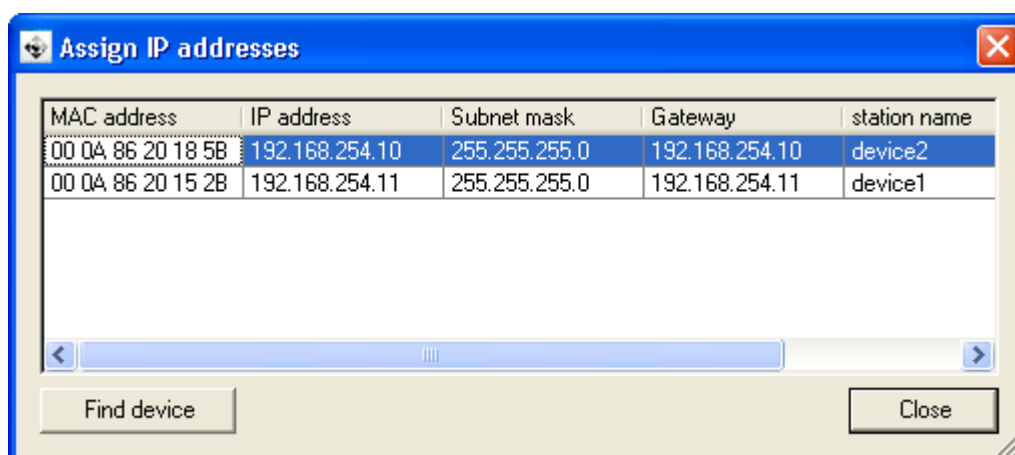


How to set the IP parameters via the PROFINET configurator:

1. Execute the menu command **Online → Profinet configurator addresses...**



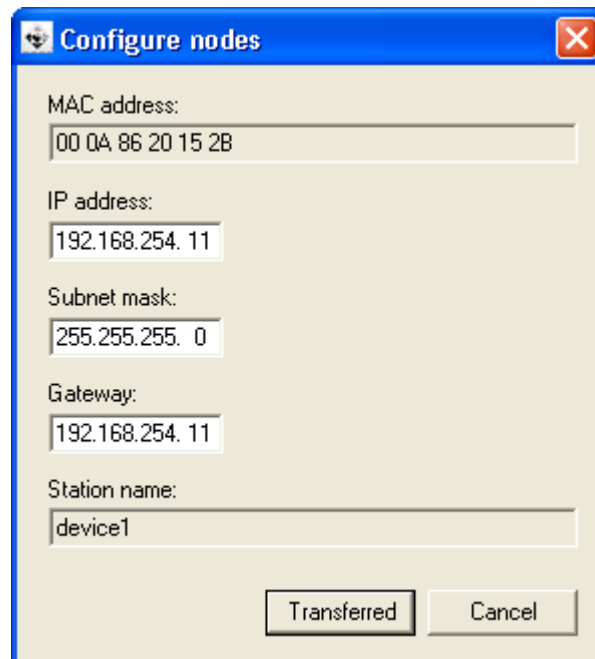
The **Assign IP addresses** dialog window is opened, and all Lenze PROFINET devices connected are listed.



Commissioning

Setting the IP configuration

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.



The screenshot shows the 'Configure nodes' dialog box. It has a blue title bar with a lightbulb icon and the text 'Configure nodes'. The dialog contains the following fields and values:

- 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

At the bottom right, there are two buttons: 'Transferred' and '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.

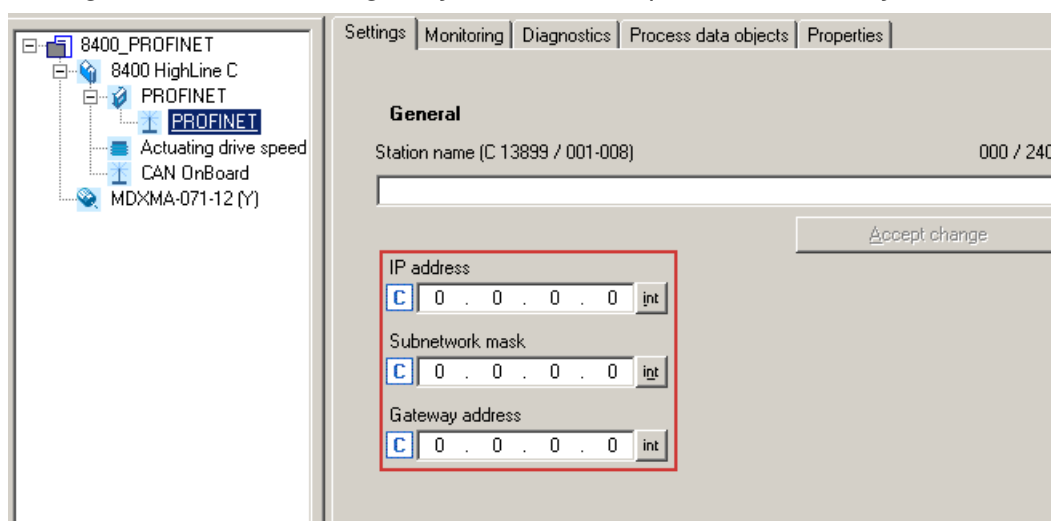
6.4.2 Setting via codes in the »Engineer«



Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network 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, or switch the voltage supply of the communication module off and on again

Commissioning

Setting the IP configuration

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

Commissioning

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

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

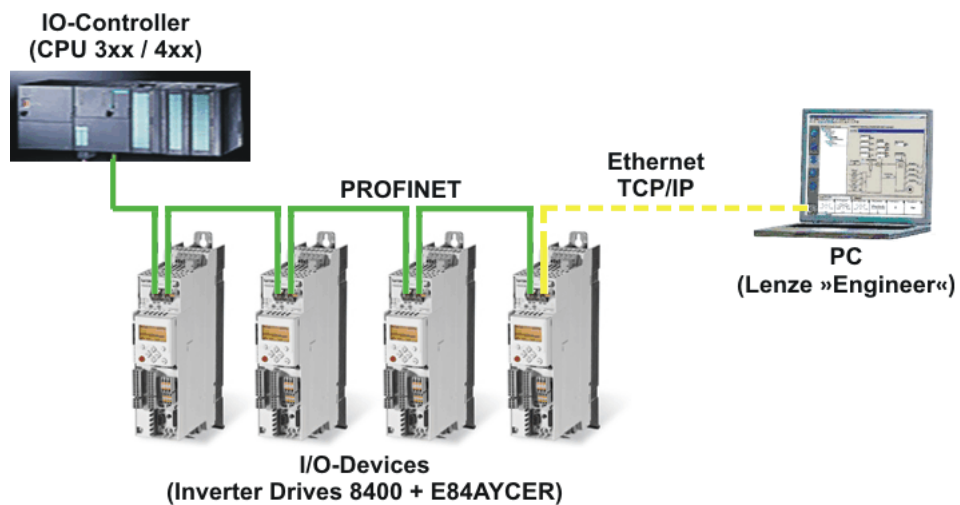
This functionality is only supported **from software version V01.30.05**.



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 PROFINET communication prior to normal TCP/IP communication. In the case of PROFINET this is effected via the VLAN identification in the Ethernet frame.

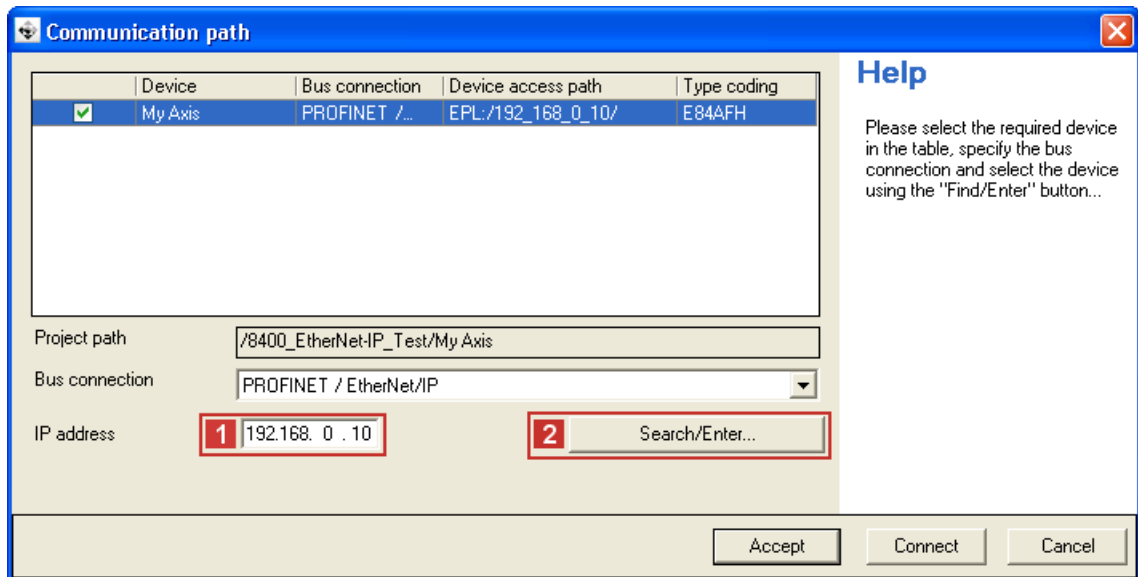


For an online connection between the »Engineer« and the inverter, the inverter must have an IP address (see [Setting the IP configuration](#) (39)).

Commissioning

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

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.

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.

Process data transfer

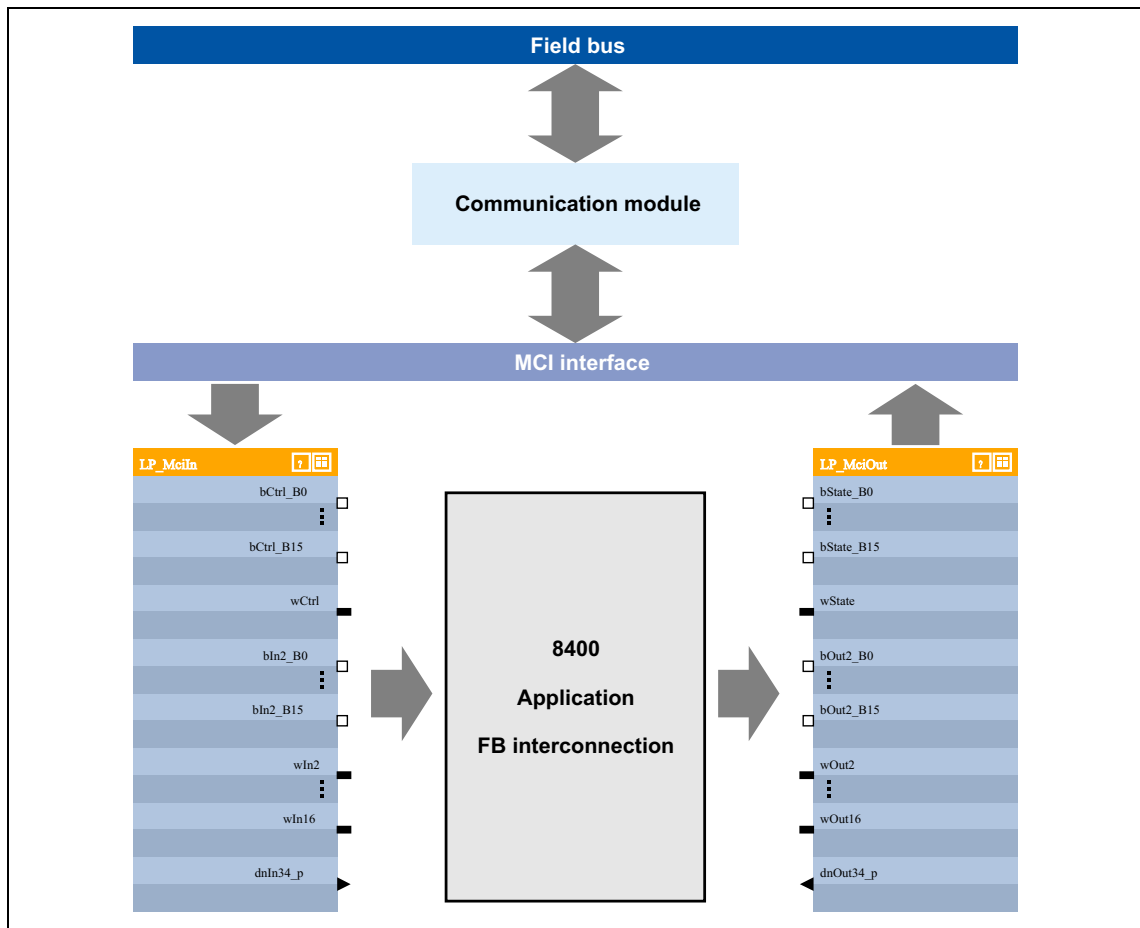
Access to process data / PDO mapping

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)



Note!

The »Engineer« screenshots shown on the following pages are only examples of the setting sequence and the resulting screens.

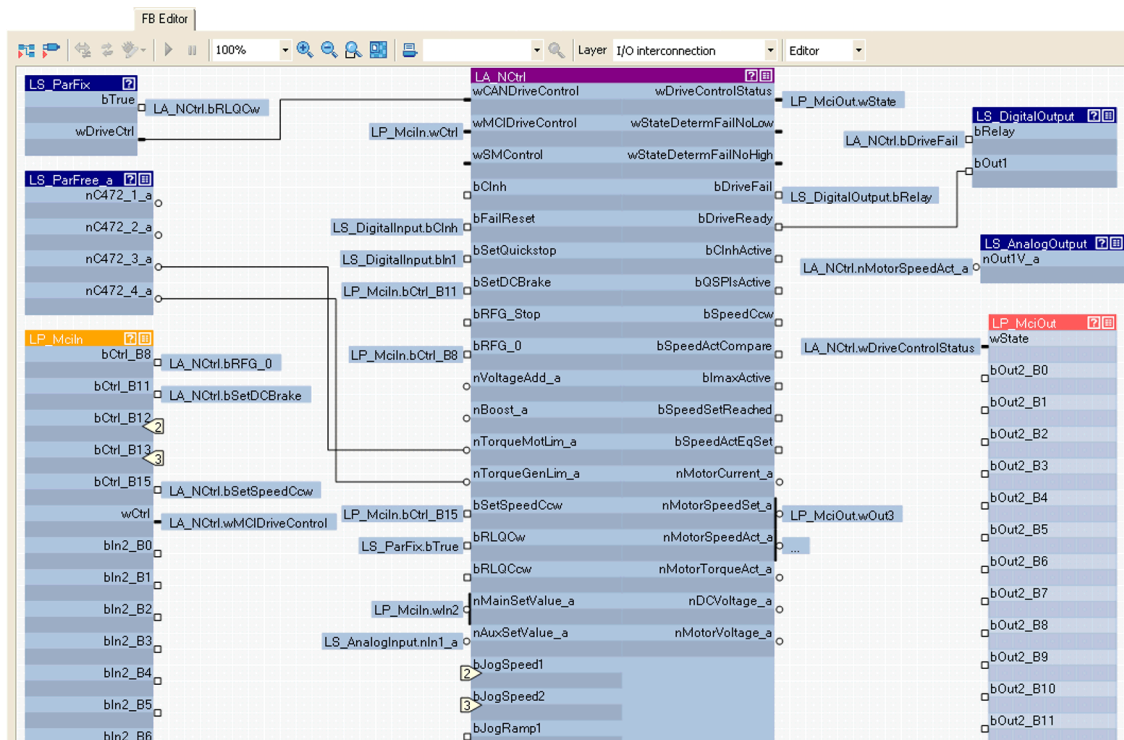
The data in the display fields may differ from the ones of your project.

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:



Process data transfer

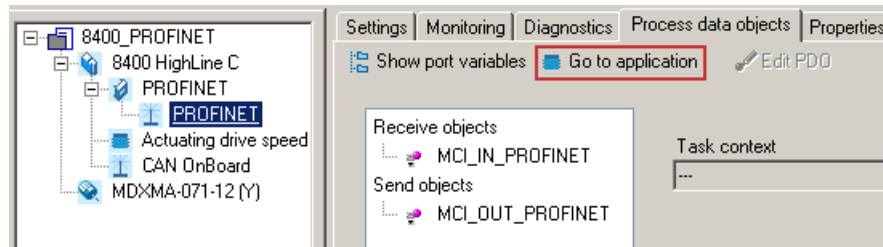
Freely configuring the port interconnection of the process data objects (PDO)

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

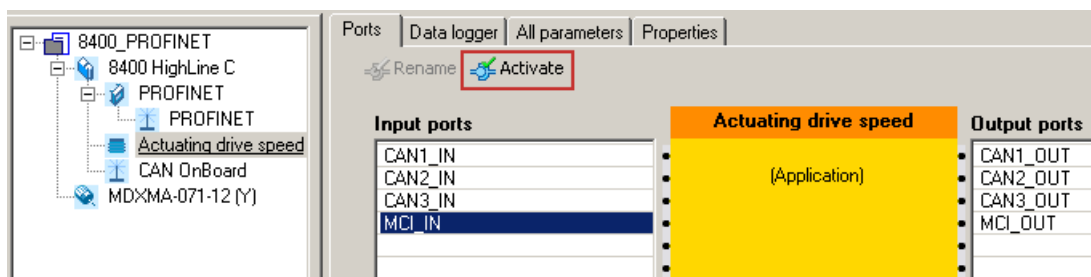


How to freely configure the port interconnection in the »Engineer«:

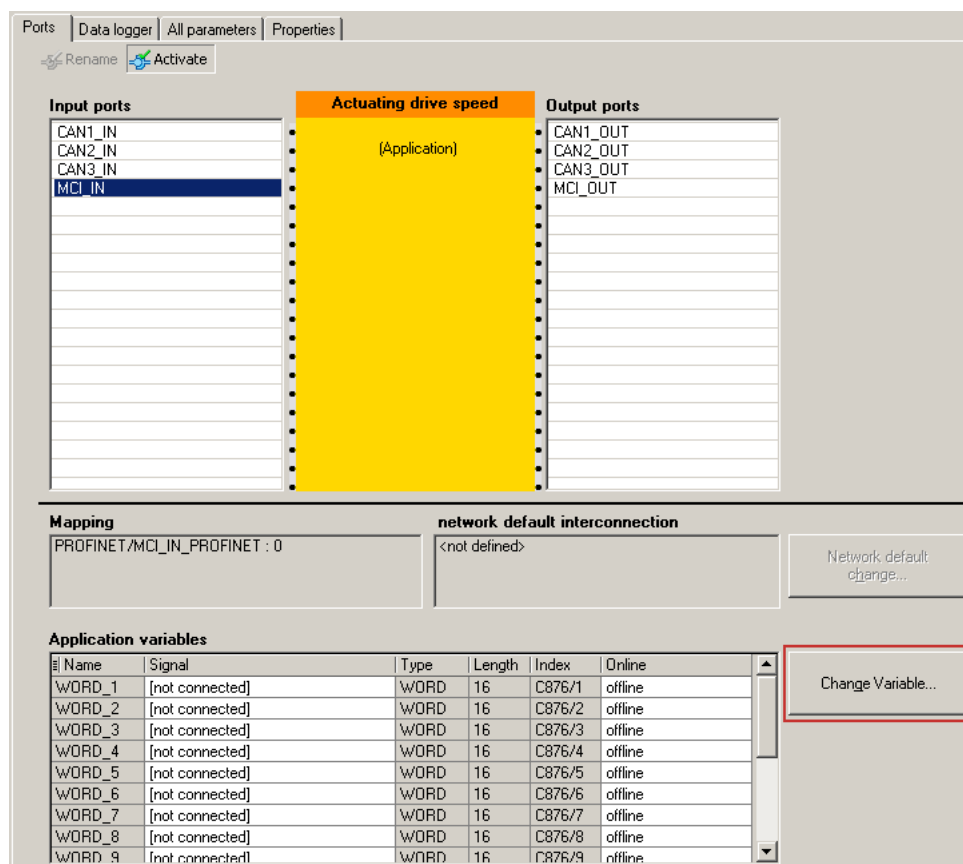
1. Go to the **Process data objects** tab and click **Go to application**.



2. Go to the **Ports** tab, select the port blocks "MCI_IN" or "MCI_OUT" and click **Activate** to activate them.



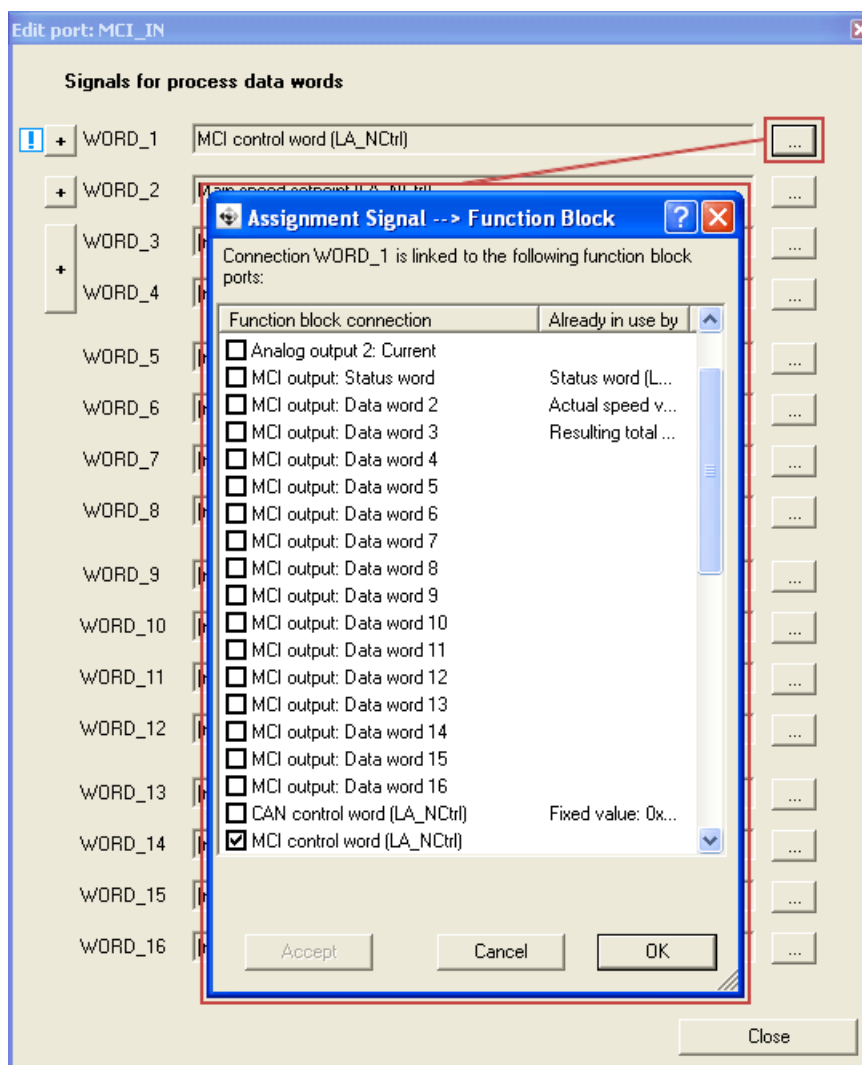
3. Click the **Change Variable ...** button.



Process data transfer

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

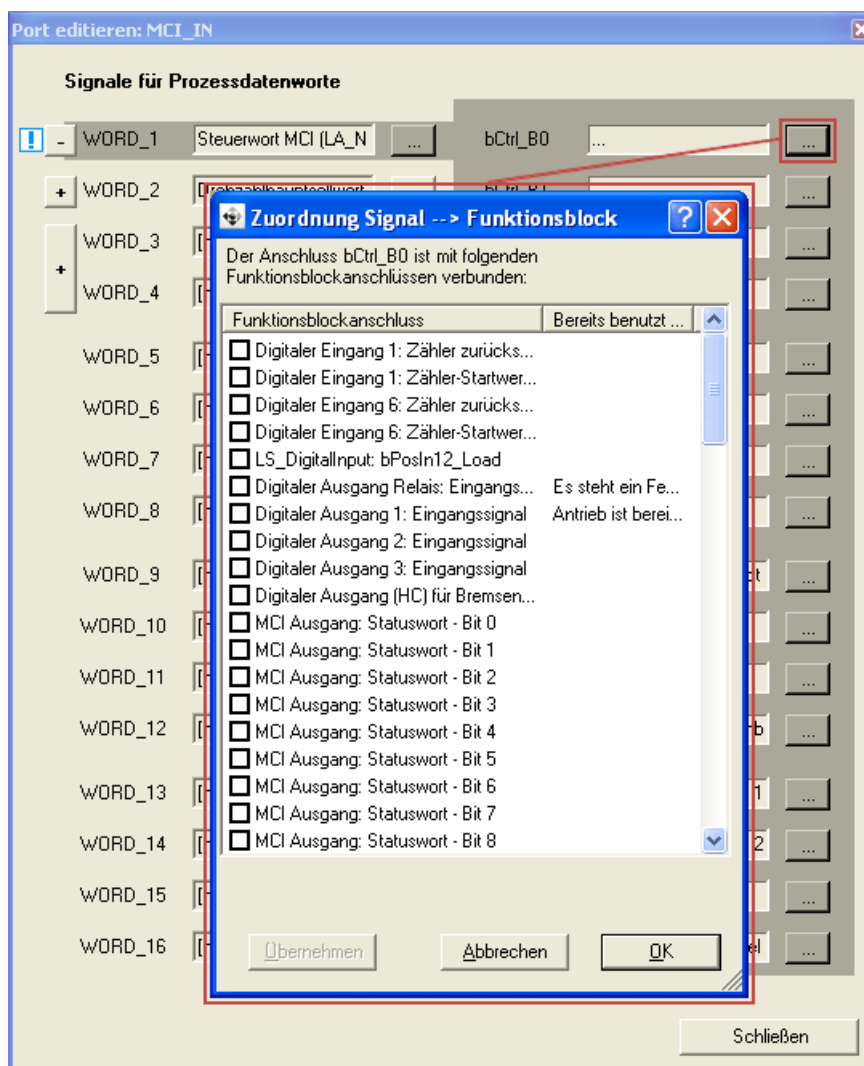
4. Via the  button, you can assign signals to the process data words in the *Assignment Signal --> Function Block* dialog window.
→ Select the signals and then confirm the selection with **OK**.



Process data transfer

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

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**.



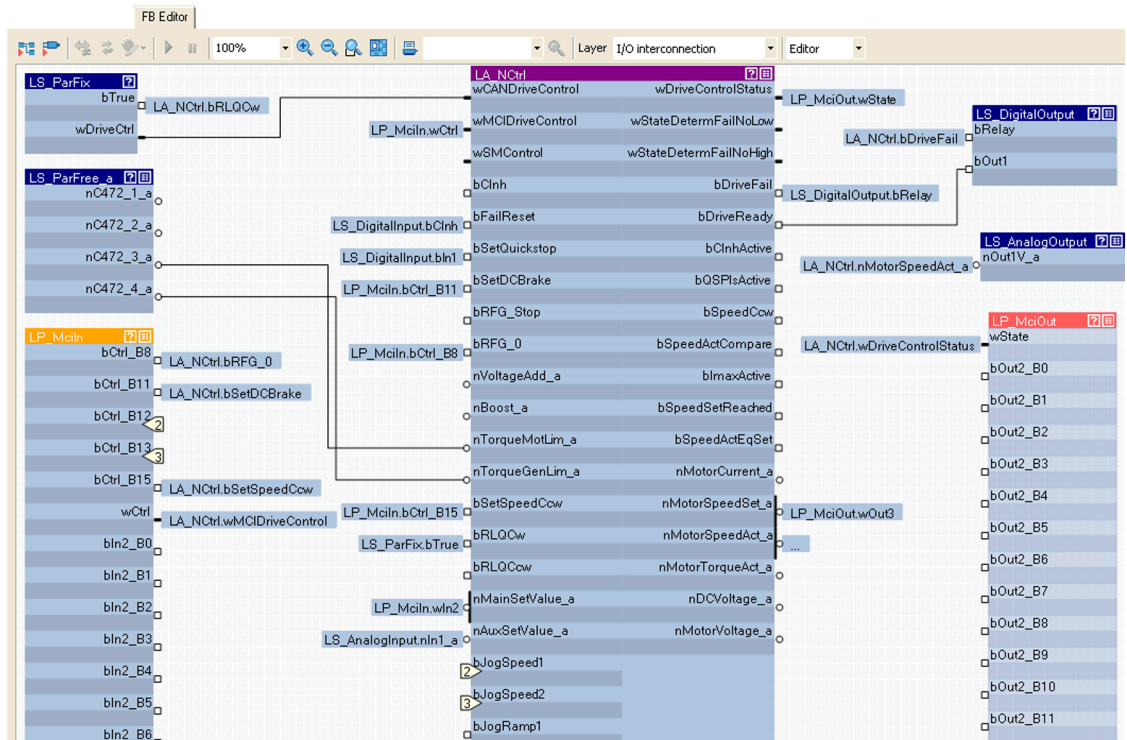
Process data transfer

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.



Parameter data transfer

The acyclic channel (PROFIdrive profile)

9 Parameter data transfer

9.1 The acyclic channel (PROFIdrive profile)

An optional service extension is the acyclic parameter data transfer.

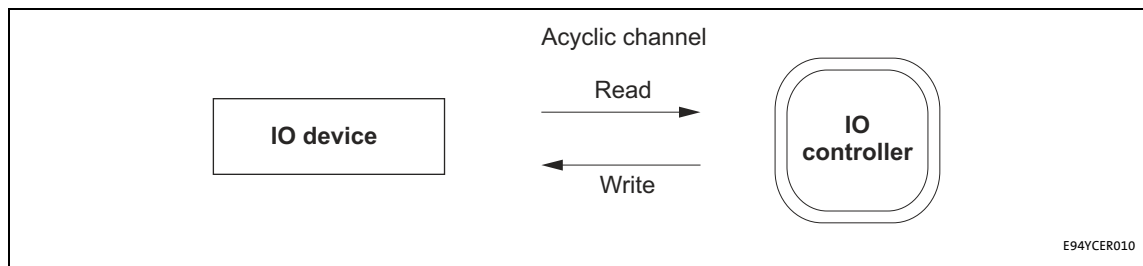
Cyclic and acyclic PROFINET services can be operated simultaneously in the network.

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.

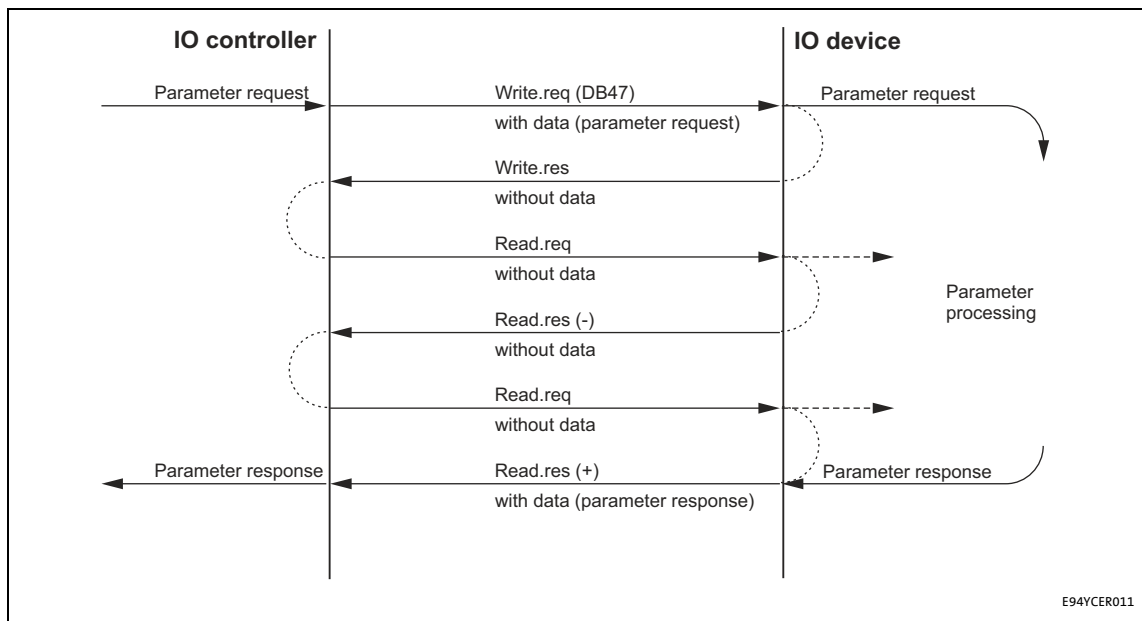


[9-1] Data communication via the acyclic channel

Parameter data transfer

The acyclic channel (PROFIdrive profile)

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)

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	

Parameter data transfer

Reading parameters from the inverter

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)

Parameter data transfer

Reading parameters from the inverter

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 data transfer

Reading parameters from the inverter

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

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

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)	

Parameter data transfer

Writing parameters to the inverter

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

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

Parameter data transfer

Writing parameters to the inverter

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

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

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 data transfer

Writing parameters to the inverter

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) " (book 68)	

Parameter data transfer

Error information (error)

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	Reserved	-	-
...			
0x0064			

Parameter data transfer

Error information (error)

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

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):



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.

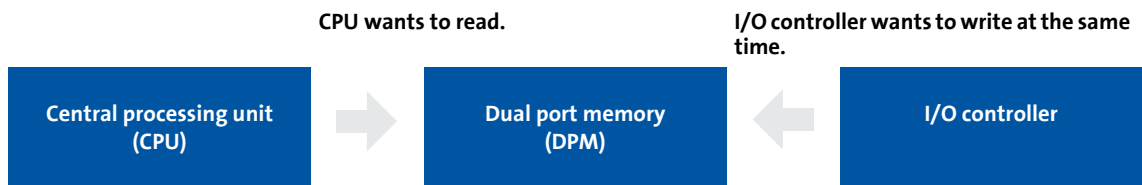
In order to avoid such an impermissible state, the parameter data to be transmitted must be marked as "consistent".

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:



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



Note!

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

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:

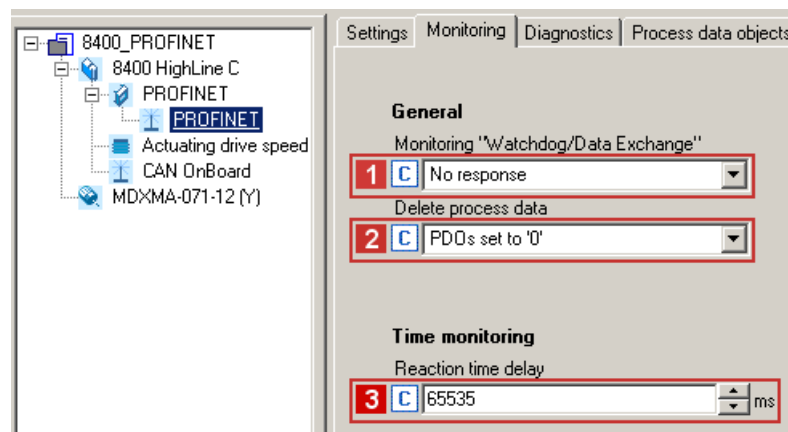
1. During the initialisation of PROFINET communication the watchdog monitoring time specified in the I/O controller ([C13882](#)) is transferred to the I/O device.

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.

Monitoring

Interruption of internal communication

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

11 Diagnostics

For purposes of fault diagnostics, the communication module is provided with the LEDs on the front. Furthermore you can carry out the [Diagnostics with the »Engineer«](#) (📖 77).

11.1 LED status displays



Note!

During normal operation ...

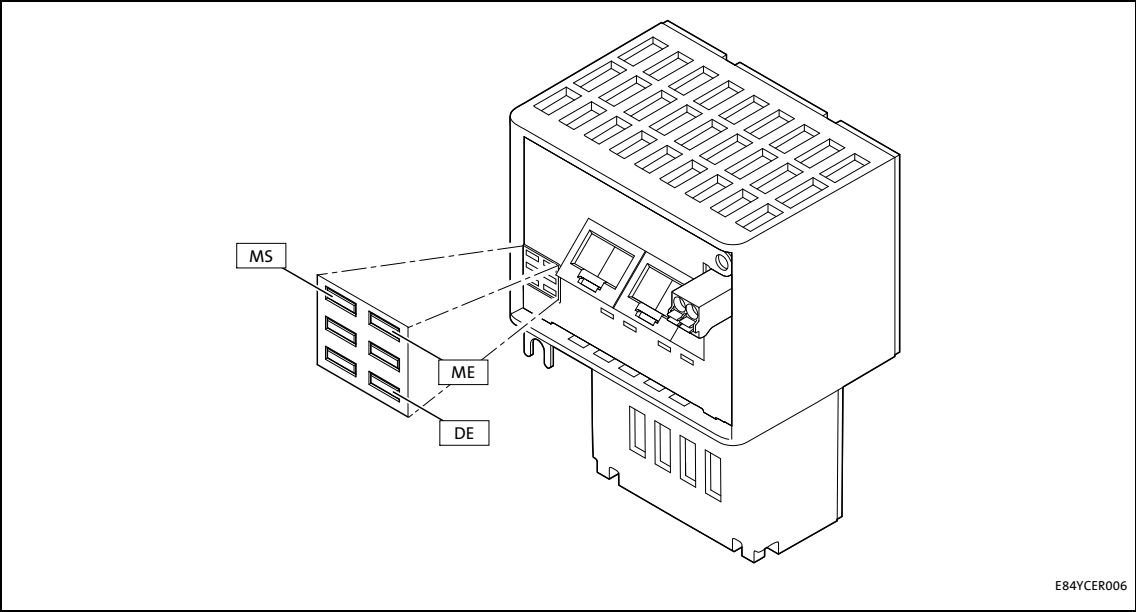
- only the LEDs **MS** (📖 74) and **BS** (📖 75) should be lit permanently.
- the green LEDs on the RJ45 sockets X256/X257 must be lit or blinking (📖 76).

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.

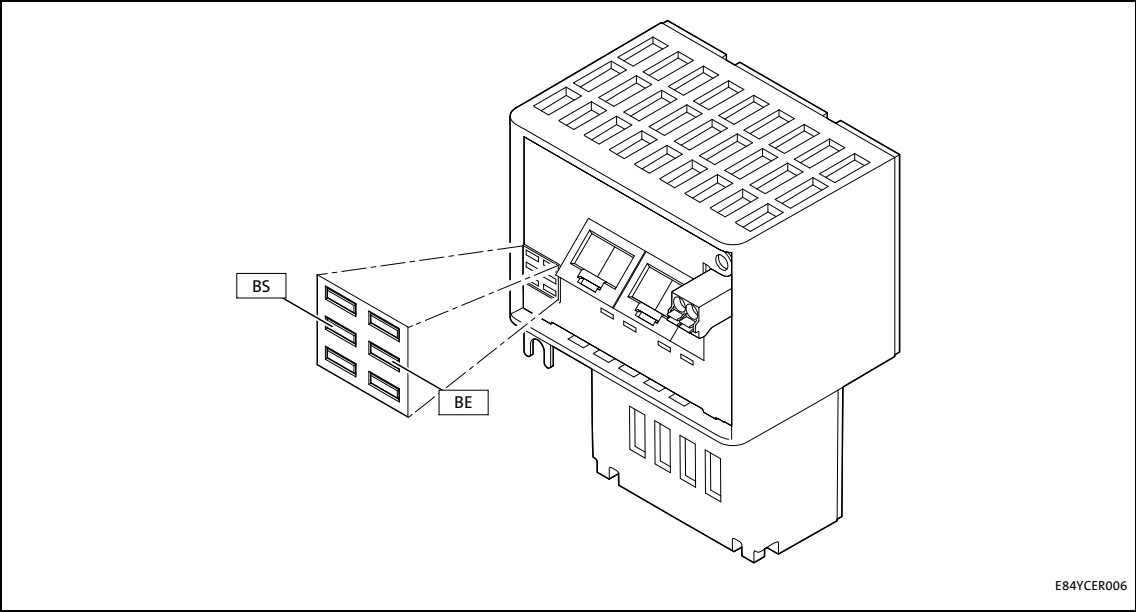


E84YCER006

LED	Colour	Status	Description
MS	green	On	 The communication module is supplied with voltage and is connected to the standard device.
		blinking	 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	 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.)

11.1.2 **Fieldbus status displays**

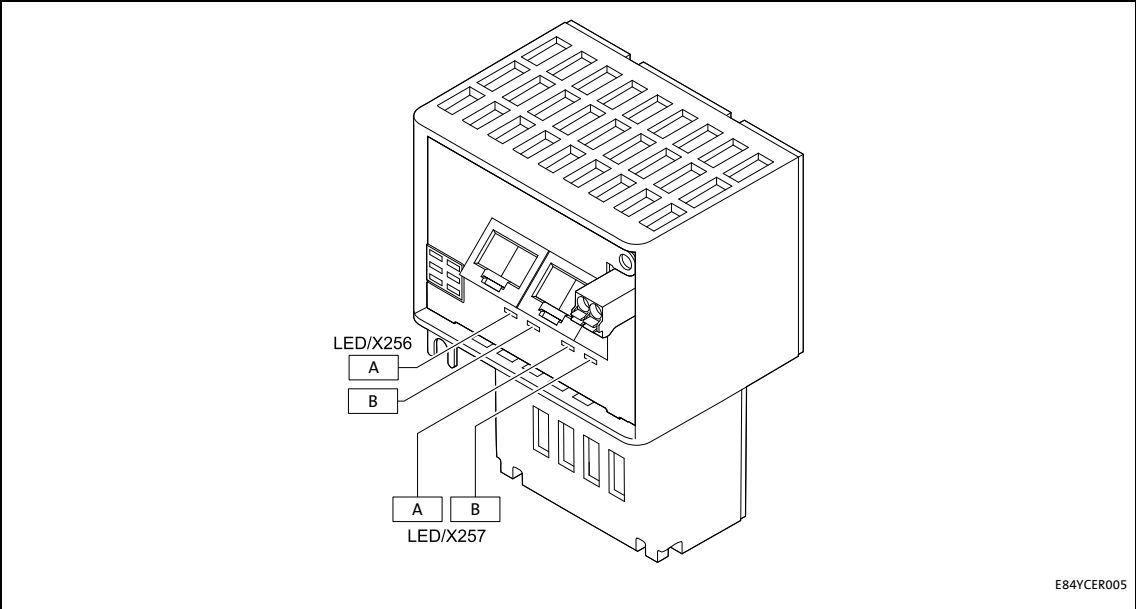
The LEDs **BS** and **BE** indicate the fieldbus status.



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.

11.1.3 Status displays at X256 and X257

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

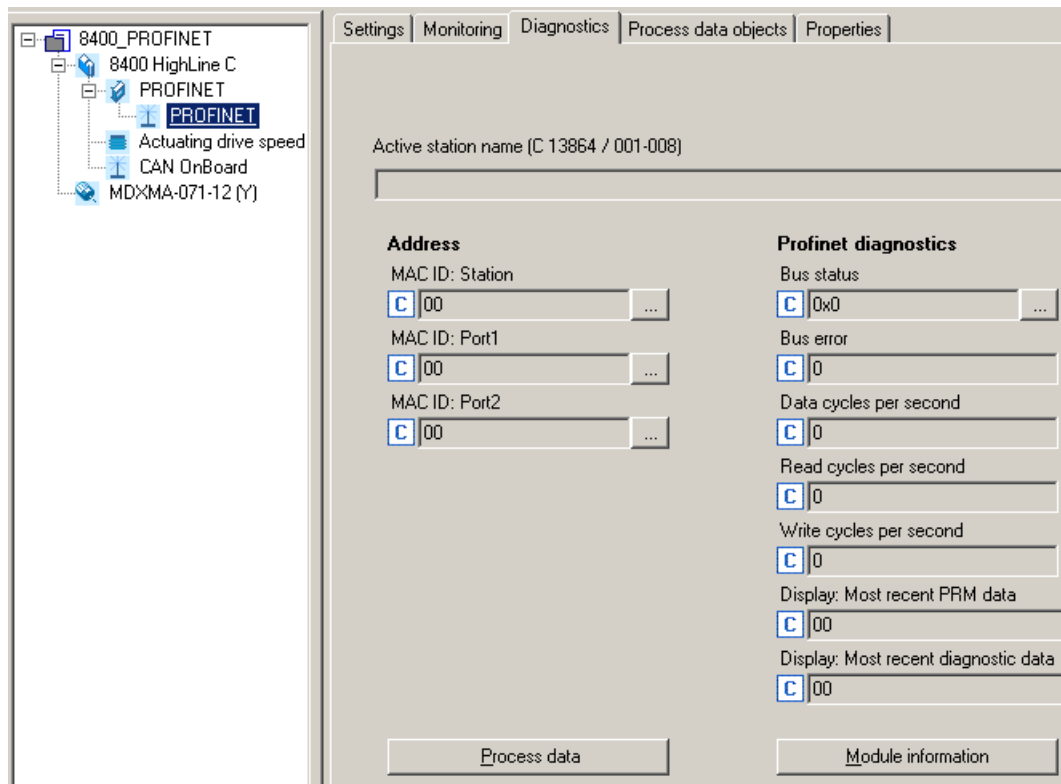


E84YCER005

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	  Communication active

11.2 Diagnostics with the »Engineer«

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

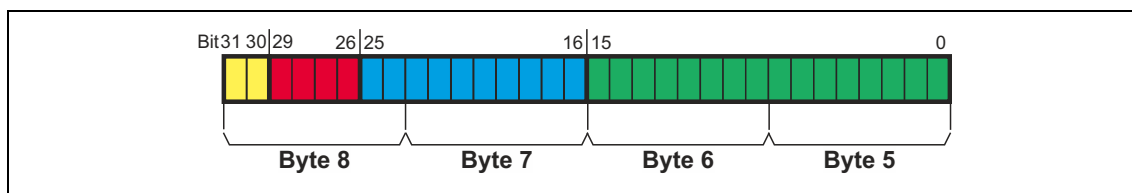


11.3 Diagnostic data

- 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	

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	0	0	1	1	0	1	1	1	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.

Error messages

Short overview of the PROFINET error messages

12 Error messages

[ALinkKeywords]
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.

[Search-Keywords]
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

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](#)" ([book 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

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

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 too 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

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.

Parameter reference

Parameters of the communication module

13 Parameter reference

[ALinkKeywords]
Parameters

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.

[Search-Keywords]
Hlp_Para

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: C13000 IP address			Data type: UNSIGNED_32 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			

Parameter reference

Parameters of the communication module

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		

Parameter reference

Parameters of the communication module

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			
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				

Parameter reference

Parameters of the communication module

C13850

Parameter Name: C13850 All words to master			Data type: UNSIGNED_16 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: C13851 All words from master			Data type: UNSIGNED_16 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: C13852 All words to standard device			Data type: UNSIGNED_16 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					

Parameter reference

Parameters of the communication module

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			

Parameter reference

Parameters of the communication module

C13862

Parameter Name: C13862 Bus counter			Data type: UNSIGNED_32 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: C13864 Active station name		Data type: VISIBLE_STRING 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		

Parameter reference

Parameters of the communication module

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		

Parameter reference

Parameters of the communication module

C13878

Parameter Name: C13878 Bus error(2)		Data type: BITFIELD_16 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: C13880 Monitoring Reaction		Data type: UNSIGNED_8 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: C13881 Reaction time delay		Data type: UNSIGNED_16 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		

Parameter reference

Parameters of the communication module

C13885

Parameter Name: C13885 Clear process data		Data type: UNSIGNED_8 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: C13887 Suppress signalling diag. mess. upon		Data type: BITFIELD_8 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: C13899 Station name		Data type: VISIBLE_STRING 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		

Parameter reference

Parameters of the communication module

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	

Parameter reference

Parameters of the communication module

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	00000000000000000000000000000000 00000000000000000000000000000000	I&M4 signature code
C13914/2	00000000000000000000000000000000 00000000000000000000000000000000	I&M4 signature code
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

Parameter reference

Table of attributes

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	

Parameter reference

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Table of attributes

Code	Name	Index		DS	DA	Data		Access		
		dec	hex			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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PROFINET®

Inverter Drives 8400 motec_____



E84DGFCRxxx

Communication Manual

EN



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1 About this documentation

Contents

This documentation exclusively contains descriptions of the PROFINET bus system for the Inverter Drive 8400 motec.



Note!

This documentation supplements the **mounting instructions** and the **"Inverter Drives 8400 motec" hardware manual** supplied with the Communication Unit.

The hardware manual contains safety instructions which must be observed!

The properties and functions of PROFINET for Inverter Drives 8400 motec are described in detail. Examples illustrate typical applications.

This documentation also contains the following:

- Safety instructions that must be observed
- The basic technical data of the communication module
- Information on 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.

This documentation does not describe any software provided by other manufacturers. No warranty can be given for corresponding data provided in this documentation. For information on how to use the software, please refer to the host (PLC, IO Controller) documents.

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

Screenshots/application examples

All screenshots in this documentation are application examples. Depending on the firmware version of the field devices and the software version of the Engineering tools installed (»Engineer«), screenshots in this documentation may differ from the representation on the screen.

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 are provided in the download area at:

www.Lenze.com

Information regarding the validity

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

Product series	Type designation	Version
Inverter Drives 8400 motec PROFINET Communication Unit	E84DGFCRxxNx	PROFINET
	E84DGFCRxxJx	PROFINET + Safety

► [Features and variants](#) (12)

1 About this documentation

1.1 Document history

1.1 Document history

Version			Description
5.0	02/2019	TD23	• General corrections
4.0	03/2017	TD17	• General corrections • Description for C13887 (📖 84) updated.
3.0	02/2017	TD17	• New layout • New: Response of the outputs in compliance with PROFINET standard V2.3 (📖 38) • Updated: LED status displays (📖 66)
2.0	11/2011	TD17	General revision
1.0	06/2011	TD17	First edition

1 About this documentation

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
Decimal separator	Point	The decimal point is always used. For example: 1234.56
Hexadecimal	0x[0 ... 9, A ... F]	Example: 0x60F4
Binary • Nibble	In inverted commas Point	Example: '100' Example: '0110.0100'
Text		
Version information	Blue text colour	All information that only applies to or from a certain software version of the inverter is marked accordingly in this documentation. Example: This function extension is available from software version V3.0!
Program name	» «	The Lenze »Engineer« PC software...
Control element	Bold	The OK button... / The Copy command... / The Properties tab... / The Name input field...
Sequence of menu commands		If several commands are required in succession for executing a function, the single commands are separated by an arrow: Select the File → Open command to...
Hyperlink	Underlined	Optically highlighted reference to another topic. It is activated with a mouse-click in this online documentation.
Icons		
Page reference	(5)	Optically highlighted reference to another page. It is activated with a mouse-click in this online documentation.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

1.3

Terminology used

Term	Meaning
Inverter	Lenze frequency inverter of the "Inverter Drives 8400 motec" product series
Standard device	
Drive Unit Communication unit Wiring Unit	The 8400 motec inverter has a modular structure that includes the following modules: "Drive Unit", "Communication Unit", and "Wiring Unit". • The drive unit is available in different power settings. • In case of the communication unit you can select between: • Without fieldbus (basic I/O, standard I/O, extended I/O) • AS interface (without safety/with safety STO) • CANopen (without safety/with safety STO) • EtherCAT (without safety/with safety STO) • EtherNET/IP (without safety/with safety STO) • PROFIBUS (without safety/with safety STO) • PROFINET (without safety/with safety STO) • POWERLINK (without safety/with safety STO) • The wiring unit provides flexible connection possibilities for a simple integration into the power supply of the machine.
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	This setting is the default factory setting of the device.
Basic setting	
»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.
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.
	PROFINET® (Process Field Network) is a real-time capable fieldbus system based on Ethernet. PROFINET® is a registered trademark and patented technology licensed by the PROFIBUS & PROFINET International (PI) user organisation.

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
	Note!	Important note to ensure trouble-free operation
	Tip!	Useful tip for easy handling
		Reference to another document

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.
 - ▶ [Features and variants](#) (📖 12)
 - 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.
- Only qualified personnel may work with and on Lenze drive and automation components. According to IEC 60364 and CENELEC, these are persons ...
 - 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.

2.2**Device and application-specific safety instructions**

- During operation, the Communication Unit must be connected to the Wiring Unit and the Drive Unit.
- With external voltage supply, always use a separate power supply unit, safely separated to EN 61800-5-1 in every control cabinet (SELV/PELV).

**Documentation for "Inverter Drives 8400 motec", control system, plant/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****Device protection**

- The Communication Unit contains electronic components that can be damaged or destroyed by electrostatic discharge.
 - ▶ [Installation](#) (📖 19)

3 Product description

3.1 Application as directed

3 Product description

3.1 Application as directed

The PROFINET communication unit can only be used in conjunction with the following modules:

Product series	Type designation
Inverter Drives 8400 motec Drive Unit	E84DGDVxxxxxxxx
Inverter Drives 8400 motec Wiring Unit	E84DGVNxx

The Communication Unit ...

- is a device intended for use in industrial power systems.
- may only be operated under the operating conditions specified in this documentation.
- may only be used in PROFINET networks.
- can also be used without being connected to the PROFINET network.

Any other use shall be deemed inappropriate!

3.2 Features and variants

The PROFINET Communication Unit is available in the following versions:

Product series	Type designation	Product features				
		Enclosure	Connection PROFINET	I/O: Connection via terminal	I/O: Connection via M12	Safety
Inverter Drives 8400 motec PROFINET Communication Unit	E84DGFCRFNP	IP 65	M12	3× DI 1× DO	2× DI	
	E84DGFCRENP	IP 65	M12	2× DI	3× DI 1× DO	
	E84DGFCRFJP	IP 65	M12	3× DI 1× DO 1× AI	2× DI	●
	E84DGFCREJP	IP 65	M12	3× DI	2× DI 1× DO 1× AI	●

-
- The PROFINET Communication Unit is ...
 - mounted on top of the Wiring Unit (E84DGVNxx);
 - supplied internally via the Drive Unit (E84DGDVxxxxxxx) or externally via a separate voltage source.
 - The I/O connections can be brought into the device via M12 connectors or cable glands.
 - Devices without an integrated safety system (safety option) have no analog input and no relay output.
 - The integrated safety system can be used on machines for the protection of persons.
 - 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.
 - Protocols supported:
 - LLDP (Link Layer Discovery Protocol) for topology recognition
 - SNMP (Simple Network Management Protocol) for diagnostics
 - MRP (Media Redundancy Protocol) for the implementation of the inverter into a ring topology as client node
 - Exchange of up to 8 process data words per direction
 - Communication with the Lenze »Engineer« (access to all Lenze parameters) is executed via the diagnostic interface of the Drive Unit.
 - An online connection via PROFINET can be established using the Lenze »Engineer«.

**"Inverter Drives 8400 motec" hardware manual**

Here you will find detailed information on the integrated safety system (safety option).

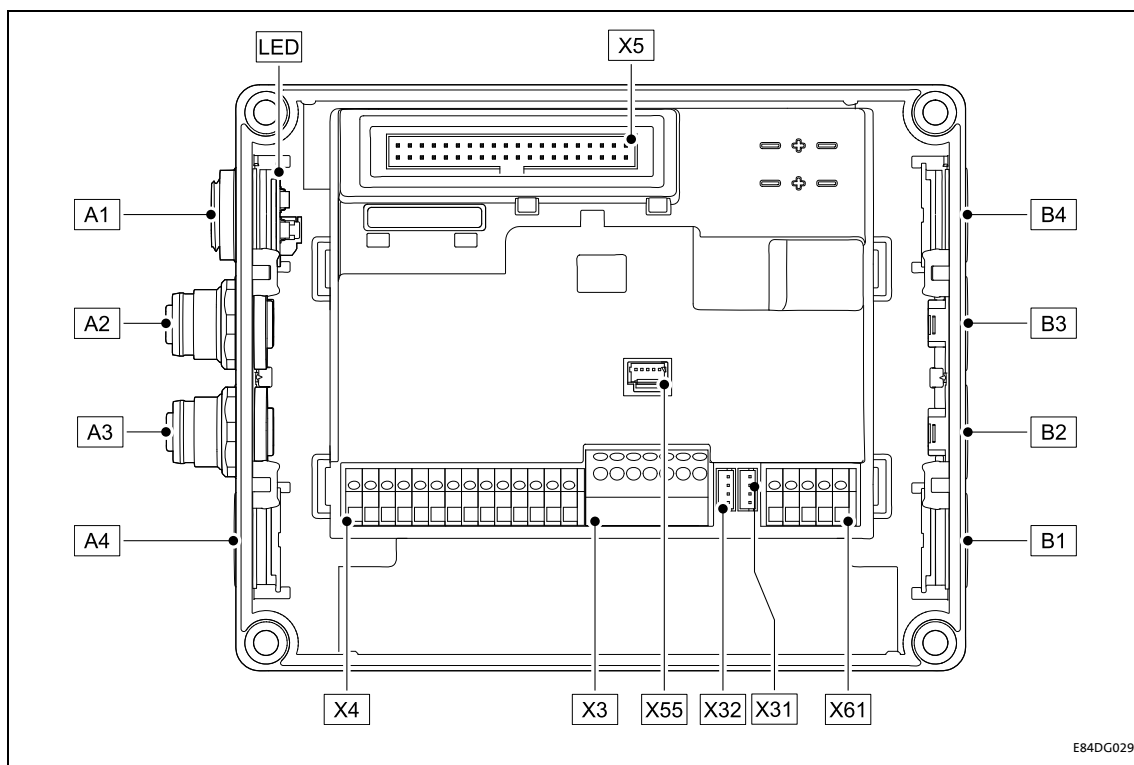
Reference manual/online help for the Inverter Drive 8400 motec

Here you will find detailed information on how to configure the safety system (safety option).

3 Product description

3.3 Connections and interfaces

3.3 Connections and interfaces



[3-1] PROFINET Communication Unit

Pos.	Description
A1 / LED	Position for LEDs for PROFINET status display ▶ LED status displays (66)
A2	PROFINET port 1 (M12 socket, 5-pole, D-coded) ▶ PROFINET connection (23)
A3	PROFINET port 2 (M12 socket, 5-pole, D-coded) ▶ PROFINET connection (23)
A4	Positions for further freely designable inputs and outputs:
B1 ... B4	• Digital inputs • Digital output • Analog input (only for E84DGFCRxJx) • Relay output (only for E84DGFCRxJx) • Connection of "Safety Option" safety system (only for E84DGFCRxJx)
X3 / X4 / X61	Terminal strips for wiring the connections at A4 and B1 ... B4
X5	Plug connector for connection to the Drive Unit
X31	Plug connector for wiring PROFINET port 1 at A2
X32	Plug connector for wiring PROFINET port 2 at A3
X55	Plug connector for the wiring of the LEDs to A1

- By default, the PROFINET connections and the LEDs for the PROFINET status displays are already mounted and wired:
 - PROFINET port 1 at plug connector X31
 - PROFINET port 2 at plug connector X32
 - LEDs on plug connector X55
- It is also possible to connect the PROFINET and other inputs and outputs (e.g. digital inputs) via the positions A1 ... A4 and B1 ... B4.
- For the connections, 5-pin M12 connectors or - alternatively - cable glands (cable cross-section max. 1.0 mm², AWG 18) can be used.
- The M12 connectors, cable glands and prefabricated system cables can be obtained from various manufacturers.
- Wire the M12 connectors or cable glands used to the corresponding contacts of the terminal strips/plug connectors X3, X4 and X61.

**"Inverter Drives 8400 motec" hardware manual**

Observe the notes and wiring instructions contained in this documentation.

4

Technical data

**"Inverter Drives 8400 motec" hardware manual**

Here you will find the **ambient conditions** and information on the **electromagnetic compatibility (EMC)** that also apply to the Communication Unit.

4.1

General data and operating conditions

Range	Values
Order designation	- E84DGFCRxNx (PROFINET) - E84DGFCRxJx (PROFINET + Safety)
Communication profile	PROFINET
Communication medium	S/FTP (Screened Foiled Twisted Pair, ISO/IEC 11801 or EN 50173), CAT 5e
Interface for communication	- PROFINET port 1: M12 socket, 5-pole, D-coded - PROFINET port 2: M12 socket, 5-pole, D-coded
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 between two nodes	100 m
PNO identification number	0x0106
Device identification (Device ID)	0x8440
Baud rate	100 Mbps
Switching method	"Store and forward"
Switch latency	Approx. 125 µs at max. frame length
External voltage supply	- U = 24 V DC (20 V - 0 % ... 29 V + 0 %) - I_{max} = 120 mA
Conformities, approvals	- CE - UR / cUR (see also hardware manual)

4.2 Protocol data

Range	Values
Process data words slot 1	1 ... 8 process data words (max. 16 bytes)
Process data words slot 2 (for digital/analog inputs)	Optionally 0, 1, or 2 process data words (max. 4 bytes) ▶ Process input data AI/DI (Slot2) (□ 44)
Acyclic parameter channel	Limited by the PROFINET frame size

4.3 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 an 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 + 0 ... 1 ms + 1 ... x ms Update cycle Processing time in the module Runtime of the application task of the technology application used (tolerance)
Parameter data	Approx. 30 ms + a tolerance of 20 ms (typically) • Some codes may require a longer processing time (see reference manual/ online help for Inverter Drive 8400 motec).

There are no interdependencies between parameter data and process data.

4.4 Internal switch latency

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

$$\text{Runtime delay} = ((36 \text{ permanent bytes} + \text{process data in bytes}) \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$$

Example :

20 process data words => 40 bytes

- $((36 \text{ permanent bytes} + 40 \text{ bytes}) \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$
- $(76 \text{ bytes} \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$
- $6.08 \text{ } \mu\text{sec} + 4 \text{ } \mu\text{sec} = \mathbf{10.08 \text{ } \mu\text{sec}}$

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](#) (📖 21)

5 Installation



Stop!

Electrostatic discharge

Electronic components within the Communication Unit can be damaged or destroyed by electrostatic discharge.

Possible consequences:

- The Communication Unit is defective.
- Fieldbus communication is not possible or faulty.
- I/O signals are faulty.
- The safety function is faulty.

Protective measures

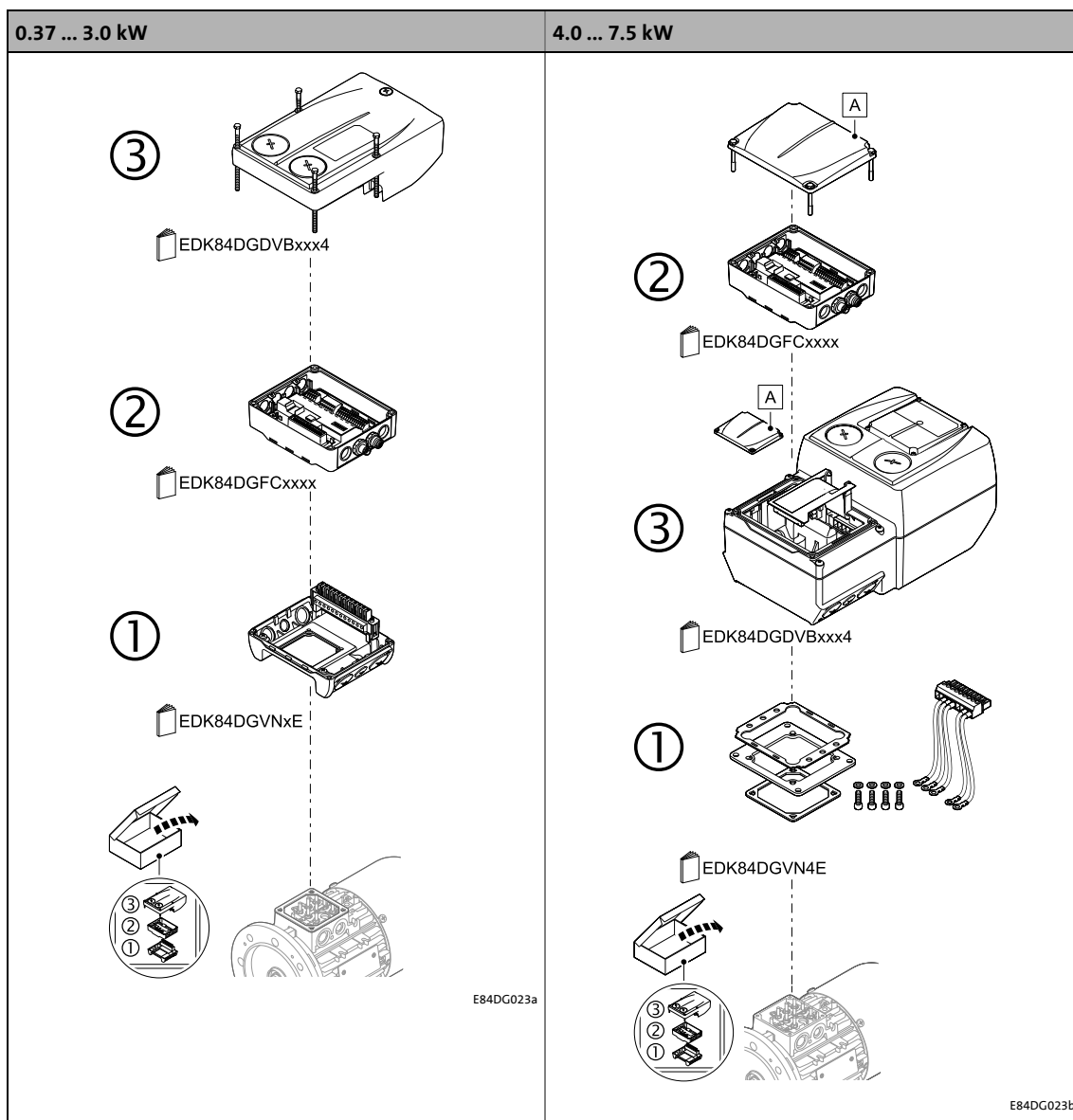
- Discharge electrostatic charges before touching the Communication Unit.

5.1 Mechanical installation



Mounting instructions "Inverter Drives 8400 motec"

Here you will find detailed information on the installation.



[5-1] Mechanical installation of the 8400 motec components

Legend for fig. [5-1]	
1	Drive Unit
2	Communication unit
3	Wiring Unit
A	Cover of the Drive Unit
EDK84DG...	Mounting instructions of the Drive Unit, Communication Unit, Wiring Unit

5.2

Electrical installation

**"Inverter Drives 8400 motec" hardware manual**

Here you can find detailed information on ...

- the digital and analog inputs/outputs;
- the relay output;
- the integrated safety system (safety option);
- the wiring of the terminals.

Observe the notes and wiring instructions contained in this documentation.

5.2.1

Network topology

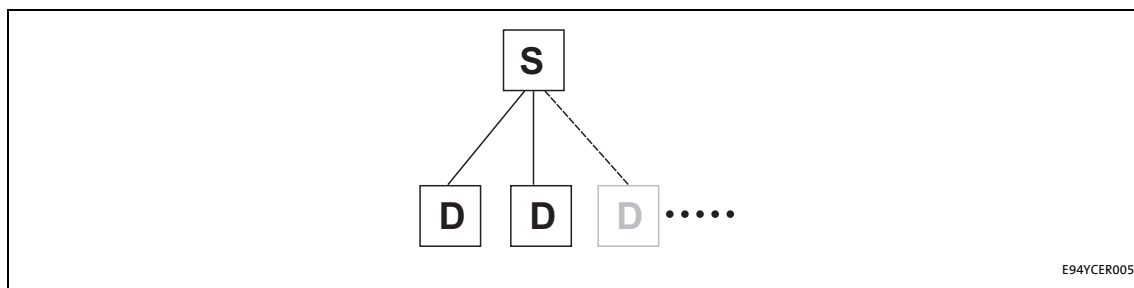
It is typical of PROFINET to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

► [Internal switch latency](#) (18)

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

PROFINET supports the following topologies:

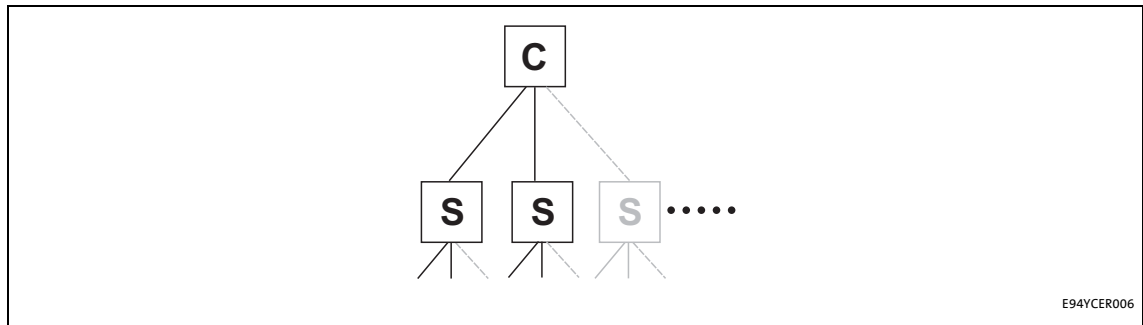
- Switch / star



E94YCER005

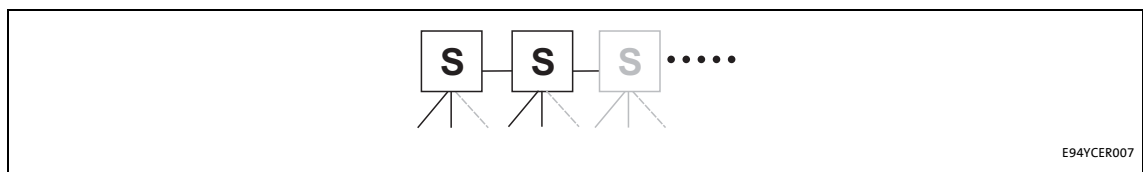
[5-2] Switch / star topology (S = switch, D = I/O device)

- Tree via switches



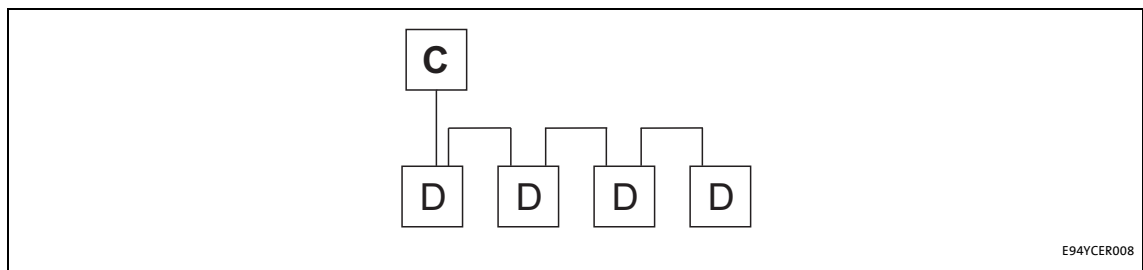
[5-3] Tree topology (C = I/O controller, S = switch)

- Switch / switch



[5-4] Switch/switch topology (S = switch)

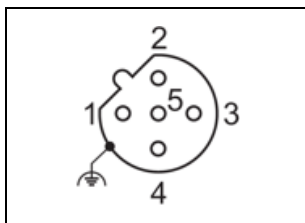
- I/O controller / I/O device



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

5.2.2 PROFINET connection

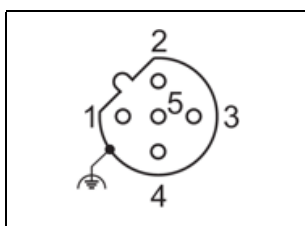
PROFINET port 1



- M12 socket, 5-pole, D-coded
- Wiring at terminal strip X31

Pin	Signal	Description
1	Tx +	Data line (transmitted data, plus)
2	Rx +	Data line (received data, plus)
3	Tx -	Data line (transmitted data, minus)
4	Rx -	Data line (received data, minus)
5	-	not assigned

PROFINET port 2



- M12 socket, 5-pole, D-coded
- Wiring at terminal strip X32

Pin	Signal	Description
1	Tx +	Data line (transmitted data, plus)
2	Rx +	Data line (received data, plus)
3	Tx -	Data line (transmitted data, minus)
4	Rx -	Data line (received data, minus)
5	-	not assigned

5.2.3 External voltage supply

- The external voltage supply can be used to establish PROFINET communication for commissioning and to query the data of the digital and analog inputs.
- Furthermore the external voltage supply serves to maintain PROFINET communication if the main supply fails.
- The digital inputs RFR, DI1 ... DI5 and the analog input can continue to be evaluated.
- The external voltage supply is done via the terminals 24E and GND of the terminal strip X3.
- Permissible voltage (DC) / max. current:
 - $U = 24 \text{ V DC (} 20 \text{ V} - 0 \% \dots 29 \text{ V} + 0 \% \text{)}$
 - $I_{\text{max}} = 120 \text{ mA}$
- Access to parameters of a device that is disconnected from the mains is not possible.



"Inverter Drives 8400 motec" hardware manual

Here you can find detailed information on how to wire the Communication Unit.

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-volatily as a data set in the memory module.

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

▶ [Parameter reference](#) (□ 75)

The data from the inverter or the memory module can only be read with the main voltage supply (400/500 V AC).

For commissioning with 24 V DC, only the data of the digital and analog inputs in the last two data words are valid and readable (see [Process input data AI/DI \(Slot2\)](#) (□ 44)).

6.1

Before initial switch-on



Stop!

Before switching on the inverter for the first time, check the entire wiring with regard to completeness, short circuit, and earth fault.

6.2 Configuring the PROFINET IO controller

For communication with the PROFINET Communication Unit, the IO controller must be configured first.

Configuration for device control

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

The device description file **GSDML-Vx.z-Lenze-8440PNabb-yyyymmdd.xml** can be found in the download area at:

www.Lenze.com

Wildcards in the file name "GSDML-Vx.z-Lenze-8440PN100-yyyymmdd.xml"	
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 PROFINET Communication Unit supports the configuration of max. 8 process data words (max. 16 bytes).

Description of the device data base file

Selection text	Process data	Assigned I/O memory
Slot 1: PCD (nW)	1 ... 8 words	0 ... 16 bytes
Slot 2: AI/DI (nW)	0 ... 2 words	0 ... 4 bytes

Example of selecting the device data base file

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

6.3

Setting the station name

**Note!**

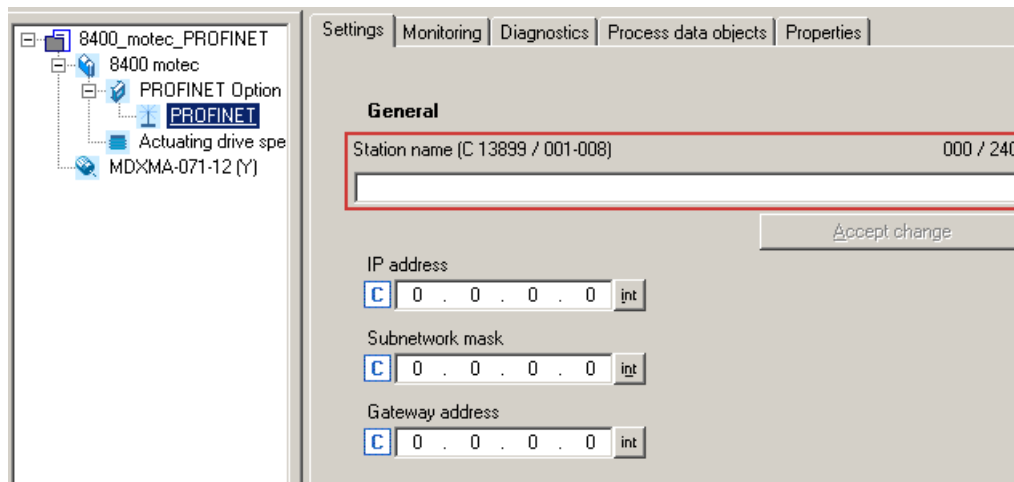
- The "Node blinking test" PROFINET function which serves to identify an accessible device is supported. The red LED **BE** ([LED status displays \(66\)](#)) flickers during execution.
- Operation of PROFINET requires a valid station name.
- In the case of impermissible settings, the red LED **BE** blinks ([LED status displays \(66\)](#)), and the error message [PROFINET: Stack init error \[0x01bc6534\] \(74\)](#) is output. The Communication Unit then internally continues to work with the deleted name.
- If the station name is assigned by the IO controller via PROFINET or via the PROFINET configurator of the »Engineer«, changes will become 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 motec 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)

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.

6.4 Setting the IP configuration

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

If no PROFINET network or no IO controller is available yet, you have the following options to allocate the IP address, subnet mask, and gateway address for the Communication Unit:

- [Setting via the PROFINET configurator of the »Engineer«](#) (📖 30)
- [Setting via codes in the »Engineer«](#) (📖 32)



Note!

- If the IP parameters are assigned by the IO controller via PROFINET or the PROFINET configurator of the »Engineer«, changes will become effective immediately and are saved with mains failure protection.
- The assignment of invalid combinations of the IP address, subnet mask, and gateway address can have the consequence that no connection to PROFINET can be established.
- In the case of impermissible settings, the red LED **BE** blinks ([LED status displays](#) (📖 66)), and the error message [PROFINET: Stack init error \[0x01bc6534\]](#) (📖 74) is output.

6.4.1 Setting via the PROFINET configurator of the »Engineer«



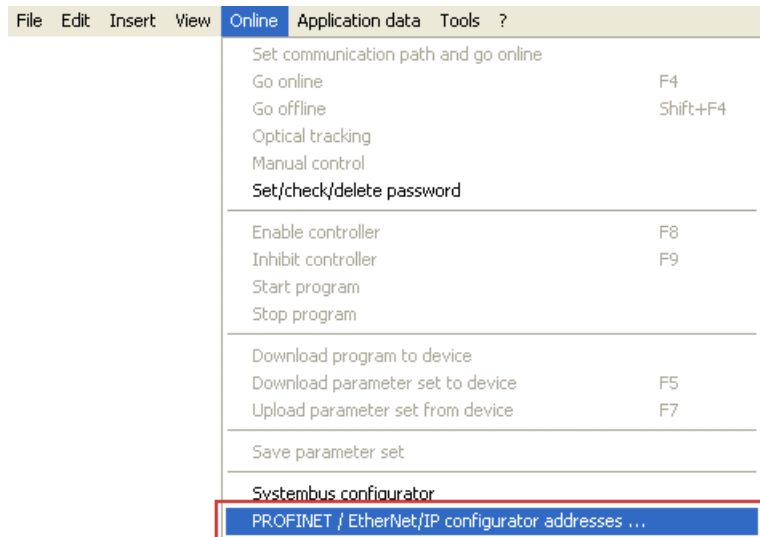
Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network 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.
- Changes will be effective immediately and are saved with mains failure protection.

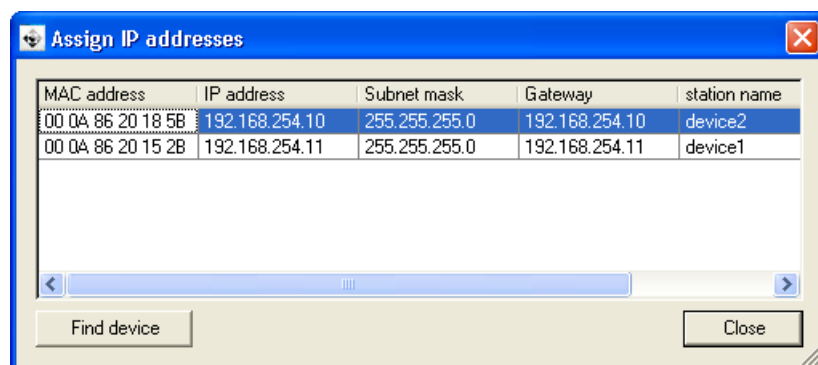


How to set the IP parameters via the PROFINET configurator:

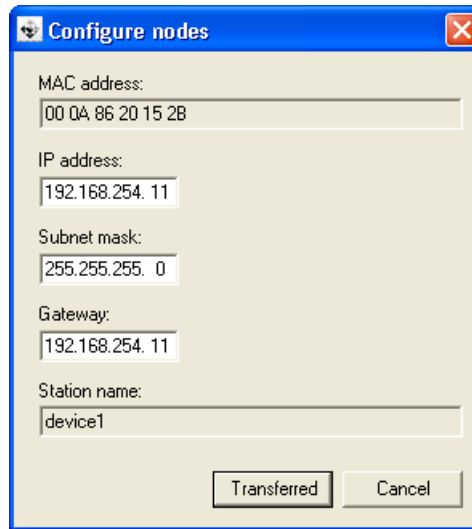
1. Execute the menu command **Online → Profinet configurator addresses....**



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.



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 Unit.

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.

4. With the **C00002 = "11: Save all parameter sets"** device command, the current IP configuration is saved non-volitely.

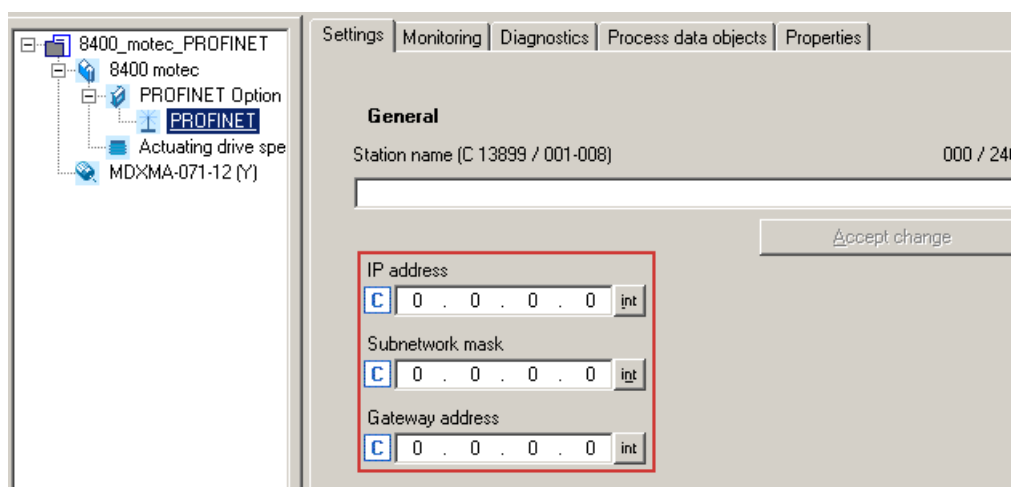
6.4.2 Setting via codes in the »Engineer«



Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network 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.

You can also set the IP parameters manually via code in the »Engineer« under the **Settings** tab.



The IP parameters are written to codes [C13000](#) (IP address), [C13001](#) (subnet mask), and [C13002](#) (gateway address).

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

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

IP address

- The IP address is set/changed in [C13000](#).

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](#).

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](#).

6.5

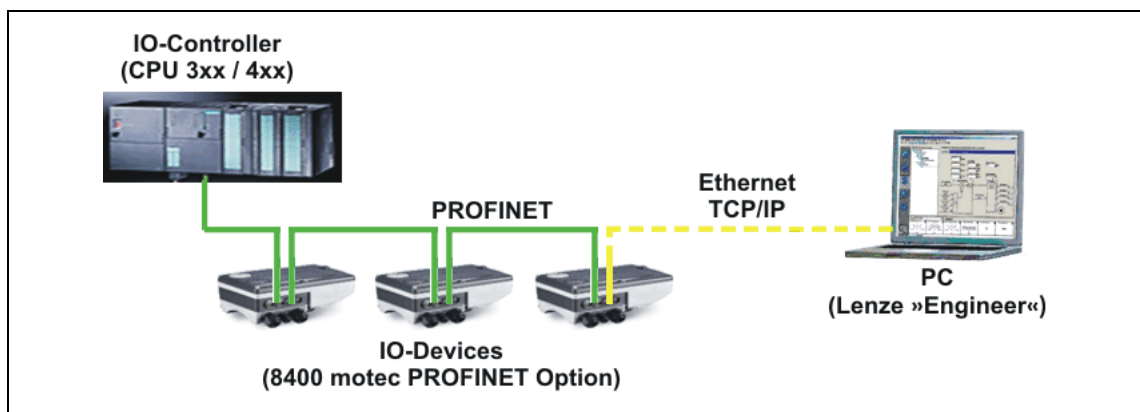
Establishing an online connection via PROFINET with the Lenze »Engineer«

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.

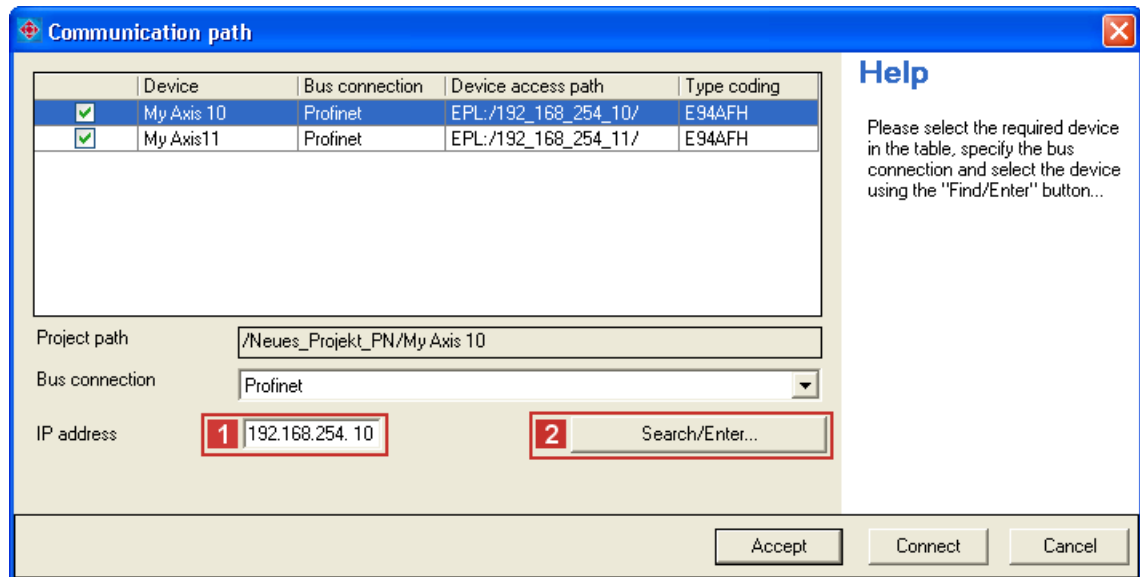
The PROFINET switch integrated in the communication module can execute cyclic PROFINET communication prior to normal TCP/IP communication. In the case of PROFINET this is effected via the VLAN identification in the Ethernet frame.



[6-1] Example: PROFINET network

For an online connection between the »Engineer« and the inverter, the inverter must have an IP address (see [Setting the IP configuration](#) (29)).

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**.
 ▶ [Setting via the PROFINET configurator of the »Engineer«](#) (30)
- 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.

6.6 Initial switch-on

Establishing communication

- To establish communication, the inverter drive must be supplied with mains voltage.
- PROFINET communication requires voltage supply of the communication unit.
- If this requirement is not met, the "CE04: MCI communication error" error message (error No. 01.0127.00002) is output. The error must be reset in the Inverter Drive, so that AS-i communication can be established.
- The external voltage supply serves to maintain PROFINET communication if the main supply fails.
 - ▶ [External voltage supply](#) (📖 24)
- With mains connection (power ON), ...
 - all parameters (codes) are read;
 - the output data are set to '0'.
- Addressing can be effected automatically via the IO controller or manually via codes in the »Engineer«.
 - ▶ [Setting the station name](#) (📖 27)
- Addressing the inverter requires a valid IP configuration if communication between the PC/ »Engineer« and the inverter via PROFINET is to be established.
 - ▶ [Setting the IP configuration](#) (📖 29)

7

Data transfer

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

7.1

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.
 - The Inverter Drive 8400 motec can exchange a maximum of 8 process data words (16 bits/word) per 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 changes must be stored via code **C00002** of the Inverter Drive 8400 motec.

7.2

Response of the outputs in compliance with PROFINET standard V2.3

Event	Response of the outputs
Switch on mains (power ON)	The output data are set to '0'.
Abort of the process data transfer	The output data are treated according to the parameter setting of codes C13880/1 , C13881/0 , and C13885/0 .
Invalid IO controller output values	The output data are set to '0'.

8

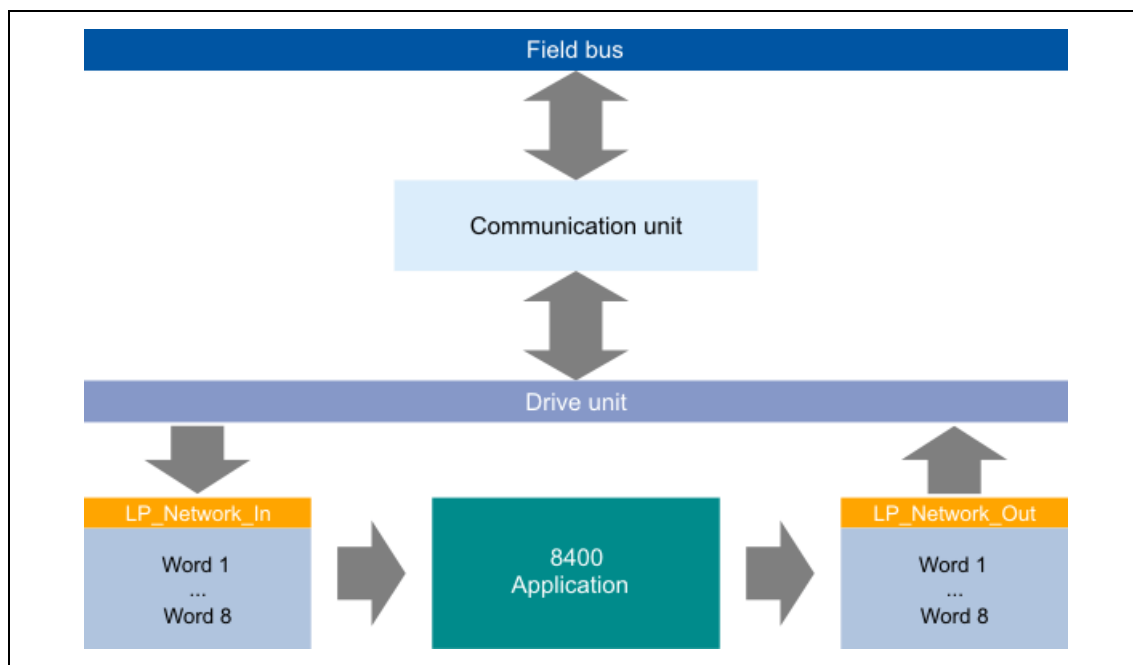
Process data transfer

8.1

Access to process data / PDO mapping

Process data are transferred via the MCI/CAN interface.

- Max. 8 words (16 bits/word) per direction can be exchanged.
- The process data are accessed via the **LP_Network_In** and **LP_Network_Out** port blocks. These port blocks are also called process data channels.
- Port block **LP_Network_In** maps the MCI PDOs received.
- Port block **LP_Network_Out** maps the MCI PDOs to be transmitted.
- The port/function blocks of the process data objects (PDO) are interconnected via the Lenze »Engineer«.



[8-1] External and internal data transfer between the bus system, inverter, and application



Reference manual/online help for the Inverter Drive 8400 motec

Here you will find detailed information on the port/function block interconnection in the »Engineer« and the port blocks.



Note!

The »Engineer« screenshots shown on the following pages are only examples of the setting sequence and the resulting screens.

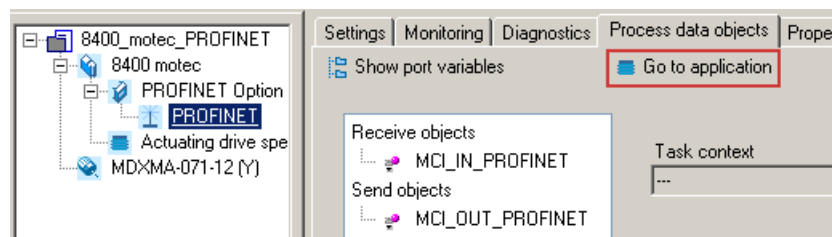
Depending on the software version of the and the version of the »Engineer« installed, the screenshots may vary from your »Engineer« depiction.

The preconfigured port interconnection of the process data objects is activated by setting code C00007 = 40: Network (MCI/CAN).

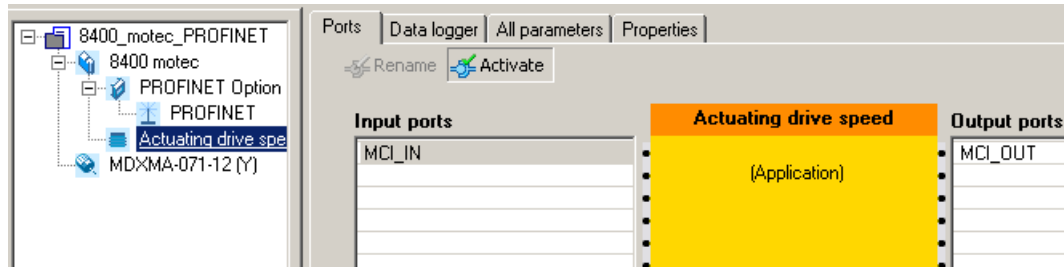


How to freely configure the port interconnection in the »Engineer«:

1. Go to the **Process data objects** tab and click **Go to application**.



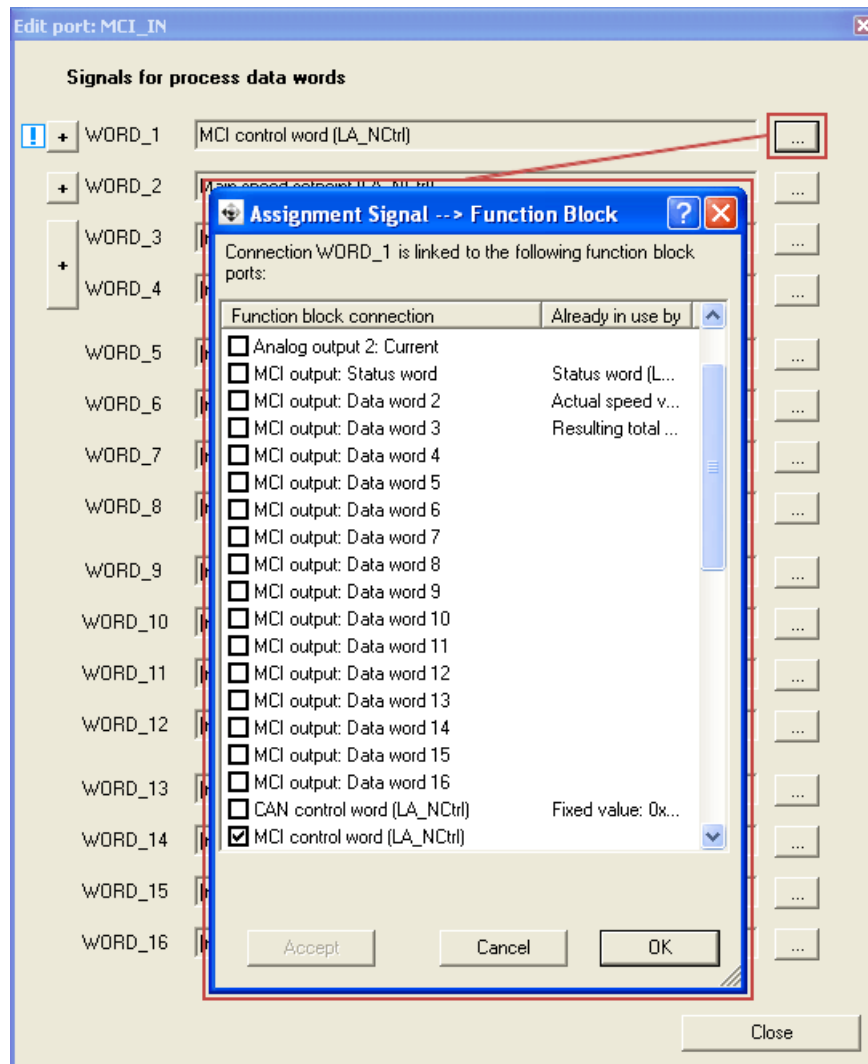
2. The **Ports** tab displays the port blocks MCI_IN and MCI_OUT.



3. Select the port to be configured and click the **Change Variable ...** button.

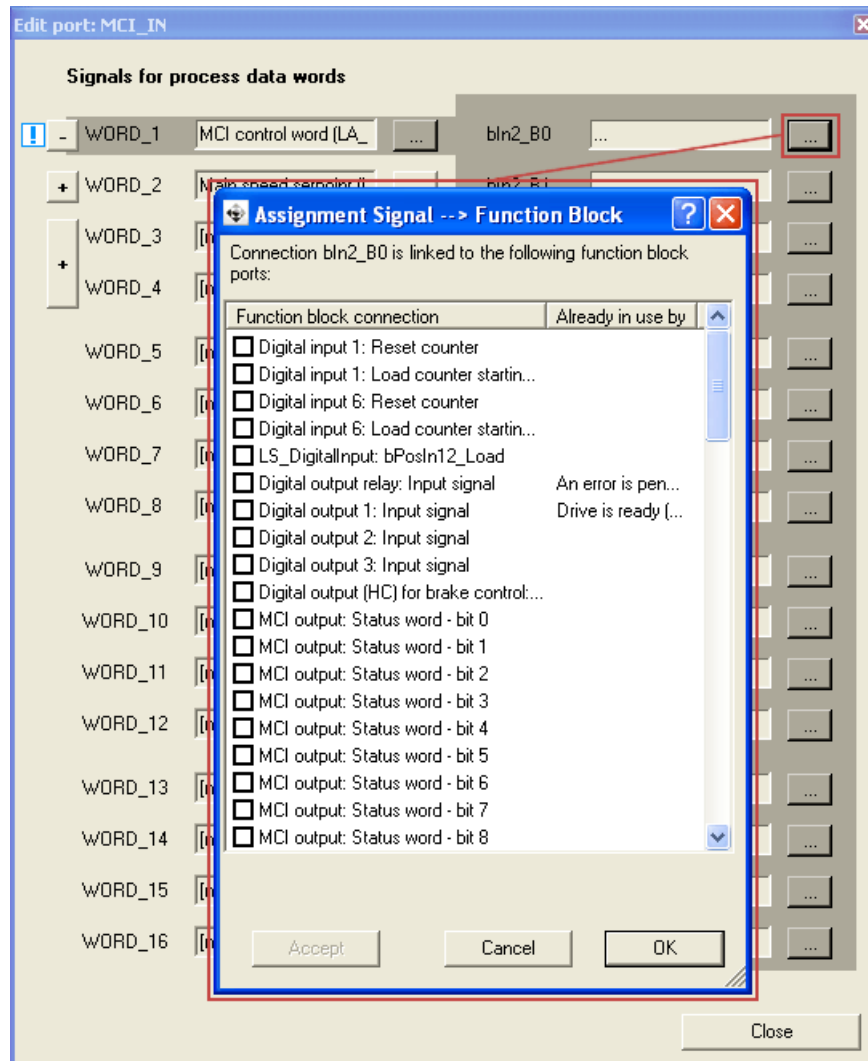
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Input ports <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #000080; color: white;"> <th>MCI_IN</th> </tr> </thead> <tbody> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </tbody> </table>	MCI_IN																						Actuating drive speed (Application)	Output ports <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #000080; color: white;"> <th>MCI_OUT</th> </tr> </thead> <tbody> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </tbody> </table>	MCI_OUT																																
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WORD_7	[not connected]	WORD	16	C876/7	offline																																																				
WORD_8	[not connected]	WORD	16	C876/8	offline																																																				

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**.



For some process data words, you can also assign signals to the individual bits via the  and  buttons.

→ Select the signals and then confirm the selection with **OK**.



The current interconnection is only displayed if the following has been set for the control mode in code **C00007 = 40: Network (MCI/CAN)**.

8.3 Process input data AI/DI (Slot2)

- 0, 1, or 2 input words can be optionally assigned to slot 2.
- The data represent the states of the digital inputs (RFR, DI1 ... DI5) and the analog input of the device.
- Via the fieldbus these data can even be read when no mains voltage is applied to the Communication Unit and only the fieldbus interface connection is supplied with 24 V DC.

Data word	Bits	Function	Value / description	
Word 1	0 ... 9	Analog input value (0 ... 10 V)	10 V = 1000	
	10	Digital input 3	0 (FALSE)	Open
			1 (TRUE)	Closed
	11	Digital input 4	0 (FALSE)	Open
			1 (TRUE)	Closed
	12	Digital input 5	0 (FALSE)	Open
			1 (TRUE)	Closed
	13	Reserved		
Word 2	14	I/O status	0 (FALSE)	Data in word 1/2 are not valid.
			1 (TRUE)	Data in word 1/2 are valid.
	15	Connection status of the inverter	0 (FALSE)	Inverter is offline ("stay-alive" operation)
			1 (TRUE)	Inverter is online
	0	RFR	0 (FALSE)	Open
			1 (TRUE)	Closed
	1	Digital input 1	0 (FALSE)	Open
			1 (TRUE)	Closed
	2	Digital input 2	0 (FALSE)	Open
			1 (TRUE)	Closed
	3	Digital input 3	0 (FALSE)	Open
			1 (TRUE)	Closed
	4	Digital input 4	0 (FALSE)	Open
			1 (TRUE)	Closed
	5	Digital input 5	0 (FALSE)	Open
			1 (TRUE)	Closed
	6 ... 13	Reserved		
	14	I/O status	0 (FALSE)	Data in word 1/2 are not valid.
			1 (TRUE)	Data in word 1/2 are valid.
	15	Connection status of the inverter	0 (FALSE)	Inverter is offline ("stay-alive" operation)
			1 (TRUE)	Inverter is online

9 Parameter data transfer

9.1 The acyclic channel (PROFIdrive profile)

An optional service extension is the acyclic parameter data transfer.

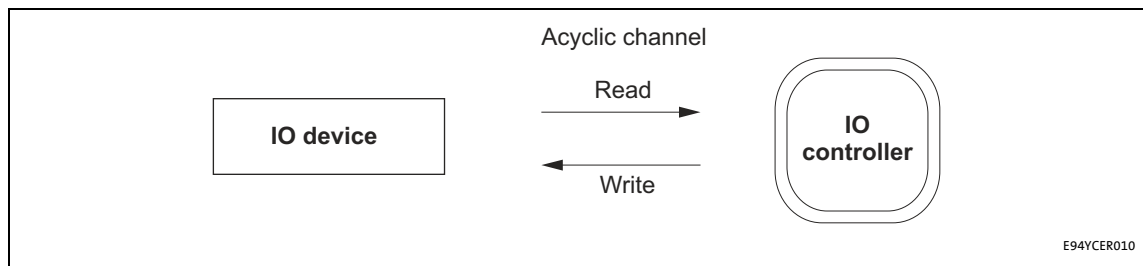
Cyclic and acyclic PROFINET services can be operated simultaneously in the network.

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.

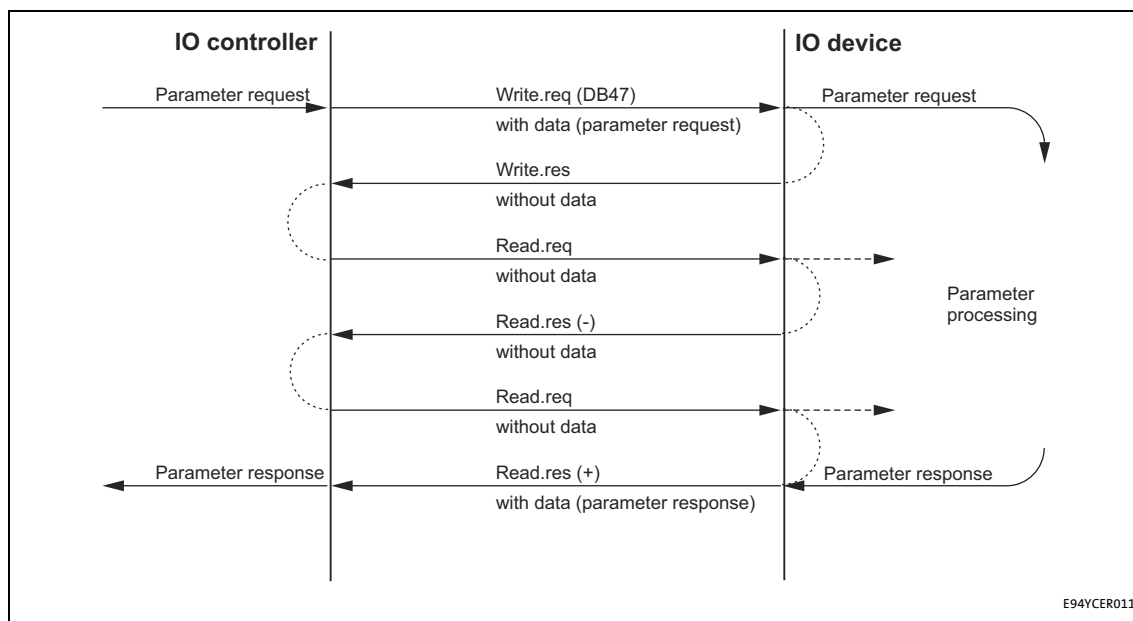
9.1.1 Connection establishment of an I/O controller to an I/O device

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

9.1.2 Acyclic data transmission process



[9-2] Data communication via the acyclic channel

- A "Write.req" is used for transmitting the data set (DB47) to the I/O device in the form of a parameter request.
- "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.

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

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 0xFFFFFFFF

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

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) (61)
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 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)	Parameter has not been 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) " (61)	

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 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 0xFFFFFFFF

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.

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) (□ 61)
Additional information (if available)	U16	

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) " (61)	

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	Reserved	-	-
...			
0x0064			

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

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):



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.

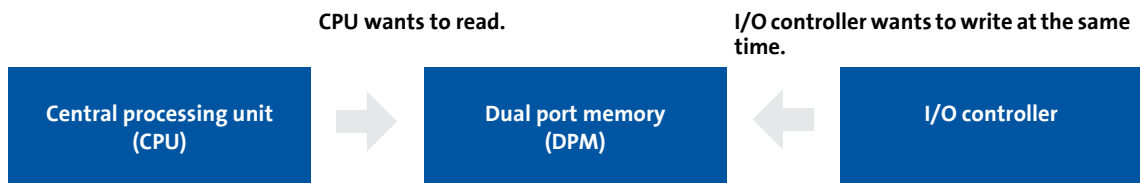
In order to avoid such an impermissible state, the parameter data to be transmitted must be marked as "consistent".

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:



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**Note!**

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

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:

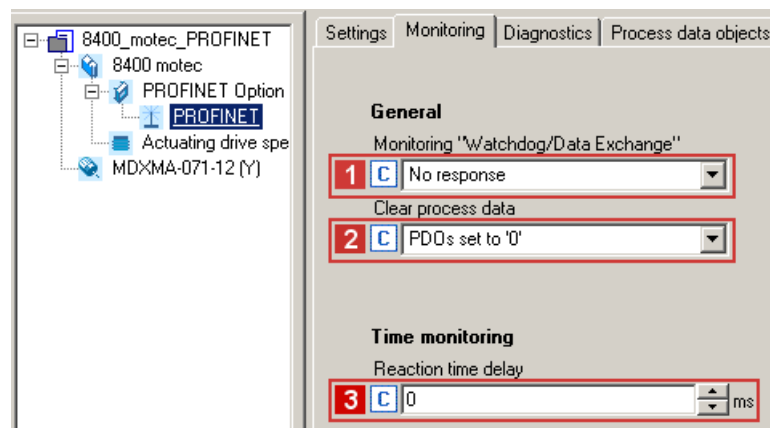
1. During the initialisation of PROFINET communication the watchdog monitoring time specified in the I/O controller ([C13882](#)) is transferred to the I/O device.

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 ([LED status displays](#) ([□ 66](#))).

There is no response in the I/O device.

2. To trigger a response in the IO device, you have to set a **Reaction of the Inverter Drive 8400 motec** **1** ([C13880](#)) additionally in the »»Engineer«« under the **Monitoring** tab.



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 \[0x01bc6531\]](#)" ([□ 73](#)).

10.2 Interruption of internal communication

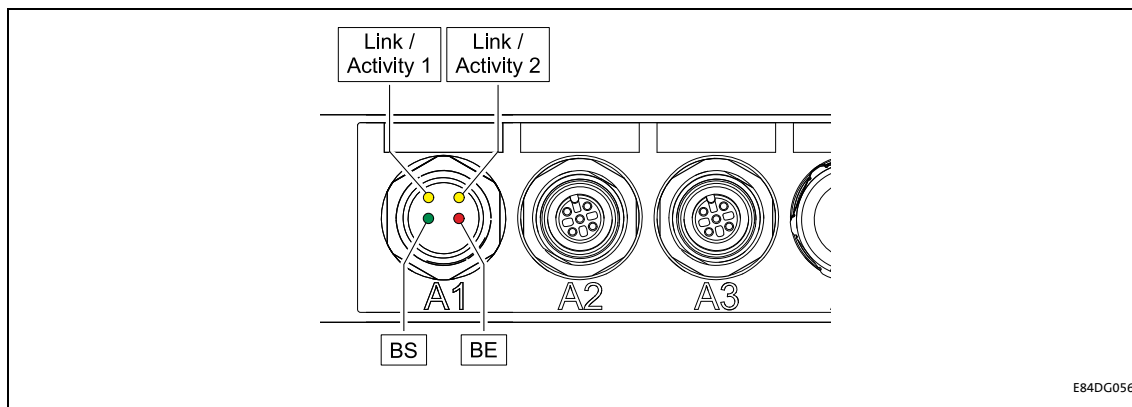
- The response in the case of a communication error between the Communication Unit and the Drive Unit can be set via code [C01501](#).
- The Communication Unit reports a connection interruption to the IO controller and changes to the "No_Data_Exchange" state.
- The error message "[PROFINET: Exist. conn. to 8400 lost \[0x01bc3100\]](#)" ( 71) is output.

11 Diagnostics

PROFINET communication faults can be diagnosed via the LEDs of the Communication Unit.

Moreover, the »Engineer« provides diagnostic PROFINET information.

11.1 LED status displays

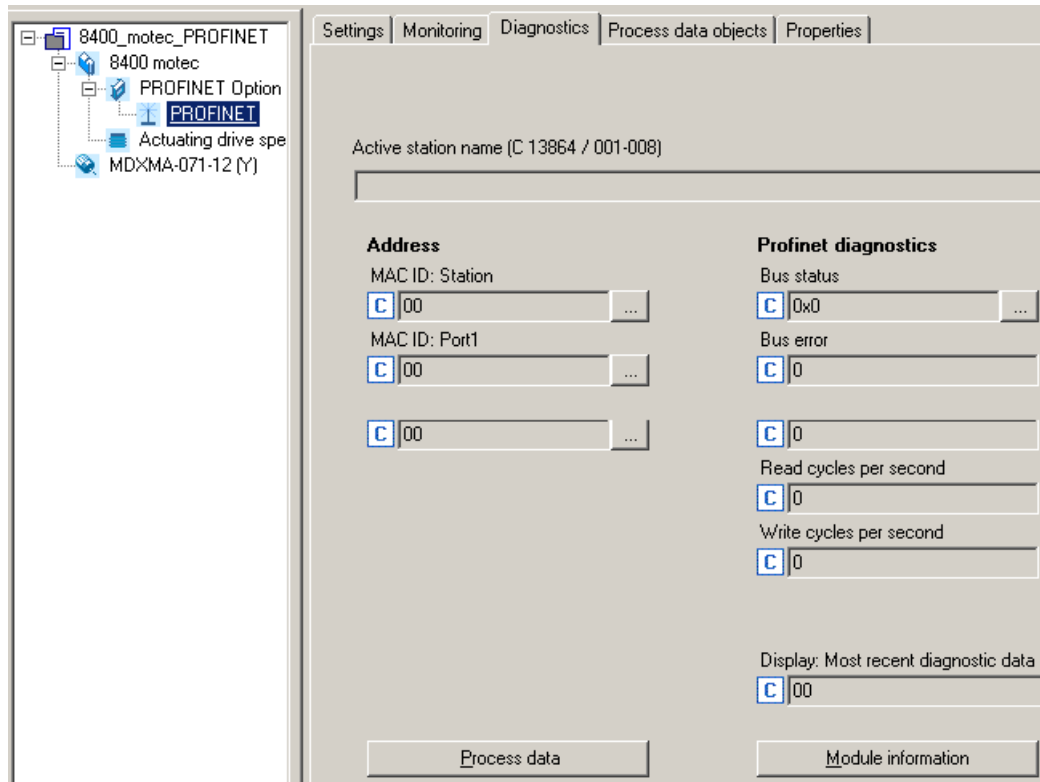


LED	Colour	Status	Description
Link / Activity 1	Yellow	Off	- No cable is connected to PROFINET port 1. - No communication
		On	 A cable is connected to PROFINET port 1.
		Flickers	 Communication at PROFINET port 1 is active.
Link / Activity 2	Yellow	Off	- No cable is connected to PROFINET port 2. - No communication
		On	 A cable is connected to PROFINET port 2.
		Flickers	 Communication at PROFINET port 2 is active.
BS (bus status)	green	Off	No communication (the Communication Unit is not active on the fieldbus or is in the "Init" status).
		blinking	 Communication active (the Communication Unit is in the "Data_Exchange" status.)

LED	Colour	Status	Description
BE (bus error)	red	On	 Bus error/fault is active (e.g. PROFINET cable not connected). The Communication Unit is in the "No_Data_Exchange" status.
		blinking	 Impermissible settings: • Invalid station name • Invalid IP parameters The Communication Unit has been initialised and continues to work internally with the corresponding standard values.
		Flickering/ blinking	From SW version 02.00 onwards with a 50 ms blinking pattern:  From SW version 03.00 onwards with a 500 ms blinking pattern:  The "Node blinking test" PROFINET function is activated by the I/O controller. The jittering LED serves to identify/localise accessible I/O devices.

11.2 Diagnosing with the »Engineer«

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

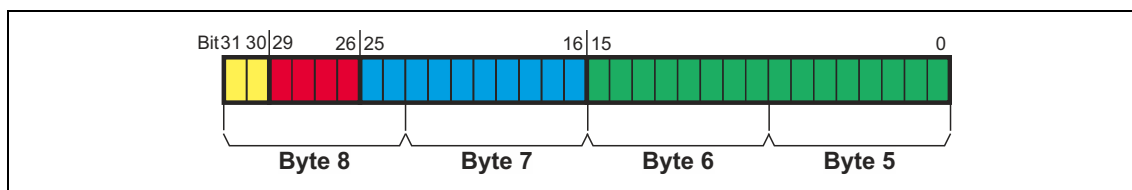


11.3 Diagnostic data

- The I/O device sends an alarm message to the I/O controller to signalise the diagnostic data below.
- Errors and warnings in the Inverter Drive 8400 motec are sent to the IO controller as extended diagnostic 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 motec	

Error code of the Inverter Drive 8400 motec



- 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	0	1	1	0	1	1	1	1	0
Response				Instance ID				Module ID				Error ID			



Reference manual/online help for the Inverter Drive 8400 motec

Detailed information on the error codes is provided here.

12

Error messages

This chapter complements the error list in the reference manual and the online help for the Inverter Drive 8400 motec by PROFINET error messages.

12.1

Short overview of the PROFINET error messages



Reference manual/online help for the Inverter Drive 8400 motec

Here you will find general information on diagnostics & fault analysis and on 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	C01501/2
0x01bc5531	444	21809	PROFINET: Memory: No access	1: No Response	C01501/2
0x01bc5532	444	21810	PROFINET: Memory: Read error	1: No Response	C01501/2
0x01bc5533	444	21811	PROFINET: Memory: Write error (nt14: COM fault 14)	1: No Response	C01501/2
0x01bc6010	444	24592	PROFINET: Restart by watchdog reset	1: No Response	C01501/2
0x01bc6011	444	24593	PROFINET: Internal error	1: No Response	C01501/2
0x01bc6100	444	24832	PROFINET: Internal error	1: No Response	C01501/2
0x01bc6101	444	24833	PROFINET: Internal error	1: No Response	C01501/2
0x01bc641f	444	25631	PROFINET: Invalid parameter set	1: No Response	C01501/2
0x01bc6420	444	25632	PROFINET: Error: Lenze setting loaded	1: No Response	-
0x01bc6430	444	25648	PROFINET: Invalid module configuration	1: No Response	C01501/2
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	-

12.2 Possible causes and remedies

This chapter contains all PROFINET error messages in numerical order of the error number. Possible causes and remedies as well as responses to the error messages are described in detail.

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

Response (Lenze setting printed in bold)		Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information		
Cause	Remedy	
- The Communication Unit is supplied with external voltage, but the Inverter Drive 8400 motec is not supplied with voltage. - The Communication Unit is not connected correctly to the Drive Unit.	- Switch off and on again the voltage supply of the Inverter Drive 8400 motec. - Check wiring and terminals. - Check internal plug connection between Communication Unit and Drive Unit. For this purpose, the Inverter Drive 8400 motec must be unscrewed. Please observe the information in the mounting instructions of the Communication Unit and the Drive Unit! - If this error continues to occur, please contact the Lenze Service. (if required, the Communication Unit must be replaced.)	

PROFINET: Memory: No access [0x01bc5531]

Response (Lenze setting printed in bold)		Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information		
Cause	Remedy	
Access to memory was not possible.	Send the device and a description of the fault to Lenze.	

PROFINET: Memory: Read error [0x01bc5532]

Response (Lenze setting printed in bold)		Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information		
Cause	Remedy	
Parameter could not be read.	- Download application again (including module). - Send the device and a description of the fault to Lenze.	

PROFINET: Memory: Error when writing [0x01bc5533] (nt14: COM fault 14)

Response (Lenze setting printed in bold)		Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information		
Cause	Remedy	
Parameter could not be written.	- Download application again (including module). - Send the device and a description of the fault to Lenze.	

PROFINET: Restart through watchdog reset [0x01bc6010]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

PROFINET: Internal error [0x01bc6011]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

PROFINET: Internal error [0x01bc6100]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

PROFINET: Internal error [0x01bc6101]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

PROFINET: Invalid parameter set [0x01bc641f]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information	
Cause	Remedy
No active parameter set could be loaded.	• Download application again (including module). • Send the device and 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 was not possible.	• Download application again (including module). • Send the device and a description of the fault to Lenze.

PROFINET: Invalid module configuration [0x01bc6430]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☒ Adjustable response)
☒ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ warning ☐ Information	
Cause	Remedy
A module or submodule does not comply with the configuration of the Siemens STEP7 engineering tool.	Check module 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 too 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 the Siemens STEP7 engineering tool has been interrupted.	- Check configuration. - Check cables and terminals.

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" (□ 64).	Check cables and terminals.

PROFINET: Station name error [0x01bc6532]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ warning ☐ Information	
Cause	Remedy
Station name is not DNS-conform.	Use a DNS-compliant station name. ▶ Setting the station name (□ 27)

PROFINET: IP address error [0x01bc6533]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ 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 (📖 29)

PROFINET: Stack init error [0x01bc6534]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ 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 (📖 29) ▶ Setting the station name (📖 27)

PROFINET: Internal error [0x01bc6650]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

13

Parameter reference

This chapter complements the parameter list and the table of attributes in the reference manual and the online help for the Inverter Drive 8400 motec by the parameters for PROFINET communication.



Reference manual/online help for the Inverter Drive 8400 motec

Here you will find general information on parameters.

13.1

Communication-relevant parameters of the operating system

This chapter lists the communication-relevant parameters of the 8400 motec operating system in numerically ascending order.

C01501

Parameter Name:		Data type: UNSIGNED_8 Index: 23074 _d = 5A22 _h
C01501 Response in case of communication fault with MCI		
Configuration of monitoring functions for the Communication Unit		
Selection list		
0	No response	
1	Error	
4	Warning Locked	
Subcodes	Lenze setting	Info
C01501/1	1: No Response	Resp. to MCI fault 1 • Response to a communication fault.
C01501/2	1: No Response	Resp. to MCI fault 2 • Response to a fault in the Communication Unit.
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ COM ☐ MOT Scaling factor: 1		

C01503

Parameter Name:		Data type: UNSIGNED_16 Index: 23072 _d = 5A20 _h
C01503 MCI timeout		
Setting range (min. value unit max. value)		
0	ms	1000
Subcodes	Lenze setting	Info
C01503/1	200 ms	MCI timeout
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ COM ☐ MOT Scaling factor: 1		

13.2 Parameters relevant for PROFINET communication

This chapter lists the PROFINET parameters of the Communication Unit 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: C13000 IP address			Data type: UNSIGNED_32 Index: 11575 _d = 2D37 _h		
Setting of the IP address ▶ Setting the IP configuration (📖 29)					
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					

C13001

Parameter Name: C13001 Subnetwork mask			Data type: UNSIGNED_32 Index: 11574 _d = 2D36 _h		
Setting of the subnet mask ▶ Setting the IP configuration (📖 29)					
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 (📖 29)			
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		

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.			
Display range (min. value unit max. value)			
0		255	
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: C13850 All words to master			Data type: UNSIGNED_16 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 8, 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					
...					
C13850/8					
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C13851

Parameter Name: C13851 All words from master			Data type: UNSIGNED_16 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 8, 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			
...			
C13851/8			
☒ 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:		Info
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 15	Reserved	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13862

Parameter Name: C13862 Bus counter		Data type: UNSIGNED_32 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: C13864 Active station name		Data type: VISIBLE_STRING 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 (📖 27)		
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		

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		

C13878

Parameter Name: C13878 Bus error(2)		Data type: BITFIELD_16 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: C13880 Monitoring Reaction		Data type: UNSIGNED_8 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: C13881 Reaction time delay		Data type: UNSIGNED_16 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 expired. • 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		

C13885

Parameter Name: C13885 Clear process data		Data type: UNSIGNED_8 Index: 10690 _d = 29C2 _h
This code is used to set the process data which the I/O device is to process in order to maintain the internal communication when the PROFINET has exited the "Data_Exchange" status.		
Selection list (Lenze setting printed in bold)		
0	Use of most recent master PDOs	
1	PDOs 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: C13887 Suppress signalling diag. mess. upon		Data type: BITFIELD_8 Index: 10688 _d = 29C0 _h
With this code, the transmission of alarm messages to the IO controller can be suppressed. By setting the corresponding bit to TRUE, errors of a specific type can be suppressed systematically. In addition, all errors are entered in the logbook. A change can only be effective immediately if no error number with the error type selected here is active in 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	Starting from SW version 3.00.
Bit 6	Reserved	
Bit 7	Connection to 8400 lost	Starting from SW version 3.00. Error message: PROFINET: Exist. conn. to 8400 lost [0x01bc3100] (□ 71)
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13899

Parameter Name: C13899 Station name		Data type: VISIBLE_STRING 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 (□ 27)		
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 identification code "E84DGFCR" 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 software creation date ("MMM DD YYYY") and time ("hh:mm:ss") 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	

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	00000000000000000000000000000000 00000000000000000000000000000000	I&M4 signature code
C13914/2	00000000000000000000000000000000 00000000000000000000000000000000	I&M4 signature code
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

13.3 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 gateway address	11563	2D2B	A	4	UNSIGNED_8	1	☒		
C13850	All words from drive to master	10725	29E5	A	8	UNSIGNED_16	1	☒		
C13851	All words from master to drive	10724	29E4	A	8	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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Your opinion is important to us

These instructions were created to the best of our knowledge and belief to give you the best possible support for handling our product.

Perhaps we have not succeeded in achieving this objective in every respect. If you have suggestions for improvement, please e-mail us to:

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Thank you very much for your support.

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PROFINET®

Inverter Drives 8400 protec_____



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1 About this documentation

Contents

This documentation exclusively contains descriptions with regard to the PROFINET® bus system for Inverter Drives 8400 protec.



Note!

This documentation supplements the **mounting instructions** supplied with the inverter and the **Inverter Drives 8400 protec hardware manual**.

The mounting instructions contain safety instructions which must be observed!

The features and functions of PROFINET for Inverter Drives 8400 protec are described in detail.

Examples illustrate typical applications.

The theoretical concepts are only explained to the level of detail required to understand the function of PROFINET communication with Inverter Drives 8400 protec.

This documentation does not describe any software provided by other manufacturers. No warranty can be given for corresponding data provided in this documentation. For information on how to use the software, please refer to the control system (PLC, IO controller) documents.

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



Tip!

Detailed information about PROFINET can be found on the website of the PROFIBUS & PROFINET user organisation:

www.profibus.com

Target group

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



Tip!

Current documentation and software updates with regard to 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:

Product series	Type designation	From hardware version	From software version
Inverter Drives 8400 protec (PROFINET option)	E84DxxxxxxxxR	VB	02.00

Screenshots/application examples

All screenshots in this documentation are application examples. Depending on the firmware version of the inverter and the software version of the Engineering tools installed (e.g. »Engineer«), the screenshots in this documentation may deviate from the actual screen representation.

1.1

Document history

Version			Description
7.0	03/2017	TD17	- General corrections - Description for C13887 (82) updated.
6.0	02/2017	TD17	- New: Response of the outputs in compliance with PROFINET standard V2.3 (35) - Updated: LED status displays (63)
5.0	02/2013	TD17	- New: Setting via the PROFINET configurator of the »Engineer« (29) - New layout
4.0	11/2010	TD17	- General revision - Update for SW version 02.00
3.0	04/2010	TD17	General revision
2.0	09/2009	TD17	General revision
1.0	06/2009	TD17	First edition

1 About this documentation

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 separator	Point	The decimal point is always used. For example: 1234.56
Hexadecimal	0x[0 ... 9, A ... F]	Example: 0x60F4
Binary • Nibble	In inverted commas Point	Example: '100' Example: '0110.0100'
Text		
Version information	Blue text colour	All information that only applies to or from a certain software version of the inverter is marked accordingly in this documentation. Example: This function extension is available from software version V3.0 onwards!
Program name	» «	The Lenze »Engineer« PC software...
Window	<i>italics</i>	The <i>Message window</i> ... / The dialog box <i>Options</i> ...
Variable names		Setting <i>bEnable</i> to TRUE...
Control element	bold	The OK button ... / The Copy command ... / The Properties tab ... / The Name input field ...
Sequence of menu commands		If several commands are required in succession for executing a function, the single commands are separated by an arrow: Select the File → Open command to...
Hyperlink	<u>Underlined</u>	Optically highlighted reference to another topic. It is activated with a mouse-click in this online documentation.
Icons		
Page reference	 4)	Optically highlighted reference to another page. It is activated with a mouse-click in this online documentation.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

1.3

Terminology used

Term	Meaning
Inverter	Lenze frequency inverters of the "Inverter Drives 8400 protec" product range
Standard device	
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.
»Engineer«	Lenze software which supports you throughout the whole machine life cycle - from planning to maintenance.
FW	Firmware
HW	Hardware
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.
	PROFINET® (Process Field Network) is a real-time capable fieldbus system based on Ethernet. PROFINET® is a registered trademark and patented technology licensed by the PROFIBUS & PROFINET International (PI) user organisation.
»STEP7«	Siemens PC software for PROFINET configuration
SW	Software

1.4 Definition of the 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:



Danger!

(characterises 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
	Note!	Important note to ensure trouble-free operation
	Tip!	Useful tip for simple handling
		Reference to another document

2 General information

PROFINET is defined by the PROFIBUS user organisation. You can differentiate between the PROFINET component model (CBA = Component Based Automation) and the PROFINET IO.

The PROFINET component model is used for the component-based communication via TCP/IP and the real time communication for real-time requirements in modular system engineering.

PROFINET IO has been developed for real-time and synchronous communication IRT (IRT = Isochronous Real Time) with decentralised peripherals. The designations RT and IRT only describe the real-time communication features within PROFINET IO.



Tip!

Detailed information about PROFINET can be found on the website of the PROFIBUS & PROFINET user organisation:

www.profibus.com

Properties of the PROFINET with Inverter Drives 8400 protec

- Support of the I&M0 ... 4 functionality for the identification of the Inverter Drive 8400 protec
- Transmission of safe information via the PROFIsafe protocol when using a version with an integrated safety system
- Automatic detection of the baud rate 100 Mbps
- A line topology is enabled by the integrated 2-port switch.
- Supported protocols:
 - LLDP (Link Layer Discovery Protocol) for the topology recognition
 - SNMP (Simple Network Management Protocol) for diagnostics
 - MRP (Media Redundancy Protocol) for implementing the inverter into a ring topology as client node
- Device replacement without exchangeable disk storage
Since the "station alias" is supported, a station name is automatically assigned to the new PROFINET node.
For storing the parameters of the inverter, a memory module will still be required.
- Up to 16 process data words (32 bytes) per direction can be exchanged.
- Access to all Lenze parameters
- An online connection via PROFINET can be established using the Lenze »Engineer«.

**"Inverter Drives 8400 protec – integrated safety system" manual**

Here you can find detailed information on devices with an integrated safety system.

3

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.

3.1

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.
- 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 a safe and trouble-free operation and for obtaining the product features specified.
 ▶ [Properties of the PROFINET with Inverter Drives 8400 protec](#) (11)
- 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.

3.2

Device and application-specific safety instructions

Only use cables that meet the listed specifications.

▶ [Ethernet cable specification](#) (📖 21)

**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.

4

Technical data

**Mounting instructions "Inverter Drives 8400 protec"**

Here you can find information on general technical data, operating conditions, and rated data of the device.

4.1

General data and operating conditions of the PROFINET

Range	Values
Communication profile	PROFINET
Communication medium	S/FTP (Screened Foiled Twisted Pair, ISO/IEC 11801 or EN 50173), CAT 5e
Interface	RJ45: Standard Ethernet (in accordance with IEEE 802.3), 100Base-TX (Fast Ethernet) or M12-socket
Network topology	Tree, star, and line
Number of device nodes	Max. 255 in the subnetwork
Max. cable length	100 m
PROFINET node	I/O device with real time (RT) communication properties
PNO identification number	0x0106
Device identification (Device ID)	0x8420
Baud rate	100 Mbps
Switching method	"Store and forward"
Switch latency	125 µs at maximum telegram length

4.2

Protocol data

Range	Values
Process data words (PCD)	Max. 16 process data words (max. 32 bytes)
PROFIsafe message	4 words (8 bytes)
Acyclic parameter data channel	Limited by the PROFINET frame size

4.3 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 an 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 + 0 ... 1 ms + 1 ... x ms	Update cycle Processing time in the inverter Runtime of the application task of the technology application used (tolerance)
Parameter data	Approx. 30 ms + a tolerance of 20 ms (typically) • Some codes may require a longer processing time.	

There are no interdependencies between parameter data and process data.

4.4 Internal switch latency

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

$$\text{Runtime delay} = ((36 \text{ permanent bytes} + \text{process data in bytes}) \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$$

Example :

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

- $((36 \text{ permanent bytes} + 48 \text{ bytes}) \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$
- $(84 \text{ bytes} \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$
- $6.72 \text{ } \mu\text{sec} + 4 \text{ } \mu\text{sec} = \mathbf{10.72 \text{ } \mu\text{sec}}$

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](#) (17)

5 Installation



Mounting instructions "Inverter Drives 8400 protec"

Here you will find detailed information on the mechanical and electrical installation of the device.

Please observe the safety instructions!

5.1 Network topology

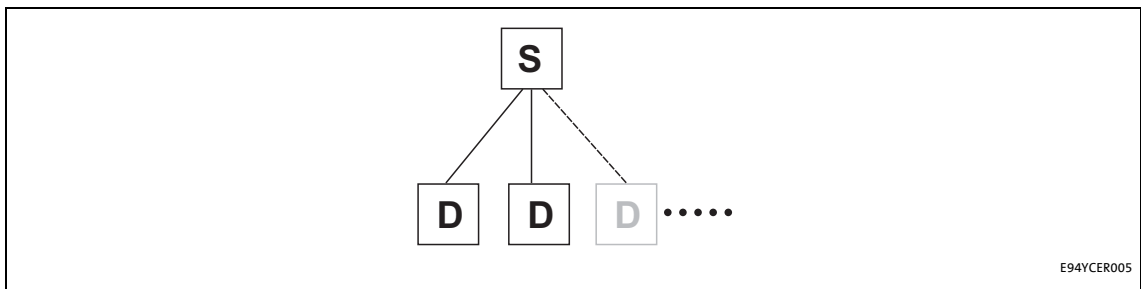
It is typical of PROFINET to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

► [Internal switch latency](#) (16)

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

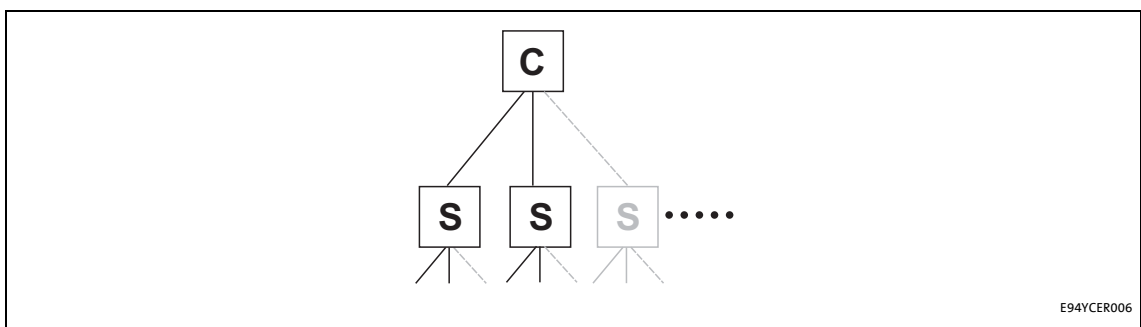
PROFINET supports the following topologies:

- Switch / star



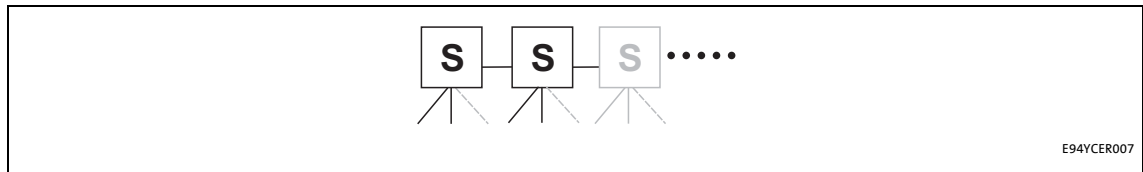
[5-1] Switch / star topology (S = switch, D = I/O device)

- Tree via switches



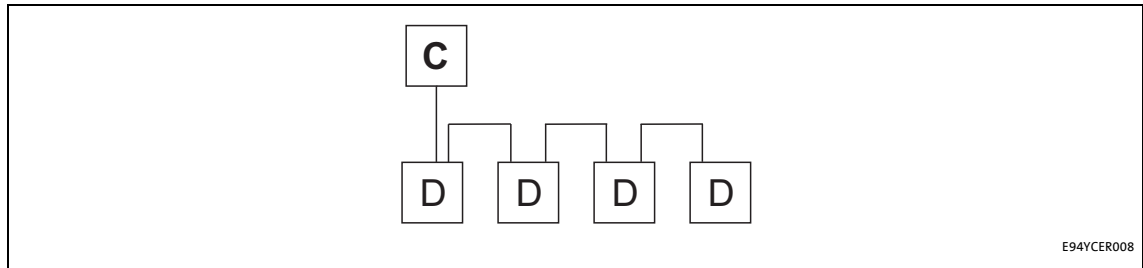
[5-2] Tree topology (C = I/O controller, S = switch)

- Switch / switch



[5-3] Switch/switch topology (S = switch)

- I/O controller / I/O device

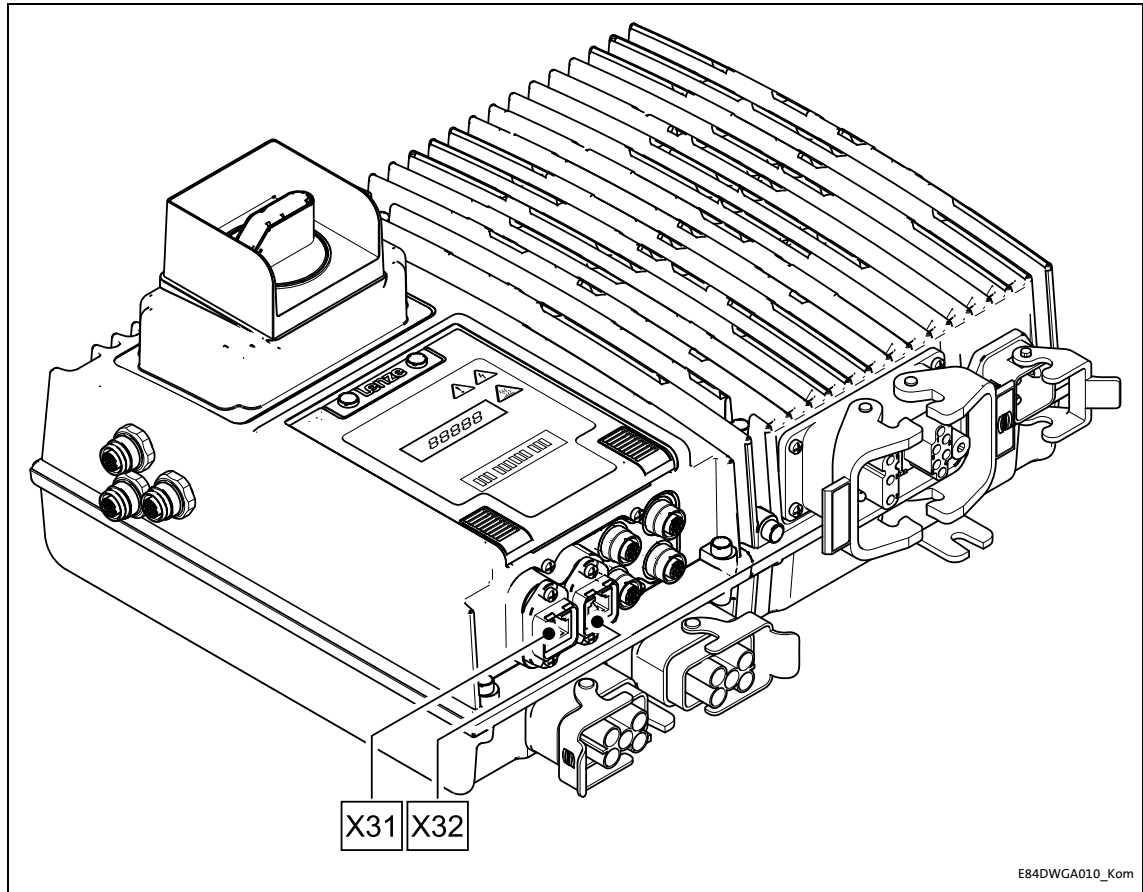


[5-4] Line topology (C = I/O controller, D = I/O device)

5.2

PROFINET connection

The connection to the PROFINET network is made via the terminals **X31** (input) and **X32** (output) – depending on the version via an RJ45 socket or an M12 socket.



- ▶ [PROFINET connection via the RJ45 socket \(□ 20\)](#)
- ▶ [PROFINET connection via the M12 socket \(□ 23\)](#)

5.2.1 PROFINET connection via the RJ45 socket

A standard Ethernet patch cable is suitable for connecting the Inverter Drive 8400 protec to the PROFINET fieldbus.

► [Ethernet cable specification](#) (📖 21)

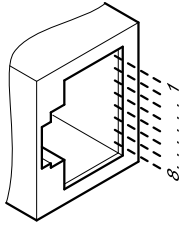
The installation and removal of the Ethernet cables is optimised for the use of connectors in accordance with the "Automation Initiative of German Domestic Automobile Manufacturers" (AIDA).



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.

5.2.1.1 Pin assignment

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).

5.2.1.2 Ethernet cable specification

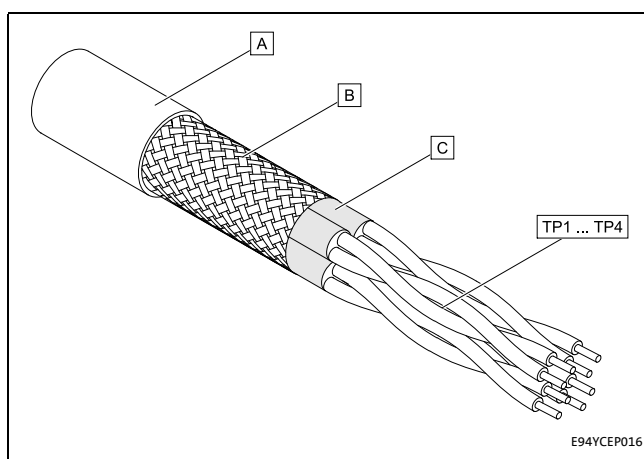


Note!

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 Twisted core pairs 1 ... 4

... [▶ Colour code of the Ethernet cable](#)

TP4 [\(22 \)](#)

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

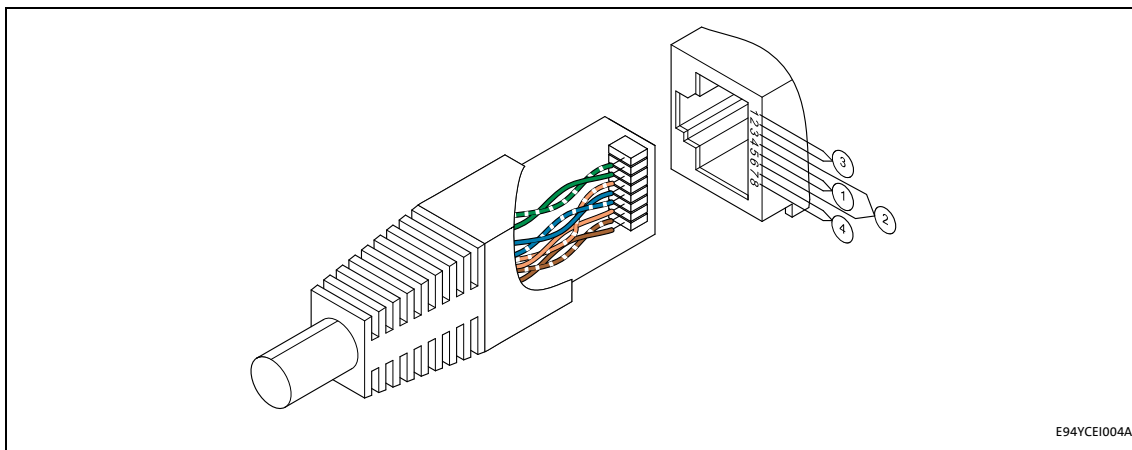
Colour code of the Ethernet cable



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

[5-6] 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

5.2.2 PROFINET connection via the M12 socket

Pin assignment

X31 (input) / X32 (output) (M12 socket, 4-pin, D-coded)	Pin	Signal
	1	Tx +
	2	Rx +
	3	Tx -
	4	Rx -

6 Commissioning

6.1 Before initial switch-on

6 Commissioning

During commissioning, plant-specific data such as motor parameters, operating parameters, responses, and parameters for fieldbus communication are defined for the inverter. Lenze devices use codes for this purpose.

The inverter and communication codes are saved to the memory module in a non-volatile data set.

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

► [Parameter reference](#) (□ 73)

6.1 Before initial switch-on



Stop!

Before you switch on the Inverter Drive 8400 protec for the first time, check the entire wiring for completeness, short circuit, and earth fault.

6.2 Configuring the PROFINET IO controller

First you have to configure the IO controller for communication with the Inverter Drive 8400 protec.

Configuration for the IO controller

For configuring PROFINET, the current PROFINET device description file (XML) of the Inverter Drive 8400 protec must be imported in the IO controller.

The **GSDML-Vx.z-Lenze-8420-PNabb-yyyymmdd.xml** device description file can be found in the download area at:

www.Lenze.com

Wildcard in the file name "GSDML-Vx.z-Lenze-8420-PNabb-yyyymmdd.xml"		
x	Main version of the GSDML scheme used	
z	Subversion of the GSDML scheme used	
a	Major version of the software version	Starting from this 8400 protec PROFINET version, the device description file can be used.
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 protec support the configuration of max. 16 process data words (max. 32 bytes) for each direction. When PROFIsafe data are transmitted, an additional number of 4 process data words (8 bytes) is assigned.

Description of the device data base file

Selection text	Parameter data (with consistency)	Process data (with consistency)	Assigned I/O memory
PCD (nW) AR cons.	-	n words	n words
Safety (4W) AR	-	4 words	4 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 frame)
- "Safety (4W) AR" = 4 safety data words (only in slot 2 of the PROFINET telegram)



Tip!

A detailed description of consistency is given in the chapter "[Consistent parameter data](#)" (60).

6.3

Setting the station name

**Note!**

- The PROFINET "node flashing test" function which serves to identify is supported. During the execution, the red LED **BUS-ERR** flickers ([LED status displays](#) (▢ 63)).
- Operation of PROFINET requires a valid station name.
- If impermissible settings are used, the red LED **BUS-ERR** is blinking and the error message [PROFINET: Station name error \[0x01bc6532\]](#) (▢ 70) is output. The Inverter Drive 8400 protec then continues working internally with the name deleted.
- If the station name is assigned by the IO controller via PROFINET or via the PROFINET configurator of the »Engineer«, changes will become effective immediately.

The station name currently used is shown in code [C13864](#).

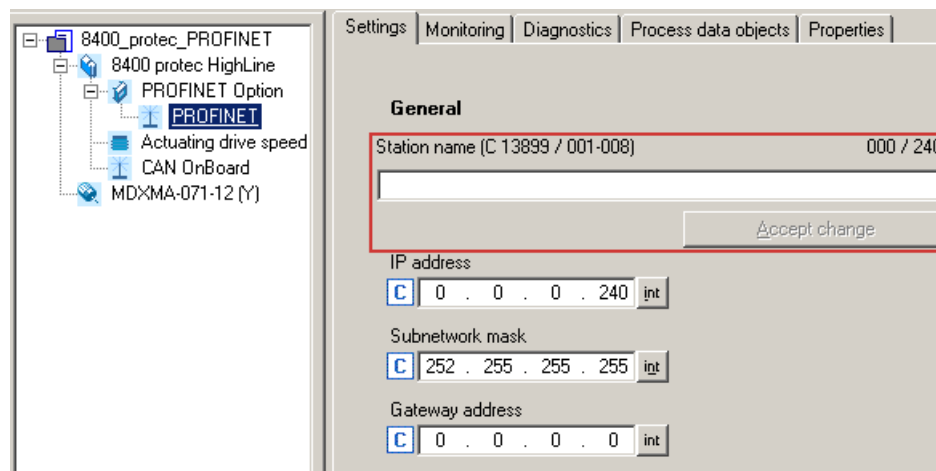
The station name ...

- is required for unambiguous addressing of the Inverter Drive 8400 protec 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)

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 inverter off and on again

6.4 Setting the IP configuration

The IP configuration is required for addressing the Inverter Drive 8400 protec in the PROFINET network. For this purpose, an IP address, subnet mask and gateway address have to be allocated.

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:

- [Setting via the PROFINET configurator of the »Engineer«](#) (📖 29)
- [Setting via codes in the »Engineer«](#) (📖 31)



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 the IP address, subnet mask, and gateway address can have the consequence that no connection to PROFINET can be established.
- In case of impermissible settings, the red LED **BUS-ERR** is blinking ([LED status displays](#) (📖 63)) and the error message [PROFINET: IP address error \[0x01bc6533\]](#) (📖 71) is output.

6.4.1 Setting via the PROFINET configurator of the »Engineer«



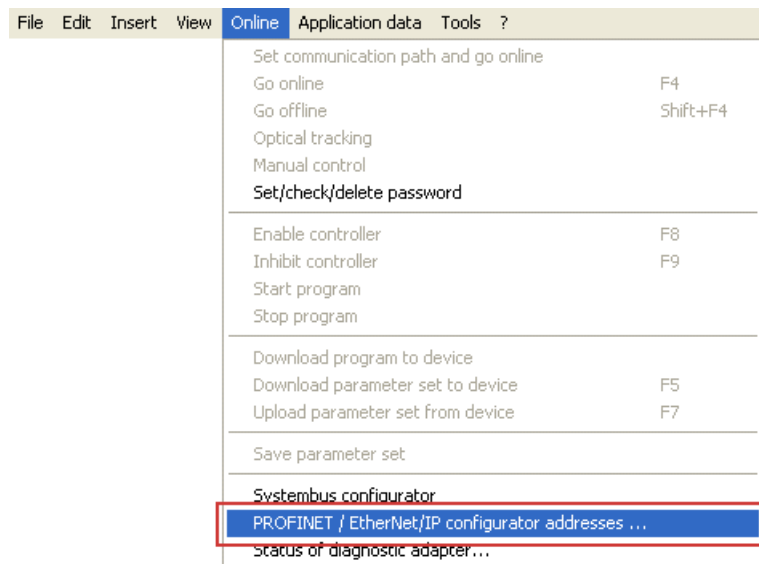
Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network 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.
- 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).

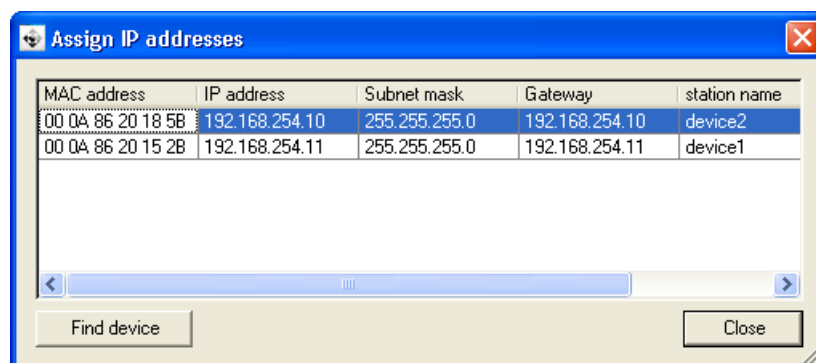


How to set the IP parameters via the PROFINET configurator:

1. Execute the menu command **Online → Profinet configurator addresses....**



The "Assign IP addresses" dialog window is opened and all Lenze PROFINET nodes 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.

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).



Tip!

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

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

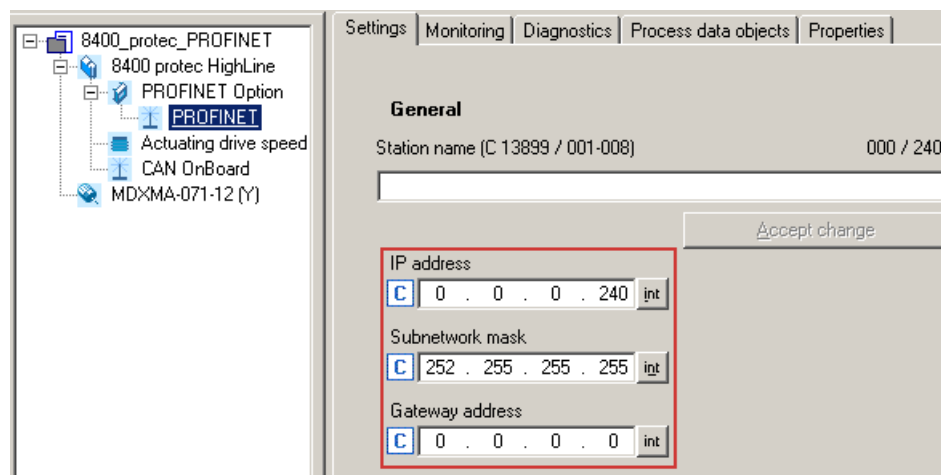
6.4.2 Setting via codes in the »Engineer«



Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network 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, or switch the voltage supply of the inverter off and on again

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 [binary: 00000001.00000000.10101000.11000000]

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

Initial switch-on

**Mounting instructions "Inverter Drives 8400 protec"**

Observe the safety instructions and information on residual hazards.

**Note!****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.

In the Lenze setting of the Inverter Drives 8400 protec, the restart protection is activated.

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 starts in a controlled mode by an explicit controller enable: LOW-HIGH edge on a digital input configured correspondingly (terminals X41, X42, X43).

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.

With mains connection (power ON), ...

- all parameters (codes) are read;
- the output data are set to '0'.

7

Data transfer

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

7.1

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.
- Up to 16 process data words (32 bytes) per direction can be exchanged.
- 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 changes must be saved via code **C00002** of the Inverter Drives 8400 protec.

7.2

Response of the outputs in compliance with PROFINET standard V2.3

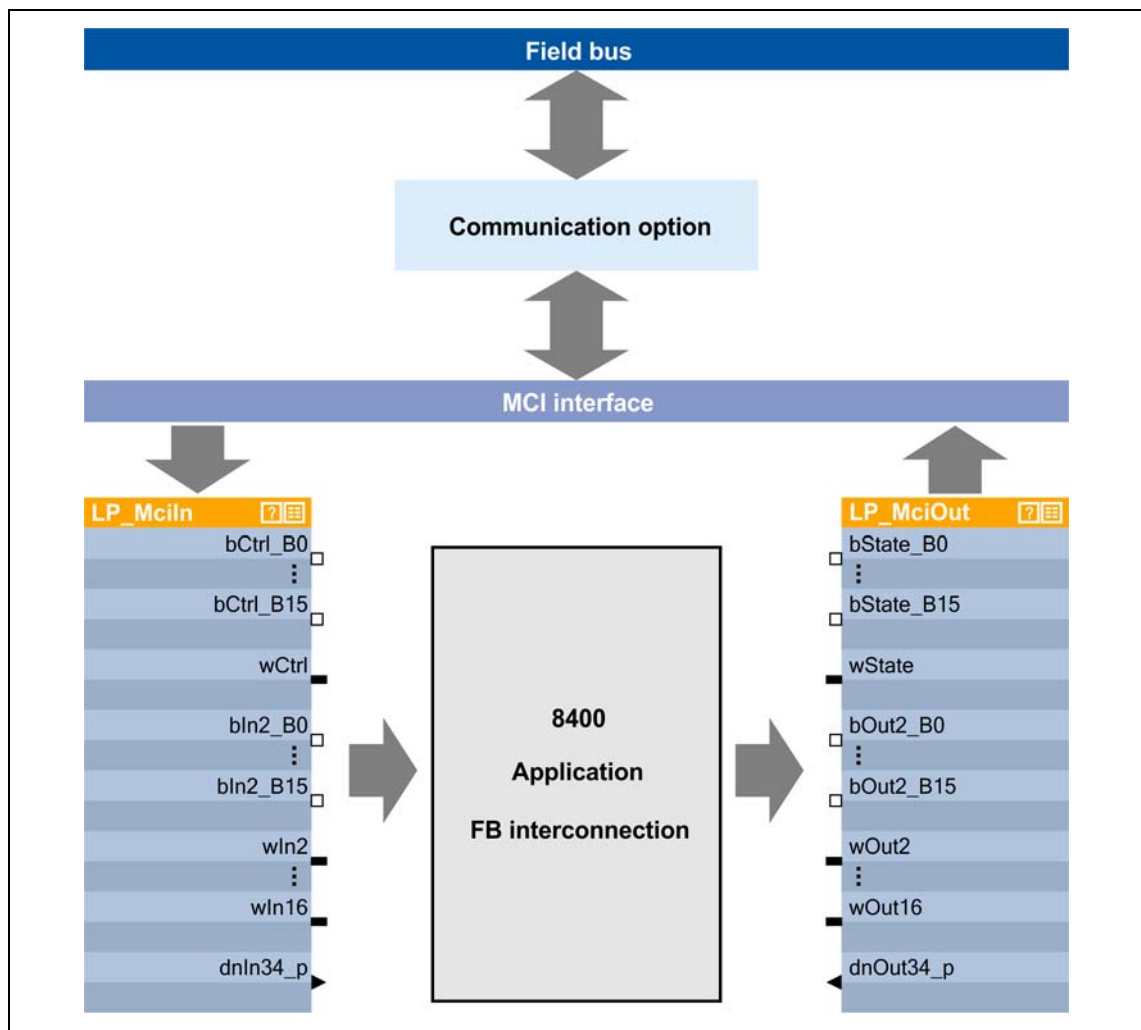
Event	Response of the outputs
Mains connection (power ON)	The output data are set to '0'.
Abort of the process data transfer	The output data are treated according to the parameter setting of codes C13880/1 , C13881/0 , and C13885/0 .
Invalid IO controller output values	The output data are set to '0'.

8 Process data transfer

8.1 Access to process data / PDO mapping

The process data (MCI PDOs) are transferred via the MCI interface.

- Up to 16 process data words (32 bytes) per direction can be exchanged.
- 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/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



Reference manual/online help for the Inverter Drive 8400 protec

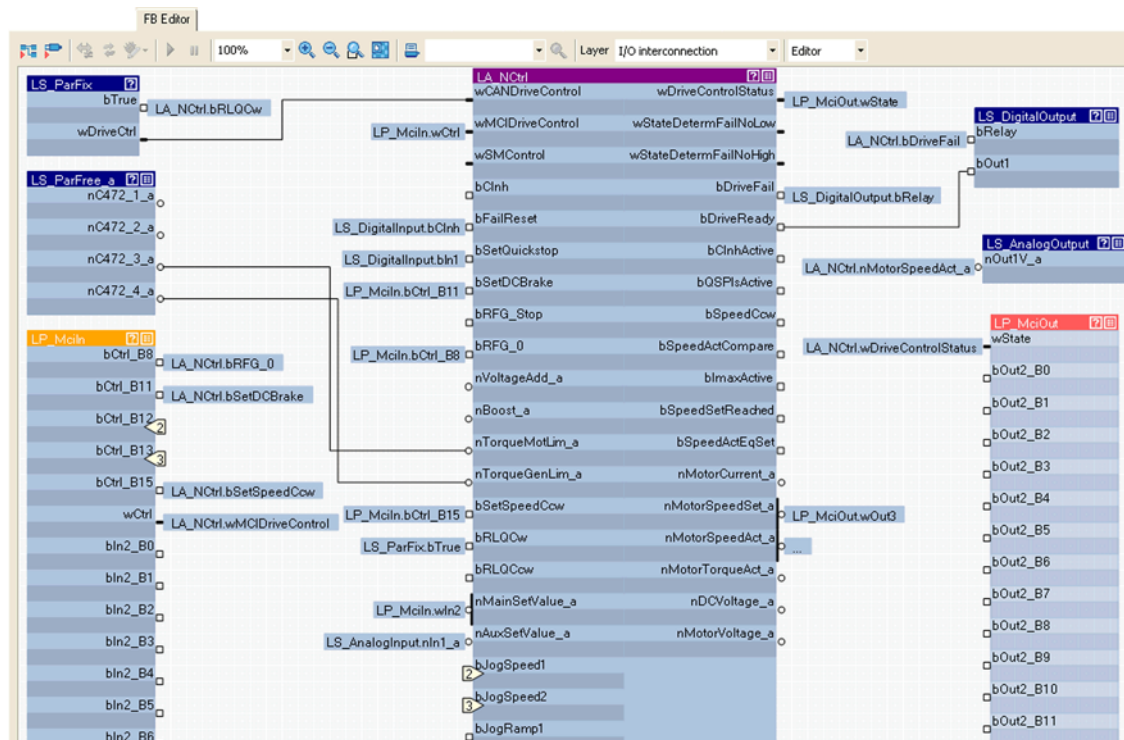
Here you will find detailed information on the port/function block interconnection in the »Engineer« and the port blocks.

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 **LP_MciIn** and **LP_MciOut** port blocks with the preconfigured interconnections:



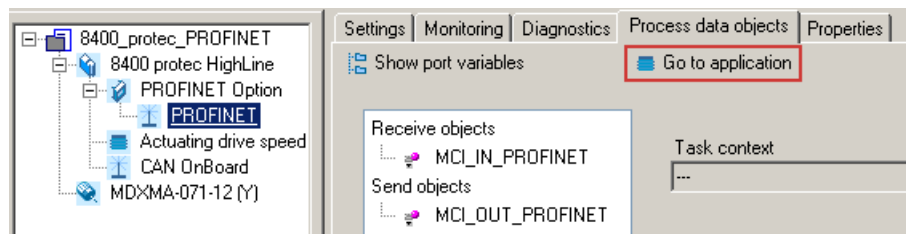
8.3

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

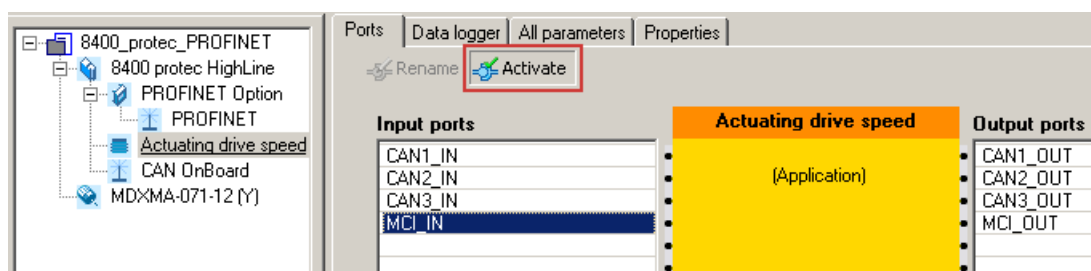


How to freely configure the port interconnection in the »Engineer«:

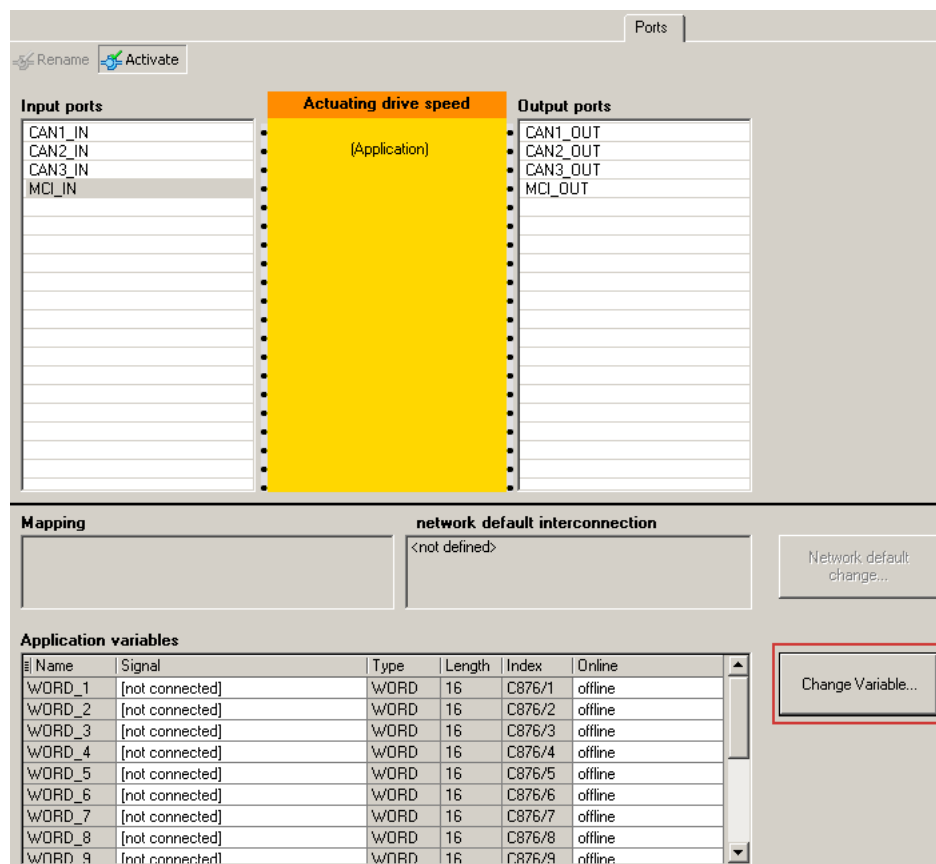
1. Go to the **Process data objects** tab and click **Go to application**.



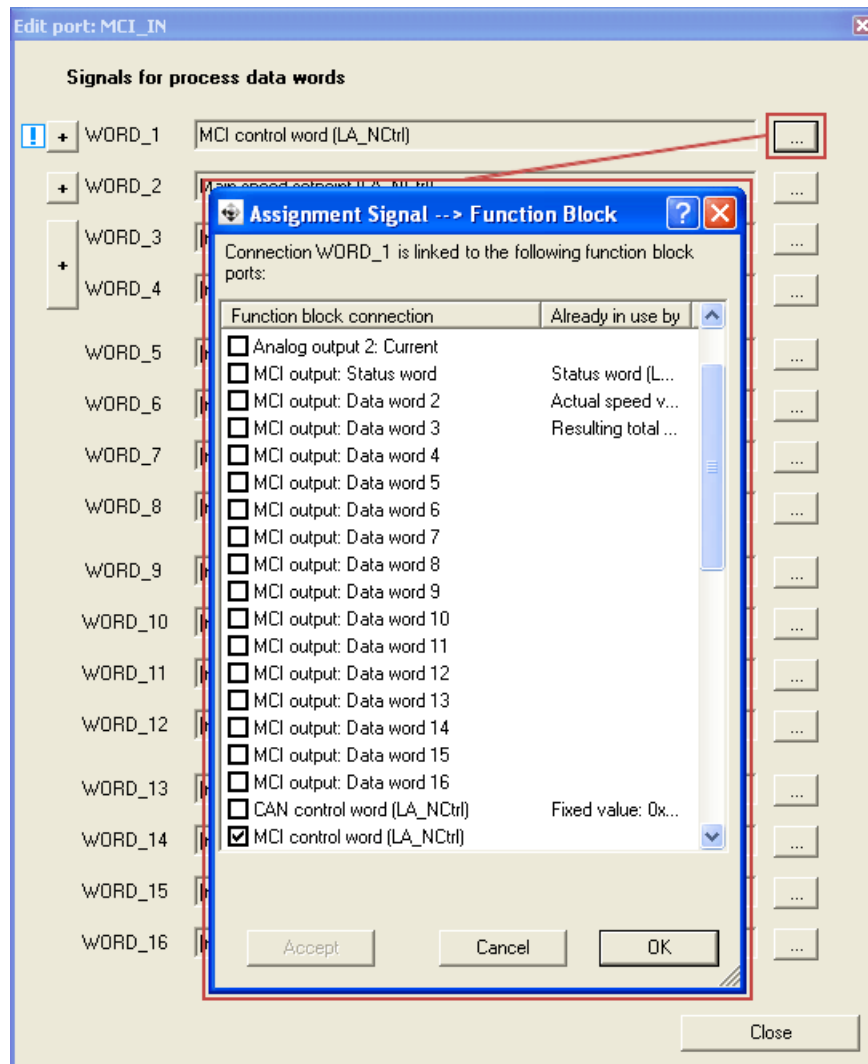
2. Go to the **Ports** tab, select the port blocks "MCI_IN" or "MCI_OUT" and click **Activate** to activate them.



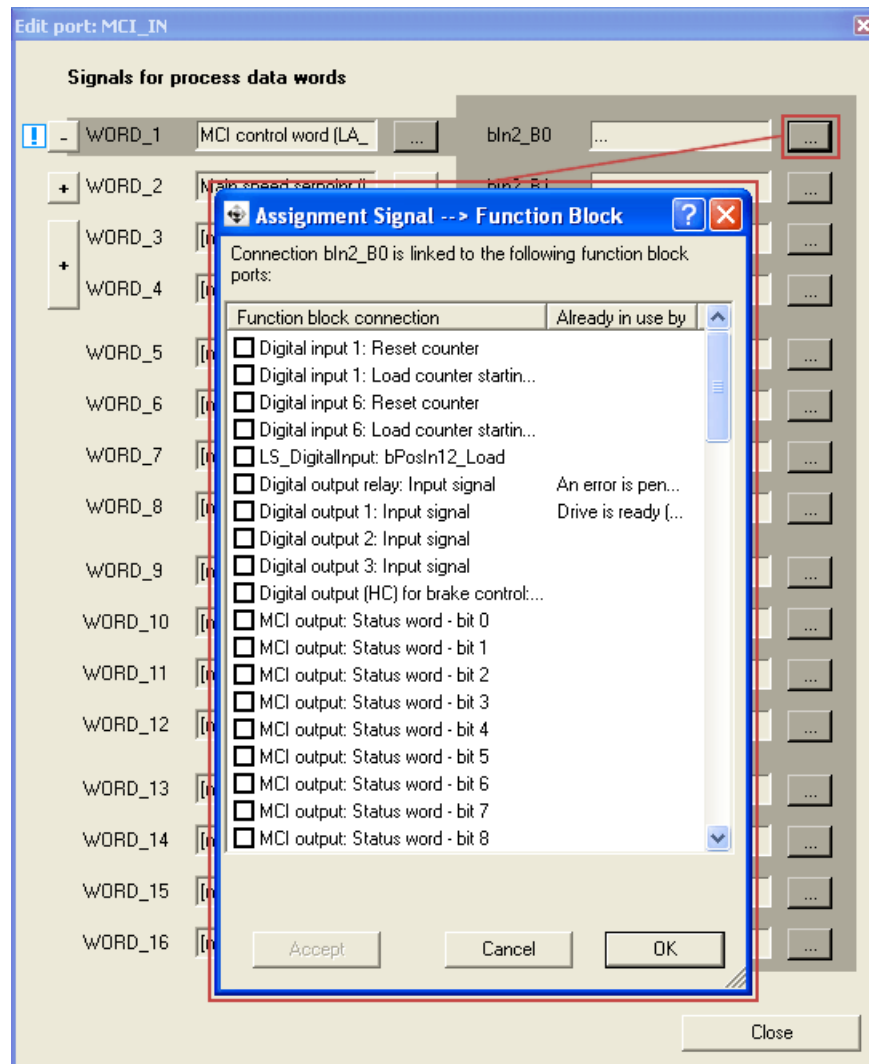
3. Click the **Change variable ...** button.



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**.

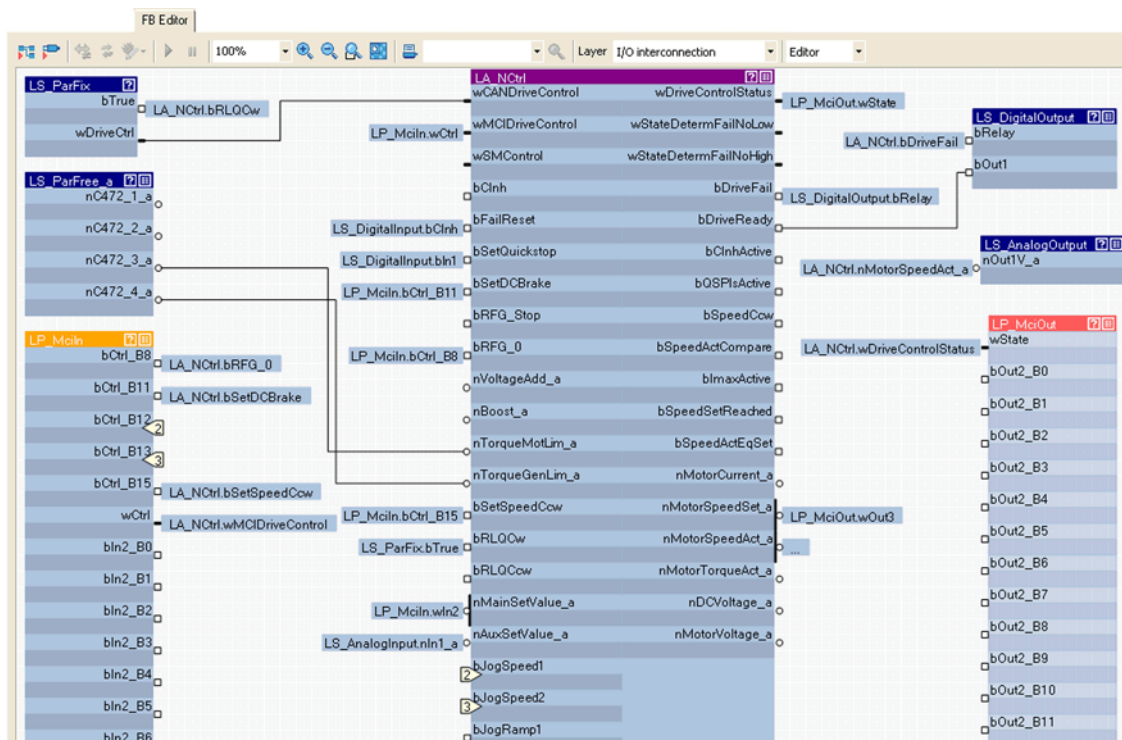


Furthermore you can assign signals to the individual control and status bits of the WORD_1 ... WORD_4 process data words using the  and  buttons.
→ Select the signals and then click **OK**.



**Tip!**

When the **LP_MciIn** and **LP_MciOut** port blocks 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.

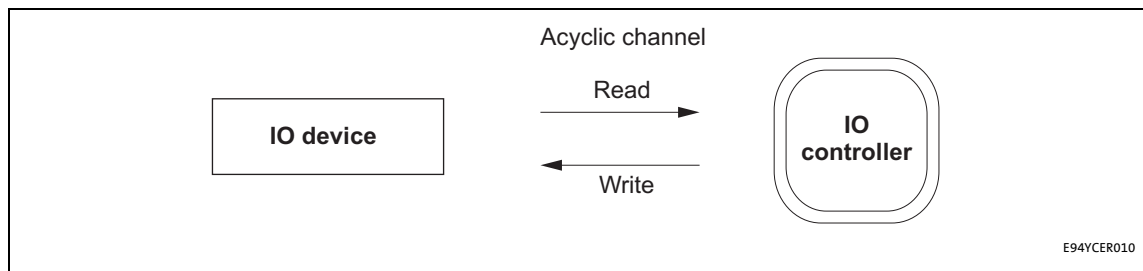
Cyclic and acyclic PROFINET services can be operated simultaneously in the network.

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.

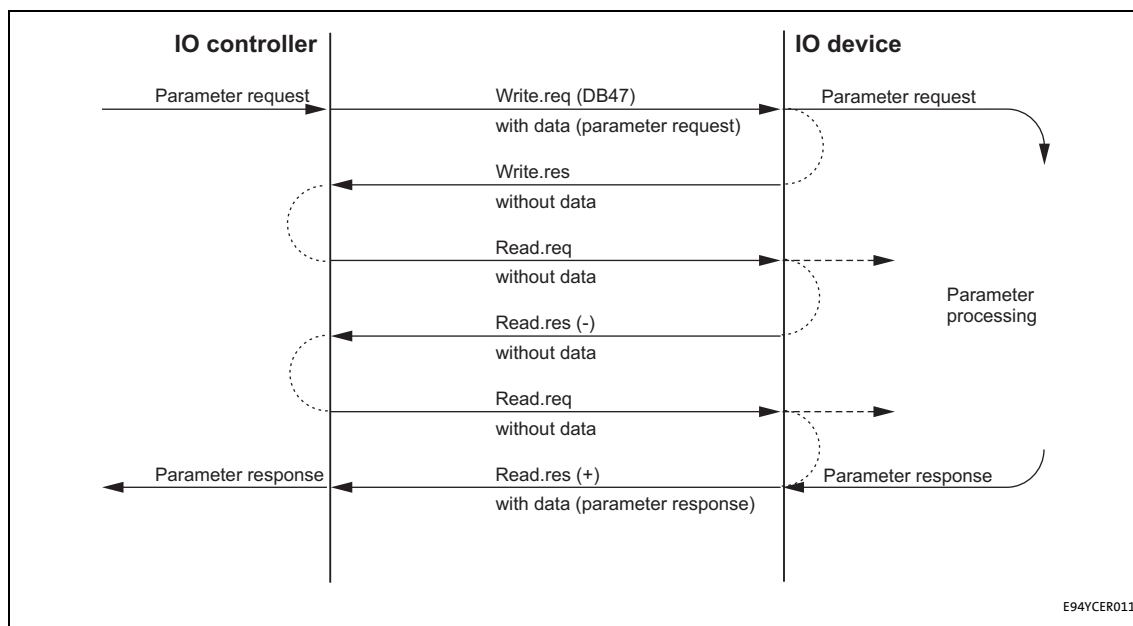
9.1.1 Connection establishment of an IO Controller to an IO device

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

9.1.2 Acyclic data transmission process



[9-2] Data communication via the acyclic channel

- A "Write.req" is used for transmitting the data set (DB47) to the I/O device in the form of a parameter request.
- "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.

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

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 0xFFFFFFFF

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

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) (58)
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 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) " (book icon 58)	



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 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 0xFFFFFFFF

9 Parameter data transfer

9.3 Writing parameters to the inverter

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.

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) (□ 58)
Additional information (if available)	U16	

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) " (58)	

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	Reserved	-	-
...			
0x0064			

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

9.5 Consistent parameter data

In the PROFINET communication system, data are permanently exchanged between the host (CPU + I/O controller) and the Inverter Drive 8400 protec. The I/O controller as well as 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):



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.

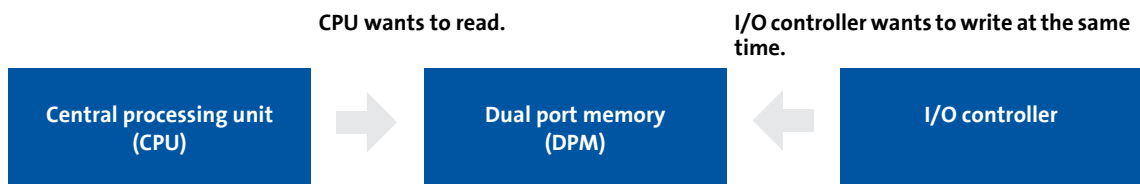
In order to avoid such an impermissible state, the parameter data to be transmitted must be marked as "consistent".

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:



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 the complete data set into the DPM.

Configuring consistent data



Note!

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

10 PROFIsafe

PROFINET enables the transfer of safe information via the PROFIsafe protocol in accordance with the "PROFIsafe - Profile for Safety Technology" specification, version 2.0.



Note!

Safe information can only be transmitted via the PROFIsafe protocol when using a version with integrated safety system.

- The PROFIsafe message is sent in the second slot of a PROFINET frame.
- One bit of the PROFIsafe data is always used to control specific safety functions.
- The structure of the PROFIsafe data is described in the PROFIsafe profile.
- The length of the PROFIsafe data (also called PROFIsafe message) always is 8 bytes.



Reference manual/online help "Inverter Drives 8400 protec – integrated safety system"

Here you'll find some detailed information about how to configure the integrated safety system.

Starting up the PROFINET/PROFIsafe in the Inverter Drive 8400 protec

Inverter Drives 8400 protec (PROFINET) are available in two versions – with and without a SO20/SO30 safety option.

Procedure: If PROFIsafe is activated in the SO20/SO30 safety option, a safety application is supported by the IO controller.

- The PRM and CFG data are sent by a PROFINET master for establishing the data exchange. These data may contain safety data and general PROFINET data.
- A data exchange exclusively including PROFINET data (parameter and process data) can always take place.
- If PRM data are transmitted with PROFIsafe data from the IO controller, the SO20/SO30 safety option must be activated.
- The PRM data are checked with the safety option.
- In the IO controller the safety data must always be placed in the first slot (Slot 0).

11 Monitoring

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:

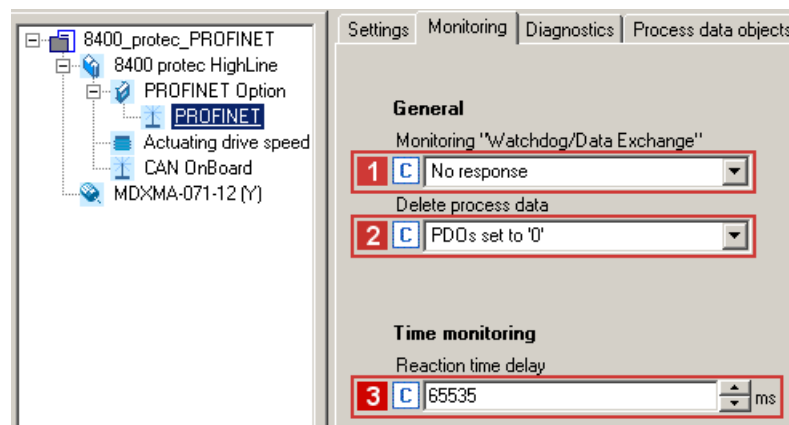
1. During the initialisation of PROFINET communication the watchdog monitoring time specified in the I/O controller is transferred to the I/O device.

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 ([C13861](#)) and the red LED **BUS-ERR** is activated ([LED status displays](#) (63)).

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 protec** **1** ([C13880](#)) under the **Monitoring** tab.



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 the response delay has elapsed, the response set is executed with the error message "[PROFINET: Data_Exchange status quit \[0x01bc6531\]](#)" (70).

12

Diagnostics

For purposes of fault diagnostics of the PROFINET, the Inverter Drive 8400 protec is provided with LEDs on the front. Furthermore, you can carry out the [Diagnosing with the »Engineer«](#) (65).

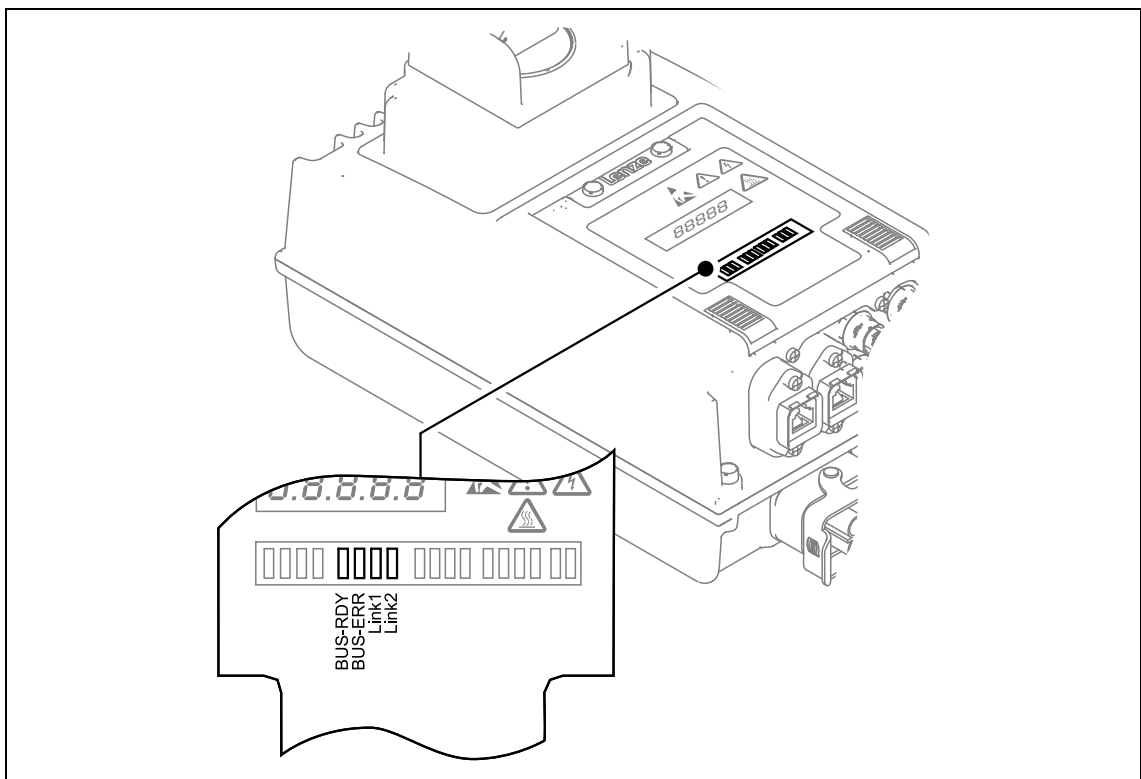


"Inverter Drives 8400 protec – integrated safety system" manual

Here you can find detailed information on the LED status displays for devices with an integrated safety system.

12.1

LED status displays

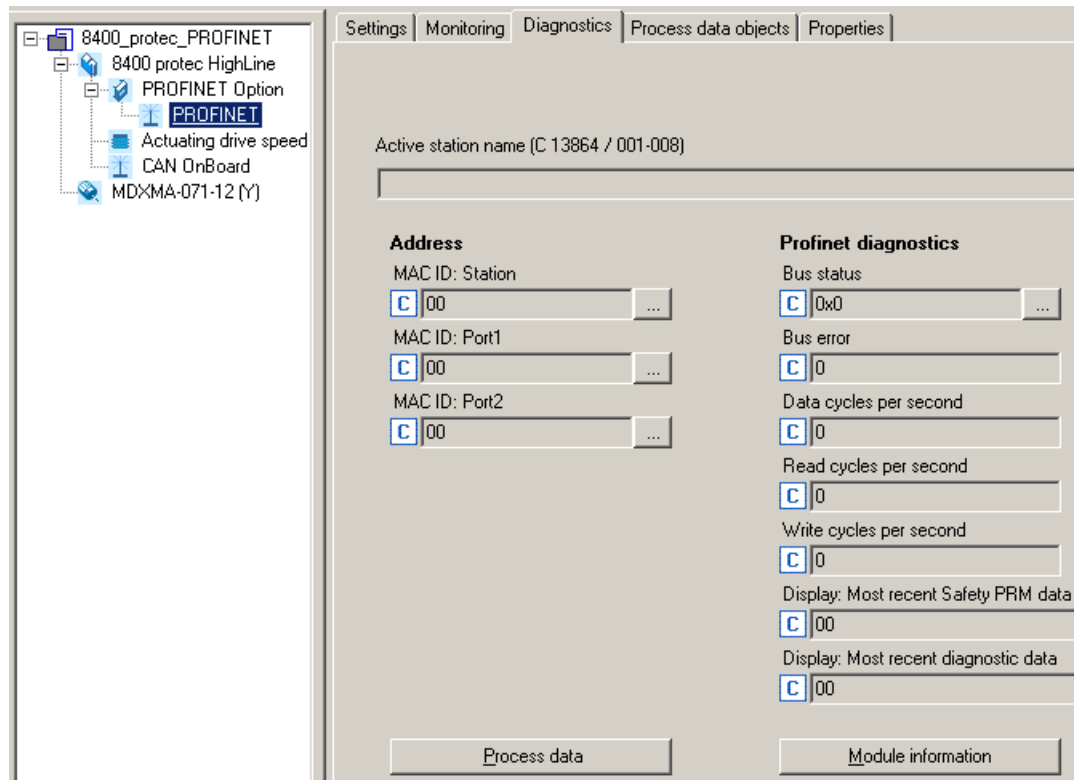


[12-1] LED display on the front of the Inverter Drive 8400 protec

Pos.	Colour	Status	Description
BUS-RDY	green	off	No communication (The Inverter Drive 8400 protec is not active on the fieldbus or is in the "Init" state.)
		Blinking	 Communication active (The Inverter Drive 8400 protec is in the "Data_Exchange" state.)
BUS-ERR	red	On	 Communication error (e.g. Ethernet cable has been unplugged)
		Blinking	 Impermissible settings: • Invalid station name • Invalid IP parameters The Inverter Drive 8400 protec has been initialised and continues working internally with the corresponding standard values.
		Flickering/ blinking	From SW version 02.00 onwards with a 50 ms blinking pattern:  From SW version 03.00 onwards with a 500 ms blinking pattern:  The "Node blinking test" PROFINET function is activated by the I/O controller. The jittering LED serves to identify/localise accessible I/O devices.
Link1 Link2	Yellow	off	• No cable connected • No communication
		On	 Cable connected
		Flickers	 Communication active

12.2 Diagnosing with the »Engineer«

In the »Engineer« under the **Diagnostics** tab, various pieces of diagnostic PROFINET information are displayed.



12.3 Diagnostic data

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

Code [C13887](#) serves to inhibit the transmission of alarm messages to the IO controller. By this, errors of a specific type can be suppressed systematically.

Errors and warnings in the Inverter Drive 8400 protec are sent to the IO controller as extended diagnostic messages.

The diagnostic data can be displayed using the hexadecimal representation of the Siemens »STEP7« engineering tool.

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



Reference manual/online help for the Inverter Drive 8400 protec

Detailed information on the inverter error codes is provided here.

13 Error messages

This chapter complements the error list in the reference manual and the online help for the Inverter Drive 8400 protec by PROFINET error messages.



Reference manual/online help for the Inverter Drive 8400 protec

Here you will find general information on diagnostics & fault analysis and on error messages.

13.1 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 number			Error text	Error type	Adjustable in
hex	dec (Subject area No.)	dec (Error No.)			
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 watchdogreset	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: IP address error	1: No Response	-
0x01bc6534	444	25908	PROFINET: Stack init error	1: No Response	-
0x01bc6610	444	26128	PROFINET: Safety communication timeout	4: Warning locked	-
0x01bc6611	444	26129	PROFINET: Safety parameter timeout	4: Warning locked	-
0x01bc6612	444	26130	PROFINET: Safety init error	4: Warning locked	-
0x01bc6613	444	26131	PROFINET: Safety connect error	4: Warning locked	-
0x01bc6650	444	26192	PROFINET: Internal error	1: No Response	-

13.2 Possible causes and remedies

This chapter contains all PROFINET error messages in numerical order of the error number. Possible causes and remedies as well as responses to the error messages are described in detail.

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

Response (Lenze setting in bold)		Setting: not possible	
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information			
Cause		Remedy	
• Network cable (plug) is defective. • Network cable on the X31/X32 PROFINET terminal is disconnected. • Voltage supply is interrupted.		• Check cables and terminals. • Plug in the network cable on the X31/X32 PROFINET terminal.	

PROFINET: Memory: No access [0x01bc5531]

Response (Lenze setting in bold)		Setting: not possible	
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information			
Cause		Remedy	
Access to memory was not possible.		Download application again (including module) If this error occurs repeatedly, contact the Lenze Service department.	

PROFINET: Memory: Read error [0x01bc5532]

Response (Lenze setting in bold)		Setting: not possible	
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information			
Cause		Remedy	
Parameter could not be read.		Download application again (including module) If this error occurs repeatedly, contact the Lenze Service department.	

PROFINET: Memory: Write error [0x01bc5533]

Response (Lenze setting in bold)		Setting: not possible	
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information			
Cause		Remedy	
Parameter could not be written.		Download application again (including module) If this error occurs repeatedly, contact the Lenze Service department.	

PROFINET: Restart by watchdogreset [0x01bc6010]

Response (Lenze setting in bold)		Setting: not possible	
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information			
Cause		Remedy	
Device is damaged.		If this error occurs repeatedly, contact the Lenze Service department.	

PROFINET: Internal error [0x01bc6011]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Device is damaged.	If this error occurs repeatedly, contact the Lenze Service department.

PROFINET: Internal error [0x01bc6100]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Internal error	If this error occurs repeatedly, contact the Lenze Service department.

PROFINET: Internal error [0x01bc6101]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Internal error	If this error occurs repeatedly, contact the Lenze Service department.

PROFINET: Invalid parameter set [0x01bc641f]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
No active parameter set could be loaded.	Download application again (including module) If this error occurs repeatedly, contact the Lenze Service department.

PROFINET: Error: Lenze setting loaded [0x01bc6420]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Access to parameter set in memory module via standard device was not successful.	Download application again (including module) If this error occurs repeatedly, contact the Lenze Service department.

PROFINET: Invalid module configuration [0x01bc6430]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
A module or submodule does not comply with the configuration of the Siemens »STEP7« engineering tool.	Check/correct configuration.

PROFINET: Record Parameter: Invalid read [0x01bc6501]

Response (Lenze setting 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/correct configuration.

PROFINET: Record Parameter: Invalid write [0x01bc6502]

Response (Lenze setting 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 too small.	Check/correct configuration.

PROFINET: Data output status bad [0x01bc6503]

Response (Lenze setting 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 the Siemens Controller has been interrupted.	• Check cables and terminals. • Plug in the network cable on the X31/X32 PROFINET terminal.

PROFINET: Data_Exchange status quit [0x01bc6531]

Response (Lenze setting 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 chapter " Interruption of PROFINET communication " (book 62).	• Check cables and terminals. • Plug in the network cable on the X31/X32 PROFINET terminal.

PROFINET: Station name error [0x01bc6532]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Station name is not DNS-conform.	Use a DNS-compliant station name. ▶ Setting the station name (book 26)

PROFINET: IP address error [0x01bc6533]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ 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 (📖 28)

PROFINET: Stack init error [0x01bc6534]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ 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 (📖 28) ▶ Setting the station name (📖 26)

PROFINET: Safety communication timeout [0x01bc6610]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
This is an error message occurring during every safe parameter download.	Reset error.

PROFINET: Safety parameter timeout [0x01bc6611]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
The SO20/SO30 safety option does not respond to a PROFISafe parameterisation telegram (PRM data) within a given time interval (200 ms).	Activate the SO20/SO30 safety option.

PROFINET: Safety init error [0x01bc6612]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
• Communication with the SO20/SO30 safety option could not be initialised correctly. • The IO controller has defined a safety application, however, no connection to the safety option was recognised internally.	Activate the SO20/SO30 safety option.

PROFINET: Safety connect error [0x01bc6613]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Communication to the I/O controller is disrupted.	Activate the SO20/SO30 safety option.

PROFINET: Internal error [0x01bc6650]

Response (Lenze setting in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Internal error	Send device with error description to Lenze.

14 Parameter reference

This chapter supplements the parameter list and the table of attributes in the reference manual and the online help for the Inverter Drive 8400 protec by the PROFINET parameters.



Reference manual/online help for the Inverter Drive 8400 protec

Here you will find general information on parameters.

14.1 Parameters relevant for communication

This chapter lists the PROFINET parameters 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: C13000 IP address			Data type: UNSIGNED_32 Index: 11575 _d = 2D37 _h
Setting of the IP address ▶ Setting the IP configuration (📖 28)			
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			

C13001

Parameter Name: C13001 Subnetwork mask			Data type: UNSIGNED_32 Index: 11574 _d = 2D36 _h
Setting of the subnet mask ▶ Setting the IP configuration (📖 28)			
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 (📖 28)			
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		

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.			
Display range (min. value unit max. value)			
0		255	
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: C13850 All words to master			Data type: UNSIGNED_16 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: C13851 All words from master			Data type: UNSIGNED_16 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: C13852 All words to standard device			Data type: UNSIGNED_16 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			

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			

C13862

Parameter Name: C13862 Bus counter			Data type: UNSIGNED_32 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: C13864 Active station name		Data type: VISIBLE_STRING 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 (📖 26)		
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		

C13865

Parameter Name: C13865 Display: Most recent safety PRM data	Data type: OCTET_STRING Index: 10710 _d = 29D6 _h
Display of the most recently sent F_parameters. This data is only valid if PROFIsafe is active. The coding of the F_parameters is described in the PROFIsafe profile V2.0.	
☒ 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	Recldx
5	
6	Accepted length
...	
9	
10	F_parameter
...	
24	

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		

C13878

Parameter Name: C13878 Bus error(2)		Data type: BITFIELD_16 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: C13880 Reaction on communication failure		Data type: UNSIGNED_8 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: C13881 Reaction time delay		Data type: UNSIGNED_16 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 expired. • 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		

C13885

Parameter Name: C13885 Clear process data		Data type: UNSIGNED_8 Index: 10690 _d = 29C2 _h
This code is used to set the process data which the I/O device is to process in order to maintain the internal communication when the PROFINET has exited 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: C13887 Suppress signalling diag. mess. upon		Data type: BITFIELD_8 Index: 10688 _d = 29C0 _h
This code serves to inhibit the transmission of alarm messages to the IO controller. Setting the corresponding bits to TRUE serves to systematically suppress errors of a specific type. Furthermore, all errors are entered in the logbook. A change will only become effective immediately if no error number with the error type selected here is pending in 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	From SW version 3.00.
Bit 6	Reserved	
Bit 7	Connection to 8400 lost	From SW version 3.00. Error message: PROFINET: Exist. conn. to 8400 lost [0x01bc3100] (□ 68)
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13899

Parameter Name: C13899 Station name		Data type: VISIBLE_STRING 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 (□ 26)		
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	

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	00000000000000000000000000000000 00000000000000000000000000000000	I&M4 signature code
C13914/2	00000000000000000000000000000000 00000000000000000000000000000000	I&M4 signature code
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

14.2 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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Your opinion is important to us

These instructions were created to the best of our knowledge and belief to give you the best possible support for handling our product.

Perhaps we have not succeeded in achieving this objective in every respect. If you have suggestions for improvement, please e-mail us to:

feedback-docu@lenze.com

Thank you very much for your support.

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E94AYCER

PROFINET®

Servo Drives 9400

Communication Manual

EN



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1 About this documentation

Contents

This documentation exclusively describes the E94AYCER communication module (PROFINET).



Note!

This documentation supplements the **mounting instructions** supplied with the inverter and the **"Servo Drives 9400" hardware manual**.

The mounting instructions contain safety instructions which must be observed!

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

Examples illustrate typical applications.

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

This documentation does not describe any software provided by other manufacturers. No warranty can be given for corresponding data provided in this documentation. For information on how to use the software, please refer to the host (PLC, IO Controller) documents.

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



Tip!

Detailed information about PROFINET can be found on the homepage of the PROFIBUS user organisation which also develops the PROFINET communication technology:

www.profibusb.com

Target group

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



Tip!

Current documentation and software updates with regard to 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	E94AYCER	VE	01.40

Screenshots/application examples

All screenshots in this documentation are application examples. Depending on the firmware version of the communication module and software version of the engineering tools installed (e.g. »Engineer«, »STEP7«), the screenshots in this documentation may differ from the screen representation.

1.1

Document history

Version			Description
11.0	04/2016	TD17	• Corrections with regard to software version 03.00 • Information regarding the use of the SM302 safety module
10.0	11/2015	TD17	• Corrections with regard to software version 02.10 • Chapter "Shared Device" function (□ 52) new • Chapter Media Redundancy Protocol (MRP) (□ 53) new
9.0	12/2013	TD17	• Revision for software version 02.10 • New layout
8.0	09/2012	TD17	Revision for software version 02.00
7.0	03/2011	TD17	Revision for software version 01.40
6.0	04/2010	TD17	Chapters "Commissioning (□ 32)" and "Monitoring (□ 77)" updated.
5.0	03/2010	TD17	New chapter "Establishing an online connection via PROFINET with the Lenze »Engineer«"
4.0	11/2009	TD17	General revision
3.0	02/2009	TD17	General revision
2.0	07/2008	TD17	Revision for hardware version VE (2 port PROFINET)
1.0	11/2007	TD17	First edition for hardware version VC (1 port PROFINET)

1 About this documentation

1.2 Conventions used

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

Type of information	Writing	Examples/notes
Spelling of numbers		
Decimal	Normal spelling	Example: 1234
Decimal separator	Point	The decimal point is always used. For example: 1234.56
Hexadecimal	0x[0 ... 9, A ... F]	Example: 0x60F4
Binary • Nibble	In inverted commas Point	Example: '100' Example: '0110.0100'
Text		
Version information	Blue text colour	All information that only applies to or from a certain software version of the inverter is marked accordingly in this documentation. Example: This function extension is available from software version V3.0!
Program name	» «	The Lenze »Engineer« PC software...
Control element	bold	The OK button... / the Copy command... / the Characteristics tab... / the Name input field...
Sequence of menu commands		If several commands are required in succession for executing a function, the single commands are separated by an arrow: Select the File → Open command to...
Hyperlink	Underlined	Optically highlighted reference to another topic. It is activated with a mouse-click in this online documentation.
Icons		
Page reference	(8)	Optically highlighted reference to another page. It is activated with a mouse-click in this online documentation.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

1 About this documentation

1.3 Terminology used

1.3 Terminology used

Term	Meaning
Inverter	Lenze inverters of the "Servo Drives 9400" product series
Standard device	
Code	Parameter that serves to parameterise and monitor the inverter. This term is usually referred to as "index" in common parlance.
Subcode	If a code contains several parameters, they are stored in "subcodes". In the documentation, the slash "/" is used as a separator between the code and the subcode (e.g. "C00118/3"). The term is also referred to as "subindex" in common parlance.
»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.
FW	Firmware
HW	Hardware
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.
IOPS (IO Provider State)	Status of the process data sent by the IO controller • A "GOOD" status indicates that the process data sent are valid. • A "BAD" status indicates that the process data sent are invalid.
Lenze setting	Default settings of the device, preconfigured ex works.
Basic setting	
	PROFINET® (Process Field Network) is a real-time capable fieldbus system based on Ethernet. PROFINET® is a registered trademark and patented technology licensed by the PROFIBUS & PROFINET International (PI) user organisation.
PROFIsafe	The certified safety protocol for the transmission of safety-oriented data via PROFINET
»STEP7« / »HW Konfig«	Siemens PC software for PROFINET configuration
»Primary Setup Tool«	
SW	Software

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
	Note!	Important note to ensure trouble-free operation
	Tip!	Useful tip for easy handling
		Reference to another document

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.

2.2**Device and application-specific safety instructions**

- During operation, the communication module must be securely connected to the standard device.
- With external voltage supply, always use a separate power supply unit, safely separated to EN 61800-5-1 in every control cabinet (SELV/PELV).
- A safety bus system (PROFIsafe) can only be operated via the upper module slot (MX11) of the Servo Drive 9400.
- Only use cables corresponding to the given specifications.
 - ▶ [Ethernet cable specification](#) (📖 29)

**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 Servo Drives 9400 are used on a phase earthed mains with a rated mains voltage ≥ 400 V, protection against accidental contact is not guaranteed without external measures.

- ▶ [Protective insulation](#) (📖 18)

Device protection

The communication module contains electronic components which may be damaged or destroyed by electrostatic discharge.

- ▶ [Installation](#) (📖 22)

3 Product description

3.1 Application as directed

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 hardware version	From software version upwards
Servo Drives 9400 HighLine	E94AxHExxx	1A	04.00
Servo Drives 9400 PLC	E94AxPExxxx	VA	02.00
Regenerative power supply module	E94ARNxxxx	VA	01.00

- must only be used together with the following safety modules:

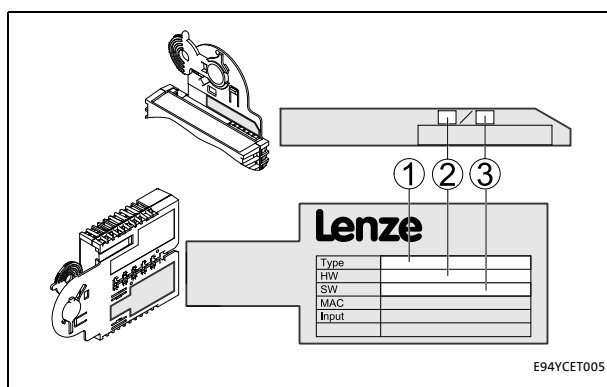
Product series	Type designation	From hardware version	From software version upwards
SM301 safety module	E94AYAE	VB	1.1
SM302 safety module (from SW version 3.00 onwards)	E94AYAF	VA	1.0

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

Any other use shall be deemed inappropriate!

3.2 Identification

The type designation and the hardware and software versions of the communication module are indicated on the nameplate:



1 Type designation

E94 Product series
A Version
Y Module identification: Extension module
C Module type: Communication module
ER PROFINET

2 Hardware version

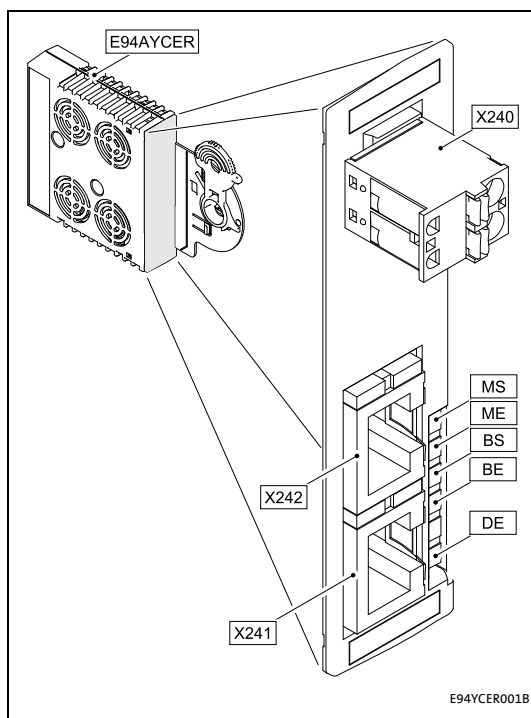
3 Software version

[3-1] Identification data

3.3**Product features**

- Interface module for the PROFINET IO communication system, for attaching to the expansion slots of Servo Drives 9400
- 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 (Link Layer Discovery Protocol) for the topology recognition
- Support of the SNMP (Simple Network Management Protocol) for diagnostic purposes
- Support of the MRP (Media Redundancy Protocol) [from SW version 2.10](#)
The Servo Drive 9400 can be integrated as client node into a ring topology.
- Support of the "Shared Device" function [from SW version 2.10](#)
- Transfer of safe information via the PROFIsafe protocol if the SM301 safety module (E94AYAE) is used simultaneously
[From SW version 3.00](#) onwards, the SM302 safety module (E94AYAF) can also be used.
- Up to 32 process data words (64 bytes) per direction can be exchanged.
- Access to all Lenze parameters
- An online connection via PROFINET can be established using the Lenze »Engineer«.
From [SW version 2.10](#) onwards, up to 3 connections are supported at the same time.
Note: It must be ensured that file services accessing a file (e.g. load parameter set) are always only executed via one engineering tool. Otherwise file access errors will occur.

3.4 Terminals and interfaces



X240 External voltage supply of the communication module

- 2-pin plug connector with spring connection
- ▶ [External voltage supply](#) (83 31)

X241 PROFINET input (IN)

X242 PROFINET output (OUT)

- RJ45 sockets according to IEC/EN 60603-7
- each with 2 LED status displays for diagnostics
- ▶ [Network topology](#) (83 25)
- ▶ [PROFINET connection](#) (83 27)
- ▶ [Status displays at X241 and X242](#) (83 82)

MS LED status displays for diagnostics

ME ▶ [Module status displays](#) (83 80)

BS ▶ [Fieldbus status displays](#) (83 81)

BE

DE

[3-2] E94AYCER communication module (PROFINET)

4

Technical data

4.1

General data and operating conditions

Range	Values	
Order designation	E94AYCER	
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)	0x9400	
TCP port	9410	
Number of TCP ports	• 1 • 3 (from SW version 2.10)	
Optional PROFINET functions (from SW version 2.10)	• Multiple access (Shared Device) • MRP (Media Redundancy Protocol)	
Baud rate	100 Mbps	
Minimum cycle time	• 4 ms • 2 ms (from SW version 2.10)	
Switching method	• "Store and forward" • "Cut-Through" (from SW version 2.10)	
Switch latency	• Approx. 125 µs at max. frame length • 6 µs (from SW version 2.10)	
Voltage supply	External supply via separate power supply unit +: U = 24 V DC (20.4 V ... 28.8 V), I = 130 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, Power Conversion Equipment (file no. E132659)



Servo Drives 9400 hardware manual

Here you can find the **ambient conditions** and data on the **electromagnetic compatibility (EMC)**, which also apply to the communication module.

4.2 Protocol data

Range	Values
Process data words (PCD)	Maximally 32 process data words (max. 64 bytes)
PROFIsafe data for use of the SM301 safety module	4 words (8 bytes)
PROFIsafe data for use of the SM302 safety module (from SW version 3.00 onwards)	8 words (16 bytes)
Acyclic parameter data channel	Limited by the PROFINET frame size

4.3 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 an 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 (I/O data)	10 ms + 0 ... 1 ms + 1 ... x ms Lenze standard update cycle (can be changed in the Rockwell engineering tool) Processing time in the module Runtime of the application task of the technology application used (tolerance)
Parameter data	Approx. 30 ms + a tolerance of 20 ms (typically) • Some codes may require a longer processing time (see reference manual/ »Engineer« online help for the Servo Drive 9400). • The times specified apply if the TCP/IP channel of the communication module is <u>not</u> used (»Engineer« communication, chapter Setting the IP configuration (□ 37)).

There are no interdependencies between parameter data and process data.

4.4 Internal switch latency

The integrated 2-port switch causes runtime delays. These runtime delays can be calculated as follows for modules [up to and including SW version V01.40](#):

$$\text{Runtime delay} = ((36 \text{ permanent bytes} + \text{process data in bytes}) \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$$

Example

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

- $((36 \text{ permanent bytes} + 48 \text{ bytes}) \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$
- $(84 \text{ bytes} \times 8 \times 10 \text{ nsec}) + 4 \text{ } \mu\text{sec}$
- $6.72 \text{ } \mu\text{sec} + 4 \text{ } \mu\text{sec} = \mathbf{10.72 \text{ } \mu\text{sec}}$

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.

From [SW version V2.10](#), a frame length-independent delay time of < 6 μs applies.



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](#) (📖 25)

4.5

Protective insulation

**Danger!****Dangerous voltage**

If the Servo Drives 9400 are operated on a phase earthed mains with a rated mains voltage ≥ 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, ...

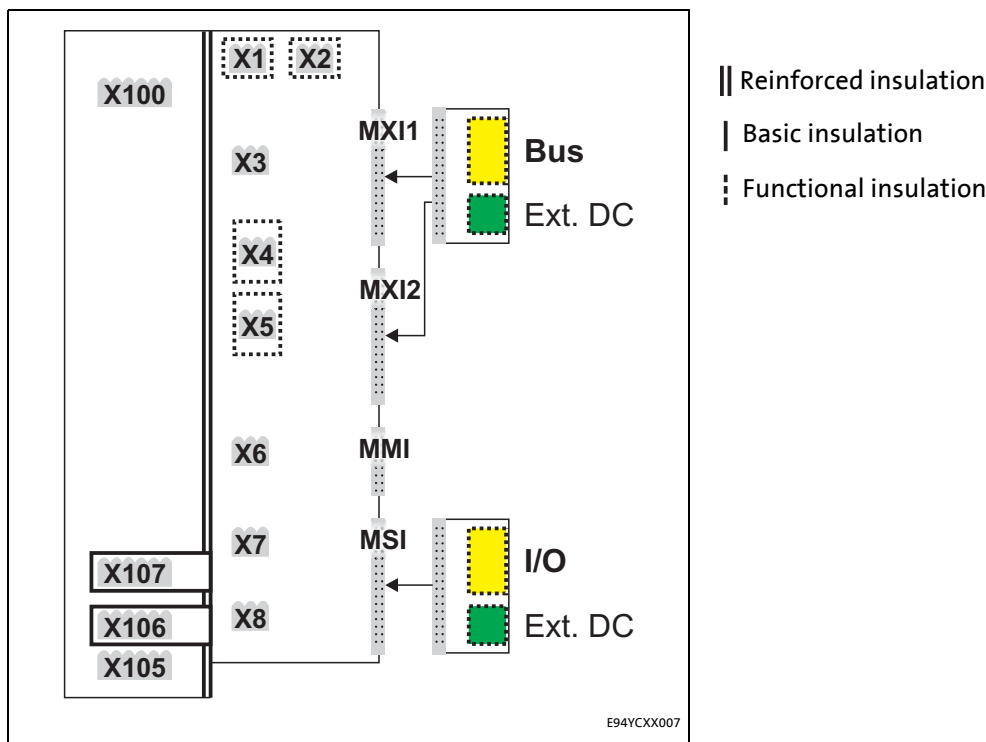
- a double isolating distance must exist.
- the components to be connected must be provided with the second isolating distance.

**Note!**

The protective insulation provided in Servo Drives 9400 is implemented in accordance with EN 61800-5-1.

The following illustration ...

- shows the arrangement of the terminal strips and the separate potential areas of the Servo Drive 9400.
- 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	Terminal	Terminal strip	Terminal
X100	L1, L2, L3 (Single Drive only)	X1	CAN on board 9400
	+UG, -UG	X2	State bus
X105	U, V, W		24 V (ext.)
	Rb1, Rb2 (Single Drive only)	X3	Analog inputs/outputs
X106	Motor PTC	X4	Digital outputs
X107	Control of the motor holding brake	X5	Digital inputs
		X6	Diagnostics
		X7	Resolver
		X8	Encoder
		MXI1, MXI2	Extension module
		MMI	Memory module
		MSI	Safety module

Example

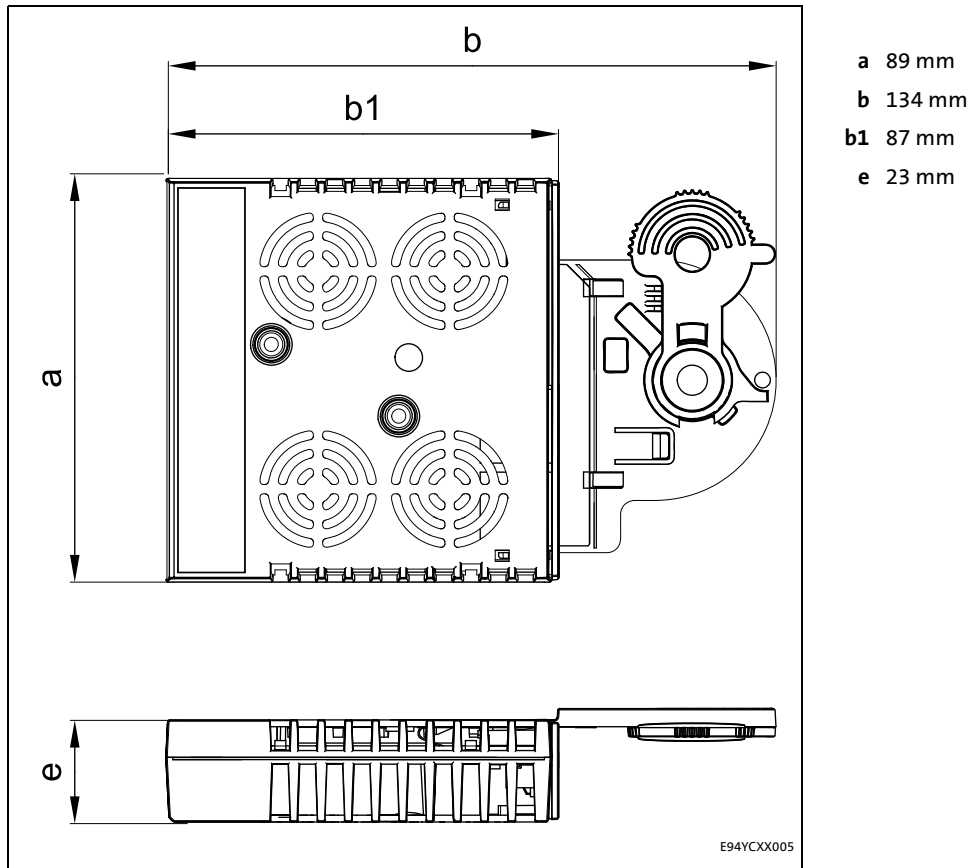
Which type of protective insulation is used between the bus terminal of the device module in slot MXI1 or MXI2 and the mains terminal X100?

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.

4.6 Dimensions



[4-2] Dimensions

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

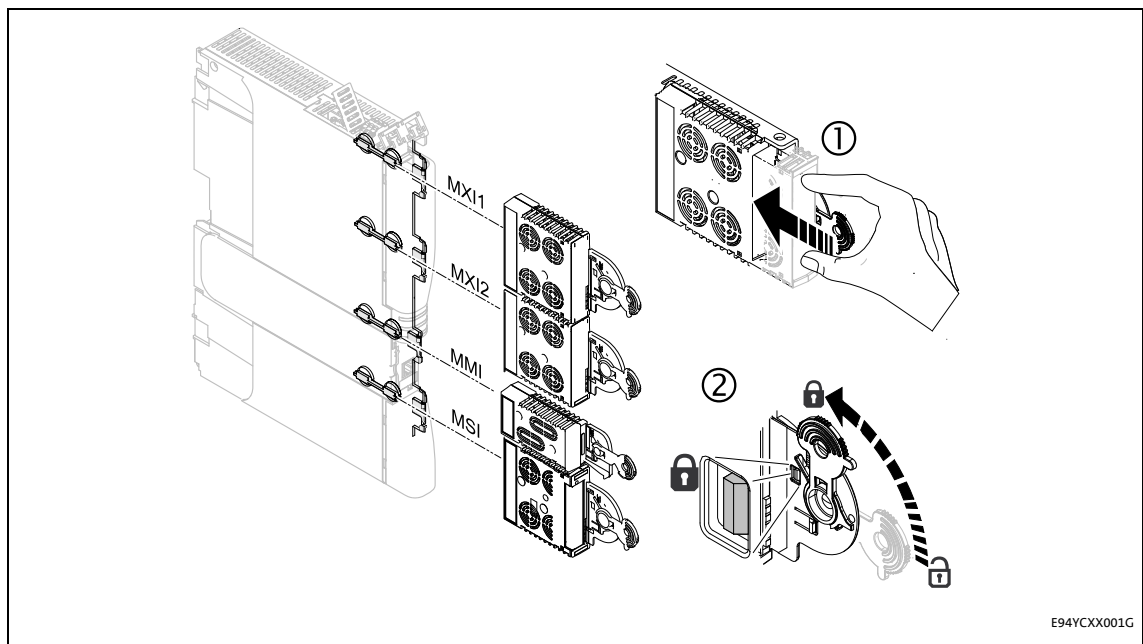
Mechanical installation

**Note!**

A safety bus system (PROFIsafe) can only be operated via the upper module slot (MXI1) of the Servo Drive 9400.

5.1.1

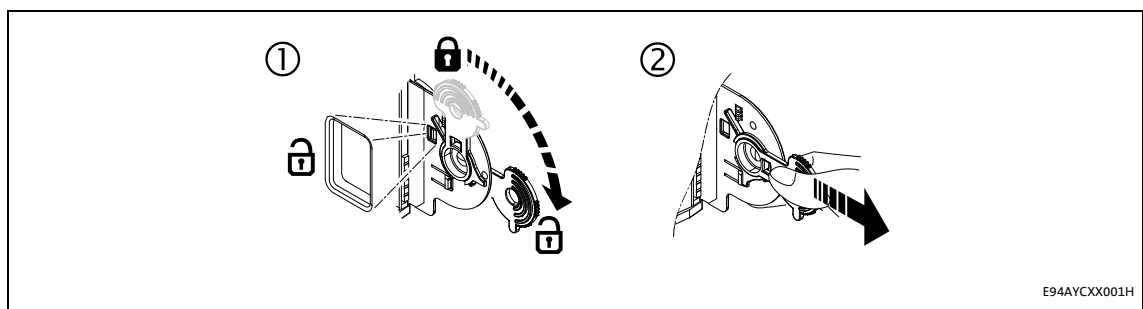
Assembly



[5-1] Assembly

5.1.2

Disassembly



[5-2] Disassembly

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

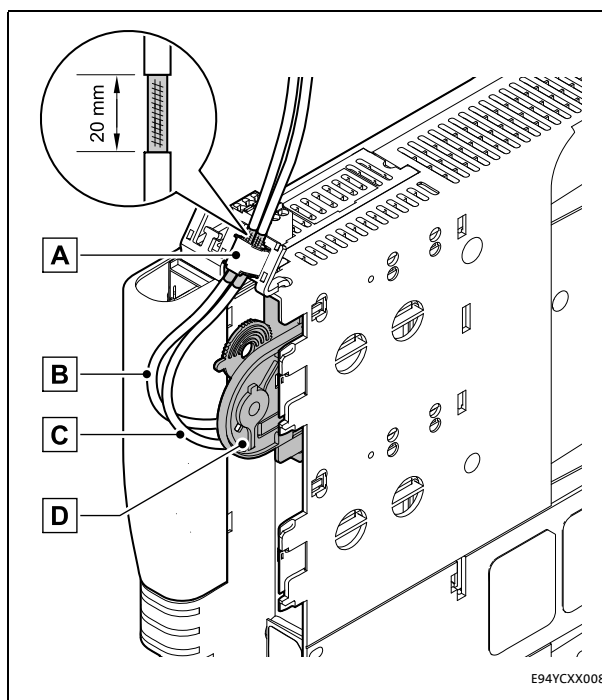
Wiring according to EMC guidelines

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. The distance between the additional earthing and the Ethernet plug depends on the module slot and is as follows:
 - approx. 10 cm for the upper slot (MXI1)
 - approx. 20 cm for the lower slot (MXI2)
2. Measure the appropriate distance along the cable and, starting from this point, remove 2 cm of the cable's plastic sheath.
3. Connect the cable shield to the shield sheet of the Servo Drive 9400.



A Connection to the shield sheet of the Servo Drive 9400

B Outgoing PROFINET cable at X242

C Incoming PROFINET cable at X241

D Communication module in slot MXI1 of the Servo Drive 9400

[5-3] Wiring according to EMC guidelines

5.2.2 Network topology

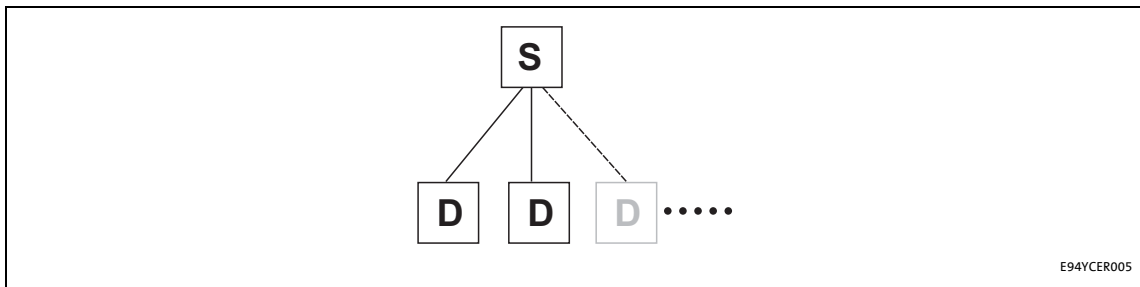
It is typical of PROFINET to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

► [Internal switch latency](#) (17)

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

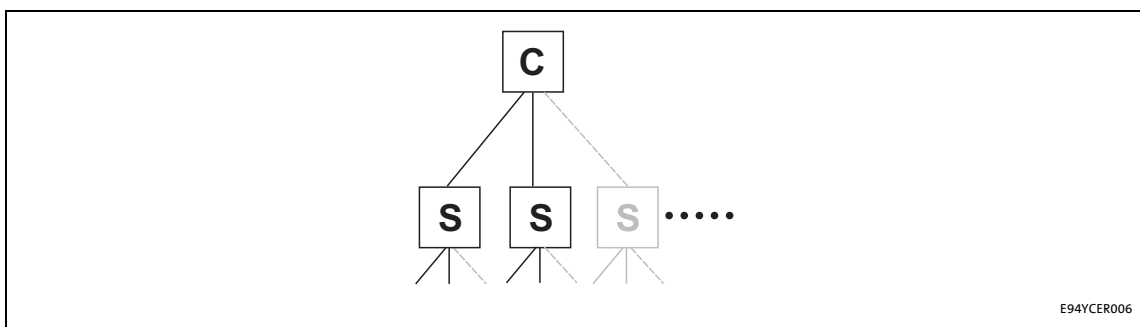
PROFINET supports the following topologies:

- Switch / star



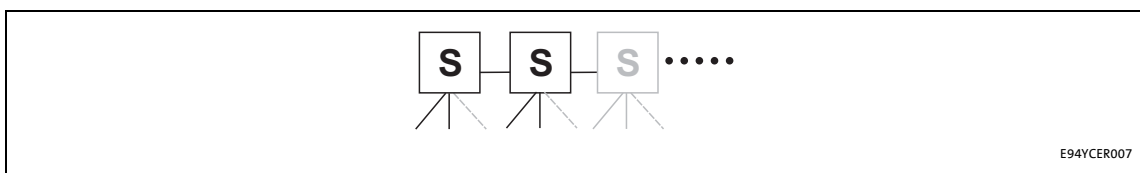
[5-4] Switch / star topology (S = switch, D = I/O device)

- Tree via switches



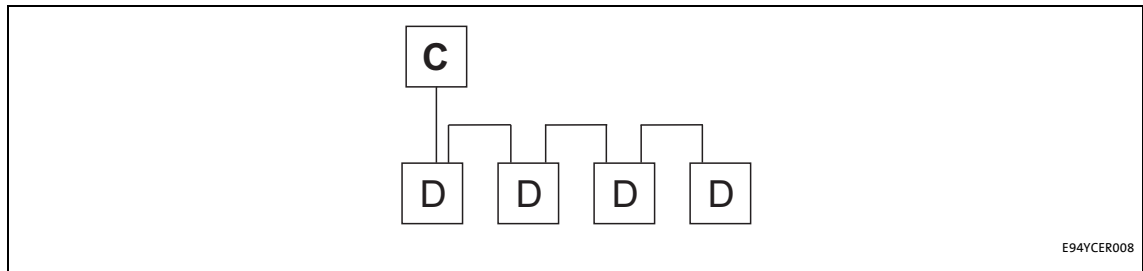
[5-5] Tree topology (C = I/O controller, S = switch)

- Switch / switch



[5-6] Switch/switch topology (S = switch)

- I/O controller / I/O device



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

5.2.3

PROFINET connection

PROFINET is connected via the RJ45 sockets **X241** and **X242**.

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

► [Ethernet cable specification](#) (📖 29)

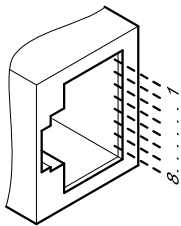
The installation and removal of the Ethernet cables is optimised for the use of connectors in accordance with the "Automation Initiative of German Domestic Automobile Manufacturers" (AIDA).



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

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



Note!

Dependent on the configuration of the Ethernet port of the device to be connected, we recommend the use of a cross-over cable.

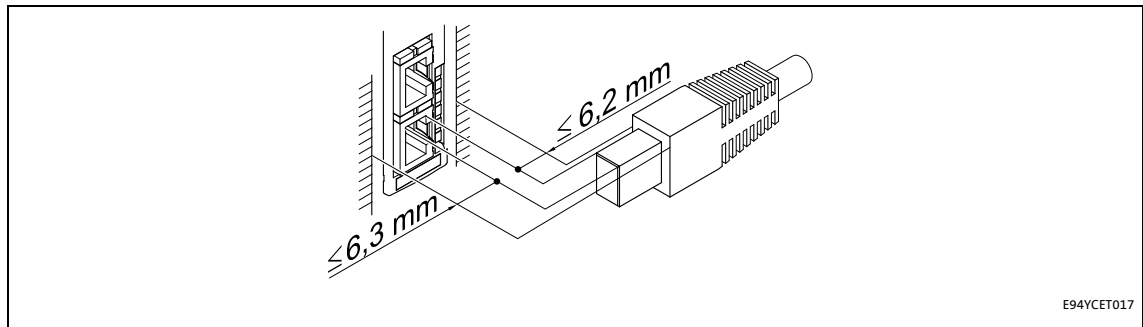


Tip!

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).

Mounting clearance

When ordering and using your Ethernet cable, note the amount of free space available.



[5-8] Mounting clearance

5.2.4 Ethernet cable specification

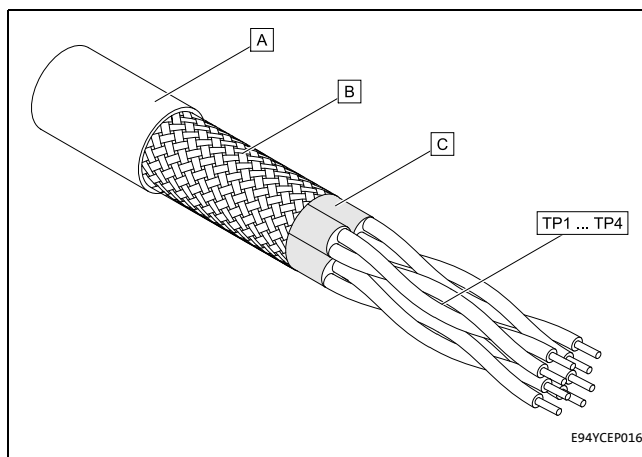


Note!

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 Twisted core pairs 1 ... 4

... [▶ Colour code of the Ethernet cable](#)

TP4 [\(30\)](#)

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

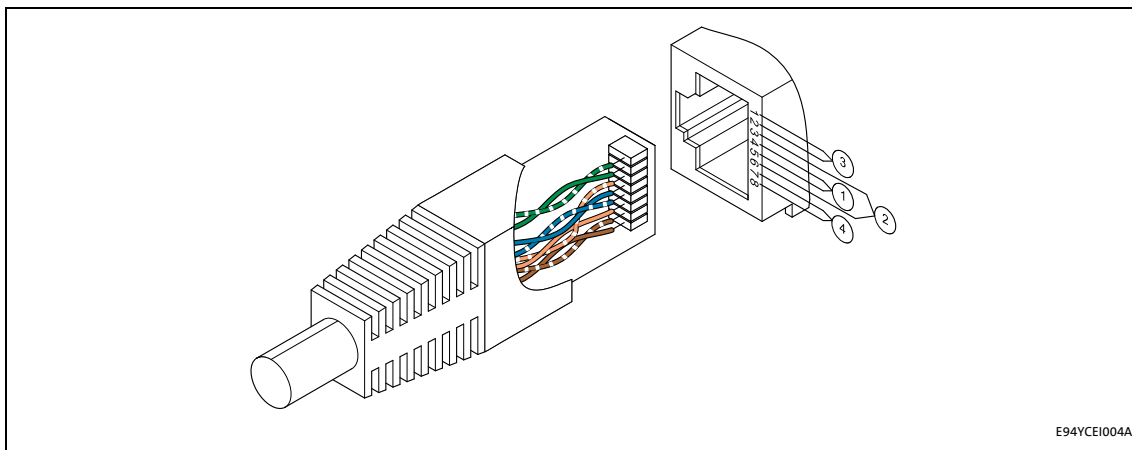
Colour code of the Ethernet cable



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

5.2.5 External voltage supply

The communication module can be supplied externally with voltage via separate supply cables at the 2-pole plug connector **X240**.



Note!

With external voltage supply, always use a separate power supply unit, safely separated to EN 61800-5-1 in every control cabinet (SELV/PELV).

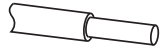
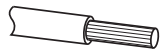
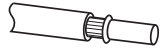
External voltage supply of the communication module is required if the communication via the bus should be maintained when the supply of the standard device fails.

The parameters of a standard device separated from the mains cannot be accessed.

Assignment of plug connector X240

Name	Description
+	U = 24 V DC (20.4 ... 28.8 V) I = 130 mA
-	Reference potential for the external voltage supply

Terminal data

Range	Values
Electrical connection	2-pin plug connector with spring connection
Possible connections	Rigid:
	 1.5 mm ² (AWG 16)
	Flexible:
	 Without wire end ferrule 1.5 mm ² (AWG 16)
	 With wire end ferrule, without plastic sleeve 1.5 mm ² (AWG 16)
	 With wire end ferrule, with plastic sleeve 1.5 mm ² (AWG 16)
Stripping length	9 mm

6

Commissioning

During commissioning, plant-specific data such as motor parameters, operating parameters, responses, and parameters for fieldbus communication are defined for the inverter. Lenze devices use codes for this purpose.

The inverter and communication codes are saved to the memory module in a non-volatile data set. In addition, there are codes for diagnosing and monitoring the stations.

▶ [Parameter reference](#) (📖 91)

**Note!**

When parameterising the communication module, please note that the code number depends on the slot of the standard device into which the communication module is plugged.

The first two digits of the code number indicate the slot:

- C13nnn for slot MXI1
▶ [Parameters of the communication module for slot MXI1](#) (📖 93)
- C14nnn for slot MXI2
▶ [Parameters of the communication module for slot MXI2](#) (📖 102)

You also have to set the [Parameters of the standard device that are relevant to communication](#) (📖 91).

6.1

Before initial switch-on

**Stop!**

Before switching on the Servo Drive 9400 and the communication module for the first time, check the entire wiring for completeness, short circuit and earth fault.

6.2 Configuring the PROFINET IO controller

To enable communication with the Servo Drive 9400, 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 E94AYCER communication module (PROFINET) has to be imported in the IO controller.

The device description file **GSDML-Vx.z-Lenze-9400PNabb-yyyymmdd.xml** can be found in the download area at:

www.lenze.com

Wildcards in the file name "GSDML-Vx.z-Lenze-9400PNabb-yyyymmdd.xml"	
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.

Servo Drives 9400 HighLine support the configuration of max. 32 process data words (max. 64 bytes).

Description of the device data base file

Selection text	Process data (with consistency)	Assigned I/O memory	Safety module
PCD (nW) AR cons.	n words	n words	-
Safety (4W) AR	4 words	4 words	SM301
Safety (8W) AR (from SW version 3.00 onwards)	8 words	8 words	SM302
n = 1 ... 32 process data words			

Examples of selecting the device data base file

- "PCD (8W) AR cons." = 8 process data words (only in slot 1 of the PROFINET frame)
- "Safety (4W) AR" = 4 safety data words (only in slot 2 of the PROFINET frame if the SM301 safety module is used simultaneously)
- "Safety (8W) AR" = 8 safety data words (only in slot 2 of the PROFINET frame if the SM302 safety module is used at the same time, [from SW version 3.00 onwards](#))

**Note!**

A safety bus system (PROFIsafe) can only be operated via the upper module slot (MXI1) of the Servo Drive 9400.

**Tip!**

A detailed description of consistency is given in the chapter "[Consistent parameter data](#)" ([book 75](#)).

6.3

Setting the station name

**Note!**

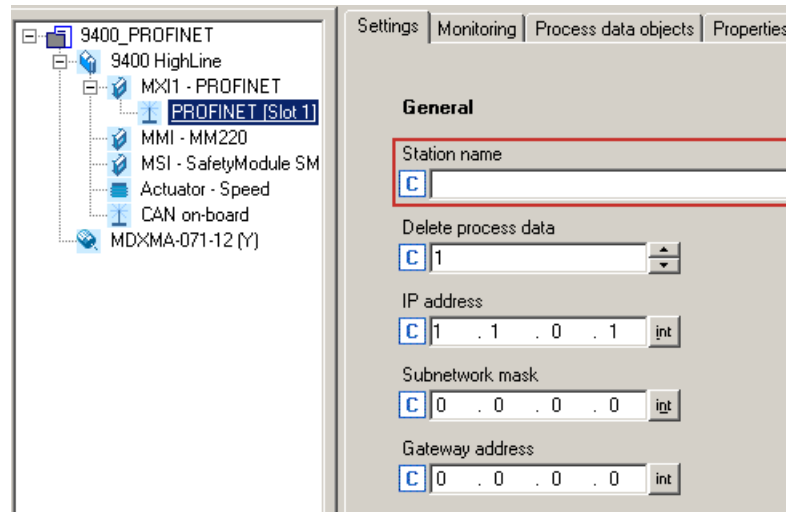
- The "node blinking" PROFINET function by means of which an accessible field service can be identified is supported. While the function is being executed, the red LED **ME** ([Module status displays](#) (80)) is blinking.
- Operation of PROFINET requires a valid station name.
- In case of impermissible settings, the red LED **BE** ([Fieldbus status displays](#) (81)) is blinking and the error message [PROFINET: Invalid station name \[0x00c86532\]](#) (88) is output. The communication module then continues to work internally with the deleted name.
- If the station name is assigned by the IO controller via PROFINET or via the PROFINET configurator of the »Engineer«, changes will become effective immediately.

The station name currently used is shown in code [C13864](#) / [C14864](#).

The station name ...

- is required for unambiguous addressing of the Servo Drive 9400 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)

In the »Engineer« the station name is set under the **Settings** tab.



The station name is written to code [C13899](#) / [C14899](#).

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 the device command **C00002 = "11: Save start parameters"**.
2. Carry out a "Reset node" of the node, or switch the voltage supply of the communication module off and then on again

6.4 Setting the IP configuration

The IP configuration is required for addressing the Servo Drive 9400 in the PROFINET network. For this purpose, an IP address, subnet mask and gateway address have to be allocated.

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:

- [Setting via the PROFINET configurator of the »Engineer«](#) (📖 38)
- [Setting via codes in the »Engineer«](#) (📖 40)
- [Setting via Siemens »STEP7« \(»HW Konfig«\)](#) (📖 43)
- [Setting via the Siemens »Primary Setup Tool«](#) (📖 47)



Note!

- If the IP parameters are assigned by the IO Controller via the PROFINET, the PROFINET configurator of the »Engineer«, Siemens »STEP7« or the Siemens »Primary Setup Tool«, the changes become effective immediately and are saved with mains failure protection.
- The assignment of invalid combinations of the IP address, subnet mask, and gateway address can have the consequence that no connection to PROFINET can be established.
- In case of impermissible settings, the red LED **BE** ([Fieldbus status displays](#) (📖 81)) is blinking and the error message [PROFINET: Invalid IP parameters \[0x00c86533\]](#) (📖 89) is output.

6.4.1 Setting via the PROFINET configurator of the »Engineer«



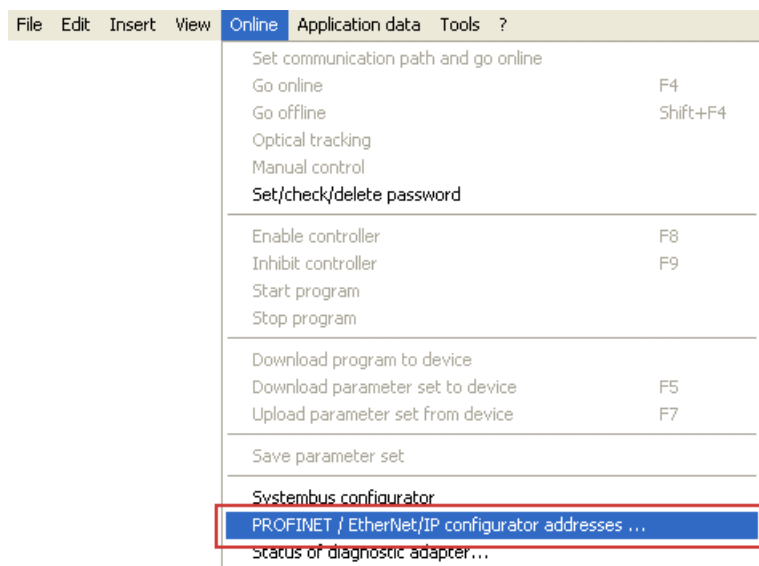
Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network 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.
- Changes will be effective immediately and are saved with mains failure protection.
- The currently used parameter values are shown in codes [C13010](#) / [C14010](#) (IP address), [C13011](#) / [C14011](#) (subnet mask), and [C13012](#) / [C14012](#) (gateway address).

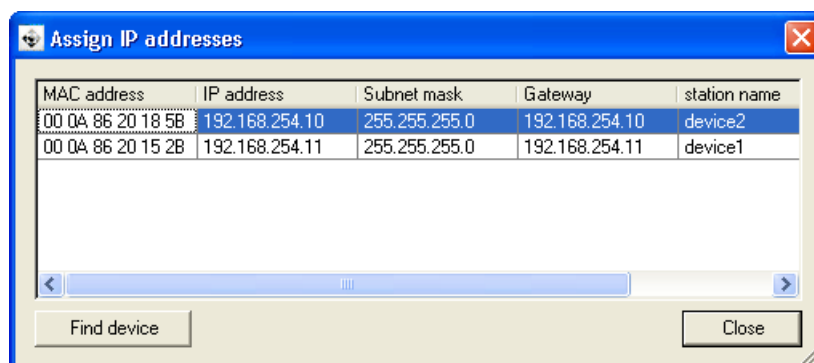


How to set the IP parameters via the PROFINET configurator:

1. Execute the menu command **Online → PROFINET configurator / EtherNet/IP addresses ...**



The "Assign IP addresses" dialog window is opened and all Lenze PROFINET nodes 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.

3. Click the **Transferred** button.
 - 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](#) / [C14000](#) (IP address), [C13001](#) / [C14001](#) (subnet mask) and [C13002](#) / [C14002](#) (gateway address).



Tip!

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

With device command **C00002 = "11: Save start parameters"**, the current IP configuration is saved non-volatily in the memory module.

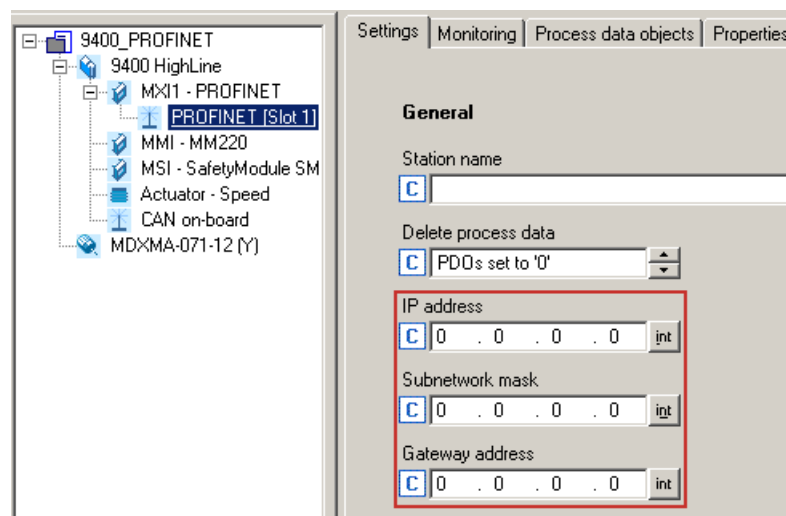
6.4.2 Setting via codes in the »Engineer«



Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network 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 currently used parameter values are shown in codes [C13010](#) / [C14010](#) (IP address), [C13011](#) / [C14011](#) (subnet mask), and [C13012](#) / [C14012](#) (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](#) / [C14000](#) (IP address), [C13001](#) / [C14001](#) (subnet mask) and [C13002](#) / [C14002](#) (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, or switch the voltage supply of the communication module off and then on again

Decimal representation of the IP parameters

By clicking the [int] buttons on the right next to the input fields, the IP parameters are shown as a decimal value.

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

Example: IP address 192.168.0.1

[C13000](#) / [C14000](#) = 16820416 [binary: 00000001.00000000.10101000.11000000]

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 C14010/4	C13010/3 C14010/3	C13010/2 C14010/2	C13010/1 C14010/1

IP address

Valid IP addresses are defined in accordance with RFC 3330.

The IP address is set/changed in [C13000](#) / [C14000](#).

In [C13010/1...4](#) / [C14010/1...4](#) the currently used IP address is shown.

Example: Display of the IP address 192.168.0.1				
Code	C13010/1 C14010/1	C13010/2 C14010/2	C13010/3 C14010/3	C13010/4 C14010/4
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](#) / [C14001](#).

In [C13011/1...4](#) / [C14011/1...4](#), the currently used subnet mask is shown.

Example: Display of the subnet mask 255.255.255.0				
Code	C13011/1 C14011/1	C13011/2 C14011/2	C13011/3 C14011/3	C13011/4 C14011/4
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](#) / [C14002](#).

In [C13012/1...4](#) / [C14012/1...4](#), the currently used gateway address is shown.

Example: Display of the gateway address 192.168.0.1				
Code	C13012/1 C14012/1	C13012/2 C14012/2	C13012/3 C14012/3	C13012/4 C14012/4
Value	192	168	0	1

6.4.3 Setting via Siemens »STEP7« (»HW Konfig«)



Note!

- Changes will be effective immediately and are saved with mains failure protection.
- When the IO Controller is connected to the network, the IP address – which has been allocated in the Siemens »HW Konfig« – is set automatically by the IO Controller in the communication module when the network starts up.



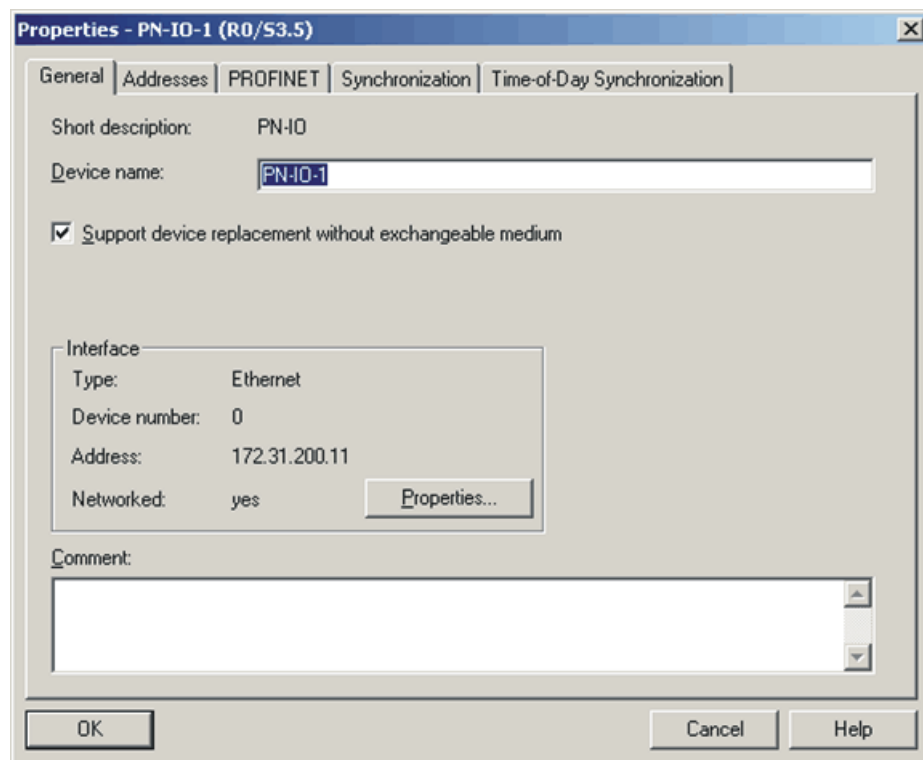
How to allocate the IP address via »STEP7« (»HW Konfig«):

1. Create a »STEP7« project with an IO Controller.

If the Siemens »HW Konfig« software is used for creating an IO Controller, you are automatically prompted to allocate an IP address for the IO Controller.

For this purpose, the I/O controller and the communication module must be connected to the PROFINET network and an online connection between your PC and the I/O controller must be established.

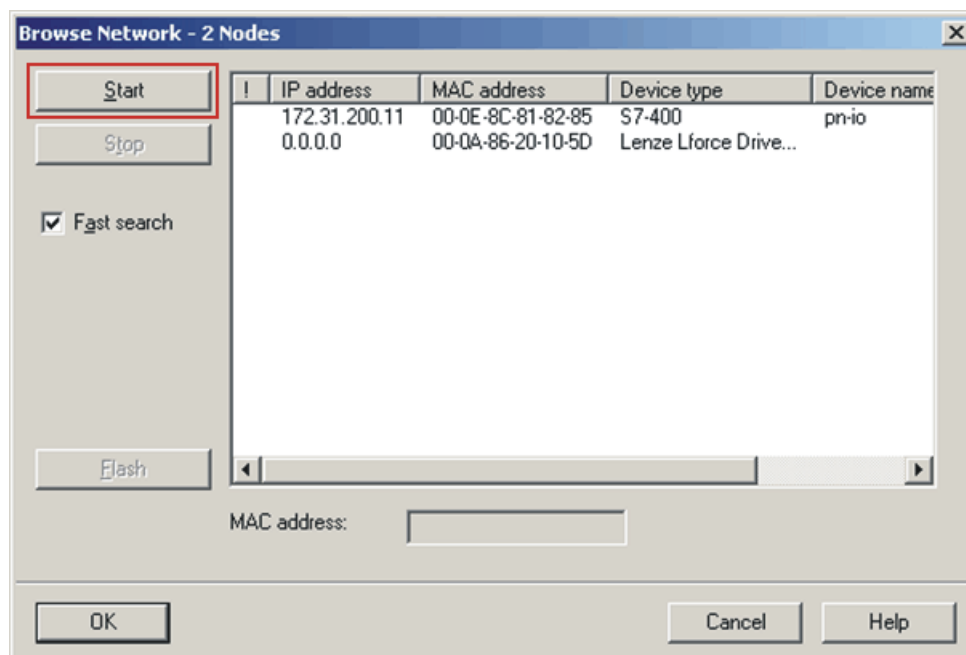
In our example, IP address 172.31.200.11 has been allocated to the I/O controller.



2. Open the corresponding dialog via the **Target system → Ethernet → Edit Ethernet Node** menu command.

Click the **Browse** button to open the "Browse network" dialog.

3. In the "Browse network" dialog, click the **Start** button to search the network for PROFINET nodes.



In our example, one Lenze PROFINET node was found that does not have an IP address yet (entry 0.0.0.0).

Definite allocation without an IP address is also possible via the MAC address.

For this purpose, select the PROFINET node without an IP address (highlighted in blue) and close the dialog by clicking the **OK** button.

4. The MAC address of the selected PROFINET node has been accepted.

Edit Ethernet Node

Ethernet node

MAC address: 00-0A-86-20-10-5D Nodes accessible online

Browse...

Set IP configuration

☒ **Use IP parameters**

IP address: 172.31.200.1 Gateway

Subnet mask: 255.255.248.0 ☒ Do not use router

☐ Use router

Address:

☐ Obtain IP address from a DHCP server

Identified by

☒ Client ID ☐ MAC address ☐ Device name

Client ID:

Assign IP Configuration

Assign device name

Device name: Assign Name

Reset to factory settings

Reset

Close Help

Go to the "Set IP configuration" section and activate **Use IP parameters** and enter the IP address.

In our example, IP address 172.31.200.1 has been allocated to the Servo Drive 9400 with MAC address 00-0A-86-20-10-5D.



Tip!

Another search via the **Browse** button can be started to check if your IP address allocation has been successful.

6.4.4 Setting via the Siemens »Primary Setup Tool«

The Siemens »Primary Setup Tool« serves to carry out the IP address allocation if the system lacks an IO Controller (PLC). The software can be downloaded free of charge from the Siemens "Automation & Drive" homepage in the support area:

<http://support.automation.siemens.com>



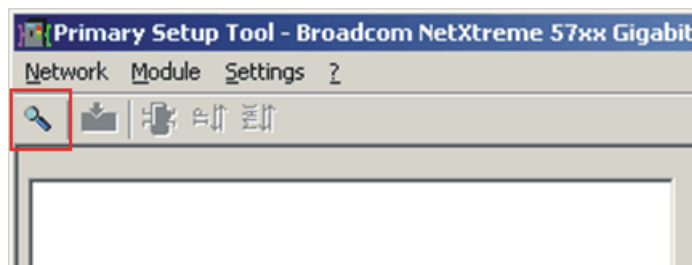
Note!

Changes will be effective immediately and are saved with mains failure protection.

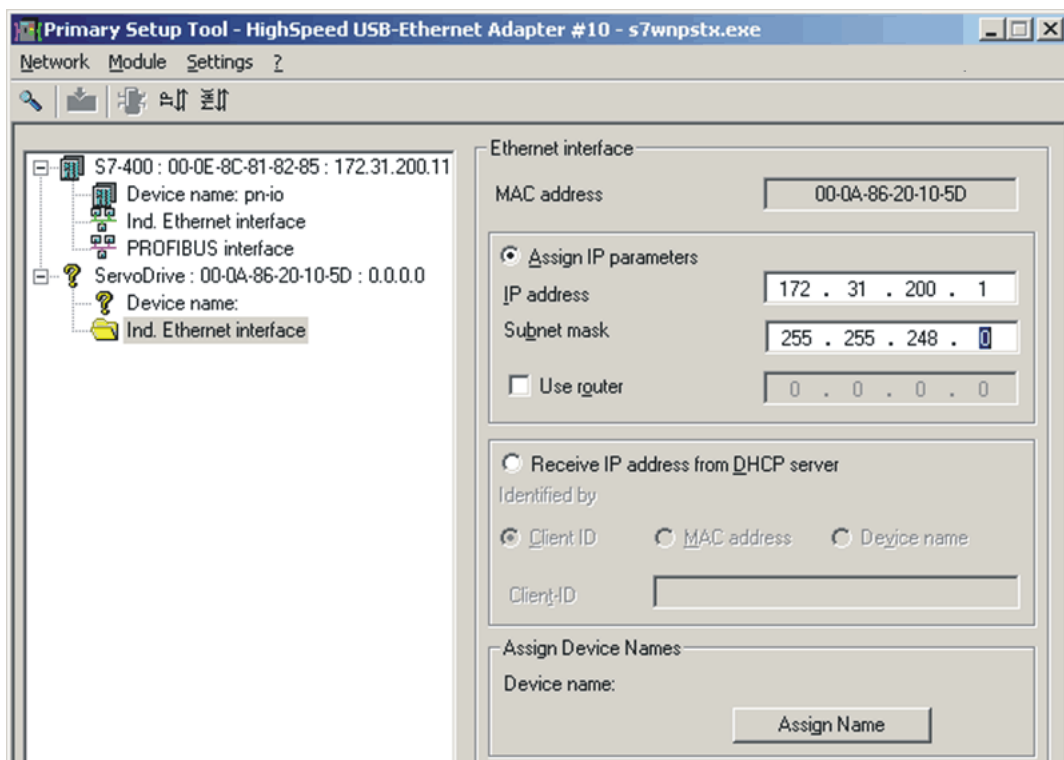


How to allocate the IP address via the Siemens »Primary Setup Tool«:

1. Start the Siemens »Primary Setup Tool«.
2. Click the **Browse** button to search the PROFINET network for nodes.



3. The PROFINET nodes found are displayed.

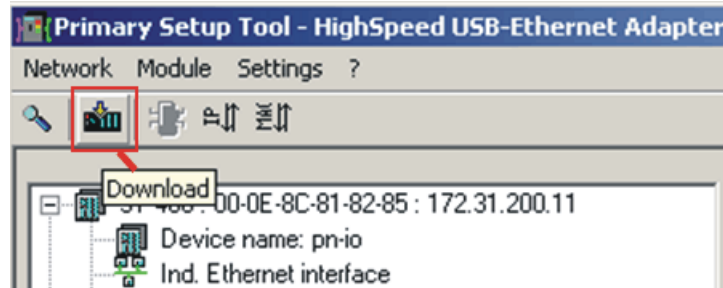


In our example, one Lenze PROFINET node was found that does not have an IP address yet (entry 0.0.0.0).

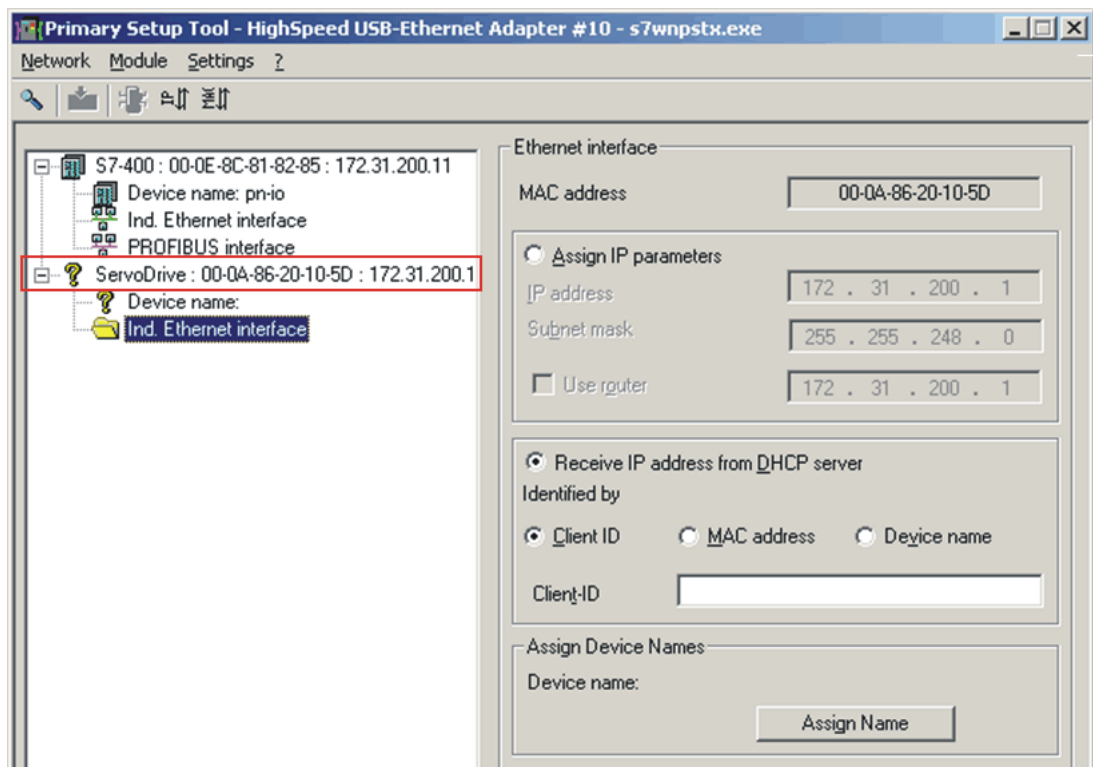
Here, activate **Assign IP parameters** and enter the IP address for the node that lacks an IP address.

- Click the **Download** button to transfer the assigned IP address.

Every IP address must be transferred individually to the corresponding IO device via the **Load** button.



In our example, IP address 172.31.200.1 has been allocated to the Servo Drive 9400 with MAC address 00-0A-86-20-10-5D.



6.5

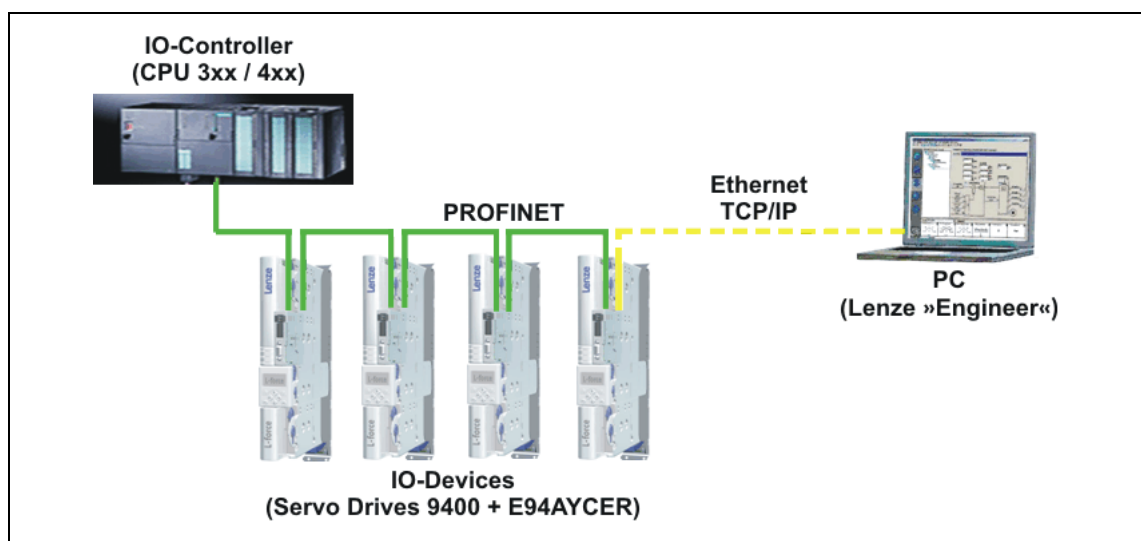
Establishing an online connection via PROFINET with the Lenze »Engineer«

This functionality will only be supported from software version V01.30.05 onwards.

**Note!**

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

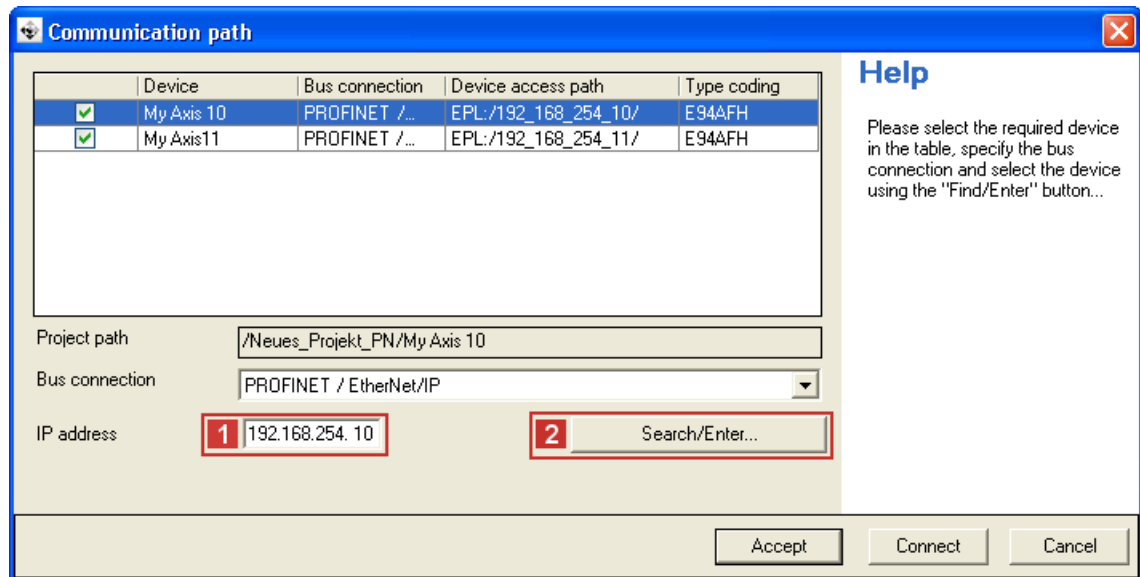
The PROFINET switch integrated in the communication module can execute cyclic PROFINET communication prior to normal TCP/IP communication. In the case of PROFINET this is effected via the VLAN identification in the Ethernet frame.



[6-1] Online connection via PROFINET with the Lenze »Engineer«

In order to establish an online connection between the »Engineer« and the inverter, the inverter has to have an IP address (see [Setting the IP configuration](#) (37)).

In the »Engineer«, you can use the **Online → Set communication path and go online** menu command to select the PROFINET communication path. The previously configured PROFINET nodes 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 the **2** **Search/Enter** button, you can establish a connection to devices which have not appeared in the display field. Corresponding settings for this can be made in the "Enter IP Address" dialog window that will appear:



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**.
 - [Setting via the PROFINET configurator of the »Engineer«](#) (38)
- 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.

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.

In the Lenze setting of Servo Drives 9400, the restart protection is activated.

The restart behaviour of the inverter can be set via **C00142** ("auto restart after mains connection"):

C00142 = "0: Inhibited" (Lenze setting)

- The inverter remains inhibited (even if the fault is no longer active).
- An explicit controller enable causes the drive to start up in a controlled manner: LOW-HIGH edge at digital input X5/RFR.

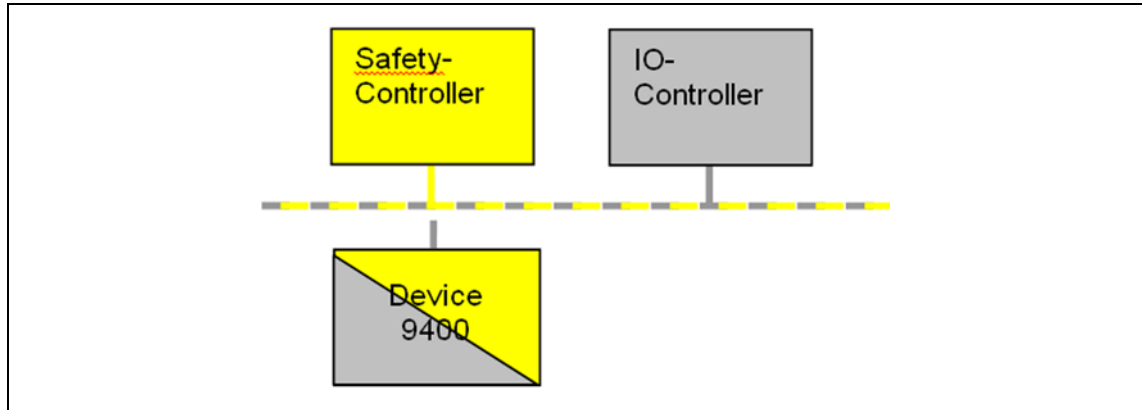
C00142 = "1: Enabled"

- An uncontrolled restart of the drive is possible.

6.7 "Shared Device" function

This function is available from SW version 2.10!

The "Shared Device" function of PROFINET IO provides the opportunity to access an IO device with two Controllers. The Lenze application for "Shared Device" is the easy assignment of data to a safety controller and an IO controller (in fig. [6-2] the separation of the grey and yellow area).



[6-2] "Shared Device" function

In order to use the "Shared Device" function, import the GSE file "GSDML-V2.3-Lenze-9400PN200-20130424.xml" into the PROFINET configuration tool of the respective controller manufacturer.

The IO data or safety data is permanently assigned to the data slots.

- Slot 1 is always the grey area (IO controller)
- Slot 2 is always the yellow area (safety controller)



Note!

The data assignment to the corresponding Controller is carried out in the configuration tool. For this purpose, follow the descriptions in the documentation of the tool.

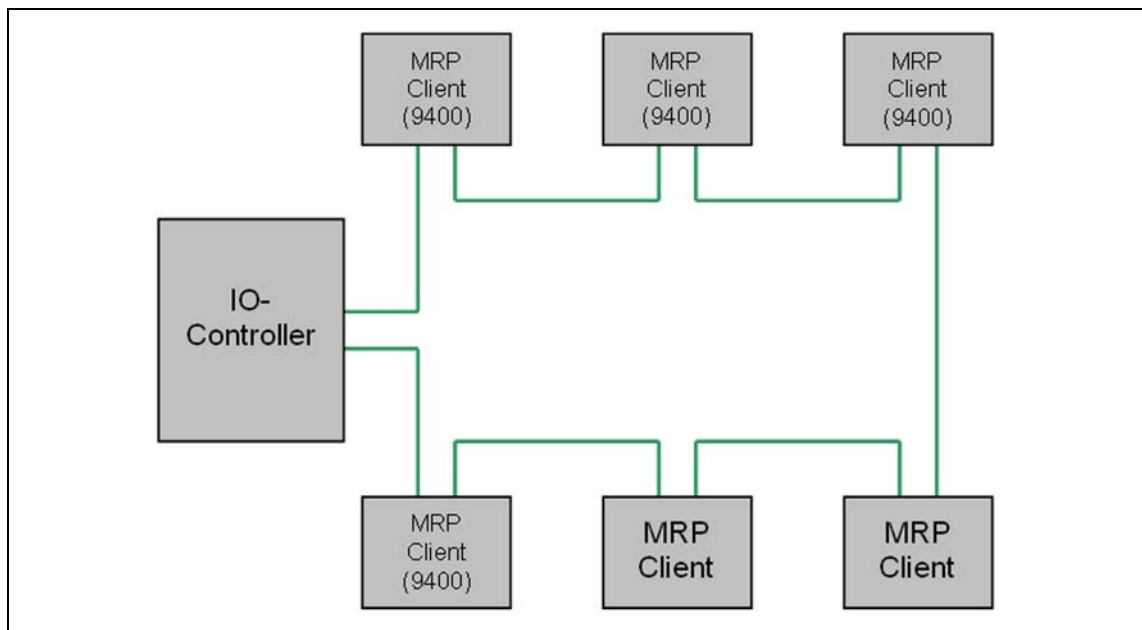
Settings in the E94AYCER communication module are not required.

6.8 Media Redundancy Protocol (MRP)

This function is available from SW version 2.10!

The "Media Redundancy Protocol" (MRP) increases the node accessibility. The MRP ensures that all nodes on the fieldbus can continued to be accessed in case of a simple network downtime. For this purpose, the line topology is interconnected to a ring.

- All nodes of the ring have to support the MRP.
- One node (e.g. IO controller) assumes the role of the redundancy manager
- The other nodes in the ring are redundancy clients.
- The E94AYCER communication module [from SW version 2.10](#) can only assume the role of a redundancy client.



[6-3] Ring topology for the "Media Redundancy Protocol" (MRP)

The engineering of the media redundancy is exclusively executed via the redundancy manager (e.g. Simatic hardware manager).

7 Data transfer

PROFINET transmits parameter data, configuration data, diagnostic data, alarm messages, and process data between the host (I/O controller) and the inverters that are part of the fieldbus (I/O devices). Depending on 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.
- Up to 32 process data words (64 bytes) per direction can be exchanged.
- 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 Servo Drives 9400.

8 Process data transfer

PDO mapping

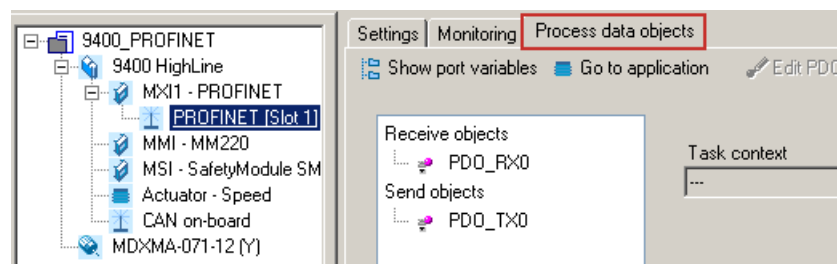
The Servo Drives 9400 enable the individual mapping of process data. For this purpose, the »Engineer« is provided with a port configurator.

In the following, you can find a description of the steps required to implement a process data communication with a host (PLC, IO Controller), in which a control word/status word and a 32 bit setpoint/actual value are exchanged.

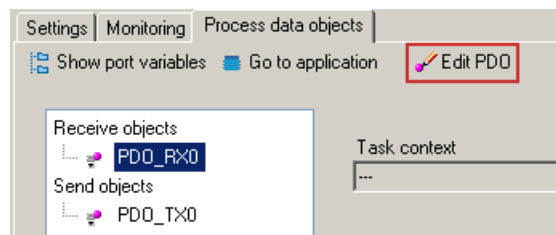


How to set the PDO mapping with the »Engineer«:

1. In the »Engineer«, the mapping of the process data is carried out under the **Process data objects** tab of the respective fieldbus communication module:

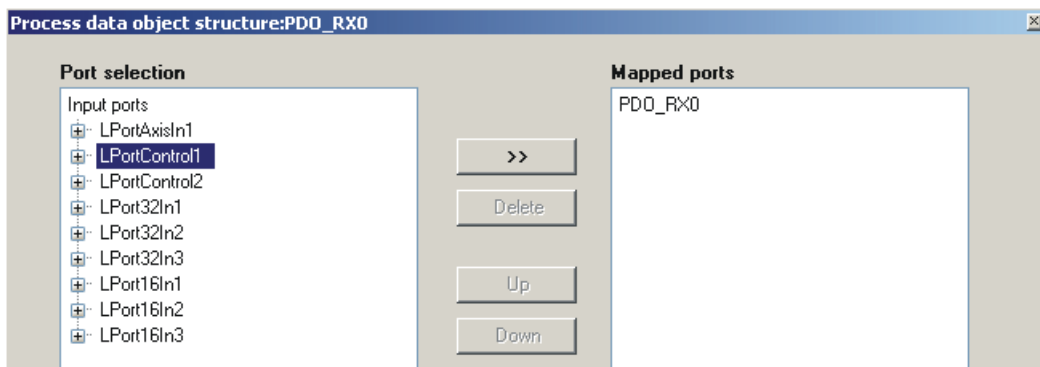


2. Select the receive object **PDO_RX0**:



3. Click the **Edit PDO** button.

The selection window for editing the process data object is opened:



Here you can map the individual ports from the **Port selection** to the receive PDO "PDO_RX0" by clicking the >> button.

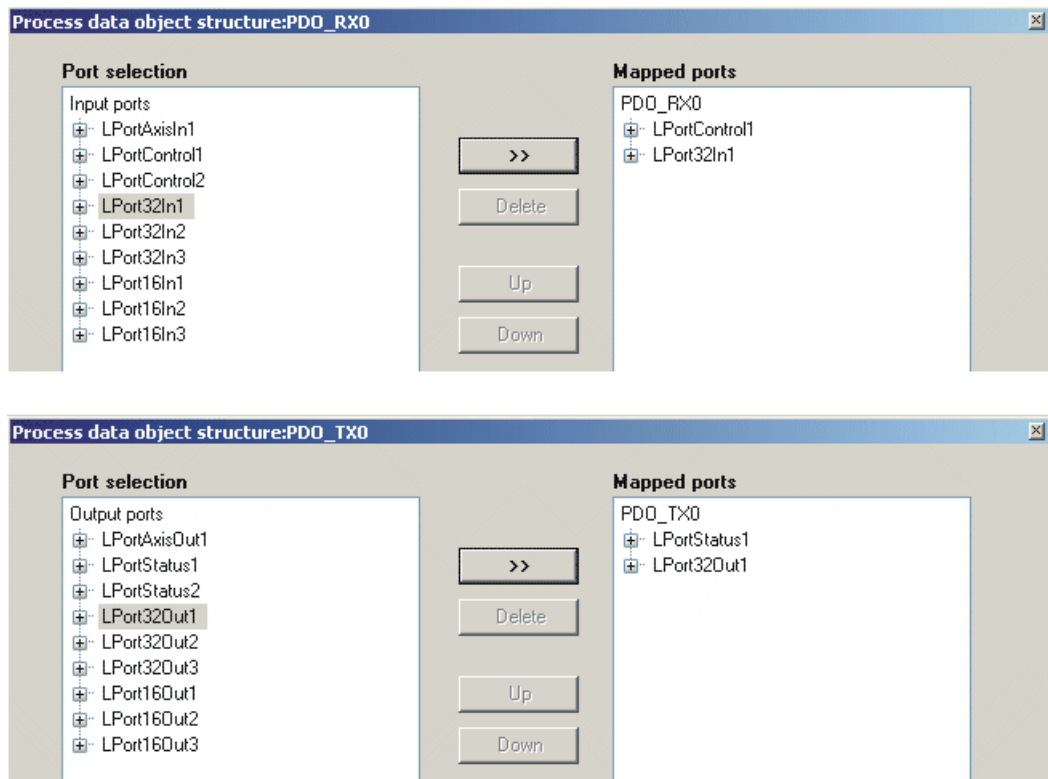
The **Up** and **Down** buttons serve to shift the sequence of the ports within the PDO.



Note!

Port mapping is no configuration which can be carried out online for the Servo Drive 9400. This always requires an update of the »Engineer« project and a subsequent download of the application.

In the following example, the ports "LPortControl1" and "Lport32In1" have been mapped into the receive PDO "PDO_RX0" and the ports "LPortStatus1" and "LPort32Out1" have been mapped into the transmit PDO "PDO_TX0":



4. Confirm the selection by pressing **OK**.
5. Repeat the steps 2. to 4. for the transmit object **PDO_TX0**.
6. Now link the ports to the application signals in the selected technology application.
 Activate the »FB Editor« via the multiplexer codes (> C03000) if this has not been done yet.
 If the »FB Editor« is activated, the multiplexer codes (> C03000) are no longer available. In this case, you must carry out the interconnection directly in the »FB Editor«.

9 Parameter data transfer

9.1 The acyclic channel (PROFIdrive profile)

An optional service extension is the acyclic parameter data transfer.

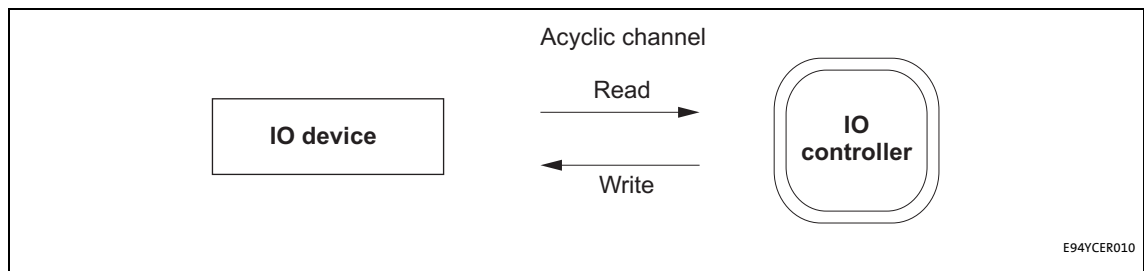
Cyclic and acyclic PROFINET services can be operated simultaneously in the network.

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.

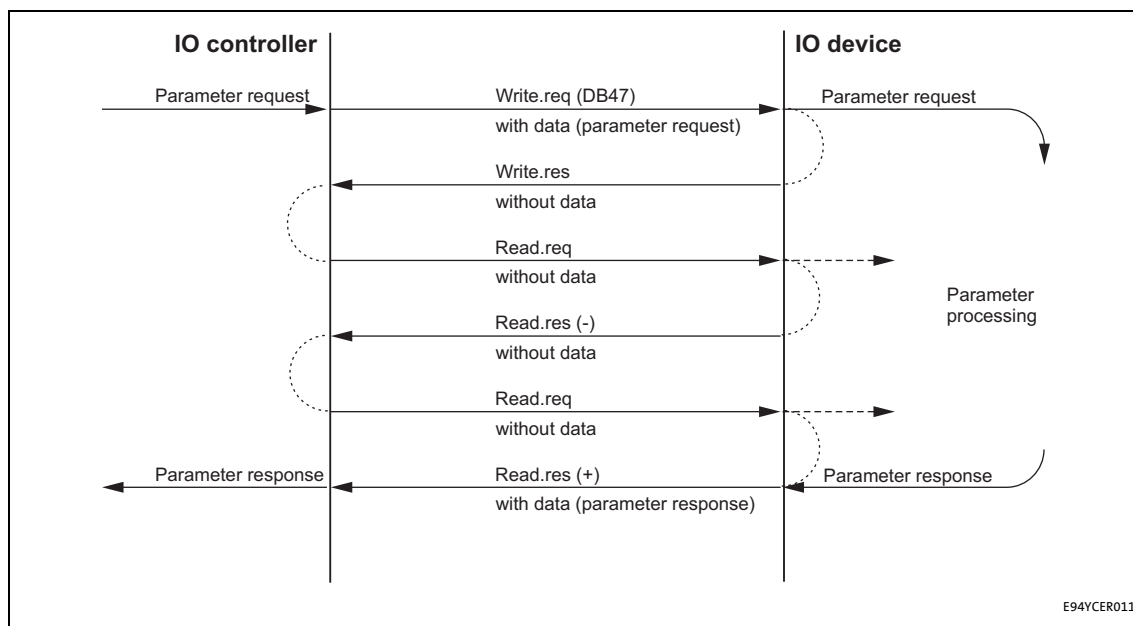
9.1.1 Connection establishment of an IO Controller to an IO device

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

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.

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 frame

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 frame.

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

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) (73)
Additional information (if available)	U16	

9 Parameter data transfer

9.2 Reading parameters from the inverter

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 response to a correctly executed read request

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

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

Byte 7	Byte 8
Error code	
High byte	Low byte
For the meaning see the chapter " Error information (error) " (73)	

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 238 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 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

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.

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) (📖 73)
Additional information (if available)	U16	

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
Fault	Error code without additional information

Byte 7	Byte 8
Error code	
High byte	Low byte
For the meaning see the chapter " Error information (error) " (73)	

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	Reserved	-	-
...			
0x0064			

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

9.5 Consistent parameter data

In the PROFINET communication system, data is permanently exchanged between the host (CPU + IO Controller) and the Servo Drive 9400 via the plugged-on communication module. The IO 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):



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.

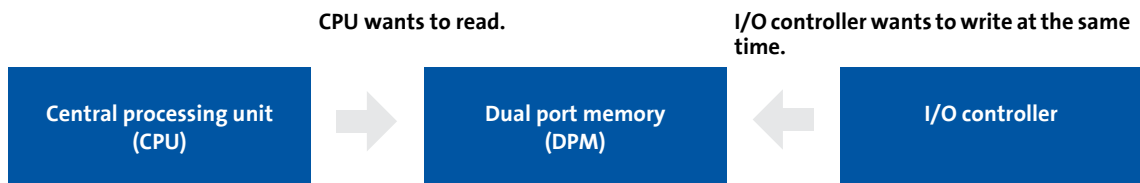
In order to avoid such an impermissible state, the parameter data to be transmitted must be marked as "consistent".

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:



1. As the I/O controller can only write when the CPU is not reading, 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



Note!

Consistency is achieved by an appropriate Configuration of the IO Controller.
Information on the issue can be found in the documentation of your configuring software.

10 PROFIsafe

PROFINET enables the transfer of safe information via the PROFIsafe protocol in accordance with the "PROFIsafe - Profile for Safety Technology" specification, version 2.0.



Note!

A safety bus system (PROFIsafe) can only be operated via the upper module slot (MXI1) of the Servo Drive 9400.

- The PROFIsafe message is sent in the second slot of a PROFINET frame.
- One bit of the PROFIsafe data is always used to control specific safety functions.
- The structure of the PROFIsafe data is described in the PROFIsafe profile.
- If the SM301 safety module is used, the length of the PROFIsafe data (also called PROFIsafe message) always is 8 bytes.
- If the SM302 safety module is used, the length of the PROFIsafe data (also referred to as the PROFIsafe message) is always 16 bytes ([from SW version 3.00](#) onwards).
- The Servo Drive 9400 forwards the PROFIsafe message to the safety module for a safe evaluation.



Documentation for the SM301 (E94AYAE) / SM302 (E94AYAF) safety module

Here you can find some detailed information on the PROFIsafe connection.

11 Monitoring

11.1 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:

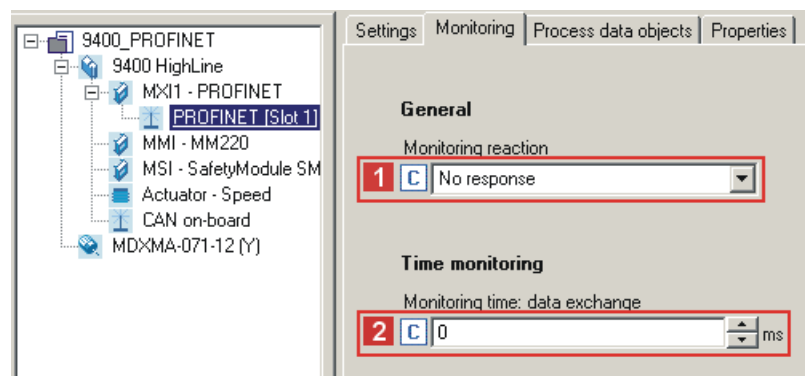
1. During the initialisation of PROFINET communication, the watchdog monitoring time specified in the IO controller ([C13882](#) / [C14882](#)) is transferred to the IO device.

If the IO device does not receive any valid process data in the "Data_Exchange" state, the process data are treated according to the setting in [C13885](#) / [C14885](#). (Like this the data that were sent last by the IO controller can be used or set to zero.)

After the watchdog monitoring time has elapsed, the IO device changes to the "No_Data_Exchange" state ([C13861](#) / [C14861](#)) and the red LED BE is activated ([Fieldbus status displays](#) (81)).

There is no response in the I/O device.

2. To trigger a response in the IO device, the »Engineer« has to provide an additional **Response of the Servo Drive 9400 1** ([C13880](#) / [C14880](#)) under the **Monitoring** tab.



In order to delay this response, you can set a **monitoring time 2** ([C13881](#) / [C14881](#)).

- 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 the response delay has elapsed, the response set is executed with the error message "[PROFINET: 'Data_Exchange' status quit \[0x00c88131\]](#)" (90).

11.2 Interruption of internal communication

The response to a communication error between the communication module and the Servo Drive 9400 can be set via these codes:

- [C01501 | Resp. to comm. error with MXI1](#)  92 (module in slot MXI1)
- [C01502 | Resp. to comm. error with MXI2](#)  92 (module in slot MXI2)

12

Diagnostics

For purposes of fault diagnostics, the communication module is provided with the LEDs on the front. Furthermore, you can carry out the [Diagnosing with the »Engineer«](#) (📖 83).

12.1

LED status displays



Note!

During normal operation ...

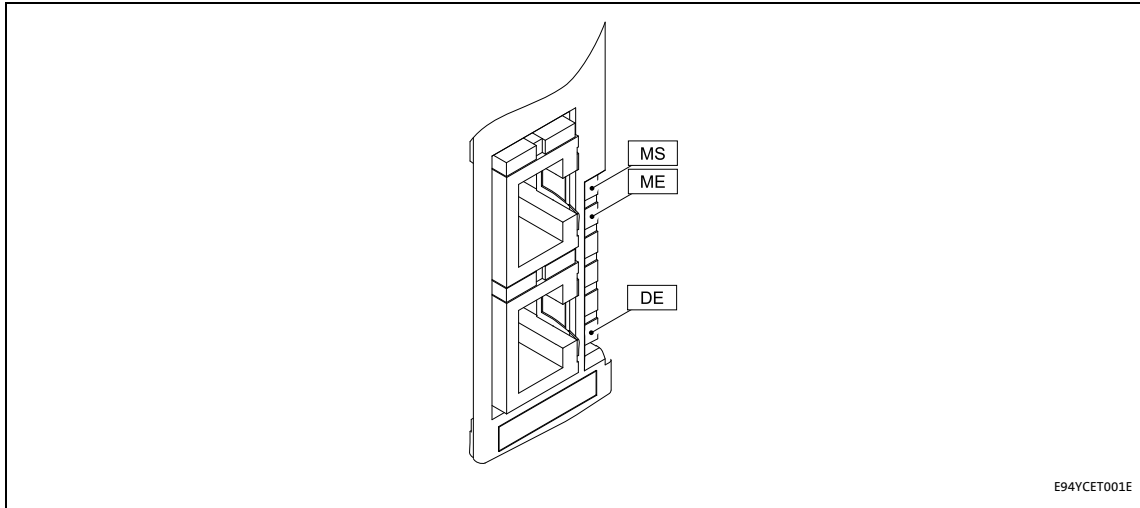
- only the LEDs **MS** (📖 80) and **BS** (📖 81) should be lit permanently.
- the green LED on the RJ45 sockets X241 and X242 must be lit or blinking (📖 81).

The following status displays are distinguished:

- [Module status displays](#) (📖 80)
- [Fieldbus status displays](#) (📖 81)
- [Status displays at X241 and X242](#) (📖 82)

12.1.1 Module status displays

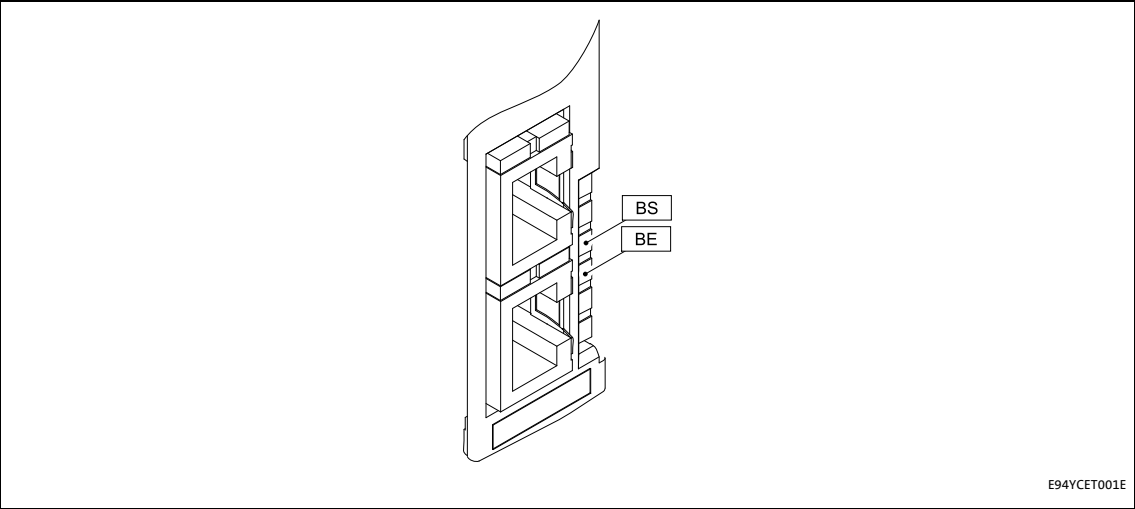
Module status displays are indicated by the LEDs **MS**, **ME**, and **DE**.



Pos.	Colour	Status	Description
MS	Green	On	 The communication module is supplied with voltage and is connected to the standard device.
		Blinking	 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	 The "Node blinking test" PROFINET function is activated by the I/O controller. The blinking LED serves to identify/localise accessible I/O devices.
DE	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.)

12.1.2 **Fieldbus status displays**

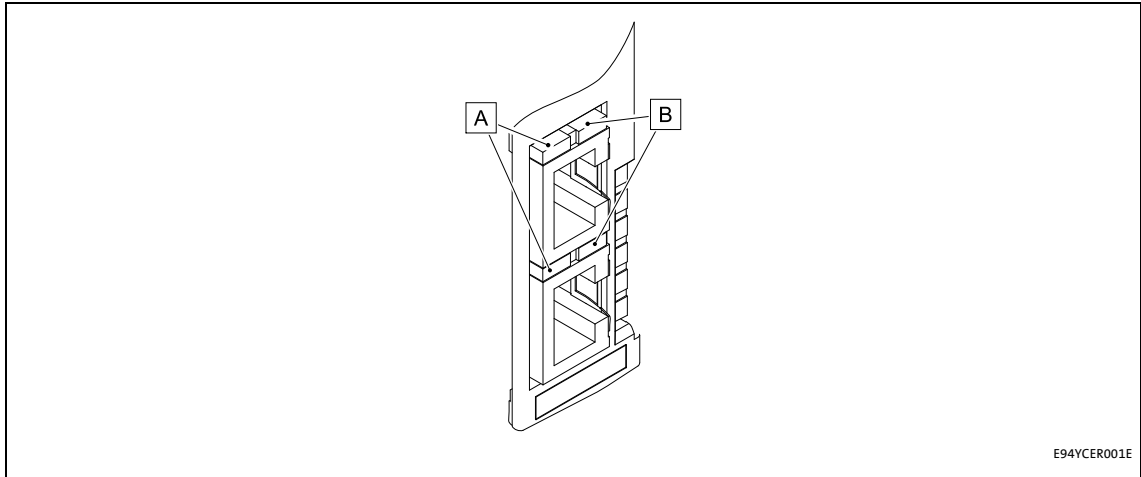
Fieldbus status displays are indicated by the LEDs **BS** and **BE**.



LED	Colour	Status	Description
BS	Green	Off	The communication module is not active at the fieldbus.
		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" state.
		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.

12.1.3 Status displays at X241 and X242

The LEDs at the RJ45 sockets X241 and X242 display the PROFINET connection status.



LED	Colour	Status	Description
A	Green	On	 A physical PROFINET connection is available.
B	Yellow	On or Flickers	 Data are being exchanged via PROFINET.

12.2 Diagnosing with the »Engineer«

Querying the current bus status

In code [C13861](#) / [C14861](#), the current PROFINET bus status is shown:

Assignment			Meaning	
Bit 15	...	Bit 6	Reserved	
	Bit 5	Bit 4	PROFINET bus status	
	0	0	Init	After the initialisation, the I/O device waits for a communication partner and a system start-up.
	1	0	Data Exchange / Process Data Valid	The "Data Exchange" state has been reached. - After the system start-up, the IO device with the IO controller goes to the "Data Exchange" state to exchange cyclic process data. - Process data that are identified as valid (IOPS is "GOOD") are received from the IO controller as well as alarms and acyclic requirement data.
	0	1	Data Exchange / Process Data Invalid	From SW version 3.00 onwards: The "Data Exchange" state has been reached. - After the system start-up, the IO device with the IO controller goes to the "Data Exchange" state to exchange cyclic process data. - Process data that are identified as invalid (IOPS is "BAD") are received from the IO controller, typically when the PLC is in the STOP state, as well as alarms and acyclic requirement data.
	1	1	No Data Exchange	The "Data Exchange" state has been exited (see chapter 11.1). Up to SW version 2.10 , the following applies: Process data that are identified as invalid (IOPS is "BAD") are received from the IO controller, typically when the PLC is in the STOP state, as well as alarms and acyclic requirement data.
Bit 3	...	Bit 0	Reserved	

12.3 Diagnostic data

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

The precondition for transmitting alarm messages is the configuration of process data words in slot 1 of the PROFINET frame (see [Configuring the PROFINET IO controller](#) (□ 33)).

- Errors and warnings in the Servo Drive 9400 and the plugged-in modules are sent to the I/O controller as extended diagnostic messages.
- With code [C13887](#) / [C14887](#) the transmission of an alarm message can be suppressed for specific error messages.
- The diagnostic data are shown in code [C13867](#) / [C14867](#):

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



Reference manual/»Engineer« online help for the Servo Drive 9400

Detailed information on the error codes is provided here.

13

Error messages

This chapter supplements the error list in the reference manual and in the »Engineer« online help for the Servo Drive 9400 by the error messages of the communication module.



Reference manual / »Engineer« online help for Servo Drive 9400

Here you will find general information on diagnostics & fault analysis and on error messages.

13.1

Short overview of the PROFINET error messages

The following table contains all error messages of the communication module in numerical order of the error numbers. Moreover the preset error response and - if applicable - the parameters for setting the error response are 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 number		Name	Response (Lenze setting)	Adjustable in
hex	dec			
0x00c85531	13129009	PROFINET: Memory: No access	6: Information	-
0x00c85532	13129010	PROFINET: Memory: Read error	6: Information	-
0x00c85533	13129011	PROFINET: Memory: Write error	6: Information	-
0x00c86010	13131792	PROFINET: Restart by watchdog reset	1: No Response	-
0x00c86011	13131793	PROFINET: Internal error	1: No Response	-
0x00c86100	13132032	PROFINET: Internal error	1: No Response	-
0x00c86101	13132033	PROFINET: Internal error	1: No Response	-
0x00c86110	13132048	PROFINET: Internal mapping error	4: Warning locked	-
0x00c8641f	13132831	PROFINET: Invalid parameter set	1: No Response	-
0x00c86420	13132832	PROFINET: Error: Lenze setting loaded	1: No Response	-
0x00c86430	13132848	PROFINET: Invalid module configuration	6: Information	-
0x00c86501	13133057	PROFINET: Invalid READ.request during parameter access	4: Warning locked	-
0x00c86502	13133058	PROFINET: Invalid WRITE.request during parameter access	4: Warning locked	-
0x00c86503	13133059	PROFINET: Data output status bad	4: Warning locked	-
0x00c86532	13133106	PROFINET: Station name error	1: No Response	-
0x00c86533	13133107	PROFINET: Invalid IP parameters	1: No Response	-
0x00c86610	13133328	PROFINET: Safety communication timeout	4: Warning locked	-
0x00c86611	13133329	PROFINET: Safety parameter timeout	4: Warning locked	-
0x00c86612	13133330	PROFINET: Safety init error	4: Warning locked	-
0x00c86613	13133331	PROFINET: Safety connect error	5: Warning	-
0x00c86650	13133392	PROFINET: Internal error	6: Information	-
0x00c88131	13140273	PROFINET: "Data_Exchange" status quit	0: No Response	C13880/1 / C14880/1

13.2 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.

PROFINET: Memory: No access [0x00c85531]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☒ Information	
Cause	Remedy
Access to memory was not possible.	Download application again (including module) If this happens repeatedly, send the communication module together with a description of the fault to Lenze.

PROFINET: Memory: Read error [0x00c85532]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☒ Information	
Cause	Remedy
Parameter could not be read.	Download application again (including module) If this happens repeatedly, send the communication module together with a description of the fault to Lenze.

PROFINET: Memory: Write error [0x00c85533]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☒ Information	
Cause	Remedy
Parameter could not be written.	Download application again (including module) If this happens repeatedly, send the communication module together with a description of the fault to Lenze.

PROFINET: Restart by watchdog reset [0x00c86010]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Communication module is defective.	Send communication module together with a description of the fault to Lenze.

PROFINET: Internal error [0x00c86011]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Communication module is defective.	Send communication module together with a description of the fault to Lenze.

PROFINET: Internal error [0x00c86100]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Internal error	Send communication module together with a description of the fault to Lenze.

PROFINET: Internal error [0x00c86101]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Internal error	Send communication module together with a description of the fault to Lenze.

PROFINET: Internal mapping error [0x00c86110]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
The selected PDO mapping is invalid: • An object not supporting the required properties has been specified. • More than 64 bytes of data have been mapped.	Repeat PDO mapping (□ 55).

PROFINET: Invalid parameter set [0x00c8641f]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
No active parameter set could be loaded.	Download application again (including module) If this happens repeatedly, send the communication module together with a description of the fault to Lenze.

PROFINET: Error: Lenze setting loaded [0x00c86420]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
The access to a parameter set in the memory module via the Servo Drive 9400 was not successful.	Download application again (including module) If this happens repeatedly, send the communication module together with a description of the fault to Lenze.

PROFINET: Invalid module configuration [0x00c86430]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☒ Information	
Cause	Remedy
A module or submodule does not comply with the configuration of the Siemens »STEP7« project.	Check/correct configuration.

PROFINET: Invalid READ.request during parameter access [0x00c86501]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
- During the parameter access to data set 47, the controller has sent an invalid READ.request. - When reading back the data, the IO Controller has requested a data length (number of data bytes) that is too small.	Check/correct configuration.

PROFINET: Invalid WRITE.request during parameter access [0x00c86502]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
- During the parameter access to data set 47, the controller has sent an invalid WRITE.request. - When reading back the data, the IO Controller has requested a data length (number of data bytes) that is too small.	Check/correct configuration.

PROFINET: Data output status bad [0x00c86503]

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 the Siemens Controller has been interrupted.	- Check cables and terminals. - Plug in the network cable on the PROFINET terminal X241/X242.

PROFINET: Invalid station name [0x00c86532]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Station name is not PROFINET-compliant.	Use a PROFINET-compliant station name. ▶ Setting the station name (p. 35)

PROFINET: Invalid IP parameters [0x00c86533]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Incorrect IP parameters (IP address, subnet mask, gateway address).	Correct IP parameters. ▶ Setting the IP configuration (📖 37)

PROFINET: Safety communication timeout [0x00c86610]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Communication to the SM30x safety module is disrupted.	Check if the SM30x safety module is plugged in and supplied with voltage.

PROFINET: Safety parameter timeout [0x00c86611]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
The SM30x safety module does not respond to a PROFISafe parameterisation frame within a given time interval (200 ms).	Check if the SM30x safety module is plugged in and supplied with voltage.

PROFINET: Safety init error [0x00c86612]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Communication to the SM30x safety module could not be initialised correctly.	Check whether the user data length configured in the PROFINET IO controller for the PROFISafe data matches the SM30x safety module used. ▶ Configuring the PROFINET IO controller (📖 33)

PROFINET: Safety connect error [0x00c86613]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☒ Warning ☐ Information	
Cause	Remedy
Communication to the I/O controller is disrupted.	Check if the SM30x safety module is plugged in and supplied with voltage.

PROFINET: Internal error [0x00c86650]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☐ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☒ Information	
Cause	Remedy
Internal error	Send communication module together with a description of the fault to Lenze.

PROFINET: "Data_Exchange" status quit [0x00c88131]

Response (Lenze setting printed in bold)		Setting: C13880/1 / C14880/1 (☒ Configurable 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 " (book 77).		• Check cables and terminals. • Plug in the network cable on the PROFINET terminal X241/X242.	

14 Parameter reference

This chapter supplements the parameter list and the table of attributes contained in the reference manual and in the »Engineer« online help for the Servo Drive 9400 with the parameters of the E94AYCER (PROFINET) communication module.



Reference manual/»Engineer« online help for the Servo Drive 9400

Here you will find general information on parameters.

14.1 Parameters of the standard device that are relevant to communication

In this chapter communication-relevant parameters of the Servo Drive 9400 are listed in numerically ascending order.

C00615

Parameter Name:		Data type: UNSIGNED_32 Index: 23960 = 0x5D98
C00615 Resp. to imp. device conf.		
Response to impermissible device configuration		
Selection list		
1	Fault	
3	Quick stop by trouble	
4	Warning Locked	
6	Information	
0	No response	
Subcodes	Lenze setting	Info
C00615/1	0: No Response	Reserved
C00615/2	1: No Response	Resp. to imp. module in MXI1
C00615/3	1: No Response	Resp. to imp. module in MXI2
C00615/4	0: No Response	Reserved
C00615/5	0: No Response	Reserved
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C00636

Parameter Name:		Data type: UNSIGNED_32 Index: 23939 = 0x5D83
C00636 Resp. to new module in MXI1		
Response for the case where a new module has been plugged into slot 1 of the standard device.		
Selection list (Lenze setting printed in bold)		
1	Fault	
6	Information	
5	Warning	
4	Warning Locked	
3	Quick stop by trouble	
0	No response	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C00637

Parameter Name: C00637 Resp. to new module in MXI2		Data type: UNSIGNED_32 Index: 23939 = 0x5D83
Response if a new module has been plugged into module slot 2 of the standard device.		
Selection list (Lenze setting printed in bold)		
1	Fault	
6	Information	
5	Warning	
4	Warning Locked	
3	Quick stop by trouble	
0	No response	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C01501

Parameter Name: C01501 Resp. to comm. error with MXI1		Data type: UNSIGNED_32 Index: 23074 = 0x5A22
Response to a communication error between an "intelligent" module in slot 1 and the standard device		
Selection list (Lenze setting printed in bold)		
0	No response	
1	Fault	
3	Quick stop by trouble	
4	Warning Locked	
5	Warning	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C01502

Parameter Name: C01502 Resp. to comm. error with MXI2		Data type: UNSIGNED_32 Index: 23074 = 0x5A22
Response to a communication error between an "intelligent" module in slot 2 and the standard device		
Selection list (Lenze setting printed in bold)		
0	No response	
1	Fault	
3	Quick stop by trouble	
4	Warning Locked	
5	Warning	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

14.2

Parameters of the communication module for slot MXI1

This chapter lists the parameters of the E94AYCER communication module (PROFINET) for slot MXI2 of the Servo Drive 9400 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, only the following PROFINET-related parameters of the communication module will be reset to 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
- [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: C13000 IP address			Data type: UNSIGNED_32 Index: 11575 = 0x2D37
Setting of the IP address ▶ Setting the IP configuration (37)			
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			

C13001

Parameter Name: C13001 Subnetwork mask			Data type: UNSIGNED_32 Index: 11574 = 0x2D36
Setting of the subnet mask ▶ Setting the IP configuration (37)			
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 = 0x2D35
Setting of the gateway address ▶ Setting the IP configuration (37)			
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 MAC ID			Data type: OCTET_STRING Index: 11572 = 0x2D34
Display of the MAC-ID			
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13010

Parameter Name: C13010 Active IP address			Data type: UNSIGNED_8 Index: 11565 = 0x2D2D
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 (C13899).			
Display range (min. value unit max. value)			
0		255	
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 = 0x2D2C
Display of the active subnetwork mask The active subnet mask may differ from the contents of code C13001 , depending on whether the station name was changed via the fieldbus or the parameter (C13899).			
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 = 0x2D2B
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 (C13899).			
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: C13850 All words to master			Data type: UNSIGNED_16 Index: 10725 = 0x29E5
Display of the process data words which are transmitted from the communication module to the I/O controller. In the subcodes 1 to 32, 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			
...			
C13850/32			
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13851

Parameter Name: C13851 All words from master			Data type: UNSIGNED_16 Index: 10724 = 0x29E4		
Display of the process data words which are transmitted from the I/O controller to the communication module. In the subcodes 1 to 32, 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					
...					
C13851/32					
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C13852

Parameter Name: C13852 All words to standard device			Data type: UNSIGNED_16 Index: 10723 = 0x29E3		
Display of the process data words 1 ... 32 that are transmitted from the communication module to the inverter.					
Display range (min. value unit max. value)					
0		65535			
Subcodes			Info		
C13852/1					
...					
C13852/32					
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C13853

Parameter Name: C13853 All words from standard device			Data type: UNSIGNED_16 Index: 10722 = 0x29E2		
Display of the process data words 1 ... 32 that are transmitted from the inverter to the communication module.					
Display range (min. value unit max. value)					
0		65535			
Subcodes			Info		
C13853/1					
...					
C13853/32					
☒ 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 = 0x29DB		
From SW version 3.00 onwards					
Display of current configuration data					
Display range (min. value unit max. value)					
0		255			
Subcodes			Info		
C13860/1			PROFIsafe • 0: not active • 1: active		
C13860/2			Number of process data words		
C13860/3			Reserved		
C13860/4			Number of PROFIsafe words (0, 4 or 8 words)		
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C13861

Parameter Name: C13861 Bus state		Data type: UNSIGNED_16 Index: 10714 = 0x29DA
Display of the current bus status ► Querying the current bus status (□ 83) (representation of the bit-coded display)		
Display list		
0x0000	Init	
0x0030	No Data Exchange	
0x0020	Data Exchange / Process Data Valid	
0x0010	Data Exchange / Process Data Invalid	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13862

Parameter Name: C13862 Data cycles per second		Data type: UNSIGNED_32 Index: 10713 = 0x29D9
Display of the data cycles per second (independent of data changes) Note: This code will not be supported anymore from SW version 2.10 for reasons related to the system.		
Display range (min. value unit max. value)		
0		4294967295
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13864

Parameter Name: C13864 Active station name		Data type: VISIBLE_STRING Index: 10711 = 0x29D7
Display of the station name actively used by the inverter. The active station name may differ from the contents of code C13899 , depending on whether the station name was changed via the fieldbus or the parameter (C13899). ► Setting the station name (□ 35)		
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13865

Parameter Name: C13865 Display: Last safety PRM data	Data type: OCTET_STRING Index: 10710 = 0x29D6
Display of the F_parameters sent last. • These data are only valid if PROFIsafe is activated. • The coding of the F_parameters is described in the PROFIsafe profile V2.0.	
☒ 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	Recldx
5	
6	Accepted length
...	
9	
10	F_parameter
...	
24	

C13867

Parameter Name: C13867 Display: Most recent diagnostic data	Data type: OCTET_STRING Index: 10708 = 0x29D4
Display of the diagnostic data sent by the inverter most recently. ▶ Diagnostic data (84)	
☒ 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	

C13879

Parameter Name: C13879 Bus error		Data type: UNSIGNED_32 Index: 10696 = 0x29C8	
Display of the error currently detected on the fieldbus.			
Display range (min. value unit max. value)			
0		4294967295	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

Value	Meaning
0	No error
3481402629	The PROFINET communication link has been interrupted.

C13880

Parameter Name: C13880 Monitoring Reaction		Data type: UNSIGNED_8 Index: 10695 = 0x29C7	
The action set in subcode 1 is executed when the node detects that it is no longer in the "Data_Exchange" state. • Please also observe the notes provided in code C13881. • A change in the monitoring response becomes immediately effective. ▶ Interruption of PROFINET communication (📖 77)			
Selection list			
0	No response		
1	Fault		
3	Quick stop by trouble		
4	Warning Locked		
6	Information		
Subcodes	Lenze setting	Info	
C13880/1	0: No Response		
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13881

Parameter Name:			Data type: UNSIGNED_16 Index: 10694 = 0x29C6		
C13881 Response time when exiting "Data_Exchange"					
If the "Data_Exchange" status is exited, the response parameterised in C13880 is activated after the time set here has expired.					
• A value of "65535" in this code deactivates the monitoring function. • A change in the monitoring response becomes immediately effective.					
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					

C13882

Parameter Name: C13882 Display: Monit. time: Watchdog		Data type: UNSIGNED_32 Index: 10693 = 0x29C5	
Display of the watchdog monitoring time specified by the IO controller Note: This code will not be supported anymore from SW version 2.10 for reasons related to the system.			
Display range (min. value unit max. value)			
0		4294967295	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13885

Parameter Name: C13885 Clear process data		Data type: UNSIGNED_8 Index: 10690 = 0x29C2
This code is used to set the process data which the I/O device is to process in order to maintain the internal communication when the fieldbus has exited the "Data_Exchange" status.		
Selection list (Lenze setting printed in bold)		
0	Use of most recent master PDOs	
1	PDOs 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: C13887 Suppression diagnostic message		Data type: BITFIELD_8 Index: 10688 = 0x29C0
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.		
Value is bit-coded:		
Bit 0	Fault	
Bit 1	Fault	
Bit 2	Quick stop by trouble	
Bit 3	Warning Locked	
Bit 4	Warning	
Bit 5	Reserved	
Bit 6	Reserved	
Bit 7	Reserved	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13899

Parameter Name: C13899 Station name		Data type: VISIBLE_STRING Index: 10676 = 0x29B4
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.		
▶ Setting the station name (35)		
☒ 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 = 0x29B3
The code contains a string with a length of 8 characters. The identification code "E94AFCER" is displayed.		
☒ 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 = 0x29B2
The code contains a string with a length of 20 characters. The software creation date ("MMM DD YYYY") and time ("hh:mm:ss") 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 = 0x29B1
The code contains a string with a length of 8 characters. The identification code is displayed (e.g. "01.10.09").	
☒ 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 = 0x29A9
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 = 0x29A8
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 = 0x29A7
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	

C13913

Parameter Name: C13913 I&M3 additional information	Data type: VISIBLE_STRING Index: 10662 = 0x29A6
Input/output if the I&M3 additional information The Lenze setting shows an empty string.	
☒ 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 = 0x29A5
Input/output of the I&M4 signature The Lenze setting shows an empty string.	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

14.3

Parameters of the communication module for slot MXI2

This chapter lists the parameters of the E94AYCER communication module (PROFINET) for slot MXI2 of the Servo Drive 9400 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, only the following PROFINET-related parameters of the communication module will be reset to standard values:

- [C14000](#) | IP address
- [C14001](#) | Subnetwork mask
- [C14002](#) | Gateway address
- [C14010](#) | Active IP address
- [C14011](#) | Active subnetwork mask
- [C14012](#) | Active gateway address
- [C14864](#) | Active station name
- [C14899](#) | Station name
- [C14910](#) | I&M1 system designation
- [C14911](#) | I&M1 installation site
- [C14912](#) | I&M2 installation date
- [C14913](#) | I&M3 additional information
- [C14914](#) | I&M4 signature code

C14000

Parameter Name: C14000 IP address			Data type: UNSIGNED_32 Index: 10575 = 0x294F
Setting of the IP address ▶ Setting the IP configuration (37)			
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			

C14001

Parameter Name: C14001 Subnetwork mask			Data type: UNSIGNED_32 Index: 10574 = 0x294E
Setting of the subnet mask ▶ Setting the IP configuration (37)			
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			

C14002

Parameter Name: C14002 Gateway address			Data type: UNSIGNED_32 Index: 10573 = 0x294D
Setting of the gateway address ▶ Setting the IP configuration (37)			
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			

C14003

Parameter Name: C14003 MAC ID			Data type: OCTET_STRING Index: 10572 = 0x294C
Display of the MAC-ID			
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14010

Parameter Name: C14010 Active IP address			Data type: UNSIGNED_8 Index: 10565 = 0x2945
Display of the active IP address The active IP address may differ from the contents of code C14000 , depending on whether the station name was changed via the fieldbus or the parameter (C14899).			
Display range (min. value unit max. value)			
0		255	
Subcodes			Info
C14010/1			Active IP address.1
C14010/2			Active IP address.2
C14010/3			Active IP address.3
C14010/4			Active IP address.4
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14011

Parameter Name: C14011 Active subnetwork mask			Data type: UNSIGNED_8 Index: 10564 = 0x2944
Display of the active subnetwork mask The active subnet mask may differ from the contents of code C14001 , depending on whether the station name was changed via the fieldbus or the parameter (C14899).			
Display range (min. value unit max. value)			
0		255	
Subcodes			Info
C14011/1			Active subnetwork mask.1
C14011/2			Active subnetwork mask.2
C14011/3			Active subnetwork mask.3
C14011/4			Active subnetwork mask.4
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14012

Parameter Name: C14012 Active gateway address			Data type: UNSIGNED_8 Index: 10563 = 0x2943
Display of the active gateway address The active gateway address may differ from the contents of code C14002 , depending on whether the station name was changed via the fieldbus or the parameter (C14899).			
Display range (min. value unit max. value)			
0		255	
Subcodes			Info
C14012/1			Active gateway address.1
C14012/2			Active gateway address.2
C14012/3			Active gateway address.3
C14012/4			Active gateway address.4
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14850

Parameter Name: C14850 All words to master			Data type: UNSIGNED_16 Index: 9725 = 0x25FD		
Display of the process data words which are transmitted from the communication module to the I/O controller. In the subcodes 1 to 32, 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		
C14850/1					
...					
C14850/32					
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C14851

Parameter Name: C14851 All words from master		Data type: UNSIGNED_16 Index: 9724 = 0x25FC	
Display of the process data words which are transmitted from the I/O controller to the communication module. In the subcodes 1 to 32, 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			
Subcodes		Info	
C14851/1			
...			
C14851/32			
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14852

Parameter Name: C14852 All words to standard device			Data type: UNSIGNED_16 Index: 9723 = 0x25FB		
Display of the process data words 1 ... 32 that are transmitted from the communication module to the inverter.					
Display range (min. value unit max. value)					
0		65535			
Subcodes			Info		
C14852/1					
...					
C14852/32					
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C14853

Parameter Name: C14853 All words from standard device			Data type: UNSIGNED_16 Index: 9722 = 0x25FA		
Display of the process data words 1 ... 32 that are transmitted from the inverter to the communication module.					
Display range (min. value unit max. value)					
0		65535			
Subcodes			Info		
C14853/1					
...					
C14853/32					
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C14860

Parameter Name: C14860 Settings			Data type: UNSIGNED_8 Index: 9715 = 0x25F3	
From SW version 3.00 onwards Display of current configuration data				
Display range (min. value unit max. value)				
0		255		
Subcodes			Info	
C13860/1			PROFIsafe • 0: not active • 1: active	
C13860/2			Number of process data words	
C13860/3			Reserved	
C13860/4			Number of PROFIsafe words (0, 4 or 8 words)	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT				

C14861

Parameter Name: C14861 Bus status		Data type: UNSIGNED_16 Index: 9714 = 0x25F2
Display of the current bus status ▶ Querying the current bus status (📖 83) (representation of the bit-coded display)		
Display list		
0x0000	Init	
0x0030	No Data Exchange	
0x0020	Data Exchange / Process Data Valid	
0x0010	Data Exchange / Process Data Invalid	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14862

Parameter Name: C14862 Data cycles per second		Data type: UNSIGNED_32 Index: 9713 = 0x25F1
Display of the data cycles per second (independent of data changes) Note: This code will not be supported anymore from SW version 2.10 for reasons related to the system.		
Display range (min. value unit max. value)		
0	4294967295	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14864

Parameter Name: C14864 Active station name		Data type: VISIBLE_STRING Index: 9711 = 0x25EF
Display of the station name actively used by the inverter. The active station name may differ from the contents of code C14899 , depending on whether the station name was changed via the fieldbus or the parameter (C14899). ► Setting the station name (□ 35)		
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14865

Parameter Name: C14865 Display: Last safety PRM data	Data type: OCTET_STRING Index: 9710 = 0x25EE
Display of the F_parameters sent last. • These data are only valid if PROFIsafe is activated. • The coding of the F_parameters is described in the PROFIsafe profile V2.0.	
☒ 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	Recldx
5	
6	Accepted length
...	
9	
10	F_parameter
...	
24	

C14867

Parameter Name: C14867 Display: Most recent diagnostic data	Data type: OCTET_STRING Index: 9708 = 0x25EC
Display of the diagnostic data sent by the inverter most recently. ▶ Diagnostic data (84)	
☒ 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	

C14879

Parameter Name: C14879 Bus error		Data type: UNSIGNED_32 Index: 9696 = 0x25E0	
Display of the error currently detected on the fieldbus.			
Display range (min. value unit max. value)			
0		4294967295	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

Value	Meaning
0	No error
3481402629	The PROFINET communication link has been interrupted.

C14880

Parameter Name: C14880 Reaction on communication fault		Data type: UNSIGNED_8 Index: 9695 = 0x25DF	
The action set in subcode 1 is executed when the node detects that it is no longer in the "Data_Exchange" state. • Please also observe the notes provided in code C14881. • A change in the monitoring response becomes immediately effective. ▶ Interruption of PROFINET communication (📖 77)			
Selection list			
0	No response		
1	Fault		
3	Quick stop by trouble		
4	Warning Locked		
6	Information		
Subcodes	Lenze setting	Info	
C14880/1	0: No Response		
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14881

Parameter Name: C14881 Response time when exiting "Data_Exchange"			Data type: UNSIGNED_16 Index: 9694 = 0x25DE		
If the "Data_Exchange" status is exited, the response parameterised in C14880 is activated after the time set here has expired. • A value of "65535" in this code deactivates the monitoring function. • A change in the monitoring response becomes immediately effective.					
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					

C14882

Parameter Name: C14882 Display: Monit. time: Watchdog		Data type: UNSIGNED_32 Index: 9693 = 0x25DD	
Display of the watchdog monitoring time specified by the IO controller Note: This code will not be supported anymore from SW version 2.10 for reasons related to the system.			
Display range (min. value unit max. value)			
0		4294967295	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14885

Parameter Name: C14885 Clear process data		Data type: UNSIGNED_8 Index: 9690 = 0x25DA
This code is used to set the process data which the I/O device is to process in order to maintain the internal communication when the fieldbus has exited the "Data_Exchange" status.		
Selection list (Lenze setting printed in bold)		
0	Use of most recent master PDOs	
1	PDOs are set to the value 0'	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14887

Parameter Name: C14887 Suppression diagnostic message		Data type: BITFIELD_8 Index: 9688 = 0x25D8
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.		
Value is bit-coded:		
Bit 0	Fault	
Bit 1	Fault	
Bit 2	Quick stop by trouble	
Bit 3	Warning Locked	
Bit 4	Warning	
Bit 5	Reserved	
Bit 6	Reserved	
Bit 7	Reserved	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14899

Parameter Name: C14899 Station name		Data type: VISIBLE_STRING Index: 9676 = 0x25CC
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. ▶ Setting the station name (35)		
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☒ COM ☐ MOT		

C14900

Parameter Name: C14900 Firmware product type		Data type: VISIBLE_STRING Index: 9675 = 0x25CB
The code contains a string with a length of 8 characters. The identification code "E94AFCER" is displayed.		
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14901

Parameter Name: C14901 Firmware compilation date		Data type: VISIBLE_STRING Index: 9674 = 0x25CA
The code contains a string with a length of 20 characters. The software creation date ("MMM DD YYYY") and time ("hh:mm:ss") 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		

C14902

Parameter Name: C14902 Firmware version	Data type: VISIBLE_STRING Index: 9673 = 0x25C9
The code contains a string with a length of 8 characters. The identification code is displayed (e.g. "01.10.09").	
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C14910

Parameter Name: C14910 I&M1 system designation	Data type: VISIBLE_STRING Index: 9665 = 0x25C1
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	

C14911

Parameter Name: C14911 I&M1 installation site	Data type: VISIBLE_STRING Index: 9664 = 0x25C0
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	

C14912

Parameter Name: C14912 I&M2 installation date	Data type: VISIBLE_STRING Index: 9663 = 0x25BF
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	

C14913

Parameter Name: C14913 I&M3 additional information	Data type: VISIBLE_STRING Index: 9662 = 0x25BE
Input/output if the I&M3 additional information The Lenze setting shows an empty string.	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C14914

Parameter Name: C14914 I&M4 signature code	Data type: OCTET_STRING Index: 9661 = 0x25BD
Input/output of the I&M4 signature The Lenze setting shows an empty string.	
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

14.4 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		0x5FFF - 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	

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Code	Name	Index		Data				Access		
		dec	hex	DS	DA	Data type	Factor	R	W	CINH
C13000	IP address	11575	0x2D37	E	1	UNSIGNED_32	1	☑	☑	
C13001	Subnet Mask	11574	0x2D36	E	1	UNSIGNED_32	1	☑	☑	
C13002	Gateway address	11573	0x2D35	E	1	UNSIGNED_32	1	☑	☑	
C13003	MAC-ID	11572	0x2D34	E	1	OCTET_STRING		☑		
C13010	Active IP Address	11565	0x2D2D	A	4	UNSIGNED_8	1	☑		
C13011	Active Subnetwork Mask	11564	0x2D2C	A	4	UNSIGNED_8	1	☑		
C13012	Active gateway address	11563	0x2D2B	A	4	UNSIGNED_8	1	☑		
C13850	All words from drive to master	10725	0x29E5	A	32	UNSIGNED_16	1	☑		
C13851	All words from master to drive	10724	0x29E4	A	32	UNSIGNED_16	1	☑		
C13852	All words to the basic device	10723	0x29E3	A	32	UNSIGNED_16	1	☑		
C13853	All words to the basic device	10722	0x29E2	A	32	UNSIGNED_16	1	☑		
C13860	Settings	10715	0x29DB	A	4	UNSIGNED_8	1	☑		
C13861	Bus status	10714	0x29DA	E	1	UNSIGNED_16		☑		
C13862	Data cycles per second	10713	0x29D9	E	1	UNSIGNED_32		☑		
C13864	Active station name	10711	0x29D7	E	1	VISIBLE_STRING		☑		
C13865	Display: Last safety PRM data	10710	0x29D6	E	1	OCTET_STRING		☑		
C13867	Display: Most recent diagnostic data	10708	0x29D4	E	1	OCTET_STRING		☑		
C13879	Bus error	10696	0x29C8	E	1	UNSIGNED_32	1	☑		
C13880	Monitoring Reaction	10695	0x29C7	A	1	UNSIGNED_8	1	☑	☑	
C13881	Response time when exiting "Data_Exchange"	10694	0x29C6	E	1	UNSIGNED_16	1	☑	☑	
C13882	Display: Monit. time: Watchdog	10693	0x29C5	E	1	UNSIGNED_32	1	☑	☑	
C13885	Delete process data	10690	0x29C2	E	1	UNSIGNED_8	1	☑	☑	
C13887	Suppression diagnostic message	10688	0x29C0	E	1	BITFIELD_8		☑	☑	
C13899	Station name	10676	0x29B4	E	1	VISIBLE_STRING		☑	☑	
C13900	Firmware Product Type	10675	0x29B3	E	1	VISIBLE_STRING		☑		
C13901	Firmware Compilation Date	10674	0x29B2	E	1	VISIBLE_STRING		☑		
C13902	Firmware Version	10673	0x29B1	E	1	VISIBLE_STRING		☑		
C13910	I&M1 system designation	10665	0x29A9	E	1	VISIBLE_STRING		☑	☑	
C13911	I&M1 installation site	10664	0x29A8	E	1	VISIBLE_STRING		☑	☑	
C13912	I&M2 installation date	10663	0x29A7	E	1	VISIBLE_STRING		☑	☑	
C13913	I&M3 additional information	10662	0x29A6	E	1	VISIBLE_STRING		☑	☑	
C13914	I&M4 signature code	10661	0x29A5	E	1	OCTET_STRING		☑	☑	
C14000	IP address	10575	0x294F	E	1	UNSIGNED_32	1	☑	☑	
C14001	Subnet Mask	10574	0x294E	E	1	UNSIGNED_32	1	☑	☑	
C14002	Gateway address	10573	0x294D	E	1	UNSIGNED_32	1	☑	☑	
C14003	MAC-ID	10572	0x294C	E	1	OCTET_STRING		☑		
C14010	Active IP Address	10565	0x2945	A	4	UNSIGNED_8	1	☑		
C14011	Active Subnetwork Mask	10564	0x2944	A	4	UNSIGNED_8	1	☑		
C14012	Active gateway address	10563	0x2943	A	4	UNSIGNED_8	1	☑		
C14850	All words from drive to master	9725	0x25FD	A	32	UNSIGNED_16	1	☑		
C14851	All words from master to drive	9724	0x25FC	A	32	UNSIGNED_16	1	☑		
C14852	All words to the basic device	9723	0x25FB	A	32	UNSIGNED_16	1	☑		
C14853	All words to the basic device	9722	0x25FA	A	32	UNSIGNED_16	1	☑		
C14860	Settings	9715	0x25F3	A	4	UNSIGNED_8	1	☑		
C14861	Bus status	9714	0x25F2	E	1	UNSIGNED_16		☑		
C14862	Data cycles per second	9713	0x25F1	E	1	UNSIGNED_32		☑		
C14864	Active station name	9711	0x25EF	E	1	VISIBLE_STRING		☑		
C14865	Display: Last safety PRM data	9710	0x25EE	E	1	OCTET_STRING		☑		

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	Data type	Factor	R	W	CINH
C14867	Display: Most recent diagnostic data	9708	0x25EC	E	1	OCTET_STRING		☒		
C14879	Bus error	9696	0x25E0	E	1	UNSIGNED_32	1	☒		
C14880	Monitoring Reaction	9695	0x25DF	A	1	UNSIGNED_8	1	☒	☒	
C14881	Response time when exiting "Data_Exchange"	9694	0x25DE	E	1	UNSIGNED_16	1	☒	☒	
C14882	Display: Monit. time: Watchdog	9693	0x25DD	E	1	UNSIGNED_32	1	☒	☒	
C14885	Delete process data	9690	0x25DA	E	1	UNSIGNED_8	1	☒	☒	
C14887	Suppression diagnostic message	9688	0x25D8	E	1	BITFIELD_8		☒	☒	
C14899	Station name	9676	0x25CC	E	1	VISIBLE_STRING		☒	☒	
C14900	Firmware Product Type	9675	0x25CB	E	1	VISIBLE_STRING		☒		
C14901	Firmware Compilation Date	9674	0x25CA	E	1	VISIBLE_STRING		☒		
C14902	Firmware Version	9673	0x25C9	E	1	VISIBLE_STRING		☒		
C14910	I&M1 system designation	9665	0x25C1	E	1	VISIBLE_STRING		☒	☒	
C14911	I&M1 installation site	9664	0x25C0	E	1	VISIBLE_STRING		☒	☒	
C14912	I&M2 installation date	9663	0x25BF	E	1	VISIBLE_STRING		☒	☒	
C14913	I&M3 additional information	9662	0x25BE	E	1	VISIBLE_STRING		☒	☒	
C14914	I&M4 signature code	9661	0x25BD	E	1	OCTET_STRING		☒	☒	

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Your opinion is important to us

These instructions were created to the best of our knowledge and belief to give you the best possible support for handling our product.

Perhaps we have not succeeded in achieving this objective in every respect. If you have suggestions for improvement, please e-mail us to:

feedback-docu@lenze.com

Thank you very much for your support.

Your Lenze documentation team

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