

8400 motec



E84DGFCRxxx

PROFINET Communication Unit

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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 controller.

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

Examples illustrate typical applications.

This documentation also contains...

- ▶ the most important technical data for PROFINET communication;
- ▶ Information on the installation and commissioning of the PROFINET network;
- ▶ Information on the PROFINET data transfer;
- ▶ information on monitoring functions and troubleshooting as well as fault elimination.

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

Depending on the software version of the controller and of the installed »Engineer« software, the screenshots in this documentation may vary from the »Engineer« depiction.

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

All product 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

Target group

This documentation is aimed at people involved in configuring, installing, commissioning, and maintaining 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

Validity information

The information in this documentation applies to the following devices:

Product series	Type designation	Variant
Inverter Drives 8400 motec PROFINET Communication Unit	E84DGFCRxNx	PROFINET
	E84DGFCRxJx	PROFINET + Safety

► [Features and variants](#) (14)

1.1 Document history

version			Description
1.0	06/2011	TD17	First edition
2.0	11/2011	TD17	General revision

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.de

Thank you very much for your support.

Your Lenze documentation team

1.2 Conventions used

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

Type of information	Writing	Examples/notes
Numbers		
Decimal	Standard notation	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 generally used. Example: 1234.56
Text		
Program name	» «	PC software Example: Lenze »Engineer«
Window	<i>Italics</i>	The <i>Message window...</i> / The <i>Options</i> dialog box...
Control element	Bold	The OK button... / The Copy command... / The Properties tab... / The Name input field...
Sequence of menu commands		If the execution of a function requires several successive commands, the individual commands are separated from each other by an arrow: Select the command File→Open to...
Hyperlink	<u>Underlined</u>	Optically highlighted reference to another subject which is activated with a mouse-click.
Symbols		
Page reference	( 8)	Optically highlighted reference to another page which is activated with a mouse-click.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

1.3 Terminology used

Term	Meaning
Controller	Lenze frequency inverter of the "Inverter Drives 8400 motec" product series
Standard device	
Drive Unit Communication Unit Wiring Unit	The controller 8400 motec consists of the following modules: "Drive Unit", "Communication Unit" and "Wiring Unit". - The Drive Unit is available in various power classes. - The Communication Unit is available in the following versions: – No fieldbus – AS-i option – CANopen option – PROFIBUS option – PROFINET option – EtherCAT option - The Wiring Unit provides flexible connection options for an easy integration into the power supply of the machine.
»Engineer«	PC software from Lenze which supports you in "engineering" (parameter setting, diagnosing, and configuring) during the entire life cycle, i.e. from planning to maintenance of the commissioned machine.
Code	Parameter which serves to parameterise and monitor the controller. In normal usage, the term is usually referred to as "Index".
Subcode	If a code contains several parameters they are stored in so-called "subcodes". In the documentation the forward slash "/" is used as a separator between the designation of the code and the subcode (e.g. "C00118/3"). In normal usage, the term is also referred to as "Subindex".
Lenze setting	These are settings with which the device is preconfigured ex works.
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.

1.4 Notes used

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

Safety instructions

Structure 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 damage to material assets Reference to a possible danger that may result in damage to material assets 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 documentation

2 Safety instructions



Note!

Always observe the specified safety measures to avoid severe injury to persons and damage to property!

Always keep this documentation to hand in the vicinity of the product during operation.

2.1 General safety and application notes



Danger!

Disregarding the following basic safety measures may lead to severe personal injury and damage to material assets.

- ▶ Lenze drive and automation components ...
 - may only be used as directed.
 - ▶ [Application as directed](#) (📖 13)
 - must never be commissioned if they display any signs of damage.
 - must never be technically modified.
 - must never be commissioned if they are not fully mounted.
 - must never be operated without the required covers.
 - can - depending on their degree of protection - have live, movable or rotating parts during operation and after operation. Surfaces can be hot.
- ▶ For Lenze drive components ...
 - Only use permissible accessories.
 - use only original spare parts from the manufacturer.
- ▶ Observe all the specifications contained in the enclosed and related documentation.
 - This is the precondition for safe and trouble-free operation and for achieving the specified product features.
 - ▶ [Features and variants](#) (📖 14)
 - The procedural notes and circuit details described in this document are only proposals. It is up to the user to check whether they can be adapted to the particular applications. Lenze does not take any responsibility for the suitability of the procedures and circuit proposals described.

- ▶ Only qualified personnel may work with and on Lenze drive and automation components. In accordance with IEC 60364 and CENELEC HD 384, these are persons ...
 - who are familiar with installing, mounting, commissioning, and operating the product.
 - who have the qualifications necessary for their occupation.
 - who know all regulations for the prevention of accidents, directives and laws applicable on site and are able to apply them.

2.2 Device- and application-specific safety instructions

- ▶ During operation, the Communication Unit must be connected to the Wiring Unit and the Drive Unit.
- ▶ In case of external voltage supply, always use a separate power supply unit, safely separated in accordance with 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 stated 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](#) (📖 20)

3 Product description

3.1 Application as directed

The PROFINET Communication Unit ...

- ▶ is a unit that can only be used in conjunction with the following modules:

Product series	Type designation
Inverter Drives 8400 motec Drive Unit	E84DGDVxxxxxxxxx
Inverter Drives 8400 motec Wiring Unit	E84DGVNxx

- ▶ is an item of equipment 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	Features				
		Enclosure IP 65	PROFINET M12	I/O: Terminal	I/O: M12	Safety
Inverter Drives 8400 motec PROFINET Communication Unit	E84DGFCRANP	●	●	●		
	E84DGFCR9NP	●	●		●	
	E84DGFCRAJP	●	●	●		●
	E84DGFCR9JP	●	●		●	●

- ▶ The PROFINET Communication Unit is ...
 - mounted to the Wiring Unit (E84DGVNxx);
 - supplied internally via the Drive Unit (E84DGDVxxxxxxxx) 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 of the E84DGFCRxJx Communication Units 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.
- ▶ Support of the LLDP protocol for the topology recognition
- ▶ Support of the SNMP protocol for diagnostic purposes
- ▶ 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 is possible with the Lenze »Engineer«.



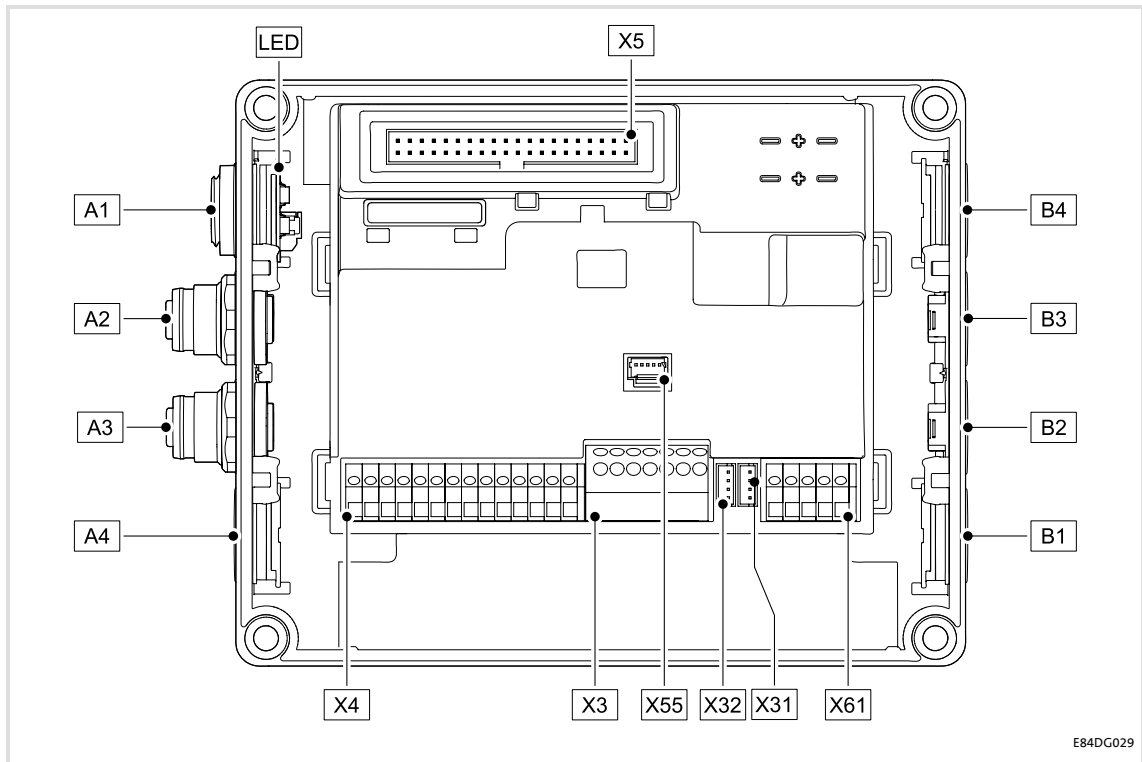
"Inverter Drives 8400 motec" hardware manual

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

Software manual / »Engineer« online help for the "Inverter Drive 8400 motec"

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

3.3 Connections and interfaces



[3-1] PROFINET Communication Unit

Pos.	Description
A1 / LED	Position for LEDs for PROFINET status display ▶ LED status displays (64)
A2	PROFINET port 1 (M12 socket, 5-pole, D-coded) ▶ PROFINET connection (24)
A3	PROFINET port 2 (M12 socket, 5-pole, D-coded) ▶ PROFINET connection (24)
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 wiring the LEDs at 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 to 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 included.

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

Area	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	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. telegram length
External voltage supply	- U = 24 V DC (20 V - 0 % ... 29 V + 0 %) - I_{max} = 400 mA
Conformities, approvals	- CE - UR / cUR

4.2 Protocol data

Area	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 a PROFINET network depend on the ...

- Processing time inside the controller;
- Transmission delay time (baud rate / telegram length);
- Nesting depth of the network.

Processing time inside the controller

Data	Processing time
Process data	Approx. 2 ms update cycle + 0 ... 1 ms processing time in the module + 1 ... x ms application task runtime 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 software manual/ »Engineer« 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:

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

Example:

20 process data words => 40 bytes

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

According to the PROFINET specification, the shortest PROFINET IO telegram 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 IO telegram is filled with "zero bytes" until it can be transmitted. As a consequence for the calculation formula, the shortest PROFINET I/O telegram 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](#) (📖 22)

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 troubled or not possible.
- I/O signals are faulty.
- The safety function is faulty.

Protective measures

- Discharge electrostatic charges before touching the Communication Unit.

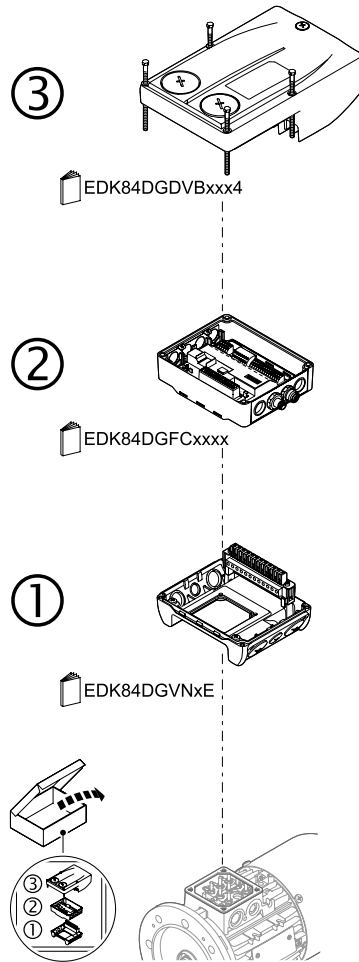
5.1 Mechanical installation



Mounting instructions for "Inverter Drives 8400 motec"

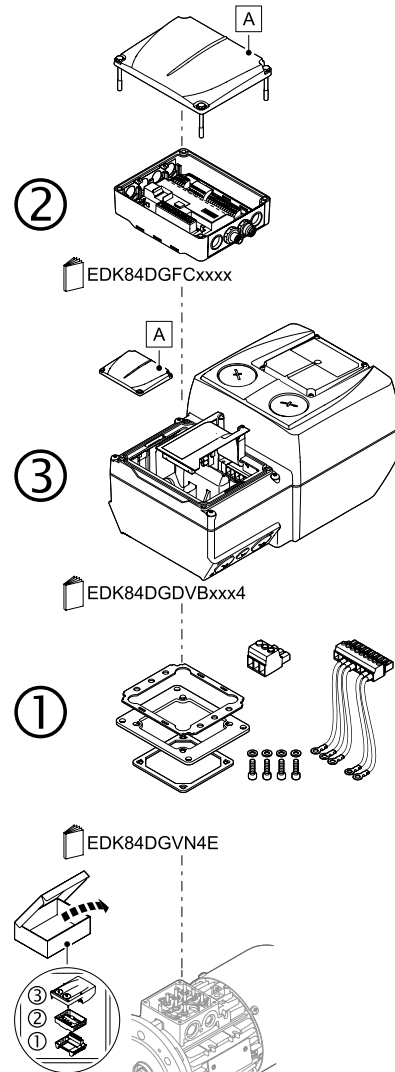
Here you will find detailed information on the installation.

0.37 ... 3.0 kW



E84DG023a

4.0 ... 7.5 kW



E84DG023b

[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 for the Drive Unit, Communication Unit, Wiring Unit

5.2 Electrical installation



"Inverter Drives 8400 motec" hardware manual

Here you will find detailed information about ...

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

Observe the notes and wiring instructions included.

5.2.1 Network topology

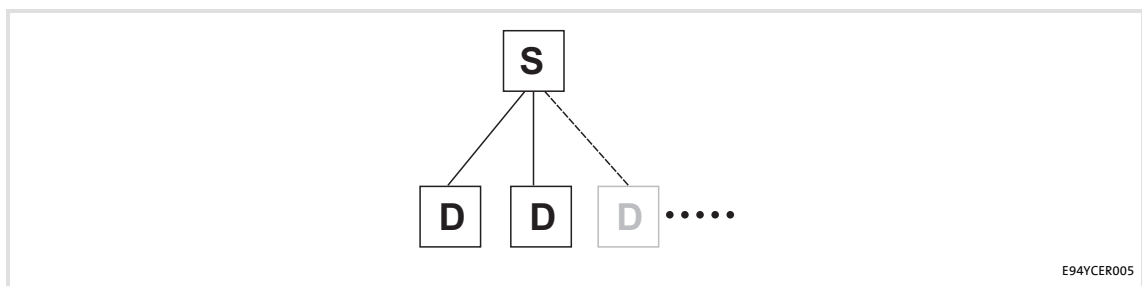
It is typical of PROFINET to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

► [Internal switch latency](#) (19)

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

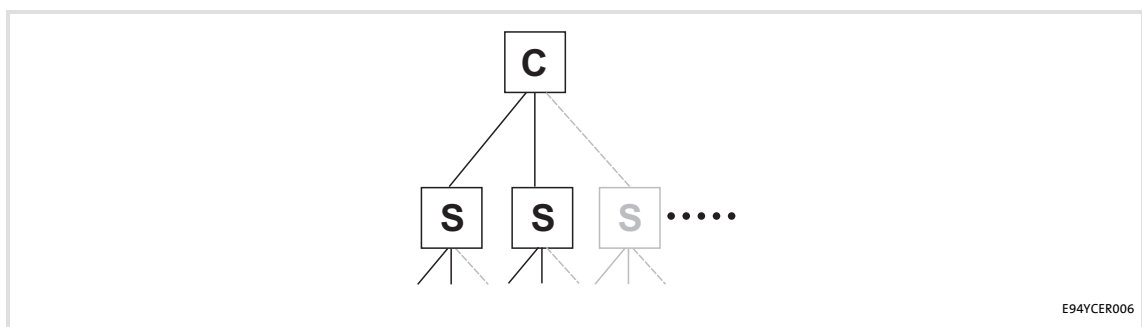
PROFINET supports the following topologies:

► Switch / star



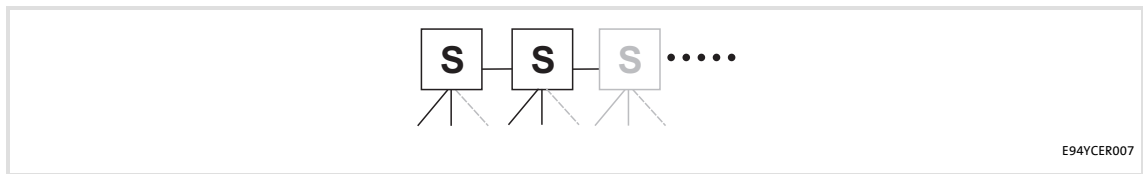
[5-2] Switch / star topology (S = switch, D = I/O device)

► Tree via switches



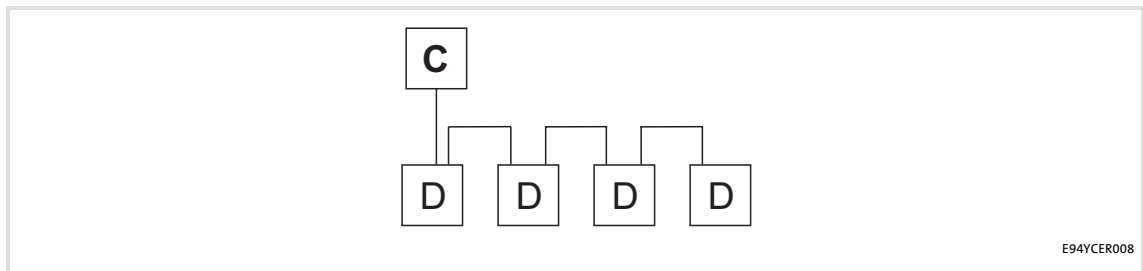
[5-3] Tree topology (C = I/O controller, S = switch)

► Switch / switch



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

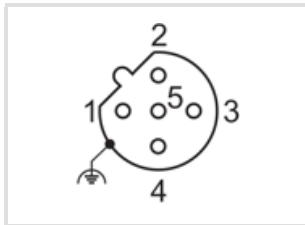
► I/O controller / I/O device



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

5.2.2 PROFINET connection

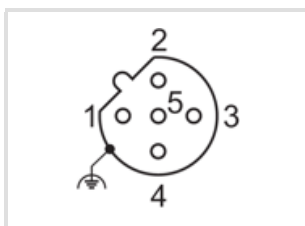
PROFINET port 1



- 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:
 - $U = 24 \text{ V DC (} 20 \text{ V} - 0 \% \dots 29 \text{ V} + 0 \%)$
 - $I_{\text{max}} = 400 \text{ mA}$
- ▶ 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 controller. For Lenze devices, this is done via the codes.

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

In addition to codes for the configuration, there are codes for diagnosing and monitoring the nodes.

► [Parameter reference](#) (□ 73)

The data from the controller 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 you switch on the controller for the first time, check the entire wiring for 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 device data base file selection

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

6.3 Setting the station name



Note!

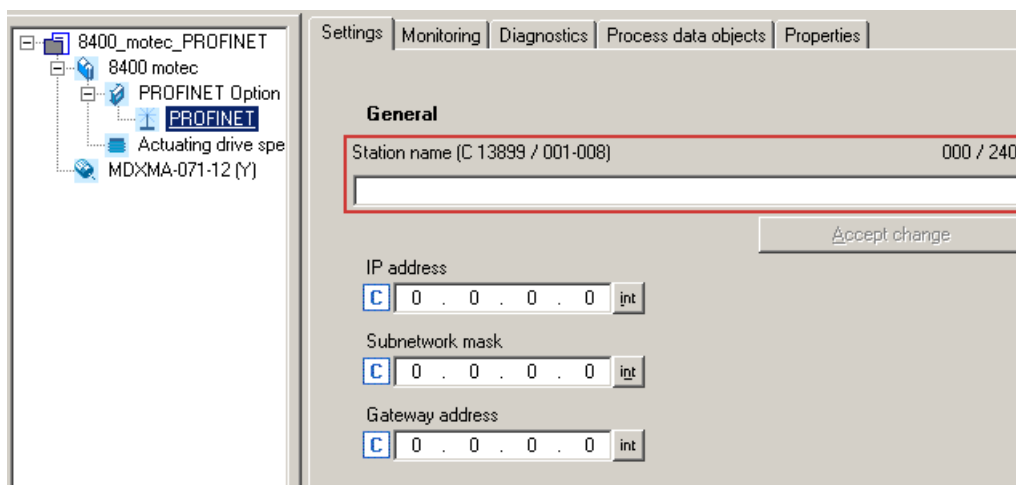
- The "Node blinking test" PROFINET function which serves to identify an accessible device is supported. The red LED **BE** ([LED status displays](#) (64)) flickers during execution.
- Operation on the PROFINET requires a valid station name.
- In the case of impermissible settings, the red LED **BE** blinks ([LED status displays](#) (64)), and the error message [PROFINET: Stack init error \[0x01bc6534\]](#) (72) 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 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 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.



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 motec if communication between the PC/»Engineer« or the IO controller and the controller is to be effected via PROFINET. For this, an IP address, subnet mask, and gateway address must be allocated.

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:

- ▶ [Settings via the PROFINET configurator of the »Engineer«](#) (📘 31)
- ▶ [Setting via codes in the »Engineer«](#) (📘 33)



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 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** blinks ([LED status displays](#) (📘 64)), and the error message [PROFINET: Stack init error \[0x01bc6534\]](#) (📘 72) is output.

6.4.1 Settings via the PROFINET configurator of the »Engineer«



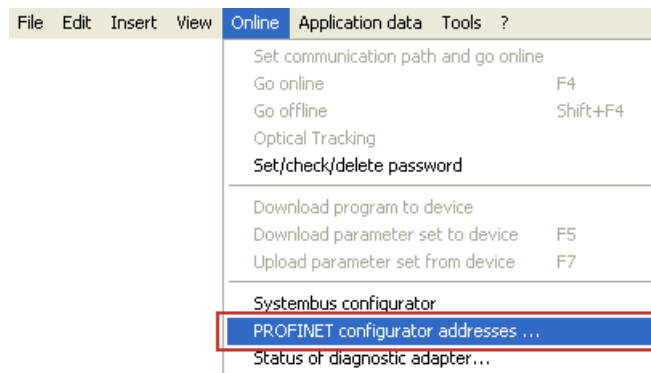
Note!

- 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.

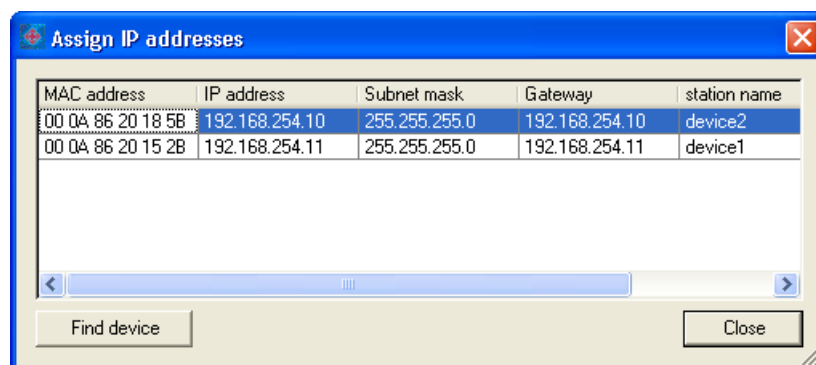


How to set the IP parameters via the PROFINET configurator:

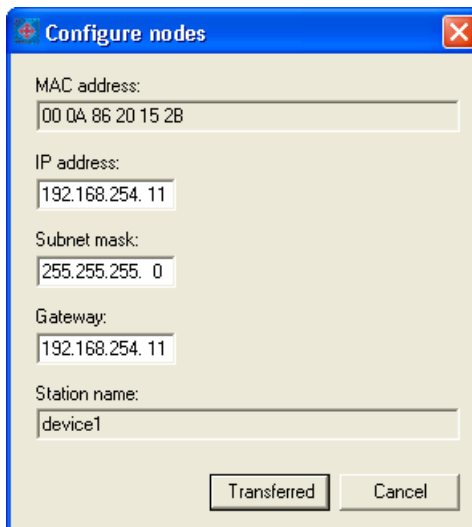
1. Execute the menu command **Online → Profinet configurator addresses....**



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.



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.

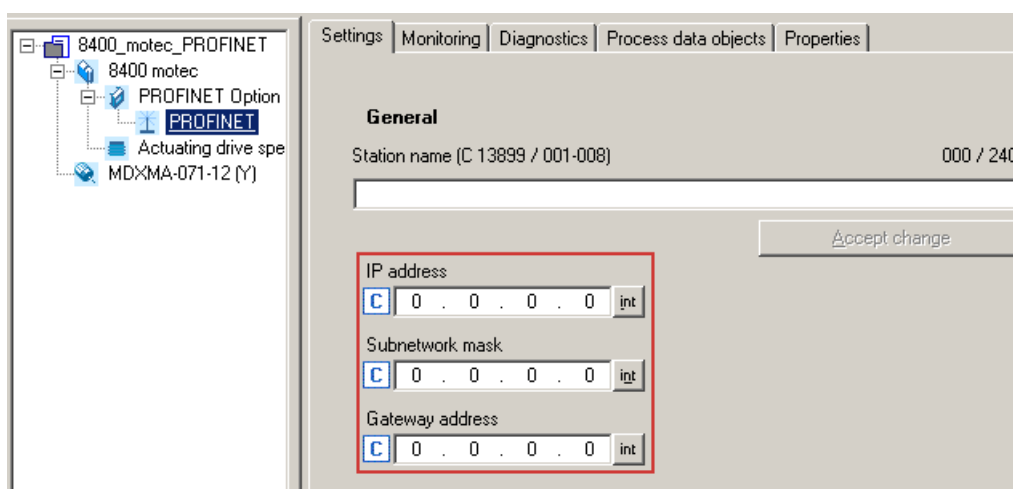
6.4.2 Setting via codes in the »Engineer«



Note!

- The IP address must only be allocated manually in the »Engineer« if the PROFINET network is not 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.

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).



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 Unit 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 [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](#).

Subnetwork 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«

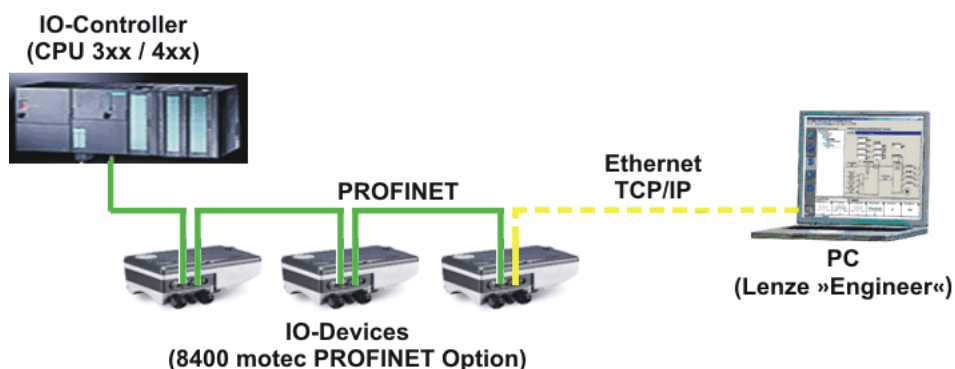
This functionality is only supported from software version V01.30.05.



Note!

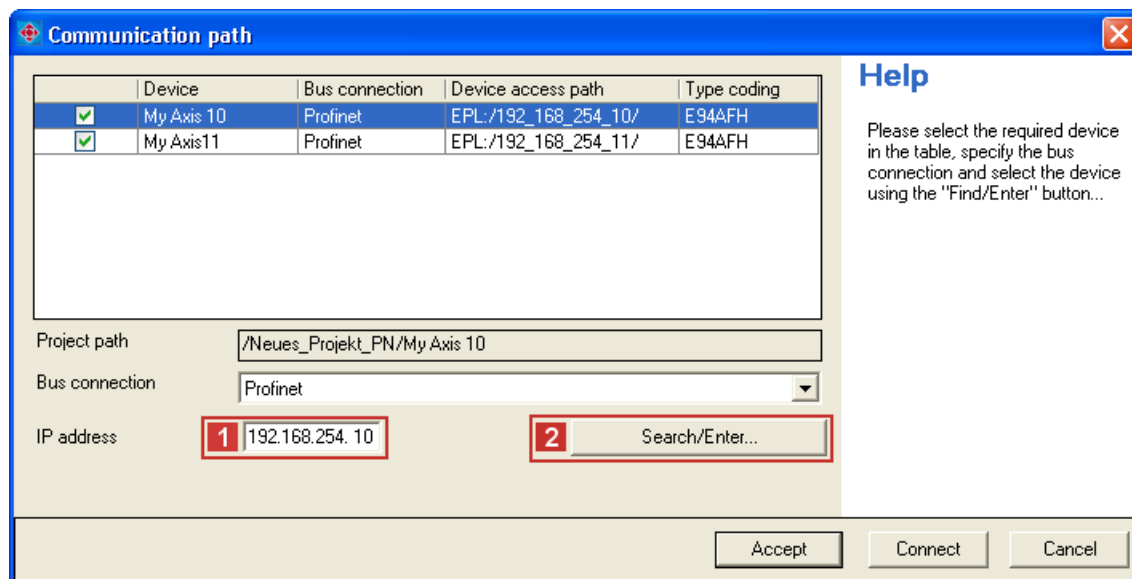
In order to ensure perfect operation of cyclic PROFINET communication, online access with the »Engineer« has to be executed via a PROFINET switch.

The PROFINET switch integrated in the communication module can manage cyclic PROFINET communication with priority over regular TCP/IP communication. With PROFINET this is effected via the VLAN identification in the Ethernet frame.



For an online connection between the »Engineer« and the controller, the controller must have an IP address (see [Setting the IP configuration](#) (30)).

In the »Engineer«, by means of the menu command **Online → Set communication path and go online**, you can select the PROFINET communication path. The PROFINET nodes configured previously are shown in the *Communication path* dialog window:



If the device access path is not configured correctly, here the **1 IP address** of the controller selected in the display field can be entered manually.

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«](#) (31)
- ▶ Select the device access path to the desired controller 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 controller must be supplied with mains voltage.
- ▶ The external voltage supply serves to keep up PROFINET communication in the event of a main supply failure.
 - ▶ [External voltage supply](#) (📖 25)
- ▶ During mains connection, all parameters (codes) are read.
- ▶ If an error occurs, the error message "CE04: MCI communication error" (error no. 01.0127.00002) is output.
- ▶ Addressing can be effected automatically via the IO controller or manually via codes in the »Engineer«.
 - ▶ [Setting the station name](#) (📖 28)
- ▶ For addressing the controller, a valid IP configuration is required if communication between the PC/»Engineer« and the controller is to be effected via PROFINET.
 - ▶ [Setting the IP configuration](#) (📖 30)

7 Data transfer

PROFINET transmits parameter data, configuration data, diagnostic data, alarm messages, and process data between the host (I/O controller) and the controllers 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.
 - With the process data the controller is actuated.
 - Transferring 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 controller.
 - Process data are for instance 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 controller (I/O device) to the I/O controller
- Process output data (Tx data):
 - Process data from the I/O controller to the controller (I/O device)

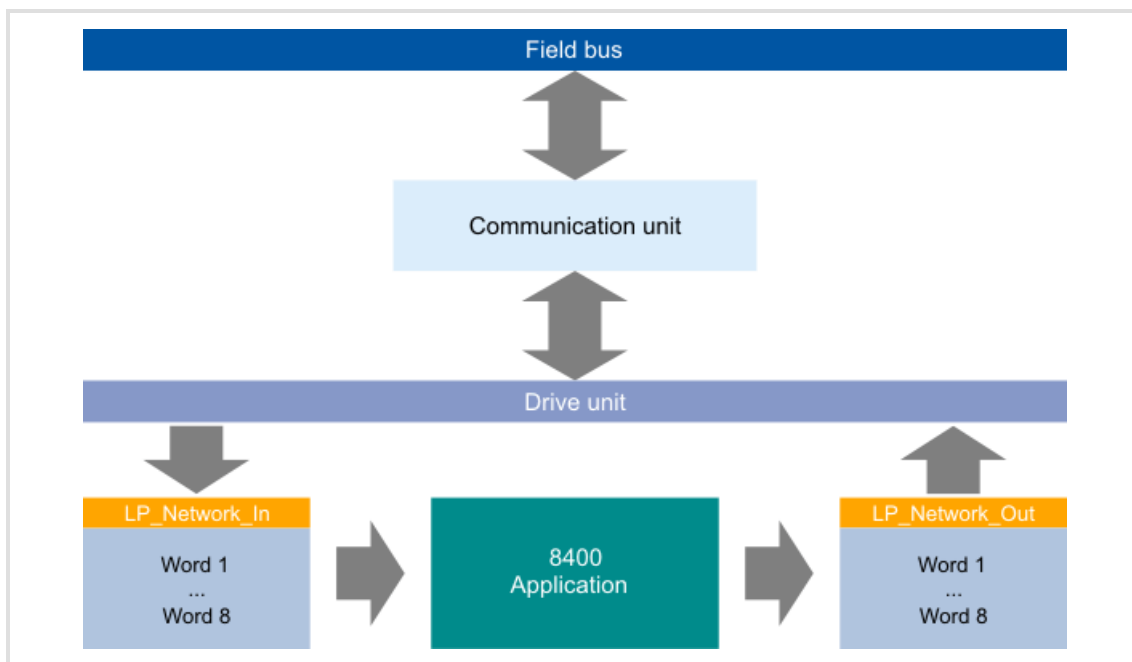
- ▶ Parameter data are transmitted via the acyclic channel.
 - In general, the parameter data transfer is not time-critical.
 - The access to the parameter data depends on the PROFIdrive profile.
 - Examples of parameter data are operating parameters, motor data, and diagnostic information.
 - The acyclic channel provides access to all Lenze codes.
 - Parameter changes must be stored via code **C00002** of the Inverter Drive 8400 motec.

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 port blocks **LP_Network_In** and **LP_Network_Out**. 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 block interconnection of the process data objects (PDO) takes place via the Lenze »Engineer«.



[8-1] Outer and inner data transfer between bus system, controller, and application



Software manual / »Engineer« 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.

8.2 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.

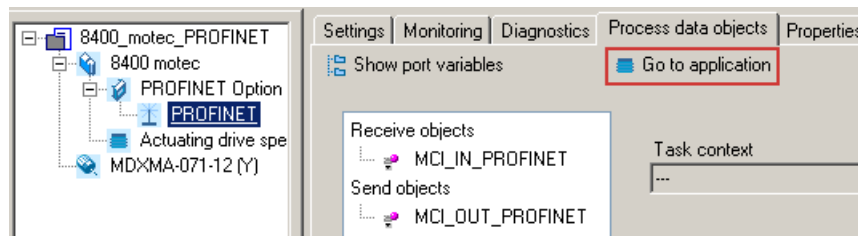
Depending on the software version of the controller and of the installed »Engineer« software, the screenshots may vary from your »Engineer« depiction.

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

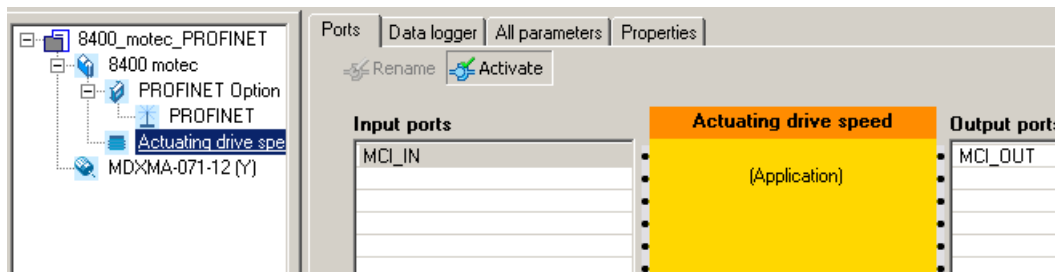


How to freely configure the port interconnection in the »Engineer«:

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

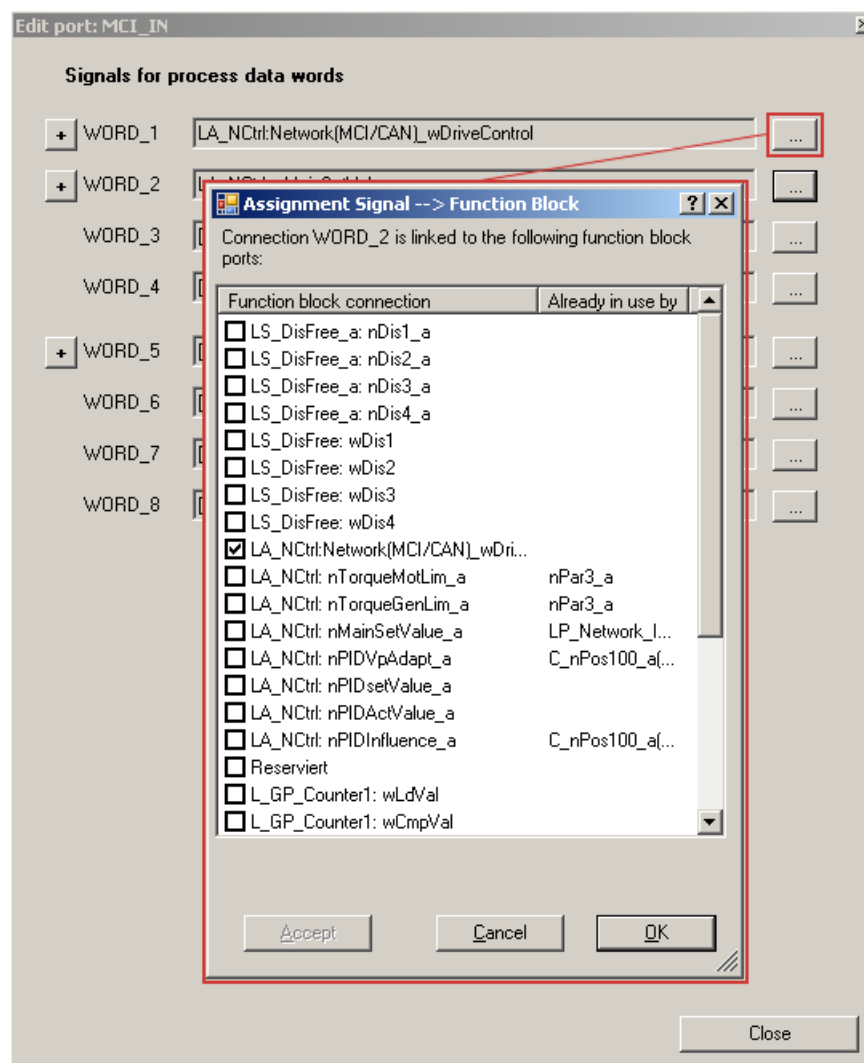


2. The **Ports** tab displays the port blocks MCI_IN and MCI_OUT.



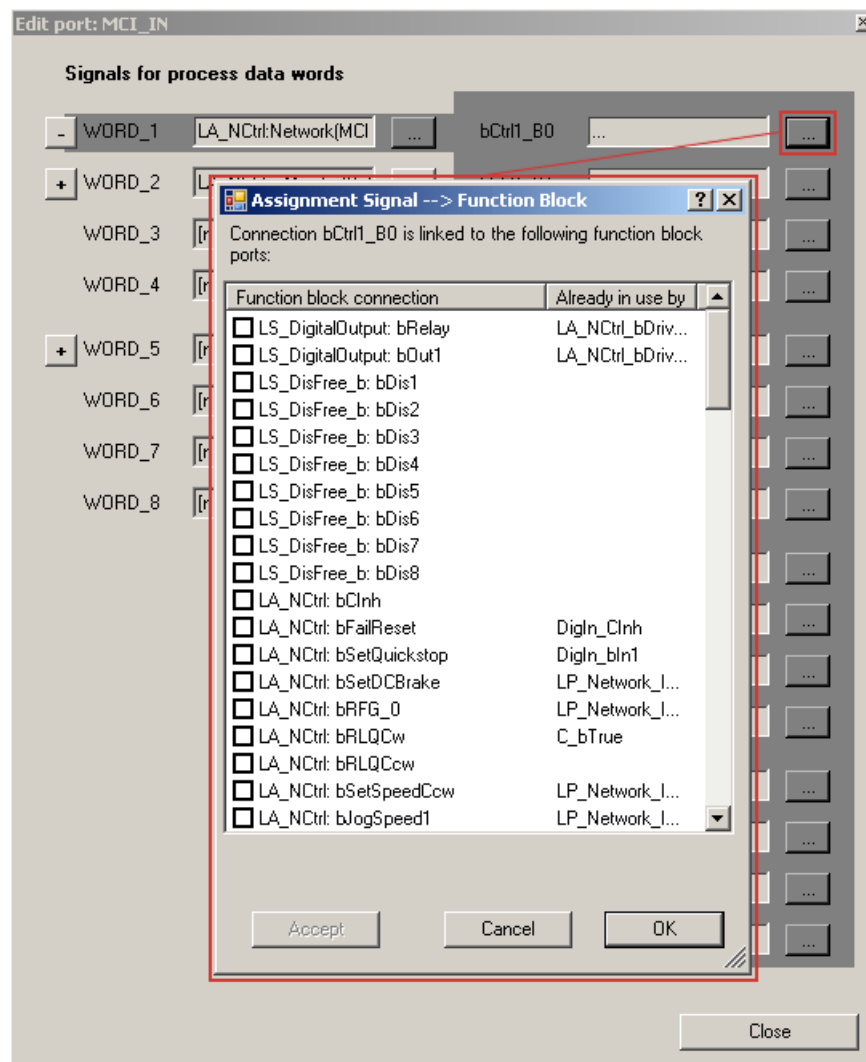
- [illegible]

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 controller	0 (FALSE)	Controller is offline ("Stay alive" operation)
			1 (TRUE)	Controller 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 controller	0 (FALSE)	Controller is offline ("Stay alive" operation)
			1 (TRUE)	Controller is online

9 Parameter data transfer

9.1 The acyclic channel (PROFIdrive profile)

An optional service extension is the acyclic parameter data transfer.

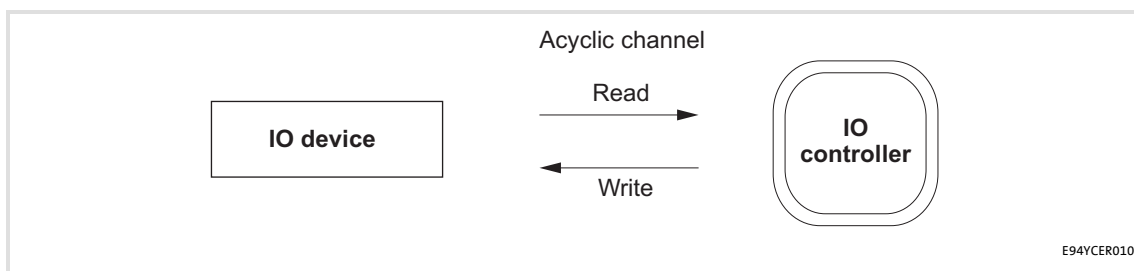
Cyclic and acyclic PROFINET services can be operated simultaneously in the network.

Features

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

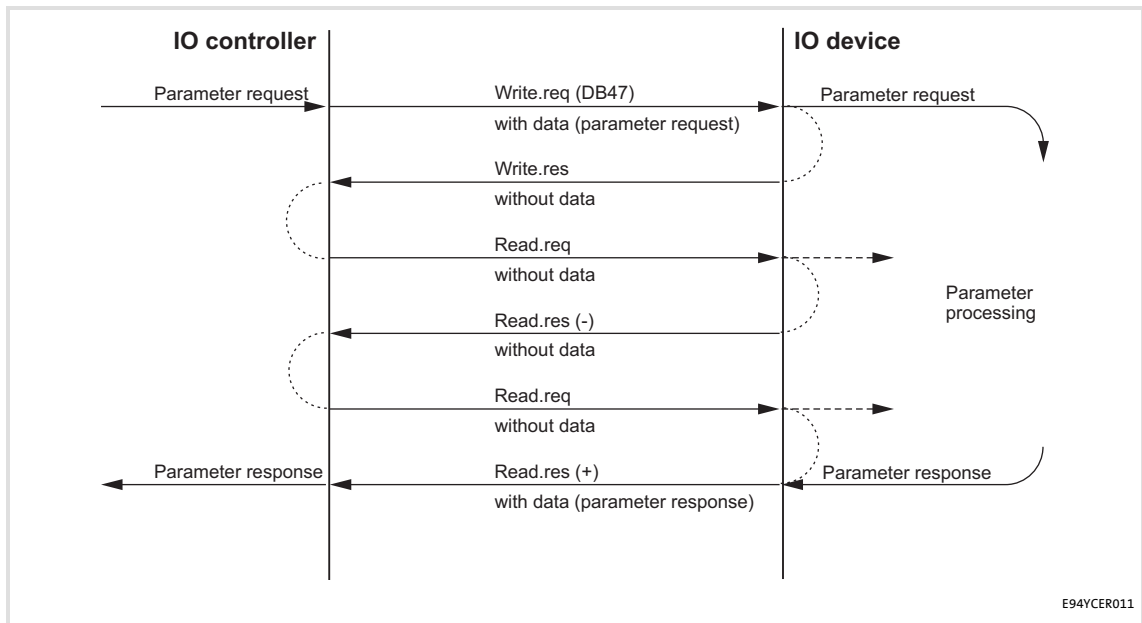
9.1.1 Connection establishment of an I/O controller to an I/O device

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 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 telegram

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, 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 controller



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 after a correct 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 head

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: Parameters 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.) • For 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 after a read error

Response head

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: Parameters not read The data in bytes 7 + 8 are to be interpreted as 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) (59)
Additional information (if available)	U16	

9.2.3 Telegram example: Read request

The heatsink temperature of the controller 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 after a correct read request

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Response identification	Axis	Number of indices
0xXX	0x01	0x00	0x01
(mirrored)	Parameters 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	Low word: high 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 meaning see chapter " Error information (error) " (59)	

9.3 Writing parameters to the controller



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 parameters
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.) • For 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 after a correct write request

Response head

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 after a write error



Note!

For a multi-parameter request, correct and faulty messages, if any, are combined in one telegram. The individual messages have the following data contents:

- Faultless 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)

Faulty access to a parameter "n" will be reported in the response message of a multi-parameter request at position n.

Response head

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: Parameters not written The data in bytes 7 + 8 are to be interpreted as 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) (59)
Additional information (if available)	U16	

9.3.3 Telegram example: Write request

In the controller, the ramp 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 parameter	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	Low word: high 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 after a correct write request

Byte 1	Byte 2	Byte 3	Byte 4
Request reference	Response identification	Axis	Number of indices
0xXX	0x02	0x00	0x01
(mirrored)	Parameters 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)	Parameters not 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 meaning see chapter " Error information (error) " (59)	

9.4 Error information (error)

Error code	Meaning	Description	Additional information
0x0000	Impermissible parameter number	Access to non-available 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 non-available subindex	Subindex
0x0004	No array	Access with subindex to non-indicated parameter	-
0x0005	Wrong data type	Change access with value that does not go with the data type of the parameter	-
0x0006	No setting permitted (only resettable)	Change access with a non-zero value, where it 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 IR is not available)	-
0x0009	Description data is not available	Access to non-available description (parameter value is available)	-
0x000A	Reserved	(PROFIdrive profile V2: Wrong access group)	-
0x000B	No parameter change rights	Change access if the parameter change rights are missing	-
0x000C	Reserved	(PROFIdrive profile V2: Password is wrong)	-
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: PPO-Write is missing)	-
0x0011	Job cannot be executed due to operating status	Access is not possible for temporary reasons that are not specified in detail	-
0x0012	Reserved	(PROFIdrive-Profil V2: Other error)	-
0x0013	Reserved	(PROFIdrive profile V2: date in the cyclic traffic cannot be read)	-
0x0014	Impermissible value	Change access with a value that is within the value limits but is not permissible for other permanent reasons (parameter with defined single values)	Subindex
0x0015	Response is too long	The length of the current response exceeds the maximally transferrable length	-
0x0016	Impermissible parameter address	Impermissible value or value which is not supported for the attribute, number of subindexes, parameter number, or subindex, or a combination	-
0x0017	Impermissible format	Write request: Impermissible parameter data format or parameter data format which is not supported	-
0x0018	Number of values are not consistent	Write request: Number of parameter data values does not match the number of subindexes in the parameter address	-

Error code	Meaning	Description	Additional information
0x0019	Reserved	-	-
...			
0x0064			
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 allows 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.

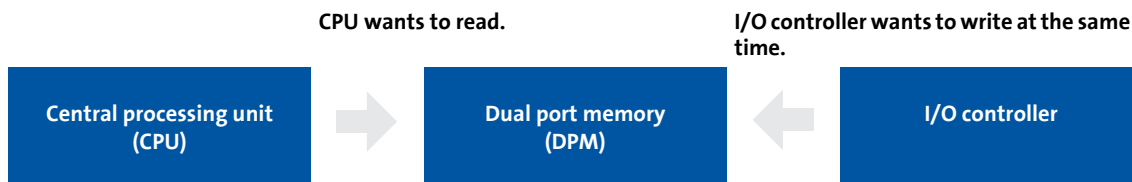
In order to avoid an impermissible status, the transmitted parameter data are to be marked as "consistent".

Data communication with consistency

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 communication interruption is controlled via the following settings:

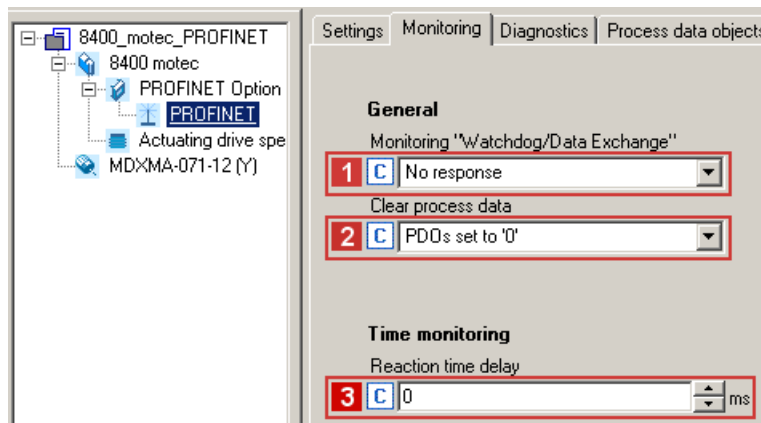
1. During the initialisation of PROFINET communication the watchdog monitoring time specified in the I/O controller ([C13882](#)) is transferred to the I/O device.

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](#) (64)).

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 in the monitoring mode becomes 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 \[0x01bc6531\]](#)" (71).

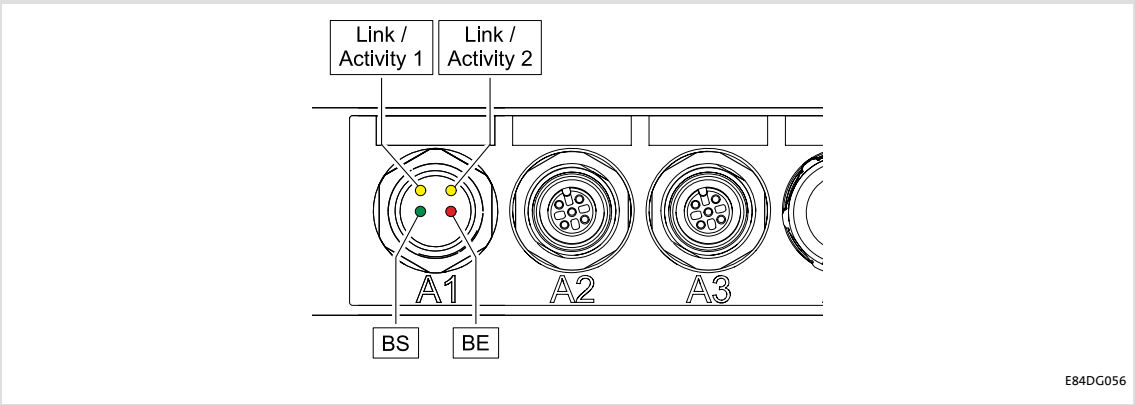
10.2 Internal communication fault

- ▶ 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 \[0x01bc3100\]](#)" ( 69) is output.

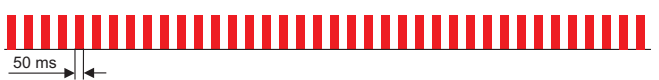
11 Diagnostics

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

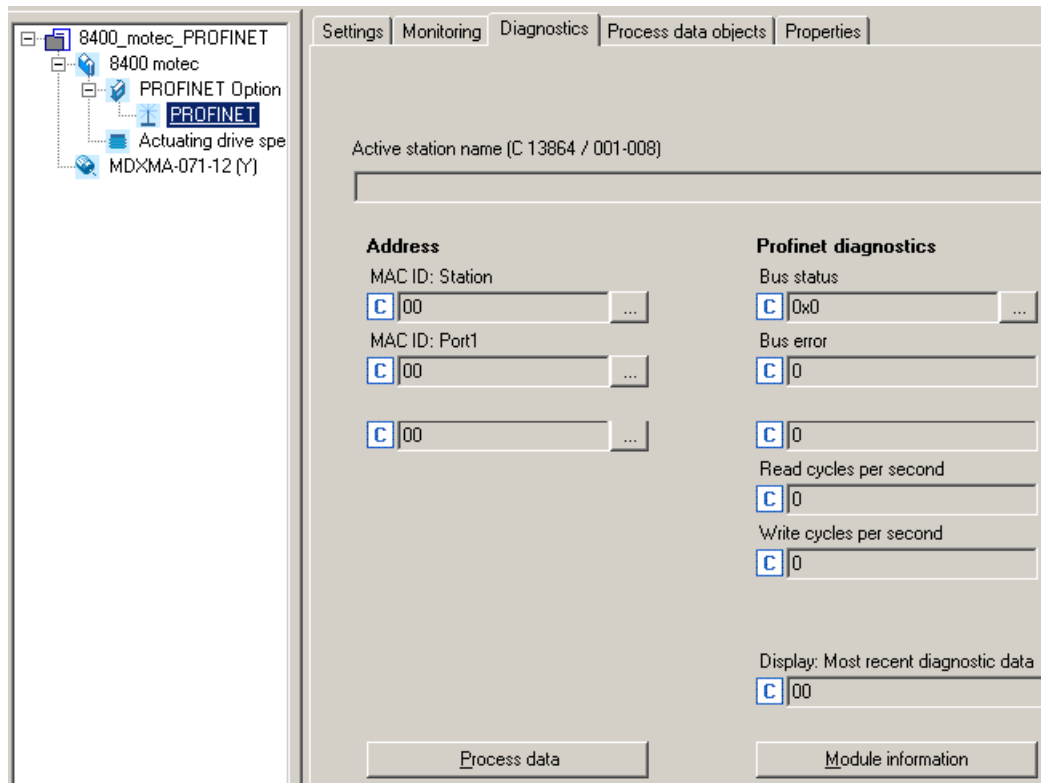


LED	Colour	Status	Description
Link / Activity 1	Yellow	off	- No cable is connected to PROFINET port 1. - No communication
		on	 A cable is connected to PROFINET port 1.
		flickering	 Communication at PROFINET port 1 is active.
Link / Activity 2	Yellow	off	- No cable is connected to PROFINET port 2. - No communication
		on	 A cable is connected to PROFINET port 2.
		flickering	 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	 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 Diagnostics with the »Engineer«

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

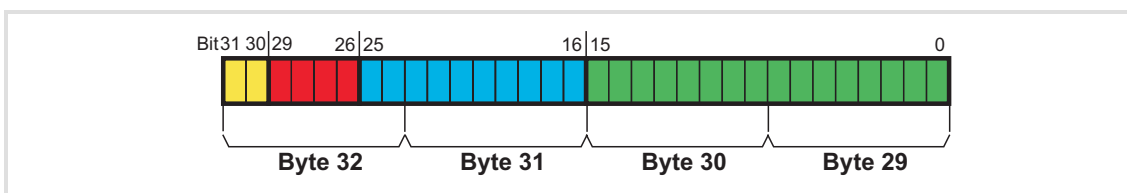


11.3 Diagnostic data

- ▶ 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



- ▶ Bytes 29 ... 32 of the diagnostic message contain the error code.
- ▶ 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	0	0
Reaction				Instance ID				Module ID				Error ID			



Software manual/»Engineer« 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 software manual and the »Engineer« online help for the Inverter Drive 8400 motec by PROFINET error messages.



Software manual/»Engineer« online help for the "Inverter Drive 8400 motec"

General information on diagnostics & fault analysis and error messages is provided here.

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!

When you click the cross-reference in the first column, you will get to the 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)	Can be set in
0x01bc3100	444	12544	PROFINET: Exist. connect. to 8400 lost	1: Error	C01501/2
0x01bc5531	444	21809	PROFINET: Memory: No access	1: Error	C01501/2
0x01bc5532	444	21810	PROFINET: Memory: Read error	1: Error	-
0x01bc5533	444	21811	PROFINET: Memory: Write error	1: Error	-
0x01bc6010	444	24592	PROFINET: Restart by watchdog reset	1: Error	C01501/2
0x01bc6011	444	24593	PROFINET: Internal error	1: Error	C01501/2
0x01bc6100	444	24832	PROFINET: Internal error	1: Error	C01501/2
0x01bc6101	444	24833	PROFINET: Internal error	1: Error	C01501/2
0x01bc641f	444	25631	PROFINET: Invalid parameter set	1: Error	C01501/2
0x01bc6420	444	25632	PROFINET: Error: Lenze setting loaded	1: Error	-
0x01bc6430	444	25648	PROFINET: Invalid module configuration	1: Error	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: Error	-
0x01bc6533	444	25907	PROFINET: IIP address error	1: Error	-
0x01bc6534	444	25908	PROFINET: Stack init error	1: Error	-
0x01bc6650	444	26192	PROFINET: Internal error	1: Error	-

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.

► [Short overview of the PROFINET error messages](#) (68)

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
Internal communication to the Control Unit has been interrupted. • Inverter Drive 8400 motec has been switched off. • Incorrect wiring of Communication Unit.	• Switch on Inverter Drive 8400 motec. • Check Communication Unit for correct wiring. • Send device with error description to Lenze.

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 device with error description to Lenze.

PROFINET: Memory: Read error [0x01bc5532]

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). • Send device with error description to Lenze.

PROFINET: Memory: Write error [0x01bc5533]

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). • Send device with error description to Lenze.

PROFINET: Restart by 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 damaged.	Send device with error description to Lenze.

Communication manual 8400 motec PROFINET

Error messages

Possible causes and remedies

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 damaged.	Send device with error description 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 damaged.	Send device with error description 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 damaged.	Send device with error description 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 device with error description to Lenze.

PROFINET: Error: Lenze setting loaded [0x01bc6420]

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 parameter set was not possible.	• Download application again (including module). • Send device with error description 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 S7 engineering tool.	Check and correct 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 data, the IO controller requested a too short data length (number of data bytes).	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. See also chapter "Interruption of PROFINET communication" (□ 62).	- Check cables and terminals. - Connect network cable to PROFINET connections.

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 DNS-conform station name. ▶ Setting the station name (□ 28)

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 (□ 30)

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 (📖 30) ▶ Setting the station name (📖 28)	

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 damaged.		Send device with error description to Lenze.	

13 Parameter reference

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



Software manual/»Engineer« online help for the "Inverter Drive 8400 motec"

Here you will find general information about 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 Resp. to communication error 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: Error	Resp. to MCI error 1 • Response to a communication error.
C01501/2	1: Error	Resp. to MCI error 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 (30)			
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 (30)			
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 (📖 30)			
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 area (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 area (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 area (min. value unit max. value)		
0		255
Subcodes		Info
C13012/1		Active gateway address.1
C13012/2		Active gateway address.2
C13012/3		Active gateway address.3
C13012/4		Active gateway address.4
☒ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13850

Parameter | Name:

Data type: UNSIGNED_16
Index: 10725_d = 29E5_h

C13850 | All words to master

Display of the process data words which are transmitted from the controller 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 area (min. value unit max. value)			Info
0		65535	
Subcodes			
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 controller.
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 area (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:		Data type: UNSIGNED_8	
C13860 Settings		Index: 10715 _d = 29DB _h	
Display area (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 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 data cycles per second (irrespective of data changes)		
Display area (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 controller.

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](#) (□ 28)

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 diagnostic data sent by the controller 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:	Data type: UNSIGNED_16
C13877 Bus error(1)	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 fail	
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:	Data type: BITFIELD_16
C13878 Bus error(2)	Index: 10697 _d = 29C9 _h

The code contains the error currently detected on the fieldbus.

- The error values can occur in combination with the error values from code [C13877](#).

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

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

C13880

Parameter Name:		Data type: UNSIGNED_8 Index: 10695 _d = 29C7 _h
C13880 Reaction on communication failure		
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 effective immediately.		
Selection list		
0	No response	
1	Error	
3	Quick stop by trouble	
4	Warning locked	
6	Information	
Subcodes	Lenze setting	Info
C13880/1	0: No response	"Watchdog/Data Exchange" monitoring
☒ Read access ☒ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13881

Parameter Name:		Data type: UNSIGNED_16 Index: 10694 _d = 29C6 _h
C13881 Reaction time delay		
If the "Data_Exchange" status is exited, the response parameterised in C13880 is activated after the time set here .		
• The value "65535" in this code deactivates monitoring. • A change in the monitoring mode becomes 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:		Data type: UNSIGNED_8 Index: 10690 _d = 29C2 _h
C13885 Clear process data		
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 last 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:	Data type: BITFIELD_8 Index: 10688 _d = 29C0 _h
C13887 Suppress signalling diag. mess. upon	

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 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 Trouble	
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:	Data type: VISIBLE_STRING Index: 10676 _d = 29B4 _h
C13899 Station name	

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 controller.

▶ [Setting the station name \(□ 28\)](#)

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:	Data type: VISIBLE_STRING Index: 10675 _d = 29B3 _h
C13900 Firmware product type	

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:	Data type: VISIBLE_STRING Index: 10674 _d = 29B2 _h
C13901 Firmware compilation date	
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:	Data type: VISIBLE_STRING Index: 10673 _d = 29B1 _h
C13902 Firmware version	
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:	Data type: VISIBLE_STRING Index: 10665 _d = 29A9 _h
C13910 I&M1 System designation	
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:	Data type: VISIBLE_STRING Index: 10664 _d = 29A8 _h
C13911 I&M1 Installation site	
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:	Data type: VISIBLE_STRING Index: 10663 _d = 29A7 _h
C13912 I&M2 Installation date	
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:

Data type: VISIBLE_STRING
Index: 10662_d = 29A6_h

C13913 | I&M3 additional information

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 which is required for communicating with the controller 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 by which the parameter is addressed. The subindex for array variables corresponds to the Lenze subcode number.	24575 - Lenze code number	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	Subnetwork 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 state	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	Reaction on communication failure	10695	29C7	A	1	UNSIGNED_8	1	☒	☒	
C13881	Reaction time delay	10694	29C6	E	1	UNSIGNED_16	1	☒	☒	
C13885	Clear 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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