



E84DGFCGxxx

EtherNet/IP™

Inverter Drives 8400 motec-----

Communication Manual

EN



13444431

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1 About this documentation

Contents

This documentation exclusively contains descriptions of the EtherNet/IP™ bus system for the Inverter Drives 8400 motec.



Note!

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

The hardware manual contains safety instructions that must be observed!

The properties and functions of the EtherNet/IP for the Inverter Drive 8400 motec are described in detail.

Examples illustrate typical applications.

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

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

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



Tip!

Detailed information on EtherNet/IP can be found on the website of the user organisation ODVA (Open DeviceNet Vendor Association):

www.odva.org

About this documentation

Target group

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



Tip!

Current documentation and software updates with regard to Lenze products can be found in the download area at:

www.Lenze.com

Information regarding the validity

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

Product series	Type designation	Version
Inverter Drives 8400 motec EtherNet/IP Communication Unit	E84DGFCGxNx	EtherNet/IP
	E84DGFCGxJx	EtherNet/IP + Safety

► [Features and variants](#) (14)

Screenshots/application examples

All screenshots in this documentation are application examples. Depending on the firmware version of the field devices and the software version of the Engineering tools installed (»Engineer«, »RSLogix 5000«), the screenshots in this documentation may differ from the actual screen display.

About this documentation

Document history

1.1 Document history

Version			Description
1.0	08/2012	TD17	First edition
2.0	10/2013	TD17	New layout Revised chapters: ▶ I/O data transfer (implicit messages) (📖 44) ▶ Parameter data transfer (explicit messages) (📖 73) ▶ Implemented CIP™ objects (📖 108)

About this documentation

Conventions used

1.2 Conventions used

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

Type of information	Writing	Examples/notes
Spelling of numbers		
Decimal	Standard notation	Example: 1234
Decimal separator	Point	The decimal point is always used. For example: 1234.56
Hexadecimal	0x[0 ... 9, A ... F]	Example: 0x60F4
Binary • Nibble	0b[0, 1]	Example: '0b0110' Example: '0b0110.0100'
Text		
Program name	» «	PC software Example: Lenze »Engineer«
Control element	bold	The OK button... / the Copy command... / the Characteristics tab... / the Name input field...
Hyperlink	<u>Underlined</u>	Optically highlighted reference to another topic. It is activated with a mouse-click in this documentation.
Icons		
Page reference	( 8)	Optically highlighted reference to another page. It is activated with a mouse-click in this documentation.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

About this documentation

Terminology used

1.3 Terminology used

Term	Meaning
ACD	Address Conflict Detection
Adapter	EtherNet/IP slave
Inverter / Drive	Lenze drive of the "Inverter Drives 8400 motec" product series
Standard device	
ARP	Address Resolution Protocol
BOOTP	Bootstrap Protocol
Code	Parameter which serves to parameterise and monitor the drive. In normal usage, the term is usually referred to as "Index".
Subcode	If a code contains several parameters, they are stored in "subcodes". In the documentation, the slash "/" is used as a separator between the code and the subcode (e.g. "C00118/3"). In everyday language, the term is also referred to as "subindex".
»Engineer«	Software from Lenze which supports you throughout the whole machine life cycle - from planning to maintenance.
	EtherNet/IP™ (EtherNet Industrial Protocol) is a fieldbus system based on Ethernet which uses the Common Industrial Protocol™ (CIP™) for data exchange. EtherNet/IP™ and Common Industrial Protocol™ (CIP™) are trademarks and patented technologies, licensed by the user organisation ODVA (Open DeviceNet Vendor Association), USA.
DHCP	Dynamic Host Configuration Protocol
DSCP	Differentiated Services Codepoints
EDS	Electronic Data Sheet
Explicit messages	Explicit Messages are used to transfer parameter data.
HW	Hardware
IGMP	Internet Group Management Protocol
Implicit messages	Implicit Messages are used to transfer I/O data.
"Class 1" connection	I/O connection
"Class 3" connection	Explicit connection
Level 2	EtherNet/IP performance level 2: I/O Message Server including Explicit Message Server
Lenze setting	Default settings of the device, preconfigured ex works.
Basic setting	
PLC	Programmable Logic Controller
QoS	Quality of Service
RPI	Requested Package Interval: Interval requested between 2 telegrams for cyclic data transmission
»RSLogix 5000«	Programming and development software from Rockwell for hosts (scanners) in EtherNet/IP networks (e.g. Allen-Bradley Logix controllers).
Scanner	EtherNet/IP master or client
Host	
SW	Software
TTL	Time To Live: Validity time of data packets in the EtherNet/IP network
UCMM	Unconnected Message Manager

About this documentation

Notes used

1.4 Notes used

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

Safety instructions

Layout of the safety instructions:



Pictograph and signal word!

(characterise the type and severity of danger)

Note

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

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

Application notes

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

2 Safety instructions



Note!

It is absolutely vital that the stated safety measures are implemented in order to prevent serious injury to persons and damage to material assets.

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

2.1 General safety and application notes



Danger!

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

- Lenze drive and automation components ...
 - must only be used as directed.
 - ▶ [Application as directed](#) (📖 13)
 - must never be commissioned if they display signs of damage.
 - must never be technically modified.
 - must never be commissioned if they are not fully mounted.
 - must never be operated without required covers.
 - during and after operation can have live, moving and rotating parts, depending on their degree of protection. Surfaces can be hot.
- The following applies to Lenze drive components ...
 - only use the accessories approved.
 - Only use original manufacturer spare parts.
- Observe all specifications contained in the enclosed documentation and related documentation.
 - This is the precondition for safe and trouble-free operation and for obtaining the product features specified.
 - ▶ [Features and variants](#) (📖 14)
 - The specifications, processes, and circuitry described in this document are for guidance only and must be adapted to your own specific application. Lenze does not take responsibility for the suitability of the process and circuit proposals.
- Only qualified personnel may work with and on Lenze drive and automation components. In accordance with IEC 60364 and CENELEC HD 384, these are persons ...
 - are familiar with installing, mounting, commissioning, and operating the product.
 - who have the corresponding qualifications for their work.
 - who know and can apply all regulations for the prevention of accidents, directives, and laws applicable at the place of use.

Safety instructions

Device and application-specific safety instructions

2.2 Device and application-specific safety instructions

During operation, the Communication Unit must be connected to the Wiring Unit and the Drive Unit.



Documentation for Inverter Drives 8400 motec, control system, plant/machine

All the other measures prescribed in this documentation must also be implemented.
Observe the safety instructions and application notes contained in this manual.

2.3 Residual hazards

Device protection

The Communication Unit contains electronic components that can be damaged or destroyed by electrostatic discharge.

► [Installation](#) (📖 20)

3 Product description

3.1 Application as directed

The EtherNet/IP 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	E84DGDVxxxxxxx (from version V04.01)
Inverter Drives 8400 motec Wiring Unit	E84DGVNxx

- is a device intended for use in industrial power systems.
- should only be used under the operating conditions prescribed in this documentation.
- can only be used in EtherNet/IP networks.
- can also be used without being connected to the EtherNet/IP network.

Any other use shall be deemed inappropriate!

Product description

Features and variants

3.2 Features and variants

The EtherNet/IP Communication Unit is available in the following versions:

Product series	Type designation	Product features				
		Enclosure IP 65	EtherNet/IP M12	I/O: Terminal	I/O: M12	Safety
Inverter Drives 8400 motec EtherNet/IP Communication Unit	E84DGFCGANP	●	●	●		
	E84DGFCG9NP	●	●		●	
	E84DGFCGAJP	●	●	●		●
	E84DGFCG9JP	●	●		●	●

- The EtherNet/IP Communication Unit is ...
 - mounted on top of 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 can be used on machines for the protection of persons.
- The Inverter Drive 8400 motec is always an adapter device:
EtherNet/IP adapter with "Level 2" functionality
- 2-port interface with integrated switch functionality
- Access to all Lenze parameters (configurable via TCP/IP using the Lenze »Engineer«)
- Up to 3 TCP/IP socket connections for communication with the Lenze »Engineer«
- Support of "IP Config Pending" (activation of changed IP configuration by "power off/on" or "type 0 reset")
- Support of the redundancy protocol DLR (Device Level Ring) as "beacon-based ring node"
- Up to 10 input data words to the scanner (20 bytes)
- Up to 8 output data words from the scanner (16 bytes)
- Further CIP features:
 - Max. 8 CIP connections
 - 1 "exclusive owner" connection
 - I/O connection type: cyclic
 - Minimum I/O cycle time: 4 ms
 - Support of multicast messages, UCMM, ACD, BOOTP/DHCP, VLAN tagging/DSCP



Hardware manual for Inverter Drives 8400 motec

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

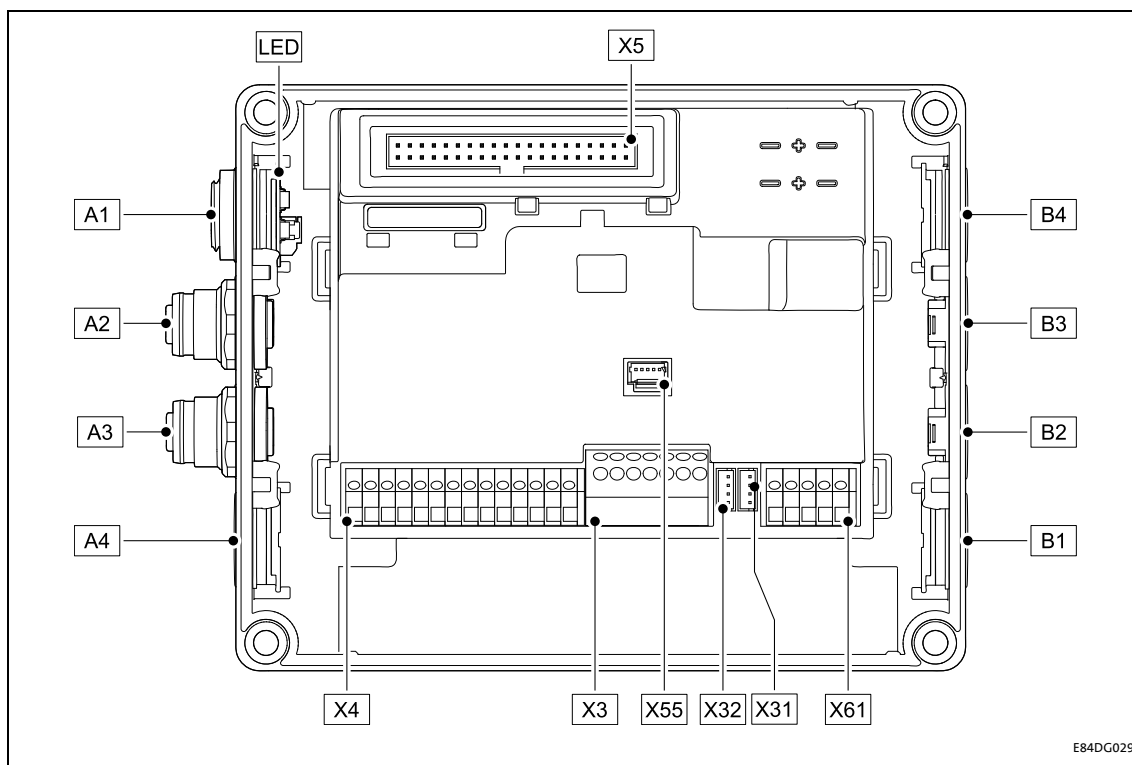
Software manual / »Engineer« online help for the Inverter Drive 8400 motec

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

Product description

Connections and interfaces

3.3 Connections and interfaces



[3-1] EtherNet/IP Communication Unit

Pos.	Description
A1 / LED	Position of LEDs for EtherNet/IP status display ▶ LED status displays (78)
A2	EtherNet/IP connections (M12 sockets, 5-pin, D-coded)
A3	▶ EtherNet/IP connection (23)
A4	Positions for further freely designable inputs and outputs:
B1 ... B4	• Digital inputs • Digital output • Analog input (only for E84DGFCGxJx) • Relay output (only for E84DGFCGxJx) • Connection of "Safety Option" safety system (only for E84DGFCGxJx)
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 the EtherNet/IP connection at A2
X32	Plug connector for wiring the EtherNet/IP connection at A3
X55	Plug connector for the wiring of the LEDs to A1

Product description

Connections and interfaces

- By default, the EtherNet/IP connections and the LEDs for the EtherNet/IP status displays are already mounted and wired:
 - EtherNet/IP connection A2 to plug connector X31
 - EtherNet/IP connection A3 to plug connector X32
 - LEDs on plug connector X55
- At positions A1 ... A4 and B1 ... B4, it is also possible to design the EtherNet/IP connections and other connections (e.g. digital inputs) freely.
- 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.



Hardware manual for Inverter Drives 8400 motec

Observe the notes and wiring instructions contained in this documentation.

4 Technical data



Hardware manual for Inverter Drives 8400 motec

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

4.1 General data and operating conditions

Range	Values
Order designation	- E84DGFCGxNx (EtherNet/IP) - E84DGFCGxJx (EtherNet/IP + Safety)
Communication profile	EtherNet/IP
Standards / specifications	Safety engineering: EN 954-1, EN 13849-1, IEC 61508 (up to safety category 4)
Interface for communication	- EtherNet/IP port 1: M12 socket, 5-pin, D-coded - EtherNet/IP port 2: M12 socket, 5-pin, D-coded
Network topology	Tree, star, and line
Type of node	Adapter (slave)
Number of nodes	Max. 254 in the subnetwork
Max. cable length	100 m
Vendor ID	587 (0x24B), Lenze ('Lenze AC Tech' in older Rockwell data)
Device type	2 (0x02), AC Drive
Product code	8440 (0x20F8)
Baud rate	10 Mbps 100 Mbps
Transmission mode	Half duplex / full duplex
Switching method	Store-and-forward / cut-through
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 (see also hardware manual)

4.2 Protocol data

Range	Values
I/O data words	1 ... 10 data words to scanner (16 bits/word, max. 20 bytes) 1 ... 8 data words from scanner (16 bits/word, max. 16 bytes)
Supported CIP services	• Get_Attributes_All • Get_Attribute_Single • Set_Attribute_Single • Reset (types '0' and '1' only) • Forward_Open • Forward_Close • Get_Member

4.3 Communication time

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

The communication times in an EtherNet/IP network depend on the ...

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

processing time within the inverter

Data	Processing time
Process data (I/O data)	10 ms Lenze standard update cycle (can be changed in the Rockwell engineering tool) + 0 ... 1 ms Processing time in the module + 1 ... x ms Runtime of the application task of the technology application used (tolerance)
Parameter data	Approx. 30 ms + a tolerance of 20 ms (typically) 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 I/O data.

4.4 Internal switch latency

The integrated 2-port switch causes runtime delays. For "store-and-forward" and 100 Mbps, these runtime delays can be calculated as follows.

Runtime delay for an output data packet of the scanners incl. 32-bit "run/idle header" with 16-bit sequence counter:

$$\text{Runtime delay} = ((66 \text{ permanent bytes} + \text{I/O data in bytes}) \times 8 \times 10 \text{ nsec}) + 4 \mu\text{sec}$$

Runtime delay for an output data packet of an adapter without 32-bit "run/idle header":

$$\text{Runtime delay} = ((62 \text{ permanent bytes} + \text{I/O data in bytes}) \times 8 \times 10 \text{ nsec}) + 4 \mu\text{sec}$$

Example

Delay of an output data packet of the scanners with 8 output data words (16 bytes):

- $((66 \text{ permanent bytes} + 16 \text{ bytes}) \times 8 \times 10 \text{ nsec}) + 4 \mu\text{sec}$
- $(82 \text{ bytes} \times 8 \times 10 \text{ nsec}) + 4 \mu\text{sec}$
- $6.56 \mu\text{sec} + 4 \mu\text{sec} = \mathbf{10.56 \mu\text{sec}}$



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

Protective measures

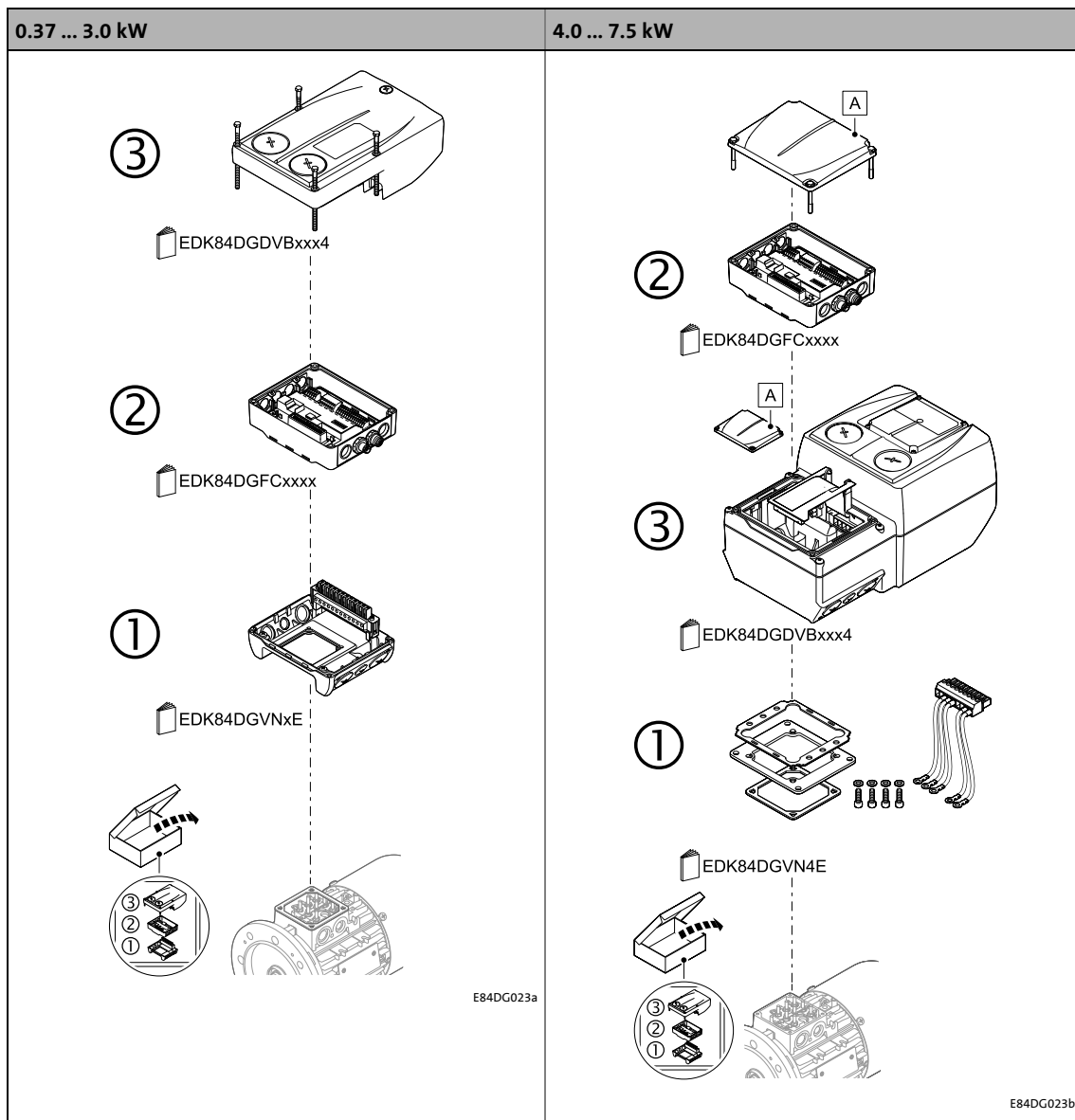
Discharge electrostatic charges before touching the Communication Unit.

5.1 Mechanical installation



Mounting instructions for Inverter Drive 8400 motec

Here you will find detailed information on the installation.



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

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

5.2 Electrical installation



Hardware manual for Inverter Drives 8400 motec

Here you can find detailed information on ...

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

Observe the notes and wiring instructions contained in this documentation!

5.2.1 Network topology

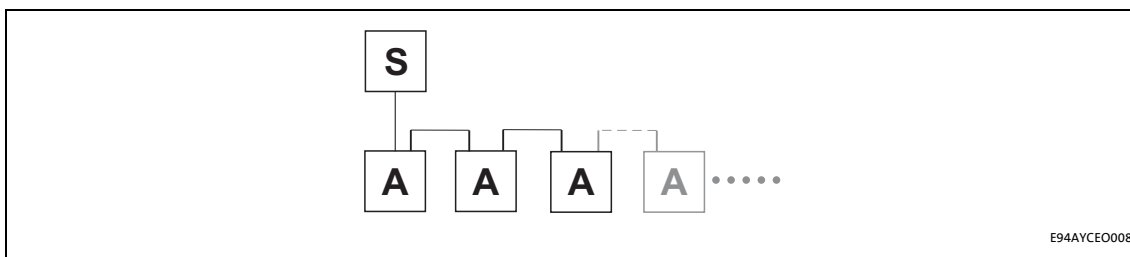
It is typical of EtherNet/IP to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

► [Internal switch latency](#) (19)

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

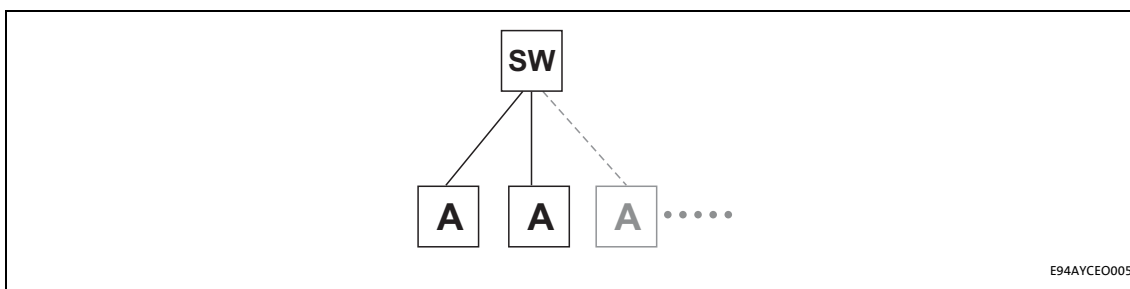
EtherNet/IP supports the following topologies:

- Line



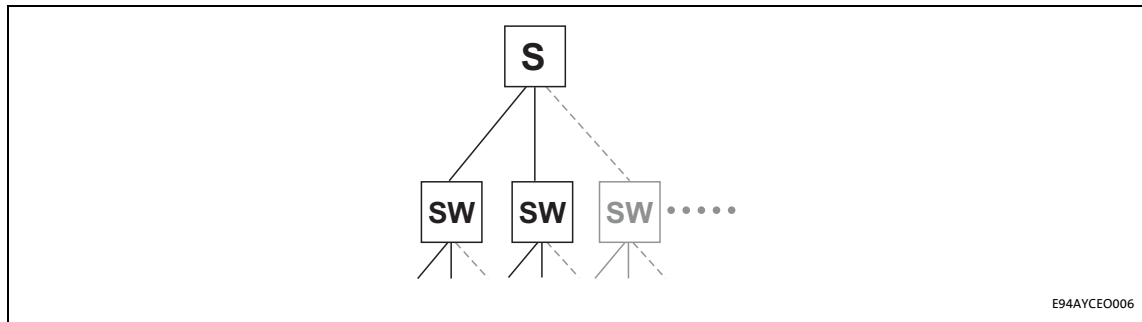
[5-2] Line topology (S = scanner, A = adapter)

- Switch / star



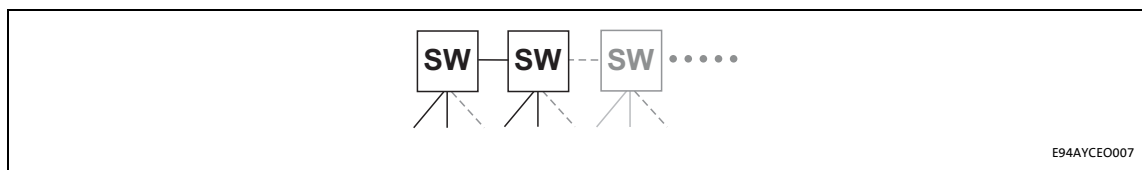
[5-3] Switch / star topology (SW = switch, A = adapter)

- Tree via switches



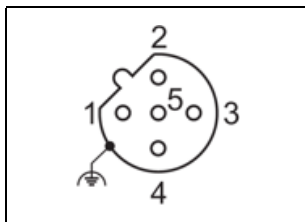
[5-4] Tree topology (S = scanner, SW = switch)

- Switch / switch



[5-5] Switch / switch topology (SW = switch)

5.2.2 EtherNet/IP connection



- M12 socket, 5-pole, D-coded
- Wiring at terminal strip X31 / 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 EtherNet/IP communication for commissioning and to query the data of the digital and analog inputs.
- Furthermore, the external voltage supply serves to maintain EtherNet/IP 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.



Hardware manual for Inverter Drives 8400 motec

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

6 Commissioning

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

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

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

▶ [Parameter reference](#) (□ 91)

The data from the drive 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 [Configuring I/O data](#) (□ 45)).

6.1 Before initial switch-on



Stop!

Before the Inverter Drive 8400 motec is switched on for the first time, the entire wiring must be checked for completeness, short circuit and earth fault.

Commissioning

Configuring the host system (scanner)

6.2 Configuring the host system (scanner)

To be able to communicate with the Communication Unit, the host system (scanner) must be configured first.

The configuration of EtherNet/IP networks always requires an EtherNet/IP configuration software (e.g. »RSLogix 5000« from Rockwell) for the host system (scanner).

The configuration software is necessary for the programming of controller programs, EtherNet/IP configuration, real-time execution and diagnostics.

The basic parameters of the Communication Unit are stored in the internal configuration memory and can be used for the node detection by the scanner.

For node detection (fieldbus scan), the corresponding device descriptions of the Lenze device family are used.



Tip!

Here you will find information on configuring with the »RSLogix 5000« programming software from Rockwell:

- ▶ [I/O configuration with »RSLogix 5000« version 19 or lower](#) (📖 57)
- ▶ [I/O configuration with »RSLogix 5000« version 20 or higher](#) (📖 62)

Commissioning

Configuring the host system (scanner)

6.2.1 EDS files

Depending on the EtherNet/IP scanner configuration software, the EDS files (Electronic Data Sheet) may be used for the configuration of the network profile, the communication with the participating devices and the automatic generation of tags. For this purpose, the EDS files have to be imported into the controller project of the EtherNet/IP configuration software.

The EDS file required for the configuration can be found in the download area at:

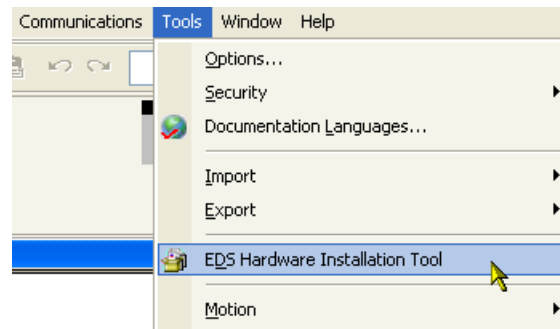
www.Lenze.com



Tip!

From version 20 onwards, Rockwell's »RSLogix 5000« programming software features an "EDS Hardware Installation Tool" that can be used to ...

- install/import EDS files;
- create EDS files;
- carry out EDS uploads;
- delete EDS files from your controller project.



In »RSLogix 5000«, the dialog for the "EDS Hardware Installation Tool" is self-explanatory and not described further in this documentation.

Commissioning

Configuring the host system (scanner)

6.2.2 Example: IP configuration of the Allen-Bradley 1769-L32E CompactLogix controller

In this example, the Allen-Bradley 1769-L32E CompactLogix controller with integrated EtherNet/IP interface is used to communicate with Inverter Drives 8400 motec.

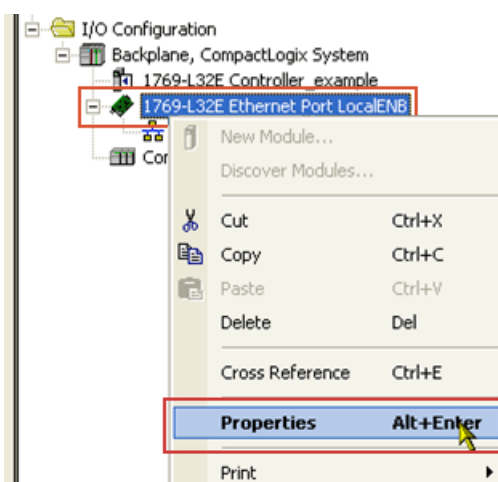
The »RSLogix 5000« programming software from Rockwell is used for the configuration.

To establish communication via an EtherNet/IP network, add the controller and its scanner to the I/O configuration.

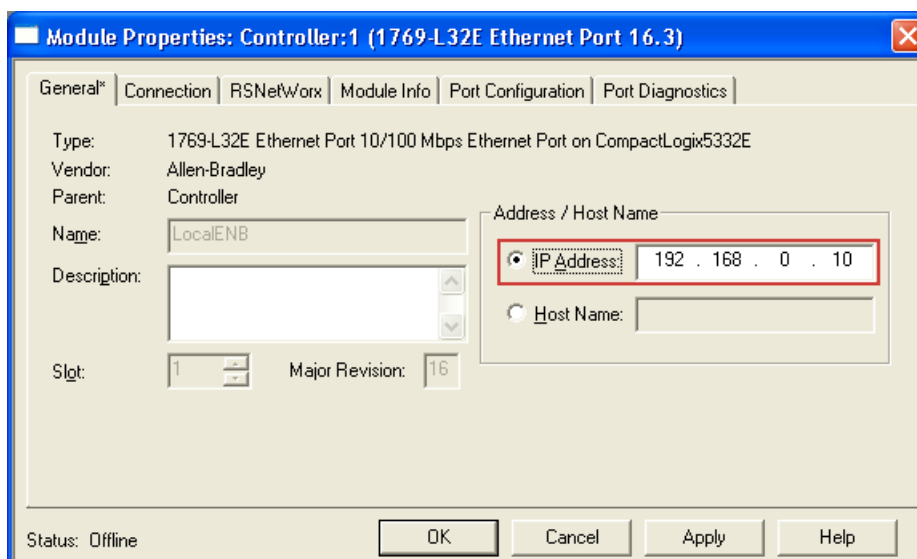


How to set the IP configuration of the 1769-L32E CompactLogix controller using the »RSLogix 5000« programming software:

1. Click on the **I/O Configuration** folder in the configuration tree.
2. Right click on "1769-L32E Ethernet Port LocalENB" and select "Properties" from the context menu.



3. Go to the **General** tab of the "Module Properties: ..." dialog window and enter the IP address of the scanner.



4. Then click **OK**.

Commissioning

Configuring the host system (scanner)

5. Go to the **Port Configuration** tab and enter the IP configuration, BOOTP setting, Ethernet baud rate and duplex mode.

The screenshot shows a software window titled "Module Properties Report: Controller:1 (1769-L32E Ethernet Port 20.11)". It has several tabs: General, Connection, RSNetWorx, Module Info, Port Configuration (selected), and Port Diagnostics. The Port Configuration tab contains the following fields and options:

- IP Address: 192 . 168 . 0 . 2 (with a note: "(Must Match IP Address on General Tab)")
- Subnet Mask: 255 . 255 . 255 . 0
- Gateway Address: 0 . 0 . 0 . 0
- Primary DNS Server Address: 0 . 0 . 0 . 0
- Secondary DNS Server Address: 0 . 0 . 0 . 0
- Domain Name: (empty text box)
- Host Name: (empty text box)
- Select Port Speed: (dropdown menu)
- Current Port Speed: 100 Mbps
- Select Duplex: (dropdown menu)
- Current Duplex: Half Duplex
- (Changes to Port Speed and Duplex require module reset.)
- ☐ Enable BOOTP
- ☐ Enable DHCP (DHCP must be configured to return a fixed address.)
- ☐ Enable DNS
- ☒ Auto-Negotiate Port Speed and Duplex
- Buttons: Refresh, Set
- Status: Running
- Buttons: OK, Cancel, Apply, Help

6. Then click **OK**.
 - Now, the scanner is configured for the EtherNet/IP network.
 - Here you will find information on project planning with the »RSLogix 5000« programming software from Rockwell:
 - ▶ [I/O configuration with »RSLogix 5000« version 19 or lower](#) (📖 57)
 - ▶ [I/O configuration with »RSLogix 5000« version 20 or higher](#) (📖 62)

Commissioning

Setting the IP configuration of the Inverter Drive 8400 motec

6.3 Setting the IP configuration of the Inverter Drive 8400 motec

The IP configuration is required for addressing the Inverter Drive 8400 motec to ensure that communication between the PC/»Engineer« or the scanner and the drive can be effected via EtherNet/IP. For this, an IP address, subnet mask, and gateway address must be allocated. You have the following options to select the IP parameters for the Inverter Drive 8400 motec:

- [Setting via the EtherNet/IP configurator of the »Engineer«](#) (📖 31)
- [Setting via codes in the »Engineer«](#) (📖 33)
- [Setting via a BOOTP/DHCP server](#) (📖 35)
- [Setting via the TCP/IP Interface Object \(0xF5\)](#) (📖 35)



Note!

- The assignment of invalid combinations of IP address, subnet mask, and gateway address can have the consequence that no connection to the EtherNet/IP network can be established.
- Codes [C13010](#) (IP address), [C13011](#) (subnet mask), [C13012](#) (gateway address), and [C13016](#) (multicast IP address) show the IP parameters currently used.
- In the case of impermissible settings, the error message [EtherNet/IP: Invalid IP Parameters \[0x01bc6533\]](#) (📖 84) is output.

Commissioning

Setting the IP configuration of the Inverter Drive 8400 motec

6.3.1 Setting via the EtherNet/IP configurator of the »Engineer«



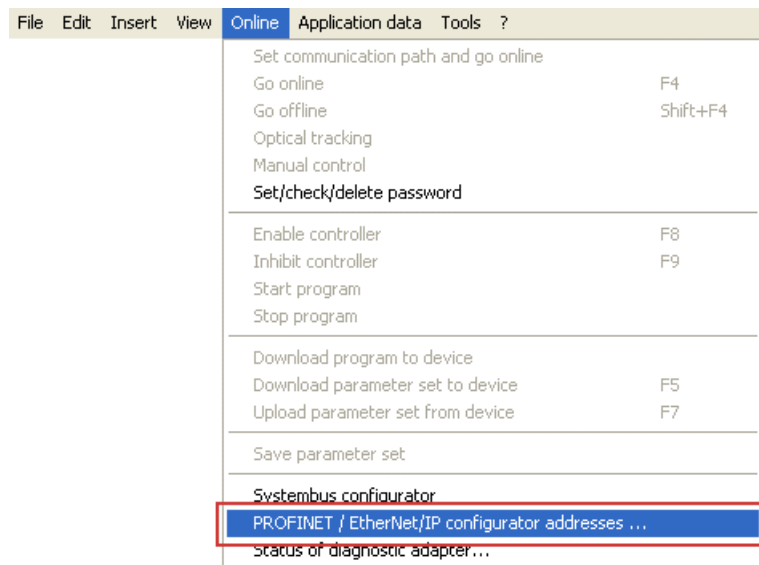
Note!

- Changes in the IP parameters will become effective immediately.
- An existing IP connection to the Inverter Drive 8400 motec will be interrupted.

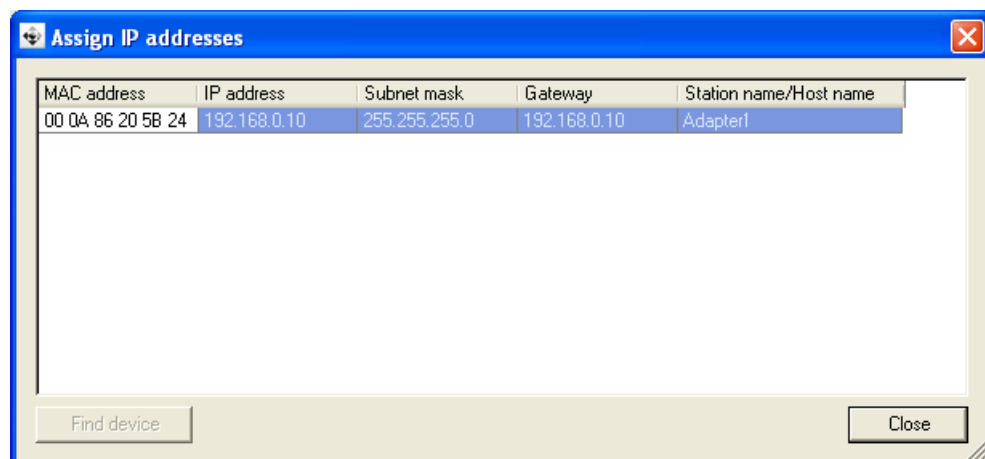


How to set the IP parameters via the EtherNet/IP configurator:

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



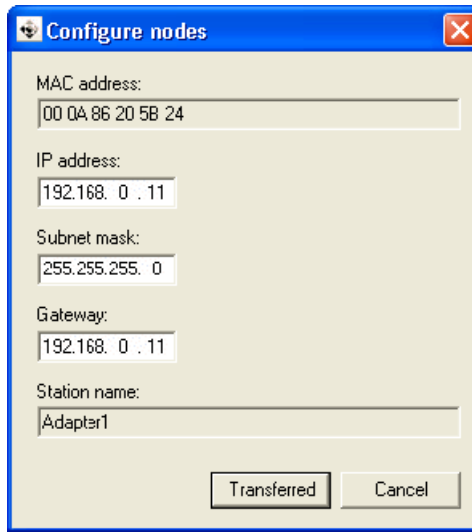
The "Assign IP addresses" dialog window is opened and all Lenze EtherNet/IP nodes connected are listed.



Commissioning

Setting the IP configuration of the Inverter Drive 8400 motec

2. A double-click on a EtherNet/IP node opens the "Configure nodes" dialog window.
Here you can set the IP parameters.



3. Click on **Transferred**.
 - The IP configuration is transferred to the corresponding EtherNet/IP node.
 - The Communication Unit executes a stack reset.
 - The IP parameters are written to codes [C13000](#) (IP address), [C13001](#) (subnet mask), and [C13002](#) (gateway address).
 - Code [C13005](#) (IP configuration reference) is set to '0: Saved address' to ensure that the transferred address can be used.



Tip!

Check whether the configuration has been transferred successfully.

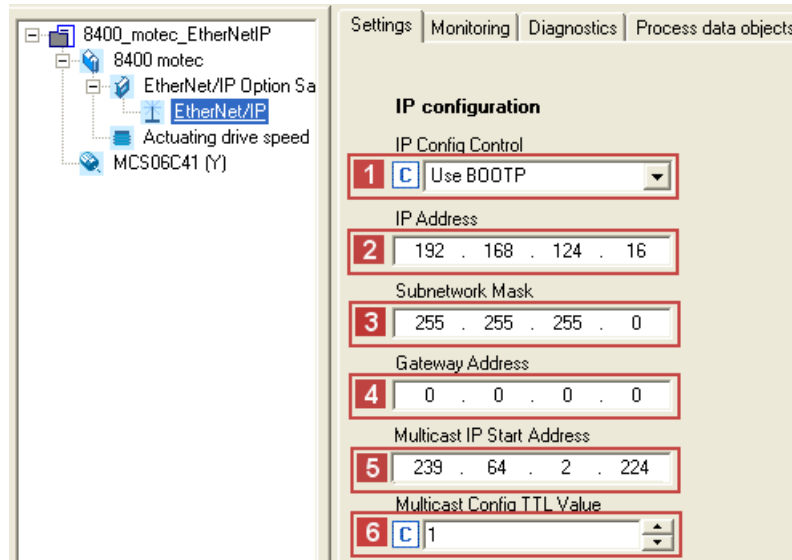
For this purpose, open the "Assign IP addresses" dialog window (see step 1) and click the **Find device** button.

Commissioning

Setting the IP configuration of the Inverter Drive 8400 motec

6.3.2 Setting via codes in the »Engineer«

You can also set the IP parameters manually in the »Engineer« under the **Settings** tab. The values will be transferred to the corresponding codes.



Settings	Description
1 IP Config Control	Selection (C13005) of how the IP configuration is to be made: • 0: The IP configuration currently saved in the Communication Unit is used. • 1: The IP configuration is assigned by a BOOTP server using the BOOTP. • 2: The IP configuration is assigned by a DHCP server using the DHCP.
2 IP Address	Setting of the IP address (C13000)
3 Subnet mask	Setting of the subnet mask (C13001)
4 Gateway Address	Setting of the gateway address (C13002)
5 Multicast IP Start Address	Setting of the Multicast IP start address (C13006) ▶ Setting the multicast configuration (p 36)
6 Multicast Config TTL Value	Setting of the multicast TTL value (C13019)



How to activate changed settings in the »Engineer«:

1. Execute device command **C00002 = "11: Save all parameter sets"**.
The current IP configuration is stored in the memory module of the drive.
2. Carry out a "Type 0 reset" for the [Identity Object \(1 / 0x01\)](#) ([p 110](#)) of the node, or switch the voltage supply of the Communication Unit off and on again.

Commissioning

Setting the IP configuration of the Inverter Drive 8400 motec

IP address

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

The IP address currently used is displayed in [C13010/1...4](#).

Example: Display of the IP address 192.168.124.16				
Code	C13010/1	C13010/2	C13010/3	C13010/4
Value	192	168	124	16

Subnet mask

The subnet mask indicates which part of the IP address is evaluated as net ID or host ID.

Valid subnet masks are defined in accordance with RFC 1878

The subnet mask is set/changed in [C13001](#).

The subnet mask currently used is displayed in [C13011/1...4](#).

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

Gateway address

The gateway address is valid if the network address of the IP address and the gateway address are identical.

If the gateway address and the IP address are identical or if the address is '0.0.0.0', gateway functionality is not used.

The gateway address is set/changed in [C13002](#).

The gateway address currently used is displayed in [C13012/1...4](#).

Example: Display of the gateway address 192.168.124.16				
Code	C13012/1	C13012/2	C13012/3	C13012/4
Value	192	168	124	16

Commissioning

Setting the IP configuration of the Inverter Drive 8400 motec

6.3.3 Setting via a BOOTP/DHCP server

DHCP is the acronym for "Dynamic Host Configuration Protocol". This protocol is defined in RFC 2131 and is a compatible advancement of the "Bootstrap Protocol" (BOOTP) according to RFC 951.

Both protocols enable network nodes to query information about the network configuration (e.g. the IP address) from a server via a TCP/IP network. The BOOTP/DHCP server assigns the IP address to the client dynamically from a defined address range. This means that the client receives an unambiguous IP address.

Code [C13005](#) is used to select how the IP configuration is to be made:

- Value '0': The IP configuration currently saved in the Communication Unit is used.
- Value '1': BOOTP is used. (Lenze standard setting)
- Value '2': DHCP is used.

The setting can also be selected by write access to attribute 3 (configuration control) of instance 1 of the [TCP/IP Interface Object \(245 / 0xF5\)](#) ([□ 126](#)).

6.3.4 Setting via the TCP/IP Interface Object (0xF5)

With a scanner, the IP configuration can be set via attribute 5 (interface configuration) of instance 1 of the [TCP/IP Interface Object \(245 / 0xF5\)](#) ([□ 126](#)).

After the IP configuration, carry out a node reset ("power off/on" or "Type 0 reset" for the [Identity Object \(1 / 0x01\)](#) ([□ 110](#))).

In the »Engineer«, codes [C13010](#) (IP address), [C13011](#) (subnet mask), [C13012](#) (gateway address), and [C13016](#) (multicast IP address) show the IP parameters currently used.

Commissioning

Setting the IP configuration of the Inverter Drive 8400 motec

6.3.5 Setting the multicast configuration

Several scanners ("Listen only" or "Input only" connections) can access multicast telegrams which are sent by drives. Settings for multicast configuration have to be carried out as well in the EtherNet/IP configuration software (z. B. »RSLogix 5000« from Rockwell).

By default, the Communication Unit automatically generates the multicast IP start address used for the I/O data transfer. The TTL default value for multicast transmission is '1', so the multicast I/O data packets are exclusively propagated via the local network.



Note!

You can also explicitly set the multicast IP start address and the multicast TTL value. We recommend, however, not to change the default settings in order to ensure a secure multicast transmission.

The following multicast codes are configurable:

Code	Description
C13018	Selection for multicast IP addressing via instance attribute 9 (Mcast Config) in the TCP/IP Interface Object (245 / 0xF5) (126) • Value '0': The default algorithm is used. • Value '1': The address from code C13006 is used as multicast IP start address.
C13019	Setting of the multicast TTL value for the validity time of data packets in the EtherNet/IP network (Instance attribute 8 (TTL Value) in the TCP/IP Interface Object (245 / 0xF5) (126))
C13020	Used to set how many multicast IP addresses will be assigned. (Instance attribute 9 (Num Mcast) in the TCP/IP Interface Object (245 / 0xF5) (126))

Multicast IP Start Address

Multicast IP start addresses serve to send a message to the members of a certain group (i.e. possibly to several nodes).

The multicast IP start address is set/changed in [C13006](#).

The currently used multicast IP address of the drive is displayed in [C13016/1...4](#).

Example: Display of the multicast IP address 239.64.2.224				
Code	C13016/1	C13016/2	C13016/3	C13016/4
Value	239	64	2	224

Commissioning

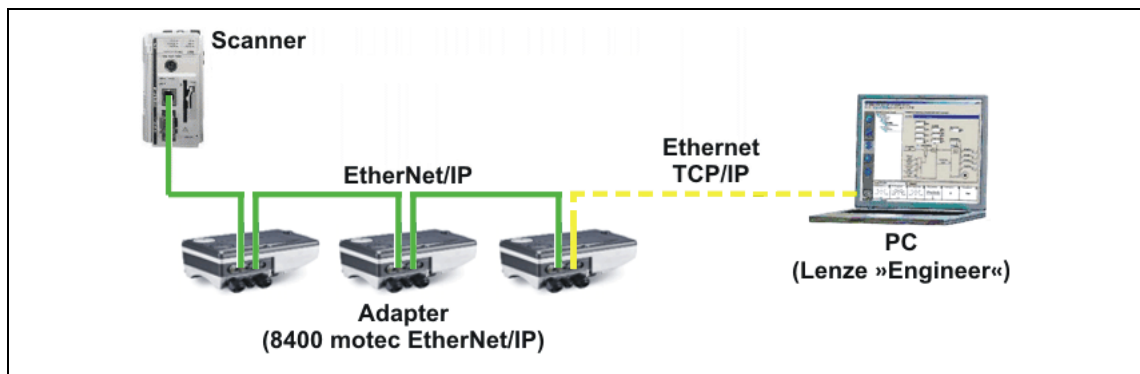
Establishing an online connection via EtherNet/IP with the Lenze »Engineer«

6.4 Establishing an online connection via EtherNet/IP with the Lenze »Engineer«



Note!

- In order to ensure perfect operation of cyclic EtherNet/IP communication, online access with the »Engineer« should be executed via an IEEE 802.1Q-capable switch.
- The IEEE 802.1Q-capable switch integrated in the Communication Unit can manage cyclic EtherNet/IP communication with priority over regular TCP/IP communication. With EtherNet/IP this is effected via the VLAN identification in the Ethernet frame (adjustable in [C13021](#)).
- If the redundancy protocol DLR (Device Level Ring) is used, the switch also must be DLR-compliant.



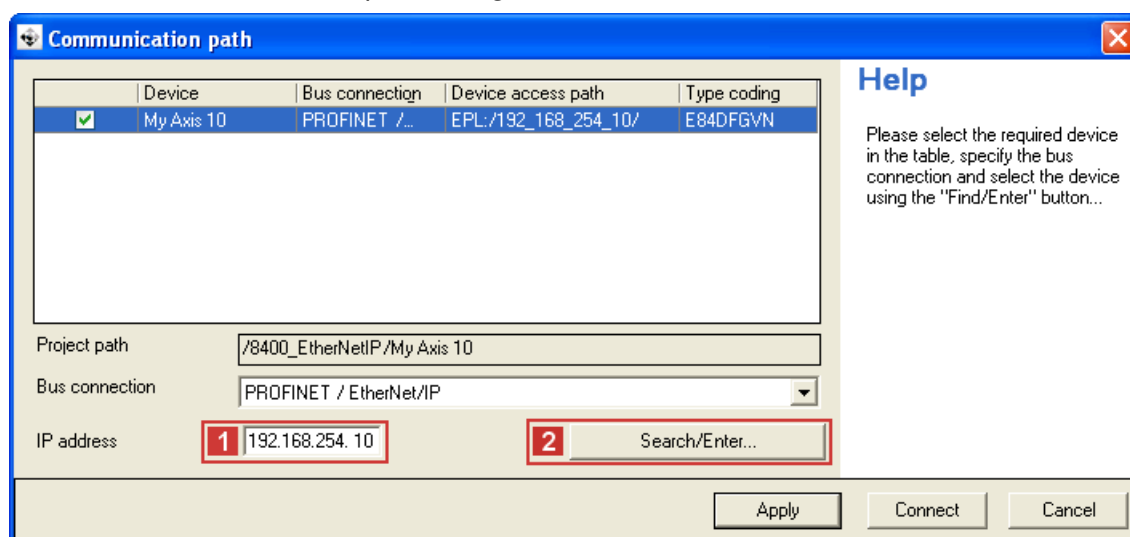
[6-1] Example set-up with an Allen Bradley CompactLogix Controller 1769-L32E (scanner)

For an online connection between the »Engineer« and the drive, the drive has to have an IP address (see [Setting the IP configuration of the Inverter Drive 8400 motec](#) (□ 30)).

Commissioning

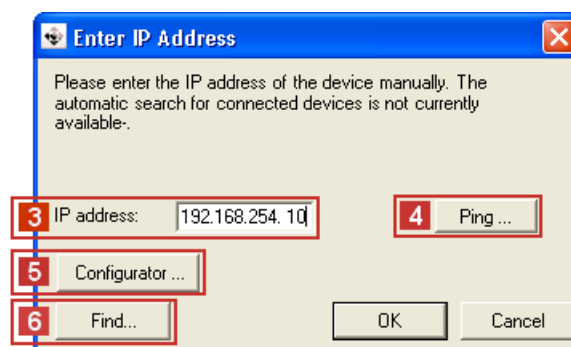
Establishing an online connection via EtherNet/IP with the Lenze »Engineer«

In the »Engineer«, you can use the **Online → Set communication path and go online** menu command to select the EtherNet/IP communication path. The previously configured EtherNet/IP nodes are shown in the "Communication path" dialog window:



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

Via the **2 Search/Enter** button, you can establish a connection to devices which have not appeared in the display field. Corresponding settings for this can be made in the "Enter IP Address" dialog window that will appear:



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

- Execute the console command **4 Ping**.
- Assign the IP address via the **5 Configurator**.
 - ▶ [Setting via the EtherNet/IP configurator of the »Engineer«](#) (31)
- Select the device access path to the desired drive by clicking **6 Find**.

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

6.5 Initial switch-on

Establishing communication

- To establish a communication, the Inverter Drive has to be supplied with mains voltage.
- For EtherNet/IP communication, the Communication Unit has to be supplied with voltage. If this is not the case, the error message "CE04: MCI communication error" (error no. 01.0127.00002) is output. The error has to be reset in the Inverter Drive in order that the EtherNet/IP communication can be established.
- The external voltage supply serves to maintain EtherNet/IP communication if the main supply fails.
 - ▶ [External voltage supply](#) (📖 24)
- During mains connection, all parameters (codes) are read.
- For addressing the drive, a valid IP configuration is required if communication between the PC/ »Engineer« and the drive is to be effected via EtherNet/IP.
 - ▶ [Setting the IP configuration of the Inverter Drive 8400 motec](#) (📖 30)

7 Data transfer

EtherNet/IP uses CIP™ (Common Industrial Protocol) for the data exchange between devices via an Ethernet network – just like the closely related bus systems DeviceNet and ControlNet.

Lenze implements the CIP following the ODVA standard (Open DeviceNet Vendor Association, www.odva.org) and supports the two main types of EtherNet/IP communication:

- Explicit messaging (for parameter data)
- Implicit messaging (for I/O data)

7.1 Communication channels



Note!

The terms "input" and "output" refer to the point of view of the scanner:

- Input data is produced by the adapter and consumed by the scanner.
- Output data is produced by the scanner and consumed by the adapter.

EtherNet/IP transmits parameter data and I/O data between the host system (scanner) and the drives (adapters) connected to the fieldbus. The data are transmitted via corresponding communication channels depending on their time-critical behaviour.

The I/O data channel transmits I/O data by means of "implicit messages".

- The inverter is controlled by means of the I/O data.
- The transmission of I/O data is time-critical.
- I/O data are transmitted cyclically between the host system (scanner) and the drives (adapters) (permanent exchange of current input and output data).
- The host system (scanner) has direct access to the I/O data (the data are, for example, stored directly in the I/O area).
- To the scanner, up to 10 data words (max. 20 bytes) can be sent.
- From the scanner, up to 8 data words (max. 16 bytes) can be sent.
- I/O data are not stored in the inverter.
- I/O data are e.g. setpoints, actual values, control and status words

The parameter data channel transmits parameter data by means of "explicit messages".

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

7.2 Telegram types

The "implicit message" and "explicit message" telegram types are transmitted between the host system (scanner) and the drive (adapter).

Implicit messages (I/O data transfer)

"Implicit messages" are transmitted or received according to the producer/consumer principle. There is one transmitter and no receiver or an optional number of receivers.

The "cyclic I/O data" transmission mode is supported. The scanner and the adapter use "cyclic I/O data" to generate their data independently of each other, which are then transmitted depending on a timer. The user must set the value of the timer in the scanner.

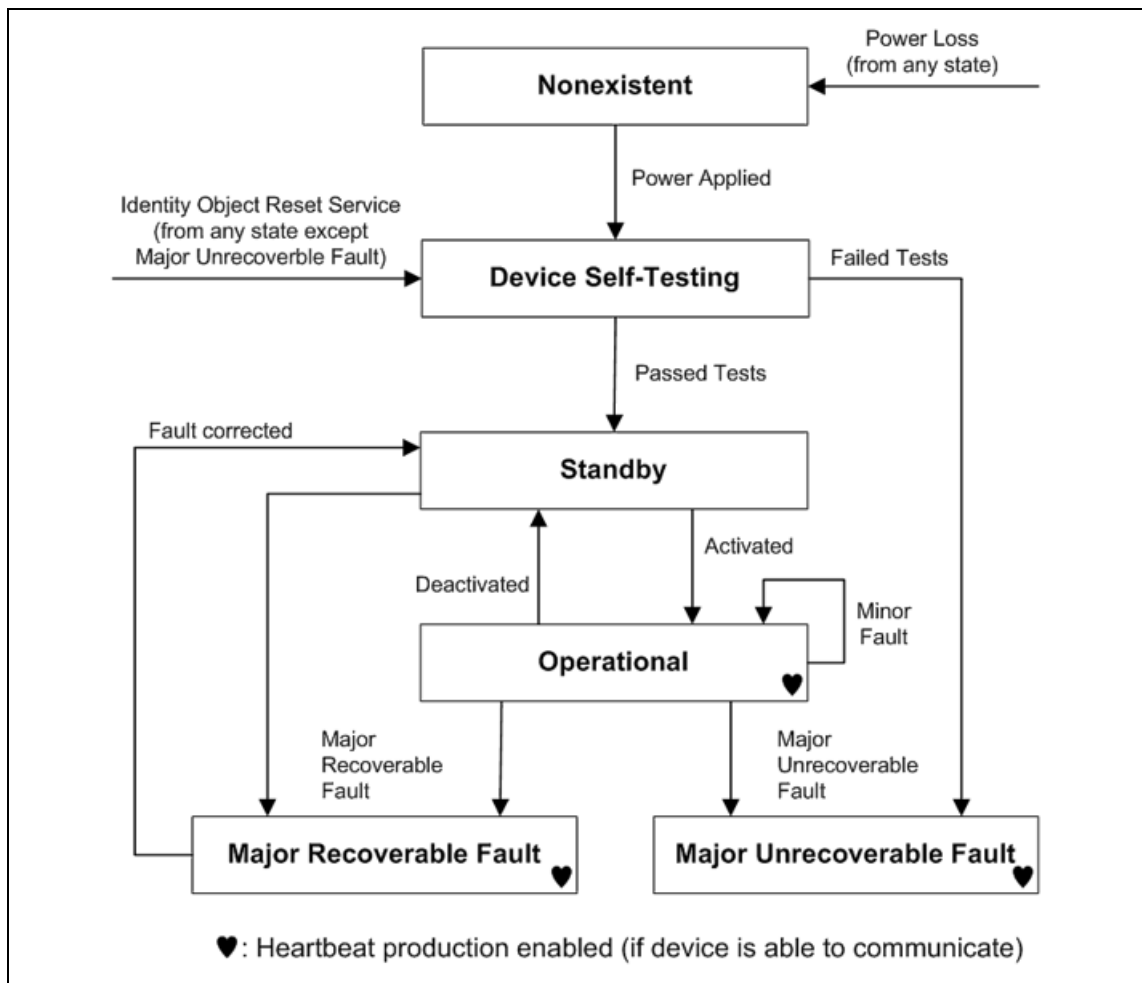
Explicit messages (parameter data transfer)

"Explicit messages" serve to configure and parameterise the individual EtherNet/IP nodes.

Two nodes have a client/server relationship:

The client transmits a job (request). The server receives this job and tries to accomplish it. The server then transmits the requested data (positive response) or an error message (negative response).

7.3 EtherNet/IP state diagram



[7-1] EtherNet/IP state diagram

The current EtherNet/IP device state is ...

- output via code [C13861](#);
- output in the [Identity Object \(1 / 0x01\)](#) ([110](#)) via instance attributes 5 and 8;
- indicated via the **MS** LED (see [LED status displays](#) ([78](#))).

8 I/O data transfer (implicit messages)

To exchange I/O data (implicit messages) between the host system (scanner) and the drive (adapter), you have to ...

- Assign the I/O data to the internal ports (MCI) in the drive (adapter):
 - ▶ [I/O data mapping](#) (📖 47)
 - ▶ [I/O configuration in the »Engineer«](#) (📖 52)
- Configure the I/O data transfer in the host (scanner):
 - ▶ [I/O configuration with »RSLogix 5000« version 19 or lower](#) (📖 57)
 - ▶ [I/O configuration with »RSLogix 5000« version 20 or higher](#) (📖 62)

I/O data transfer (implicit messages)

Configuring I/O data

8.1 Configuring I/O data

- The I/O data configuration is specified during the initialisation phase of the scanner (PDO mapping).
- To the scanner, up to 10 data words (max. 20 bytes) can be sent.
- From the scanner, up to 8 data words (max. 16 bytes) can be sent.
- In the **111 (0x6F, Custom Input)** assembly object instance, the I/O data is entered in the last two words:

Data word	Bits	Function	Value / description	
Word 9	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 10	14	I/O status	0 (FALSE)	Data in word 9/10 are not valid.
			1 (TRUE)	Data in word 9/10 are valid.
	15	Connection status of the drive	0 (FALSE)	Drive is offline ("Stay alive" operation)
			1 (TRUE)	Drive 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 9/10 are not valid.
			1 (TRUE)	Data in word 9/10 are valid.
	15	Connection status of the drive	0 (FALSE)	Drive is offline ("Stay alive" operation)
			1 (TRUE)	Drive is online

I/O data transfer (implicit messages)

Configuring I/O data

- In the assembly input object instances **70 ... 73 (0x46 ... 0x49)**, this data is not used due to profile conformity reasons.
- The I/O data configuration is application-specifically predefined in the device description files and can be adapted, if necessary.
 - ▶ [I/O configuration in the »Engineer«](#) (📖 52)

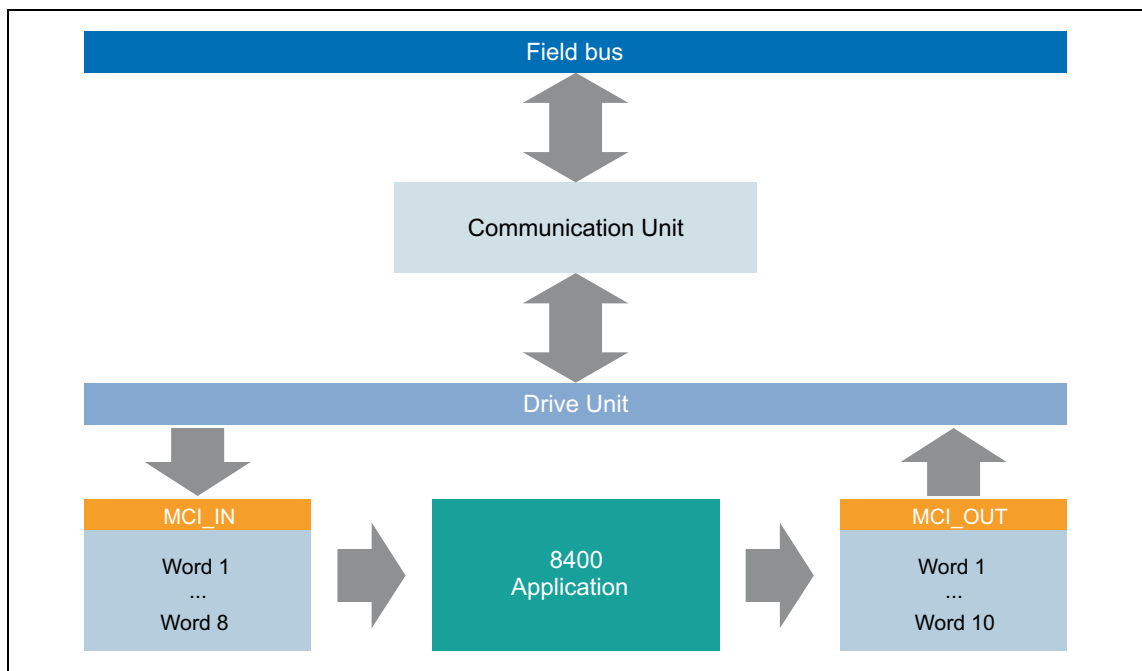
I/O data transfer (implicit messages)

I/O data mapping

8.2 I/O data mapping

I/O data transfer takes place via the MCI interface.

- The I/O data are accessed via the port blocks **MCI_IN** and **MCI_OUT**. These port blocks are also referred to as I/O data channels.
- The **MCI_IN** port block maps the received data objects.
- The **MCI_OUT** port block maps the data objects to be sent.
- To the scanner, up to 10 data words (max. 20 bytes) can be sent.
- From the scanner, up to 8 data words (max. 16 bytes) can be received.
- The ports/function blocks of the I/O data objects are interconnected with the Lenze »Engineer«.



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



Software manual / online help for the Inverter Drive 8400 motec

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

8.3 Technology applications (TA) / drive profiles

The Inverter Drives 8400 motec is provided with various drive profiles. They define a standardised/ individual control and status word assignment and the standardisation of setpoints and actual value scalings.

The following drive profiles are supported by the Inverter Drives 8400:

- Lenze technology applications / user-definable parameter sets
- "AC Drive Profile" application

8.3.1 Lenze technology applications / user-definable parameter sets

The technology applications integrated in the drive provide the main signal flow for realising a general or specific drive solution.

For using the Lenze technology application selection in the »Engineer« via standard device code **C00005**, the following assembly object instances have to be used in the host (scanner):

Instance ID		Assembly object instance
[dec]	[hex]	
110	0x6E	Custom Output (from the adapter to the scanner)
111	0x6F	Custom Input (from the adapter to the scanner)

See also [Assembly Object \(4 / 0x04\)](#) (📖 113).

The custom assemblies also allow for a user-definable parameter setting, depending on the application. Hence, the data words can be freely assigned with variables of the MCI port blocks in the »Engineer«.

The user-definable parameter setting can be used in addition to the previously set technology application.

▶ [Lenze technology application / configuring user-definable parameter sets](#) (📖 52)



Tip!

Here you will find information on configuring with the »RSLogix 5000« programming software from Rockwell:

- ▶ [I/O configuration with »RSLogix 5000« version 19 or lower](#) (📖 57)
- ▶ [I/O configuration with »RSLogix 5000« version 20 or higher](#) (📖 62)

8.3.2 "AC Drive Profile" application

The Inverter Drives 8400 motec supports the EtherNet/IP-specific "AC Drive Profile".

The standard device code **C00005** = "**1100: AC Drive Profile**" serves to select the "AC Drive Profile" application.

The "AC Drive Profile" contains ...

- the data basis for motor parameters,
- management functions of the motor control devices,
- Device-specific functions of the drive, e.g. speed ramps, torque control etc.

For using the "AC Drive Profile", the following assembly object instances in the host (scanner) have to be used:

Instance ID		Assembly object instance	
[dec]	[hex]		
20	0x14	Basic Speed Control Output	Outputs: From the scanner to the adapter
21	0x15	Extended Speed Control Output	
22	0x16	Speed and Torque Control Output	
23	0x17	Extended Speed and Torque Control Output	
70	0x46	Basic Speed Control Input	Inputs: From the adapter to the scanner
71	0x47	Extended Speed Control Input	
72	0x48	Speed and Torque Control Input	
73	0x49	Extended Speed and Torque Control Input	

See also:

- [Assembly Object \(4 / 0x04\)](#) (📖 113)
- ["AC Drive Profile" objects](#) (📖 133)



Tip!

Here you will find information on configuring with the »RSLogix 5000« programming software from Rockwell:

- ▶ [I/O configuration with »RSLogix 5000« version 19 or lower](#) (📖 57)
- ▶ [I/O configuration with »RSLogix 5000« version 20 or higher](#) (📖 62)

8.4 I/O assemblies



Note!

The terms "input" and "output" refer to the point of view of the scanner:

- Assembly input objects (input) are sent from the adapter to the scanner.
- Assembly output objects (output) are sent from the scanner to the adapter.

The length of the I/O data must correspond with the respective resulting length of the mapped ports ([I/O data mapping](#) (134 47)).

The Communication Unit supports the [Assembly Object \(4 / 0x04\)](#) (134 113) and the ["AC Drive Profile" objects](#) (134 133).

For data exchange, the Communication Unit supports the following assembly object instances:

Instance ID		Assembly object instance	
[dec]	[hex]		
Lenze technology applications / user-definable parameter sets	110	0x6E	Custom Output
	111	0x6F	Custom Input
"AC Drive Profile" application	20	0x14	Basic Speed Control Output
	21	0x15	Extended Speed Control Output
	22	0x16	Speed and Torque Control Output
	23	0x17	Extended Speed and Torque Control Output
	70	0x46	Basic Speed Control Input
	71	0x47	Extended Speed Control Input
	72	0x48	Speed and Torque Control Input
	73	0x49	Extended Speed and Torque Control Input

Assembly output objects (outputs) are usually used for controlling the enable/disable state of the drive and for supplying the speed or torque references.

Assembly input objects (inputs) are usually used to monitor the drive status and the runtime values such as actual speed, current, actual position and position error.

Depending on the data length defined by the scanner, the memory map of the I/O data can have different sizes.

I/O data transfer (implicit messages)

I/O assemblies

Assembly output objects (scanner → Adapter)

Assembly output objects are assumed to have a 4-byte header (32-bit "run/idle header"). When mapping the assemblies, this header will automatically be added to the data stream by most Allen-Bradley PLC/SLC equipment.

If your PLC does not support this header (like the Rockwell PLCs do), add a preceding 32-bit header to the output image.

You can then define the **bit 0** of this header in the process image of your PLC:

- 0: Idle mode
- 1: Run mode

For the operation with Rockwell PLCs, adaptations are not required.

Assembly input objects (adapter → scanner)

The assembly input objects are mapped in the adapter memory starting with byte 0.

The input objects are transmitted in a "modeless" manner, i.e. a 4-byte header (32-bit "Run/Idle header") is not included in the transfer.

So the start address in the assembly memory map is the actual start of the first assembly data element.

Please observe the actual assembly lengths when mapping the input objects to the controller memory.

The contents of the input data depends on the I/O data arrangement in the drive ([I/O data mapping \(47\)](#)).

I/O data transfer (implicit messages)

I/O configuration in the »Engineer«

8.5 I/O configuration in the »Engineer«

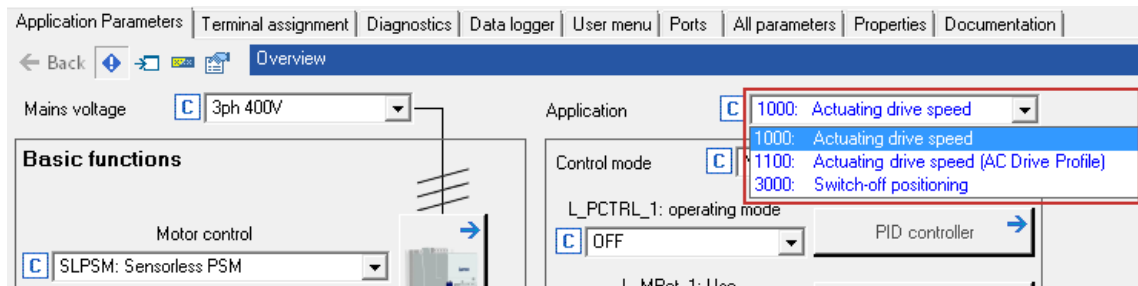
8.5.1 Lenze technology application / configuring user-definable parameter sets



How to configure the Lenze technology applications / user-definable parameter sets in the »Engineer«:

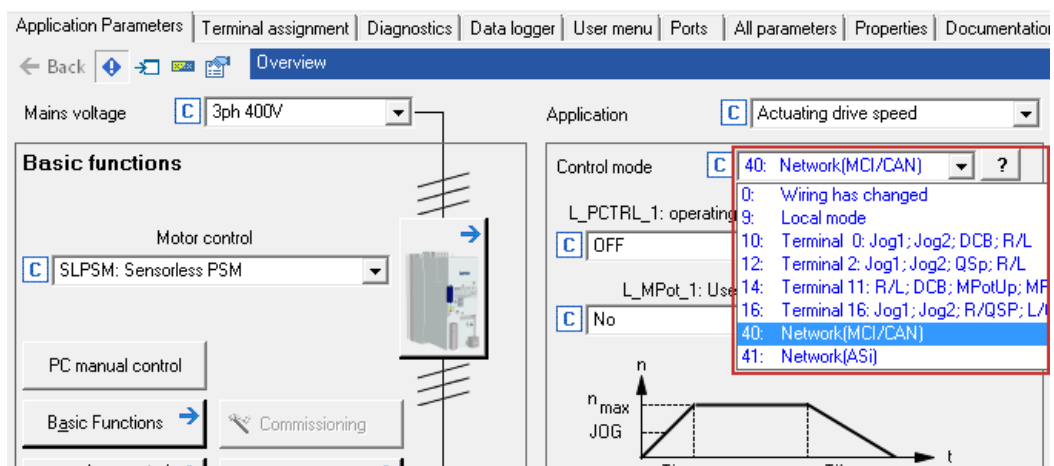
1. Select the application (C00005 = 1000) in the **Application parameters** tab.

In the example, the "speed actuating drive" application is configured.



2. Make the default setting of the I/O configuration.

Select "MCI" control mode (C00007 = 40).



I/O configuration in the »Engineer«

Application Parameters
FB Editor
Terminal assignment
Diagnostics
Data logger
User menu
Ports
Oscilloscope
All parameters
Properties

Rename
Activate

1

MCI_IN

Actuating drive speed

(Applikation)

Output ports

MCI_OUT

Mapping

EtherNet/IP/MCI_IN_ETHERNETIP : 0

Network default interconnection

<not defined>

Network default change...

2 Application variables

Name	Signal	Type	Length	Index	Online
WORD_1	MCI control word (LA_NCtrl)	WORD	16	C876/1	offline
WORD_2	Main speed setpoint (LA_NCtrl)	WORD	16	C876/2	offline
WORD_3	[not connected]	WORD	16	C876/3	offline
WORD_4	[not connected]	WORD	16	C876/4	offline
WORD_5	[not connected]	WORD	16	C876/5	offline
WORD_6	[not connected]	WORD	16	C876/6	offline
WORD_7	[not connected]	WORD	16	C876/7	offline
WORD_8	[not connected]	WORD	16	C876/8	offline
Bool_R8	hRFG_0	Bool	1	---	offline

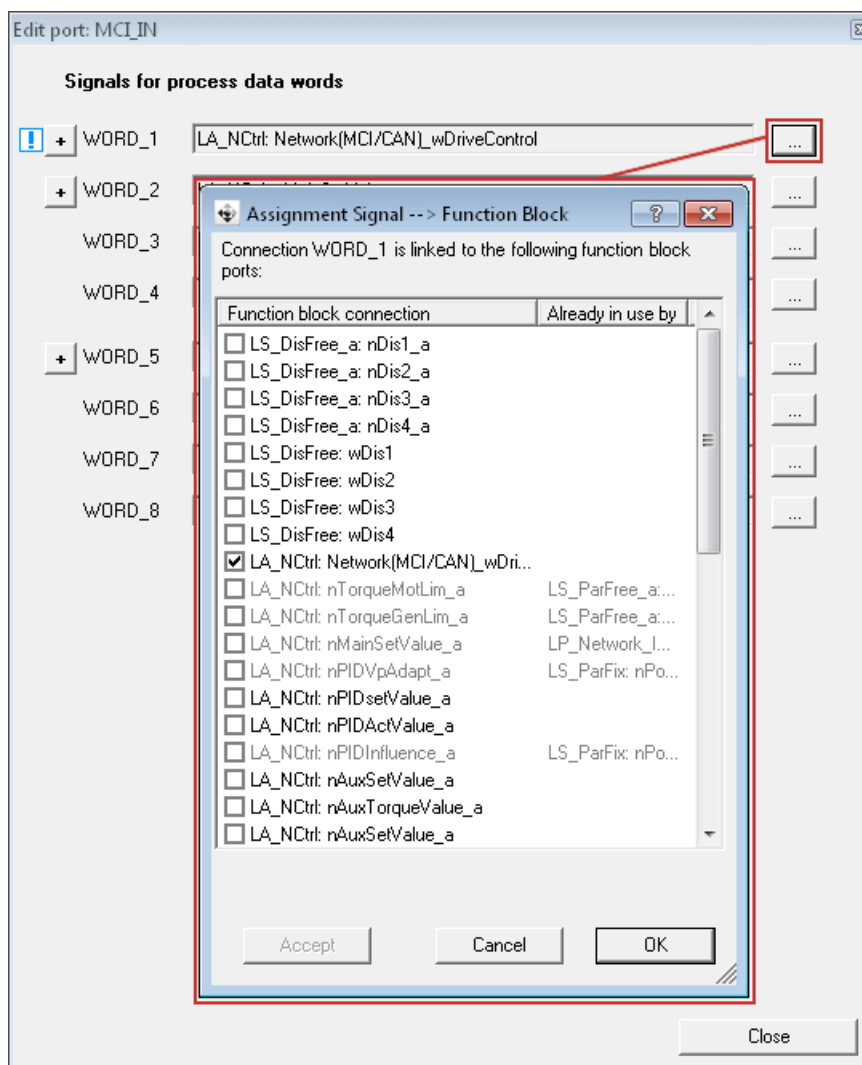
3 Change Variable...

- 53

I/O data transfer (implicit messages)

I/O configuration in the »Engineer«

4. In the "Edit port" dialog window, you can assign signals to the I/O data words via the  button.
→ Select the signals and confirm the selection with **OK**.

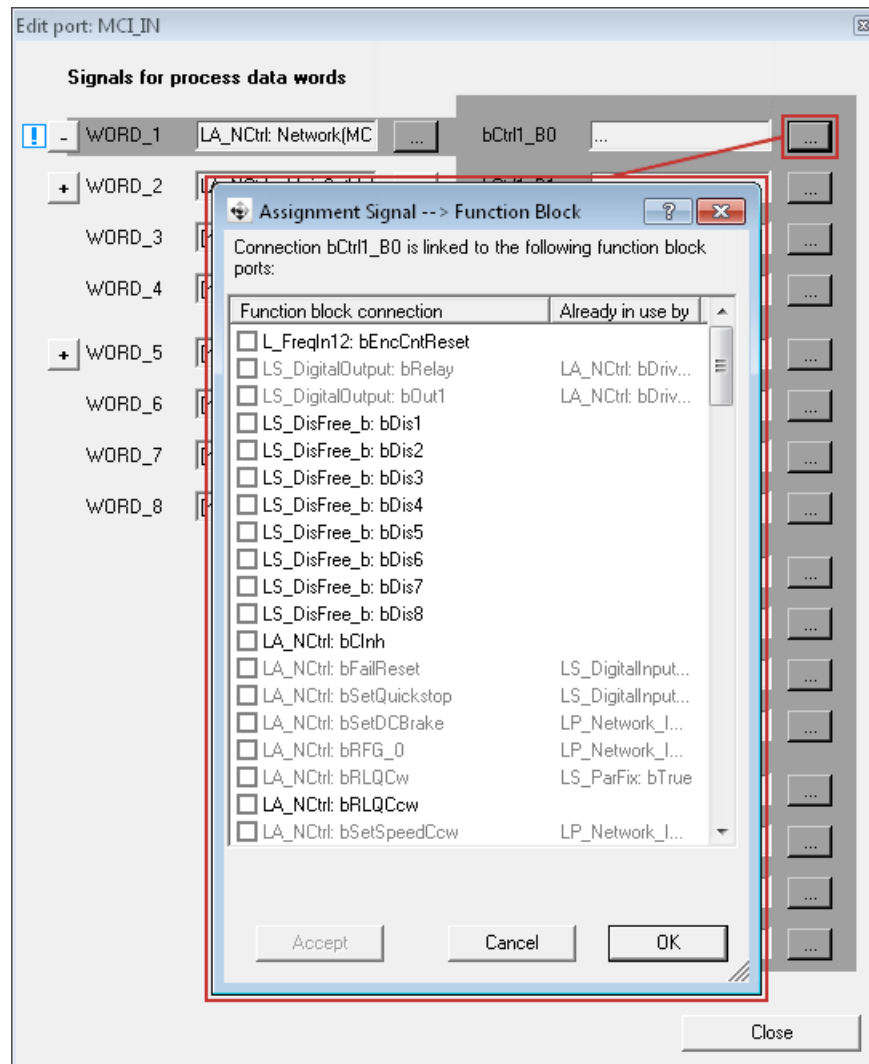


I/O data transfer (implicit messages)

I/O configuration in the »Engineer«

For some 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**.



5. Use the standard device code **C00002** to execute the command **"11: Save all parameter sets"**.

The changed settings are activated and saved with mains failure protection.

I/O data transfer (implicit messages)

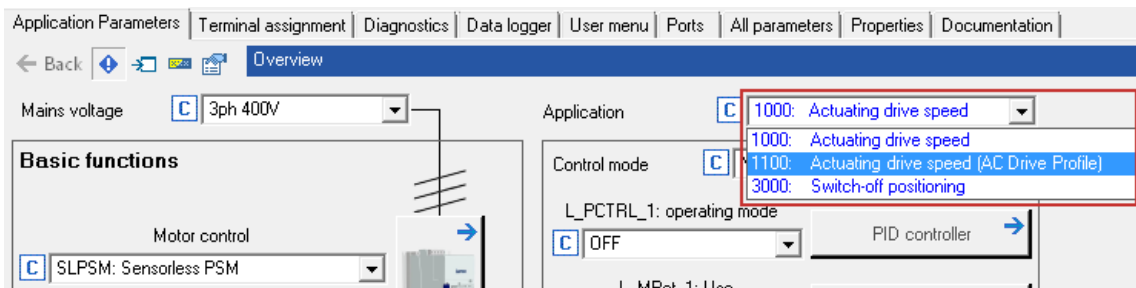
I/O configuration in the »Engineer«

8.5.2 Configuring "AC Drive Profile" application



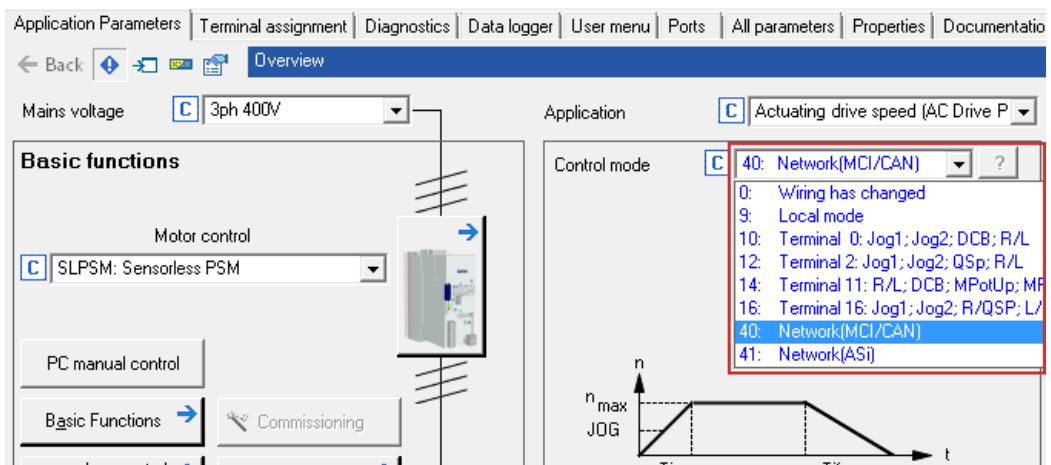
How to configure the "AC Drive Profile" application in the »Engineer«:

1. Select the "AC Drive Profile" application (C00005 = 1100) in the **Application parameters** tab.



2. Make the default setting of the I/O configuration.

Select "MCI" control mode (C00007 = 40).



I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 19 or lower

8.6 I/O configuration with »RSLogix 5000« version 19 or lower

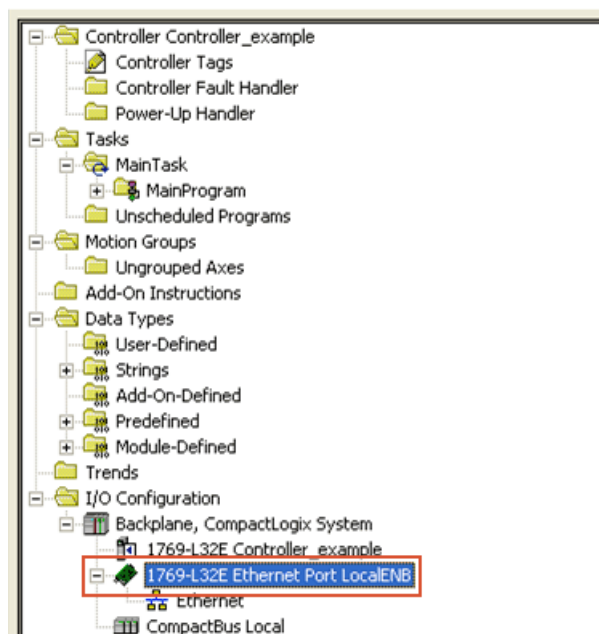
The following example describes the I/O configuration of the Allen-Bradley 1769-L32E CompactLogix controller using the Rockwell »RSLogix 5000« programming software up to version 19.

Up to and including software version 19, the I/O configuration is carried out without EDS files.



How to carry out the I/O configuration, taking the CompactLogix controller 1769-L32E with »RSLogix 5000« as an example:

1. Click the **I/O Configuration** folder in the configuration tree.



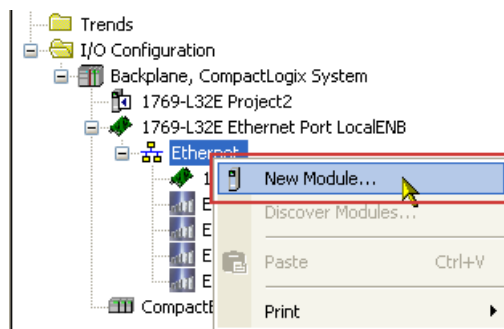
For the 1769-L32E CompactLogix controller, the I/O configuration already includes a local Ethernet port.

If a SoftLogic or ControlLogix controller is used, an Ethernet port scanner needs to be added to the configuration.

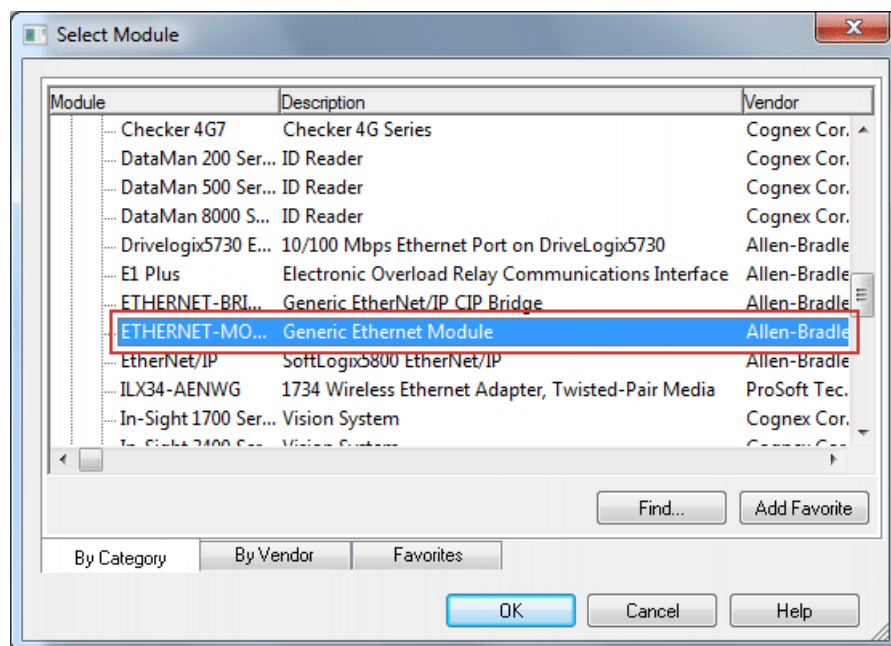
I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 19 or lower

2. Right click on "Ethernet" and execute the "**New Module ...**" command from the context menu.



3. Open "Communications" and select "ETHERNET-MODULE | Generic Ethernet Module".



4. Confirm the selection with **OK**.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 19 or lower

5. Go to the "New Module" dialog window and define the properties of the newly added device .

The terms "input" and "output" refer to the point of view of the scanner:

- Assembly input objects (input) are sent from the adapter to the scanner.
- Assembly output objects (output) are sent from the scanner to the adapter.

Settings for Lenze technology applications or user-definable parameter sets:

	Assembly Instance:	Size:	
1 Input:	111	10	(16-bit)
2 Output:	110	8	(16-bit)
3 Configuration:	130	0	(8-bit)

If you use a Lenze technology application or an individual parameter set in the drive, you can exchange up to 10 user-definable words (INT) via the MCI_OUT port using the assembly object distance **1** "Input = 111". The **2** "Output = 110" assembly object instance serves to exchange up to 8 user-definable words (INT) via the MCI_IN port.

Go to **3** "Configuration" and enter the **Assembly instance "130"** and the **Size "0"**.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 19 or lower

Settings for an "AC Drive Profile" application:

The screenshot shows the 'New Module' dialog box. The 'Type' is 'ETHERNET-MODULE Generic Ethernet Module', 'Vendor' is 'Allen-Bradley', and 'Parent' is 'LocalENB'. The 'Name' field is 'My_8400_motec'. The 'Comm Format' is 'Data - INT'. The 'IP Address' is '172.031.021.102'. The 'Connection Parameters' section shows 'Input' with 'Assembly Instance' 73 and 'Size' 3 (16-bit), 'Output' with 'Assembly Instance' 23 and 'Size' 3 (16-bit), and 'Configuration' with 'Assembly Instance' 130 and 'Size' 0 (8-bit). The 'Open Module Properties' checkbox is checked. The 'OK' button is highlighted.

The assembly object instances **4** "Input = 73" and **5** "Output = 23" shown here exemplify the use of the AC Drive Profile "Extended Speed and Torque".

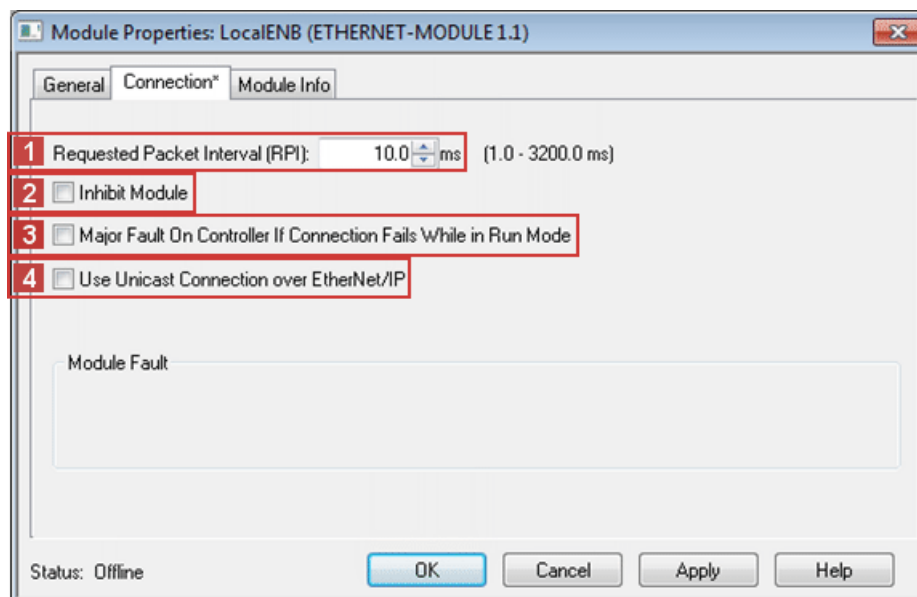
Settings	Description
1 Name	Device name or type of the drive, usually with reference to the process (in the example "My_8400_motec")
2 Comm Format	Data format for the assembly object instances ("connection parameters" area)
3 IP Address	IP address of the drive - The IP address must be in the same subnetwork like the controller. (Depending on the subnet mask; in general, the first 3 octets of the IP address must be identical.) - DNS is not supported; the host name merely describes the device.
4 Input	Assembly object instance for input objects - Max. 10 input data words (20 bytes, 16 bits/word) - The number of input data must correspond to the length of the mapped ports in the transmit PDO (PDO_TX0), otherwise the adapter will reject the connection with the error message "Invalid Target to Originator Size" (0x0128). - In the 111 (0x6F, Custom Input) assembly object instance, the I/O data is entered in the last two words (see Configuring I/O data (45)) ▶ I/O data mapping (47)
5 Output	Assembly object instance for output objects - Max. 8 output data words (16 bytes, 16 bits/word) - The number of output data must correspond to the length of the mapped ports in the receive PDO (PDO_RX0), otherwise the adapter will reject the connection with the error message "Invalid Originator to Target Size" (0x0127). ▶ I/O data mapping (47)
6 Configuration	Select the Assembly instance "130" and the Size "0" for the configuration. These values are required!

6. Complete the settings with **OK**.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 19 or lower

- Under **I/O Configuration** in the configuration tree, right click "1769-L32E Ethernet Port LocalENB" and select "Properties".
- Go to the **Connection** tab and set further properties.



Required setting

Setting	Description
1 Requested Packet Interval (RPI)	Set RPI ≥ 4.0 ms. (Standard setting: 10 ms) The RPI [ms] specifies the intervals for the I/O data exchange between the drive (adapter) and the controller (scanner).

Optional settings

Settings	Description
2 Inhibit module	This option serves to interrupt or inhibit the communication to the adapter.
3 Major Fault On Controller If Connection Fails While In Run Mode	This option serves to put the controller into the error status if the EtherNet/IP connection to the drive fails while the controller is running.
4 Use Unicast Connection over EtherNet/IP	Option deactivated (standard setting): - The input data is sent from the adapter to the scanner by means of multicast telegrams. - Other scanners can access this data in addition to the currently configured scanner ("Listen only" or "Input only" connections). Option activated: The input data is sent from the adapter to the scanner by means of unicast telegrams .

- Complete the settings with **OK**.
 - The I/O configuration is now complete.
 - The corresponding tags will then be created in the "Controller Tags" of the controller project.
- The last step is [Saving the I/O configuration in »RSLogix 5000«](#) (72).

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

8.7 I/O configuration with »RSLogix 5000« version 20 or higher

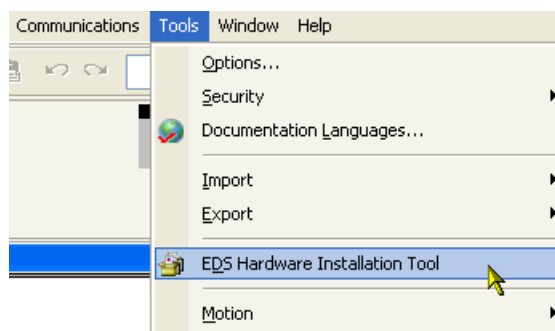
The following example describes the I/O configuration of the Allen-Bradley 1769-L32E CompactLogix controller using the Rockwell »RSLogix 5000« programming software from version 20.

From software version 20 onwards, [EDS files](#) (📖 27) are used for the I/O configuration.



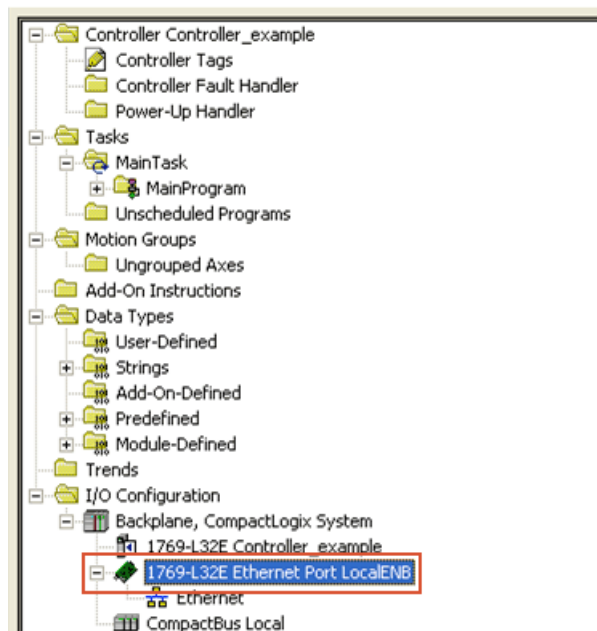
How to carry out the I/O configuration, taking the CompactLogix controller 1769-L32E with »RSLogix 5000« as an example:

1. Use the "EDS Hardware Installation Tool" item to import the [EDS files](#) (📖 27) of the EtherNet/IP nodes.



In »RSLogix 5000«, the dialog for the "EDS Hardware Installation Tool" is self-explanatory and not described further in this documentation.

2. Click the **I/O Configuration** folder in the configuration tree.



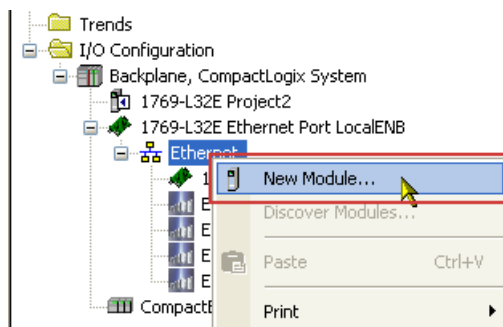
For the 1769-L32E CompactLogix controller, the I/O configuration already includes a local Ethernet port.

If a SoftLogic or ControlLogix controller is used, an Ethernet port scanner needs to be added to the configuration.

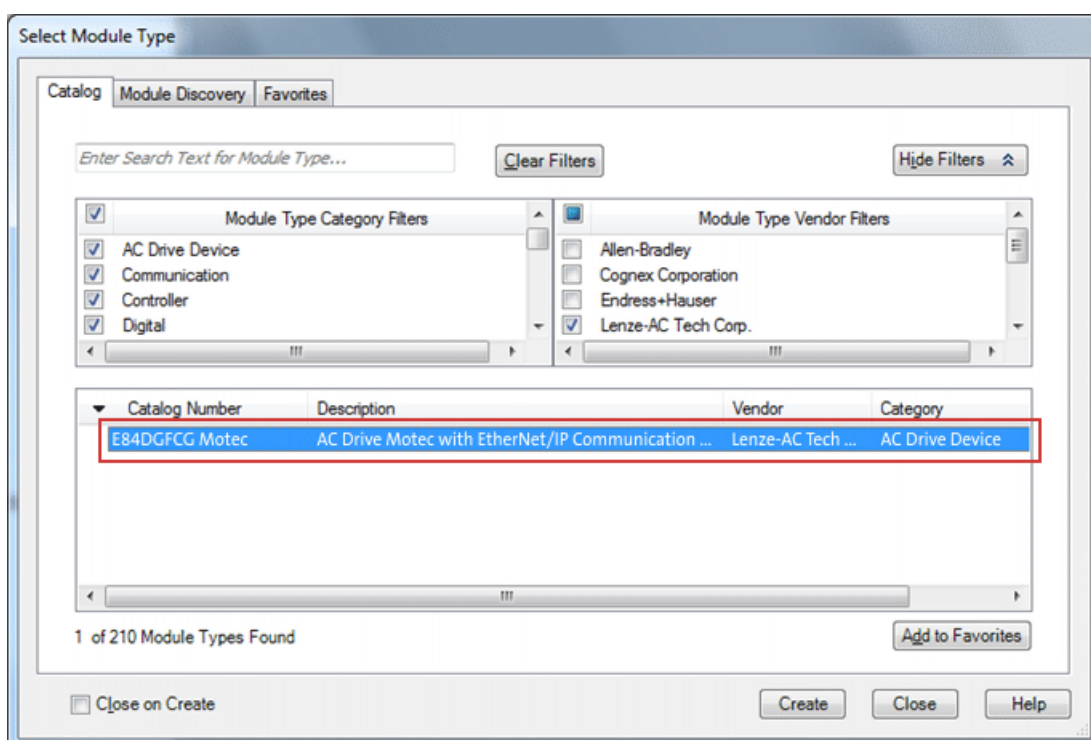
I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

3. Right click on "Ethernet" and execute the "**New Module ...**" command from the context menu.



4. Open the "Select Module Type" dialog window, go to the **Catalog** tab and select "E84DGFCG Motec".



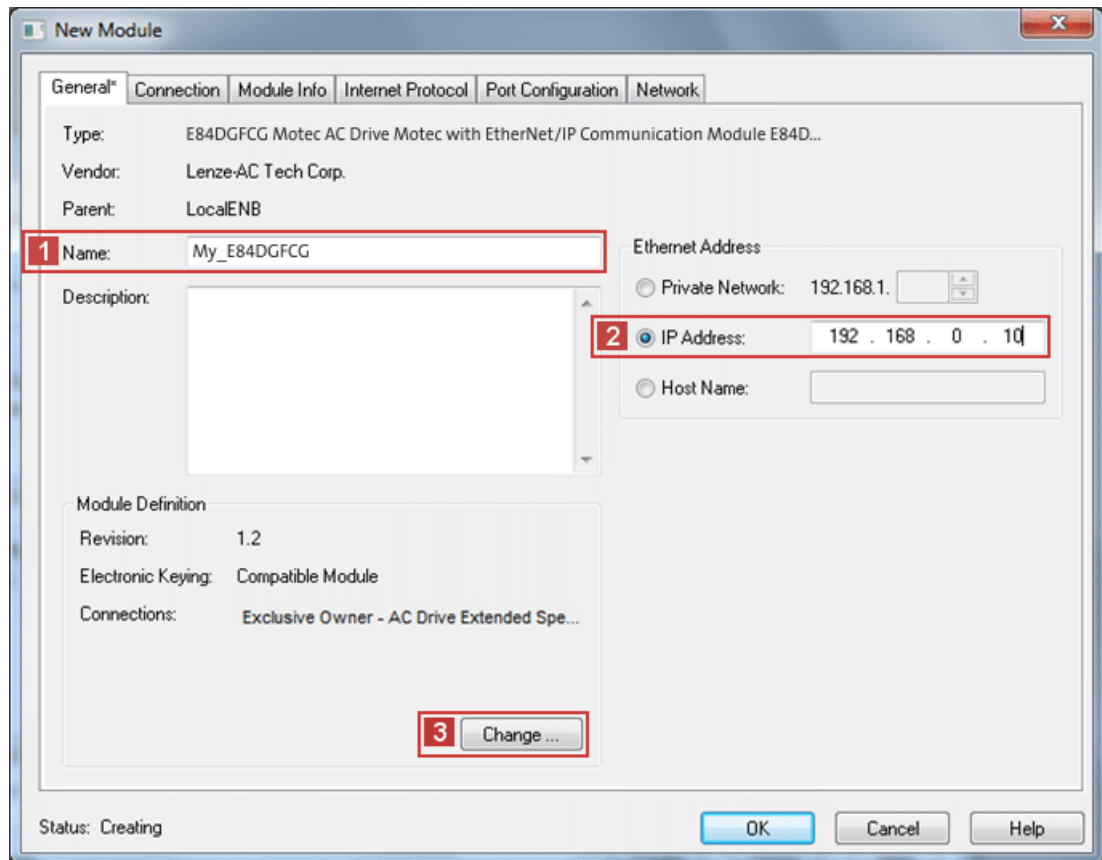
5. Confirm the selection with **Create**.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

6. In the "New Module" dialog window, select the **General** tab and allocate a **1** name and an unique **2** IP address.

Example settings:



DNS is not supported; the host name merely describes the device.

7. Click the **3** **Change ...** button.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

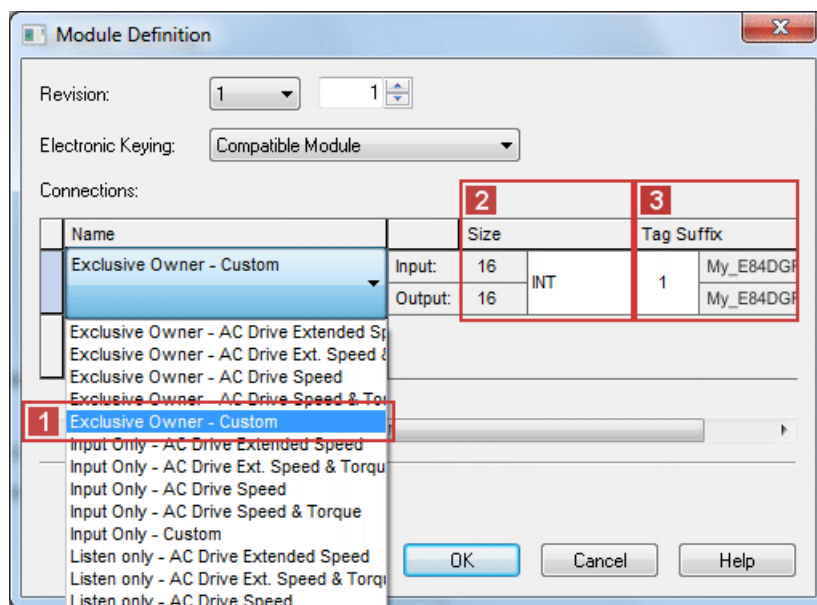
- Go to the "Module Definition" dialog window and make the connection settings.

The terms "input" and "output" refer to the point of view of the scanner:

- Assembly input objects (input) are sent from the adapter to the scanner.
- Assembly output objects (output) are sent from the scanner to the adapter.

Settings for Lenze technology applications or user-definable parameter sets:

- **1** Select "Exclusive Owner - Custom" connection.
If you use the Lenze technology applications or user-definable parameter sets in the drive, the "Exclusive Owner - Custom" assembly object instance always has to be selected.
- **2** Set Data type = INT.
The INT data type is exchanged via the ports MCI_IN and MCI_OUT of the Inverter Drives 8400. In case of the SINT data type, an additional PLC logic is required for conversion.
- **3** Set Tag Suffix = 1.
A tag suffix formulates a module-describing tag name.

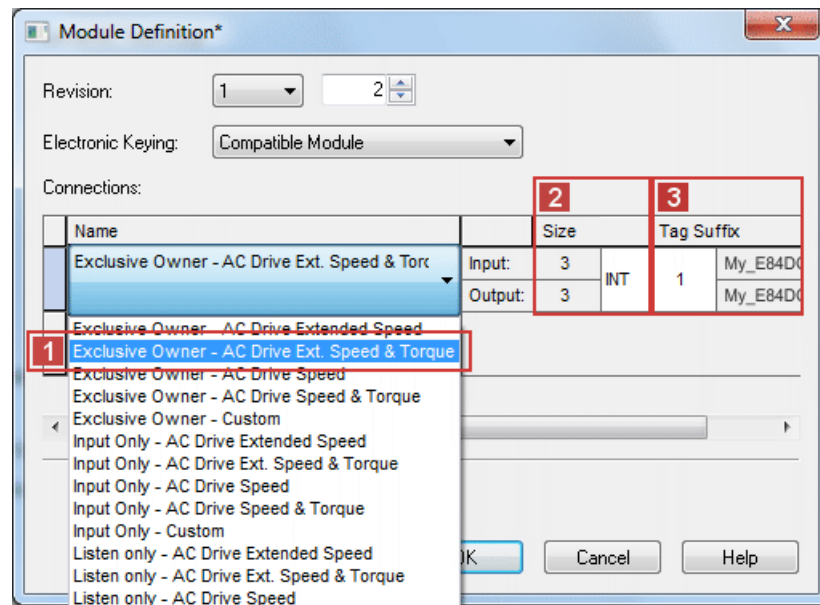


I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

Settings for an "AC Drive Profile" application:

- **1** Select "AC Drive" connection.
In the example, the AC Drive Profile "Exclusive Owner - AC Drive Ext. Speed & Torque" is used.
- **2** Set Data type = INT.
The INT data type is exchanged via the ports MCI_IN and MCI_OUT of the Inverter Drives 8400. In case of the SINT data type, an additional PLC logic is required for conversion.
- **3** Set Tag Suffix = 1.
A tag suffix formulates a module-describing tag name.



9. Complete the settings with OK.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

10. Open the "New Module" dialog window, select the **Connection** tab and set further properties.

- 1** "Name" displays the name of the connection set under 8..

The example shows an "Exclusive Owner - Custom" connection. According to this, the name of an "AC Drive Profile" connection may be displayed here too.

Required settings

Settings	Description
2 Requested Packet Interval (RPI)	Set RPI ≥ 4.0 ms. (Standard: 10 ms) The RPI [ms] specifies the intervals for the I/O data exchange between the drive (adapter) and the controller (scanner).
3 Input type	Select the "Multicast" input type. • The input data is sent from the adapter to the scanner by means of multicast telegrams. • Other scanners can access this data in addition to the currently configured scanner ("Listen only" or "Input only" connections).

Optional settings

Settings	Description
4 Inhibit module	This option serves to interrupt or inhibit the communication to the adapter.
5 Major Fault On Controller If Connection Fails While In Run Mode	This option serves to put the drive into the error status if the EtherNet/IP connection to the drive fails while the controller is running.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

11. Complete the settings with OK.

- The drive is inserted in the configuration tree under the **2** "I/O Configuration".
- The corresponding tags are created in the **1** "Controller Tags".
- The example **3** shows the ...
input assembly tags as "MY_EIP8400_FROM_EDS:I1";
output assembly tags as "MY_EIP8400_FROM_EDS:O1";

The screenshot shows the RSLogix 5000 Controller Organizer interface. On the left, the configuration tree is expanded to 'I/O Configuration', showing a hierarchy of backplane and Ethernet modules. A red box labeled '2' highlights the 'E84DGF CG MY_EIP8400_FROM_EDS' module. On the right, the 'Controller Tags' table is displayed for the scope 'LACT_TEST_UNIT'. A red box labeled '1' highlights the 'Controller Tags' folder in the tree. Another red box labeled '3' highlights the first two rows of the tag table, which are assembly tags: 'MY_EIP8400_FROM_EDS:I1' and 'MY_EIP8400_FROM_EDS:O1'. The table has columns for Name, Value, Force Mask, Style, and Data Type.

Name	Value	Force Mask	Style	Data Type
+ Drive_Mode_Select	0		Decimal	DINT
+ MY_EIP8400_FROM_EDS:I1	{...}	{...}		_0248:E84AYCE...
+ MY_EIP8400_FROM_EDS:O1	{...}	{...}		_0248:E84AYCE...
+ Read_INT	0		Decimal	DINT
Read_Target	0.0		Float	REAL
+ SET_Attribute_1	{...}	{...}		MESSAGE
+ TEST2	0		Decimal	INT
Trigger1	0		Decimal	BOOL

If you click the "+" in front of the assembly tag name, all data contained in the assembly tags are shown below it. You can create "alias tags" to reference to single bits of the assembly tag.

I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

12. Create an "alias tag".

Example with the assembly object instance 23 (0x17):

For a forward motion of a conveyor, bit '0' (Run Fwd) is to be referenced by byte '0'.

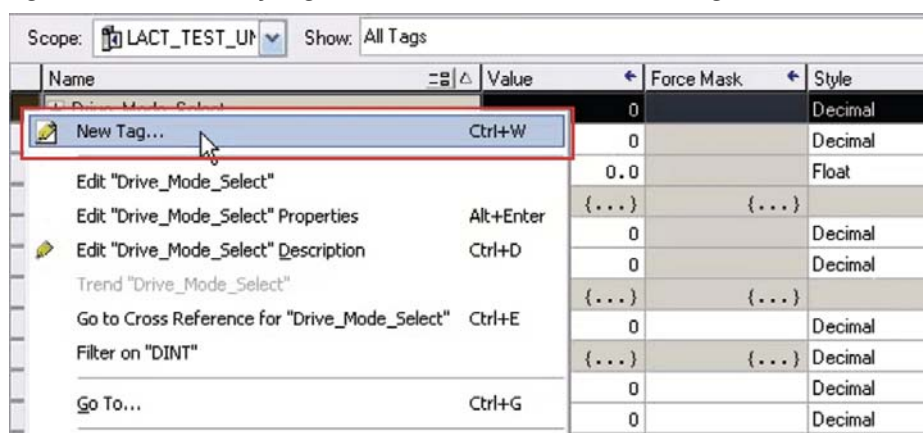
Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
23 (0x17)	0		Net Ref	NetCtrl			Fault Reset	Run Rev	Run Fwd
	1								
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Torque Reference (Low Byte)							
	5	Torque Reference (High Byte)							



Note!

- **NetCtrl (Bit 5)** and **NetRef (Bit 6)** have to be set in order that the drive can receive start/stop commands and speed/torque command via the network.
- In order to be able to use the torque control of the **assembly object distance 23 (0x17)**, the "DriveMode" attribute has to be written by means of explicit message transmission.
▶ [Write "DriveMode" attribute](#) (□ 138)

Right-click an assembly tag and select the command **"New Tag..."** in the context menu.

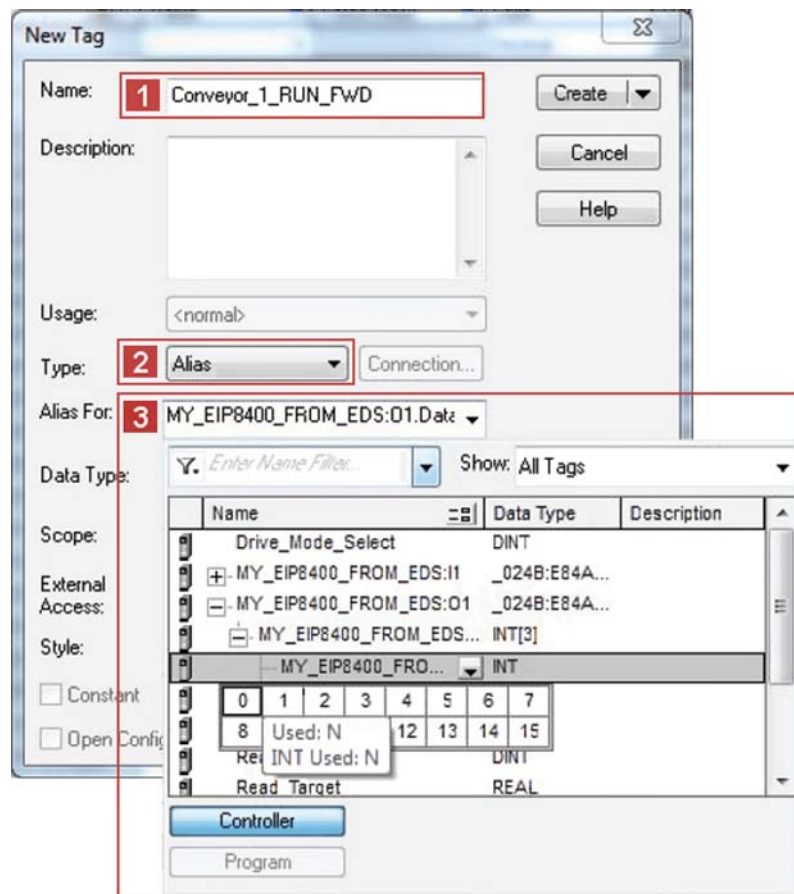


I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

13. Go to the "New Tag" dialog window and ...

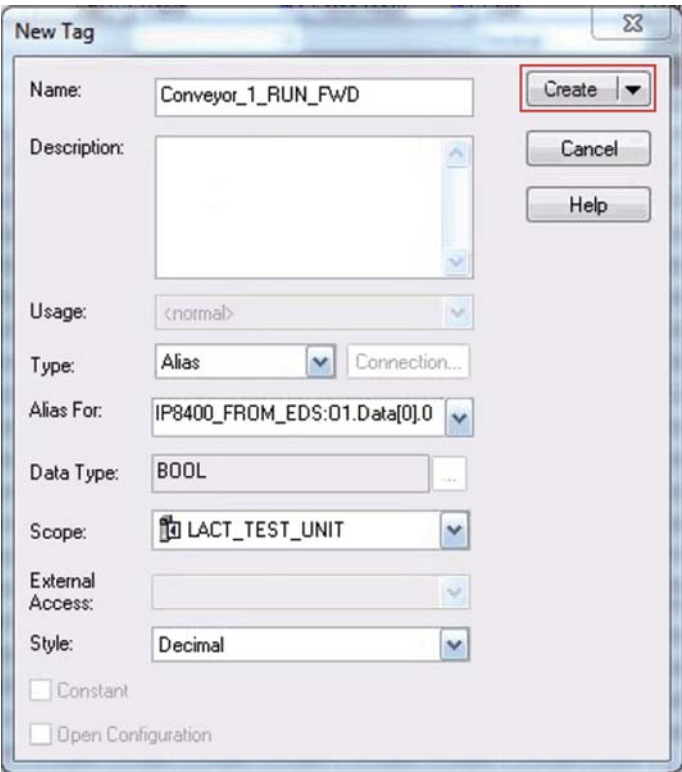
- assign a **1** Name for the tag (in the example: "Conveyor_1_RUN_FWD");
- **2** set Type = "Alias";
- select the **3** Alias address which is to be referenced for the alias tag.
(in the example: "MY_EIP8400_FROM_EDS:01.Data(0).0" (bit '0' of byte '0'))



I/O data transfer (implicit messages)

I/O configuration with »RSLogix 5000« version 20 or higher

14. Confirm the settings with the **Create** button.



The alias tag "Conveyor_1_RUN_FWD" is created below the "Controller Tags":

Name	Value	Force Mask	Style	Data Type
...	...	...	...	...
[−] MY_EIP8400_FROM_EDS:01	{...}	{...}		_024B:E84AYCE...
[+] MY_EIP8400_FROM_EDS:01.Data[1]	0		Decimal	SINT
[+] MY_EIP8400_FROM_EDS:01.Data[2]	0		Decimal	SINT
[+] MY_EIP8400_FROM_EDS:01.Data[3]	0		Decimal	SINT
[+] MY_EIP8400_FROM_EDS:01.Data[4]	0		Decimal	SINT
[+] MY_EIP8400_FROM_EDS:01.Data[5]	0		Decimal	SINT
Conveyor_1_RUN_FWD	0		Decimal	BOOL

15. The last step is [Saving the I/O configuration in »RSLogix 5000«](#) (72).

I/O data transfer (implicit messages)

Saving the I/O configuration in »RSLogix 5000«

8.8 Saving the I/O configuration in »RSLogix 5000«

After adding the scanner and the adapter to the I/O configuration, the configuration must be downloaded to the controller. The configuration file should also be saved on your computer.



How to save the I/O configuration:

1. Select the menu command **Communications → Download**.
 - The "Download" dialog box will open.
 - If a message box reports that »RSLogix 5000« is unable to go online, select the menu command **Communications → Communications Who Active** and try to find your controller in the "Who Active" dialog box. If the controller is not shown there, the EtherNet/IP driver needs to be added to »RSLinx« or configured in »RSLinx«. For more information, please refer to the »RSLinx« online help.
2. Click the **Download** button.
 - The I/O configuration is downloaded to the controller.
 - When the download has been successfully completed, »RSLogix 5000« changes to online mode and the I/O OK box in the upper left of the screen is green.
3. Select the menu command **File → Save**.
 - If this is the first time the I/O configuration is saved, the "Save As" dialog box will open.
 - Select a folder and enter a file name to save the configuration to a file on your computer.
 - Finally, click the **Save** button.

9 Parameter data transfer (explicit messages)

An "explicit message" is a logical instruction in the PLC program used for messaging. It can be used to read or write to either a parameter setting or the data of an assembly object.

For all Allen-Bradley devices of the CompactLogix, ControlLogix and SoftLogix series, the MSG instruction provides the application possibilities described in this chapter. For other PLC types, please consult the programming documentation for the corresponding PLC.



Note!

When you use several MSG BLOCKs per adapter, you can work resource-friendly by sequential triggering and hold available enough communication reserves in the EtherNet/IP module for further possible clients.



Application note

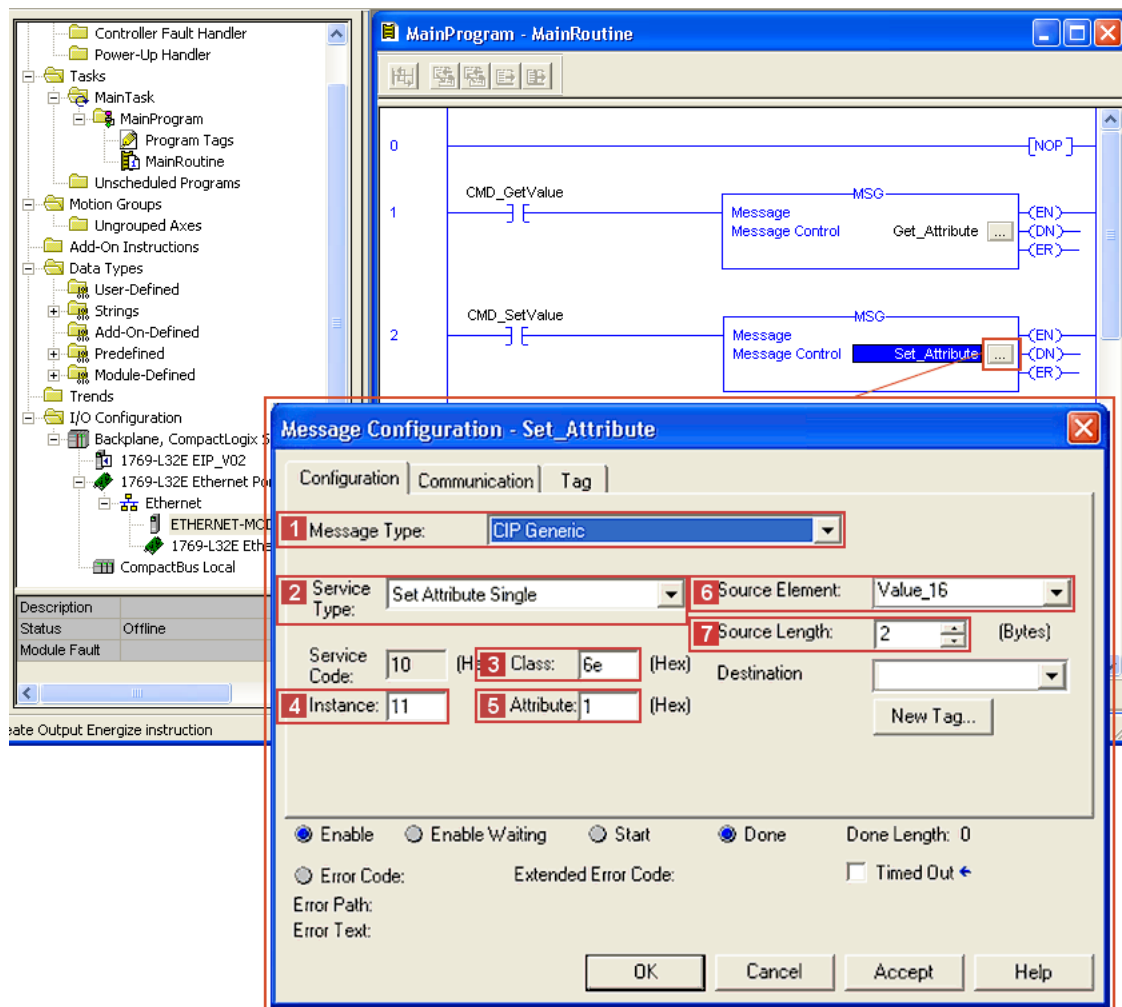
An example of parameter data transfer (read/write parameters) in a "AC Drive Profile" application can be found in the download area (Application Knowledge Base) at www.Lenze.com.

Parameter data transfer (explicit messages)

Write parameters

9.1 Write parameters

In order to write data into code **C00011** (reference speed) of the Inverter Drive 8400 motec by means of explicit message transfer, for example, the following settings are necessary:



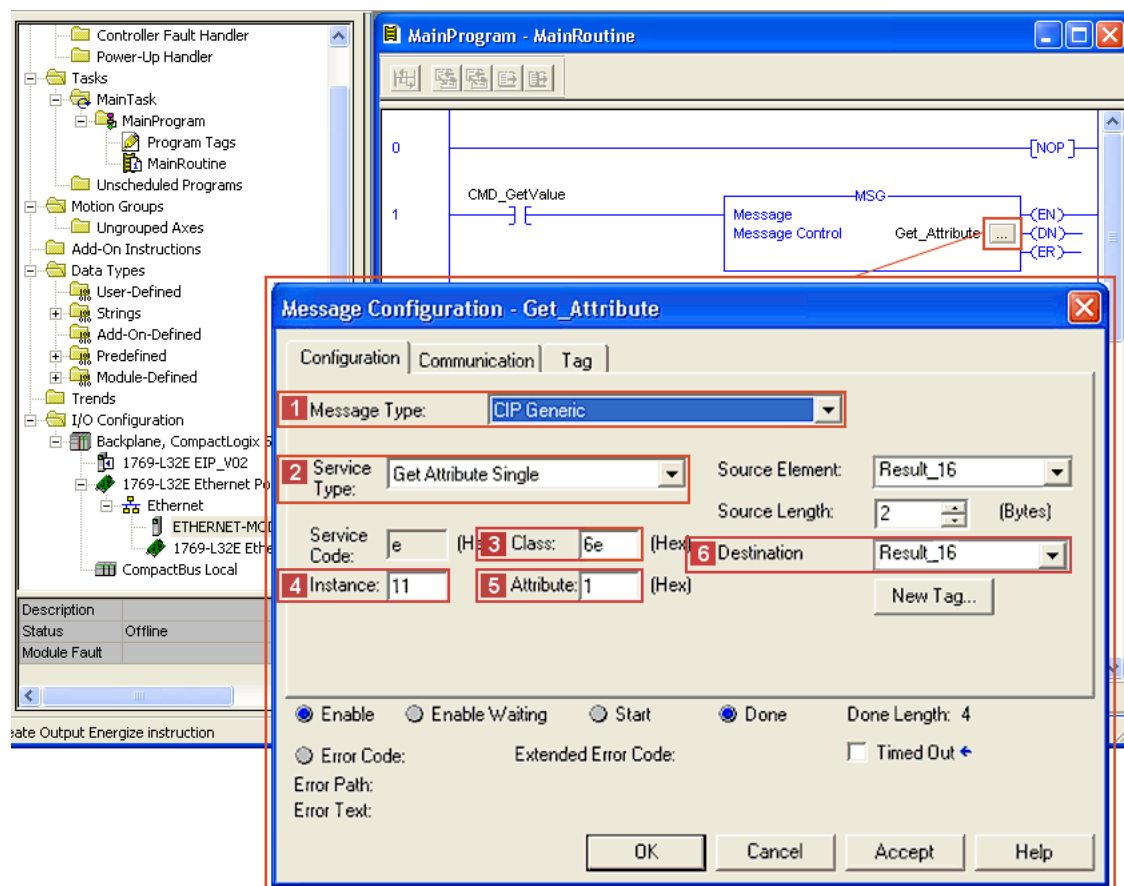
Settings	Value / description
1 Message Type	"CIP Generic"
2 Service Type	"Set Attribute Single" (service code "0x10")
3 Class	"6E" (access to Lenze code)
4 Instance	"11" = Lenze code C00011 of Inverter Drive 8400 motec
5 Attribute	"1" = Subcode of the Lenze code • If the corresponding Lenze code does not have a subcode, the value '1' must be entered here. • A display code cannot be configured by the "SET" service.
6 Source Element	Variable in the PLC program used as data source for writing.
7 Source Length	The source length has to be set to the length (data type) of the current parameter (see parameter reference in the software manual/online help of the drive). For writing to code C00011, set the source length to "2 bytes".

Parameter data transfer (explicit messages)

Read parameters

9.2 Read parameters

In order to read out Lenze code **C00011** (reference speed) of the Inverter Drive 8400 motec by means of explicit message transfer, for example, the following settings are necessary:



Settings		Value / description
1	Message Type	"CIP Generic"
2	Service Type	"Get Attribute Single" (service code "0x0E")
3	Class	"6E" (access to Lenze code)
4	Instance	"11" = Lenze code C00011 of Inverter Drive 8400 motec
5	Attribute	"1" = Subcode of the Lenze code If the corresponding Lenze code does not have a subcode, the value '1' must be entered here.
6	Destination	Variable in the PLC program the drive data will be copied to. When reading code C00011, make sure that the tag used as destination is a single word in UINT16 format.

Parameter data transfer (explicit messages)

Read parameters

For every "explicit message", the path for sending the message via the Ethernet port of the controller to the IP address of the drive needs to be set under the **Communication** tab.

If you need assistance with the setting of this path, please consult the PLC manufacturer.

The screenshot shows the 'Message Configuration - read' dialog box with the 'Communication' tab selected. The 'Path' field is highlighted with a red rectangle and contains the text 'My_E84DGFCG'. Below the path field, the same text 'My_E84DGFCG' is displayed. The 'Communication Method' section has three radio buttons: 'CIP' (selected), 'DH+', and 'CIP With Source ID'. The 'Channel' dropdown is set to '0'. The 'Destination Link' is '0'. The 'Source Link' is '0'. The 'Destination Node' is '0' with '(0 total)' next to it. There are two checked checkboxes: 'Connected' and 'Cache Connections'. At the bottom, there are several options: 'Enable' (selected), 'Enable Waiting', 'Start', 'Done', 'Done Length: 0', 'Error Code:', 'Extended Error Code:', 'Timed Out' (unchecked), 'Error Path:', and 'Error Text:'. The 'OK', 'Cancel', 'Accept', and 'Help' buttons are at the bottom right.

10 Monitoring

Fault with regard to EtherNet/IP communication

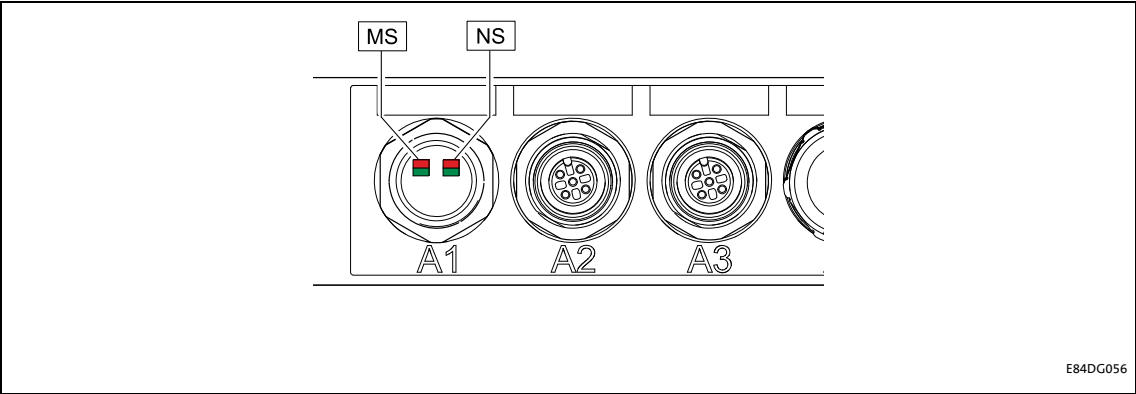
The response of the Inverter Drive 8400 motec to a fault with regard to EtherNet/IP communication can be set in the »Engineer« under the **Monitoring** tab.

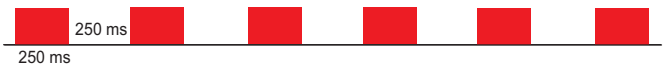
Settings	Description
1 Idle Mode	The 32-bit real time header sent by the scanner is evaluated. - Run/idle flag (bit 0) = 1: - The scanner indicates the validity of the I/O data. - Run/idle flag (bit 0) = 0: - The I/O data are invalid and the response parameterised here (C13880/1) is executed on the drive. - The I/O data are processed as set in 6 (C13885).
2 Overall Ethernet Communication Timeout	If after the time set in 4 (C13881) there is no longer any access via the »Engineer«, the response parameterised here is activated in the drive (C13880/4).
3 Fault Mode	The adapter (Communication Unit) monitors the I/O connection to the scanner. If no "implicit message" has been received within the timeout time for implicit messages parameterised by the scanner, the response parameterised here (C13880/2) is executed on the drive.
4 Overall Ethernet Timeout Time	Here, the overall message timeout time (C13881) is set. If no message has been received within this time, the response parameterised in 2 (C13880/4) is executed. The following messages are monitored: - Implicit messages - Explicit messages »Engineer« access via EtherNet/IP
5 Explicit Msg Timeout	If no "explicit message" has been received within the timeout time for explicit messages parameterised by the scanner, the response parameterised here (C13880/3) is executed on the drive.
6 Clear I/O Data	(C13885), serves to set the I/O data to be processed by the adapter to maintain internal communication if... - the CIP network status (C13862) of the controlling I/O connection is not "Connected" or - an idle event has occurred.

11 Diagnostics

EtherNet/IP communication can be diagnosed via the LEDs of the Communication Unit. Moreover, the »Engineer« serves to show diagnostic information.

11.1 LED status displays



LED	Colour / status		Description
MS	Green	Red	
	Off	Off	CIP module status: "Nonexistent" The Communication Unit is not supplied with voltage.
	Off	On	 CIP module status: "Major Unrecoverable Fault" The Communication Unit has an unrecoverable fault.
	Off	Blinking	 CIP module status: "Major Recoverable Fault" The Communication Unit has a recoverable fault.
	On	Off	 CIP module status: "Operational" The Communication Unit is working correctly.
	Blinking	Off	 CIP module status: "Standby" The Communication Unit has not been completely configured yet, or the configuration is incorrect.
	Blinking	Blinking	 CIP module status: "Device Self Testing" The Communication Unit performs a self-test.

LED	Colour / status		Description
NS	Green	Red	
	Off	Off	CIP network status: "No IP Address" The Communication Unit is not supplied with voltage or does not yet have an IP address.
	Off	On	 CIP network status: "Duplicate IP" The Communication Unit cannot access the fieldbus (IP address conflict).
	Off	Blinking	 CIP network status: "Connection Timeout" A time-out is executed.
	On	Off	 CIP network status: "Connected" The Communication Unit is working correctly and has established a connection to the scanner.
	Blinking	Off	 CIP network status: "No Connections" The Communication Unit ... • is working correctly; • has been assigned an IP address; • has not been integrated into the network by the scanner yet.
	Blinking	Blinking	 CIP network status: "Self-Test" The Communication Unit performs a self-test.

Diagnostics

Diagnosing with the »Engineer«

11.2 Diagnosing with the »Engineer«

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

Settings | Monitoring | **Diagnostics** | Process data objects

EtherNet/IP diagnostics

Address

MAC ID: 1 C 00

Active IP Address: 2 0 . 0 . 0 . 0

Active Subnetwork Mask: 3 0 . 0 . 0 . 0

Active Gateway Address: 4 0 . 0 . 0 . 0

Active Multicast IP Start Address: 5 0 . 0 . 0 . 0

Status

CIP Module Status: 7 C Nonexistent

CIP Network Status: 8 C No IP Address

Ethernet port status

Ethernet Port X1.31.A2 P1 Link: 9 C No Connection

Ethernet Port X1.32.A3 P2 Link: 10 C No Connection

6 Process data...

Display	Code
1 MAC-ID	C13003
2 Active IP Address	C13010
3 Active Subnetwork Mask	C13011
4 Active Gateway Address	C13012
5 Active multicast IP address	C13016
6 Process data	C13850 , C13851
7 CIP Module Status	C13861
8 CIP Network Status	C13862
9 Ethernet Port X31 Link State	C13863/1
10 Ethernet Port X32 Link State	C13863/2

Error messages

Short overview of the EtherNet/IP error messages

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 EtherNet/IP error messages.

12.1 Short overview of the EtherNet/IP error messages



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

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

The following table lists all EtherNet/IP error messages in the numerical order of the error numbers. Furthermore, the preset error response and - if available - the parameter for setting the error response are specified.



Tip!

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

Error no. [hex]	Subject area no. [dec]	Error no. [dec]	Error text	Error type (Error response)	Adjustable in
0x01bc3100	444	12544	EtherNet/IP: Exist. connect. to 8400 lost	1: No Response	C01501/2
0x01bc5531	444	21809	EtherNet/IP: Memory: No Access	1: No Response	C01501/2
0x01bc5532	444	21810	EtherNet/IP: Memory: Read Error	1: No Response	C01501/2
0x01bc5533	444	21811	EtherNet/IP: Memory: Write Error (nt14: COM fault 14)	1: No Response	C01501/2
0x01bc6010	444	24592	EtherNet/IP: Restart by watchdog reset	1: No Response	C01501/2
0x01bc6011	444	24593	EtherNet/IP: Internal Error	1: No Response	C01501/2
0x01bc6100	444	24832	EtherNet/IP: Internal Error	1: No Response	C01501/2
0x01bc6101	444	24833	EtherNet/IP: Internal Error	1: No Response	C01501/2
0x01bc641f	444	25631	EtherNet/IP: Invalid Parameter Set	1: No Response	C01501/2
0x01bc6420	444	25632	EtherNet/IP: Error: Lenze Setting Loaded	1: No Response	-
0x01bc6430	444	25648	EtherNet/IP: Invalid Configuration	1: No Response	-
0x01bc6533	444	25907	EtherNet/IP: Invalid IP Parameter	1: No Response	-
0x01bc8111	444	33041	EtherNet/IP: Fault Mode	1: No Response	C13880/2
0x01bc8112	444	33042	EtherNet/IP: Explicit Message Timeout	0: No Response	C13880/3
0x01bc8114	444	33044	EtherNet/IP: Overall Ethernet Timeout	0: No Response	C13880/4
0x01bc8132	444	33074	EtherNet/IP: Idle Mode (nt05: COM fault 5)	0: No Response	C13880/1
0x01bc8273	444	33395	EtherNet/IP: Duplicate IP Address	1: No Response	-

Error messages

Possible causes and remedies

12.2 Possible causes and remedies

This chapter lists all EtherNet/IP error messages in the numerical order of the error numbers. Possible causes and remedies as well as responses to the error messages are described in detail.

EtherNet/IP: Exist. connect. to 8400 lost [0x01bc3100]

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

EtherNet/IP: Memory: No Access [0x01bc5531]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☑ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
Access to memory was not possible.	Send the device and a description of the fault to Lenze.

EtherNet/IP: Memory: Read Error [0x01bc5532]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☑ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ TroubleQuickStop ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
Parameter could not be read.	• Download application again (including module). • Send the device and a description of the fault to Lenze.

EtherNet/IP: Memory: Write Error [0x01bc5533] (nt14: COM fault 14)

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☑ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ TroubleQuickStop ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
Parameter could not be written.	• Download application again (including module). • Send the device and a description of the fault to Lenze.

Error messages

Possible causes and remedies

EtherNet/IP: Restart by watchdog reset [0x01bc6010]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☒ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ TroubleQuickStop ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

EtherNet/IP: Internal Error [0x01bc6011]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☒ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

EtherNet/IP: Internal error [0x01bc6100]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☒ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ TroubleQuickStop ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

EtherNet/IP: Internal error [0x01bc6101]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☒ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ TroubleQuickStop ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
Device is defective.	Send the device and a description of the fault to Lenze.

EtherNet/IP: Invalid parameter set [0x01bc641f]

Response (Lenze setting printed in bold)	Setting: C01501/2 (☑ Adjustable response)
☒ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ TroubleQuickStop ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
No active parameter set could be loaded.	• Download application again (including module). • Send the device and a description of the fault to Lenze.

EtherNet/IP: 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 the device and a description of the fault to Lenze.

Error messages

Possible causes and remedies

EtherNet/IP: Invalid Configuration [0x01bc6430]

Response (Lenze setting printed in bold)	Setting: not possible
☐ None ☐ System fault ☒ Fault ☐ Trouble ☐ Quick stop by trouble ☐ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
Module configuration is faulty.	Check and correct module configuration.

EtherNet/IP: Invalid IP Parameters [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
One or more IP parameters are faulty.	Check and correct IP configuration. ▶ Setting the IP configuration of the Inverter Drive 8400 motec (30)

EtherNet/IP: Fault Mode [0x01bc8111]

Response (Lenze setting printed in bold)	Setting: C13880/2
☒ No reaction ☐ System fault ☒ Fault ☐ Trouble ☐ TroubleQuickStop ☒ WarningLocked ☐ Warning ☐ Information	
Cause	Remedy
• Connection to scanner has been interrupted. • Controlling I/O connection failed by timeout. • Within the timeout time for implicit messages parameterised by the scanner, no "implicit messages" have been received.	• Check cables and terminals. • Plug the network cable into the EtherNet/IP terminal. • Check Requested Package Interval (RPI) of I/O connection. • Increase timeout time for implicit messages.

EtherNet/IP: Explicit Message Timeout [0x01bc8112]

Response (Lenze setting printed in bold)	Setting: C13880/3
☒ None ☐ System error ☒ Error ☐ Fault ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
• Connection to scanner has been interrupted. • Failure of an explicit connection • Within the timeout time for explicit messages parameterised by the scanner, no "explicit messages" have been received.	• Check cables and terminals. • Plug the network cable into the EtherNet/IP terminal. • Check Requested Package Interval (RPI) of the explicit connection. • Increase timeout time for explicit messages.

EtherNet/IP: Overall Ethernet Timeout [0x01bc8114]

Response (Lenze setting printed in bold)	Setting: C13880/4
☒ None ☐ System error ☒ Error ☐ Fault ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
• Failure of »Engineer« communication via Ethernet • When the time set in C13881 has expired, there is no access via the »Engineer«.	• Check cables and terminals. • Plug in network cable. • Increase the overall Ethernet timeout time in C13881. ▶ Fault with regard to EtherNet/IP communication (77)

Error messages

Possible causes and remedies

EtherNet/IP: Idle Mode [0x01bc8132] (nt05: COM fault 5)

Response (Lenze setting printed in bold)	Setting: C13880/1
☒ None ☐ System error ☒ Error ☐ Fault ☐ Quick stop by trouble ☒ Warning locked ☐ Warning ☐ Information	
Cause	Remedy
• Scanner has received an idle event. • The scanner is in the "PROG" mode. • In the "Scanner Command Register", the run/idle flag (bit 0) is 0.	Set the scanner to the run mode. Run/idle flag (bit 0) = 1

EtherNet/IP: Duplicate IP Address [0x01bc8273]

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 IP address has been allocated twice within the network. The addresses of the network nodes must differ from each other.	Correct the IP address (C13000). ▶ Setting the IP configuration of the Inverter Drive 8400 motec (📘 30)

Error messages

CIP™ error messages

12.3 CIP™ error messages

Error code [hex]	Error designation	Description
0x000	SUCCESS	No error
0x001	...	Instance error messages (□ 121) of the Connection Manager Object (6 / 0x06) (□ 120)
0x002	RESOURCE_UNAVAILABLE	Resource required to perform the service not available.
0x003	INVALID_PARAM_VALUE	Invalid parameter value
0x008	SERVICE_NOT_SUPP	Service is not supported.
0x009	INVALID_ATTRIB_VALUE	Invalid attribute.
0x00B	ALREADY_IN_STATE	The object is already in the required state.
0x00C	OBJ_STATE_CONFLICT	The object cannot perform the service.
0x00E	ATTR_NOT_SETTABLE	The attribute is write-protected.
0x00F	PRIVILEGE_VIOLATION	Access denied.
0x010	DEVICE_STATE_CONFLICT	The current state of the device prohibits performing the requested service.
0x011	REPLY_DATA_TOO_LARGE	The response data are longer than the response buffer
0x013	NOT_ENOUGH_DATA	The data length is too short.
0x014	ATTRIBUTE_NOT_SUPP	The attribute is not supported.
0x015	TOO_MUCH_DATA	The data length is too long.
0x016	OBJECT_DOES_NOT_EXIST	The object is not supported by the adapter.
0x017	FRAGMENTATION	The fragmentation for the requested service is currently not activated.
0x020	INVALID_PARAMETER	Invalid parameter

Error messages

Mapping of Lenze device errors to DRIVECOM errors

12.4 Mapping of Lenze device errors to DRIVECOM errors

Via the instance attribute "FaultCode" of the [Control Supervisor Object \(41 / 0x29\)](#) (135) Lenze device errors are output with the DRIVECOM error numbers.

The following tables show the assignment of the Lenze device errors and "CAN Emergency Error Codes" to the DRIVECOM errors.



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

Here you will find detailed information about the Lenze error messages listed in the following table.

Lenze error		CAN	DRIVECOM error	
Error number [32 bits]	Error message	Emergency Error Code	Error number [hex]	Error message
xx.0111.00002	Su02: One mains phase is missing	0x3000	0x3000	Voltage
xx.0111.00003	Su03: Too frequent mains switching	0x3000	0x3000	Voltage
xx.0111.00004	Su04: CU insufficiently supplied	0x3000	0x3000	Voltage
xx.0111.00006	Su06: Power input overload	0x3000	0x3000	Voltage
xx.0119.00000	OH4: Heat sink temp. > Switch-off temp. -5°C	0x4000	0x4000	Temperature
xx.0119.00001	OH1: Heatsink overtemperature	0x4000	0x4000	Temperature
xx.0119.00002	OH7: Motor temperature resolver > C121	0x4000	0x4000	Temperature
xx.0119.00003	OH9: Motor overtemperature resolver	0x4000	0x4000	Temperature
xx.0119.00012	Sd6: Error temperature sensor resolver	0x7300	0x7300	Sensor
xx.0119.00015	OH3: Motor temperature (X106) triggered	0x4000	0x4000	Temperature
xx.0119.00020	OH6: Motor temperature MultiEncoder > C121	0x4000	0x4000	Temperature
xx.0119.00021	OH12: Motor overtemperature MultiEncoder	0x4000	0x4000	Temperature
xx.0119.00022	Sd12: Error temperature sensor MultiEncoder	0x7300	0x7300	Sensor
xx.0119.00050	OC5: Ixt overload	0x2000	0x2000	Current
xx.0123.00001	OT1: Maximal torque reached	0x8300	0x8302	Torque limiting
xx.0123.00007	OC7: Motor overcurrent	0x2000	0x2000	Current
xx.0123.00014	OU: DC bus overvoltage	0x3100	0x3110	Mains overvoltage
xx.0123.00015	LU: DC bus undervoltage	0x3100	0x3120	Mains undervoltage
xx.0123.00016	OC1: Power section - short circuit	0x2000	0x2130	Short Circuit
xx.0123.00017	OC2: Power section - earth fault	0x2000	0x2120	Short to Earth
xx.0123.00024	Sd2: Wire breakage resolver	0x7300	0x7303	Resolver 1 defective
xx.0123.00026	Sd7: Error encoder communication	0x7300	0x7305	Incremental encoder 1 defective
xx.0123.00027	Sd4: Wire breakage MultiEncoder	0x7300	0x7300	Sensor
xx.0123.00030	OC10: Maximum current reached	0x2000	0x2000	Current
xx.0123.00031	OC17: Clamp sets pulse inhibit	0xF000	0xF000	Additional functions
xx.0123.00032	OS1: Maximum speed limit reached	0x8400	0x8402	Velocity Limiting
xx.0123.00033	OS2: Max. motor speed	0x8400	0x8400	Speed Controller
xx.0123.00056	ID2: Motor data identification error	0xF000	0xF000	Additional functions
xx.0123.00057	ID1: Motor data identification error	0xF000	0xF000	Additional functions
xx.0123.00058	ID3: CINH motor data identification	0xF000	0xF000	Additional functions
xx.0123.00059	ID4: Error resistor identification	0xF000	0xF000	Additional functions
xx.0123.00060	ID7: Motor control does not match motor data	0xF000	0xF000	Additional functions
xx.0123.00062	Sd8: Encoder angular drift monitoring	0x7300	0x7300	Sensor
xx.0123.00065	OC12: I2xt overload - brake resistor	0xF000	0x7110	Brake Chopper
xx.0123.00071	OC11: Current clamp for too long (>1 sec)	0xF000	0xF000	Additional functions
xx.0123.00074	ID5: Error pole position identification	0xF000	0xF000	Additional functions
xx.0123.00075	ID6: Error resolver ident.	0xF000	0xF000	Additional functions

Error messages

Mapping of Lenze device errors to DRIVECOM errors

Lenze error		CAN	DRIVECOM error	
Error number [32 bits]	Error message	Emergency Error Code	Error number [hex]	Error message
xx.0123.00090	OC13: Maximum current for Fch exceeded	0x2000	0x2000	Current
xx.0123.00093	OT2: Speed controller output is limited	0xF000	0x7310	Speed
xx.0123.00094	FC01: Switching frequency reduction	0x2000	0xF000	Additional functions
xx.0123.00095	FC02: Maximum speed for Fchop	0xF000	0xF000	Additional functions
xx.0123.00096	OC14: Limitation direct-axis current controller	0xF000	0xF000	Additional functions
xx.0123.00097	OC15: Limitation cross current controller	0xF000	0xF000	Additional functions
xx.0123.00098	OC16: Limitation torque controller	0xF000	0xF000	Additional functions
xx.0123.00099	FC03: Limitation field controller	0xF000	0xF000	Additional functions
xx.0123.00105	OC6: l2xt overload - motor	0x2000	0x7120	Motor
xx.0123.00145	LP1: Motor phase failure	0x3000	0x3130	Phase Failure
xx.0123.00200	SD10: Speed limit - feedback system 12	0x7300	0x7300	Sensor
xx.0123.00201	SD11: Speed limit - feedback system 67	0x7300	0x7300	Sensor
xx.0123.00205	SD3: Open circuit - feedback system	0x7300	0x7301	Tacho defective
xx.0125.00001	An01: AIN1_I < 4 mA	0xF000	0xF000	Additional functions
xx.0125.00002	An02: AIN2_I < 4 mA	0xF000	0xF000	Additional functions
xx.0126.00001	Ab01: Axis bus timeout	0x8000	0x8000	Monitoring
xx.0126.00002	Ab02: Axis bus IO error	0x8100	0x8100	Communication
xx.0127.00002	CE04: MCI communication error	0x7000	0x7500	Communication
xx.0127.00015	CE0F: MCI control word	0xF000	0xF000	Additional functions
xx.0131.00000	CE4: CAN Bus Off	0x8000	0x8000	Monitoring
xx.0131.00006	CA06: CAN CRC error	0x8000	0x8000	Monitoring
xx.0131.00007	CA07: CAN Bus Warn	0x8000	0x8000	Monitoring
xx.0131.00008	CA08: CAN Bus Stopped	0x8000	0x8000	Monitoring
xx.0131.00011	CA0b: CAN HeartBeatEvent	0x8130	0x8000	Monitoring
xx.0131.00015	CA0F: CAN control word	0xF000	0x8000	Monitoring
xx.0135.00001	CE1: CAN RPDO1	0x8100	0x8100	Communication
xx.0135.00002	CE2: CAN RPDO2	0x8100	0x8100	Communication
xx.0135.00003	CE3: CAN RPDO3	0x8100	0x8100	Communication
xx.0135.00004	CP04: CAN RPDO4	0x8100	0x8100	Communication
xx.0140.00013	CI01: Module missing/incompatible	0x7000	0x7000	Additional Modules
xx.0144.00001	PS01: No memory module	0x6300	0x6300	Date Set
xx.0144.00002	PS02: Par. set invalid	0x6300	0x6300	Date Set
xx.0144.00003	PS03: Par. set device invalid	0x6300	0x6300	Date Set
xx.0144.00004	PS04: Par. set device incompatible	0x6300	0x6300	Date Set
xx.0144.00007	PS07: Par. mem. module invalid	0x6300	0x6300	Date Set
xx.0144.00008	PS08: Par. device invalid	0x6300	0x6300	Date Set
xx.0144.00009	PS09: Par. format invalid	0x6300	0x6300	Date Set
xx.0144.00010	PS10: Memory module link invalid	0x5000	0x5000	Device Hardware
xx.0144.00031	PS31: Ident. error	0x6300	0x6300	Date Set
xx.0145.00014	dF14: SW-HW invalid	0x5530	0x6000	Device software
xx.0145.00015	dF15: DCCOM CU2 error	0x6100	0x6100	Internal software
xx.0145.00024	dF18: BU RCOM error	0x6100	0x6100	Internal software
xx.0145.00025	dF25: CU RCOM error	0x6100	0x6100	Internal software
xx.0145.00026	dF26: Appl. watchdog	0x6200	0x6010	Software reset (watchdog)
xx.0145.00033	dF21: BU watchdog	0x6100	0x6010	Software reset (watchdog)
xx.0145.00034	dF22: CU Watchdog	0x6100	0x6010	Software reset (watchdog)
xx.0145.00035	dF10: AutoTrip reset	0xF000	0xF000	Additional functions
xx.0145.00050	dF50: Retain error	0x6100	0x6100	Internal software
xx.0145.00051	dF51: CuCcr error	0x6100	0x6100	Internal software
xx.0145.00052	dF52: BuCcr error	0x6100	0x6100	Internal software

Error messages

Mapping of Lenze device errors to DRIVECOM errors

Lenze error		CAN	DRIVECOM error	
Error number [32 bits]	Error message	Emergency Error Code	Error number [hex]	Error message
xx.0184.00001	Ck01: Pos. HW limit switch	0x8600	0x8600	Positioning controller
xx.0184.00002	Ck02: Neg. HW limit switch	0x8600	0x8600	Positioning controller
xx.0184.00005	Ck15: Error message sig. brake	0x8600	0x8600	Positioning controller
xx.0184.00007	Ck03: Pos. SW limit position	0x8600	0x8600	Positioning controller
xx.0184.00008	Ck04: Neg. SW limit position	0x8600	0x8600	Positioning controller
xx.0184.00015	Ck14: Target position outside SW limit position	0x8600	0x8600	Positioning controller
xx.0184.00064	Ck16: Time overrun manual operation	0x8600	0x8600	Positioning controller
xx.0184.00153	Ck05: Error following error 1	0x8611	0x8611	Following error
xx.0184.00154	Ck06: Error following error 2	0x8611	0x8611	Following error
xx.0184.00155	Ck07: Traversing range limit exceeded	0x8612	0x8612	Reference limit
xx.0184.00156	Ck08: Reference position unknown	0x8612	0x8612	Reference limit
xx.0184.08005	Ck09: Positioning mode invalid	0x8600	0x8600	Positioning controller
xx.0184.08007	Ck10: Profile data implausible	0x8600	0x8600	Positioning controller
xx.0184.08009	Ck11: Operating mode invalid	0x8600	0x8600	Positioning controller
xx.0184.08014	Ck12: Profile number invalid	0x8600	0x8600	Positioning controller
xx.0184.08015	Ck13: Error FB MCKCtrlInterface	0x8600	0x8600	Positioning controller
xx.0400.00009	dH09: EEPROM power unit	0x5530	0x7600	Data memory
xx.0400.00016	dH10: Fan failure	0x5000	0x5000	Device Hardware
xx.0400.00104	dH68: Adjustment data error CU	0x5530	0x6000	Device software
xx.0400.00105	dH69: Adjustment data error BU	0x5530	0x6000	Device software
xx.0980.00001	User error 1	0x6200	0x6200	User software
xx.0981.00002	User error 2	0x6200	0x6200	User software
xx.0982.00003	User error 3	0x6200	0x6200	User software
xx.0983.00004	User error 4	0x6200	0x6200	User software
xx.0984.00001	User error 5	0x6200	0x6200	User software
xx.0985.00002	User error 6	0x6200	0x6200	User software
xx.0986.00003	User error 7	0x6200	0x6200	User software
xx.0987.00004	User error 8	0x6200	0x6200	User software

Error messages

Mapping of Lenze device errors to DRIVECOM errors

EtherNet/IP error messages

Lenze error		DRIVECOM error	
Error number [32 bits]	Error message	Error number [hex]	Error message
xx.0444.12544	EtherNet/IP: Exist. connect. to 8400 lost	0x7510	Serial Interface No 1
xx.0444.21809	EtherNet/IP: Memory: No Access	0x7600	Data memory
xx.0444.21810	EtherNet/IP: Memory: Read Error	0x7600	Data memory
xx.0444.21811	EtherNet/IP: Memory: Write Error	0x7600	Data memory
xx.0444.24592	EtherNet/IP: Restart by Watchdogreset	0x6010	Software reset (watchdog)
xx.0444.24593	EtherNet/IP: Internal Error	0x6100	Internal software
xx.0444.24832	EtherNet/IP: Internal Error	0x6100	Internal software
xx.0444.24833	EtherNet/IP: Internal Error	0x6100	Internal software
xx.0444.25631	EtherNet/IP: Invalid Parameter Set	0x7421	Invalid Parameters
xx.0444.25632	EtherNet/IP: Error: Lenze Setting Loaded	0x7421	Invalid Parameters
xx.0444.25648	EtherNet/IP: Invalid Configuration	0x7421	Invalid Parameters
xx.0444.25907	EtherNet/IP: Invalid IP Parameter	0x7421	Invalid Parameters
xx.0444.33041	EtherNet/IP: Fault Mode	0x7000	Additional Modules
xx.0444.33042	EtherNet/IP: Explicit Message Timeout	0x7500	Communication
xx.0444.33044	EtherNet/IP: Overall Ethernet Timeout	0x7500	Communication
xx.0444.33074	EtherNet/IP: Idle Mode	0x7000	Additional Modules
xx.0444.33395	EtherNet/IP: Duplicate IP Address	0x7421	Invalid Parameters

Parameter reference

Parameters of the Communication Unit

13 Parameter reference

This chapter supplements 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 of the E84DGFCGxxx Communication Unit (EtherNet/IP).

13.1 Parameters of the Communication Unit



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

Here you will find general information on parameters.

This chapter lists the parameters of the E84DGFCGxxx Communication Unit (EtherNet/IP) in numerically ascending order.

C13000

Parameter Name: C13000 IP Address			Data type: UNSIGNED_8 Index: 11575 = 0x2D37
Setting of the IP address ▶ Setting the IP configuration of the Inverter Drive 8400 motec (📖 30)			
Setting range (min. value unit max. value)			
0		255	
Subcodes	Lenze setting	Info	
C13000/1	192	IP address (most significant byte)	
C13000/2	168	IP address	
C13000/3	124	IP address	
C13000/4	16	IP address (least significant byte)	
☒ 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_8 Index: 11574 = 0x2D36
Setting of the subnet mask ▶ Setting the IP configuration of the Inverter Drive 8400 motec (📖 30)			
Setting range (min. value unit max. value)			
0		255	
Subcodes	Lenze setting	Info	
C13001/1	255	Subnet mask (most significant byte)	
C13001/2	255	Subnet mask	
C13001/3	255	Subnet mask	
C13001/4	0	Subnet mask (least significant byte)	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

Parameter reference

Parameters of the Communication Unit

C13002

Parameter Name: C13002 Gateway Address		Data type: UNSIGNED_8 Index: 11573 = 0x2D35	
Setting of the gateway address ▶ Setting the IP configuration of the Inverter Drive 8400 motec (📖 30)			
Setting range (min. value unit max. value)			
0			
Subcodes	Lenze setting	Info	
C13002/1	0	Gateway address (most significant byte)	
C13002/2	0	Gateway address	
C13002/3	0	Gateway address	
C13002/4	0	Gateway address (least significant byte)	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13003

Parameter Name: C13003 MAC ID	Data type: OCTET_STRING Index: 11572 = 0x2D34
Display of the MAC-ID	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13005

Parameter Name: C13005 IP Config Control		Data type: UNSIGNED_8 Index: 11570 = 0x2D32	
Selection how the IP configuration is to be effected. (Instance attribute 3 (Configuration Control) in the TCP/IP Interface Object (245 / 0xF5) (📘 126)) ▶ Setting the IP configuration of the Inverter Drive 8400 motec (📘 30)			
Selection list (Lenze setting printed in bold)		Info	
0	Use stored IP	The IP configuration currently saved in the Communication Unit is used.	
1	Use BOOTP	The IP configuration is assigned by the scanner using BOOTP.	
2	Use DHCP	The IP configuration is assigned by the scanner using DHCP. The assignment of a gateway address which is not in the same subnetwork than the IP address, is rejected.	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

Parameter reference

Parameters of the Communication Unit

C13006

Parameter Name: C13006 Multicast IP Start Address		Data type: UNSIGNED_8 Index: 11569 = 0x2D31	
Setting of the multicast IP address ▶ Setting the IP configuration of the Inverter Drive 8400 motec (📘 30)			
Setting range (min. value unit max. value)			
0			
Subcodes	Lenze setting	Info	
C13006/1	239	Multicast IP start address (most significant byte)	
C13006/2	64	Multicast IP start address	
C13006/3	2	Multicast IP start address	
C13006/4	224	Multicast start address (least significant byte)	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13010

Parameter Name: C13010 Active IP Address			Data type: UNSIGNED_8 Index: 11565 = 0x2D2D		
Display of the active IP address (Instance attribute 5 (IP Address) in the TCP/IP Interface Object (245 / 0xF5) ( 126))					
Display range (min. value unit max. value)					
0		255			
Subcodes			Info		
C13010/1			Active IP address (most significant byte)		
C13010/2			Active IP Address		
C13010/3			Active IP Address		
C13010/4			Active IP address (least significant byte)		
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

C13011

Parameter Name: C13011 Active Subnetwork Mask			Data type: UNSIGNED_8 Index: 11564 = 0x2D2C		
Display of the active subnetwork mask (Instance attribute 5 (IP Network Mask) in the TCP/IP Interface Object (245 / 0xF5) ( 126))					
Display range (min. value unit max. value)					
0		255			
Subcodes			Info		
C13011/1			Active subnet mask (most significant byte)		
C13011/2			Active Subnetwork Mask		
C13011/3			Active Subnetwork Mask		
C13011/4			Active subnet mask (least significant byte)		
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

Parameter reference

Parameters of the Communication Unit

C13012

Parameter Name: C13012 Active Gateway Address			Data type: UNSIGNED_8 Index: 11563 = 0x2D2B
Display of the active gateway address (Instance attribute 5 (Gateway Address) in the TCP/IP Interface Object (245 / 0xF5) (□ 126))			
Display range (min. value unit max. value)			
0		255	
Subcodes			Info
C13012/1			Active gateway address (most significant byte)
C13012/2			Active gateway address
C13012/3			Active gateway address
C13012/4			Active gateway address (least significant byte)
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13016

Parameter Name: C13016 Active Multicast IP Address			Data type: UNSIGNED_8 Index: 11559 = 0x2D27		
Display of the active multicast IP address					
Display range (min. value unit max. value)					
0		255			
Subcodes			Info		
C13016/1			Multicast IP address (most significant byte)		
C13016/2			Multicast IP address		
C13016/3			Multicast IP address		
C13016/4			Multicast IP address (least significant byte)		
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT					

Parameter reference

Parameters of the Communication Unit

C13017

Parameter Name: C13017 Ethernet Config Control		Data type: UNSIGNED_16 Index: 11558 = 0x2D26
Setting of the baud rate for the Ethernet connections		
Selection list		
0	Auto-Negotiation	
1	10 Mbps	
2	100 Mbps	
3	Reserved	
4	Reserved	
5	10 Mbps/Half Duplex	
6	10 Mbps/Full Duplex	
7	100 Mbps/Half Duplex	
8	100 Mbps/Full Duplex	
9	Reserved	
10	Reserved	
11	Reserved	
12	Reserved	
Subcodes	Lenze setting	Info
C13017/1	0: Auto-Negotiation	Ethernet setting port X31
C13017/2	0: Auto-Negotiation	Ethernet setting port X32
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13018

Parameter Name: C13018 Multicast Config Alloc Control		Data type: UNSIGNED_8 Index: 11557 = 0x2D25
Selection for multicast IP addressing via instance attribute 9 (Mcast Config) in the TCP/IP Interface Object (245 / 0xF5) (□ 126)		
Selection list (Lenze setting printed in bold)		
0	Default Allocation Algorithm	
1	Multicast IP Start Address	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO MAP RX ☐ PDO MAP TX ☐ COM ☐ MOT		

C13019

Parameter Name: C13019 Multicast Config TTL Value		Data type: UNSIGNED_8 Index: 11556 = 0x2D24
Setting of the multicast TTL value for the validity time of data packets in the EtherNet/IP network (Instance attribute 8 (TTL Value) in the TCP/IP Interface Object (245 / 0xF5) (□ 126))		
Setting range (min. value unit max. value)		Lenze setting
1	255	1
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

Parameter reference

Parameters of the Communication Unit

C13020

Parameter Name: C13020 Multicast Config Num Mcast		Data type: UNSIGNED_8 Index: 11555 = 0x2D23	
Used to set how many multicast IP addresses will be assigned. (Instance attribute 9 (Num Mcast) in the TCP/IP Interface Object (245 / 0xF5) (126))			
Setting range (min. value unit max. value)		Lenze setting	
1		8	1
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13021

Parameter Name: C13021 Quality of Service (VLAN-Tagging)		Data type: UNSIGNED_8 Index: 11554 = 0x2D22	
Used to set whether QoS tags will be used for the prioritisation of the data packets to be transferred. (Instance attribute 1 (802.1Q Tag Enable) in the Quality of Service (QoS) Object (72 / 0x48) (124))			
Selection list (Lenze setting printed in bold)			
0	802.1Q Tag Disable		
1	802.1Q Tag Enable		
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13022

Parameter Name: C13022 Quality of Service (DSCP)			Data type: UNSIGNED_8 Index: 11553 = 0x2D21
Setting for the prioritisation of the data packets to be transferred using Differentiated Services Codepoints (DSCP)			
Setting range (min. value unit max. value)			
0			
Subcodes	Lenze setting	Info	
C13022/1	59	Reserved	
C13022/2	47	Reserved	
C13022/3	55	Reserved	
C13022/4	47	QoS DSCP Scheduled (Instance attribute 5 (DSCP Scheduled) in the Quality of Service (QoS) Object (72 / 0x48) (124))	
C13022/5	43	QoS DSCP High Prio (Instance attribute 6 (DSCP High Prio) in the Quality of Service (QoS) Object (72 / 0x48) (124))	
C13022/6	31	Reserved	
C13022/7	27	QoS DSCP Explicit Msg (Instance attribute 8 (DSCP Explicit Msg.) in the Quality of Service (QoS) Object (72 / 0x48) (124))	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

Parameter reference

Parameters of the Communication Unit

C13840

Parameter Name: C13840 DLR Network Topology		Data type: UNSIGNED_8 Index: 10735 = 0x29EF
Display of the used DLR network topology (Device Level Ring) (Instance attribute 1 (Network Topology) in the Device Level Ring (DLR) Object (71 / 0x47) (122))		
Selection list (read only)		
0	Linear	
1	Ring	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13841

Parameter Name: C13841 DLR Network Status		Data type: UNSIGNED_8 Index: 10734 = 0x29EE
Display of the DLR network status (Device Level Ring) (Instance attribute 2 (Network Status) in the Device Level Ring (DLR) Object (71 / 0x47) (122))		
Selection list (read only)		
0	Normal	
1	Ring Fault	
2	Unexpected Loop detected	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13842

Parameter Name: C13842 Supervisor IP Address		Data type: UNSIGNED_8 10733 = 0x29ED	
Display of the supervisor IP address (Instance attribute 10 (Supervisor IP Address) in the Device Level Ring (DLR) Object (71 / 0x47) (122))			
Display range (min. value unit max. value)			
0			
Subcodes		Info	
C13842/1		Supervisor IP address (most significant byte)	
C13842/2		Supervisor IP Address	
C13842/3		Supervisor IP Address	
C13842/4		Supervisor IP address (least significant byte)	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13843

Parameter Name: C13843 Supervisor MAC ID		Data type: OCTET_STRING Index: 10732 = 0x29EC
Display of the supervisor MAC ID (Instance attribute 10 (Supervisor MAC Address) in the Device Level Ring (DLR) Object (71 / 0x47) (122))		
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

Parameter reference

Parameters of the Communication Unit

C13844

Parameter Name: C13844 Beacon Times		Data type: UNSIGNED_32 Index: 10731 = 0x29EB
Display of the beacon times (µs)		
Subcodes		Info
C13844/1		Beacon interval
C13844/2		Beacon timeout
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13845

Parameter Name: C13845 Beacon Frames		Data type: UNSIGNED_32 Index: 10730 = 0x29EA
Display of beacon frame information		
Subcodes	Info	
C13845/1	Beacon frames - port X31	
C13845/2	Beacon frame error - port X31	
C13845/3	Beacon frames - port X32	
C13845/4	Beacon frame error - port X32	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13846

Parameter Name: C13846 Address Conflict Detection		Data type: UNSIGNED_8 Index: 10729 = 0x29E9
Activation of the address conflict detection (ACD) (Instance attribute 10 (SelectAcid) in the TCP/IP Interface Object (245 / 0xF5) ( 126)) Changing this value requires a reset of the device ("power off/on" or "type 0 reset").		
Selection list (Lenze setting printed in bold)		
0	Deactivated	
1	Enable	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13847

Parameter Name: C13847 Active Conflict Detection State		Data type: UNSIGNED_8 Index: 10728 = 0x29E8
Display of the status of address conflict detection (ACD)		
Selection list (read only)		
0	Not conflicted	
1	Conflicted	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

Parameter reference

Parameters of the Communication Unit

C13848

Parameter Name: C13848 Last Conflicted MAC ID	Data type: OCTET_STRING Index: 10727 = 0x29E7
Display of the MAC address of the EtherNet/IP node with the last address conflict (ACD). The data of the last conflict will only be saved in this code if ACD is active at the moment when the conflict occurs (C13846 = 1). (Instance attribute 11 (RemoteMAC) in the TCP/IP Interface Object (245 / 0xF5) (□ 126))	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13849

Parameter Name: C13849 Last Conflicted IP Address	Data type: UNSIGNED_8 Index: 10726 = 0x29E6
Display of the IP address of the EtherNet/IP node with the last address conflict (ACD). The data of the last conflict will only be saved in this code if ACD is active at the moment when the conflict occurs (C13846 = 1).	
Display range (min. value unit max. value)	
0	255
Subcodes	Info
C13849/1	Last conflicted IP address (most significant byte)
C13849/2	Last conflicted IP address
C13849/3	Last conflicted IP address
C13849/4	Last conflicted IP address (least significant byte)
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C13850

Parameter Name: C13850 All words to scanner	Data type: INTEGER_16 Index: 10725 = 0x29E5
Display of the I/O data words transferred from the Communication Unit (adapter) to the scanner. In the subcodes, all I/O data words transferred to the scanner are displayed. However, only the configured I/O data words are valid.	
Display range (min. value unit max. value)	
-32768	32767
Subcodes	Info
C13850/1	
...	
C13850/10	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

Parameter reference

Parameters of the Communication Unit

C13851

Parameter Name: C13851 All words from scanner			Data type: INTEGER_16 Index: 10724 = 0x29E4	
Display of the I/O data words transferred from the scanner to the Communication Unit (adapter). In the subcodes, all I/O data words transferred from the scanner are displayed. However, only the configured I/O data words are valid.				
Display range (min. value unit max. value)				
-32768		32767		
Subcodes			Info	
C13851/1				
...				
C13851/8				
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT				

C13858

Parameter Name: C13858 Ethernet Port Statistics		Data type: UNSIGNED_32 Index: 10717 = 0x29DD
Display of statistical values for the data transfer via the Ethernet connections		
Subcodes		Info
C13858/1		Ethernet port X31: RX
C13858/2		Ethernet port X31: RX CRC error
C13858/3		Ethernet port X31: RX discarded
C13858/4		Ethernet port X31: TX
C13858/5		Ethernet port X31: TX discarded
C13858/6		Ethernet port X32: RX
C13858/7		Ethernet port X32: RX CRC error
C13858/8		Ethernet port X32: RX discarded
C13858/9		Ethernet port X32: TX
C13858/10		Ethernet port X32: TX discarded
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13861

Parameter Name: C13861 CIP Module Status		Data type: UNSIGNED_16 Index: 10714 = 0x29DA
Display of the current CIP module status (Instance attribute 8 (State) in the Identity Object (1 / 0x01) (110)) The status is also indicated via the MS LED. LED status displays (78)		
Selection list (read only)		
0	Nonexistent	
1	Device Self Testing	
2	Standby	
3	Operational	
4	Major Recoverable Fault	
5	Major Unrecoverable Fault	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

Parameter reference

Parameters of the Communication Unit

C13862

Parameter Name: C13862 CIP Network Status		Data type: UNSIGNED_16 Index: 10713 = 0x29D9
Display of the current CIP network status The status is also indicated via the NS LED. ▶ LED status displays (78)		
Selection list (read only)		
0	No IP Address	
1	Nonexistent	
2	Established	
3	Timed Out	
4	Duplicate IP	
5	Self-Test	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13863

Parameter Name: C13863 Ethernet Port		Data type: UNSIGNED_16 Index: 10712 = 0x29D8
Display of the baud rate currently used on the Ethernet connections		
Selection list (read only)		
0	Nonexistent	
1	10 Mbps/Half Duplex	
2	10 Mbps/Full Duplex	
3	100 Mbps/Half Duplex	
4	100 Mbps/Full Duplex	
5	Reserved	
6	Reserved	
Subcodes		Info
C13863/1		Ethernet port X31 link state
C13863/2		Ethernet port X32 link state
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13870

Parameter Name: C13870 CIP Connections State		Data type: UNSIGNED_16 Index: 10705 = 0x29D1
Display of the current CIP connection status		
Selection list (read only)		
0	Nonexistent	
3	Established	
4	Timed Out	
Subcodes		Info
C13870/1		Status of CIP connection 1
...		...
C13870/8		Status of CIP connection 8
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

Parameter reference

Parameters of the Communication Unit

C13871

Parameter Name: C13871 CIP Connections Type		Data type: UNSIGNED_16 Index: 10704 = 0x29D0
Display of the current CIP connection types • "Listen Only" connections are not displayed.		
Selection list (read only)		
0	Nonexistent	
1	Exclusive Owner	
2	Input Only	
3	Listen Only	
4	Explicit Connection	
Subcodes		Info
C13871/1		Type of CIP connection 1
...		...
C13871/8		Type of CIP connection 8
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13872

Parameter Name: C13872 CIP Connection Triggers		Data type: UNSIGNED_16 Index: 10703 = 0x29CF
Display of the current CIP connection class		
Selection list (read only)		
0	Nonexistent	
1	Class 1, Cyclic, Client	
163	Class 3, App. Obj., Server	
Subcodes		Info
C13872/1		Trigger of CIP connection 1
...		...
C13872/8		Trigger of CIP connection 8
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13873

Parameter Name: C13873 CIP Connections RPI		Data type: UNSIGNED_32 Index: 10702 = 0x29CE
Display of the RPI times (Requested Package Interval) currently used for the CIP connections ("Originator to Target" time)		
Display range (min. value unit max. value)		
0	ms	
4294967295		
Subcodes		Info
C13873/1		RPI of CIP connection 1
...		...
C13873/8		RPI of CIP connection 8
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

Parameter reference

Parameters of the Communication Unit

C13874

Parameter Name: C13874 CIP Connections Timeout Time			Data type: UNSIGNED_32 Index: 10701 = 0x29CD
Display of the timeouts (ms) of the CIP connections			
Display range (min. value unit max. value)			
0	ms	4294967295	
Subcodes			Info
C13874/1			Timeout time of CIP connection 1
...			...
C13874/8			Timeout time of CIP connection 8
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13875

Parameter Name: C13875 CIP Connections RUN/IDLE Flag		Data type: UNSIGNED_16 Index: 10700 = 0x29CC	
Display of the run and idle flags of the CIP connections			
Selection list (read only)			
0	Nonexistent		
1	IDLE		
2	RUN		
Subcodes		Info	
C13875/1		RUN/IDLE flag - CIP connection 1	
...		...	
C13875/8		RUN/IDLE flag - CIP connection 8	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13880

Parameter Name: C13880 Monitoring Reaction		Data type: UNSIGNED_8 Index: 10695 = 0x29C7	
Setting of the monitoring response in the event of a Fault with regard to EtherNet/IP communication (📘 77) (Mapping of the Lenze object Lenze Class (101 / 0x65) (📘 139)) A change in the monitoring response becomes immediately effective.			
Selection list			
0	No response		
1	Fault		
4	Warning Locked		
Subcodes	Lenze setting	Info	
C13880/1	0: No Response	Idle Mode	
C13880/2	1: No Response	Fault Mode (only for "exclusive owner" connections)	
C13880/3	0: No Response	Expl. message timeout	
C13880/4	0: No Response	Overall Ethernet communication timeout	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

Parameter reference

Parameters of the Communication Unit

C13881

Parameter Name: C13881 Overall Ethernet Timeout Time			Data type: UNSIGNED_16 Index: 10694 = 0x29C6
Setting of the overall monitoring time (see Fault with regard to EtherNet/IP communication (□ 77)) A change in the monitoring response becomes immediately effective.			
Setting range (min. value unit max. value)			Lenze setting
500	ms	65535	10000 ms
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13885

Parameter Name: C13885 Clear I/O Data		Data type: UNSIGNED_8 Index: 10690 = 0x29C2
Setting which I/O data are to be processed by the adapter to maintain internal communication if ... • the network status of the controlling I/O connection is "Not connected" (see C13862) or • an idle event has occurred. Changes in the setting becomes effective immediately. (See Fault with regard to EtherNet/IP communication (📖 77).)		
Selection list (Lenze setting printed in bold)		
0	Use of last Scanner Output Data	
1	Clear Scanner Output Data	
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13899

Parameter Name: C13899 Hostname		Data type: VISIBLE_STRING Index: 10676 = 0x29B4
Each subcode contains a string with a length of 32 bytes indicating the designation of the EtherNet/IP node. (Instance attribute 6 (Host Name) in the TCP/IP Interface Object (245 / 0xF5) (📖 126))		
Subcodes	Lenze setting	Info
C13899/1		Host name
C13899/2		Host name
☒ Read access ☒ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C13900

Parameter Name: C13900 Firmware Product Type			Data type: VISIBLE_STRING Index: 10675 = 0x29B3
The code contains a string with a length of 8 bytes. The identification code "E84DGFCG" is displayed.			
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13901

Parameter Name: C13901 Firmware Compilation Date			Data type: VISIBLE_STRING Index: 10674 = 0x29B2
The code contains a string with a length of 20 bytes. 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			

Parameter reference

Parameters of the Communication Unit

C13902

Parameter Name: C13902 Firmware Version	Data type: VISIBLE_STRING Index: 10673 = 0x29B1
The code contains a string with a length of 11 bytes. The firmware version is displayed (e.g. "00.01.00.00").	
☒ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

Parameter reference

Table of attributes

13.2 Table of attributes

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

How to read the table of attributes:

Column		Meaning	Entry	
Code		Parameter name	Cxxxxx	
Name		Parameter short text (display text)	Text	
Index	dec	Index under which the parameter is addressed. The subindex for array variables corresponds to the Lenze subcode number.	24575 - Lenze code number	Is only required for access via a bus system.
	hex		0x5FFF - Lenze code number	
Data	DS	Data structure	E	Single variable (only one parameter element)
			A	Array variable (several parameter elements)
	DA	Number of array elements (subcodes)	Number	
	DT	Data type	BITFIELD_8	1 byte, bit-coded
			BITFIELD_16	2 bytes, bit-coded
			BITFIELD_32	4 bytes, bit-coded
			INTEGER_8	1 byte, with sign
			INTEGER_16	2 bytes with sign
			INTEGER_32	4 bytes, with sign
			UNSIGNED_8	1 byte without sign
			UNSIGNED_16	2 bytes without sign
			UNSIGNED_32	4 bytes, without sign
			VISIBLE_STRING	ASCII string
			OCTET_STRING	
	Factor	Factor for data transmission via a bus system, depending on the number of decimal positions	Factor	1 = No decimal positions 10 = 1 decimal position 100 = 2 decimal positions 1000 = 3 decimal positions
Access	R	Read access	☒ Reading permitted	
	W	Write access	☒ Writing permitted	
	CINH	Controller inhibit (CINH) required	☒ Writing is only possible when the controller is inhibited	

Parameter reference

Table of attributes

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C13000	IP address	11575	0x2D37	A	4	UNSIGNED_8		☒	☒	
C13001	Subnet mask	11574	0x2D36	A	4	UNSIGNED_8		☒	☒	
C13002	Gateway address	11573	0x2D35	A	4	UNSIGNED_8		☒	☒	
C13003	MAC-ID	11572	0x2D34	E	1	OCTET_STRING		☒		
C13005	IP Config Control	11570	0x2D32	E	1	UNSIGNED_8	1	☒	☒	
C13006	Multicast IP Start Address	11569	0x2D31	A	4	UNSIGNED_8		☒	☒	
C13010	Active IP Address	11565	0x2D2D	A	4	UNSIGNED_8	1	☒		
C13011	Active Subnetwork Mask	11564	0x2D2C	A	4	UNSIGNED_8	1	☒		
C13012	Active gateway address	11563	0x2D2B	A	4	UNSIGNED_8	1	☒		
C13016	Active Multicast IP Address	11559	0x2D27	A	4	UNSIGNED_8	1	☒		
C13017	Ethernet Config Control	11558	0x2D26	A	2	UNSIGNED_16	1	☒	☒	
C13018	Multicast Config Alloc Control	11557	0x2D25	E	1	UNSIGNED_8	1	☒	☒	
C13019	Multicast Config TTL Value	11556	0x2D24	E	1	UNSIGNED_8	1	☒	☒	
C13020	Multicast Config Num Mcast	11555	0x2D23	E	1	UNSIGNED_8	1	☒	☒	
C13021	Quality of Service (VLAN-Tagging)	11554	0x2D22	E	1	UNSIGNED_8	1	☒	☒	
C13022	Quality of Service (DSCP)	11553	0x2D21	A	7	UNSIGNED_8		☒	☒	
C13840	DLR Network Topology	10735	0x29EF	E	1	UNSIGNED_8	1	☒		
C13841	DLR Network Status	10734	0x29EE	E	1	UNSIGNED_8	1	☒		
C13842	Supervisor IP Address	10733	0x29ED	A	4	UNSIGNED_8	1	☒		
C13843	Supervisor MAC ID	10732	0x29EC	E	1	OCTET_STRING		☒		
C13844	Beacon Times	10731	0x29EB	A	2	UNSIGNED_32	1	☒		
C13845	Beacon Frames	10730	0x29EA	A	4	UNSIGNED_32	1	☒		
C13846	Address Conflict Detection	10729	0x29E9	E	1	UNSIGNED_8	1	☒	☒	
C13847	Active Conflict Detection State	10728	0x29E8	E	1	UNSIGNED_8	1	☒		
C13848	Last Conflicted MAC ID	10727	0x29E7	E	1	OCTET_STRING		☒		
C13849	Last Conflicted IP Address	10726	0x29E6	A	4	UNSIGNED_8	1	☒		
C13850	All words to scanner	10725	0x29E5	A	10	INTEGER_16	1	☒		
C13851	All words from scanner	10724	0x29E4	A	8	INTEGER_16	1	☒		
C13858	Ethernet Port Statistics	10717	0x29DD	A	10	UNSIGNED_32	1	☒		
C13861	CIP Module Status	10714	0x29DA	E	1	UNSIGNED_16	1	☒		
C13862	CIP Network Status	10713	0x29D9	E	1	UNSIGNED_16	1	☒		
C13863	Ethernet Port	10712	0x29D8	A	2	UNSIGNED_16	1	☒		
C13870	CIP Connections State	10705	0x29D1	A	8	UNSIGNED_16	1	☒		
C13871	CIP Connections Type	10704	0x29D0	A	8	UNSIGNED_16	1	☒		
C13872	CIP Connection Triggers	10703	0x29CF	A	8	UNSIGNED_16	1	☒		
C13873	CIP Connections RPI	10702	0x29CE	A	8	UNSIGNED_32	1	☒		
C13874	CIP Connections Timeout Time	10701	0x29CD	A	8	UNSIGNED_32	1	☒		
C13875	CIP Connections RUN/IDLE Flag	10700	0x29CC	A	8	UNSIGNED_16	1	☒		
C13880	Monitoring Reaction	10695	0x29C7	A	4	UNSIGNED_8	1	☒	☒	
C13881	Overall Ethernet Timeout Time	10694	0x29C6	E	1	UNSIGNED_16	1	☒	☒	
C13885	Clear I/O Data	10690	0x29C2	E	1	UNSIGNED_8	1	☒	☒	
C13899	Hostname	10676	0x29B4	A	2	VISIBLE_STRING		☒	☒	
C13900	Firmware Product Type	10675	0x29B3	E	1	VISIBLE_STRING		☒		
C13901	Firmware Compilation Date	10674	0x29B2	E	1	VISIBLE_STRING		☒		
C13902	Firmware Version	10673	0x29B1	E	1	VISIBLE_STRING		☒		

14 Implemented CIP™ objects

An EtherNet/IP node can be seen as an accumulation of objects. An individual object is characterised by its class, its instances and attributes. Several services such as read and write services can be applied to these objects.



Note!

This chapter only describes the CIP objects implemented by Lenze and the properties supported by them (attributes, service codes etc.).

Not all object properties described in the "Common Industrial Protocol Specification" of the ODVA are supported.



"Common Industrial Protocol Specification" of the ODVA

Here you will find detailed information about the CIP objects.

Overview of the implemented CIP objects

CIP objects	Description
General objects	
Identity Object (1 / 0x01) (📖 110)	Identification and general information about the device
Message Router Object (2 / 0x02) (📖 112)	Addressing of a service for the transfer of data to any object class or instance
Assembly Object (4 / 0x04) (📖 113)	Input/output data of the scanner
Connection Manager Object (6 / 0x06) (📖 120)	Management of the internal resources for the transfer of data (implicit/explicit messaging)
EtherNet/IP objects	
Device Level Ring (DLR) Object (71 / 0x47) (📖 122)	Status information for the DLR protocol
Quality of Service (QoS) Object (72 / 0x48) (📖 124)	Classification and prioritisation of the data packets for EtherNet/IP communication
TCP/IP Interface Object (245 / 0xF5) (📖 126)	Configuration of the TCP/IP network interface of the device
Ethernet Link Object (246 / 0xF6) (📖 130)	General information and status information about the Ethernet interfaces of the device
AC drive profile objects	
Motor Data Object (40 / 0x28) (📖 134)	Data basis for motor parameters
Control Supervisor Object (41 / 0x29) (📖 135)	Management functions of the motor control devices.
AC Drive Object (42 / 0x2A) (📖 137)	Device-specific functions of the drive, e.g. speed ramps, torque control etc.
Lenze objects	
Lenze Class (101 / 0x65) (📖 139)	Lenze error responses to EtherNet/IP errors
Lenze Class (103 / 0x67) (📖 141)	Image of the scanner input data
Lenze Class (104 / 0x68) (📖 142)	Image of the scanner output data
Lenze Class (110 / 0x6E) (📖 143)	Access to Lenze codes

General class attributes

Attribute ID	Service	Name	Data type	Description
1	Get	Revision	UINT	Revision no. of the object
2	Get	Max. Instance	UINT	Max. number of instances of the object
3	Get	Number of Instances	UINT	Number of instances of the object
4	Get	Optional Attribute List:	STRUCT of:	List of the optional instance attributes:
		Number Attributes	UINT	Number of optional attributes
		Optional Attributes	ARRAY of UINT	Listing of the optional attributes
5	Get	Optional Service List:	STRUCT of:	List of the optional services:
		Number Services	UINT	Number of optional services
		Optional Services	ARRAY of UINT	Listing of the optional services
6	Get	Max. ID Number Class Attributes	UINT	The attribute ID of the last class attribute of the class description implemented in the device
7	Get	Max. ID Number Instance Attributes	UINT	The attribute ID of the last instance attribute of the class description implemented in the device

Implemented CIP™ objects

General CIP objects

14.1 General CIP objects

14.1.1 Identity Object (1 / 0x01)

The "Identity Object" provides the identification and general information about the device.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	1 (0x0001)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)
6	Get	Max. ID Number Class Attributes	UINT	7 (0x0007)
7	Get	Max. ID Number Instance Attributes	UINT	8 (0x0008)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Vendor ID	UINT	587 (0x024B)
2	Get	Device Type	UINT	2 (0x0002): AC Drive
3	Get	Product Code	UINT	8440 (0x20F8)
4	Get	Revision:	STRUCT of:	Firmware revision of the device
		Major Revision	USINT	
		Minor Revision	USINT	
5	Get	Status	WORD	Current device status (status bits) • Instance attribute "Status" (attribute 5) (📖 111) • EtherNet/IP state diagram (📖 43)
6	Get	Serial Number	UDINT	Serial number of the device
7	Get	Product Name	SHORT_STRING	E84DGFCG
8	Get	State	USINT	Current device state: • 0: Nonexistent • 1: Device self-testing • 2: Standby • 3: Operational • 4: Major recoverable fault • 5: Major unrecoverable fault • 6 ... 254: Reserved • 255: Standard for "Get_Attributes_All" service (See also C13861 , LED status displays (📖 78))

Implemented CIP™ objects

General CIP objects

Instance attribute "Status" (attribute 5)

Bits	Name	Description
0	Owned	The state '1' indicates that the device (or an object within the device) has an owner. Within a master/slave model, the state '1' indicates that the "predefined master/slave connection set" is assigned to a master. Outside the master/slave model, it means "TBD".
1	-	Reserved (0)
2	Configured	The state '1' indicates that the activities the device application carries out differ from the "out of box" standard configuration. This should not comprise the configuration of communication.
3	-	Reserved (0)
4 ... 7	Extended Device Status	• 0000: Status is "self-testing" or unknown • 0001: Firmware update is being carried out • 0010: At least one faulty I/O connection • 0011: No I/O connections available • 0100: Non-volatile configuration is faulty • 0101: "Major fault" (bit 10 or 11 is '1') • 0110: At least one I/O connection is in the "run mode" • 0111: At least one I/O connection is available, all are in the "idle mode" • 1000: Reserved • 1001: Reserved • 1010 ... 1111: Reserved / manufacturer-specific
8	Minor Recoverable Fault	The state '1' indicates that a "Minor Recoverable Fault" has occurred.
9	Minor Unrecoverable Fault	The state '1' indicates that a "Minor Unrecoverable Fault" has occurred.
10	Major Recoverable Fault	The state '1' indicates that a "Major Recoverable Fault" has occurred.
11	Major Unrecoverable Fault	The state '1' indicates that a "Major Unrecoverable Fault" has occurred.
12 ... 15	Extended Device Status 2	Reserved (0) / manufacturer-specific

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x05	Reset	These reset service types are supported: • 0: Mains switching (power off/on) is simulated. • 1: The parameters of the device are reset to the Lenze setting and mains switching (power off/on) is simulated.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.

Implemented CIP™ objects

General CIP objects

14.1.2 Message Router Object (2 / 0x02)

With the "Message Router Object", a client can address a service for the transfer of data to any object class or instance.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	1 (0x0001)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)
4	Get	Optional Attribute List:	STRUCT of:	
		Number Attributes	UINT	2 (0x0002)
		Optional Attributes	ARRAY of UINT	1, 2 (0x0001.0002)
5	Get	Optional Service List:	STRUCT of:	
		Number Services	UINT	1 (0x0001)
		Optional Services	ARRAY of UINT	10 (0x000A)
6	Get	Max. ID Number Class Attributes	UINT	7 (0x0007)
7	Get	Max. ID Number Instance Attributes	UINT	6 (0x0006)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Object list:	STRUCT of:	Object list:
		Number	UINT	Number of supported object class codes
		Classes	ARRAY of UINT	Listing of the supported object class codes
2	Get	Number Available	UINT	Max. number of supported connections

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.

Implemented CIP™ objects

General CIP objects

14.1.3 Assembly Object (4 / 0x04)

For data exchange, the Communication Unit supports the following assembly object instances:

Instance ID		Assembly object instance	
[dec]	[hex]		
Lenze technology applications / user-definable parameter sets	110	0x6E	Custom Output
	111	0x6F	Custom Input
AC Drive Profile" application	20	0x14	Basic Speed Control Output
	21	0x15	Extended Speed Control Output
	22	0x16	Speed and Torque Control Output
	23	0x17	Extended Speed and Torque Control Output
	70	0x46	Basic Speed Control Input
	71	0x47	Extended Speed Control Input
	72	0x48	Speed and Torque Control Input
	73	0x49	Extended Speed and Torque Control Input

The contents of the input and output data depends on the I/O data arrangement in the drive ([I/O data mapping](#) (47)).



Application note

An example of parameter data transfer (read/write parameters) in a "AC Drive Profile" application can be found in the download area (Application Knowledge Base) at www.Lenze.com.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x0002)
2	Get	Max. Instance	UINT	130 (0x0082)
3	Get	Number of Instances	UINT	11 (0x000B)
4	Get	Optional Attribute List:	STRUCT of:	
		Number Attributes	UINT	1 (0x0001)
		Optional Attributes	ARRAY of UINT	4 (0x0004)
6	Get	Max. ID Number Class Attributes	UINT	7 (0x0007)
7	Get	Max. ID Number Instance Attributes	UINT	4 (0x0004)

Implemented CIP™ objects

General CIP objects

Instance attributes for output data of the scanner

Attribute ID	Service	Name	Data type	Value
3	Get / Set	Data	ARRAY of SINT / INT / DINT	Max. 16 bytes from the scanner to the adapter: • 20 (0x14): Basic Speed Control Output • 21 (0x15): Extended Speed Control Output • 22 (0x16): Speed and Torque Control Output • 23 (0x17): Extended Speed and Torque Control Output • 110 (0x6E): Custom Output ▶ Instance attribute "Data" (attribute 3) (116)
4	Get	Size	UINT	Number of bytes in attribute 3 (Data)

Assembly output objects (scanner to adapter) are assumed to have a 4-byte header (32-bit "run/idle header"). When mapping the assemblies, this header will automatically be added to the data stream by most Allen-Bradley PLC/SLC equipment.

If your PLC does not support this header (like the Rockwell PLCs do), add a preceding 32-bit header to the output image.

You can then define the **bit 0** of this header in the process image of your PLC:

- State '0': idle mode
- State '1': run mode

For the operation with Rockwell PLCs, adaptations are not required.

The [Lenze Class \(104 / 0x68\)](#) (142) provides the image of the output data of the scanner.

Implemented CIP™ objects

General CIP objects

Instance attributes for input data of the scanner

Attribute ID	Service	Name	Data type	Value
3	Get / Set	Data	ARRAY of SINT / INT / DINT	Max. 20 bytes from the adapter to the scanner: • 70 (0x46): Basic Speed Control Input • 71 (0x47): Extended Speed Control Input • 72 (0x48): Speed and Torque Control Input • 73 (0x49): Extended Speed and Torque Control Input • 111 (0x6F): Custom Input ► Instance attribute "Data" (attribute 3) (📖 116) In the 111 (0x6F, Custom Input) assembly object instance, the I/O data are entered in the last two words. ► Configuring I/O data (📖 45)
4	Get	Size	UINT	Number of bytes in attribute 3 (Data)

The assembly input objects (adapter to scanner) are mapped in the adapter memory starting with byte 0.

The input objects are transmitted in a "modeless" manner, i.e. a 4-byte header is not included in the transfer.

So the start address in the assembly memory map is the actual start of the first assembly data element.

Please observe the actual assembly lengths when mapping the input objects to the controller memory.

The [Lenze Class \(103 / 0x67\)](#) (📖 141) provides the image of the input data of the scanner.

Implemented CIP™ objects

General CIP objects

Instance attribute "Data" (attribute 3)

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
20 (0x14)	0						Fault Reset		Run Fwd
	1								
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
21 (0x15)	0		Net Ref	NetCtrl			Fault Reset	Run Rev	Run Fwd
	1								
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							

Implemented CIP™ objects

General CIP objects

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
22 (0x16)	0						Fault Reset		Run Fwd
	1								
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Torque Reference (Low Byte)							
	5	Torque Reference (High Byte)							
23 (0x17)	0		Net Ref	NetCtrl			Fault Reset	Run Rev	Run Fwd
	1								
	2	Speed Reference (Low Byte)							
	3	Speed Reference (High Byte)							
	4	Torque Reference (Low Byte)							
	5	Torque Reference (High Byte)							
110 (0x6E)	0	Custom Output							
	...	...							
	31	Custom Output							
70 (0x46)	0						Running1 (Fwd)		Faulted
	1								
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							
71 (0x47)	0	At Referenc e	RefFrom Net	CtrlFrom Net	Ready	Running2 (Rev)	Running1 (Fwd)	Warning	Faulted
	1	Drive State							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							
72 (0x48)	0						Running1 (Fwd)		Faulted
	1								
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							
	4	Torque Actual (Low Byte)							
	5	Torque Actual (High Byte)							
73 (0x49)	0	At Referenc e	RefFrom Net	CtrlFrom Net	Ready	Running2 (Rev)	Running1 (Fwd)	Warning	Faulted
	1	Drive State							
	2	Speed Actual (Low Byte)							
	3	Speed Actual (High Byte)							
	4	Torque Actual (Low Byte)							
	5	Torque Actual (High Byte)							
111 (0x6F)	0	Custom Input							
	...	...							
	31	Custom Input							

Implemented CIP™ objects

General CIP objects



Note!

In order to be able to use the torque control for the **assembly object instances 22 (0x16), 23 (0x17), 72 (0x48), 73 (0x49)**, the "DriveMode" attribute has to be written by means of explicit message transfer.

► [Write "DriveMode" attribute](#) (📖 138)

Data mapping of the output assemblies

Data component [Bits 0 ... 7]	Class		Instance Number	Attribute	
	Name	Number		Name	Number
RunFwd [Bit 0]	Control Supervisor	0x29	1	Run1	3
RunRev [Bit 1]	Control Supervisor	0x29	1	Run2	4
FaultReset [Bit 2]	Control Supervisor	0x29	1	FaultRst	12
NetCtrl [Bit 5]	Control Supervisor	0x29	1	NetCtrl	5
NetRef [Bit 6]	AC Drive	0x2A	1	NetRef	4
Drive Mode [Bits 0 ... 7]	AC Drive	0x2A	1	DriveMode	6
Speed Reference [Bits 0 ... 7]	AC Drive	0x2A	1	SpeedRef	8
Torque Reference [Bits 0 ... 7]	AC Drive	0x2A	1	TorqueRef	12
Custom Output [Bits 0 ... 7]					



Note!

In case of the **assembly object instances 21 (0x15) and 23 (0x17)**, **NetCtrl (Bit 5)** and **NetRef (Bit 6)** have to be set in order that the drive can receive start/stop commands and speed/torque commands via the network.

Implemented CIP™ objects

General CIP objects

Data mapping of the input assemblies

Data component [Bits 0 ... 7]	Class		Instance Number	Attribute	
	Name	Number		Name	Number
Faulted [Bit 0]	Control Supervisor	0x29	1	Faulted	10
Warning [Bit 1]	Control Supervisor	0x29	1	Warning	11
Running1 (Fwd) [Bit 2]	Control Supervisor	0x29	1	Running1	7
Running2 (Rev) [Bit 3]	Control Supervisor	0x29	1	Running2	8
Ready [Bit 4]	Control Supervisor	0x29	1	Ready	9
CtrlFromNet [Bit 5]	Control Supervisor	0x29	1	CtrlFromNet	15
RefFromNet [Bit 6]	AC Drive	0x2A	1	RefFromNet	29
At Reference [Bit 7]	AC Drive	0x2A	1	AtReference	3
Drive State [Bits 0 ... 7]	Control Supervisor	0x29	1	State	6
Speed Actual [Bits 0 ... 7]	AC Drive	0x2A	1	SpeedActual	7
Torque Actual [Bits 0 ... 7]	AC Drive	0x2A	1	TorqueActual	11
Custom Input [Bits 0 ... 7]					

Supported service codes

Service code [hex]	Name	Description
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

Implemented CIP™ objects

General CIP objects

14.1.4 Connection Manager Object (6 / 0x06)

The "Connection Manager Object" manages the internal resources for the I/O data transfer (implicit messaging) and the parameter data transfer (explicit messaging). The instance specified by the "connection manager" class refers to a "connection instance" or a "connection object".

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	1 (0x0001)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)
4	Get	Optional Attribute List:	STRUCT of:	
		Number Attributes	UINT	8 (0x0008)
		Optional Attributes	ARRAY of UINT	1 ... 8 0x0001.0002.0003.0004.0005.0006.0007. 0008
6	Get	Max. ID Number Class Attributes	UINT	7 (0x0007)
7	Get	Max. ID Number Instance Attributes	UINT	8 (0x0008)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Set ¹⁾	Open Requests	UINT	Number of "Forward Open Service Requests" received
2	Set ¹⁾	Open Format Rejects	UINT	Number of "Forward Open Service Requests" rejected due to faulty format.
3	Set ¹⁾	Open Resource Rejects	UINT	Number of "Forward Open Service Requests" rejected due to a lack of resources.
4	Set ¹⁾	Open Other Rejects	UINT	Number of "Forward Open Service Requests" rejected due to other reasons than faulty format or lack of resources.
5	Set ¹⁾	Close Requests	UINT	Number of "Forward Close Service Requests" received
6	Set ¹⁾	Close Format Requests	UINT	Number of "Forward Close Service Requests" rejected due to faulty format.
7	Set ¹⁾	Close Other Requests	UINT	Number of "Forward Close Service Requests" rejected due to other reasons than faulty format.
8	Set ¹⁾	Connection Timeouts	UINT	Total number of "Connection Timeouts" that have occurred within the connections monitored by this object.

- 1) A device can reject a "Request" of the attribute with the general status code "0x09" (invalid attribute value) if the attribute value sent is unequal to zero.

Implemented CIP™ objects

General CIP objects

Instance error messages

Error code [hex]	Extended code [hex]	Error designation	Description
0x000	-	SUCCESS	No error
0x001	0x106	OWNERSHIP_CONFLICT	The connection could not be established because another connection has already occupied the required resources. It is only possible to establish an "exclusive owner" connection to the adapter.
0x001	0x119	NON-LISTEN ONLY CONNECTION NOT OPENED	The connection could not be established because there is no "non-listen only" connection (input only, exclusive owner). The "non-listen only" connection must be of the "multicast" connection type.
0x001	0x127	INVALID_ORIGINATOR_TO_TARGET_SIZE	The resulting length of the ports mapped in the receive object PDO_RX0 does not correspond to the number of data bytes of the assembly object instance 110 (0x6E, Custom Output) defined in the scanner.
0x001	0x128	INVALID_TARGET_TO_ORIGINATOR_SIZE	The resulting length of the ports mapped in the transmit object PDO_TX0 does not correspond to the number of data bytes of the assembly object instance 111 (0x6F, Custom Input) defined in the scanner.
0x001	0x204	UNCONNECTED_REQUEST_TIMED_OUT	The adapter does not respond to the establishment of the connection. • There might be no physical connection. • The adapter is switched off. • The adapter has an invalid IP configuration.
0x001	0x320	ACCESS_CONTENTION	Manufacturer-specific error: • The configurations of the assembly input and output objects are mixed up. • The connection could not be established because another connection has already occupied the required resources. It is only possible to establish an "exclusive owner" connection to the adapter.
0x001	0x111	ROUTER_EXT_ERR_RPI_NOT_SUPPORTED	The RPI set for a connection is not supported. • Min. class 1 RPI = 4 ms • Min. class-3-RPI = 10 ms
0x001	0x112	RROUTER_EXT_ERR_RPI_VALUE_NOT_ACCEPTABLE	The RPI set for a connection is not supported. • Min. class 1 RPI = 4 ms • Min. class-3-RPI = 10 ms
0x001	0x123	ROUTER_EXT_ERR_INVALID_TO_CONNECTION_TYPE	The output image connection type is invalid or not supported.
0x001	0x124	ROUTER_EXT_ERR_INVALID_TO_CONNECTION_TYPE	The input image connection type is invalid or not supported.
0x001	0x12A	ROUTER_EXT_ERR_INVALID_CONSUMING_PATH	The path specification for the output data from the scanner is invalid.
0x001	0x12B	ROUTER_EXT_ERR_INVALID_PRODUCING_PATH	The path specification for the input data to the scanner is invalid.

Supported service codes

Service code [hex]	Name	Description
0x54	Forward_Open	Opens a CIP connection from the PLC to the target drive.
0x4E	Forward_Close	Closes a CIP connection from the PLC to the target drive.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.

14.2 EtherNet/IP objects

14.2.1 Device Level Ring (DLR) Object (71 / 0x47)

The "Device Level Ring (DLR) Object" provides status information for the DLR protocol. The DLR protocol is a "layer 2" protocol enabling the use of an Ethernet ring topology.



Note!

Only the "beacon-based ring node" mode is supported.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x0002)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)
6	Get	Max. ID Number Class Attributes	UINT	7 (0x0007)
7	Get	Max. ID Number Instance Attributes	UINT	2 (0x0002)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Network Topology	USINT	Current network topology • 0: Line topology • 1: Ring topology (Display via C13840)
2	Get	Network Status	USINT	Current network status • 0: Normal • 1: Ring Fault (only for ring topology) • 2: Unexpected Loop Detected (only for line topology) (Display via C13841)
10	Get	Active Supervisor Address	STRUCT of:	IP and MAC address of the active ring supervisor
		Supervisor IP Address	UDINT	Ethernet MAC address The value '0' indicates that no IP address has been configured for the device. (Display via C13842)
		Supervisor MAC Address	ARRAY of USINT[6]	Ethernet MAC address (Display via C13843)
12	Get	Capability Flags	DWORD	Telegram processing method for the ring node implementation • 2: Beacon-based ring node ▶ Instance attribute "Capability Flags" (attribute 12) (□ 123)

Implemented CIP™ objects

EtherNet/IP objects

Instance attribute "Capability Flags" (attribute 12)

Bits	Name	Description
0	Announce-based Ring Node	Is not supported (state '0').
1	Beacon-based Ring Node	The state '1' is set if the ring node implementation is based on the processing of "beacon frames". See also: • C13844 (Beacon Times) • C13845 (Beacon Frames)
2 ... 31	-	Reserved (0)

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.
0x18	Get_Member	Outputs the members of a certain attribute.

Implemented CIP™ objects

EtherNet/IP objects

14.2.2 Quality of Service (QoS) Object (72 / 0x48)

The "Quality of Service (QoS) Object" enables different classifications and prioritisations of the data packets for EtherNet/IP communication. For this purpose, the EtherNet/IP messages are marked with "802.1Q tags" and "Differentiated Services Codepoints" (DSCP).

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	1 (0x0001)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)
6	Get	Max. ID Number Class Attributes	UINT	7 (0x0007)
7	Get	Max. ID Number Instance Attributes	UINT	8 (0x0008)

Instance attributes

The instance attributes act independently of each other.

The DSCP values are used for the IP headers.

Irrespective of this, VLAN tagging can be activated in addition ([C13021](#) = 1).

The VLAN ID of Lenze devices is '0'.

The VLAN priority results from the DSCP values configured.

Changes in the attribute values will only take effect after a reset of the device ("power off/on" or "type 0 reset").



Note!

Before activating VLAN tagging, please ensure that all involved components support VLAN tagging. It may occur that the devices not supporting VLAN tagging cannot be accessed anymore.

Attribute ID	Service	Name	Data type	Value
1	Set	802.1Q Tag Enable	USINT	Enables the sending of data packets with 802.1Q tags (C13021) • 0: No use of 802.1Q tags (Lenze setting) • 1: Use of 802.1Q tags
4	Set	DSCP Urgent	USINT	55: Urgent/imperative messages Is not supported at the moment.
5	Set	DSCP Scheduled	USINT	47: Scheduled messages (Can only be used for "exclusive owner" connections.) (C13022/4)
6	Set	DSCP High	USINT	43: Messages with high priority (Can only be used for "input only" and "listen only" connections.) (C13022/5)

Implemented CIP™ objects

EtherNet/IP objects

Attribute ID	Service	Name	Data type	Value
7	Set	DSCP Low	USINT	31: Messages with low priority Is not supported at the moment.
8	Set	DSCP Explicit	USINT	27: "Explicit messages" (parameter data) (C13022/7)

Supported service codes

Service code [hex]	Name	Description
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

14.2.3 TCP/IP Interface Object (245 / 0xF5)

The "TCP/IP Interface Object" serves to configure the TCP/IP network interface of the device.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x0002)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)
4	Get	Optional Attribute List:	STRUCT of:	
		Number Attributes	UINT	4 (0x0004)
		Optional Attributes	ARRAY of UINT	8 ... 11 (0x0008.0009.000A.000B)
6	Get	Max. ID Number Class Attributes	UINT	0x0007
7	Get	Max. ID Number Instance Attributes	UINT	0x000B

Instance attributes



Note!

Write access to attribute 3 (Configuration Control) permanently saves the TCP/IP configuration defined in attribute 5.

If the TCP/IP configuration defined in attribute 5 is to be used as a "static IP" during the start-up, "0 = use static TCP/IP configuration" must be set in attribute 3.

Attribute ID	Service	Name	Data type	Value
1	Get	Status	DWORD	Current status of the TCP/IP network interface ► Instance attribute "Status" (attribute 1) (128)
2	Get	Configuration Capability	DWORD	Possible options for TCP/IP configuration ► Instance attribute "Configuration Capability" (attribute 2) (128)
3	Get / Set	Configuration Control	DWORD	Selection of how the TCP/IP configuration is to be made (C13005): Possible values for bits 0 ... 3: • 0000: Use static TCP/IP config. • 0001: TCP/IP config. via BOOTP • 0010: TCP/IP config. via DHCP Bits 4 ... 31 are reserved (0).
4	Get	Physical Link Object:	STRUCT of:	Path to "Physical Link Object"
		Path Size	UINT	2 (0x0002)
		Path	padded EPATH	• 32 (0x0020) • 246 (0x00F6) • 36 (0x0024) • 1 (0x0001)

Implemented CIP™ objects

EtherNet/IP objects

Attribute ID	Service	Name	Data type	Value
5	Get	Interface Configuration:	STRUCT of:	Current TCP/IP configuration
		IP Address	UDINT	C13010 (active IP address)
		Network Mask	UDINT	C13011 (active subnet mask)
		Gateway Address	UDINT	C13012 (active gateway address)
		Name Server	UDINT	
		Name Server 2	UDINT	
		Domain Name 1	STRING	
6	Get / Set	Host Name	STRING	Host name of the device (C13899 , max. 64 ASCII characters)
8	Get / Set	TTL Value	USINT	TTL value (C13019) for EtherNet/IP multicast data packets (value range: 1 ... 255)
9	Get / Set	Mcast Config:	STRUCT of:	Configuration of the multicast IP addressing
		Alloc Control	USINT	Control word (C13018) for addressing: • 0: The multicast IP addresses are generated with the standard assignment algorithm. • 1: The multicast IP addresses are assigned via the values in "Num Mcast" and "Mcast Start Addr" (C13006) • 2: Reserved
		Reserved	USINT	0 (0x0000)
		Num Mcast	UINT	Total number of multicast IP addresses assigned (C13020)
		Mcast Start Addr	UDINT	Active multicast IP start address (C13006)
10	Set	SelectAcd	BOOL	Activation of address conflict detection (ACD, C13846) • 0: Disable ACD • 1: Enable ACD Changing this value requires a reset of the device ("power off/on" or "type 0 reset").
11	Get / Set	LastConflictDetected:	STRUCT of:	ACD diagnostics information about the last occurred address conflict
		AcdActivity	USINT	Status of the ACD algorithm when the last address conflict occurred: • 0: NoConflictDetected (default) • 1: Probelpv4Address • 2: OngoingDetection • 3: SemiActiveProbe
		RemoteMAC	ARRAY of USINT[6]	MAC address of the device with the last address conflict
		ArpPdu	ARRAY of USINT[28]	Reproduction of the ARP message with information about the address conflict ► Structure of the ARP message (attribute 11, "ArpPdu") (129)

Implemented CIP™ objects

EtherNet/IP objects

Instance attribute "Status" (attribute 1)

Bits	Name	Description
0 ... 3	Interface Configuration Status	• 0000: No TCP/IP configuration available (attribute 5) • 0001: Valid TCP/IP configuration (attribute 5) via BOOTP, DHCP or static/permanent storage • 0010 ... 1111: Reserved
4	Mcast Pending	This bit indicates a pending change of the multicast configuration in attribute 9 (Mcast Config) and/or the TTL value (C13019). It is set to '1' if either a multicast attribute or the TTL value is set. The pending change will only take effect after a reset of the device ("power off/on" or "type 0 reset"). This bit is then reset to '0'.
5	Interface Configuration Pending	This bit indicates a pending change of the TCP/IP configuration in attribute 5 (Interface Configuration). It is set to '1' if an attribute is set. The pending change will only take effect after a reset of the device ("power off/on" or "type 0 reset").
6	AcdStatus	Display of the status of address conflict detection (ACD, C13847): • 0: No address conflict detected • 1: Address conflict detected
7 ... 31	-	Reserved (0)

Instance attribute "Configuration Capability" (attribute 2)

Bits	Name	Description
0	BOOTP Client	The state '1' indicates that BOOTP is used for the TCP/IP configuration of the device.
1	DNS Client	Is not supported (state '0').
2	DHCP Client	The state '1' indicates that DHCP is used for the TCP/IP configuration of the device.
3	DHCP-DNS Update	Is not supported (state '0').
4	Configuration Settable	The state '1' indicates that the TCP/IP configuration can be set in attribute 5 (Interface Configuration).
5	Hardware Configurable	Is not supported (state '0').
6	Interface Configuration Change Requires Reset	The state '1' indicates that changes of the TCP/IP configuration in attribute 5 (Interface Configuration) will only take effect after a reset of the device ("power off/on" or "type 0 reset"). The state '0' is not supported (changes becoming effective immediately).
7	AcdCapable	The state '1' indicates that the device is provided with address conflict detection (ACD).
8 ... 31	-	Reserved (0)

Implemented CIP™ objects

EtherNet/IP objects

Structure of the ARP message (attribute 11, "ArpPdu")

Field size [Bytes]	Field name	Value
2	Hardware Address Type	1: Ethernet H/W
2	Protocol Address Type	0x0800: IP
1	HADDR LEN	6: Ethernet H/W
1	PADDR LEN	4: IP
2	OPERATION	1: Request 2: Response
6	SENDER HADDR	H/W address of the sender
4	SENDER PADDR	Protocol address of the sender
6	TARGET HADDR	H/W address of the target
4	TARGET PADDR	Protocol address of the target

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

Implemented CIP™ objects

EtherNet/IP objects

14.2.4 Ethernet Link Object (246 / 0xF6)

The "Ethernet Link Object" provides general information and status information about the Ethernet interfaces (IEEE 802.3).



Note!

Write accesses to writable attributes become effective immediately.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	3 (0x0003)
2	Get	Max. Instance	UINT	2 (0x0002)
3	Get	Number of Instances	UINT	2 (0x0002)
4	Get	Optional Attribute List:	STRUCT of:	
		Number Attributes	UINT	4 (0x0004)
		Optional Attributes	ARRAY of UINT	7 ... 10 (0x0007.0008.0009.000A)
6	Get	Max. ID Number Class Attributes	UINT	0x0007
7	Get	Max. ID Number Instance Attributes	UINT	0x000A

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Interface Speed	UDINT	Current baud rate • 10 Mbps • 100 Mbps
2	Get	Interface Flags	DWORD	Status bits of the Ethernet interface ► Instance attribute "Interface Flags" (attribute 2) (131)
3	Get	Physical Address	ARRAY of USINT[6]	MAC address of the Ethernet interface
6	Set	Interface Control	STRUCT of:	
		Control Bits	WORD	Control bits for the Ethernet interface ► Instance attribute "Control Bits" (attribute 6, Interface Control) (132)
		Forced Interface Speed	UINT	Baud rate [in Mbps] at which the Ethernet interface is to be operated (C13017). Example values: • 10 = 10 Mbps • 100 = 100 Mbps
7	Get	Interface Type	USINT	Interface type (transmission medium) • 0: Unknown interface type • 1: Device-internal interface (e.g. embedded switch) • 2: Twisted pair (e.g. 100Base-TX), Lenze setting • 3: Optical fibre (e.g. 100Base-FX) • 4 ... 255: Reserved

Implemented CIP™ objects

EtherNet/IP objects

Attribute ID	Service	Name	Data type	Value
8	Get	Interface State	USINT	Current operating status of the Ethernet interface • 0: Unknown status • 1: Enable (The interface can send and receive data.) • 2: Disable • 3: Testing • 4 ... 255: Reserved
9	Set	Admin State	USINT	Administrative status • 0: Reserved • 1: Enable • 2: Disable • 3 ... 255: Reserved
10	Get	Interface Label	SHORT_STRING	Text for the identification/designation of the Ethernet interface

Instance attribute "Interface Flags" (attribute 2)

Bits	Name	Description
0	Link Status	This bit indicates whether the Ethernet interface is connected to an active network. • 0: No Ethernet connection available • 1: Ethernet connection available
1	Half/Full Duplex	This bit indicates the current transmission mode of the Ethernet interface. • 0: Half duplex • 1: Full duplex Note: If "Link Status" bit = 0, it is not possible to determine the value of the "Half/Full Duplex" bit.
2 ... 4	Negotiation Status	These bits indicate the status of "Link Auto-Negotiation". • 000: "Link Auto-Negotiation" is being processed. • 001: "Link Auto-Negotiation" and speed detection have failed. • Use the standard baud rate and transmission mode values. • The standard values depend on the product; recommended values are '10 Mbps' and 'Half Duplex'. • 010: "Link Auto-Negotiation" has failed, but a baud rate has been detected. • Use the recommended value ('Half Duplex') for the transmission mode. • 011: "Link Auto-Negotiation" and speed detection have been successful. • 100: No "Link Auto-Negotiation" active.
5	Manual Setting Requires Reset	Reset after changes in the link parameters • 0: The Ethernet interface can activate changes in the link parameters (auto-negotiation, transmission mode, baud rate) automatically. • 1: If the link parameters (auto-negotiation, transmission mode, baud rate) are changed, the device must be reset ("power off/on" or "type 0 reset").
6	Local Hardware Fault	Hardware fault detection • 0: No hardware fault has been detected on the Ethernet interface. • 1: A hardware fault has been detected on the Ethernet interface.
7 ... 31	-	Reserved (0)

Implemented CIP™ objects

EtherNet/IP objects

Instance attribute "Control Bits" (attribute 6, Interface Control)

Bits	Name	Description
0	Auto-negotiate	Activation of "Link Auto-Negotiation" • 0: "Link Auto-Negotiation" is not active. The device uses the settings of the bits "Forced Duplex Mode" (bit 1) and "Forced Interface Speed" (see attribute 6, Interface Control). • 1: "Link Auto-Negotiation" is active.
1	Forced Duplex Mode	If "Auto-negotiate" bit = 0, this bit indicates the transmission mode to be used. • 0: Half duplex • 1: Full duplex
2 ... 15	-	Reserved (0)

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

14.3 "AC Drive Profile" objects

The standard device code **C00005** = "**1100: AC Drive Profile**" serves to select the "AC Drive Profile" application.

The "AC Drive Profile" contains ...

- the data basis for motor parameters,
- management functions of the motor control devices,
- Device-specific functions of the drive, e.g. speed ramps, torque control etc.

For using the "AC Drive Profile", the following assembly object instances in the host (scanner) have to be used:

Instance ID		Assembly object instance	
[dec]	[hex]		
20	0x14	Basic Speed Control Output	Outputs: From the scanner to the adapter
21	0x15	Extended Speed Control Output	
22	0x16	Speed and Torque Control Output	
23	0x17	Extended Speed and Torque Control Output	
70	0x46	Basic Speed Control Input	Inputs: From the adapter to the scanner
71	0x47	Extended Speed Control Input	
72	0x48	Speed and Torque Control Input	
73	0x49	Extended Speed and Torque Control Input	

See also [Assembly Object \(4 / 0x04\)](#) (📖 113)



Software manual/ »Engineer« online help for Inverter Drives 8400

Here you can find detailed information on how to use the "AC Drive Profile".

Implemented CIP™ objects

"AC Drive Profile" objects

14.3.1 Motor Data Object (40 / 0x28)

The "Motor Data Object" provides a data basis for motor parameters.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	1 (0x0001)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	NumAttr	USINT	Number of supported attributes
2	Get	Attributes	ARRAY of USINT	Listing of the supported attributes
3	Get / Set	MotorType	USINT	AC motor type • 6: Wound-rotor induction motor • 7: Squirrel-cage induction motor

Instance attributes for AC motor types

Attribute ID	Service	Name	Data type	Value
6	Get / Set	RatedCurrent	UINT	Rated stator current [100mA]
7	Get / Set	RatedVoltage	UINT	Rated base voltage [V]

For a write access to the attributes *RatedCurrent* and *RatedVoltage*, the controller enable (RFR = 0) has to be deactivated.

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

Implemented CIP™ objects

"AC Drive Profile" objects

14.3.2 Control Supervisor Object (41 / 0x29)

The "Control Supervisor Object" describes all management functions of the devices used to control the motor.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	1 (0x0001)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	NumAttr	USINT	Number of supported attributes
2	Get	Attributes	ARRAY of USINT	Listing of the supported attributes
3	Set	Run1	BOOL	Run/stop can be controlled via a local setting on the device or terminal, or via the network (see attribute "NetCtrl"). The relationship between Run1, Run2 and the trigger events is described in the Run/stop event (136) section.
4	Set	Run2	BOOL	
5	Set	NetCtrl	BOOL	Run/Stop control • 0: Run/stop control via local setting on the device or terminal • 1: Run/stop control via network (e.g. from the scanner)
6	Get	State	USINT	• 0: Manufacturer-specific • 1: Startup • 2: Not_Ready • 3: Ready • 4: Enabled • 5: Stopping • 6: Fault_Stop • 7: Faulted
7	Get	Running1	BOOL	• 0: Other status than listed under '1' • 1: [Enabled and Run1] or [Stopping and Running1] or [Fault_Stop and Running1]
8	Get	Running2	BOOL	• 0: Other status than listed under '1' • 1: [Enabled and Run2] or [Stopping and Running2] or [Fault_Stop and Running2]
9	Get	Ready	BOOL	• 0: Other status than listed under '1' • 1: Ready or Enabled or Stopping
10	Get	Faulted	BOOL	• 0: No errors • 1: Errors have occurred
11	Get	Warning	BOOL	• 0: No warnings • 1: Warnings have occurred
12	Set	FaultRst	BOOL	• 0 → 1: Reset error • 0: No Response

Implemented CIP™ objects

"AC Drive Profile" objects

Attribute ID	Service	Name	Data type	Value
13	Get	FaultCode	UINT	DRIVECOM error code of the error causing the Faulted status. ► Mapping of Lenze device errors to DRIVECOM errors (📖 87)
15	Get	CtrlFromNet	BOOL	Status of run/stop control • 0: Run/stop control via local setting on the device or terminal • 1: Run/stop control via network (e.g. from the scanner)

Run/stop event

Relationships between Run1 and Run2:

Run1 / Run2	Starter					Drive
	Contactor	Starter	Reverser	Speed	Soft start	
Run1	Close	Run	RunFwd	RunLow	RunRamp1	RunFwd
Run2	No Action	No Action	RunRev	RunHigh	RunRamp2	RunRev

Run1 and Run2 trigger:

Run1	Run2	Trigger event	Run type
0	0	Stop	No Action
0 → 1	0	Run	Run1
0	0 → 1	Run	Run2
0 → 1	0 → 1	No Action	No Action
1	1	No Action	No Action
1 → 0	1	Run	Run2
1	1 → 0	Run	Run1

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

Implemented CIP™ objects

"AC Drive Profile" objects

14.3.3 AC Drive Object (42 / 0x2A)

The "AC Drive Object" describes the device-specific functions of the drive, e.g. speed ramps, torque control etc.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	1 (0x0001)
2	Get	Max. Instance	UINT	1 (0x0001)
3	Get	Number of Instances	UINT	1 (0x0001)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	NumAttr	USINT	Number of supported attributes
2	Get	Attributes	ARRAY of USINT	Listing of the supported attributes
3	Get	AtReference	BOOL	1: The drive currently runs at reference speed or reference torque (depending on attribute 6, DriveMode).
4	Get / Set	NetRef	BOOL	• 0: Reference via local setting on the device or terminal • 1: Reference via network (e.g. from the scanner)
6	Get / Set	DriveMode	USINT	Drive mode: • 1: Idle speed (frequency) • 3: Torque control In order to be able to use the torque control for the assembly object instances 22 (0x16), 23 (0x17), 72 (0x48), 73 (0x49) , this attribute has to be written. ► Write "DriveMode" attribute (138)
7	Get	SpeedActual	INT	Current speed [rpm/2 ^{SpeedScale}]
8	Get / Set	SpeedRef	INT	Reference speed [rpm/2 ^{SpeedScale}]
11	Get	TorqueActual	INT	Current torque [Nm/2 ^{TorqueScale}]
12	Get / Set	TorqueRef	INT	Reference torque [Nm/2 ^{TorqueScale}]
22	Get / Set	SpeedScale	SINT	Speed scaling factor [Nm/2 ^{SpeedScale}] Value range: -128 ... 127
24	Get / Set	TorqueScale	SINT	Torque scaling factor [Nm/2 ^{TorqueScale}] Value range: -128 ... 127
29	Get / Set	RefFromNet	BOOL	Status of reference speed / reference torque • 0: Reference via local setting on the device or terminal • 1: Reference via network (e.g. from the scanner)

Implemented CIP™ objects

"AC Drive Profile" objects

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

14.3.4 Write "DriveMode" attribute

In order to be able to use the torque control for the **assembly object instances 22 (0x16), 23 (0x17), 72 (0x48), 73 (0x49)**, the "DriveMode" attribute has to be written by means of explicit message transfer.

In order to write the "DriveMode" attribute by means of explicit message transmission, the following settings are required:

Settings	Value / description
1 Message Type	"CIP Generic"
2 Service Type	"Set Attribute Single" (service code "0x10")
3 Class	"2A" (AC Drive Object)
4 Instance	"1"
5 Attribute	"6" ("DriveMode" attribute)
6 Source Element	"Drive_Mode" (variable in the PLC program used as data source for writing.)
7 Source Length	"1 byte" (The variable data type is SINT.)

14.4 Lenze objects

14.4.1 Lenze Class (101 / 0x65)

The "Lenze Class (101 / 0x65)" enables the access to the adjustable error responses to EtherNet/IP errors which can be set in code [C13880](#).



Note

The attributes of this class are described in the EDS file. Using the »RSNetWorx« Rockwell software, the attributes can thus be directly set under "Parameters" in the properties dialog of the EtherNet/IP node.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x0002)
2	Get	Max. Instance	UINT	1 (0x0001)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	No. of supported Attributes	USINT	6 (0x0006)
2	Get	Attribute List	USINT	1 (0x0001) ... 6 (0x0006)
3	Get / Set	Reaction on Idle Mode	USINT	Corresponds to the value in C13880/1 : • 0 = no response • 1 = error • 4 = warning locked
4	Get / Set	Reaction on Fault Mode	USINT	Corresponds to the value in C13880/2 : • 0 = no response • 1 = error • 4 = warning locked
5	Get / Set	Reaction on Expl. Msg. TO	USINT	Corresponds to the value in C13880/3 : • 0 = no response • 1 = error • 4 = warning locked
6	Get / Set	Reaction on I/O Timeout	USINT	Corresponds to the value in C13880/4 : • 0 = no response • 1 = error • 4 = warning locked

Implemented CIP™ objects

Lenze objects

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

14.4.2 Lenze Class (103 / 0x67)

The "Lenze Class (103 / 0x67)" provides the image of the scanner input data.

The input data for the scanner are placed on the **MCI_OUT** interface of the Communication Unit and sent to the scanner via the assembly object instance **111 (0xE6)**.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x0002)
2	Get	Max. Instance	UINT	1 (0x0001)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	No. of supported Attributes	USINT	3 (0x0003)
2	Get	Attribute List	USINT	1 (0x0001) ... 3 (0x0003)
3	Get	I/O image of produced data	USINT	Image of the scanner input data

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.

Implemented CIP™ objects

Lenze objects

14.4.3 Lenze Class (104 / 0x68)

The "Lenze Class (104 / 0x68)" provides the image of the scanner output data.

The output data of the scanner are sent via the assembly object instance **110 (0xE5, Custom Output)** and placed on the **MCI_IN** interface of the Communication Unit.

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x0002)
2	Get	Max. Instance	UINT	1 (0x0001)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	No. of supported Attributes	USINT	3 (0x0003)
2	Get	Attribute List	USINT	1 (0x0001) ... 3 (0x0003)
3	Get	I/O image of consumed data	USINT	Image of the scanner output data

Supported service codes

Service code [hex]	Name	Description
0x01	Get_Attributes_All	Outputs a list of the attributes and the attribute's values for a certain object.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.

14.4.4 Lenze Class (110 / 0x6E)

The "Lenze Class (110 / 0x6E)" enables read or write access to Lenze codes.

The Lenze code must be specified as an "instance" (corresponding code no. 1 ... 65535) and its subcodes must be specified as "attributes".



Note!

- If the corresponding Lenze code does not have a subcode, the value '0' must be entered in the attribute. If '0' is not supported as attribute value by the engineering tool used, the value '1' must be entered.
- A display code cannot be configured using "Set_Attribute_Single".

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x0002)
2	Get	Max. Instance	UINT	1 (0x0001)

Instance attributes

Attribute ID	Service	Name	Data type	Value
0 ... 255	Get / Set	Lenze Subcode number	Data type of the subcode	Value of the subcode

Supported service codes

Service code	Name	Description
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

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Your opinion is important to us

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

If you have suggestions for improvement, please e-mail us to:

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Thank you for your support.

Your Lenze documentation team



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