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Accessories



EtherNet/IP™

E94AYCEO

Servo Drives 9400

Communication Manual EN

13451095

Lenze

Contents

1 About this documentation 5
1.1 Document history 7
1.2 Conventions used 8
1.3 Terminology used 9
1.4 Notes used 10

2 Safety instructions 11
2.1 General safety and application notes 11
2.2 Device and application-specific safety instructions 12
2.3 Residual hazards 12

3 Product description 13
3.1 Application as directed 13
3.2 Identification 13
3.3 Product features 14
3.4 Terminals and interfaces 15

4 Technical data 16
4.1 General data and operating conditions 16
4.2 Protocol data 17
4.3 Communication time 17
4.4 Internal switch latency 18
4.5 Protective insulation 19
4.6 Dimensions 22

5 Installation 23
5.1 Mechanical installation 24
5.1.1 Assembly 24
5.1.2 Disassembly 24
5.2 Electrical installation 25
5.2.1 Wiring according to EMC guidelines 25
5.2.2 Network topology 26
5.2.3 EtherNet/IP connection 28
5.2.4 Ethernet cable specification 30
5.2.5 External voltage supply 32

6 Commissioning 33
6.1 Before initial switch-on 33
6.2 Configuring the host system (scanner) 34
6.2.1 EDS files 34
6.2.2 Example: IP configuration of the Allen-Bradley 1769-L32E CompactLogix controller 35
6.3 Setting the IP configuration of the Servo Drive 9400 37
6.3.1 Setting via the EtherNet/IP configurator of the »Engineer« 38
6.3.2 Setting via codes in the »Engineer« 40
6.3.3 Setting via a BOOTP/DHCP server 42
6.3.4 Setting via the TCP/IP Interface Object (0xF5) 42
6.3.5 Setting the multicast configuration 43
6.4 Establishing an online connection via EtherNet/IP with the Lenze »Engineer« 44
6.5 Initial switch-on 46

Contents

7 Data transfer 47
7.1 Communication channels 48
7.2 Telegram types 49
7.3 EtherNet/IP state diagram 50

8 I/O data transfer (implicit messages) 51
8.1 Technology applications (TA) / drive profiles 52
8.1.1 Lenze technology applications / user-definable parameter sets 52
8.1.2 I/O assemblies 53
8.2 I/O configuration in the »Engineer« 55
8.3 I/O configuration with »RSLogix 5000« version 19 or lower 58
8.4 I/O configuration with »RSLogix 5000« version 20 or higher 63
8.5 Saving the I/O configuration in »RSLogix 5000« 69

9 Parameter data transfer (explicit messages) 70
9.1 Write parameters 71
9.2 Read parameters 72

10 Monitoring 74
10.1 Fault with regard to EtherNet/IP communication 74
10.2 Interruption of internal communication 75

11 Diagnostics 76
11.1 LED status displays 76
11.1.1 Module status displays 77
11.1.2 CIP™ status displays 78
11.1.3 Status displays on the RJ45 sockets (X233, X234) 80
11.2 Diagnostics with the »Engineer« 81

12 Error messages 82
12.1 Short overview of the EtherNet/IP error messages 82
12.2 Possible causes and remedies 83
12.3 CIP™ error messages 87

13 Parameter reference 88
13.1 Parameters of the standard device that are relevant to communication 88
13.2 Parameters of the communication module for slot MXI1 90
13.3 Parameters of the communication module for slot MXI2 103
13.4 Table of attributes 116

Contents

14 Implemented CIP™ objects 119
14.1 General CIP objects 121
14.1.1 Identity Object (1 / 0x01) 121
14.1.2 Message Router Object (2 / 0x02) 123
14.1.3 Assembly Object (4 / 0x04) 124
14.1.4 Connection Manager Object (6 / 0x06) 126
14.2 EtherNet/IP objects 128
14.2.1 Device Level Ring (DLR) Object (71 / 0x47) 128
14.2.2 Quality of Service (QoS) Object (72 / 0x48) 130
14.2.3 TCP/IP Interface Object (245 / 0xF5) 132
14.2.4 Ethernet Link Object (246 / 0xF6) 136
14.3 Lenze objects 139
14.3.1 Lenze Class (101 / 0x65) 139
14.3.2 Lenze Class (103 / 0x67) 141
14.3.3 Lenze Class (104 / 0x68) 142
14.3.4 Lenze Class (110 / 0x6E) 143

Index 144

Your opinion is important to us 148

1 About this documentation

Contents

This documentation only contains descriptions of the E94AYCEO (EtherNet/IP™) communication module.

Note!

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

The mounting instructions contain safety instructions which must be observed!

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

Examples illustrate typical applications.

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

This documentation does not describe the software of another manufacturer. No guarantee can be given for corresponding information in this documentation. Information on the use of the software can be found in the documents for the host system (PLC, scanner).

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

Target group

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



Tip!

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

www.lenze.com

Information regarding the validity

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

Extension module	Type designation	From hardware version	From software version
Communication module EtherNet/IP	E94AYCEO	VE	01.01.00.00

Screenshots/application examples

All screenshots in this documentation are application examples. Depending on the firmware version of the communication module and software version of the installed engineering tools (»Engineer«, »RSLogix 5000«), the screenshots in this documentation may differ from the screen representation.

1.1 Document history

Version			Description
1.0	03/2012	TD17	First edition for field test version V0.3.0.0
2.0	09/2012	TD17	General revision of version V01.01.00.00
3.0	12/2013	TD17	• New layout • Revision of the parameter descriptions

1.2 Conventions used

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

Type of information	Identification	Examples/notes
Numbers		
Decimal	Standard notation	Example: 1234
Decimal separator	Point	In general, the decimal point is used. Example: 1234.56
Hexadecimal	0x[0 ... 9, A ... F]	Example: 0x60F4
Binary • Nibble	In inverted commas Point	Example: '100' Example: '0110.0100'
Text		
Version information	Text colour blue	All pieces of information that only apply to or from a specific software version of the device are highlighted accordingly in this documentation. Example: This function extension is available from software version V3.0!
Program name	» «	The Lenze PC software »Engineer«...
Control element	**Bold**	The **OK** button... / The **Copy** command... / The **Properties** tab... / The **Name** input field...
Sequence of menu commands		If several successive commands are required for executing a function, the individual commands are separated from each other by an arrow: Select the command **File → Open** to...
Hyperlink	Underlined	Optically highlighted reference to another topic. Can be activated with a mouse-click in this online documentation.
Icons		
Page reference	(📖 9)	Optically highlighted reference to another page. Can be activated with a mouse-click in this online documentation.
Step-by-step instructions		Step-by-step instructions are marked by a pictograph.

1.3 Terminology used

Term	Meaning
ACD	Address Conflict Detection
Adapter	EtherNet/IP slave
Drive	Lenze inverters of the "Servo Drives 9400" product series
Inverter	
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 so-called "subcodes". This manual uses a slash "/" as a separator between code and subcode (e.g. "C00118/3"). In normal usage, the term is also referred to as "Subindex".
DHCP	Dynamic Host Configuration Protocol
DSCP	Differentiated Services Codepoints
EDS	Electronic Data Sheet
»Engineer«	PC software from Lenze which supports you during engineering (parameterisation, diagnostics, and configuration) throughout the entire life cycle, i.e. from planning to maintenance of the commissioned machine.
EtherNet/IP	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.
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.
Standard 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

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 applied 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 a safe and trouble-free operation and for achieving the specified product features.
  ▸ Product features (📖 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.

All works on and with Lenze drive and automation components must only be carried out by qualified personnel. According to IEC 60364 or CENELEC HD 384 these are persons who ...

- are familiar with installing, mounting, commissioning, and operating the product.
- who have the corresponding qualifications for their work.
- who know and can apply all regulations for the prevention of accidents, directives, and laws applicable at the place of use.

2.2 Device and application-specific safety instructions

- During operation, the communication module must be securely connected to the standard device.
- With external voltage supply, always use a separate power supply unit, safely separated to EN 61800-5-1 in every control cabinet (SELV/PELV).
- Only use cables that comply with the listed specifications.
  ▸ Ethernet cable specification (📖 30)



Documentation for the standard device, control system, system/machine

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

2.3 Residual hazards

Protection of persons

If Servo Drives 9400 are used on a phase earthed mains with a rated mains voltage of ≥ 400 V, the protection against accidental contact is not ensured without external measures.
▸ Protective insulation (📖 19)

Device protection

The communication module contains electronic components which may be damaged or destroyed by electrostatic discharge.
▸ Installation (📖 23)

3 Product description

3.1 Application as directed

The EtherNet/IP communication module ...

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

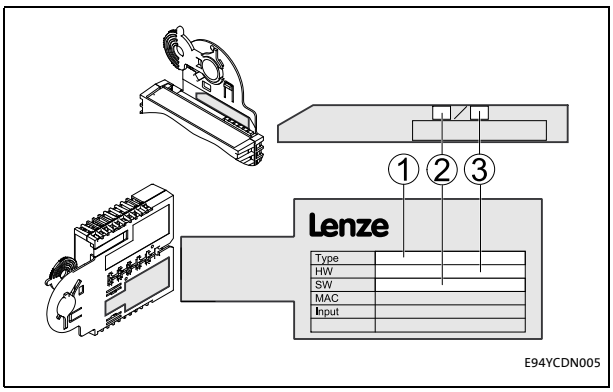
Product series	Type designation	From hardware version	From software version
Servo Drives 9400 HighLine	E94AxHExxxx	1A	04.00
Servo Drives 9400 PLC	E94AxPExxxx	VA	02.00
Regenerative power supply module	E94ARNxxxx	VA	01.00

- 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.

Any other use shall be deemed inappropriate!

3.2 Identification

The type designation and hardware and software version of the communication module are specified on the nameplate:



[3-1] Identification data

1 Type designation (type)
- E94 Product series
- A Version
- Y Module identification: Extension module
- C Module type: Communication module
- EO EtherNet/IP

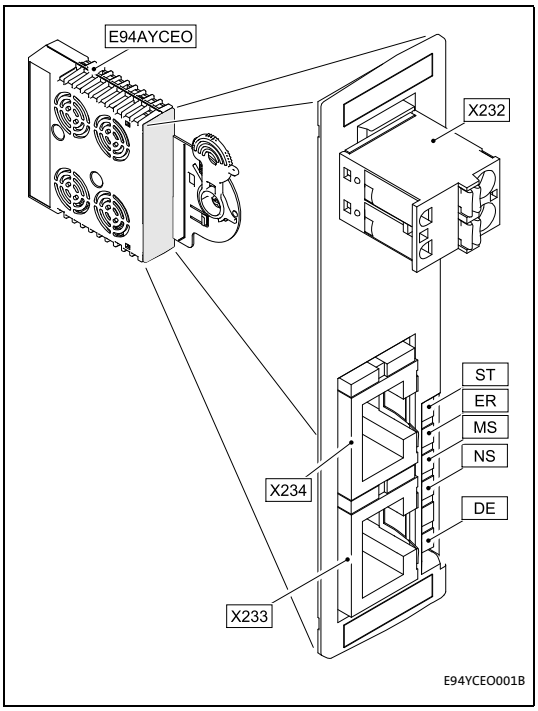
2 Hardware version (HW)

3 Software version (SW)

3.3 Product features

- Interface module for the EtherNet/IP communication system to be connected to the expansion slots of the Servo Drives 9400
- The communication module can either be supplied internally by the standard device or externally by a separate voltage source.
- The Servo Drive 9400 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 32 I/O data words (64 bytes) are possible.
- Further CIP features:
  - Max. 8 CIP connections
  - 1 "exclusive owner" connection
  - I/O connection type: cyclic
  - Minimum I/O cycle time: 2 ms
  - Support of multicast messages, "IGMP snooping" (V2 according to RFC 2236), UCMM, ACD, BOOTP/DHCP, VLAN tagging/DSCP

3.4 Terminals and interfaces



[3-2] E94AYCEO communication module (EtherNet/IP)

X232 External voltage supply of the communication module
- 2-pin plug connector with spring connection

▸ External voltage supply (📖 32)

X233 EtherNet/IP terminals
X234
- RJ45-sockets
- each with 2 LED status displays for diagnostics

▸ Network topology (📖 26)
▸ EtherNet/IP connection (📖 28)
▸ Status displays on the RJ45 sockets (X233, X234) (📖 80)

ST LED status displays for diagnostic purposes
ER
MS
NS
DE

▸ Module status displays (📖 77)
▸ CIP™ status displays (📖 78)

4 Technical data

4.1 General data and operating conditions

Range	Values
Order designation	E94AYCEO
Communication profile	EtherNet/IP
Communication medium	S/FTP (Screened Foiled Twisted Pair), ISO/IEC 11801 or EN 50173, CAT 5e
Interface for communication	RJ45: Standard Ethernet (in accordance with IEEE 802.3), 100Base-TX (Fast Ethernet)
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	43 (0x2B), Generic device
Product code	9400 (0x24B8)
TCP port	9410 (GCI)
Baud rate	• 10 Mbps • 100 Mbps
Transmission mode	Half duplex / full duplex
Switching method	Store-and-Forward
Switch latency	Approx. 125 µs at max. telegram length
Voltage supply	External supply via separate power supply unit + : U = 24 V DC (20.4 ... 28.8 V), I_{max} = 130 mA - : Reference potential for external voltage supply
Conformities, approvals	• CE • UL (see also hardware manual)

Servo Drives 9400 hardware manual

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

4.2 Protocol data

Range	Values
I/O data words	1 ... 32 words (max. 64 bytes, 16 bits/word)
Supported CIP services	• Get_Attributes_All • Get_Attribute_Single • Set_Attribute_Single • Reset (only type '0') • Forward_Open • Forward_Close

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 reference manual/ »Engineer« online help for the Servo Drive 9400).	

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:

Runtime delay = ((66 permanent bytes + I/O data in bytes) x 8 x 10 nsec) + 4 µsec

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

Runtime delay = ((62 permanent bytes + I/O data in bytes) x 8 x 10 nsec) + 4 µsec

Example

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

- ((66 permanent bytes + 16 bytes) x 8 x 10 nsec) + 4 µsec
- (82 bytes x 8 x 10 nsec) + 4 µsec
- 6.56 µsec + 4 µsec = **10.56 µsec**

Note!

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

▸ Network topology (📖 26)

4.5 Protective insulation

Danger!

Dangerous voltage

If the Servo Drives 9400 are operated on a phase earthed mains with a rated mains voltage ≥ 400 V, external measures need to be implemented in order to ensure protection against accidental contact.

Possible consequences:

Death or severe injuries

Protective measures:

If protection against accidental contact is required for the control terminals of the inverter and the connections of the plugged device modules, ...

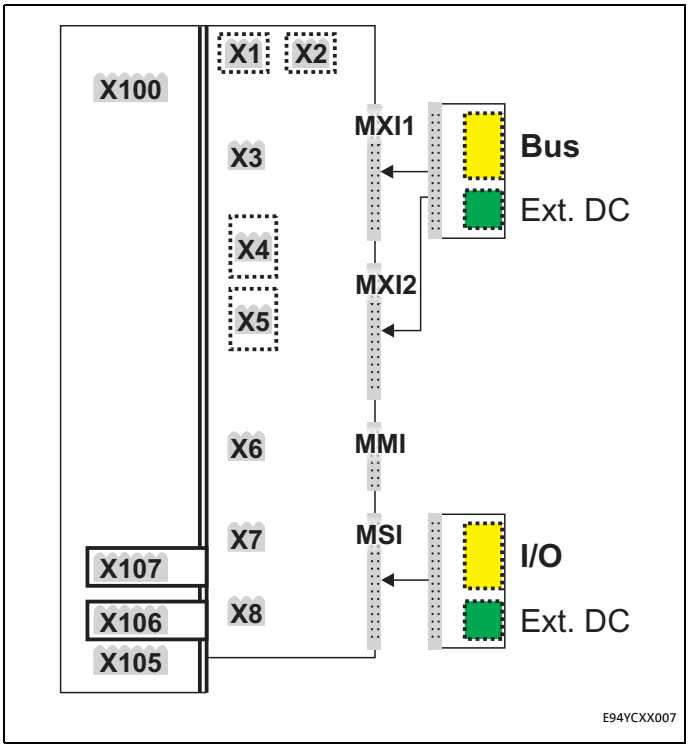
- a double isolating distance must exist.
- the components to be connected must be provided with the second isolating distance.

Note!

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

The following illustration ...

- shows the arrangement of the terminal strips and the separate potential areas of the inverter.
- serves to determine the decisive protective insulation between two terminals located in differently insulated separate potential areas.



[4-1] Protective insulation in accordance with EN61800-5-1

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

Example

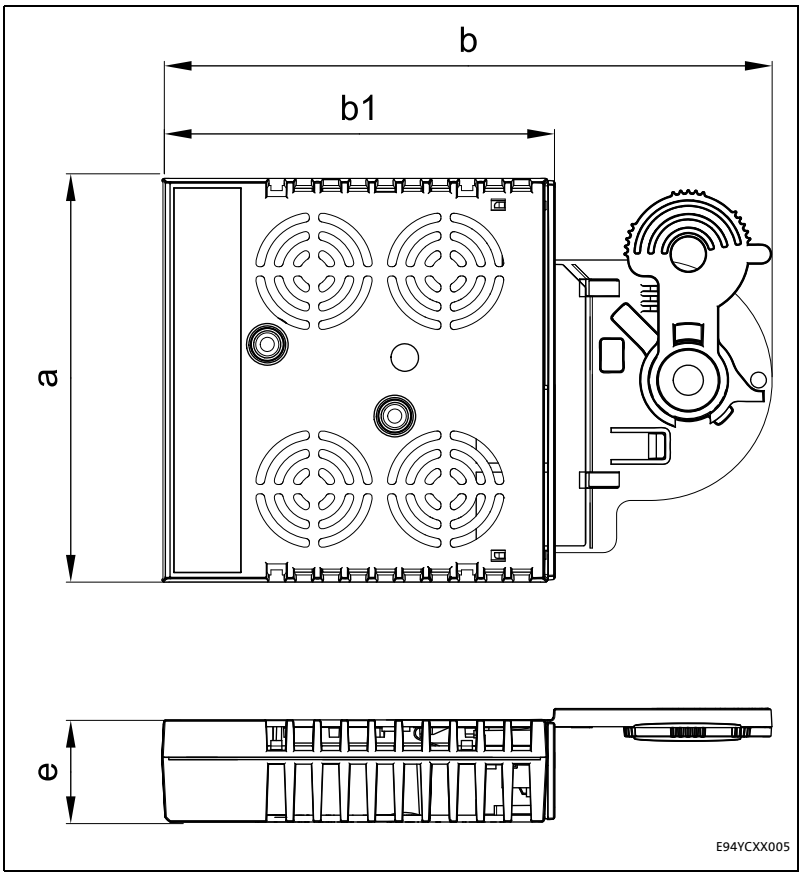
Which type of protective insulation is used between the bus terminal of the device module in slot MXI1 or MXI2 and the mains terminal X100?

The separate potential area with the better protective insulation is decisive.

- The separate potential area of the bus terminal of the device module has a "functional insulation".
- The separate potential area of the mains terminal has a "reinforced insulation".

Result: The insulation between mains terminal X100 and the bus terminal is of the "reinforced insulation" type.

4.6 Dimensions



a 89 mm
b 134 mm
b1 87 mm
e 23 mm

[4-2] Dimensions

5 Installation



Stop!

Electrostatic discharge

Electronic components within the communication module can be damaged or destroyed by electrostatic discharge.

Possible consequences:

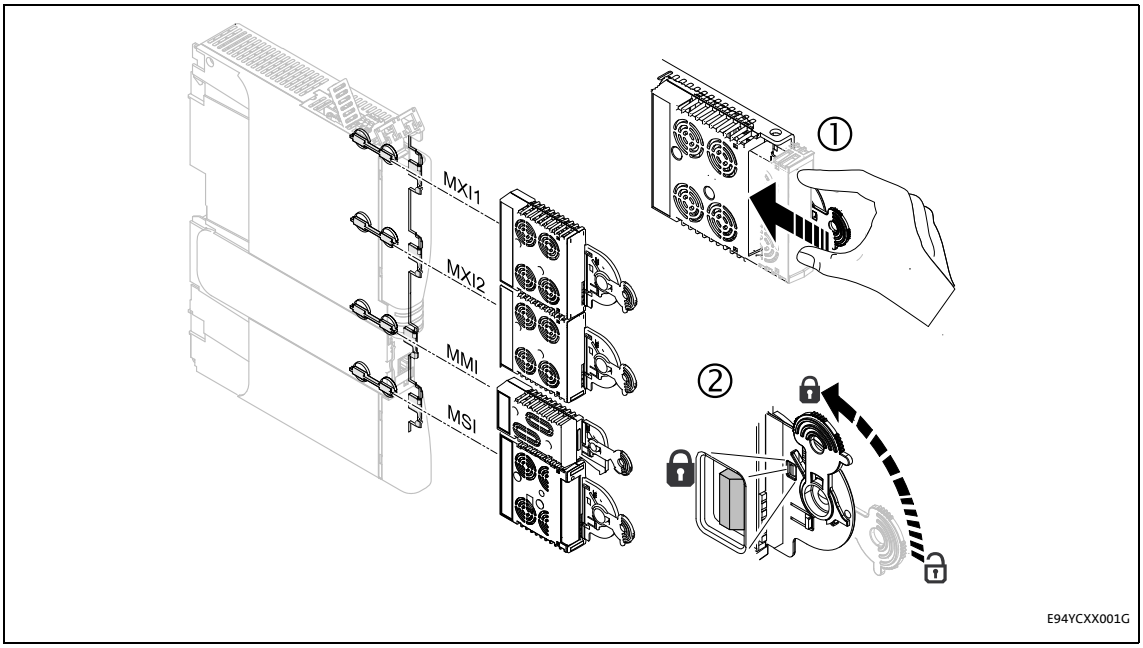
- The communication module is defective.
- Fieldbus communication is not possible or faulty.

Protective measures

- Before touching the module, be sure that you are free of electrostatic charge.

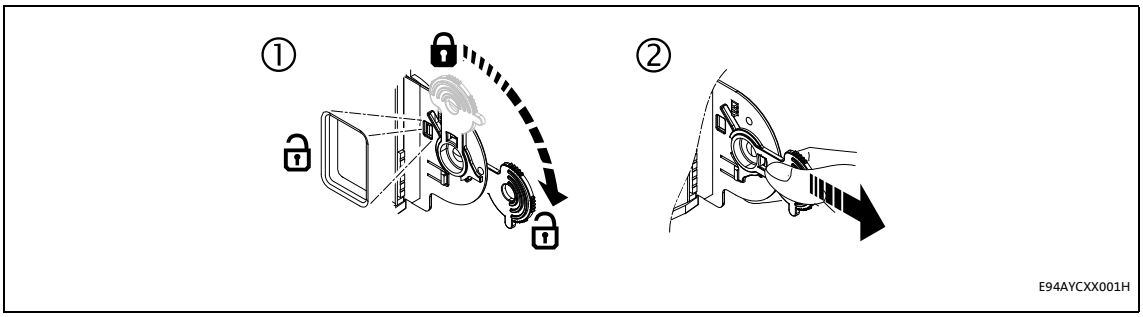
5.1 Mechanical installation

5.1.1 Assembly



[5-1] Assembly

5.1.2 Disassembly



[5-2] Disassembly

5.2 Electrical installation

Documentation for the standard device, control system, system/machine

Observe the notes and wiring instructions contained in this documentation.

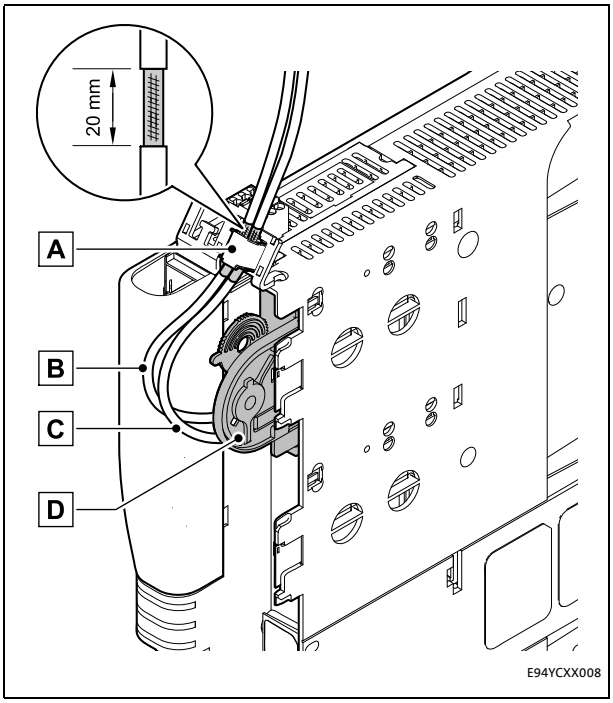
5.2.1 Wiring according to EMC guidelines

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

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

For this observe the following notes:

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



A Connection to the shield sheet of the Servo Drive 9400

B Ethernet cable at X234

C Ethernet cable at X233

D Communication module in slot MXI1 of the Servo Drive 9400

[5-3] Wiring according to EMC guidelines

5.2.2 Network topology

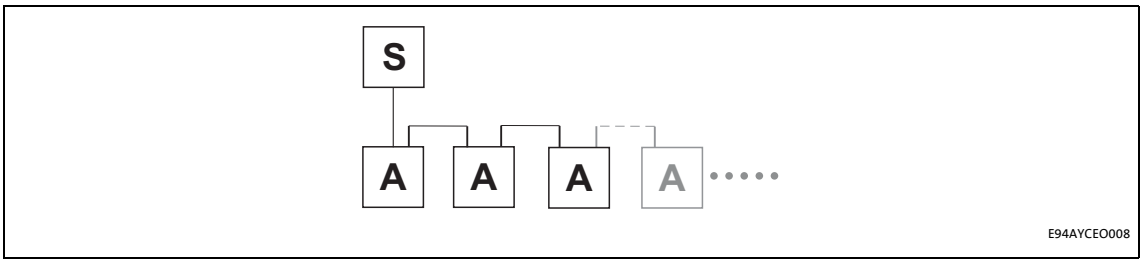
It is typical of EtherNet/IP to have a rather free topology the limiting factor of which is large message latencies due to e.g. switches connected in series.

▸ Internal switch latency (📖 18)

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

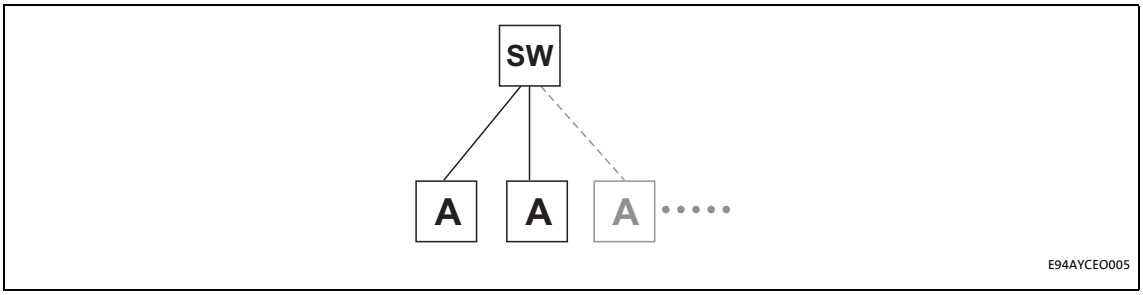
EtherNet/IP supports the following topologies:

- Line



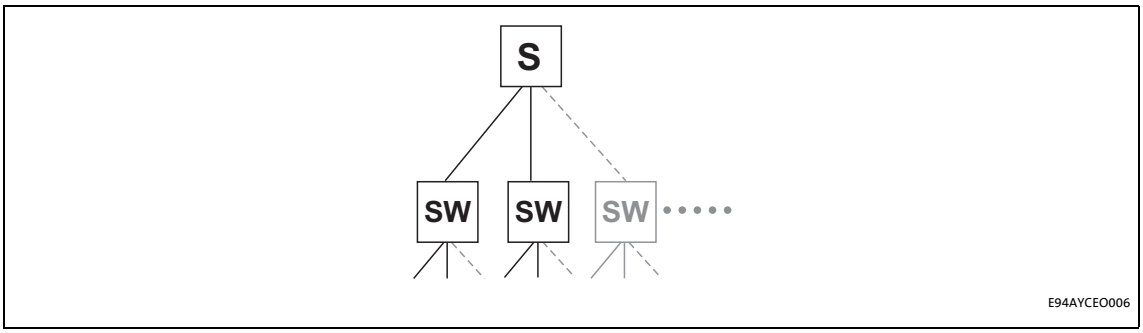
[5-4] Line topology (S = scanner, A = adapter)

- Switch / star



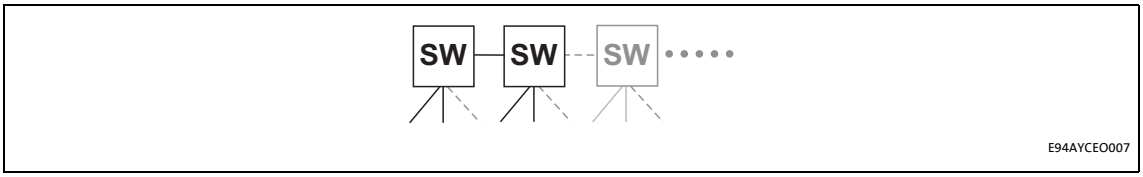
[5-5] Switch / star topology (SW = switch, A = adapter)

- Tree via switches



[5-6] Tree topology (S = scanner, SW = switch)

- Switch / switch



[5-7] Switch / switch topology (S = switch)

5.2.3 EtherNet/IP connection

The EtherNet/IP connection is carried out via the RJ45 sockets **X233** and **X234**.

You can use a standard Ethernet patch cable to connect the communication module to the EtherNet/IP fieldbus.

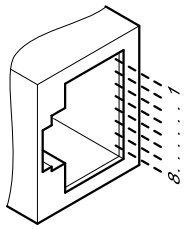
▸ Ethernet cable specification (📖 30)

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

Note!

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

Pin assignment

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

Note!

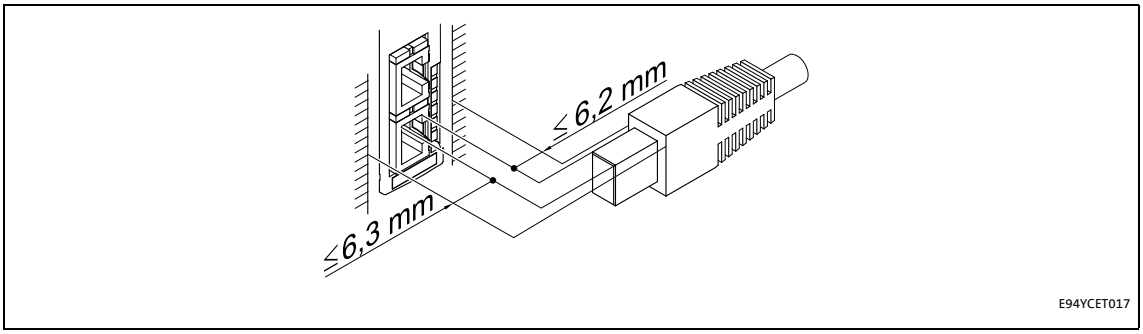
Dependent on the configuration of the Ethernet port of the device to be connected, we recommend the use of a cross-over cable.

Tip!

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

Mounting clearance

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



[5-8] Mounting clearance

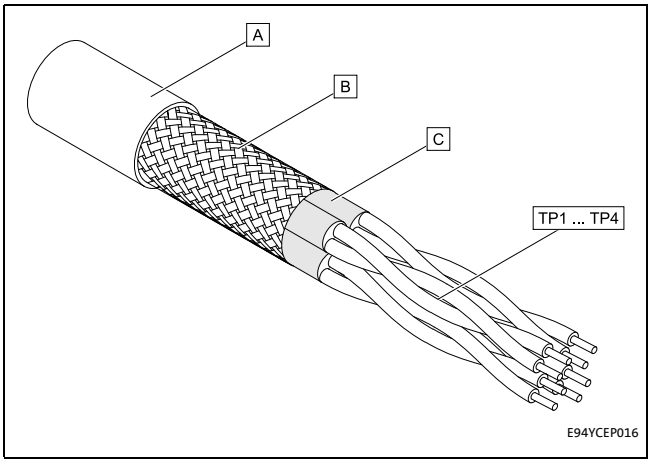
5.2.4 Ethernet cable specification

Note!

Only use cables that meet the listed specifications.

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

Structure of the Ethernet cable



A Cable insulation

B Braid

C Foil shielding

TP1 Twisted core pairs 1 ... 4
...
TP4

▸ Colour code of the Ethernet cable (📖 31)

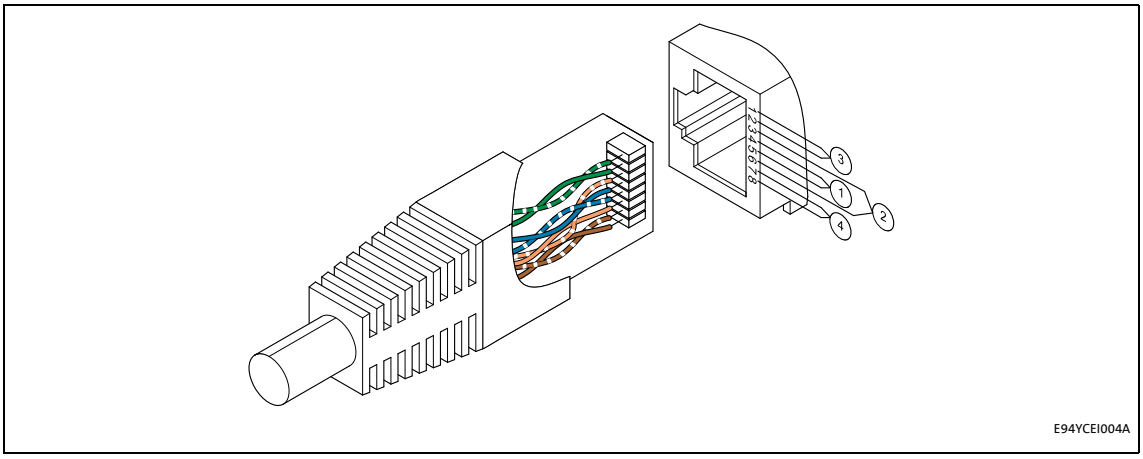
[5-9] Structure of the Ethernet cable (S/FTP, CAT 5e)

Colour code of the Ethernet cable

Note!

Wiring and colour code are standardised in EIA/TIA 568A/568B.

In accordance with the industrial standard, the use of 4-pin Ethernet cables is permissible. The cable type only connects the assigned pins 1, 2, 3 and 6 to one another.



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

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

5.2.5 External voltage supply

The communication module can be supplied externally with voltage via separate supply cables at the 2-pole plug connector **X232**.

Note!

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

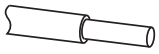
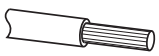
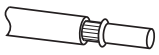
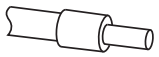
The external voltage supply of the communication module is necessary if the power supply for the basic device fails but communication via the fieldbus is to be maintained.

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

Assignment of the X232 plug connector

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

Terminal data

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

6 Commissioning

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

The 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 (📖 88)

Note!

When parameterising the communication module, please note that the code number depends on the slot of the Servo Drive 9400 into which the communication module is plugged.

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

- C**13**nnn for slot MXI1
  ▸ Parameters of the communication module for slot MXI1 (📖 90)
- C**14**nnn for slot MXI2
  ▸ Parameters of the communication module for slot MXI2 (📖 103)

Additionally set Parameters of the standard device that are relevant to communication (📖 88).

6.1 Before initial switch-on

Stop!

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

6.2 Configuring the host system (scanner)

To be able to communicate with the communication module, the host (scanner) must be configured first.

The configuration of EtherNet/IP networks always requires an EtherNet/IP scanner configuration software (e.g. »RSLogix 5000« from Rockwell) for the host (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 module are stored in the internal configuration memory and can be used for node detection by the scanner.

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

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 must be imported into the controller project of the scanner configuration software.

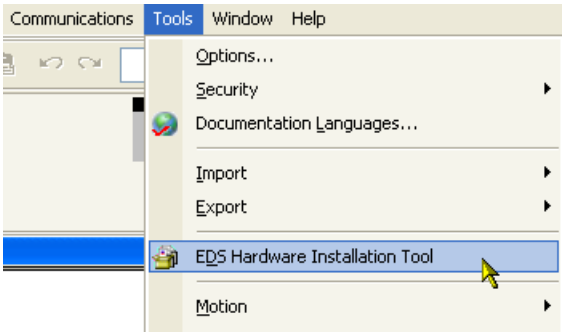
The EDS file required for the configuration can be found in the download area at:

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.

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

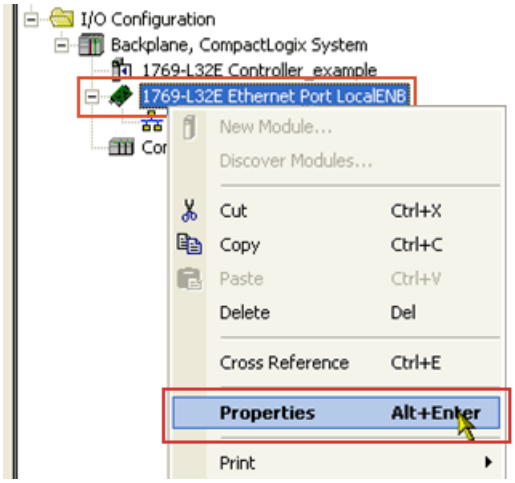
In this example, the Allen-Bradley CompactLogix controller 1769-L32E with an integrated EtherNet/IP interface is used to communicate with Servo Drives 9400.

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

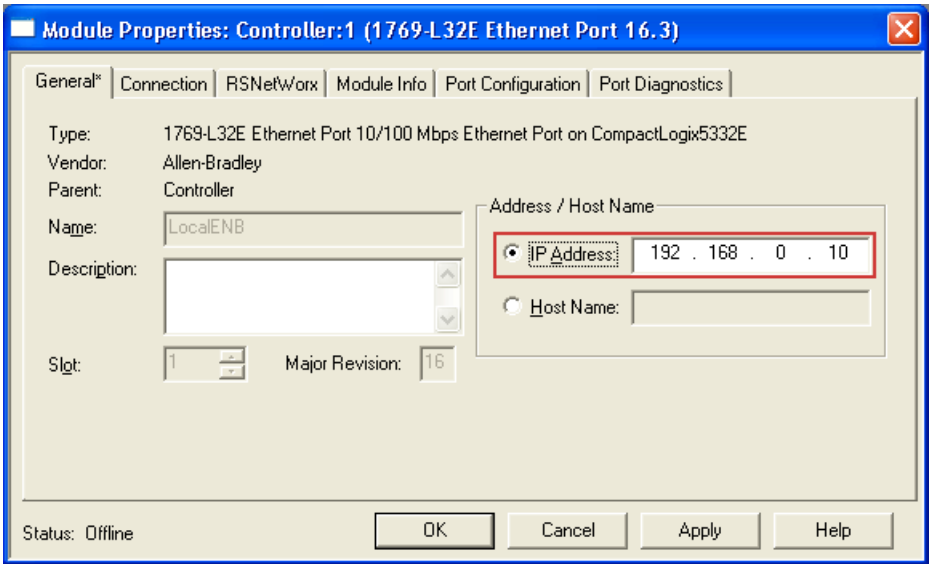
To establish communication via an EtherNet/IP network, add the controller and its scanner to the I/O configuration.

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.

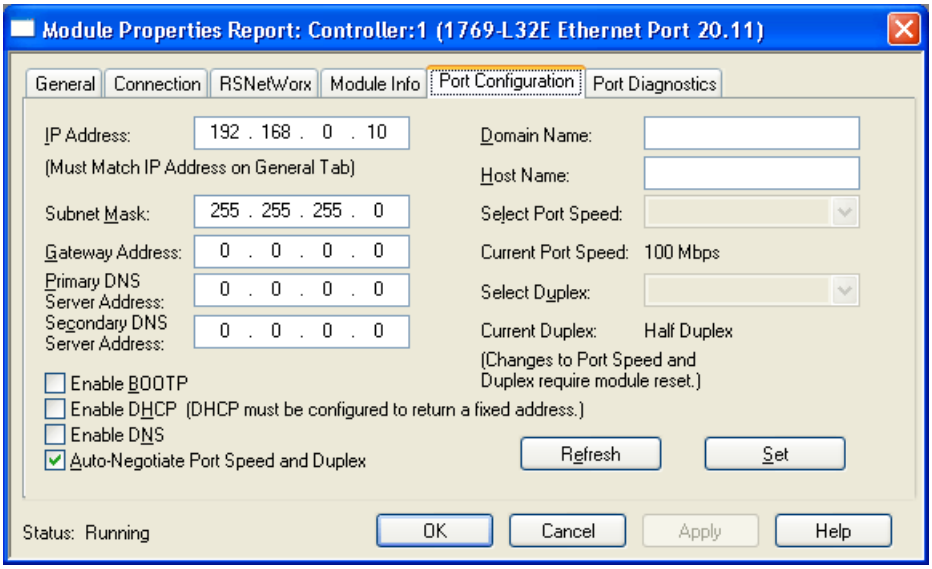


3. Go to the **General** tab of the "Module Properties: ..." dialog window and enter the IP address of the scanner.



4. Then click **OK**.

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



6. Then click **OK**.
   - Now, the scanner is configured for the EtherNet/IP network.
   - Information on project planning with the »RSLogix 5000« programming software by Rockwell can be found here:
     - I/O configuration with »RSLogix 5000« version 19 or lower (📖 58)
     - I/O configuration with »RSLogix 5000« version 20 or higher (📖 63)

6.3 Setting the IP configuration of the Servo Drive 9400

The IP configuration is required for addressing the Servo Drive 9400 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 Servo Drive 9400:

- Setting via the EtherNet/IP configurator of the »Engineer« (📖 38)
- Setting via codes in the »Engineer« (📖 40)
- Setting via a BOOTP/DHCP server (📖 42)
- Setting via the TCP/IP Interface Object (0xF5) (📖 42)

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 / C14010 (IP address), C13011 / C14011 (subnet mask), C13012 / C14012 (gateway address), and C13016 / C14016 (multicast IP address) show the IP parameters currently used.
- In the case of impermissible settings, the error message EtherNet/IP: Invalid IP parameters [0x00c86533] (📖 84) is output.

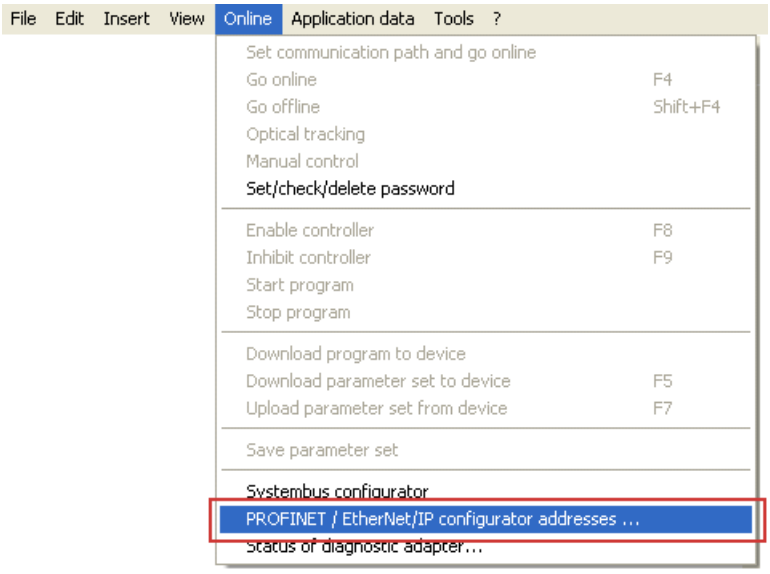
6.3.1 Setting via the EtherNet/IP configurator of the »Engineer«

Note!

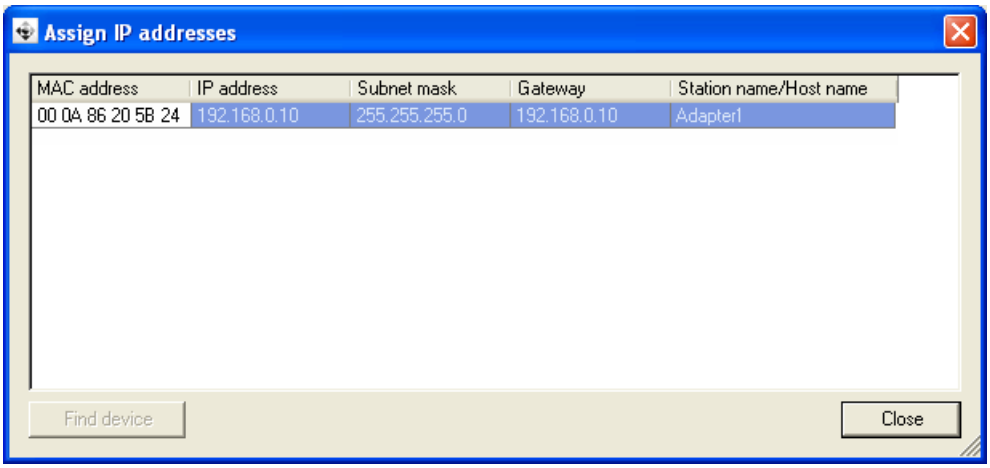
- Changes in the IP parameters will become effective immediately.
- An existing IP connection to the Servo Drive 9400 will be interrupted.
- This procedure cannot be applied if the network is configured by a BOOTP/DHCP server.
  ▸ Setting via a BOOTP/DHCP server (📖 42) (C13005 / C14005)

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

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

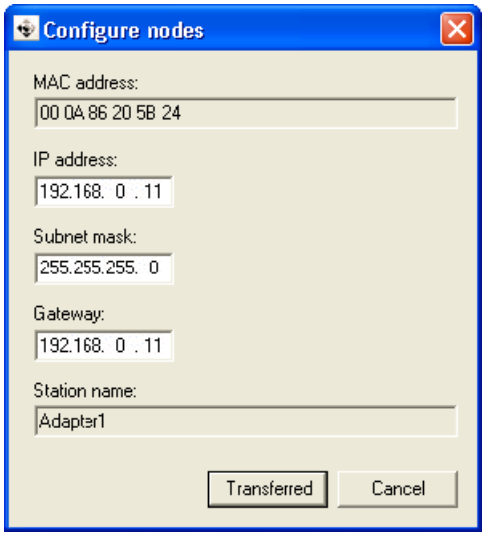


The **Assign IP addresses** dialog window is opened and all Lenze EtherNet/IP nodes connected are listed.



2. A double-click on an 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 module carries out a stack reset.
   - The IP parameters are written to codes C13000 / C14000 (IP address), C13001 / C14001 (subnet mask) und C13002 / C14002 (gateway address).
   - Code C13005 / C14005 (IP configuration reference) is set to '0: Saved address' to ensure that the address transferred can be used.

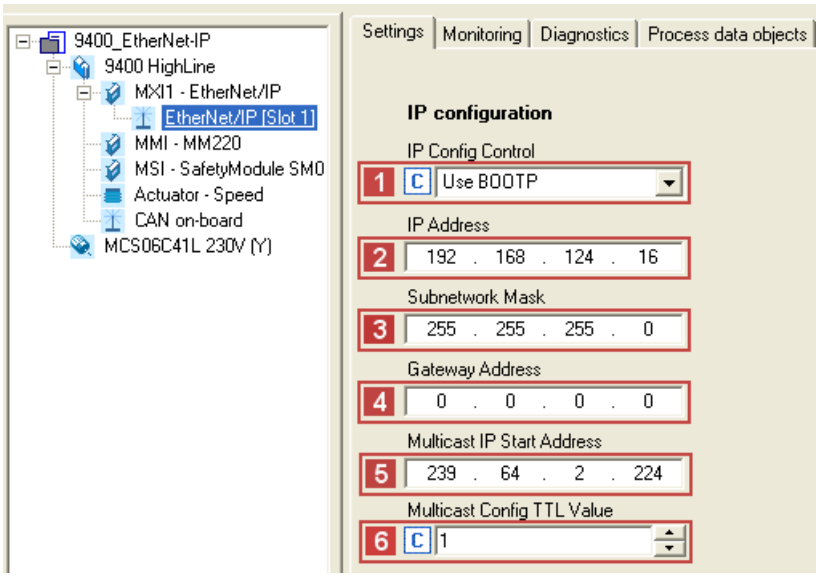
Tip!

Check whether the configuration has been transferred successfully.

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

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 / C14005) of how the IP configuration is to be effected: • **0**: The IP configuration currently stored in the communication module 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 the IP address (C13000 / C14000)
3	**Subnet mask**	Setting the subnet mask (C13001 / C14001)
4	**Gateway Address**	Setting the gateway address (C13002 / C14002)
5	**Multicast IP Start Address**	Setting of the multicast IP start address (C13006 / C14006) ▸ Setting the multicast configuration (📖 43)
6	**Multicast Config TTL Value**	Setting of the multicast TTL value (C13019 / C14019)

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) (📖 121) of the node, or switch the voltage supply of the communication module off and on again.

IP address

The IP address is set/changed in C13000 / C14000.

In C13010/1...4 / C14010/1...4 the currently used IP address is shown.

Example: Display of the IP address 192.168.0.10				
Code	C13010/1 C14010/1	C13010/2 C14010/2	C13010/3 C14010/3	C13010/4 C14010/4
Value	192	168	0	10

Subnet mask

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

Valid subnet masks are defined in accordance with RFC 1878

The subnet mask is set/changed in C13001 / C14001.

In C13011/1...4 / C14011/1...4 the currently used subnet mask is shown.

Example: Display of the subnet mask 255.255.255.0				
Code	C13011/1 C14011/1	C13011/2 C14011/2	C13011/3 C14011/3	C13011/4 C14011/4
Value	255	255	255	0

Gateway address

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

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

The gateway address is set/changed in C13002 / C14002.

In C13012/1...4 / C14012/1...4 the currently used gateway address is shown.

Example: Display of the gateway address 192.168.0.10				
Code	C13012/1 C14012/1	C13012/2 C14012/2	C13012/3 C14012/3	C13012/4 C14012/4
Value	192	168	0	10

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 / C14005 is used to define how the IP configuration is to be carried out:

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

This setting can also be made by means of write access to attribute 3 (Configuration Control) of instance 1 of the TCP/IP Interface Object (245 / 0xF5) (📖 132).

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

A scanner serves to set the IP configuration via attribute 5 (Interface configuration) of instance 1 of the TCP/IP Interface Object (245 / 0xF5) (📖 132).

After the IP configuration, carry out a node reset ("power off/on" or "Type 0 reset" for the Identity Object (1 / 0x01) (📖 121)).

In »Engineer«, codes C13010 / C14010 (IP address), C13011 / C14011 (subnet mask), C13012 / C14012 (gateway address), and C13016 / C14016 (multicast IP address) show the IP parameters currently used.

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 module automatically generates the Multicast IP start address for I/O data transfer. The standard TTL value for Multicast transfer is '1'; the Multicast I/O data packages are therefore distributed solely 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 / C14018	Selection for multicast IP addressing via the instance attribute 9 (Mcast Config) in the TCP/IP Interface Object (245 / 0xF5) (📖 132) • Value '0': The default algorithm is used. • Value '1': The address stored in code C13006 / C14006 is used as multicast IP start address.
C13019 / C14019	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) (📖 132))
C13020 / C14020	Used to set how many multicast IP addresses will be assigned. (Instance attribute 9 (Num Mcast) in the TCP/IP Interface Object (245 / 0xF5) (📖 132))

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 / C14006.

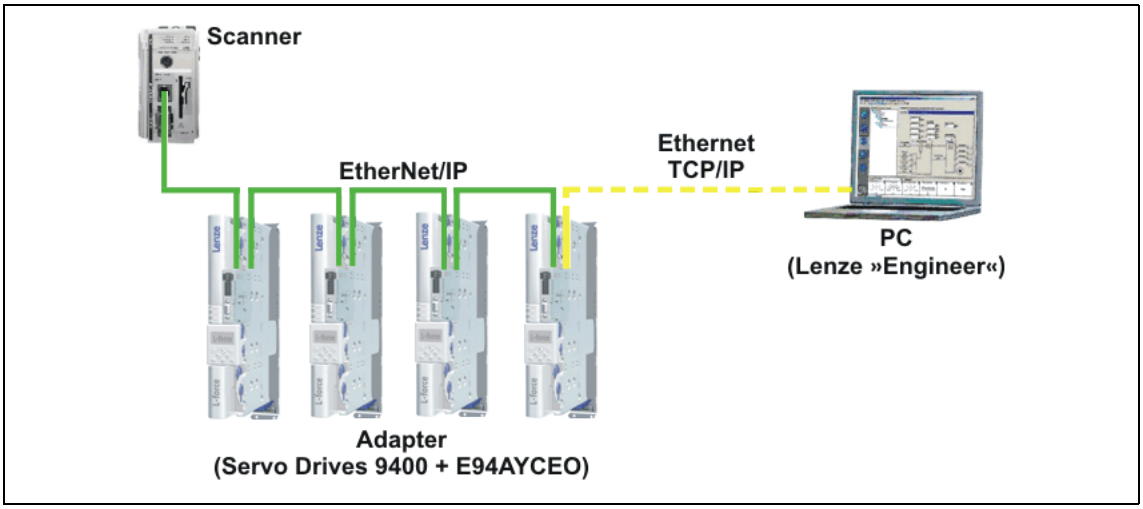
In C13016/1...4 / C14016/1...4 the currently used multicast IP address of the drive is shown.

Example: Display of the multicast IP address 239.64.2.224				
Code	C13016/1 C14016/1	C13016/2 C14016/2	C13016/3 C14016/3	C13016/4 C14016/4
Value	239	64	2	224

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

Note!

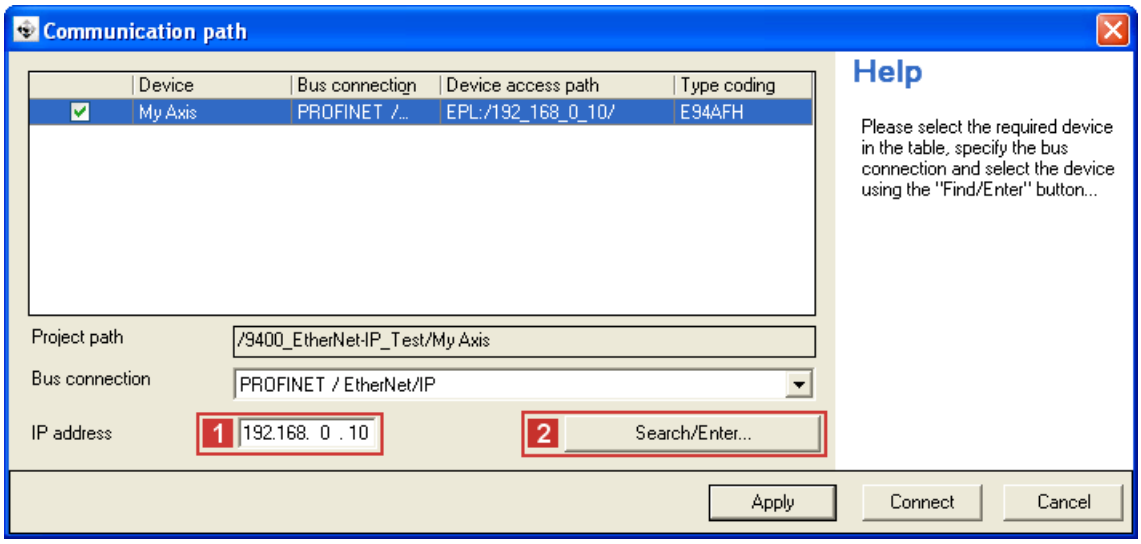
- In order to ensure perfect operation of cyclic EtherNet/IP communication, online access with the »Engineer« should be executed via an IEEE 802.1Q-capable switch.
- The IEEE 802.1Q-capable switch integrated in the communication module can manage cyclic EtherNet/IP communication preferentially to normal TCP/IP communication. In the case of EtherNet/IP this is effected using the VLAN identification in the Ethernet frame (adjustable in C13021 / C14021).
- If the redundancy protocol DLR (Device Level Ring) is used, the switch also must be DLR-compliant.



[6-1] Example setup: Allen-Bradley CompactLogix controller with Servo Drives 9400

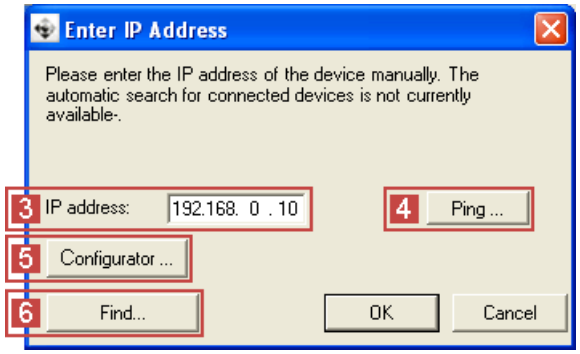
For an online connection between the »Engineer« and the drive, the drive must have an IP address (see Setting the IP configuration of the Servo Drive 9400 (📖 37)).

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« (📖 38)
- 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



Documentation for the Servo Drive 9400

Observe the safety instructions and information on residual hazards.



Note!

Establishing communication

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

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

Protection against uncontrolled restart

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

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

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

C00142 = "0: Inhibited" (Lenze setting)

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

C00142 = "1: Enabled"

- An uncontrolled restart of the drive is possible.

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 drive 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).
- In the case of Servo Drives 9400, maximally 32 data words (max. 64 bytes) for each direction can be exchanged.
- I/O data are not stored in the drive.
- 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 Servo Drive 9400.

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.

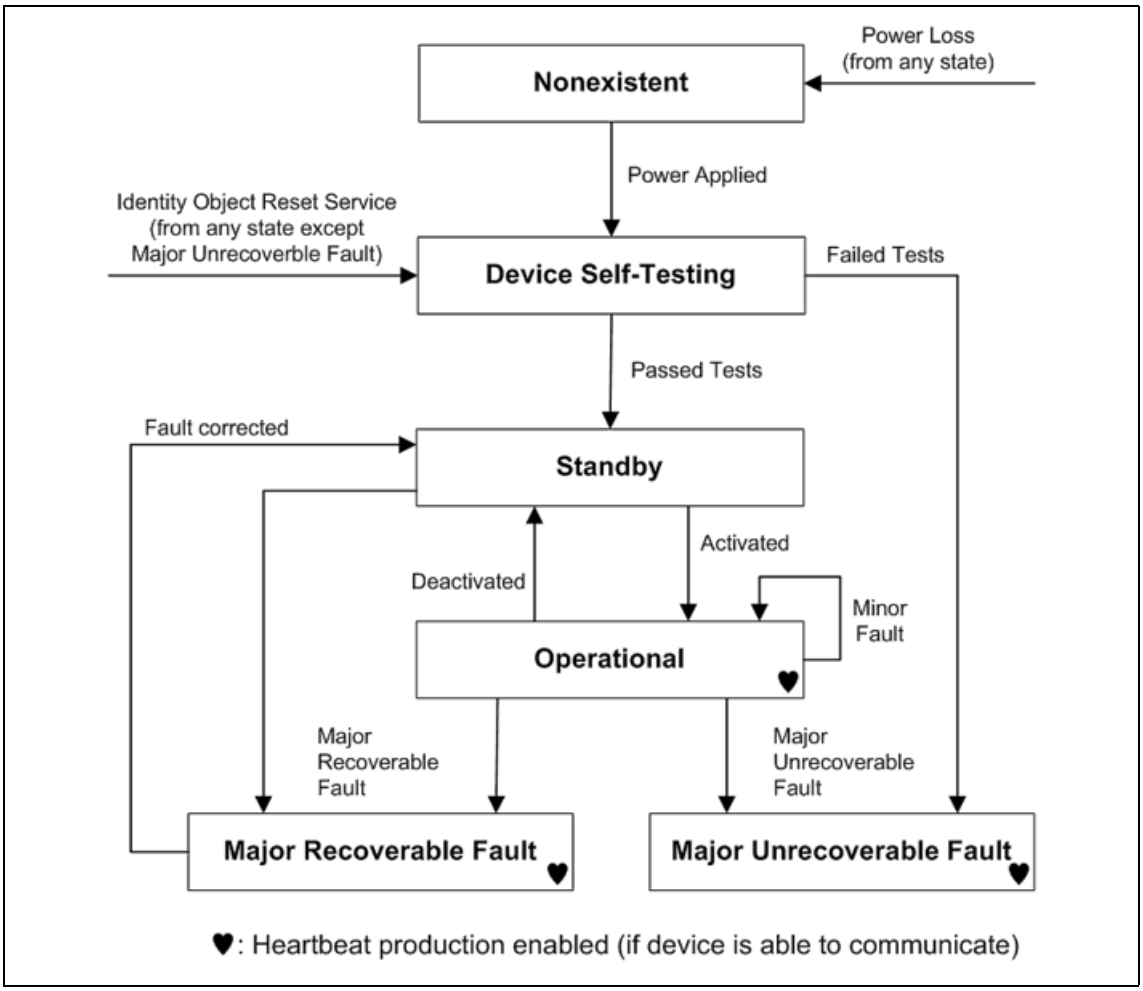
The "cyclic I/O data" transmission mode is supported. The scanner and the adapter use "cyclic I/O data" to generate their data independently of each other, which are then transmitted depending on a timer. The user must set the value of the timer in the scanner.

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 / C14861;
- output in the Identity Object (1 / 0x01) (📖 121) via instance attributes 5 and 8;
- indicated via the LED **MS** (see CIP™ 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 port modules in the drive (adapter):
  - I/O configuration in the »Engineer« (📖 55)
- configure the I/O data transfer in the host (scanner):
  - I/O configuration with »RSLogix 5000« version 19 or lower (📖 58)
  - I/O configuration with »RSLogix 5000« version 20 or higher (📖 63)

Preconditions for establishing an I/O connection

- The data length of the displayed ports in the receive PDO (PDO_RX0) must comply with the length of the I/O data of the assembly object instance 110 (0x6E, Custom Output) in the scanner.
- The data length of the displayed ports in the transmit PDO (PDO_TX0) must comply with the length of the I/O data of the assembly object instance 111 (0x6F, Custom Input) in the scanner.
- An I/O data object can contain a maximum of 32 mapping entries.
- The maximum data length of an I/O data object is 64 bytes

8.1 Technology applications (TA) / drive profiles

The Servo Drive 9400 is provided with different drive profiles. They define a standardised or individual control and status word assignment as well as the standardisation of setpoint and actual value scalings.

The Servo Drive 9400 supports Lenze technology applications and user-definable parameter sets.

8.1.1 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.

In order to use the Lenze technology applications, the following assembly object instances must 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) (📖 124).

The custom assemblies also allow for a user-definable parameter setting, depending on the application. Hence, 32 data words (64 bytes) can freely be assigned in the »Engineer« with variables of the port modules.

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

▸ I/O configuration in the »Engineer« (📖 55)



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 (📖 58)
▸ I/O configuration with »RSLogix 5000« version 20 or higher (📖 63)

8.1.2 I/O assemblies

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.

The length of the I/O data must correspond to the resulting length of the mapped ports (I/O configuration in the »Engineer« (📖 55)).

The communication module supports the "I/O Assembly Object" class "0x04" (Assembly Object (4 / 0x04) (📖 124)).

- For the data exchange, the assembly object instances 110 (0x6E, Custom Output), and 111 (0x6F, Custom Input) are supported
- Both assembly objects transmit a maximum of 64 bytes of I/O data, respectively.
- Depending on the data length defined by the scanner, the memory map of the data can have a different size.

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

Assembly input objects 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.

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 configuration in the »Engineer« (📖 55)).

8.2 I/O configuration in the »Engineer«

For the Servo Drives 9400 HighLine the I/O data can be arranged individually (mapping). For this purpose, the »Engineer« is provided with a port configurator.

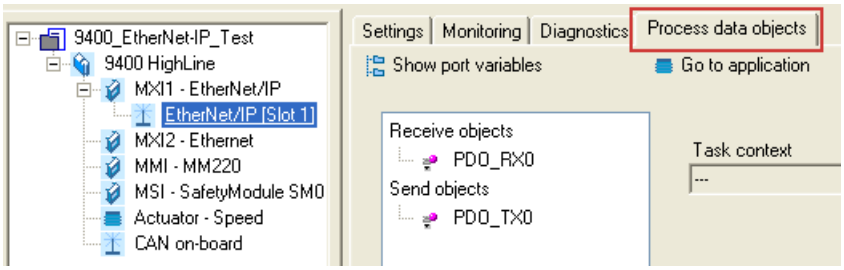
Note!

The port mapping is no configuration that can be carried out online for the Servo Drive 9400. For this purpose, an update of the »Engineer« project and a subsequent download of the application is always required.

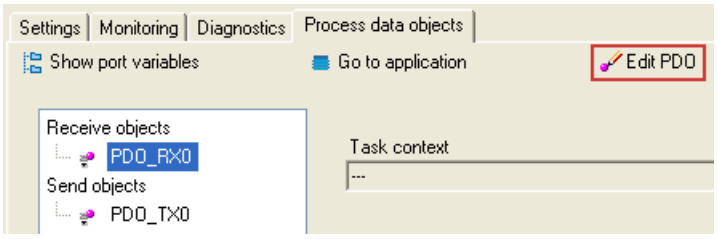
Below you can find a description of the steps required to realise an I/O data communication with the host (scanner) in which one control/status word and one 32 bit setpoint/actual value are exchanged each.

How to implement PDO mapping using the »Engineer«:

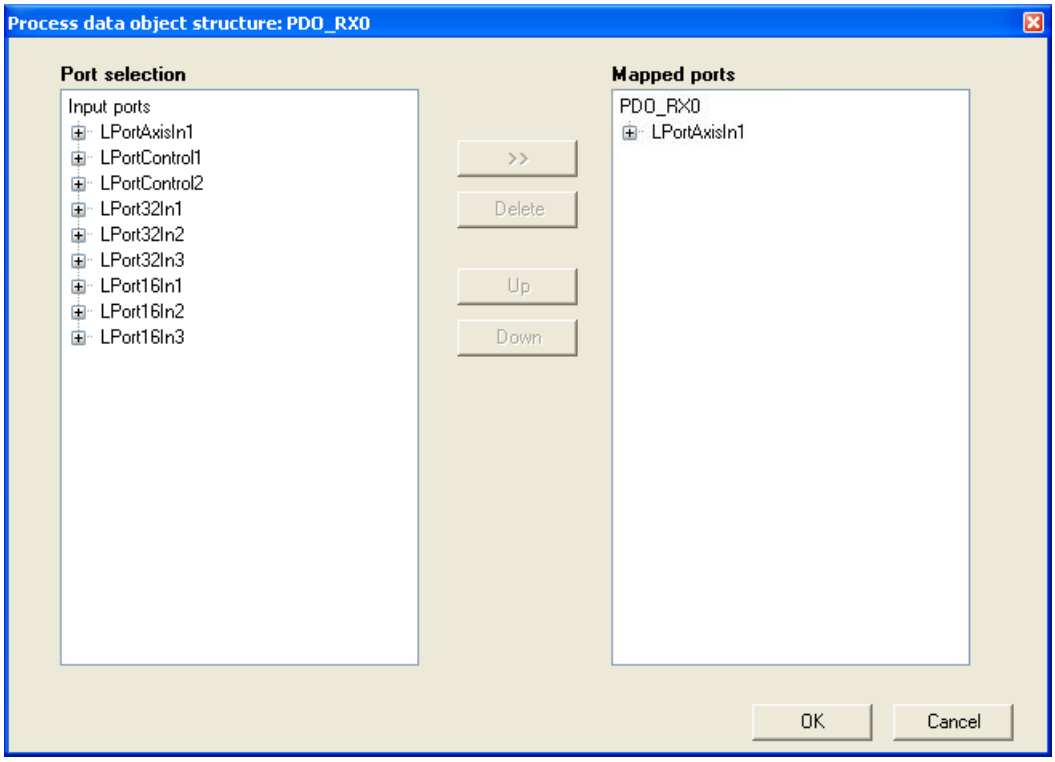
1. In the »Engineer«, the mapping of the I/O data is carried out under the **Process data objects** tab of the respective fieldbus communication module:



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



3. Click the **Edit PDO** button. The **Process data object structure:PDO_RX0** selection window opens:

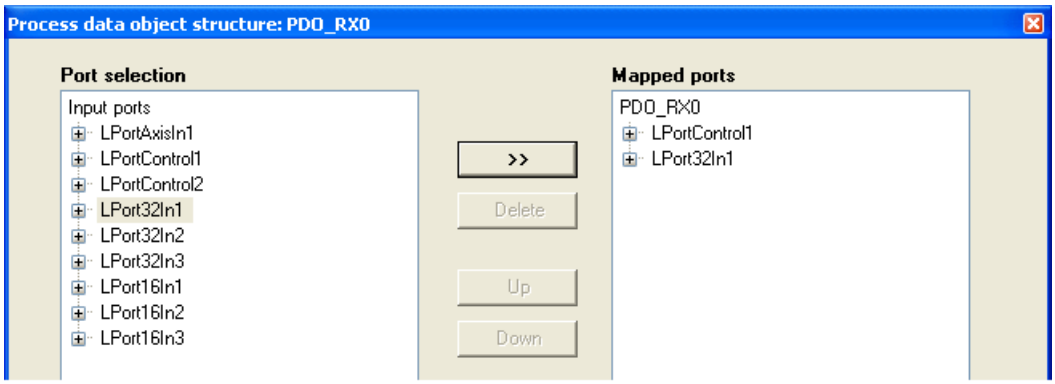


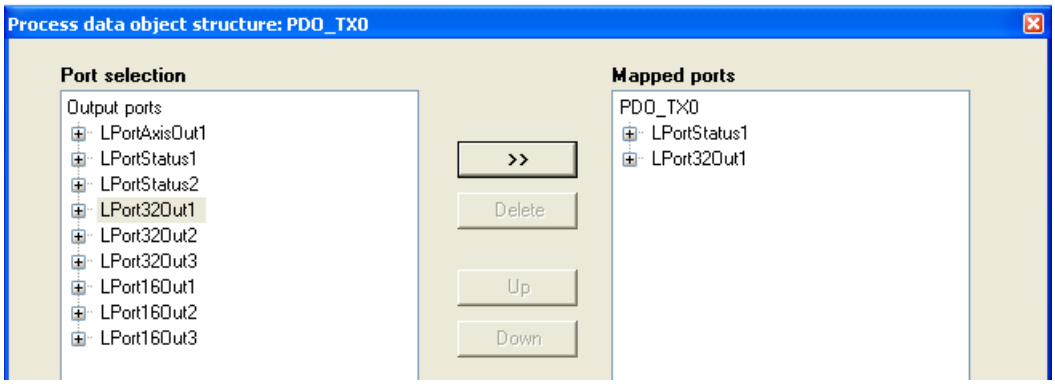
Here you can map the individual ports from the **Port Selection** list to the receive PDO "PDO_RX0" by clicking the **>>** button. The **Up** and **Down** buttons serve to shift the sequence of the ports within the PDO.

4. Repeat steps 2. and 3. for the send object **PDO_TX0**.

In the following example, ...

- the ports "LPortControl1" and "Lport32In1" (a total of 6 bytes) have been mapped into the receive PDO **PDO_RX0**;
- the ports "LPortStatus1" and "LPort32Out1" (a total of 6 bytes) have been mapped into the transmit PDO **PDO_TX0**.





5. Then link the mapped ports to application signals in the technology application selected.
   - Activate the »FB-Editor« via the multiplexer codes (from code C03000) if this has not been done yet.
   - If the »FB Editor« is activated, the multiplexer codes are no longer available. In this case, you must carry out the interconnection directly in the »FB Editor«.

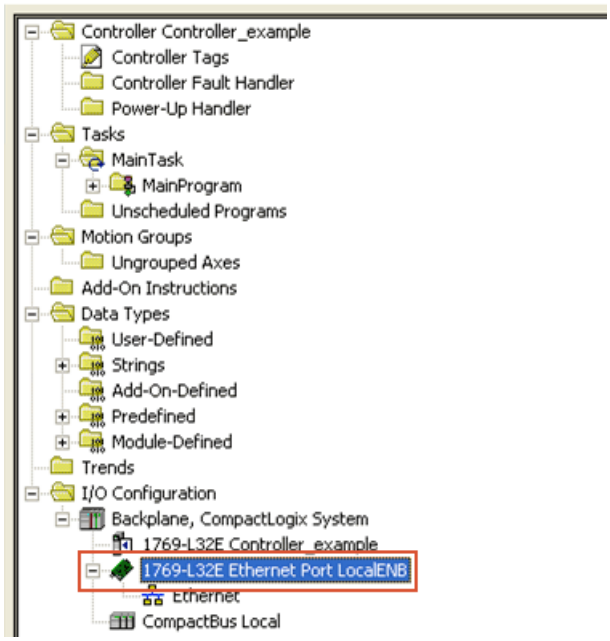
8.3 I/O configuration with »RSLogix 5000« version 19 or lower

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 (📖 34).

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

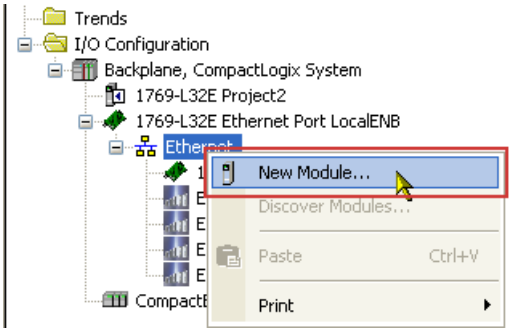
1. Click on the **I/O Configuration** folder in the configuration tree.



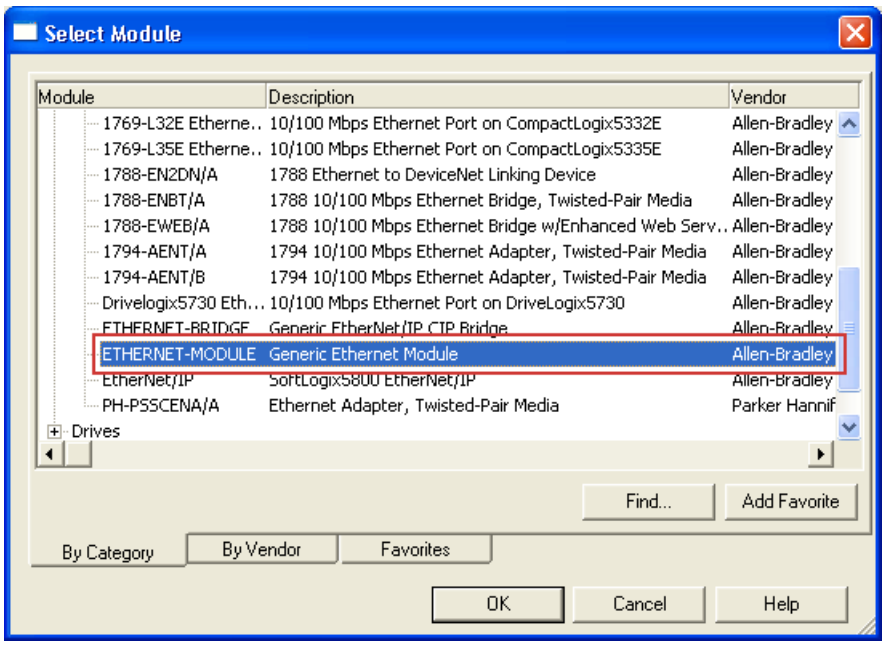
For the 1769-L32E CompactLogix controller, the I/O configuration already includes a local Ethernet port.

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

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".

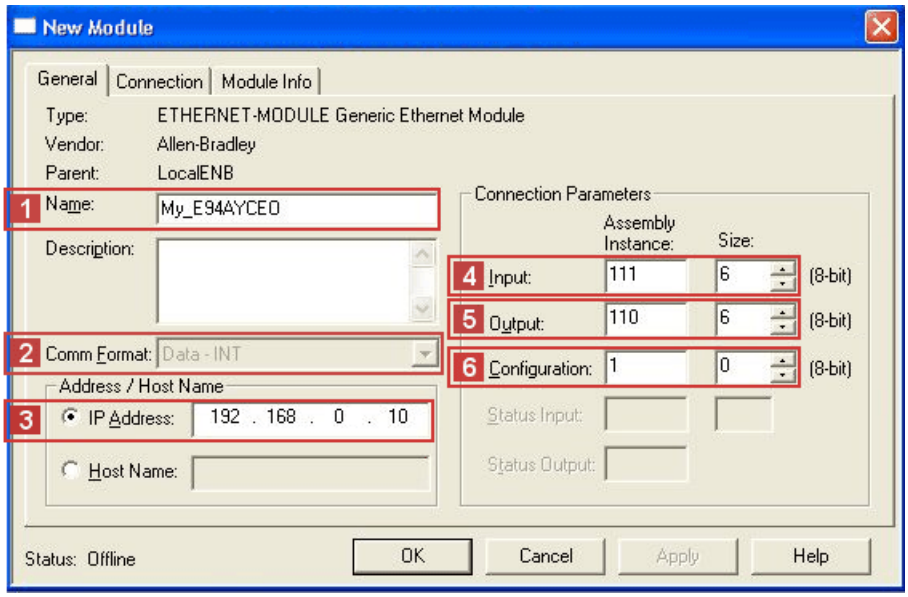


4. Confirm the selection by clicking**OK**.

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.

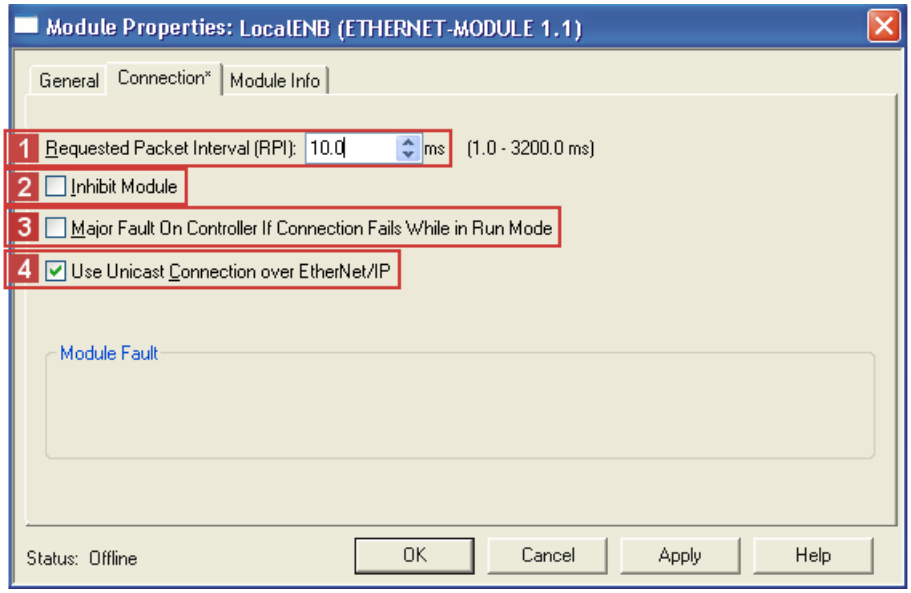
   Example settings



Settings		Description
1	**Name**	Device name or drive type, usually referring to the process (in the example "My_E94AYCEO")
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. 32 input data words (64 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).
5	**Output**	Assembly object instance for output objects • Max. 32 output data words (64 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).
6	**Configuration**	Select the **assembly instance "1"** and the **size "0"** for the configuration. These values are required!

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

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



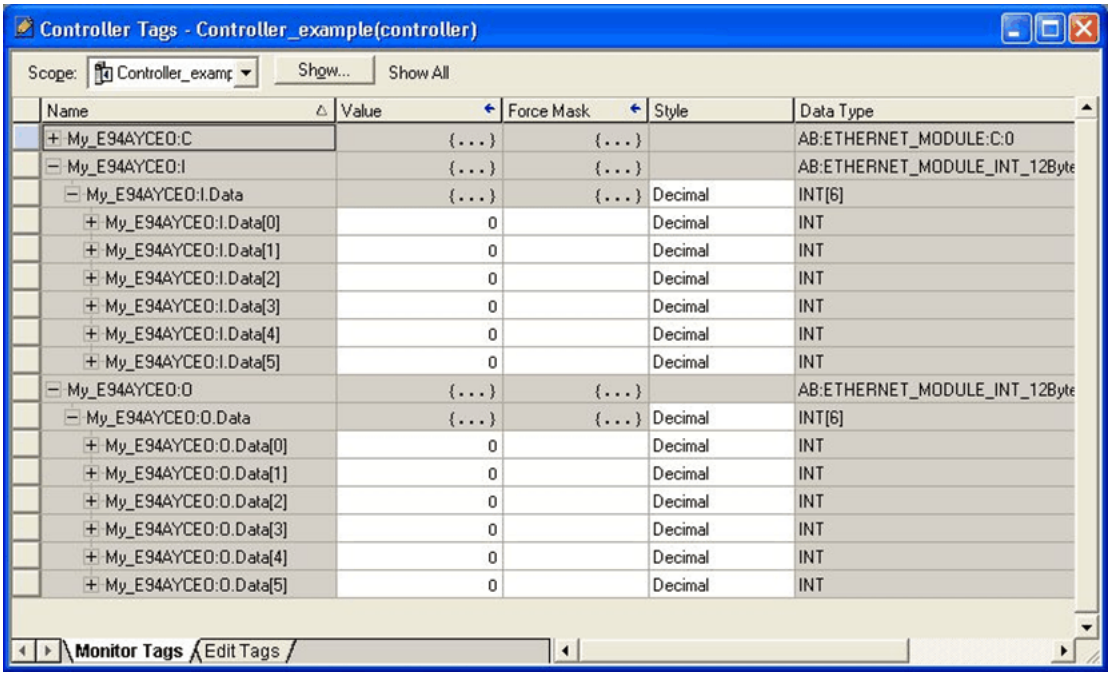
Required settings

Setting		Description
1	**Requested Packet Interval (RPI)**	Set **RPI ≥ 2.0 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).
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**.

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 scanner into the error status if the EtherNet/IP connection to the drive (adapter) fails while the scanner is in operation.

9. Complete the settings with **OK**.
   - The I/O configuration is now complete.
   - The corresponding tags are then created in the "controller tags" of the control project:



   In the example, the drive was named "My_E94AYCEO". There are three tag sets labelled "My_E94AYCEO":
   - "My_E94AYCEO:C" for the assembly configuration instance "1"
   - "My_E94AYCEO:I" for the assembly input object instance "111"
   - "My_E94AYCEO:O" for the assembly output object instance "110"

   Click on the **[+]** in front of the "My_E94AYCEO" data to display the I/O data words of the assemblies.

10. The last step is Saving the I/O configuration in »RSLogix 5000« (📖 69).

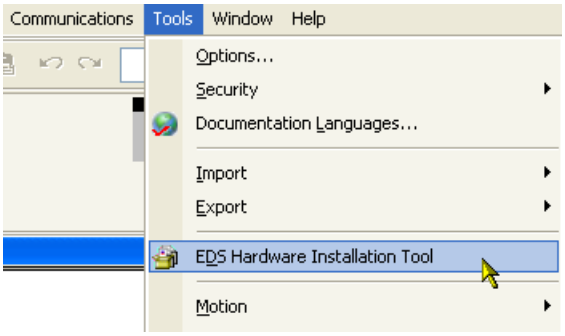
8.4 I/O configuration with »RSLogix 5000« version 20 or higher

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 (📖 34) are used for the I/O configuration.

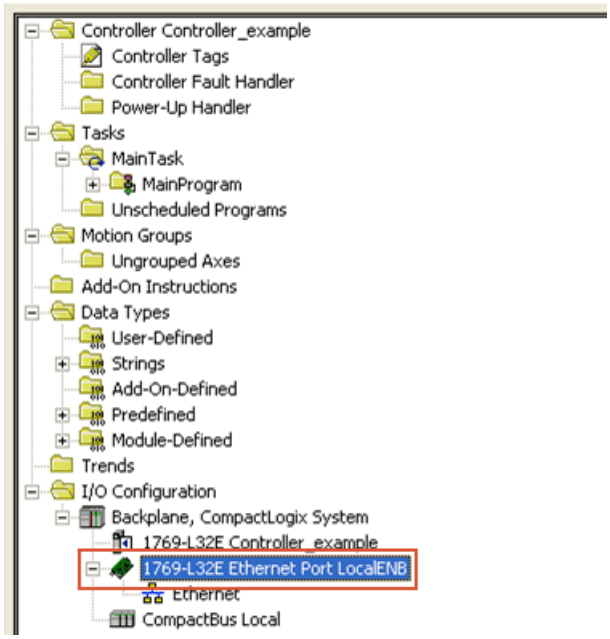
How to carry out the I/O configuration, taking the CompactLogix controller 1769-L32E with »RSLogix 5000« as an example:

1. Use the "EDS Hardware Installation Tool" item to import the EDS files (📖 34) 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.

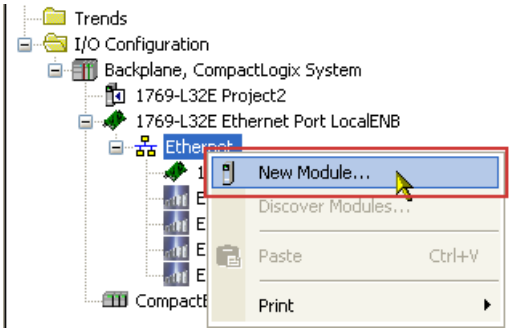
2. Click the **I/O Configuration** folder in the configuration tree.



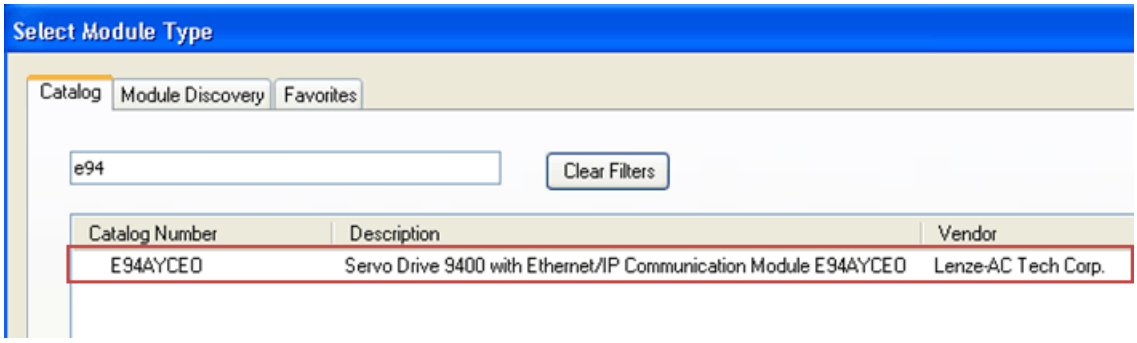
For the 1769-L32E CompactLogix controller, the I/O configuration already includes a local Ethernet port.

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

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



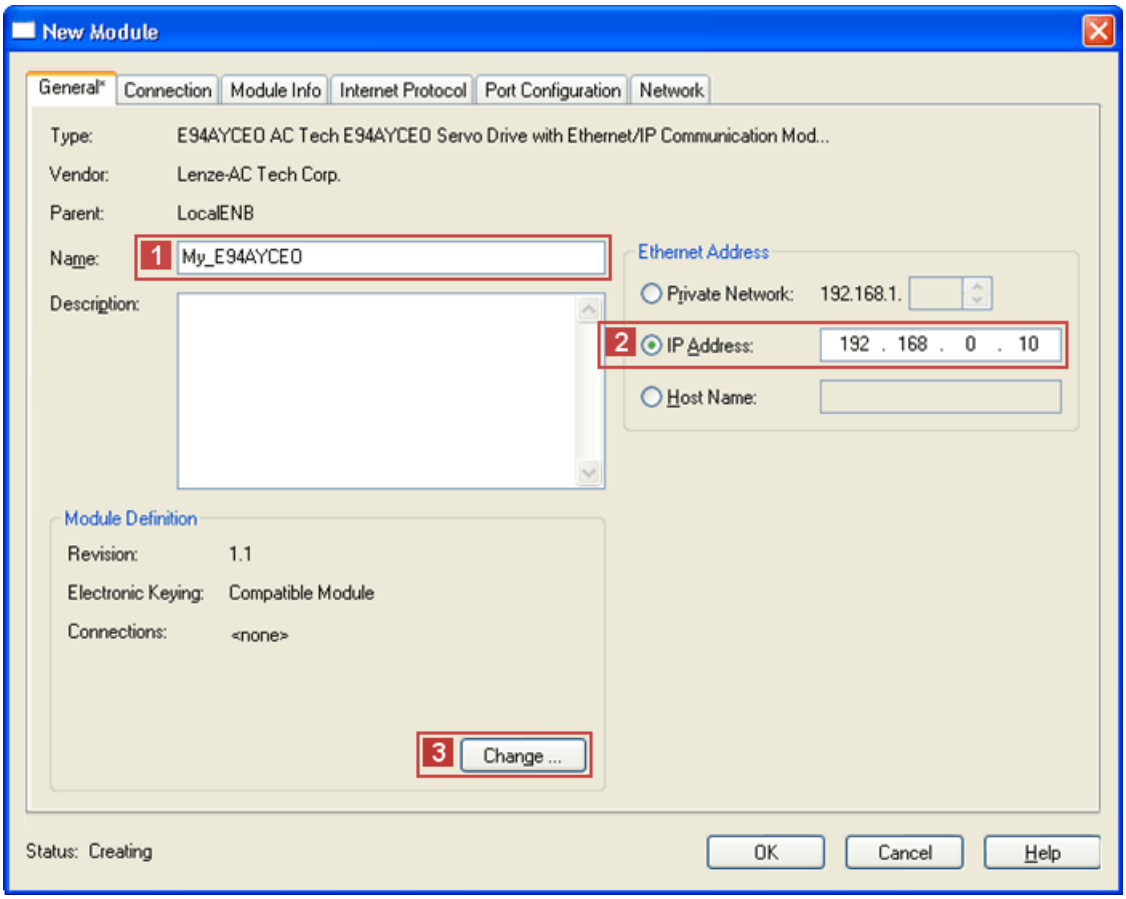
4. Go to the "Select Module Type" dialog box and select "E94AYCEO" on the **Catalog** tab.



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

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

   Example settings:

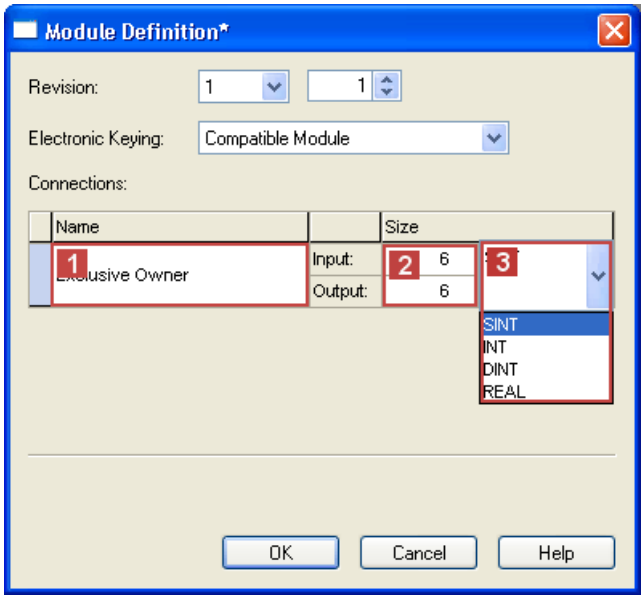


   DNS is not supported; the host name merely describes the device.

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

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

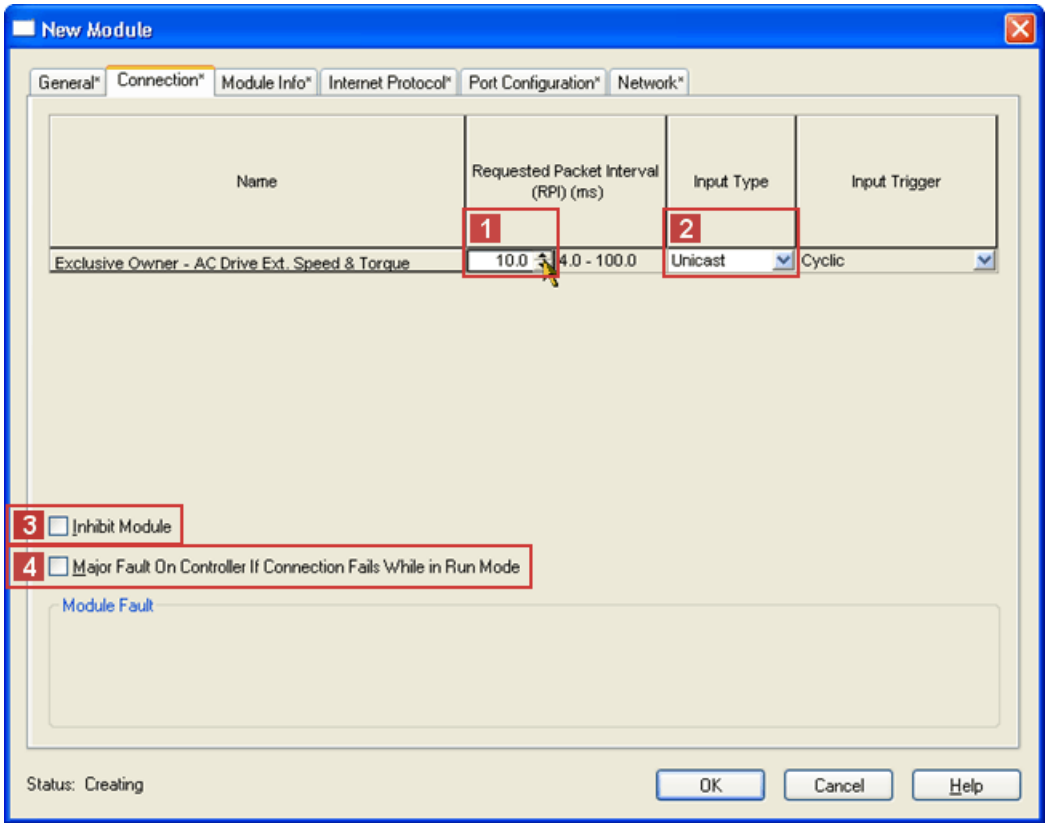
   The terms "input" and "output" refer to the point of view of the scanner:
   - Assembly input objects (input) are sent from the adapter to the scanner.
   - Assembly output objects (output) are sent from the scanner to the adapter.



Settings		Value / description
1	**Name**	Name (type) of the connection • "Exclusive owner": The scanner controls the adapter outputs. • "Listen only": If a connection has been established, the scanner only receives the input data. • "Input only": The scanner does not transmit any output data to the adapter, but only receives the input data.
2	**Number of I/O data words**	A maximum of 32 data words (max. 64 bytes) for each direction
3	**Selection of the data type**	• 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). • 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).

9. Complete the settings with **OK**.

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



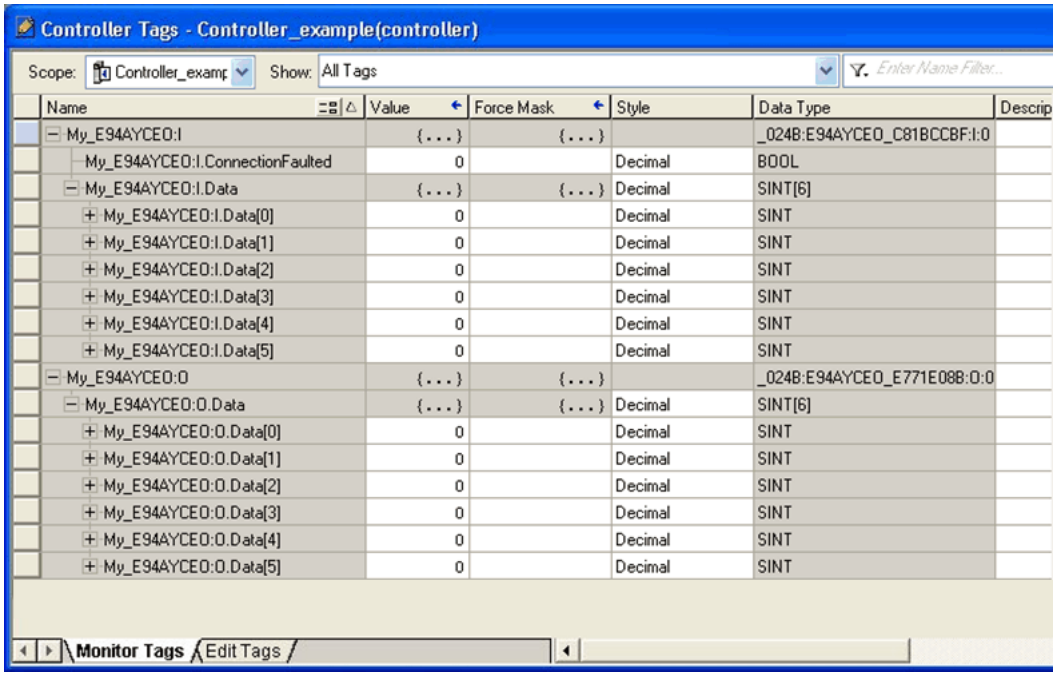
Required settings

Settings		Description
1	**Requested Packet Interval (RPI)**	Set **RPI ≥ 2.0 ms**. (Standard: 10 ms) The RPI [ms] specifies the intervals for the I/O data exchange between the drive (adapter) and the controller (scanner).
2	**Input type**	**"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).
		"Unicast" input type: The input data is sent from the adapter to the scanner by means of unicast telegrams.

Optional settings

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

11. Complete the settings with **OK**.
    - The drive is inserted in the configuration tree under the "I/O Configuration".
    - The corresponding tags are created in the "Controller Tags".



In the example, the drive was named "My_E94AYCEO".
- Tag "My_E94AYCEO:I.ConnectionFaulted" for the connection status
- Tag set "My_E94AYCEO:I.Data" for the assembly input object instance "111"
- Tag set "My_E94AYCEO:O.Data" for the assembly output object instance "110"

If you click "+" before the assembly tag name, all data contained in the assembly tag are displayed below.

12. The last step is Saving the I/O configuration in »RSLogix 5000« (📖 69).

8.5 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.

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.

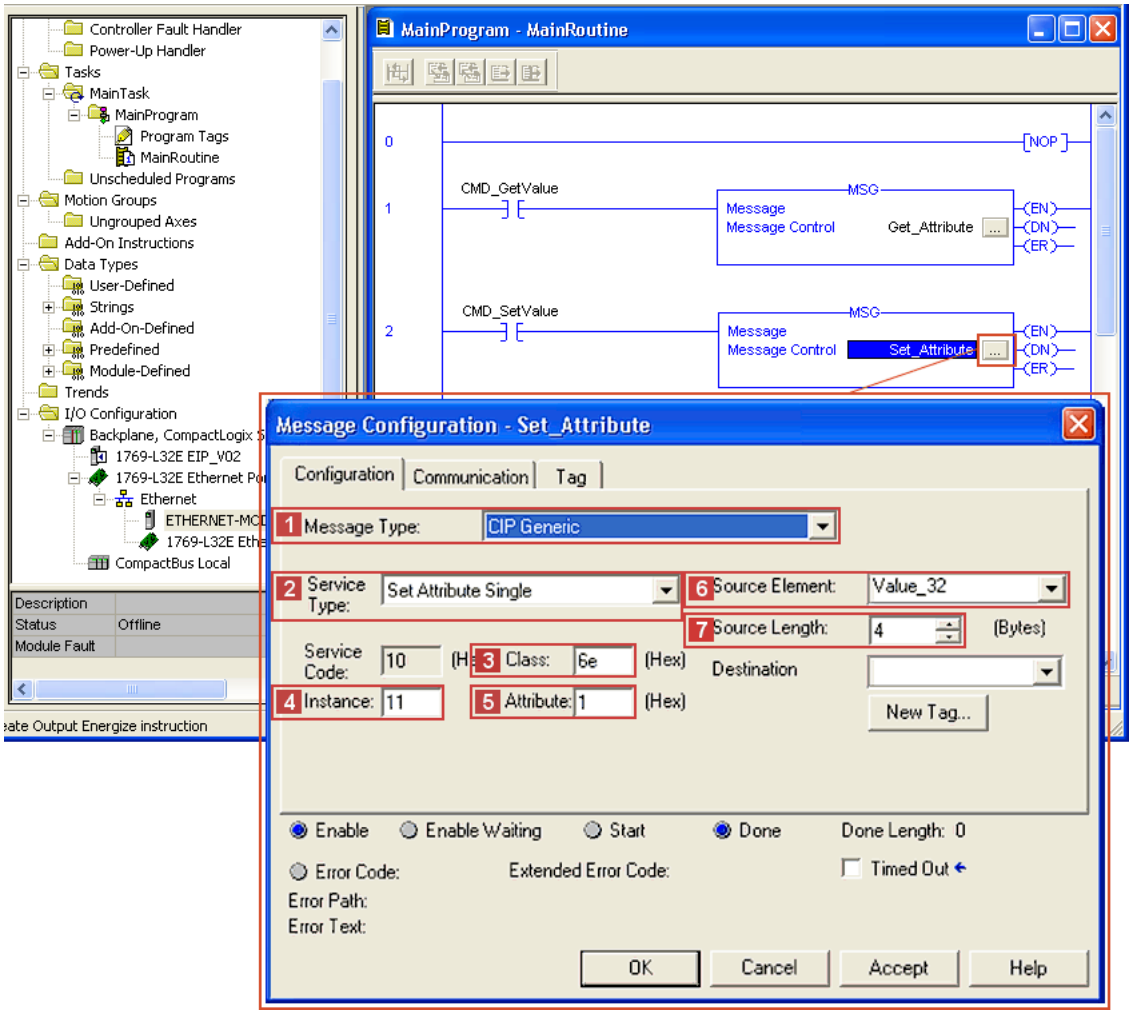


Note!

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.

9.1 Write parameters

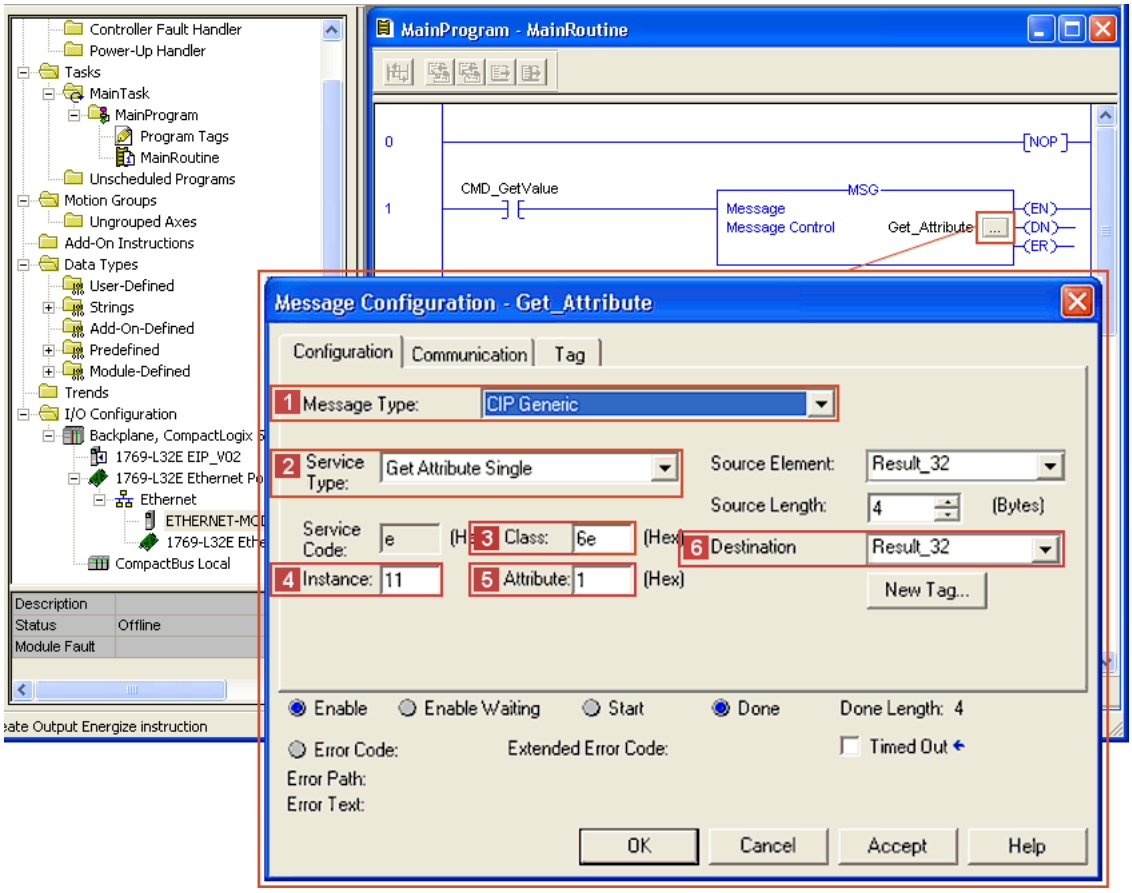
In order to write data into code **C00011** (reference speed) of the Inverter Drive 8400 by means of explicit message transfer, for example, the following settings are necessary:



Settings		Value / description
1	**Message Type**	"CIP Generic"
2	**Service Type**	"Set Attribute Single" (service code "10" [hex])
3	**Class**	"6E" [hex] (access to Lenze code)
4	**Instance**	"11" = Lenze code C00011 of the Servo Drive 9400
5	**Attribute**	"1" = Subcode of the Lenze code • If the corresponding Lenze code does not have a subcode, the value 1 must be entered. • 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 documentation of the drive). For writing to code C00011, set the source length to "4 bytes".

9.2 Read parameters

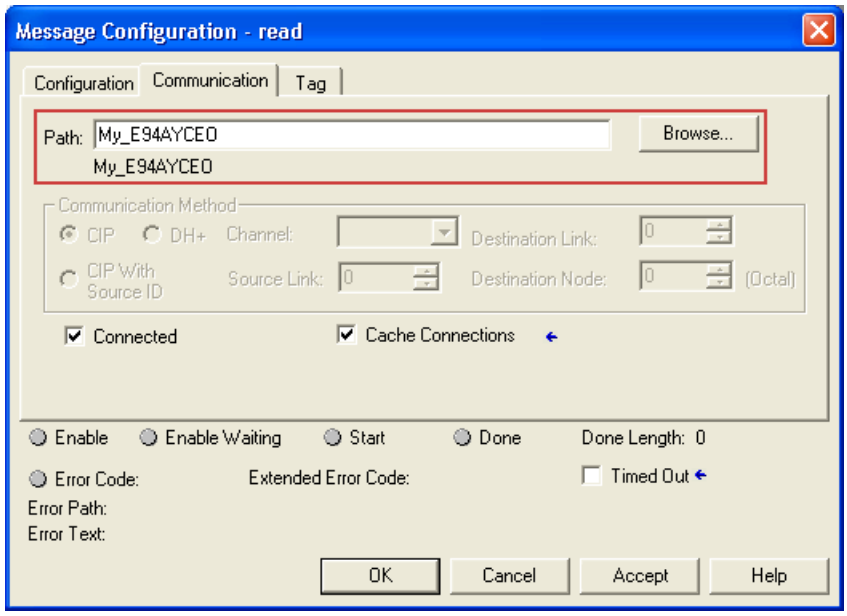
If you want to use explicit EtherNet/IP messaging, for instance, in order to read the Lenze code **C00011** (motor reference speed) of the Servo Drive 9400, the following settings are required:



Settings		Value / description
1	**Message Type**	"CIP Generic"
2	**Service Type**	"Get Attribute Single" (service code "e" [hex])
3	**Class**	"6E" [hex] (access to Lenze code)
4	**Instance**	"11" = Lenze code C00011 of the Servo Drive 9400
5	**Attribute**	"1" = Subcode of the Lenze code If the corresponding Lenze code does not have a subcode, the value 1 must be entered.
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 DINT format.

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

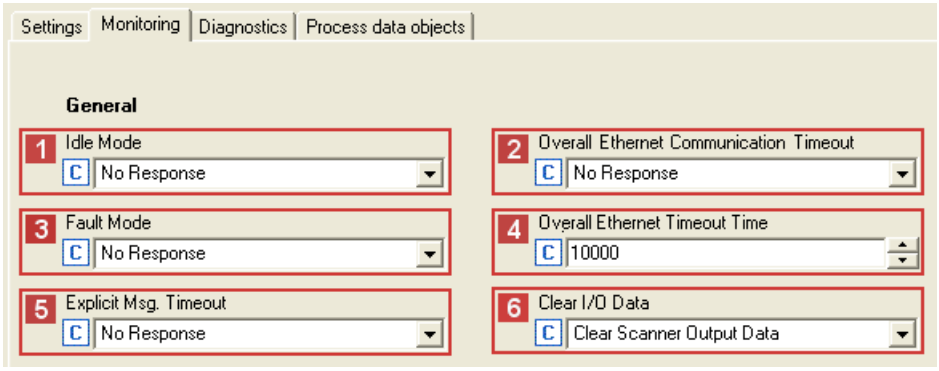
If you need assistance with the setting of this path, please consult the PLC manufacturer.



10 Monitoring

10.1 Fault with regard to EtherNet/IP communication

The response of the Servo Drive 9400 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) = TRUE: • The scanner indicates the validity of the I/O data. Run/Idle flag (Bit 0) = FALSE: • The I/O data is invalid and the response parameterised here (C13880/1 / C14880/1) is activated in the drive. • The I/O data is processed as set in 6 (C13885 / C14885).
2	**Overall Ethernet Communication Timeout**	If the time set in 4 (C13881 / C14881) has elapsed and no explicit or implicit messages are received any more or if there is no more access via the »Engineer«, the response parameterised here (C13880/4 / C14880/4) is effected in the drive. Access to the web server is not monitored.
3	**Fault Mode**	The adapter (communication module) monitors the I/O connection to the scanner. If there is no "implicit message" received within the time-out time for implicit messages parameterised by the scanner, the response parameterised here (C13880/2 / C14880/2) is activated in the drive.
4	**Overall Ethernet Communication Timeout Timer**	Here, the overall message monitoring time (C13881 / C14881) is set. If no message is received within this time, the response parameterised in 2 (C13880/4 / C14880/4) is activated. The following messages are monitored: • Implicit messages • Explicit messages • »Engineer« access via EtherNet/IP
5	**Timeout in the case of explicit messages**	If there is no "explicit message" reveived within the time-out time for explicit messages parameterised by the scanner, the response parameterised here (C13880/3 / C14880/3) is activated in the drive.
6	**Clear I/O Data**	Setting (C13885 / C14885), which I/O data is to processed by the adapter in order to maintain the internal communication if ... • the CIP network status (C13862 / C14862) of the controlling I/O connection is not "Connected" or • an idle event has occurred.

10.2 Interruption of internal communication

The response to a communication error between the communication module and the Servo Drive 9400 can be set via standard device codes C01501 (module in slot MXI1) and C01502 (module in slot MXI2).

11 Diagnostics

The LEDs on the front of the communication module serve to diagnose faults. Moreover, the »Engineer« serves to show diagnostic information.

11.1 LED status displays

Note!

LED status displays for trouble-free operation:

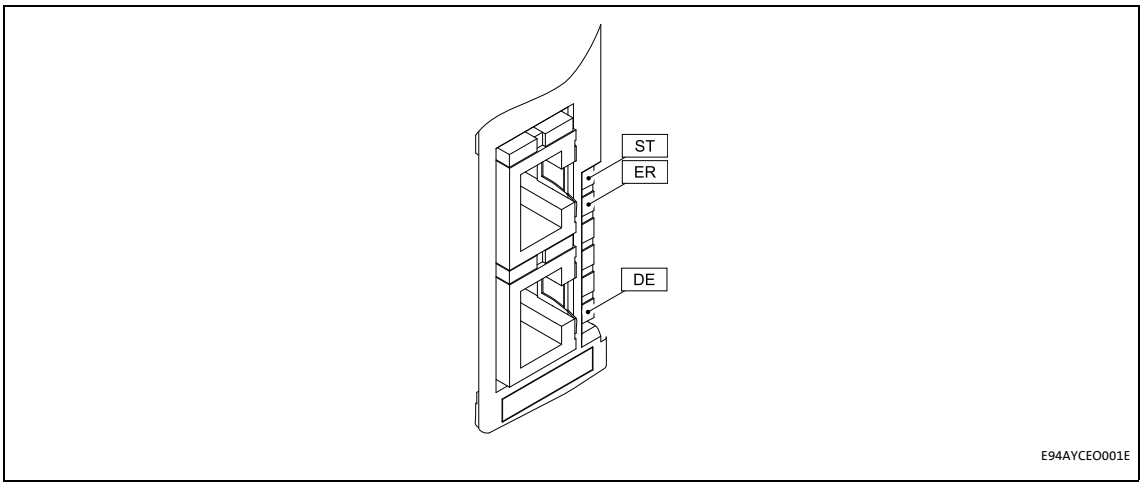
- The LEDs **ST** (📖 77) and **NS** (📖 78) are permanently on.
- The green LEDs on the **X233** and **X234** RJ45 sockets are lit, and the yellow LEDs are blinking or jittering (📖 80).

The following status displays are distinguished:

- Module status displays (📖 77)
- CIP™ status displays (📖 78)
- Status displays on the RJ45 sockets (X233, X234) (📖 80)

11.1.1 Module status displays

Module states are indicated by the **ST**, **ER** and **DE** LEDs.

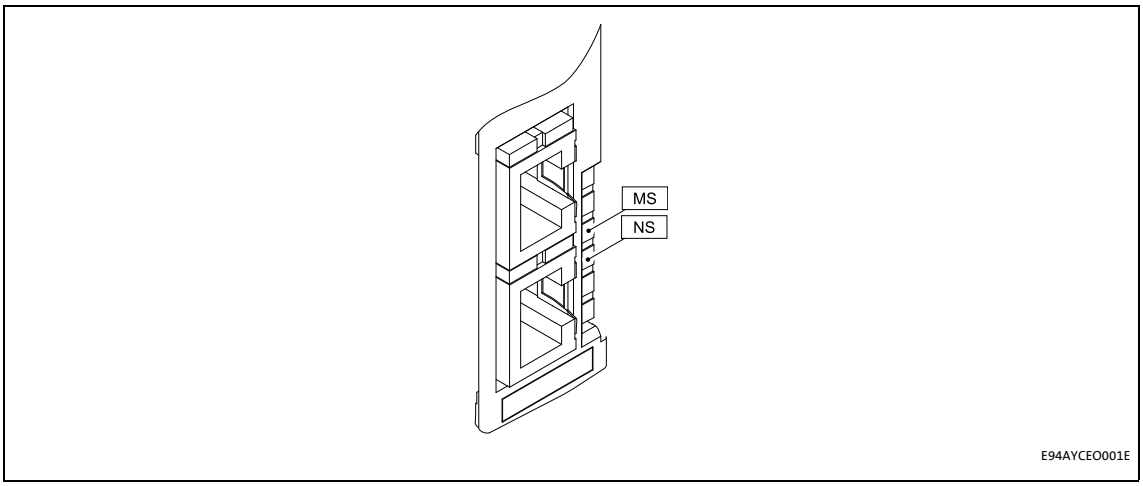


[11-1] LEDs ST, ER, DE

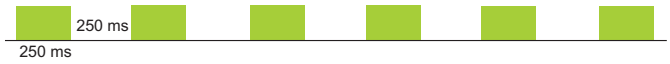
LED	Colour	Status	Description
ST	Green	On	The communication module is supplied with voltage and is connected to the standard device.
		Blinking	250 ms 250 ms The communication module is supplied with voltage, but is not connected to the standard device. (Standard device is switched off, in the initialisation phase, or not available.)
ER	Red	On	An error has occurred in the communication module.
DE	Red	On	The communication module is not accepted by the basic device or the basic device is not active (see notes in the documentation relating to the basic device.)

11.1.2 CIP™ status displays

CIP statuses are indicated by the **MS** and **NS** LEDs.



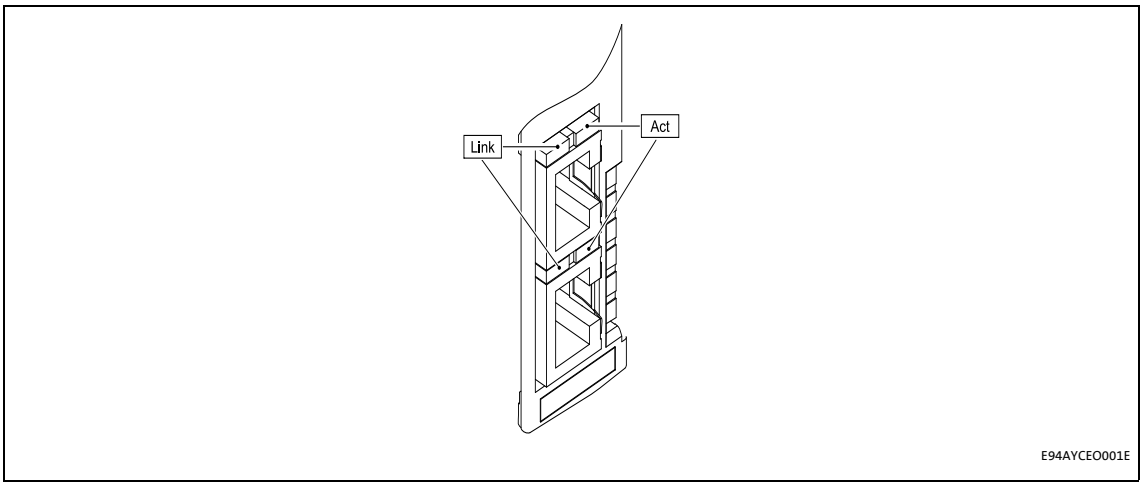
[11-2] LEDs MS, NS

LED	Colour / status		Description
MS	**Green**	**Red**	
	Off	Off	CIP module status: "Nonexistent" The communication module is not being supplied with voltage.
	Off	On	 CIP module status: "Major Unrecoverable Fault" The communication module has a fault that cannot be rectified. The status is set if the pending status determining device error shows the "System fault" response.
	Off	Blinking	 CIP module status: "Major Recoverable Fault" The communication module has a fault that can be rectified. The status is set if the pending status determining device error shows the "Fault", "Trouble", "Quick stop by trouble", "Warning locked", or "Warning" response.
	On	Off	 CIP module status: "Operational" The communication module is working perfectly.
	Blinking	Off	 CIP module status: "Standby" The communication module has not been fully configured yet, or the configuration is incorrect (e.g. invalid IP address).
	Blinking	Blinking	 CIP module status: "Device Self Testing" The communication module is currently undergoing a self-test.

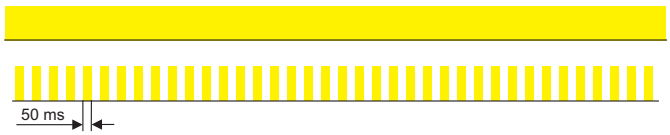
LED	Colour / status		Description
NS	**Green**	**Red**	
	Off	Off	CIP network status: "No IP Address" The communication module is not being supplied with voltage or has not been given an IP address.
	Off	On	 CIP network status: "Duplicate IP" The communication module is unable to gain access to the fieldbus (IP address conflict).
	Off	Blinking	 CIP network status: "Connection Timeout" A time-out is executed.
	On	Off	 CIP network status: "Connected" The communication module is working perfectly and has established a connection to the scanner.
	Blinking	Off	 CIP network status: "No Connections" The communication module ... • 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 module is currently undergoing a self-test.

11.1.3 Status displays on the RJ45 sockets (X233, X234)

The LEDs on the RJ45 sockets **X233** and **X234** indicate the Ethernet connection status.

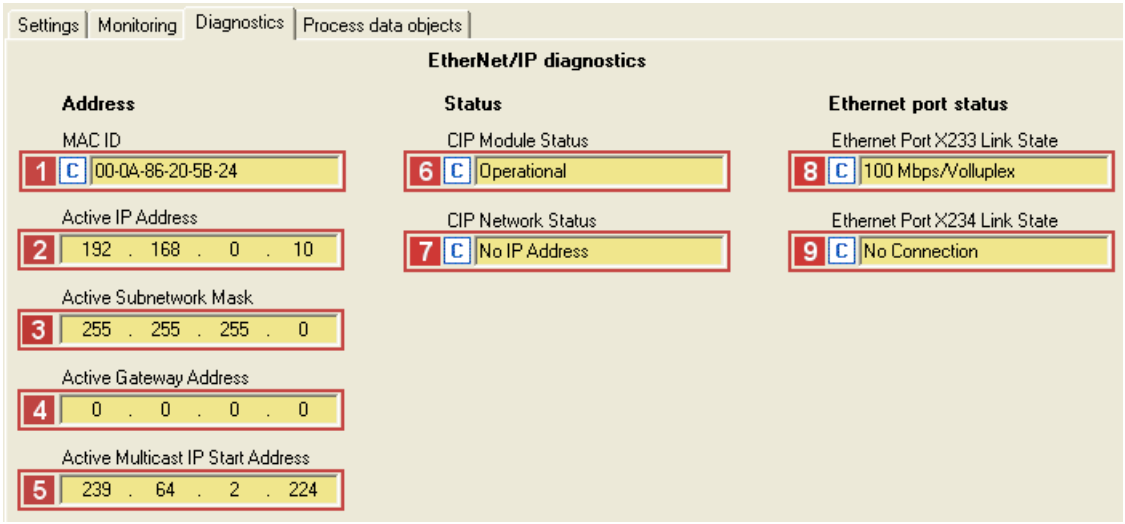


[11-3] LEDs Link , Act

LED	Colour	Status	Description
Link	Green	Off	No Ethernet connection
		On	 There is a physical Ethernet connection.
Act	Yellow	Off	No Ethernet data transfer
		On *or* flickers	 Data are being exchanged via Ethernet.

11.2 Diagnostics with the »Engineer«

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



Display		Code
1	**MAC-ID**	C13003 / C14003
2	**Active IP Address**	C13010 / C14010
3	**Active Subnetwork Mask**	C13011 / C14011
4	**Active gateway address**	C13012 / C14012
5	**Active Multicast IP Start Address**	C13016 / C14016
6	**CIP Module Status**	C13861 / C14861
7	**CIP Network Status**	C13862 / C14862
8	**Ethernet Port X233 connection status**	C13863/1 / C14863/1
9	**Ethernet Port X234 connection status**	C13863/2 / C14863/2

12 Error messages

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

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

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

12.1 Short overview of the EtherNet/IP 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 number		Name	Response (Lenze setting)	Adjustable in
hex	dec			
0x00c85531	13129009	EtherNet/IP: Memory: No Access	6: Information	-
0x00c85532	13129010	EtherNet/IP: Memory: Read Error	6: Information	-
0x00c85533	13129011	EtherNet/IP: Memory: Write Error	6: Information	-
0x00c86010	13131792	EtherNet/IP: Restart by Watchdogreset	1: No Response	-
0x00c86011	13131793	EtherNet/IP: Internal Error	1: No Response	-
0x00c86100	13132032	EtherNet/IP: Internal Error	1: No Response	-
0x00c86101	13132033	EtherNet/IP: Internal Error	1: No Response	-
0x00c8641f	13132831	EtherNet/IP: Invalid Parameter Set	1: No Response	-
0x00c86420	13132832	EtherNet/IP: Error: Lenze Setting Loaded	1: No Response	-
0x00c86430	13132848	EtherNet/IP: Internal mapping error	6: Information	-
0x00c86533	13133107	EtherNet/IP: Invalid IP Parameter	1: No Response	-
0x00c88111	13140241	EtherNet/IP: Fault Mode	1: No Response	C13880/2 / C14880/2
0x00c88112	13140242	EtherNet/IP: Explicit Message Timeout	1: No Response	C13880/3 / C14880/3
0x00c88114	13140244	EtherNet/IP: Overall Ethernet Timeout	1: No Response	C13880/4 / C14880/4
0x00c88132	13140274	EtherNet/IP: Idle Mode	1: No Response	C13880/1 / C14880/1
0x00c88142	13140290	EtherNet/IP: Class 1 Connection Closed	6: Information	-
0x00c88143	13140291	EtherNet/IP: Class 3 Connection Closed	6: Information	-
0x00c88273	13140595	EtherNet/IP: Duplicate IP Address	1: No Response	-

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: No access to memory [0x00c85531]

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

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

EtherNet/IP: Error while reading from memory [0x00c85532]

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

Cause	Remedy
Parameter could not be read.	• Download application again (including module). • Send communication module together with a description of the fault to Lenze.

EtherNet/IP: Error while writing to memory [0x00c85533]

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

Cause	Remedy
Parameter could not be written.	• Download application again (including module). • Send communication module together with a description of the fault to Lenze.

EtherNet/IP: Restart by watchdog reset [0x00c86010]

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

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

EtherNet/IP: Internal error [0x00c86011]

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

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

EtherNet/IP: Internal error [0x00c86100]

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

Cause	Remedy
Communication module is defective.	Send communication module with error description to Lenze.

EtherNet/IP: Internal error [0x00c86101]

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

Cause	Remedy
Communication module is defective.	Send communication module with error description to Lenze.

EtherNet/IP: Invalid parameter set [0x00c8641f]

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

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

EtherNet/IP: Lenze setting loaded [0x00c86420]

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

Cause	Remedy
Access to parameter set in memory module via standard device was not successful.	• Download application again (including module). • Send communication module together with a description of the fault to Lenze.

EtherNet/IP: Internal mapping error [0x00c86430]

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

Cause	Remedy
The entered I/O data mapping is invalid. • An object not supporting the required properties has been specified. • More than 64 bytes of data have been mapped.	Repeat I/O configuration in the »Engineer« (📖 55).

EtherNet/IP: Invalid IP parameters [0x00c86533]

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

Cause	Remedy
One or more IP parameters are faulty.	Check and correct IP configuration. ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)

EtherNet/IP: Fault Mode [0x00c88111]

Response (Lenze setting printed in bold)	**Setting:** C13880/2 / C14880/2
☒ **None** ☐ System fault ☑ Fault ☐ Trouble ☑ Quick stop by trouble ☑ Warning locked ☐ 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 in the network cable into the Ethernet port. • Check Requested Package Interval (RPI) of I/O connection. • Increase timeout time for implicit messages.

EtherNet/IP: Explicit Message Timeout [0x00c88112]

Response (Lenze setting printed in bold)	**Setting:** C13880/3 / C14880/3
☒ **None** ☐ System fault ☑ Fault ☐ Trouble ☑ 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 in the network cable into the Ethernet port. • Check Requested Package Interval (RPI) of the explicit connection. • Increase timeout time for explicit messages.

EtherNet/IP: Overall Ethernet communication timeout [0x00c88114]

Response (Lenze setting printed in bold)	**Setting:** C13880/4 / C14880/4
☒ **None** ☐ System fault ☑ Fault ☐ Trouble ☑ Quick stop by trouble ☑ Warning locked ☐ Warning ☑ Information	

Cause	Remedy
• Failure of »Engineer« communication via Ethernet • When the time set in C13881 / C14881 has expired, there is no access via the »Engineer«.	• Check cables and terminals. • Plug in the network cable into the Ethernet port. • Increase the overall Ethernet timeout time in C13881. ▸ Fault with regard to EtherNet/IP communication (📖 74)

EtherNet/IP: Idle Mode [0x00c88132]

Response (Lenze setting printed in bold)	**Setting:** C13880/1 / C14880/1
☒ **None** ☐ System fault ☑ Fault ☐ Trouble ☑ 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: Class 1 Connection Closed [0x00c88142]

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

Cause	Remedy
The scanner has closed the controlling "Class 1" connection.	Check scanner functionality.

EtherNet/IP: Class 3 Connection Closed [0x00c88143]

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

Cause	Remedy
Scanner has closed a "Class 3" connection.	Check scanner functionality.

EtherNet/IP: Duplicate IP address [0x00c88273]

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 IP address (C13000 / C14000). ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)

12.3 CIP™ error messages

Error code [hex]	Error designation	Description
0x000	SUCCESS	No error
0x001	. . .	Instance error messages (📖 126) of the Connection Manager Object (6 / 0x06) (📖 126)
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

13 Parameter reference

This chapter supplements the parameter list and the attribute table in the reference manual and the »Engineer« online help for the Servo Drive 9400 by the parameter of the E94AYCEO (EtherNet/IP) communication module.



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

Here you will find general information on parameters.

13.1 Parameters of the standard device that are relevant to communication

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

C00615

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

C00636

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

C00637

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

C01501

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

C01502

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

13.2 Parameters of the communication module for slot MXI1

This chapter lists the parameters of the E94AYCEO communication module (EtherNet/IP) for slot MXI2 of the Servo Drive 9400 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 Servo Drive 9400 (📖 37)			
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 Servo Drive 9400 (📖 37)			
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			

C13002

Parameter | Name: **C13002 | Gateway address**			Data type: UNSIGNED_8 Index: 11573 = 0x2D35
Setting of the gateway address ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)			
Setting range (min. value | unit | max. value)			
0		255	
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 configuration reference**		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) (📖 132)) ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)		
Selection list (Lenze setting printed in bold)		**Info**
0	Use stored IP	The IP configuration currently saved in the communication module 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		

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 Servo Drive 9400 (📖 37)			
Setting range (min. value | unit | max. value)			
0		255	
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) (📖 132))			
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) (📖 132))			
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

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) (📖 132))			
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

C13017

Parameter | Name: **C13017 | Ethernet Config Control**	Data type: UNSIGNED_16 Index: 11558 = 0x2D26

Setting of the baud rate for the Ethernet connections
- Depending on the configuration of the Ethernet port of the device to be connected, we recommend the use of a cross-over cable.
  ▸ EtherNet/IP connection (📖 28)
- After changing the setting, carry out a "Type 0 Reset" for the Identity Object (1 / 0x01) (📖 121) of the node or switch off and on the voltage supply of the communication module.

Selection list	
0	Auto-Negotiation
1	Reserved
2	Reserved
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 X233
C13017/2	0: Auto-Negotiation	Ethernet setting port X234

☑ 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 the instance attribute 9 (Mcast Config) in the TCP/IP Interface Object (245 / 0xF5) (📖 132)	

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) (📖 132))	

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

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) (📖 132))	

Setting range (min. value | unit | max. value)			**Lenze setting**
1		32	**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) (📖 130))	

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		63	
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) (📖 130))
C13022/5	43		QoS DSCP High Prio (Instance attribute 6 (DSCP High Prio) in the Quality of Service (QoS) Object (72 / 0x48) (📖 130))
C13022/6	31		Reserved
C13022/7	27		QoS DSCP Explicit Msg (Instance attribute 8 (DSCP Explicit Msg.) in theQuality of Service (QoS) Object (72 / 0x48) (📖 130))
☑ Read access ☑ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☑ COM ☐ MOT			

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) (📖 128))		
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) (📖 128))		
Selection list (read only)		
0	Normal	
1	Ring Fault	
2	Unexpected Loop detected	
3	Partial network fault	
4	Rapid fault/restore cycle	
☑ 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) (📖 128))			
Display range (min. value | unit | max. value)			
0		255	
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) (📖 128))	
☑ 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 (Selectcd) in the TCP/IP Interface Object (245 / 0xF5) (📖 132)) 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		

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 module (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			
...			
C13850/32			
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13851

Parameter | Name: **C13851 | All words from scanner**			Data type: INTEGER_16 Index: 10724 = 0x29E4
Display of the I/O data words transferred from the scanner to the communication module. 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			
...			
C13851/32			
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13852

Parameter | Name: **C13852 | All words to the basic device**			Data type: INTEGER_16 Index: 10723 = 0x29E3
Display of the I/O data words transferred from the communication module to the standard device.			
Display range (min. value | unit | max. value)			
-32768		32767	
Subcodes			**Info**
C13852/1			
...			
C13852/32			
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C13853

Parameter | Name: **C13853 | All words to the basic device**			Data type: INTEGER_16 Index: 10722 = 0x29E2
Display of the I/O data words transferred from the standard device to the communication module.			
Display range (min. value | unit | max. value)			
-32768		32767	
Subcodes			**Info**
C13853/1			
...			
C13853/32			
☑ 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 X233: RX
C13858/2	Ethernet port X233: RX CRC error
C13858/3	Ethernet port X233: RX rejected
C13858/4	Ethernet port X233: TX
C13858/5	Ethernet port X233: TX rejected
C13858/6	Ethernet port X234: RX
C13858/7	Ethernet port X234: RX CRC error
C13858/8	Ethernet port X234: RX rejected
C13858/9	Ethernet port X234: TX
C13858/10	Ethernet port X234: TX rejected
☑ 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) (📖 121)) • The status is also indicated via the **MS** LED. ▸ CIP™ 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	

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. ▸ CIP™ 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 X233 link state
C13863/2		Ethernet port X234 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		

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
Indication of the current RPI times (Requested Package Interval) of the CIP connections			
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			

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 (📖 74) (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		
3	Quick stop by trouble		
4	Warning Locked		
6	Information		
Subcodes	**Lenze setting**		**Info**
C13880/1	0: No Response		Idle Mode
C13880/2	0: 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			

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 (📖 74)) 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 (📖 74).)		
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 64 bytes indicating the designation of the EtherNet/IP node. (Instance attribute 6 (Host Name) in the TCP/IP Interface Object (245 / 0xF5) (📖 132))	
☑ 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	

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	

13.3 Parameters of the communication module for slot MXI2

This chapter lists the parameters of the E94AYCEO communication module (EtherNet/IP) for slot MXI2 of the Servo Drive 9400 in numerically ascending order.

C14000

Parameter | Name: **C14000 | IP address**			Data type: UNSIGNED_8 Index: 10575 = 0x294F
Setting of the IP address ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)			
Setting range (min. value | unit | max. value)			
0		255	
Subcodes	**Lenze setting**		**Info**
C14000/1	192		IP address (most significant byte)
C14000/2	168		IP address
C14000/3	124		IP address
C14000/4	16		IP address (least significant byte)
☑ Read access ☑ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☑ COM ☐ MOT			

C14001

Parameter | Name: **C14001 | Subnetwork mask**			Data type: UNSIGNED_8 Index: 10574 = 0x294E
Setting of the subnet mask ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)			
Setting range (min. value | unit | max. value)			
0		255	
Subcodes	**Lenze setting**		**Info**
C14001/1	255		Subnet mask (most significant byte)
C14001/2	255		Subnet mask
C14001/3	255		Subnet mask
C14001/4	0		Subnet mask (least significant byte)
☑ Read access ☑ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☑ COM ☐ MOT			

C14002

Parameter | Name: **C14002 | Gateway address**			Data type: UNSIGNED_8 Index: 10573 = 0x294D
Setting of the gateway address ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)			
Setting range (min. value | unit | max. value)			
0		255	
Subcodes	**Lenze setting**		**Info**
C14002/1	0		Gateway address (most significant byte)
C14002/2	0		Gateway address
C14002/3	0		Gateway address
C14002/4	0		Gateway address (least significant byte)
☑ Read access ☑ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☑ COM ☐ MOT			

C14003

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

C14005

Parameter | Name: **C14005 | IP Config Control**	Data type: UNSIGNED_8 Index: 10570 = 0x294A
Selection how the IP configuration is to be effected. (Instance attribute 3 (Configuration Control) in the TCP/IP Interface Object (245 / 0xF5) (📖 132)) ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)	

Selection list (Lenze setting printed in bold)		**Info**
0	Use stored IP	The IP configuration currently saved in the communication module 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

C14006

Parameter | Name: **C14006 | Multicast IP Start Address**	Data type: UNSIGNED_8 Index: 10569 = 0x2949
Setting of the multicast IP address ▸ Setting the IP configuration of the Servo Drive 9400 (📖 37)	

Setting range (min. value | unit | max. value)			
0		255	
Subcodes	**Lenze setting**		**Info**
C14006/1	239		Multicast IP start address (most significant byte)
C14006/2	64		Multicast IP start address
C14006/3	2		Multicast IP start address
C14006/4	224		Multicast start address (least significant byte)

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

C14010

Parameter | Name: **C14010 | Active IP address**			Data type: UNSIGNED_8 Index: 10565 = 0x2945
Display of the active IP address (Instance attribute 5 (IP Address) in the TCP/IP Interface Object (245 / 0xF5) (📖 132))			
Display range (min. value | unit | max. value)			
0		255	
Subcodes			**Info**
C14010/1			Active IP address (most significant byte)
C14010/2			Active IP Address
C14010/3			Active IP Address
C14010/4			Active IP address (least significant byte)
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14011

Parameter | Name: **C14011 | Active subnetwork mask**			Data type: UNSIGNED_8 Index: 10564 = 0x2944
Display of the active subnetwork mask (Instance attribute 5 (IP Network Mask) in the TCP/IP Interface Object (245 / 0xF5) (📖 132))			
Display range (min. value | unit | max. value)			
0		255	
Subcodes			**Info**
C14011/1			Active subnet mask (most significant byte)
C14011/2			Active Subnetwork Mask
C14011/3			Active Subnetwork Mask
C14011/4			Active subnet mask (least significant byte)
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14012

Parameter | Name: **C14012 | Active gateway address**			Data type: UNSIGNED_8 Index: 10563 = 0x2943
Display of the active gateway address (Instance attribute 5 (Gateway Address) in the TCP/IP Interface Object (245 / 0xF5) (📖 132))			
Display range (min. value | unit | max. value)			
0		255	
Subcodes			**Info**
C14012/1			Active gateway address (most significant byte)
C14012/2			Active gateway address
C14012/3			Active gateway address
C14012/4			Active gateway address (least significant byte)
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14016

Parameter | Name: **C14016 | Active Multicast IP Address**			Data type: UNSIGNED_8 Index: 10559 = 0x293F
Display of the active multicast IP address			
Display range (min. value | unit | max. value)			
0		255	

Subcodes	Info
C14016/1	Multicast IP address (most significant byte)
C14016/2	Multicast IP address
C14016/3	Multicast IP address
C14016/4	Multicast IP address (least significant byte)

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

C14017

Parameter | Name: **C14017 | Ethernet Config Control**	Data type: UNSIGNED_16 Index: 10558 = 0x293E

Setting of the baud rate for the Ethernet connections
- Depending on the configuration of the Ethernet port of the device to be connected, we recommend the use of a cross-over cable.
  ▸ EtherNet/IP connection (📖 28)
- After changing the setting, carry out a "Type 0 Reset" for the Identity Object (1 / 0x01) (📖 121) of the node or switch off and on the voltage supply of the communication module.

Selection list	
0	Auto-Negotiation
1	Reserved
2	Reserved
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
C14017/1	0: Auto-Negotiation	Ethernet setting port X233
C14017/2	0: Auto-Negotiation	Ethernet setting port X234

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

C14018

Parameter | Name: **C14018 | Multicast Config Alloc Control**	Data type: UNSIGNED_8 Index: 10557 = 0x293D
Selection for multicast IP addressing via the instance attribute 9 (Mcast Config) in the TCP/IP Interface Object (245 / 0xF5) (📖 132)	

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

C14019

Parameter | Name: **C14019 | Multicast Config TTL Value**	Data type: UNSIGNED_8 Index: 10556 = 0x293C
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) (📖 132))	

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

C14020

Parameter | Name: **C14020 | Multicast Config Num Mcast**	Data type: UNSIGNED_8 Index: 10555 = 0x293B
Used to set how many multicast IP addresses will be assigned. (Instance attribute 9 (Num Mcast) in the TCP/IP Interface Object (245 / 0xF5) (📖 132))	

Setting range (min. value | unit | max. value)			**Lenze setting**
1		32	**1**

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

C14021

Parameter | Name: **C14021 | Quality of Service (VLAN tagging)**	Data type: UNSIGNED_8 Index: 10554 = 0x293A
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) (📖 130))	

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

C14022

Parameter | Name: **C14022 | Quality of Service (DSCP)**			Data type: UNSIGNED_8 Index: 10553 = 0x2939
Setting for the prioritisation of the data packets to be transferred using Differentiated Services Codepoints (DSCP)			
Setting range (min. value | unit | max. value)			
0		63	
Subcodes	**Lenze setting**		**Info**
C14022/1	59		Reserved
C14022/2	47		Reserved
C14022/3	55		Reserved
C14022/4	47		QoS DSCP Scheduled (Instance attribute 5 (DSCP Scheduled) in the Quality of Service (QoS) Object (72 / 0x48) (📖 130))
C14022/5	43		QoS DSCP High Prio (Instance attribute 6 (DSCP High Prio) in the Quality of Service (QoS) Object (72 / 0x48) (📖 130))
C14022/6	31		Reserved
C14022/7	27		QoS DSCP Explicit Msg (Instance attribute 8 (DSCP Explicit Msg.) in theQuality of Service (QoS) Object (72 / 0x48) (📖 130))
☑ Read access ☑ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☑ COM ☐ MOT			

C14840

Parameter | Name: **C14840 | DLR Network Topology**		Data type: UNSIGNED_8 Index: 9735 = 0x2607
Display of the used DLR network topology (Device Level Ring) (Instance attribute 1 (Network Topology) in the Device Level Ring (DLR) Object (71 / 0x47) (📖 128))		
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		

C14841

Parameter | Name: **C14841 | DLR Network Status**		Data type: UNSIGNED_8 Index: 9734 = 0x2606
Display of the DLR network status (Device Level Ring) (Instance attribute 2 (Network Status) in the Device Level Ring (DLR) Object (71 / 0x47) (📖 128))		
Selection list (read only)		
0	Normal	
1	Ring Fault	
2	Unexpected Loop detected	
3	Partial network fault	
4	Rapid fault/restore cycle	
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14842

Parameter | Name: **C14842 | Supervisor IP Address**			Data type: UNSIGNED_8 Index: 9733 = 0x2605
Display of the supervisor IP address (Instance attribute 10 (Supervisor IP Address) in the Device Level Ring (DLR) Object (71 / 0x47) (📖 128))			
Display range (min. value | unit | max. value)			
0		255	
Subcodes			**Info**
C14842/1			Supervisor IP address (most significant byte)
C14842/2			Supervisor IP Address
C14842/3			Supervisor IP Address
C14842/4			Supervisor IP address (least significant byte)
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14843

Parameter | Name: **C14843 | Supervisor MAC ID**	Data type: OCTET_STRING Index: 9732 = 0x2604
Display of the supervisor MAC ID (Instance attribute 10 (Supervisor MAC Address) in the Device Level Ring (DLR) Object (71 / 0x47) (📖 128))	
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C14846

Parameter | Name: **C14846 | Address Conflict Detection**		Data type: UNSIGNED_8 Index: 9729 = 0x2601
Activation of the address conflict detection (ACD) (Instance attribute 10 (Selectcd) in the TCP/IP Interface Object (245 / 0xF5) (📖 132)) 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		

C14850

Parameter | Name: **C14850 | All words to scanner**			Data type: INTEGER_16 Index: 9725 = 0x25FD
Display of the I/O data words transferred from the communication module (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**
C14850/1			
...			
C14850/32			
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14851

Parameter | Name: **C14851 | All words from scanner**			Data type: INTEGER_16 Index: 9724 = 0x25FC
Display of the I/O data words transferred from the scanner to the communication module (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**
C14851/1			
...			
C14851/32			
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14852

Parameter | Name: **C14852 | All words to standard device**			Data type: INTEGER_16 Index: 9723 = 0x25FB
Display of the I/O data words transferred from the communication module to the standard device.			
Display range (min. value | unit | max. value)			
-32768		32767	
Subcodes			**Info**
C14852/1			
...			
C14852/32			
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14853

Parameter | Name: **C14853 | All words from standard device**			Data type: INTEGER_16 Index: 9722 = 0x25FA
Display of the I/O data words transferred from the standard device to the communication module.			
Display range (min. value | unit | max. value)			
-32768		32767	
Subcodes			**Info**
C14853/1			
...			
C14853/32			
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14858

Parameter | Name: **C14858 | Ethernet Port Statistics**	Data type: UNSIGNED_32 Index: 9717 = 0x25F5
Display of statistical values for the data transfer via the Ethernet connections	
Subcodes	**Info**
C14858/1	Ethernet port X233: RX
C14858/2	Ethernet port X233: RX CRC error
C14858/3	Ethernet port X233: RX rejected
C14858/4	Ethernet port X233: TX
C14858/5	Ethernet port X233: TX rejected
C14858/6	Ethernet port X234: RX
C14858/7	Ethernet port X234: RX CRC error
C14858/8	Ethernet port X234: RX rejected
C14858/9	Ethernet port X234: TX
C14858/10	Ethernet port X234: TX rejected
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C14861

Parameter | Name: **C14861 | CIP Module Status**	Data type: UNSIGNED_16 Index: 9714 = 0x25F2
Display of the current CIP module status (Instance attribute 8 (State) in the Identity Object (1 / 0x01) (📖 121)) • The status is also indicated via the **MS** LED. ▸ CIP™ 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	

C14862

Parameter | Name: **C14862 | CIP Network Status**	Data type: UNSIGNED_16 Index: 9713 = 0x25F1
Display of the current CIP network status • The status is also indicated via the **NS** LED. ▸ CIP™ 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	

C14863

Parameter | Name: **C14863 | Ethernet Port**		Data type: UNSIGNED_16 Index: 9712 = 0x25F0
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**
C14863/1		Ethernet port X233 link state
C14863/2		Ethernet port X234 link state
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14870

Parameter | Name: **C14870 | CIP Connections State**		Data type: UNSIGNED_16 Index: 9705 = 0x25E9
Display of the current CIP connection status		
Selection list (read only)		
0	Nonexistent	
3	Established	
4	Timed Out	
Subcodes		**Info**
C14870/1		Status of CIP connection 1
...		...
C14870/8		Status of CIP connection 8
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14871

Parameter | Name: **C14871 | CIP Connections Type**		Data type: UNSIGNED_16 Index: 9704 = 0x25E8
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**
C14871/1		Type of CIP connection 1
...		...
C14871/8		Type of CIP connection 8
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14872

Parameter | Name: **C14872 | CIP Connection Triggers**		Data type: UNSIGNED_16 Index: 9703 = 0x25E7
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**
C14872/1		Trigger of CIP connection 1
...		...
C14872/8		Trigger of CIP connection 8
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14873

Parameter | Name: **C14873 | CIP Connections RPI**			Data type: UNSIGNED_32 Index: 9702 = 0x25E6
Indication of the current RPI times (Requested Package Interval) of the CIP connections			
Display range (min. value | unit | max. value)			
0	ms	4294967295	
Subcodes			**Info**
C14873/1			RPI of CIP connection 1
...			...
C14873/8			RPI of CIP connection 8
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14874

Parameter | Name: **C14874 | CIP Connections Timeout Time**			Data type: UNSIGNED_32 Index: 9701 = 0x25E5
Display of the timeouts (ms) of the CIP connections			
Display range (min. value | unit | max. value)			
0	ms	4294967295	
Subcodes			**Info**
C14874/1			Timeout time of CIP connection 1
...			...
C14874/8			Timeout time of CIP connection 8
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT			

C14875

Parameter | Name: **C14875 | CIP Connections RUN/IDLE Flag**		Data type: UNSIGNED_16 Index: 9700 = 0x25E4
Display of the run and idle flags of the CIP connections		
Selection list (read only)		
0	Nonexistent	
1	IDLE	
2	RUN	
Subcodes		**Info**
C14875/1		RUN/IDLE flag - CIP connection 1
...		...
C14875/8		RUN/IDLE flag - CIP connection 8
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT		

C14880

Parameter | Name: **C14880 | Reaction on communication fault**			Data type: UNSIGNED_8 Index: 9695 = 0x25DF
Setting of the monitoring response in the event of a Fault with regard to EtherNet/IP communication (📖 74) (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		
3	Quick stop by trouble		
4	Warning Locked		
6	Information		
Subcodes	**Lenze setting**		**Info**
C13880/1	0: No Response		Idle Mode
C13880/2	0: 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			

C14881

Parameter | Name: **C14881 | Overall Ethernet Timeout Time**			Data type: UNSIGNED_16 Index: 9694 = 0x25DE
Setting of the overall monitoring time (see Fault with regard to EtherNet/IP communication (📖 74)) 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			

C14885

Parameter | Name: **C14885 | Clear I/O Data**		Data type: UNSIGNED_8 Index: 9690 = 0x25DA
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 C14862) or • an idle event has occurred. Changes in the setting becomes effective immediately. (See Fault with regard to EtherNet/IP communication (📖 74).)		
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		

C14899

Parameter | Name: **C14899 | Hostname**	Data type: VISIBLE_STRING Index: 9676 = 0x25CC
Each subcode contains a string with a length of 64 bytes indicating the designation of the EtherNet/IP node. (Instance attribute 6 (Host Name) in the TCP/IP Interface Object (245 / 0xF5) (📖 132))	
☑ Read access ☑ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C14900

Parameter | Name: **C14900 | Firmware product type**	Data type: VISIBLE_STRING Index: 9675 = 0x25CB
The code contains a string with a length of 8 bytes. The identification code "E94AYCEO" is output.	
☑ Read access ☐ Write access ☐ CINH ☐ PLC STOP ☐ No transfer ☐ PDO_MAP_RX ☐ PDO_MAP_TX ☐ COM ☐ MOT	

C14901

Parameter | Name: **C14901 | Firmware compilation date**	Data type: VISIBLE_STRING Index: 9674 = 0x25CA
The code contains a string with a length of 20 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	

C14902

Parameter | Name: **C14902 | Firmware version**	Data type: VISIBLE_STRING Index: 9673 = 0x25C9
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	

13.4 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	

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		☑		
C13846	Address Conflict Detection	10729	0x29E9	E	1	UNSIGNED_8	1	☑	☑	
C13850	All words to scanner	10725	0x29E5	A	32	INTEGER_16	1	☑		
C13851	All words from scanner	10724	0x29E4	A	32	INTEGER_16	1	☑		
C13852	All words to the basic device	10723	0x29E3	A	32	INTEGER_16	1	☑		
C13853	All words to the basic device	10722	0x29E2	A	32	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	E	1	VISIBLE_STRING		☑	☑	
C13900	Firmware Product Type	10675	0x29B3	E	1	VISIBLE_STRING		☑		
C13901	Firmware Compilation Date	10674	0x29B2	E	1	VISIBLE_STRING		☑		
C13902	Firmware Version	10673	0x29B1	E	1	VISIBLE_STRING		☑		
C14000	IP address	10575	0x294F	A	4	UNSIGNED_8		☑	☑	
C14001	Subnet mask	10574	0x294E	A	4	UNSIGNED_8		☑	☑	
C14002	Gateway address	10573	0x294D	A	4	UNSIGNED_8		☑	☑	
C14003	MAC-ID	10572	0x294C	E	1	OCTET_STRING		☑		
C14005	IP Config Control	10570	0x294A	E	1	UNSIGNED_8	1	☑	☑	
C14006	Multicast IP Start Address	10569	0x2949	A	4	UNSIGNED_8		☑	☑	
C14010	Active IP Address	10565	0x2945	A	4	UNSIGNED_8	1	☑		

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C14011	Active Subnetwork Mask	10564	0x2944	A	4	UNSIGNED_8	1	☑		
C14012	Active gateway address	10563	0x2943	A	4	UNSIGNED_8	1	☑		
C14016	Active Multicast IP Address	10559	0x293F	A	4	UNSIGNED_8	1	☑		
C14017	Ethernet Config Control	10558	0x293E	A	2	UNSIGNED_16	1	☑	☑	
C14018	Multicast Config Alloc Control	10557	0x293D	E	1	UNSIGNED_8	1	☑	☑	
C14019	Multicast Config TTL Value	10556	0x293C	E	1	UNSIGNED_8	1	☑	☑	
C14020	Multicast Config Num Mcast	10555	0x293B	E	1	UNSIGNED_8	1	☑	☑	
C14021	Quality of Service (VLAN-Tagging)	10554	0x293A	E	1	UNSIGNED_8	1	☑	☑	
C14022	Quality of Service (DSCP)	10553	0x2939	A	7	UNSIGNED_8		☑	☑	
C14840	DLR Network Topology	9735	0x2607	E	1	UNSIGNED_8	1	☑		
C14841	DLR Network Status	9734	0x2606	E	1	UNSIGNED_8	1	☑		
C14842	Supervisor IP Address	9733	0x2605	A	4	UNSIGNED_8	1	☑		
C14843	Supervisor MAC ID	9732	0x2604	E	1	OCTET_STRING		☑		
C14846	Address Conflict Detection	9729	0x2601	E	1	UNSIGNED_8	1	☑	☑	
C14850	All words to scanner	9725	0x25FD	A	32	INTEGER_16	1	☑		
C14851	All words from scanner	9724	0x25FC	A	32	INTEGER_16	1	☑		
C14852	All words to the basic device	9723	0x25FB	A	32	INTEGER_16	1	☑		
C14853	All words to the basic device	9722	0x25FA	A	32	INTEGER_16	1	☑		
C14858	Ethernet Port Statistics	9717	0x25F5	A	10	UNSIGNED_32	1	☑		
C14861	CIP Module Status	9714	0x25F2	E	1	UNSIGNED_16	1	☑		
C14862	CIP Network Status	9713	0x25F1	E	1	UNSIGNED_16	1	☑		
C14863	Ethernet Port	9712	0x25F0	A	2	UNSIGNED_16	1	☑		
C14870	CIP Connections State	9705	0x25E9	A	8	UNSIGNED_16	1	☑		
C14871	CIP Connections Type	9704	0x25E8	A	8	UNSIGNED_16	1	☑		
C14872	CIP Connection Triggers	9703	0x25E7	A	8	UNSIGNED_16	1	☑		
C14873	CIP Connections RPI	9702	0x25E6	A	8	UNSIGNED_32	1	☑		
C14874	CIP Connections Timeout Time	9701	0x25E5	A	8	UNSIGNED_32	1	☑		
C14875	CIP Connections RUN/IDLE Flag	9700	0x25E4	A	8	UNSIGNED_16	1	☑		
C14880	Monitoring Reaction	9695	0x25DF	A	4	UNSIGNED_8	1	☑	☑	
C14881	Overall Ethernet Timeout Time	9694	0x25DE	E	1	UNSIGNED_16	1	☑	☑	
C14885	Clear I/O Data	9690	0x25DA	E	1	UNSIGNED_8	1	☑	☑	
C14899	Hostname	9676	0x25CC	E	1	VISIBLE_STRING		☑	☑	
C14900	Firmware Product Type	9675	0x25CB	E	1	VISIBLE_STRING		☑		
C14901	Firmware Compilation Date	9674	0x25CA	E	1	VISIBLE_STRING		☑		
C14902	Firmware Version	9673	0x25C9	E	1	VISIBLE_STRING		☑		

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 implemented objects

CIP objects	Description
General objects	
TCP/IP Interface Object (245 / 0xF5) (📖 132)	Identification and general information about the device
Message Router Object (2 / 0x02) (📖 123)	Addressing of a service for the transfer of data to any object class or instance
Assembly Object (4 / 0x04) (📖 124)	Input/output data of the scanner
Connection Manager Object (6 / 0x06) (📖 126)	Management of the internal resources for the transfer of data (implicit/explicit messaging)
EtherNet/IP objects	
Device Level Ring (DLR) Object (71 / 0x47) (📖 128)	Status information for the DLR protocol
Quality of Service (QoS) Object (72 / 0x48) (📖 130)	Classification and prioritisation of the data packets for EtherNet/IP communication
TCP/IP Interface Object (245 / 0xF5) (📖 132)	Configuration of the TCP/IP network interface of the device
Ethernet Link Object (246 / 0xF6) (📖 136)	General information and status information about the Ethernet interfaces of the device
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
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

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	10 (0x000A)

Instance attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Vendor ID	UINT	587 (0x024B)
2	Get	Device Type	UINT	43 (0x002B)
3	Get	Product Code	UINT	9400 (0x24B8)
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) (📖 122) • EtherNet/IP state diagram (📖 50)
6	Get	Serial Number	UDINT	Serial number of the device
7	Get	Product Name	SHORT_STRING	E94AYCEO
8	Get	State	USINT	Current device state: • 0: Nonexistent • 1: Device self-testing • 2: Standby • 3: Operational • 4: Major Recoverable Fault [1)] • 5: Major Unrecoverable Fault [2)] • 6 ... 254: Reserved • 255: Standard for "Get_Attributes_All" service (See also C13861 / C14861, LED status displays (📖 76))

1) The status is set if the pending, status determining device error displays the fault, trouble, quick stop by trouble, warning locked, or warning response.

2) The status is set if the pending, status determining device error displays the system fault response.

Attribute ID	Service	Name	Data type	Value
10	Get	Heartbeat Interval	USINT	Interval between heartbeat messages in milliseconds 0 ms: No transmission of heartbeat messages (standard setting)

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	Only reset service type '0' is supported: • Mains switching (power off/on) is simulated.
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute. (Not attribute 10, Heartbeat Interval)

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.



Note!

There are no GET/SET services for this object!

14.1.3 Assembly Object (4 / 0x04)

For the data exchange, the communication module supports the assembly object instances 110 (0x6E, Custom Output) and 111 (0x6F, Custom Input).

The contents of the input and output data depends on the I/O data arrangement in the drive (I/O configuration in the »Engineer« (📖 55)).

Class attributes

Attribute ID	Service	Name	Data type	Value
1	Get	Revision	UINT	2 (0x02)
2	Get	Max. Instance	UINT	111 (0x6F)

Instance attributes for output data of the scanner

Attribute ID	Service	Name	Data type	Value
3	Get / Set	Data	Array of BYTE	Max. 64 bytes from the scanner
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 scanner output data.

Instance attributes for input data of the scanner

Attribute ID	Service	Name	Data type	Value
3	Get / Set	Data	Array of BYTE	Max. 64 bytes to the scanner
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 scanner input data.

Instance attribute "Data" (attribute 3)

Instance	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
110 (0x6E)	**0**	Custom Output							
	...	...							
	31	Custom Output							
111 (0x6F)	**0**	Custom Input							
	...	...							
	31	Custom Input							

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.

14.1.4 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)

Instance error messages

Error code [hex]	Extended code [hex]	Error designation	Description
0x000	-	SUCCESS	No error
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 = 2 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 = 2 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)

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 / C14840))
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) • 3: Partial network fault • 4: Rapid fault/restore cycle (display via C13841 / C14841)
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 / C14842)
		Supervisor MAC Address	ARRAY of USINT[6]	Ethernet MAC address (display via C13843 / C14843)
12	Get	Capability Flags	DWORD	Telegram processing method for the ring node implementation • 2: Beacon-based ring node ▸ Instance attribute "Capability Flags" (attribute 12) (📖 129)

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".
2 ... 31	-	Reserved (0)

Supported service codes

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

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)

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 additionally (C13021 / C14021 = 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 transmission of data packets with 802.1Q tags (C13021 / C14021) • 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 / C14022/4)
6	Set	DSCP High	USINT	43: Messages with high priority (Can only be used for "input only" and "listen only" connections.) (C13022/5 / C14022/5)
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 / C14022/7)

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)

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) (📖 133)
2	Get	Configuration Capability	DWORD	Possible options for TCP/IP configuration ▸ Instance attribute "Configuration Capability" (attribute 2) (📖 134)
3	Get / Set	Configuration Control	DWORD	Selection of how the TCP/IP configuration is to be effected (C13005 / C14005): 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)
5	Get	Interface Configuration:	STRUCT of:	Current TCP/IP configuration
		IP Address	UDINT	C13010 / C14010 (active IP address)
		Network Mask	UDINT	C13011 / C14011 (active subnet mask)
		Gateway Address	UDINT	C13012 / C14012 (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 / C14899, max. 64 ASCII characters)

Attribute ID	Service	Name	Data type	Value
8	Get / Set	TTL Value	USINT	TTL value (C13019 / C14019) 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 / C14018) 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 / C14006) • 2: Reserved
		Reserved	USINT	0 (0x0000)
		Num Mcast	UINT	Total number of multicast IP addresses assigned (C13020 / C14020)
		Mcast Start Addr	UDINT	Active multicast IP start address (C13016 / C14016)
10	Set	SelectAcd	BOOL	Activation of address conflict detection (ACD, C13846 / C14846) • 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: ProbeIpv4Address • 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") (📖 135)

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 / C14019). 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").

Bits	Name	Description
6	AcdStatus	Display of the status of address conflict detection (ACD): • 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)

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 attributes' values for a certain object (only instance 1).
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

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 only effective after the device is reset ("Power off/on" or "Type 0 Reset").

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)

Instance attributes

(instance 1 for X233 interface / instance 2 for X234 interface)

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) (📖 137)
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) (📖 138)
		Forced Interface Speed	UINT	Baud rate [in Mbps] at which the Ethernet interface is to be operated (C13017 / C14017). Example values: • 10 = 10 Mbps • 100 = 100 Mbps
10	Get	Interface Label	SHORT_ STRING	Text for the identification/designation of the Ethernet interface: • X233 (instance 1) • X234 (instance 2)

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	This bit indicates 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. - **Is not supported!** • 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)

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
0x0E	Get_Attribute_Single	Outputs the value of a certain attribute.
0x10	Set_Attribute_Single	Changes the value of a certain attribute.

14.3 Lenze objects

14.3.1 Lenze Class (101 / 0x65)

The "Lenze Class (101 / 0x65)" enables the access to the error responses to EtherNet/IP errors adjustable in code C13880 / C14880.

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 / C14880/1: • 0 = no response • 1 = error • 3 = quick stop by trouble • 4 = warning locked • 6 = information
4	Get / Set	Reaction on Fault Mode	USINT	Corresponds to the value in C13880/2 / C14880/2: • 0 = no response • 1 = error • 3 = quick stop by trouble • 4 = warning locked • 6 = information
5	Get / Set	Reaction on Expl. Msg. TO	USINT	Corresponds to the value in C13880/3 / C14880/3: • 0 = no response • 1 = error • 3 = quick stop by trouble • 4 = warning locked • 6 = information
6	Get / Set	Reaction on I/O Timeout	USINT	Corresponds to the value in C13880/4 / C14880/4: • 0 = no response • 1 = error • 3 = quick stop by trouble • 4 = warning locked • 6 = information

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.

14.3.2 Lenze Class (103 / 0x67)

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

The input data for the scanner are 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.

14.3.3 Lenze Class (104 / 0x68)

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

The output data of the scanner are transmitted via the assembly object instance **110 (0xE5, Custom Output)**.

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.

14.3.4 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.

Index

A

Active gateway address (C13012) 92
Active gateway address (C14012) 105
Active IP address (C13010) 92
Active IP address (C14010) 105
Active Multicast IP Address (C13016) 93
Active Multicast IP Address (C14016) 106
Active subnetwork mask (C13011) 92
Active subnetwork mask (C14011) 105
Address Conflict Detection (C13846) 96
Address Conflict Detection (C14846) 109
All words from scanner (C13851) 97
All words from scanner (C14851) 110
All words from the standard device (C14853) 110
All words to scanner (C13850) 96
All words to scanner (C14850) 109
All words to the basic device (C13852) 97
All words to the basic device (C13853) 97
All words to the standard device (C14852) 110
Application as directed 13
Application notes (representation) 10
Approvals 16
ARP message 135
Assemblies 53
Assembly 24
Assembly input objects (adapter to scanner) 54
Assembly Object (4 / 0x04) 124
Assembly output objects (scanner to adapter) 54

B

Baud rate 16
Before initial switch-on 33
BOOTP server 42

C

C00615 | Resp. to imp. device conf. 88
C00636 | Resp. to new module in MXI1 88
C00637 | Resp. to new module in MXI2 89
C01501 | Resp. to comm. error with MXI1 89
C01502 | Resp. to comm. error with MXI2 89
C13000 | IP Address 90
C13001 | Subnetwork mask 90
C13002 | Gateway Address 90
C13003 | MAC ID 91
C13005 | IP Config Control 91
C13006 | Multicast IP Start Address 91
C13010 | Active IP address 92
C13011 | Active Subnetwork Mask 92
C13012 | Active gateway address 92
C13016 | Active Multicast IP Address 93
C13017 | Ethernet Config Control 93
C13018 | Multicast Config Alloc Control 94
C13019 | Multicast Config TTL Value 94
C13020 | Multicast Config Num Mcast 94
C13021 | Quality of Service (VLAN-Tagging) 94
C13022 | Quality of Service (DSCP) 95
C13840 | DLR Network Topology 95
C13841 | DLR Network Status 95
C13842 | Supervisor IP Address 96
C13843 | Supervisor MAC ID 96
C13846 | Address Conflict Detection 96
C13850 | All words to scanner 96
C13851 | All words from scanner 97
C13852 | All words to the basic device 97
C13853 | All words to the basic device 97
C13858 | Ethernet Port Statistics 98
C13861 | CIP Module Status 98
C13862 | CIP Network Status 98
C13863 | Ethernet Port 99
C13870 | CIP Connections State 99
C13871 | CIP Connections Type 100
C13872 | CIP Connection Triggers 100
C13873 | CIP Connections RPI 100
C13874 | CIP Connections Timeout Time 101
C13875 | CIP Connections RUN/IDLE Flag 101
C13880 | Monitoring Reaction 101
C13881 | Overall Ethernet Timeout Time 102
C13885 | Clear I/O Data 102
C13899 | Hostname 102
C13900 | Firmware product type 102
C13901 | Firmware compilation date 102
C13902 | Firmware version 102
C14000 | IP address 103
C14001 | Subnetwork Mask 103
C14002 | Gateway address 103
C14003 | MAC ID 104
C14005 | IP configuration reference 104
C14006 | Multicast IP Start Address 104
C14010 | Active IP address 105
C14011 | Active subnetwork mask 105
C14012 | Active gateway address 105
C14016 | Multicast IP Address 106
C14017 | Ethernet setting 106
C14018 | Multicast Config Alloc Control 107
C14019 | Multicast Config TTL Value 107
C14020 | Multicast Config Num Mcast 107
C14021 | Quality of Service (VLAN-Tagging) 107
C14022 | Quality of Service (DSCP) 108
C14840 | DLR Network Topology 108
C14841 | DLR Network Status 108
C14842 | Supervisor IP Address 109
C14843 | Supervisor MAC ID 109
C14846 | Address Conflict Detection 109
C14850 | All words to scanner 109
C14851 | All words from scanner 110
C14852 | All words to standard device 110

C14853 | All words from standard device 110
C14858 | Ethernet port statistics 111
C14861 | CIP Module Status 111
C14862 | CIP Network Status 111
C14863 | Ethernet port 112
C14870 | Status of CIP connections 112
C14871 | Type of CIP connections 113
C14872 | Trigger of CIP connections 113
C14873 | RPI of CIP connections 113
C14874 | Timeout time of CIP connections 114
C14875 | CIP Connections RUN/IDLE Flag 114
C14880 | Reaction on communication fault 114
C14881 | Overall Ethernet communication timeout time 115
C14885 | Clear I/O data 115
C14899 | Hostname 115
C14900 | Firmware product type 115
C14901 | Firmware compilation date 115
C14902 | Firmware version 115
Cable length 16
CIP Connection Triggers (C13872) 100
CIP Connections RPI (C13873) 100
CIP Connections RUN/IDLE Flag (C13875) 101
CIP Connections RUN/IDLE Flag (C14875) 114
CIP Connections State (C13870) 99
CIP Connections Timeout Time (C13874) 101
CIP Connections Type (C13871) 100
CIP error messages 87
CIP Module Status (C13861) 98
CIP Module Status (C14861) 111
CIP Network Status (C13862) 98
CIP Network Status (C14862) 111
CIP objects 119
CIP status indicators 78
Class attributes 120
Clear I/O Data (C13885) 102
Clear I/O data (C14885) 115
Codes 88
Colour code of the Ethernet cable 31
Commissioning 33
Communication channels 48
Communication medium 16
Communication profile 16
Communication time 17
Configuring the host system (scanner) 34
Configuring the scanner 34
Conformities 16
Connection Manager Object (6 / 0x06) 126
Connections 15
Conventions 8
Conventions used 8
Cyclic I/O data 49

D

Data transfer 47
Device and application-specific safety instructions 12
Device Level Ring (DLR) Object (71 / 0x47) 128
Device protection 12
Device type 16
DHCP server 42
Diagnostics 76
Diagnostics with the »Engineer« 81
Dimensions 22
Disassembly 24
DLR Network Status (C13841) 95
DLR Network Status (C14841) 108
DLR Network Topology (C13840) 95
DLR Network Topology (C14840) 108
Document history 7
Drive profiles 52

E

EDS files 34
Electrical installation 25
E-mail to Lenze 148
Error messages 82
  Causes and remedies 83
  Short overview 82
Error messages of the "Connection Manager Object" (0x06) 126
Error number
  0x00c85531 83
  0x00c85532 83
  0x00c85533 83
  0x00c86010 83
  0x00c86011 83
  0x00c86100 84
  0x00c86101 84
  0x00c8641f 84
  0x00c86420 84
  0x00c86430 84
  0x00c86533 84
  0x00c88111 85
  0x00c88112 85
  0x00c88114 85
  0x00c88132 85
  0x00c88142 85
  0x00c88143 86
  0x00c88273 86
Establishing an online connection via EtherNet/IP using the Lenze »Engineer« 44
Establishing communication 46
Ethernet cable 30
Ethernet cable specification 30
Ethernet cable, colour code 31
Ethernet cable, structure 30
Ethernet Config Control (C13017) 93
Ethernet Link Object (246 / 0xF6) 136

Index

Ethernet Port (C13863) 99
Ethernet port (C14863) 112
Ethernet Port Statistics (C13858) 98
Ethernet port statistics (C14858) 111
Ethernet setting (C14017) 106
EtherNet/IP
  Class 1 Connection Closed (error message) 85
  Class 3 Connection Closed (error message) 86
  Duplicate IP Address (error message) 86
  Error: Lenze Setting Loaded (error message) 84
  Explicit Message Timeout (error message) 85
  Fault Mode (error message) 85
  Idle Mode (error message) 85
  Internal error (error message) 83, 84
  Internal mapping error (error message) 84
  Invalid IP Parameter (error message) 84
  Invalid Parameter Set (error message) 84
  Memory
    No Access (error message) 83
    Read Error (error message) 83
    Write Error (error message) 83
  Overall Ethernet Timeout (error message) 85
  Restart by Watchdogreset (error message) 83
EtherNet/IP configurator of the »Engineer« 38
EtherNet/IP connection 28
EtherNet/IP error messages
  Causes and remedies 83
  Short overview 82
EtherNet/IP objects 128
EtherNet/IP state diagram 50
Explicit messages 70
Explicit messages (parameter data transfer) 49

F

Fault with regard to EtherNet/IP communication 74
Feedback to Lenze 148
Firmware Compilation Date (C13901) 102
Firmware compilation date (C14901) 115
Firmware Product Type (C13900) 102
Firmware product type (C14900) 115
Firmware Version (C13902) 102
Firmware version (C13902) 115

G

Gateway address 41
Gateway Address (C13002) 90
Gateway address (C14002) 103
General data 16
General safety and application notes 11

H

Hostname (C13899) 102
Hostname (C14899) 115

I

I/O assemblies 53
I/O configuration in the »Engineer« 55
I/O configuration with »RSLogix 5000« version 19 or lower 58
I/O configuration with »RSLogix 5000« version 20 or higher 63
I/O data transfer (implicit messages) 51
Identification 13
Identity Object (1 / 0x01) 121
Implicit messages 51
Implicit messages (I/O data transfer) 49
Information regarding the validity 6
Initial switch-on 46
Input assemblies 53
Installation 23
Interface for communication 16
Interfaces 15
Internal switch latency 18
Interruption of internal communication 75
IP address 41
IP address (C13000) 90
IP address (C14000) 103
IP Config Control (C13005) 91
IP configuration reference (C14005) 104

L

LED status displays 76
Lenze Class (101 / 0x65) 139
Lenze Class (103 / 0x67) 141
Lenze Class (104 / 0x68) 142
Lenze Class (110 / 0x6E) 143
Lenze objects 139
Lenze technology application 52

M

MAC-ID (C13003) 91
MAC-ID (C14003) 104
Mechanical installation 24
Message Router Object (2 / 0x02) 123
Module status displays 77
Monitoring 74
Monitoring Reaction (C13880) 101
Mounting clearance 29
Multicast Config Alloc Control (C13018) 94
Multicast Config Alloc Control (C14018) 107
Multicast Config Num Mcast (C13020) 94
Multicast Config Num Mcast (C14020) 107
Multicast Config TTL Value (C13019) 94
Multicast Config TTL Value (C14019) 107
Multicast configuration 43
Multicast IP Start Address 43
Multicast IP Start Address (C13006) 91
Multicast IP Start Address (C14006) 104

Index

N

Nameplate 13
Network topology 26
Notes used 10
Number of nodes 16

O

Operating conditions 16
Output assemblies 53
Overall Ethernet communication timeout time (C14881) 115
Overall Ethernet Timeout Time (C13881) 102

P

Parameter data transfer (explicit messages) 70
Parameter reference 88
Parameters of the communication module for slot MXI1 90, 103
Parameters of the standard device that are relevant to communication 88
Pin assignment 28
Processing time 17
Product code 16
Product description 13
Product features 14
Protection against uncontrolled restart 46
Protection of persons 12
Protective insulation 19
Protocol data 17

Q

Quality of Service (DSCP, C13022) 95
Quality of Service (DSCP, C14022) 108
Quality of Service (QoS) Object (72 / 0x48) 130
Quality of Service (VLAN Tagging, C13021) 94
Quality of Service (VLAN Tagging, C14021) 107

R

Reaction on communication fault (C14880) 114
Read parameters 72
Residual hazards 12
Resp. to comm. error with MXI1 (C01501) 89
Resp. to comm. error with MXI2 (C01502) 89
Resp. to imp. device config. (C00615) 88
Resp. to new module in MXI1 (C00636) 88
Resp. to new module in MXI2 (C00637) 89
RPI of CIP connections (C14873) 113
Runtime delays 18

S

Safety instructions 11
Safety instructions (representation) 10
Saving the I/O configuration in »RSLogix 5000« 69
Screenshots/application examples 6
Setting the IP configuration 37
State diagram 50
Status displays (LEDs) 76
Status displays on the RJ45 sockets (X233, X234) 80
Status of CIP connections (C14870) 112
Structure of the Ethernet cable 30
Subnet mask 41
Subnetwork mask (C13001) 90
Subnetwork mask (C14001) 103
Supervisor IP Address (C13842) 96
Supervisor IP Address (C14842) 109
Supervisor MAC ID (C13843) 96
Supervisor MAC ID (C14843) 109
Switch latency 18
System error messages 82

T

Table of attributes 116
Target group 6
TCP/IP Interface Object 42
TCP/IP Interface Object (245 / 0xF5) 132
Technical data 16
Technology applications (TA) 52
Telegram types 49
Terminals 32
Terminology used 9
Timeout time of CIP connections (C14874) 114
Trigger of CIP connections (C14872) 113
Type of CIP connections (C14871) 113
Type of node 16

U

User-definable parameter sets 52
Using the communication module 13

V

Vendor ID 16
VLAN tagging 130
Voltage supply 16
Voltage supply (external) 32

W

Wiring according to EMC guidelines 25
Write parameters 71

Your opinion is important to us

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

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

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Thank you very much for your support.

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