

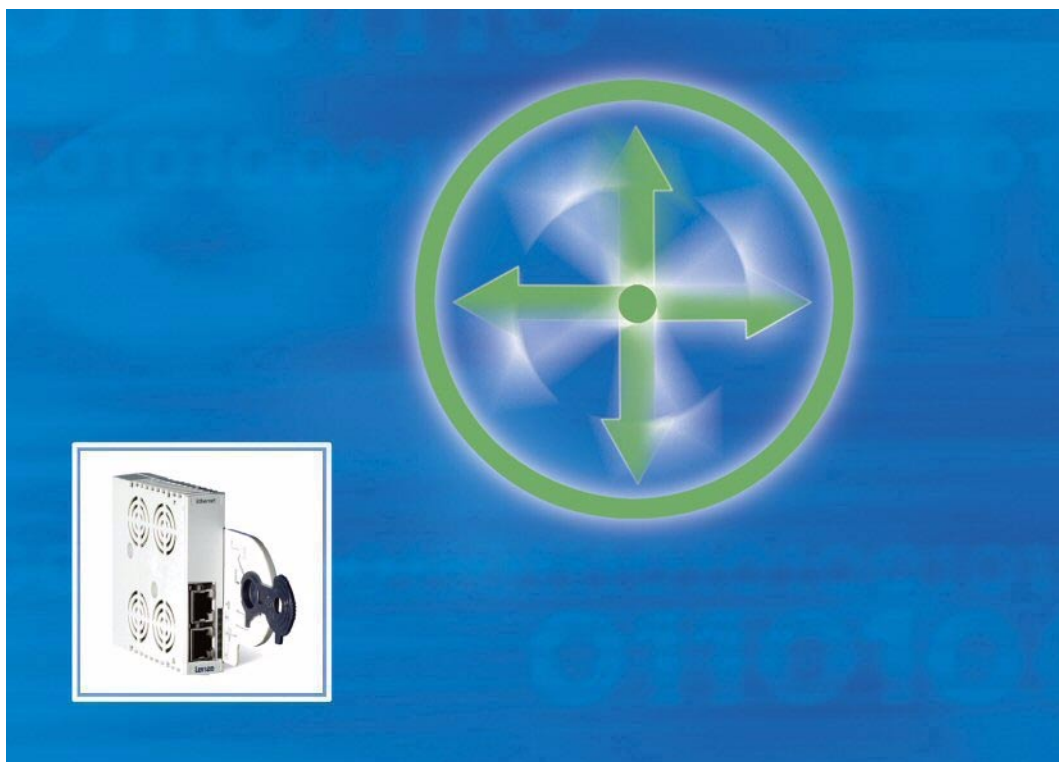
EDS94AYCEN
13416838

L-force *Communication*



Communication Manual

9400



E94AYCEN

Ethernet communication module

Lenze

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1 About this documentation

Contents

The descriptions in this documentation only refer to the E94AYCEN communication module (Ethernet).



Note!

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

The mounting instructions contain safety instructions that must be observed!

The features and functions of the Ethernet communication module are described in detail. Examples illustrate typical applications.

This documentation furthermore contains:

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

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

This documentation does not describe 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.

Screenshots/application examples

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

Target group

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



Tip!

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

www.Lenze.com

Validity information

The information in this documentation applies to the following devices:



Extension module	Type designation	From hardware version	From software version
Ethernet communication module	E94AYCEN	VC	-

1.1 Document history

Version			Description
1.0	11/2004	TD06	First edition
2.0	03/2005	TD06	Description of the GCI protocol added
3.0	03/2005	TD06	Description of displays added
4.0	10/2006	TD06	General revision
5.0	11/2007	TD17	General revision and provision of the documentation in the form of the »Engineer« online help
6.0	11/2008	TD17	Revision for hardware version VC (2-port Ethernet)
7.0	06/2009	TD17	Update of the description for the configuration of the communication module with the »Engineer«.
8.0	07/2010	TD17	General revision
9.0	09/2012	TD17	<ul style="list-style-type: none">• Revision of the telegram description in chapter Parameter data transfer (38).• Parameter reference (54) supplemented.

1.2 Conventions used

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

Type of information	Identification	Examples/notes
Numbers		
Decimal	Standard notation	Example: 1234
Hexadecimal	0x[0 ... 9, A ... F]	Example: 0x60F4
Binary • Nibble	In inverted commas Point	Example: '100' Example: '0110.0100'
Decimal separator	Point	In general, the decimal point is used. Example: 1234.56
Text		
Program name	» «	PC software Example: Lenze »Engineer«
Control element	Bold	The OK button... / The Copy command... / The Properties tab... / The Name input field...
Hyperlink	<u>Underlined</u>	Optically highlighted reference to another topic. In this documentation activated via mouse-click.
Icons		
Page reference	 8	Optically highlighted reference to another page. In this documentation activated via mouse-click.
Step-by-step instructions		Step-by-step instructions are marked by a pictograph.

1.3 Terminology used

Term	Meaning
Drive	Lenze controllers of the "Servo Drives 9400" series
Standard device	
»Engineer«	Lenze PC software supporting you for the "Engineering" (parameterisation, diagnostics, and configuration) during the whole life cycle, i. e. from the design to the maintenance of the machine commissioned.
Code	Parameter which serves to parameterise and monitor the drive. In normal usage, the term is usually referred to as "Index".
Lenze setting	This setting is the default factory setting of the device.
Basic setting	
HW	Hardware
SW	Software
PLC	Programmable Logic Controller (PLC)
Use DHCP	Dynamic Host Configuration Protocol

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 suggests how to prevent dangerous situations)

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

Application notes

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

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 instructions and application notes



Danger!

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

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

- ▶ All operations with and on Lenze drive and automation components may only be carried out by qualified personnel. In accordance with IEC 60364 or CENELEC HD 384 these are persons ...
 - who are familiar with the installation, mounting, commissioning, and operation of 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.
- ▶ Decouple your Ethernet house network from the system network for Ethernet-capable Lenze devices.
 - ▶ [Ethernet connection](#) (16 22)
- ▶ Only use cables that comply with the listed specifications.
 - ▶ [Specification of the Ethernet cable](#) (16 23)



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

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

2.3 Residual hazards

Protection of persons

- ▶ If Servo Drives 9400 are used on a phase earthed mains with a rated mains voltage ≥ 400 V, protection against accidental contact is not guaranteed without external measures.
 - ▶ [Protective insulation](#) (16 16)

Device protection

- ▶ The communication module contains electronic components that can be damaged or destroyed by electrostatic discharge.
 - ▶ [Installation](#) (16 19)

3 Product description

3.1 Application as directed

The Ethernet communication module ...

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

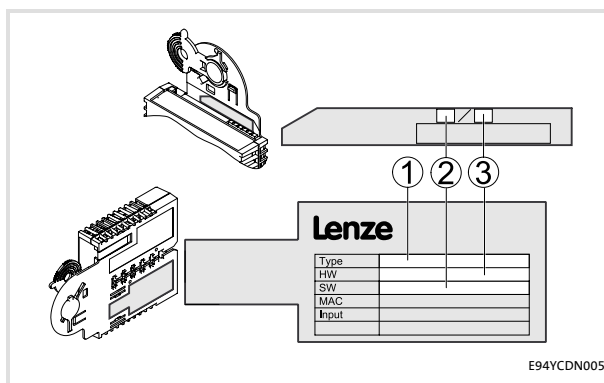
Product series	Type designation	From hardware version	From software version
Servo Drives 9400 HighLine	E94AxHExxxx	VB	01.50
Servo Drives 9400 PLC	E94AxPExxxx	VA	01.00
Regenerative power supply module	E94ARNxxxx	VA	01.00

- ▶ 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 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:



1 Type designation (type)

E94 Product series

A Version

Y Module identification: Extension module

C Module type: Communication module

EN Ethernet

2 Hardware version (HW)

3 Software version (SW)

[3-1] Identification data

E94AYCEN communication manual (Ethernet)

Product description

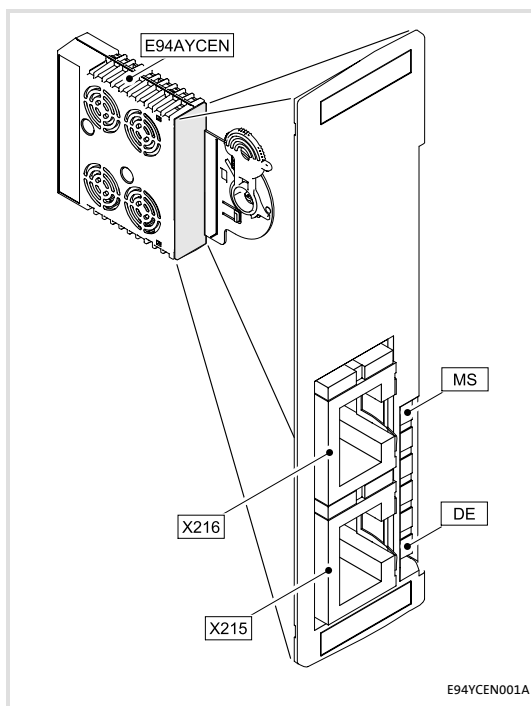
Product features

3.3 Product features

- ▶ Interface module for the Ethernet communication system, for attaching to the expansion slots of the Servo Drives 9400
- ▶ 2-port interface with integrated switch functionality
- ▶ Automatic setting of baud rate and transmission mode (auto-negotiation)
- ▶ Automatic detection of wiring errors and polarity reversal of data signals (auto-polarity)
- ▶ Automatic detection and (internal) swapping of data signals from receive paths and transmit paths (auto-crossing)
- ▶ Access to all Lenze parameters via the Lenze »Engineer«

3.4 Terminals and interfaces

- ▶ 2 RJ45 sockets for Ethernet connection
- ▶ Front LEDs for diagnosing the ...
 - Voltage supply of the communication module
 - Connection to the standard device
 - Ethernet connection
 - Ethernet activity



X215 Ethernet connections

X216 • RJ45 sockets

• Each with 2 LED status displays for diagnostics

▶ [Ethernet connection](#) (📖 22)

▶ [Status display at X215 and X216](#) (📖 52)

MS 2 LED status displays for diagnostics

DE ▶ [LED status displays](#) (📖 52)

[3-2] Communication module E94AYCEN (Ethernet)

4 Technical data

4.1 General data and operating conditions

Area	Values
Order designation	E94AYCEN
Communication profile	GCI, based on TCP/IP
Communication medium	S/FTP (screened foiled twisted pair, ISO/IEC 11801 or EN 50173), CAT 5e
Interface	RJ45: Standard Ethernet (in accordance with IEEE 802.3), 100Base-TX (Fast Ethernet)
Network topology	Line, star
Ethernet port	9410 (GCI)
Baud rate	<ul style="list-style-type: none"> • 10 Mbps • 100 Mbps
Transmission mode	Half duplex / full duplex
Switching method	Store and forward
Switch latency	125 µs at maximum telegram length
Voltage supply	The communication module is solely supplied with voltage by the standard device.
Conformities, approvals	<ul style="list-style-type: none"> • CE • UL



Servo Drives 9400 hardware manual

This manual contains data on **ambient conditions** and the **electromagnetic compatibility (EMC)** which also apply to the communication module.

4.2 Protective insulation



Danger!

Dangerous electrical voltage

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

Possible consequences:

- Death or severe injuries

Protective measures:

- If protection against accidental contact is required for the control terminals of the drive and for the connections of the plugged-in device modules, ...
 - a double isolating distance must exist.
 - the components to be connected must be provided with the second isolating distance.

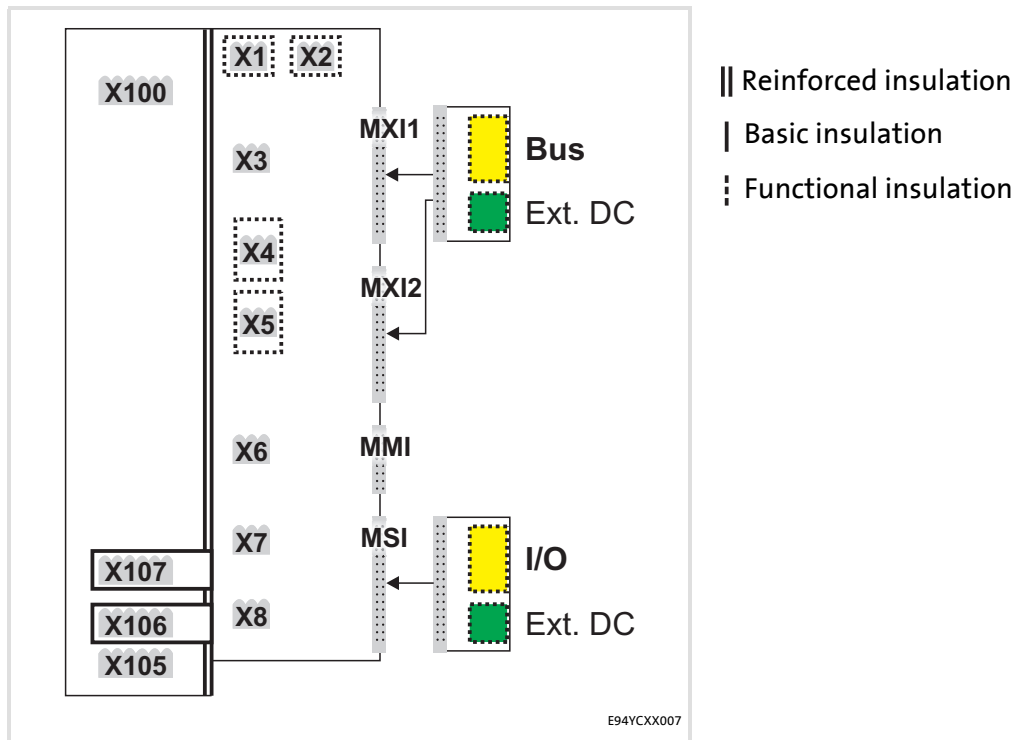


Note!

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 drive.
- ▶ 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

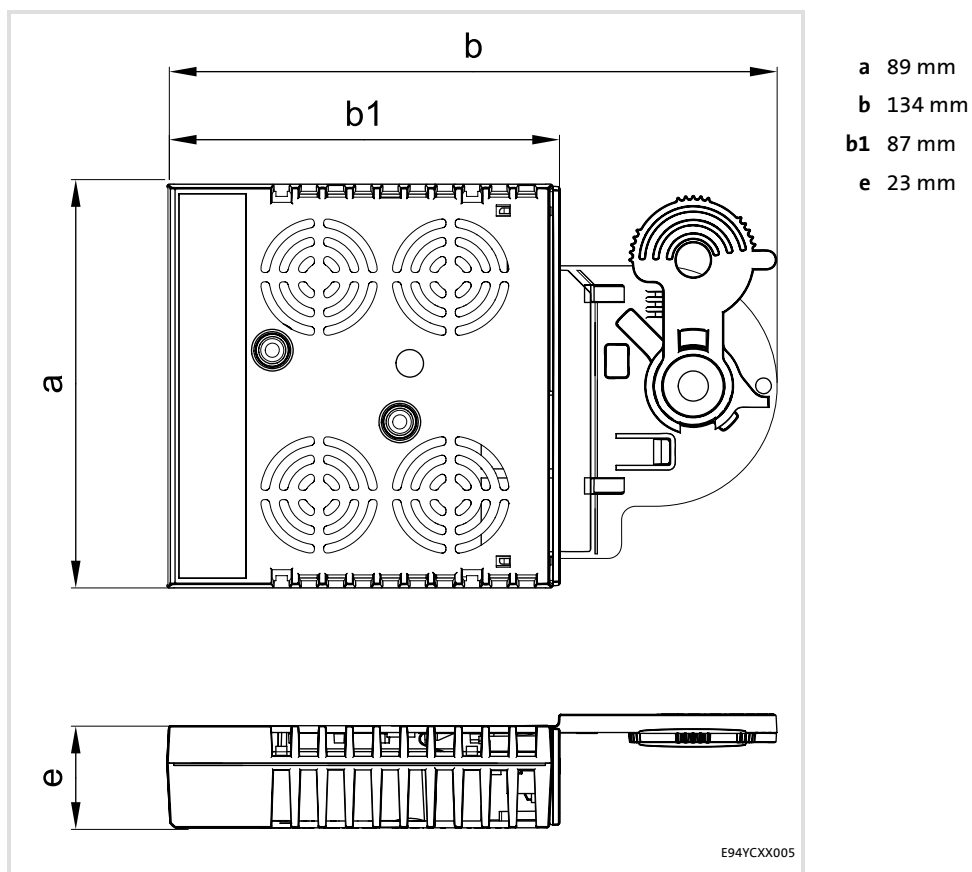
Terminal strip	Connection	Terminal strip	Connection
X100	L1, L2, L3 (Single Drive only)	X1	CAN on board 9400
	+UG, -UG	X2	Statebus
X105	U, V, W		24 V (ext.)
	Rb1, Rb2 (Single Drive only)	X3	Analog inputs/outputs
X106	Motor PTC	X4	Digital outputs
X107	Control of the motor holding brake	X5	Digital inputs
		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.

4.3 Dimensions



[4-2] Dimensions

5 Installation



Stop!

Electrostatic discharge

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

Possible consequences:

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

Protective measures

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

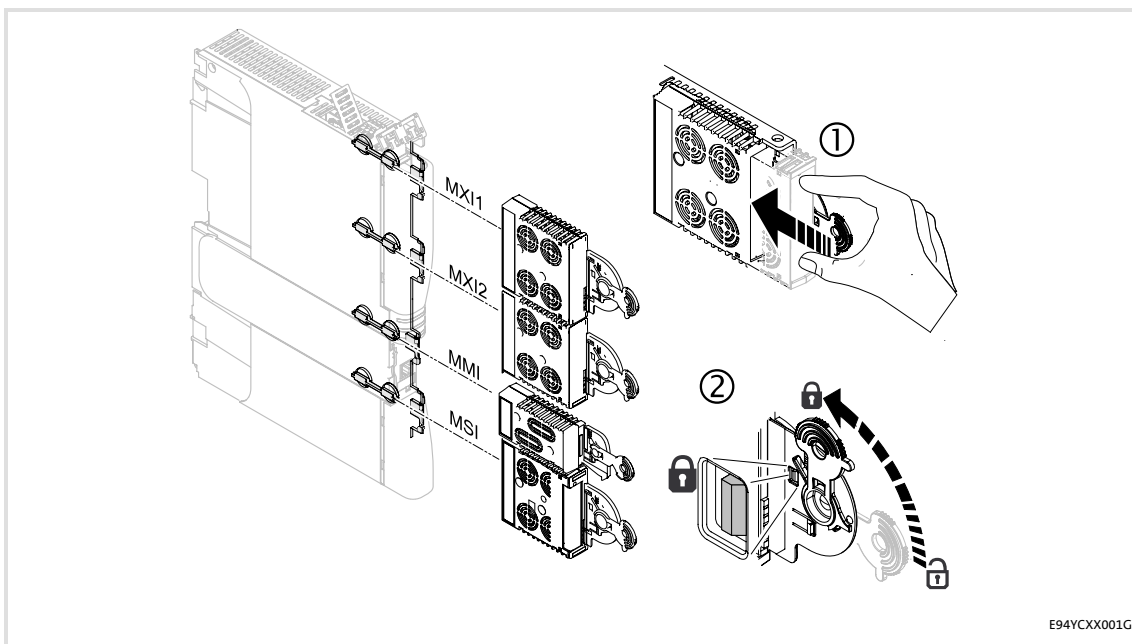
5.1 Mechanical installation



Note!

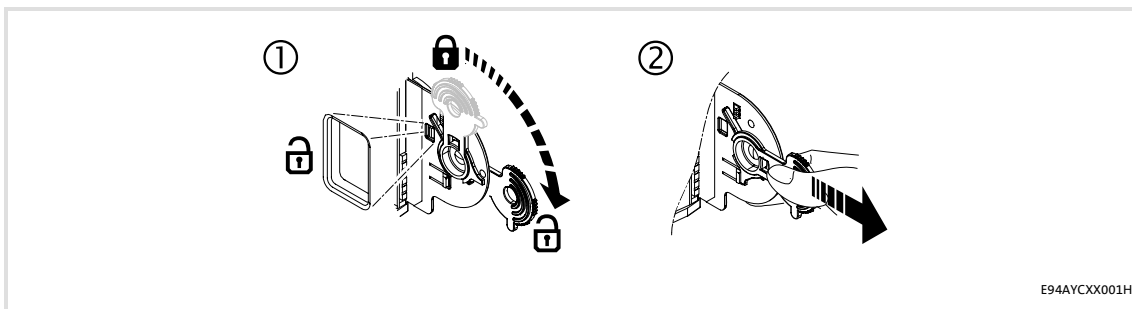
Only one Ethernet module may be attached to a Servo Drive 9400, either in module slot MXI1 or MXI2.

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.

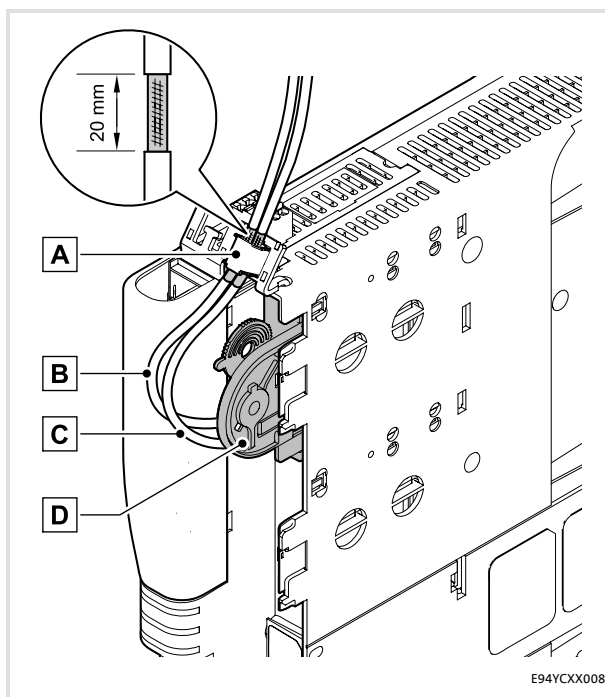
5.2.1 EMC-compliant wiring

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. Fasten the cable shield onto the shield sheet of the Servo Drive 9400.



A Fastening on the shield sheet of the Servo Drive 9400

B Outgoing Ethernet cable at X216

C Incoming Ethernet cable at X215

D Communication module in slot MXI1 of the Servo Drive 9400

[5-3] EMC-compliant wiring

5.2.2 Ethernet connection

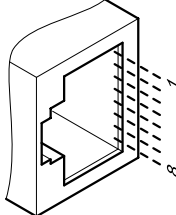
- ▶ The Ethernet connection is made via the RJ45 sockets **X215** and **X216**.
- ▶ You can use a standard Ethernet patch cable to connect the communication module to the Ethernet fieldbus.
 - ▶ [Specification of the Ethernet cable](#) (📖 23)



Note!

- Decouple your Ethernet house network from the system network for Ethernet-capable Lenze devices in order to prevent trouble in the Ethernet communication.
Further information can be obtained from the "Ethernet in the industrial application" manual.
- To prevent the RJ45 socket from being damaged, hold the Ethernet cable connector straight (at a right angle) when inserting it into or removing it from the socket.

Pin assignment

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

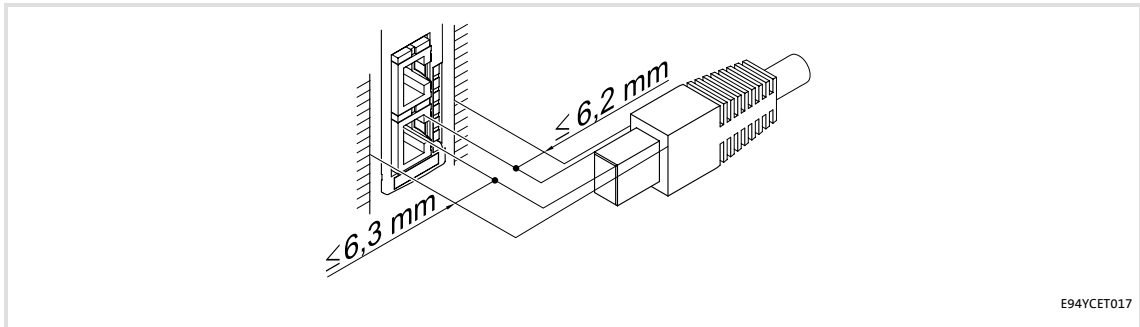


Tip!

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

Free space

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



[5-4] Free space

5.2.3 Specification of the Ethernet cable



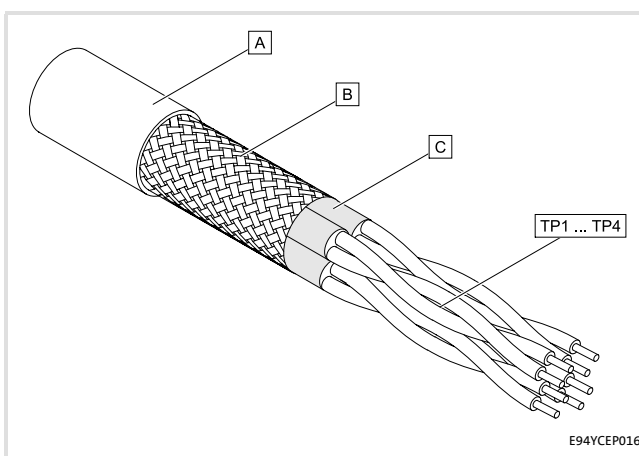
Note!

Only use cables that meet the listed specifications.

Specification of the Ethernet cable

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 (at 100 MHz and per 100 m)
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 shield

TP1 Twisted core pairs 1 ... 4

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

TP4 [\(24\)](#)

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

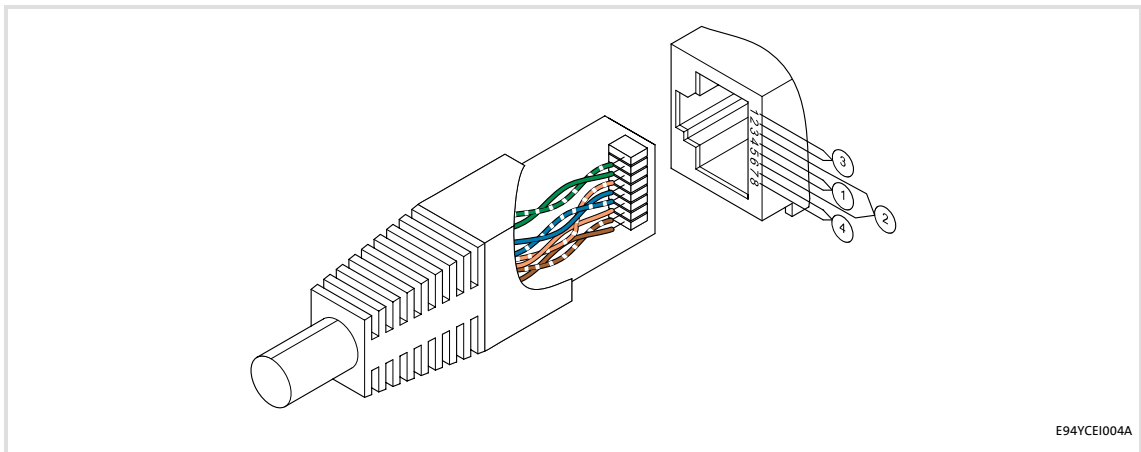
Colour coding of the Ethernet cable



Note!

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

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



E94YCEI004A

[5-6] Ethernet plug in accordance with EIA/TIA 568A/568B

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

5.2.4 Voltage supply

Internal supply

The communication module is solely supplied with voltage by the standard device.



Note!

If the standard device fails and daisy-chain wiring has been used, the transmission of data between the Ethernet nodes at interface X215 and the Ethernet nodes at interface X216 will be interrupted.

6 Commissioning

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

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

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



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:

- C13nnn for slot MXI1
 - ▶ [Parameters of the communication module for slot MXI1](#) (📖 56)
- C14nnn for slot MXI2
 - ▶ [Parameters of the communication module for slot MXI2](#) (📖 60)

Additionally set the [Parameters of the standard device that are relevant to communication](#) (📖 54).

6.1 Before initial switch-on



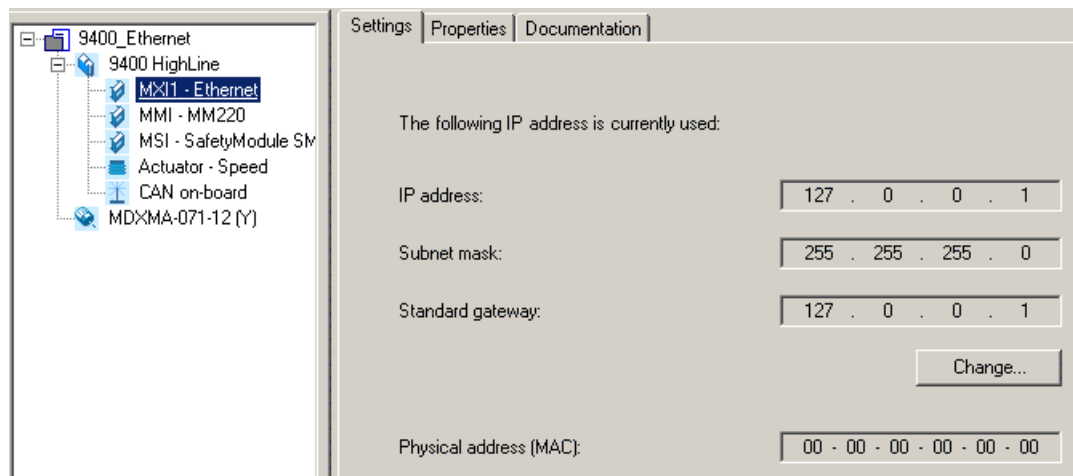
Stop!

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 communication module

The address settings required for Ethernet operation are displayed in the »Engineer« in the **Settings** tab (Fig. [6-1]). The settings correspond to the values of the codes:

Parameter	Code		Lenze setting
	for slot MXI1	for slot MXI2	
IP address	C13000/1...4	C14000/1...4	127.0.0.1
Subnet mask	C13001/1...4	C14001/1...4	255.255.255.0
Standard gateway	C13002/1...4	C14002/1...4	127.0.0.1
Physical address (MAC)	C13003/1...6	C14003/1...6	00-00-00-00-00-00



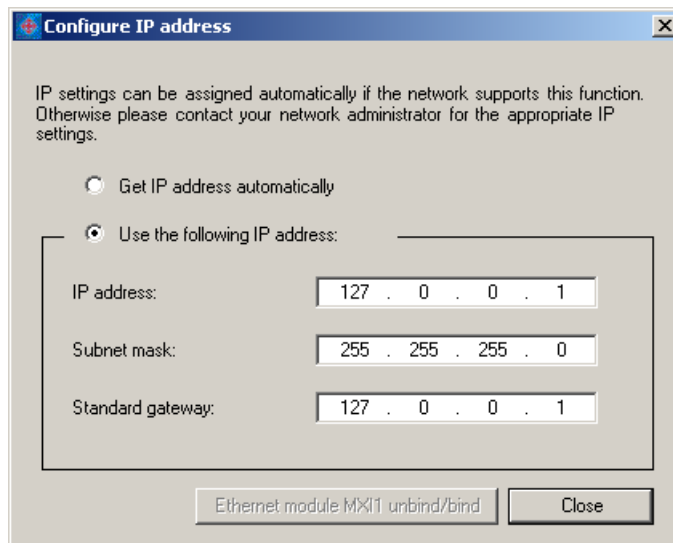
[6-1] Ethernet address settings

You can set the [IP address](#) (☞ 31), the [Subnet mask](#) (☞ 31) and the [Gateway address](#) (☞ 32) manually, but the IP address can also be received automatically from a DHCP server.

- ▶ [Setting the address](#) (☞ 28)
- ▶ [Automatically receiving an IP address](#) (☞ 29)

6.2.1 Setting the address

Clicking the **Change** button in the **Settings** tab (Fig. [6-1]) opens the "Configure IP address" dialog window:



[6-2] Setting the address

In the input fields for the IP address, the subnet mask and the standard gateway, you can directly set the addresses.

Setting the standard device code **C00002** to "101: bind/unbind" or "102: bind/unbind" copies the values and writes them to the corresponding codes:

Parameter	Code	
	for slot MX11	for slot MX12
IP address	C13000/1...4	C14000/1...4
Subnet mask	C13001/1...4	C14001/1...4
Standard gateway	C13002/1...4	C14002/1...4

The codes can also be set via the parameter list of the Servo Drive 9400 (**All parameters** tab).

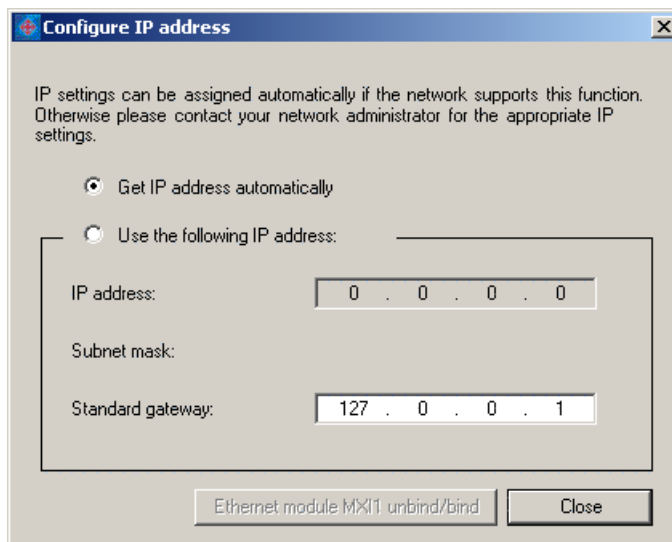
 **Tip!**

You can use a ping command in the MS-DOS input window to test whether the entered IP address is valid or not.

6.2.2 Automatically receiving an IP address

Clicking the **Change** button in the **Settings** tab (Fig. [6-1]) opens the "Configure IP address" dialog window.

Mark "Receive IP address automatically" in order to receive an IP address automatically from the DHCP server:



[6-3] Automatically receiving an IP address

The input field for the standard gateway serves to manually enter a gateway address. By default, the current values of the corresponding codes are displayed.

Setting the standard device code **C00002** to "101: bind/unbind" or "102: bind/unbind" copies the values and writes them to the corresponding codes:

Parameter	Code	
	for slot MX11	for slot MX12
IP address	C13000/1...4	C14000/1...4
Use of DHCP	C13005	C14005

The codes can also be set via the parameter list of the Servo Drive 9400 (**All parameters** tab).



Note!

Observe the information given in chapter [DHCP implementation in the Servo Drive 9400](#) (p. 34).



Tip!

You can use a ping command in the MS-DOS input window to test whether the received IP address is valid or not.

Output of the »Network Analyzer«

With "DHCP ACK", the DHCP server (here IP address "192.216.31.1") assigns the IP address "192.216.31.239" to the Servo Drive 9400 (DHCP client):

The screenshot displays the Network Analyzer interface with a packet capture list and detailed view of a DHCP ACK packet.

No.	Time	Source	Destination	Protocol	Info
1	0.000000	0.0.0.0	255.255.255.255	DHCP	DHCP Discover - Transaction ID 0xaa94d437
2	0.000123	192.216.31.1	255.255.255.255	DHCP	DHCP Offer - Transaction ID 0xaa94d437
3	0.099759	0.0.0.0	255.255.255.255	DHCP	DHCP Request - Transaction ID 0xaa94d437
4	0.099941	192.216.31.1	Broadcast	ARP	who has 192.216.31.239? Tell 192.216.31.1
5	0.173662	192.216.31.1	255.255.255.255	DHCP	DHCP ACK - Transaction ID 0xaa94d437

Frame 5 (322 bytes on wire, 322 bytes captured)

- Ethernet II, Src: 00:14:22:50:de:a3, Dst: ff:ff:ff:ff:ff:ff
- Internet Protocol, Src Addr: 192.216.31.1 (192.216.31.1), Dst Addr: 255.255.255.255 (255.255.255.255)
- User Datagram Protocol, Src Port: bootps (67), Dst Port: bootpc (68)
- Bootstrap Protocol
 - Message type: Boot Reply (2)
 - Hardware type: Ethernet
 - Hardware address length: 6
 - Hops: 0
 - Transaction ID: 0xaa94d437
 - Seconds elapsed: 0
 - Bootp flags: 0x8000 (Broadcast)
 - Client IP address: 0.0.0.0 (0.0.0.0)
 - Your (client) IP address: 192.216.31.239 (192.216.31.239)**
 - Next server IP address: 0.0.0.0 (0.0.0.0)
 - Relay agent IP address: 0.0.0.0 (0.0.0.0)
 - Client hardware address: 00:0a:86:00:06:19
 - Server host name not given
 - Boot file name not given
 - Magic cookie: (OK)
 - Option 53: DHCP Message Type = DHCP ACK
 - Option 1: Subnet Mask = 255.255.255.0
 - Option 3: Router = 192.216.31.1
 - Option 58: Renewal Time value = 2 days
 - Option 59: Rebinding Time value = 2 days, 12 hours
 - Option 51: IP Address Lease Time = 3 days
 - Option 54: Server Identifier = 192.216.31.1
 - End option

0000 ff ff ff ff ff ff 00 14 22 50 de a3 08 00 45 00 "P...E.
0010 01 34 64 cc 00 00 80 11 f5 13 c0 d8 1f 01 ff ff .4d....
0020 ff ff 00 43 00 44 01 20 a0 2a 02 01 06 00 aa 94 ...C.D. .*.....
0030 d4 37 00 00 80 00 00 00 00 c0 d8 1f ef 00 00 .7.....
0040 00 00 00 00 00 00 00 0a 86 06 19 00 00 00 00
.....

Filter: [] Add Expression... Clear Apply File: (Untitled) 1377 bytes 00:00:00 Drops: 0 P: 5 D: 5 M: 0

6.2.3 IP address

The IP address is required for addressing the Servo Drive 9400 if communication between the PC and the controller is to be established via an Ethernet connection.

- ▶ The IP address consists of four numbers between 0 and 255 which respectively are separated from each other by a point, e. g. "192.168.10.1".
- ▶ Eight bits are reserved for each of the four numbers, which makes a total of 32 bits.
- ▶ The first one, two, or three numbers indicate the network (Net-ID), the remaining numbers indicate the host (Host-ID). The definite specification of the part that is to be evaluated as Net-ID is effected via the [Subnet mask](#) (31).

Codes

Parameter (MX1):	C13000/1	C13000/2	C13000/3	C13000/4
Lenze setting	127	0	0	1
Parameter (MX12):	C14000/1	C14000/2	C14000/3	C14000/4
Lenze setting	127	0	0	1

6.2.4 Subnet mask

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

- ▶ The subnet mask consists of four numbers which are separated by a point, e.g. "255.255.255.0".
- ▶ Eight bits are reserved for each of the four numbers, which makes a total of 32 bits.

Examples

1. The first three numbers of the IP address indicate the network, the last number indicates the host (Lenze setting):

Subnet mask:	255	.	255	.	255	.	0
Subdivision of IP address:	Net ID						Host ID

2. The first two numbers of the IP address indicate the network, the last two numbers indicate the host:

Subnet mask:	255	.	255	.	0	.	0
Subdivision of IP address:	Net ID				Host ID		

3. The first number of the IP address indicates the network, the remaining three numbers indicate the host:

Subnet mask:	255	.	0	.	0	.	0
Subdivision of IP address:	Net ID	Host ID					

Codes

Parameter (MXI1): [C13001/1](#) [C13001/2](#) [C13001/3](#) [C13001/4](#)
Lenze setting **255** . **255** . **255** . **0**

Parameter (MXI2): [C14001/1](#) [C14001/2](#) [C14001/3](#) [C14001/4](#)
Lenze setting **255** . **255** . **255** . **0**

6.2.5 Gateway address

The gateway address is required if the Servo Drive 9400 is not located in the same subnetwork as the PC.

- ▶ The gateway address consists of four numbers between 0 and 255, separated by points, e.g. "127.0.0.0".
- ▶ Eight bits are reserved for each of the four numbers, which makes a total of 32 bits.

Codes

Parameter (MXI1): [C13002/1](#) [C13002/2](#) [C13002/3](#) [C13002/4](#)
Lenze setting **127** . **0** . **0** . **1**

Parameter (MXI2): [C14002/1](#) [C14002/2](#) [C14002/3](#) [C14002/4](#)
Lenze setting **127** . **0** . **0** . **1**

6.2.6 MAC-ID

The MAC-ID is a globally unique identifier of an Ethernet-capable device. The MAC-ID is assigned by the manufacturer and permanently burnt into the device (Lenze communication module).

- ▶ The MAC-ID consists of six hexadecimal numerical codes (00 ... FF) which respectively are separated from each other by a hyphen, e. g. "00-0A-86-00-00-0A".
- ▶ Eight bits are reserved for each one of the six numerical codes, which makes a total 48 bits.
- ▶ The MAC-ID consists of the manufacturer's identification mark and a running number which is clearly assigned by the manufacturer.

Display of the MAC-ID

The MAC-ID of the communication module is displayed in [C13003/C14003](#):

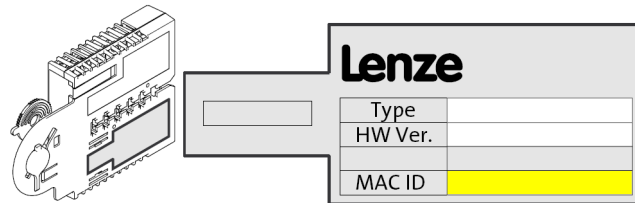
Parameter (MXI1):	C13003/1	C13003/2	C13003/3	C13003/4	C13003/5	C13003/6
Display [hex]:	00	0A	86	xx	xx	xx
	Manufacturer's identification mark (Lenze)			Consecutive definite number		

Parameter (MXI2):	C14003/1	C14003/2	C14003/3	C14003/4	C14003/5	C14003/6
Display [hex]:	00	0A	86	xx	xx	xx
	Manufacturer's identification mark (Lenze)			Consecutive definite number		



Tip!

The MAC ID is also entered in the nameplate of the communication module:



6.3 DHCP implementation in the Servo Drive 9400

DHCP is the acronym for "Dynamic Host Configuration Protocol". This protocol is defined in RFC 2131 and is an advancement on BOOTP (RFC 951). DHCP enables computers to query information about the network configuration (e.g. IP address) from a server via a TCP/IP network. The DHCP server assigns the IP address to the client dynamically, from a defined address range. This means that the client always receives a new, but unique IP address.

DHCP is implemented in the firmware (program organisation unit RTCS). The following chapter describes how the Servo Drive 9400 receives an IP address via DHCP.

DHCP code

For standard devices from version **V03.xx.xx.xx**, the DHCP codes [C13005](#) and [C14005](#) are available. These codes can be used to define whether DHCP is to be used or not:

- ▶ Value 0 (FALSE): Do not use DHCP (Lenze setting)
- ▶ Value 1 (TRUE): Use DHCP

DHCP flag settings

- ▶ *UseIPfromDhcp* = TRUE (Use DHCP):
The IP settings are assigned by the DHCP server.
- ▶ *UseIPfromDhcp* = FALSE (Do not use DHCP):
The IP settings are assigned manually.

6.3.1 Basic terms

DHCP client

TCP/IP stack of a host. Network node that makes DHCP requests and is configured.

DHCP server

Network node that waits for DHCP requests and responds to them.

Lease time

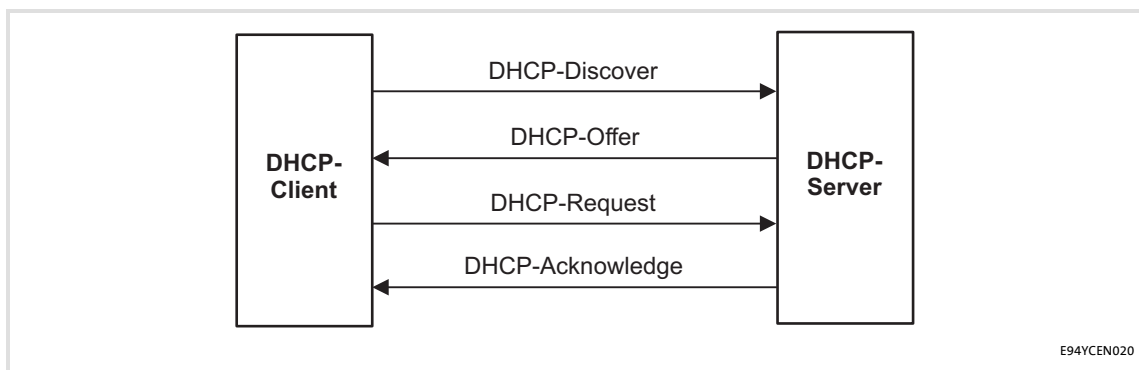
Service life of the assigned IP address. After this period expires, the IP address will be invalid. If it still needs to be used after this period, the lease time must be extended.

6.3.2 DHCP network architecture

Data relating to the DHCP network architecture	
DHCP model	Client/Server
Transport protocol	UDP
Ports	Server - UDP port 67 Client - UDP port 68
DHCP packet size	576 bytes
Compatibility	DHCP is an advancement on BOOTP, so the DHCP server can also manage BOOTP clients.

6.3.3 DHCP operating mode

DHCP is a client-server architecture. The DHCP server has access to a pool of IP addresses, which it can freely assign to the DHCP clients. For larger networks, the DHCP server also needs to know which subnetworks and gateways are available.



[6-4] DHCP operating mode

- ▶ In the first step, the client transmits a "DHCP discover broadcast", which searches for the server.
- ▶ The server responds to the client with a "DHCP offer" (unicast). This message contains the IP address, subnet mask, lease time and other information for the client.
- ▶ The client then accepts this data and reports this situation to the server by means of a "DHCP request" message.
- ▶ The server completes the DHCP configuration with a "DHCP acknowledge" message. This message contains the server IP address, client IP address, lease time, subnet mask and other configuration information.

6.3.4 DHCP packet structure

The DHCP packets have the following structure:

Bit 1 ... 8	Bit 9 ... 16	Bit 17 ... 24	Bit 25 ... 32
op (1 byte)	htype (1 byte)	hlen (1 byte)	hops (1 byte)
xid (4 bytes)			
secs (2 bytes)		flags (2 bytes)	
ciaddr (4 bytes)			
yiaddr (4 bytes)			
siaddr (4 bytes)			
giaddr (4 bytes)			
chaddr (4 bytes)			
sname (4 bytes)			
file (4 bytes)			
options (variable)			

Description of the fields:

Field	Size	Description
op	1 Byte	Opcode: Task carried out by the DHCP packet <ul style="list-style-type: none"> Indicates a client request or a server response.
htype	1 Byte	Hardware type: Specification of the network topology <ul style="list-style-type: none"> Examples: 1 for Ethernet, 15 for Frame Relay (specification in RFC 1700)
hlen	1 Byte	Hardware address length: Length of the hardware address in the "chaddr" (client hardware address) field
hops	1 Byte	Hop count: Number of routers / gateways between the client and the server
xid	4 bytes	Transaction ID: Unique identifier generated by the client <ul style="list-style-type: none"> This is required in order to assign a DHCP response to the corresponding DHCP request.
secs	2 bytes	Number of seconds: Time in seconds that has elapsed since the DHCP process began
flags	2 bytes	Flags: The first bit is used as a broadcast flag. All other flags are reserved for later use (status = 0).
ciaddr	4 bytes	Client IP address: Most recently used client IP address <ul style="list-style-type: none"> This is only used in a client DHCP request.
yiadr	4 bytes	Your IP address: IP address assigned to the client by the server <ul style="list-style-type: none"> This is only used in a server DHCP response.
siaddr	4 bytes	Server IP address: IP address of the server <ul style="list-style-type: none"> This is only used in a server DHCP response.
giaddr	4 bytes	Gateway IP address: This field enables the client to communicate with servers in other DHCP subnetworks. <ul style="list-style-type: none"> IP address "0.0.0.0" in a client request A DHCP relay agent enters its IP address here.
chaddr	4 bytes	Client hardware address: MAC address of the client
sname	4 bytes	Server host name: This field is optional and can contain the server name.
file	4 bytes	Boot filename: The client defines the full path for its boot file here.
options	Variable (1 to 4 bytes)	Options: This field contains additional information for the client. <ul style="list-style-type: none"> The specification of the DHCP message type, for example, is very important. Defined in full in RFC 2132

6.4 Initial switch-on

**Documentation for the standard device**

Observe the safety instructions and information on residual hazards.

**Note!****Activate changed settings**

To activate changed settings ...

- execute the device command "11: Save start parameters" via standard device code **C00002** and ...
- then reset the bus node or switch off and on again the voltage supply of the communication module.

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.

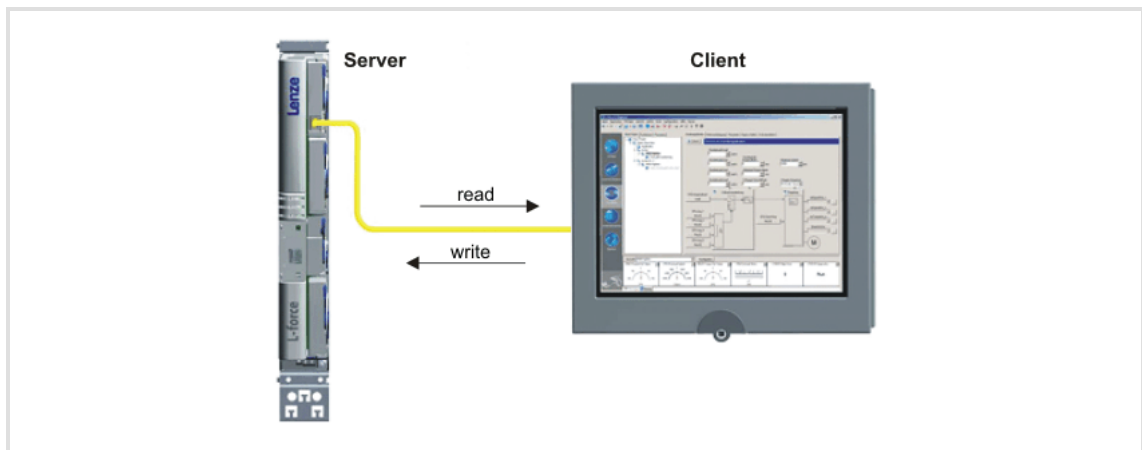
The restart behaviour of the controller can be set using **C00142** ("Auto-restart following mains connection"):

- **C00142 = "0: Inhibited"** (Lenze setting)
 - The drive remains inhibited (even if the fault is no longer active).
 - An explicit controller enable causes the drive to start up in a controlled manner: LOW-HIGH edge at digital input X5/RFR.
- **C00142 = "1: Enabled"**
 - An uncontrolled restart of the drive is possible.

7 Parameter data transfer

The PC (client) used for setting parameters and the controller (server) communicate with one another by exchanging data telegrams via the Ethernet. The parameter data are contained in the user data area of the data telegram.

- ▶ Parameters are set, for instance, when the system is initially adjusted during commissioning or when the material of the production machine is changed.
- ▶ The parameter data are transmitted as SDOs (Service Data Objects) and confirmed by the receiver, i.e. the transmitter receives a feedback whether the transmission was successful.
The SDOs provide for the write and read access to the object directory in the controller.
- ▶ The transmission of the parameter data usually is not time-critical.
- ▶ The parameter data are saved in Lenze devices as "codes".
Via the codes, for instance operating parameters, motor data or diagnostics information can be set.



[7-1] Data communication according to the client/server model



Note!

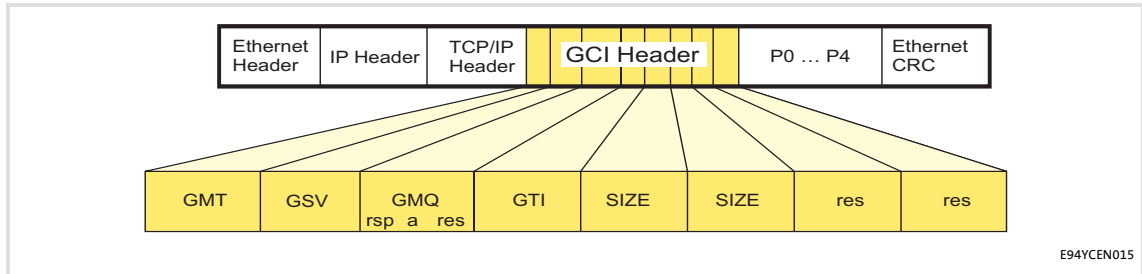
With regard to the writing access on parameter data, observe that the changes carried out are not stored automatically in the controller.

In order to save changed parameter settings with mains failure protection, carry out the device command **C0002 = "11: Save start parameters"**.

7.1 Structure of the Ethernet data telegram

The GCI protocol is used for communication.

The Ethernet data telegram is shown below. Here, the GCI header represents the part of the program that is independent of the type of command transmitted.



[7-2] Structure of the GCI header within the Ethernet frame

Field	Size	Description						
GMT	1 Byte	GCI message type						
		0x01 Reserved						
GSV	1 Byte	GCI service identification						
		0x82 Reading parameters						
		0x83 Writing parameters						
GMQ	1 Byte	GCI message qualifier						
		<table border="1"> <tr> <td>Bit 7</td> <td>Bit 6</td> <td>Bit 5 ... Bit 0</td> </tr> <tr> <td>rsp</td> <td>a</td> <td>res</td> </tr> </table>	Bit 7	Bit 6	Bit 5 ... Bit 0	rsp	a	res
		Bit 7	Bit 6	Bit 5 ... Bit 0				
		rsp	a	res				
rsp Request/response (1 bit) 0: request 1: response								
a Abort (1 bit) 0: data transmission ok 1: data transmission aborted								
GTI	1 Byte	GCI transaction ID						
		0x00 Serial number (transaction identification)						
		0xFF <ul style="list-style-type: none"> For each client a definite serial number (0 ... 255) is allocated. The serial number in the multitasking environment is used for referencing to the calling tasks (reverse transaction). 						
SIZE	2 bytes	User data length (P0, P1, P2, P3, P4)						
		0x14 20 bytes						
							
		0x114 276 bytes						
res	2 bytes	Reserved						
		0x0000 Data contents = 0						

E94AYCEN communication manual (Ethernet)

Parameter data transfer

Reading parameters from the controller

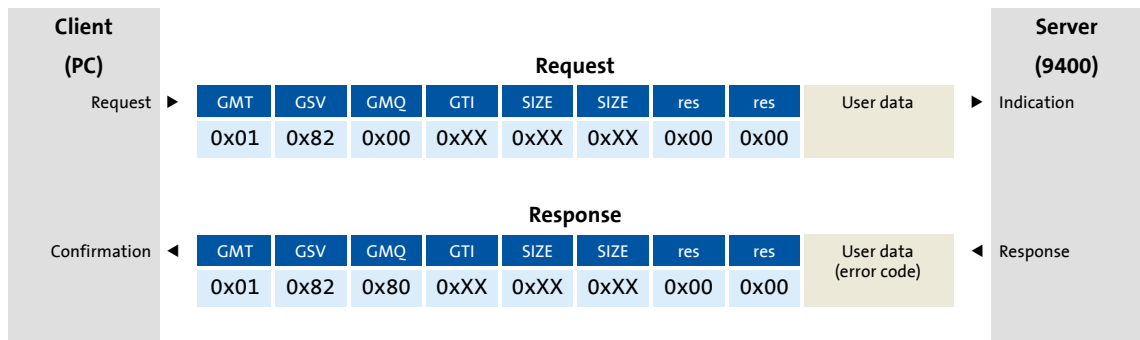


Tip!

The GCI header will be described in greater detail during the course of this manual. The other signals refer to the transfer characteristics of the Ethernet telegram, which are not described in this documentation.

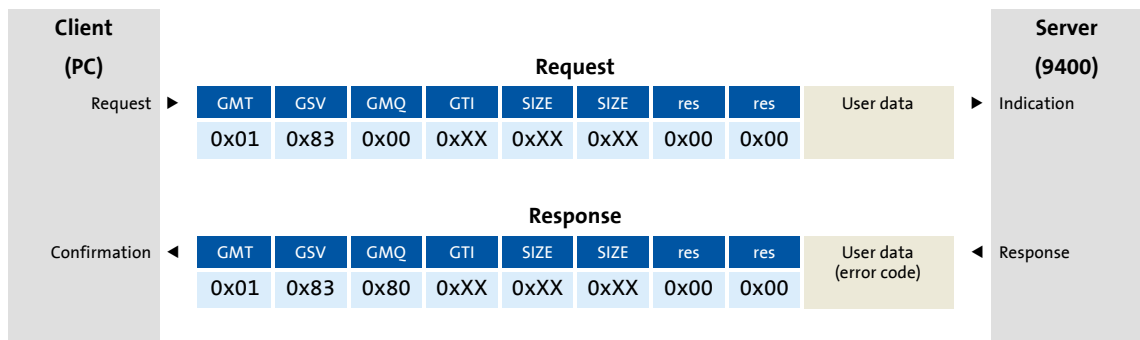
7.2 Reading parameters from the controller

With the service identification (GSV) = 0x82 in the GCI header parameter data can be read from the controller:



7.3 Writing parameters to the controller

With the service identification (GSV) = 0x83 in the GCI header parameter data can be written to the controller:



7.4 Assignment of user data areas P0 ... P4

Area	Byte 1	Byte 2	Byte 3	Byte 4
P0	Status/error code		Data type	Reserved
P1	Code		Reserved	Reserved
P2	Subcode		Reserved	Reserved*
P3	Parameter value			
P4	Parameter value			

* When the data type VISIBLE_STRING is transmitted, byte 4 contains the number of the characters attached.

Data type in P0 / byte 3

ID	Data type	Data length
0x01	INTEGER_8	1 byte
0x02	INTEGER_16	2 bytes
0x03	INTEGER_32	4 bytes
0x04	INTEGER_64	8 bytes
0x05	UNSIGNED_8	1 byte
0x06	UNSIGNED_16	2 bytes
0x07	UNSIGNED_32	4 bytes
0x08	UNSIGNED_64	8 bytes
0x09	FLOATING_POINT	4 bytes
0x0A	VISIBLE_STRING	256 bytes (max.)
0x0B	OCTET_STRING	256 bytes (max.)
0x0C	BITFIELD_8	1 byte
0x0D	BITFIELD_16	2 bytes
0x0E	BITFIELD_32	4 bytes
0x0F	FIXPOINT_16	2 bytes
0x10	FIXPOINT_32	4 bytes

Assignment of the User data area with parameter values of different data lengths

Depending on the data format, the parameter value occupies 1 to 8 bytes. Data are stored in little-endian format, i.e. first the low byte or low word, then the high byte or high word:

Data length	Data area P3				Data area P4			
	Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
1 byte	Value	00	00	00	00	00	00	00
2 bytes	Low byte	High byte	00	00	00	00	00	00
	Value							
4 bytes	Double word				00	00	00	00
	Low word		High word					
	Low byte	High byte	Low byte	High byte				
	Value							
8 bytes	Lower-order double word				Higher-order double word			
	Low word		High word		Low word		High word	
	Low byte	High byte	Low byte	High byte	Low byte	High byte	Low byte	High byte
	Value							

7.5 Transmission abort

The transmission is either aborted by the client or the server of a parameter data telegram. The message is aborted without confirmation. If the SDO client awaits the message to be confirmed, it will receive an abort message instead.

7.6 Error codes

The error code is located in the User data area P0, byte 1 and byte 2.

User data area P0			
Byte 1	Byte 2	Byte 3	Byte 4
Error code		Data type	Reserved
Example error code 0x9002			
Low byte	High byte		
0x02	0x90		



Note!

The other user data contents correspond to those of an error-free message.

Possible error codes

Error code	Definition		Description	
	dec	hex		
33803		0x840B	Invalid type	Invalid parameter type
33805		0x840D	FB not found	Function block not found
33812		0x8414	Invalid size	Invalid parameter format
33813		0x8415	Not in select list	Parameter is not in the selection list
33814		0x8416	Read not allowed	Parameter read is not allowed
33815		0x8417	Write not allowed	Parameter write is not allowed
33816		0x8418	CINH not set	Controller inhibit is not set
33817		0x8419	PLC not stopped	The PLC is not in the "Stopped" status
33828		0x8424	Invalid index	Invalid parameter index
33829		0x8425	Invalid subindex	Invalid parameter subindex
33837		0x842D	Access not allowed	Parameter access not allowed
33848		0x8438	Invalid length	Invalid parameter length
33862		0x8446	Unallowed characters	Parameter contains invalid characters
33865		0x8449	No array parameter	Parameter is no array parameter
33874		0x8452	Invalid select index	Invalid selection index
36866		0x9002	No memory available	No more memory available
36867		0x9003	No TID available	No transaction ID (TID) available anymore for identifying the telegram. TIDs are released again after receiving a reply with the corresponding TID.
36868		0x9004	Channel init error	General error when opening the communication channel
36869		0x9005	Error if not connected	No connection could be established.
36870		0x9006	Error of send function	Error when sending a GCI telegram
36871		0x9007	Error of receive function	Error when receiving a GCI telegram
36872		0x9008	Timeout error of msg wait function	No reply could be received to a request within the timeout.

E94AYCEN communication manual (Ethernet)

Parameter data transfer

Error codes

Error code		Definition	Description
dec	hex		
36873	0x9009	Wrong GMT received	The general telegram identification does not correspond to the GCI communication.
36874	0x900A	Unknown server request	Internal error in the GCI
36875	0x900B	Wrong server parameter	
36876	0x900C	Server queue is full	
36877	0x900D	SRV send error	
36878	0x900E	SRV timeout	
36879	0x900F	Wrong client parameter	
36880	0x9010	Wrong channel number	
36881	0x9011	TX conversion error	
36882	0x9012	RX conversion error	
36883	0x9013	Retry number abort	
36884	0x9014	Unknown client response	

7.7 Telegram examples

7.7.1 Example 1: Querying the heatsink temperature (read request)

The heatsink temperature of the controller is to be read.

- ▶ Code to be read: C00061
- ▶ Assumption: $\vartheta = 43^{\circ}\text{C}$

Request

- ▶ SDO command (GSV) = 0x82 = "Read parameter"
- ▶ GCI message qualifier (GMQ) = 0x00 = 00000000B = "Request"
- ▶ Transaction ID (GTI) here "0" (optional consecutive number 0 ... 255)
- ▶ Length of the user data (SIZE) = 0x0014 = 20 bytes

GCI header							
GMT	GSV	GMQ	GTI	SIZE	SIZE	res	res
0x01	0x82	0x00	0x00	0x14	0x00	0x00	0x00
Fixed	Reading parameters	Request	Transactions ID	Length of the user data = 20 bytes		Reserved	

User data area P0			
Byte 1	Byte 2	Byte 3	Byte 4
Reserved	Reserved	Data type	Reserved
0x00	0x00	0x00	0x00
		Optional for read request	

User data area P1				User data area P2			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Code		Reserved	Reserved	Subcode		Reserved	Reserved
0x3D	0x00	0x00	0x00	0x00	0x00	0x00	0x00
Code = 61 = 0x003D				Subcode = 0			

User data area P3				User data area P4			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Reserved				Reserved			
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00

E94AYCEN communication manual (Ethernet)

Parameter data transfer

Telegram examples

Response

GCI message qualifier (GMQ) = 0x80 = 10000000B = "Response"

GCI header							
GMT	GSV	GMQ	GTI	SIZE	SIZE	res	res
0x01	0x82	0x80	0x00	0x14	0x00	0x00	0x00
Fixed	Reading parameters	Response	Transactions ID	Length of the user data = 20 bytes		Reserved	

User data area P0			
Byte 1	Byte 2	Byte 3	Byte 4
Reserved	Reserved	Data type	Reserved
0x00	0x00	0x03	0x00
		INTEGER_32	

User data area P1				User data area P2			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Code		Reserved	Reserved	Subcode		Reserved	Reserved
0x3D	0x00	0x00	0x00	0x00	0x00	0x00	0x00
Code = 61 = 0x003D				Subcode = 0			

User data area P3				User data area P4			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Parameter value of data type INTEGER_32				Reserved			
0x00	0x00	0x00	0x2B	0x00	0x00	0x00	0x00
Read value = 0x0000002B = 43 [°C]							

7.7.2 Example 2: Querying the firmware product type (read request)

The firmware product type of the controller is to be read.

- ▶ Code to be read: C00200
- ▶ Assumption: product type = "E94AFH"

Request

- ▶ SDO command (GSV) = 0x82 = "Read parameter"
- ▶ GCI message qualifier (GMQ) = 0x00 = 00000000B = "Request"
- ▶ Transaction ID (GTI) here "1" (optional consecutive number 0 ... 255)
- ▶ Length of the user data (SIZE) = 0x0014 = 20 bytes

GCI header							
GMT	GSV	GMQ	GTI	SIZE	SIZE	res	res
0x01	0x82	0x00	0x01	0x14	0x00	0x00	0x00
Fixed	Reading parameters	Request	Transactions ID	Length of the user data = 20 bytes		Reserved	

User data area P0			
Byte 1	Byte 2	Byte 3	Byte 4
Reserved	Reserved	Data type	Reserved
0x00	0x00	0x00	0x00
		Optional for read request	

User data area P1				User data area P2			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Code		Reserved	Reserved	Subcode		Reserved	Reserved
0xC8	0x00	0x00	0x00	0x00	0x00	0x00	0x00
Code = 200 = 0x00C8				Subcode = 0			

User data area P3				User data area P4			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Reserved				Reserved			
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00

Response

GCI message qualifier (GMQ) = 0x80 = 10000000B = "Response"

GCI header							
GMT	GSV	GMQ	GTI	SIZE	SIZE	res	res
0x01	0x82	0x80	0x01	0x14	0x00	0x00	0x00
Fixed	Reading parameters	Response	Transactions ID	Length of the user data = 20 bytes		Reserved	

User data area P0			
Byte 1	Byte 2	Byte 3	Byte 4
Reserved	Reserved	Data type	Reserved
0x00	0x00	0x0A	0x00
		VISIBLE_STRING	

User data area P1				User data area P2			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Code		Reserved	Reserved	Subcode		Reserved	Character length
0xC8	0x00	0x00	0x00	0x00	0x00	0x00	0x07
Code = 200 = 0x00C8				Subcode = 0		Number of the characters attached	

User data area P3				User data area P4			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Reserved				Reserved			
0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00



Note!

The parameter value read ("E94AFH") of data type VISIBLE_STRING follows subsequent to the standard data area.

7.7.3 Example 3: Setting the deceleration time for quick stop (QSP) (write request)

The deceleration time for quick stop (QSP) is to be set to 50 ms in the controller.

- ▶ Code to be written: C00105

Request

- ▶ SDO command (GSV) = 0x83 = "Write parameter"
- ▶ GCI message qualifier (GMQ) = 0x00 = 00000000B = "Request"
- ▶ Transaction ID (GTI) here "42" (optional consecutive number 0 ... 255)
- ▶ Length of the user data (SIZE) = 0x0014 = 20 bytes

GCI header							
GMT	GSV	GMQ	GTI	SIZE	SIZE	res	res
0x01	0x83	0x00	0x2A	0x14	0x00	0x00	0x00
Fixed	Writing parameters	Request	Transactions ID	Length of the user data = 20 bytes		Reserved	

User data area P0			
Byte 1	Byte 2	Byte 3	Byte 4
Reserved	Data type	Reserved	Reserved
0x00	0x00	0x07	0x00
		UNSIGNED_32	

User data area P1				User data area P2			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Code		Reserved	Reserved	Subcode		Reserved	Reserved
0x69	0x00	0x00	0x00	0x00	0x00	0x00	0x00
Code = 105 = 0x0069				Subcode = 0			

User data area P3				User data area P4			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Parameter value of data type UNSIGNED_32				Reserved			
0x32	0x00	0x00	0x00	0x00	0x00	0x00	0x00
Value to be written = 0.05 [s] x 1000 (internal factor) = 50 = 0x32							

E94AYCEN communication manual (Ethernet)

Parameter data transfer

Telegram examples

Response

GCI message qualifier (GMQ) = 0x80 = 10000000B = "Response"

GCI header							
GMT	GSV	GMQ	GTI	SIZE	SIZE	res	res
0x01	0x83	0x80	0x2A	0x14	0x00	0x00	0x00
Fixed	Writing parameters	Response	Transactions ID	Length of the user data = 20 bytes		Reserved	

User data area P0			
Byte 1	Byte 2	Byte 3	Byte 4
Reserved	Data type	Reserved	Reserved
0x00	0x00	0x07	0x00
		UNSIGNED_32	

User data area P1				User data area P2			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Code		Reserved	Reserved	Subcode		Reserved	Reserved
0x69	0x00	0x00	0x00	0x00	0x00	0x00	0x00
Code = 105 = 0x0069				Subcode = 0			

User data area P3				User data area P4			
Byte 1	Byte 2	Byte 3	Byte 4	Byte 1	Byte 2	Byte 3	Byte 4
Parameter value of data type UNSIGNED_32				Reserved			
0x32	0x00	0x00	0x00	0x00	0x00	0x00	0x00
Written value (reflected)							

8 Diagnostics

The LEDs on the front of the Ethernet module are used to diagnose faults.

Furthermore, the »Engineer« indicates via codes [C13006](#) and [C14006](#) if an error has occurred during Ethernet communication or if a telegram has been lost.



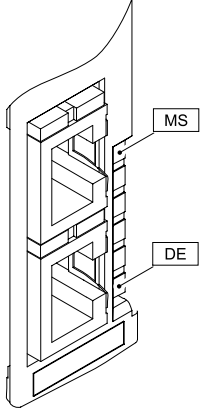
Note!

LED status displays for trouble-free operation:

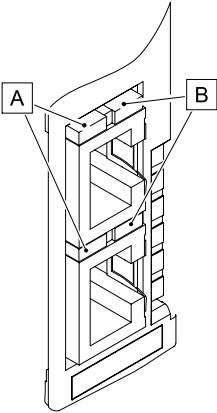
- The **MS** LED is constantly lit.
- At the RJ45 sockets **X215** and **X216**, the green LEDs are lit and the yellow LEDs are lit or flickering.

8.1 LED status displays

► MS and DE status displays

LEDs	Pos.	Colour	Status	Description
 <p style="text-align: center;">E94YCEN001B</p>	MS	Green	On	The communication module is supplied with voltage.
	DE	Red	On	The communication module is not accepted by the standard device. (See notes provided in the documentation for the standard device.)

► Status display at X215 and X216

LEDs	Pos.	Colour	Status	Description
 <p style="text-align: center;">E94YCEN001B</p>	A	Green	On	Ethernet connection has been established.
	B	Yellow	On/ Jittering	Data are being exchanged via Ethernet.

8.2 Error messages of the Servo Drive 9400

In the »Engineer«, the content of the fault memory can be displayed via the standard device code **C00168**.



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

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

9 Parameter reference

This chapter supplements the parameter list and the table of attributes in the software manual and in the »Engineer« online help for the Servo Drive 9400 by the parameters of the E94AYCEN communication module (Ethernet).



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

Here you will find general information on parameters.

9.1 Parameters of the standard device that are relevant to communication

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

C00615

Parameter Name:		Data type: UNSIGNED_32
C00615 Resp. to imp. device config.		Index: 23960 _d = 5D98 _h
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	0: No Response	Resp. to imp. module in MXI1
C00615/3	0: No Response	Resp. to imp. module in MXI2
C00615/4	0: No Response	Reserved
C00615/5	0: No Response	Reserved
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C00636

Parameter Name:		Data type: UNSIGNED_32
C00636 Resp. to new module in MXI1		Index: 23939 _d = 5D83 _h
Response if a new module has been plugged into module 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	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C00637

Parameter | Name:

C00637 | **Resp. to new module in MXI2**Data type: UNSIGNED_32
Index: 23939_d = 5D83_h

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
**Note!**

The standard device codes **C01501** and **C01502** have no effect when using the E94AYCEN (Ethernet) communication module.

E94AYCEN communication manual (Ethernet)

Parameter reference

Parameters of the communication module for slot MXI1

9.2 Parameters of the communication module for slot MXI1

This chapter lists, in ascending numerical order, the parameters of the E94AYCEN (Ethernet) communication module for slot MXI1 of the Servo Drive 9400.

C13000

Parameter Name: C13000 Ethernet: IP address		Data type: UNSIGNED_8 Index: 11575 _d = 2D37 _h
The IP address is required for addressing the Servo Drive 9400 if communication between the PC and the controller is to be established via an Ethernet connection.		
<ul style="list-style-type: none">• The IP address consists of four numbers from 0 to 255 which can be set in the four subcodes.• The first one, two, or three numbers indicate the network (Net-ID), the remaining numbers indicate the host (Host-ID). The definite specification of the part that is to be evaluated as Net-ID is effected in C13001 (Ethernet: Subnetwork mask).		
▶ IP address (📖 31)		
Setting range (min. value unit max. value)		
0		255
Subcodes	Lenze setting	Info
C13000/1	127	IP address <ul style="list-style-type: none">• Sequence: "[1].[2].[3].[4]"• Lenze setting: "127.0.0.1"
C13000/2	0	
C13000/3	0	
C13000/4	1	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C13001

Parameter Name: C13001 Ethernet: Subnetwork mask		Data type: UNSIGNED_8 Index: 11574 _d = 2D36 _h
The subnet mask indicates which part of the IP address is evaluated as Net- ID and which part as Host-ID.		
<ul style="list-style-type: none">• The subnet mask consists of four numbers from 0 to 255 which can be set in the four subcodes.		
▶ Subnet mask (📖 31)		
Setting range (min. value unit max. value)		
0		255
Subcodes	Lenze setting	Info
C13001/1	255	Subnet mask <ul style="list-style-type: none">• Sequence: "[1].[2].[3].[4]"• Lenze setting: "255.255.255.0" (The first three bytes of the IP address are the Net-ID.)
C13001/2	255	
C13001/3	255	
C13001/4	0	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C13002

Parameter Name: C13002 Ethernet gateway address		Data type: UNSIGNED_8 Index: 11573 _d = 2D35 _h
<p>The gateway address is required if the Servo Drive 9400 is not located in the same subnetwork as the PC.</p> <ul style="list-style-type: none"> The gateway address consists of four numbers from 0 to 255 which can be set in the four subcodes. <p>▶ Gateway address (📖 32)</p>		
Setting range (min. value unit max. value)		
0		255
Subcodes	Lenze setting	Info
C13002/1	127	Gateway address • Sequence: "[1].[2].[3].[4]" • Lenze setting: "127.0.0.1"
C13002/2	0	
C13002/3	0	
C13002/4	1	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C13003

Parameter Name: C13003 Ethernet: MAC-ID		Data type: UNSIGNED_8 Index: 11572 _d = 2D34 _h
<p>The MAC-ID is a globally unique identifier of an Ethernet-capable device. The MAC-ID is assigned by the manufacturer and permanently burnt into the device (Lenze communication module).</p> <ul style="list-style-type: none"> The MAC-ID consists of six numbers from 0 to 255 which are displayed in the six subcodes. <p>▶ MAC-ID (📖 32)</p>		
Display range (min. value unit max. value)		
0		255
Subcodes		Info
C13003/1		MAC-ID • Sequence: "[1]-[2]-[3]-[4]-[5]-[6]"
C13003/2		
C13003/3		
C13003/4		
C13003/5		
C13003/6		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

E94AYCEN communication manual (Ethernet)

Parameter reference

Parameters of the communication module for slot MXI1

C13004

Parameter | Name: **C13004 | Resolved IP-Adress** Data type: UNSIGNED_8
Index: 11571_d = 2D33_h

The IP address is required for addressing the Servo Drive 9400 if communication between the PC and the controller is to be established via an Ethernet connection.

- The IP address consists of four numbers from 0 to 255 which can be set in the four subcodes.
- The first one, two, or three numbers indicate the network (Net-ID), the remaining numbers indicate the host (Host-ID). The definite specification of the part that is to be evaluated as Net-ID is effected in [C13001](#) (Ethernet: Subnetwork mask).

▶ [IP address](#) (🔗 31)

Display range (min. value unit max. value)	
0	255
Subcodes	Info
C13004/1	IP address <ul style="list-style-type: none">• Sequence: "[1].[2].[3].[4]"
C13004/2	
C13004/3	
C13004/4	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer	

C13005

Parameter | Name: **C13005 | Use of DHCP** Data type: UNSIGNED_8
Index: 11570_d = 2D32_h

This code is available for Servo Drives 9400 of version **V03.00.00.00** or higher.

You use this code to define whether DHCP is to be used or not.

▶ [DHCP implementation in the Servo Drive 9400](#) (🔗 34)

Selection list (Lenze setting printed in bold)	
0	Do not use DHCP
1	Use DHCP
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer	

C13006

Parameter | Name: **C13006 | Ethernet node state** Data type: UNSIGNED_8
Index: 11569_d = 2D31_h

Indicates if an error has occurred or a telegram has been lost during Ethernet communication.

Selection list (read only)	
0	No error
1	Error, frame lost
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer	

C13007

Parameter Name: C13007 Resolved Subnetmask		Data type: UNSIGNED_8 Index: 11568 _d = 2D30 _h
<p>The subnet mask indicates which part of the IP address is evaluated as Net-ID and which part as Host-ID.</p> <ul style="list-style-type: none"> The subnet mask consists of four numbers from 0 to 255 which can be set in the four subcodes. <p>▶ Subnet mask (📖 31)</p>		
Display range (min. value unit max. value)		
0		255
Subcodes		Info
C13007/1		Subnet mask • Sequence: "[1].[2].[3].[4]"
C13007/2		
C13007/3		
C13007/4		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C13008

Parameter Name: C13008 Resolved Gateway-Address		Data type: UNSIGNED_8 Index: 11567 _d = 2D2F _h
<p>The gateway address is required if the Servo Drive 9400 is not located in the same subnetwork as the PC.</p> <ul style="list-style-type: none"> The gateway address consists of four numbers from 0 to 255 which can be set in the four subcodes. <p>▶ Gateway address (📖 32)</p>		
Display range (min. value unit max. value)		
0		255
Subcodes		Info
C13008/1		Gateway address • Sequence: "[1].[2].[3].[4]"
C13008/2		
C13008/3		
C13008/4		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

E94AYCEN communication manual (Ethernet)

Parameter reference

Parameters of the communication module for slot MXI2

9.3 Parameters of the communication module for slot MXI2

This chapter lists, in ascending numerical order, the parameters of the E94AYCEN (Ethernet) communication module for slot MXI2 of the Servo Drive 9400.

C14000

Parameter Name: C14000 Ethernet: IP address		Data type: UNSIGNED_8 Index: 10575 _d = 294F _h
The IP address is required for addressing the Servo Drive 9400 if communication between the PC and the controller is to be established via an Ethernet connection.		
<ul style="list-style-type: none">• The IP address consists of four numbers from 0 to 255 which can be set in the four subcodes.• The first one, two, or three numbers indicate the network (Net-ID), the remaining numbers indicate the host (Host-ID). The definite specification of the part that is to be evaluated as Net-ID is effected in C14001 (Ethernet: Subnetwork mask).		
▶ IP address (📖 31)		
Setting range (min. value unit max. value)		
0		255
Subcodes	Lenze setting	Info
C14000/1	127	IP address <ul style="list-style-type: none">• Sequence: "[1].[2].[3].[4]"• Lenze setting: "127.0.0.1"
C14000/2	0	
C14000/3	0	
C14000/4	1	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C14001

Parameter Name: C14001 Ethernet: Subnetwork mask		Data type: UNSIGNED_8 Index: 10574 _d = 294E _h
The subnet mask indicates which part of the IP address is evaluated as Net-ID and which part as Host-ID.		
<ul style="list-style-type: none">• The subnet mask consists of four numbers from 0 to 255 which can be set in the four subcodes.		
▶ Subnet mask (📖 31)		
Setting range (min. value unit max. value)		
0		255
Subcodes	Lenze setting	Info
C14001/1	255	Subnet mask <ul style="list-style-type: none">• Sequence: "[1].[2].[3].[4]"• Lenze setting: "255.255.255.0" (The first three bytes of the IP address are the Net-ID.)
C14001/2	255	
C14001/3	255	
C14001/4	0	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C14002

Parameter Name: C14002 Ethernet gateway address		Data type: UNSIGNED_8 Index: 10573 _d = 294D _h
<p>The gateway address is required if the Servo Drive 9400 is not located in the same subnetwork as the PC.</p> <ul style="list-style-type: none"> The gateway address consists of four numbers from 0 to 255 which can be set in the four subcodes. <p>▶ Gateway address (📖 32)</p>		
Setting range (min. value unit max. value)		
0		255
Subcodes	Lenze setting	Info
C14002/1	127	Gateway address • Sequence: "[1].[2].[3].[4]" • Lenze setting: "127.0.0.1"
C14002/2	0	
C14002/3	0	
C14002/4	1	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C14003

Parameter Name: C14003 Ethernet: MAC-ID		Data type: UNSIGNED_8 Index: 10572 _d = 294C _h
<p>The MAC-ID is a globally unique identifier of an Ethernet-capable device. The MAC-ID is assigned by the manufacturer and permanently burnt into the device (Lenze communication module).</p> <ul style="list-style-type: none"> The MAC-ID consists of six numbers from 0 to 255 which are displayed in the six subcodes. <p>▶ MAC-ID (📖 32)</p>		
Display range (min. value unit max. value)		
0		255
Subcodes		Info
C14003/1		MAC-ID • Sequence: "[1]-[2]-[3]-[4]-[5]-[6]"
C14003/2		
C14003/3		
C14003/4		
C14003/5		
C14003/6		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

E94AYCEN communication manual (Ethernet)

Parameter reference

Parameters of the communication module for slot MX12

C14004

Parameter Name:	C14004 Resolved IP-Adress	Data type: UNSIGNED_8 Index: 10571 _d = 294B _h
<p>The IP address is required for addressing the Servo Drive 9400 if communication between the PC and the controller is to be established via an Ethernet connection.</p> <ul style="list-style-type: none">• The IP address consists of four numbers from 0 to 255 which can be set in the four subcodes.• The first one, two, or three numbers indicate the network (Net-ID), the remaining numbers indicate the host (Host-ID). The definite specification of the part that is to be evaluated as Net-ID is effected in C14001 (Ethernet: Subnetwork mask). <p>▶ IP address (🔗 31)</p>		
Display range (min. value unit max. value)		
0 255		
Subcodes		Info
C14004/1		IP address • Sequence: "[1].[2].[3].[4]"
C14004/2		
C14004/3		
C14004/4		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C14005

Parameter Name:	C14005 Use of DHCP	Data type: UNSIGNED_8 Index: 10570 _d = 294A _h
<p>This code is available for Servo Drives 9400 of version V03.00.00.00 or higher. You use this code to define whether DHCP is to be used or not.</p> <p>▶ DHCP implementation in the Servo Drive 9400 (🔗 34)</p>		
Selection list (Lenze setting printed in bold)		
0	Do not use DHCP	
1	Use DHCP	
<input checked="" type="checkbox"/> Read access <input checked="" type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C14006

Parameter Name:	C14006 Ethernet node state	Data type: UNSIGNED_8 Index: 10569 _d = 2949 _h
<p>Indicates if an error has occurred or a telegram has been lost during Ethernet communication.</p>		
Selection list (read only)		
0	No error	
1	Error, frame lost	
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C14007

Parameter Name: C14007 Resolved Subnetmask		Data type: UNSIGNED_8 Index: 10568 _d = 2948 _h
<p>The subnet mask indicates which part of the IP address is evaluated as Net-ID and which part as Host-ID.</p> <ul style="list-style-type: none"> The subnet mask consists of four numbers from 0 to 255 which can be set in the four subcodes. <p>▶ Subnet mask (📖 31)</p>		
Display range (min. value unit max. value)		
0		255
Subcodes	Info	
C14007/1	Subnet mask • Sequence: "[1].[2].[3].[4]"	
C14007/2		
C14007/3		
C14007/4		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

C14008

Parameter Name: C14008 Resolved Gateway-Address		Data type: UNSIGNED_8 Index: 10567 _d = 2947 _h
<p>The gateway address is required if the Servo Drive 9400 is not located in the same subnetwork as the PC.</p> <ul style="list-style-type: none"> The gateway address consists of four numbers from 0 to 255 which can be set in the four subcodes. <p>▶ Gateway address (📖 32)</p>		
Display range (min. value unit max. value)		
0		255
Subcodes	Info	
C14008/1	Gateway address • Sequence: "[1].[2].[3].[4]"	
C14008/2		
C14008/3		
C14008/4		
<input checked="" type="checkbox"/> Read access <input type="checkbox"/> Write access <input type="checkbox"/> CINH <input type="checkbox"/> PLC STOP <input type="checkbox"/> No transfer		

9.4 Table of attributes

The table of attributes contains information required for communicating with the drive 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	Only required for access via a bus system.	
	hex		5FFF _h - Lenze code number		
Data	DS	Data structure	E	Single variable (only one parameter element)	
			A	Array variable (several parameter elements)	
	DA	Number of array elements (subcodes)	Number		
	DT	Data type	BITFIELD_8	1 byte, bit-coded	
			BITFIELD_16	2 bytes, bit-coded	
			BITFIELD_32	4 bytes, bit-coded	
			INTEGER_8	1 byte, with sign	
			INTEGER_16	2 bytes with sign	
			INTEGER_32	4 bytes, with sign	
			UNSIGNED_8	1 byte, without sign	
			UNSIGNED_16	2 bytes without sign	
			UNSIGNED_32	4 bytes, without sign	
			VISIBLE_STRING	ASCII string	
OCTET_STRING					
Factor	Factor for data transmission via a bus system, depending on the number of decimal positions	Factor	1 = no decimal positions 10 = 1 decimal position 100 = 2 decimal positions 1000 = 3 decimal positions		
Access	R	Read access	<input checked="" type="checkbox"/> Reading permitted		
	W	Write access	<input checked="" type="checkbox"/> Writing permitted		
	CINH	Controller inhibit (CINH) required	<input checked="" type="checkbox"/> Writing is only possible when the controller is inhibited (CINH)		

Table of attributes

Code	Name	Index		Data				Access		
		dec	hex	DS	DA	DT	Factor	R	W	CINH
C13000	Ethernet: IP address	11575	2D37	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C13001	Ethernet: Subnetwork mask	11574	2D36	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C13002	Ethernet gateway address	11573	2D35	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C13003	Ethernet: MAC-ID	11572	2D34	A	6	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C13004	Resolved IP-Adress	11571	2D33	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C13005	Use of DHCP	11570	2D32	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C13006	Ethernet node state	11569	2D31	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C13007	Resolved Subnetmask	11568	2D30	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C13008	Resolved Gateway-Address	11567	2D2F	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C14000	Ethernet: IP address	10575	294F	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C14001	Ethernet: Subnetwork mask	10574	294E	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C14002	Ethernet gateway address	10573	294D	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C14003	Ethernet: MAC-ID	10572	294C	A	6	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C14004	Resolved IP-Adress	10571	294B	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C14005	Use of DHCP	10570	294A	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C14006	Ethernet node state	10569	2949	E	1	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C14007	Resolved Subnetmask	10568	2948	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		
C14008	Resolved Gateway-Address	10567	2947	A	4	UNSIGNED_8	1	<input checked="" type="checkbox"/>		

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