Controller-based Automation

Controller

Parameter setting and programming _____

Reference Manual EN

Lenze

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1 About this documentation

This documentation ...

- contains general information on how to parameterise, configure and diagnose the Lenze Controllers.
- is part of the "Controller-based Automation" manual collection. It consists of the following sets of documentation:

Documentation type	Subject
Product catalogue	Controller-based Automation (system overview, sample topologies) Lenze Controller (product information, technical data)
System manuals	Visualisation (system overview/sample topologies)
Communication manuals **Online helps**	Bus systems • Controller-based Automation EtherCAT® • Controller-based Automation CANopen® • Controller-based Automation PROFIBUS® • Controller-based Automation PROFINET®
Reference manuals **Online helps**	Lenze Controllers: • Controller 3200 C • Controller c300 • Controller p300 • Controller p500
software manuals **Online helps**	Lenze Engineering Tools: • »PLC Designer« (programming) • »Engineer« (parameter setting, configuration, diagnostics) • »VisiWinNET® Smart« (visualisation) • »Backup & Restore« (data backup, recovery, update)

More technical documentation for Lenze components

Further information on Lenze products which can be used in conjunction with Controller-based Automation can be found in the following sets of documentation:

	Design / configuration / technical data
☐	**Product catalogues** • Controller-based Automation • Controllers • Inverter Drives/Servo Drives
	Installation and wiring
🕮	**Mounting instructions** • Controllers • Communication cards (MC-xxx) • I/O system 1000 (EPM-Sxxx) • Inverter Drives/Servo Drives • Communication modules
☐	**Hardware manuals** • Inverter Drives/Servo Drives
	Parameterisation / configuration / commissioning
☐	**Online help/reference manuals** • Controllers • Inverter Drives/Servo Drives • I/O system 1000 (EPM-Sxxx)
☐	**Online help/communication manuals** • Bus systems • Communication modules
	Sample applications and templates
☐	**Online help / software manuals and reference manuals** • i700 application sample • Application Samples 8400/9400 • FAST application template • FAST technology modules

Symbols:

🕮 Printed documentation
☐ PDF file / online help in the Lenze engineering tool

Tip!

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

www.lenze.com

Target group

This documentation is intended for persons who commission and maintain a Controller-based automation system by means of a Lenze Controller and the »PLC Designer« engineering tool.

Screenshots/application examples

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

Information regarding the validity

The information provided in this documentation is valid for the following Lenze Controllers:

Controllers	Versions
Cabinet Controller	
 **Example:** Controller 3241 C with connected I/O system 1000	• Controller 3221 C • Controller 3231 C • Controller 3241 C • Controller 3251 C
 **Example:** Controller c300 with connected I/O system 1000	• Controller c300
Panel Controller/HMI	
 **Example:** Controller p500	• Controller p300 • Controller p500

1.1 Document history

Version			Description
4.0	11/2020	TD06	• Status LEDs of the Controllers (📖 92) corrected: Test mode (insufficient application credits). • Chapter Parameter reference (📖 143) extended: • C0189 ... C0195, C0619 / C0620, C0660 / C0661 • Functionality for activating the field device firmware update extended (C0640).
3.2	05/2017	TD17	• Error messages (backplane bus) (📖 52) updated. • Corrected: maximum electronic supply 650 mA for the Controller c300 ▸ Limits on the backplane bus (📖 47)
3.1	11/2016	TD17	Update for the Lenze automation system "Controller-based Automation" 3.14 • Neu: PROFINET option for Controller c300 and p300 • New: Chapter Limits on the backplane bus (📖 47) • New: Chapter Script commands in PreStart.txt/PostStart.txt (📖 108) • General corrections
3.0	04/2016	TD17	Update for the Lenze automation system "Controller-based Automation" 3.13 • New: Controller 3251 C • New: EtherNet/IP™ for Controllers 3200 C and p500 • General corrections
2.0	10/2015	TD17	Update for the Lenze automation system "Controller-based Automation" 3.11 • General corrections • Chapter Safety instructions (📖 13) extended • Chapter RTC function (Real Time Clock) (📖 83) new • Chapter Parameter reference (📖 142) extended
1.7	05/2015	TD17	Update for the "Controller-based Automation" 3.10 Lenze automation system • General corrections • Chapter Lenze FAST application software (📖 30) • Chapter "Visualisation" application software (📖 31)
1.6	01/2015	TD17	Update for the Lenze automation system "Controller-based Automation" 3.9 • Controller p300: C0427 • Chapter »Backup & Restore« (data backup/restore) (📖 77) • Chapter »EASY Starter - Application Loader« (data transfer) (📖 78) • Chapter Visualisation with »VisiWinNET®« (📖 111)
1.5	04/2014	TD17	Update for the "Controller-based Automation" 3.8 Lenze automation system • Controller c300/p300
1.4	11/2012	TD11	Update for the Lenze automation system "Controller-based Automation" 3.6 • Controller c300/p300 added (in preparation)
1.3	05/2012	TD11	Update for the Lenze automation system "Controller-based Automation" 3.3 • Amended by Controllers p500 (panel controllers)
1.2	12/2011	TD11	Update for the Lenze automation system "Controller-based Automation" 3.2
1.1	04/2011	TD11	Update for the "Controller-based Automation" 3.1 Lenze automation system
1.0	10/2010	TD11	First edition on the Lenze automation system "Controller-based Automation" 3.x

1.2 Conventions used

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

Type of information	Highlighting	Examples/notes
Spelling of numbers		
Decimal separator	Point	The decimal point is always used. For example: 1234.56
Text		
Program name	» «	»PLC Designer«...
Window	*italics*	The *message window*... / The *Options* dialog box ...
Variable names		Setting *bEnable* to TRUE...
Control element	**bold**	The **OK** button... / The **Copy** command... / The **Properties** tab... / The **Name** input field...
Sequence of menu commands		If several commands must be used in sequence to carry out a function, the individual commands are separated by an arrow. Select **File→Open** to...
Shortcut	**<bold>**	Use **<F1>** to open the online help.
		If a key combination is required for a command, a "+" is placed between the key identifiers: With **<Shift>+<ESC>**...
Hyperlink	underlined	Reference to further information: Hyperlink to further information.
Icons		
Page reference	(📖 10)	Reference to further information: Page number in PDF file.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

1.3 Terminology used

Term	Meaning
Controllers	The Controller is the central component of the Lenze automation system which control the motion sequences by means of the application software. The Controller communicates with the field devices (inverters) via the fieldbus.
Engineering PC	The Engineering PC and the Engineering tools installed serve to configure and parameterise the system "Controller-based Automation". The Engineering PC communicates with the controller via Ethernet.
Engineering tools	Software solutions for easy engineering in all phases which serve to commission, configure, parameterise and diagnose the Lenze automation system. ▸ Engineering tools (📖 27)
FAST	Lenze FAST application software (📖 30)
Fieldbus node	Devices integrated in the bus system as, for instance, Controller and inverter
Field device	
Inverters	Generic term for Lenze frequency inverters, servo inverters
PLC	Programmable Logic Controller (German designation: SPS - Speicherprogrammierbare Steuerung)
RTC	RTC function (Real Time Clock)
UPS	Uninterruptible power system (UPS)
Bus systems	
CAN	CAN (Controller Area Network) is an asynchronous, serial fieldbus system.
CANopen	CANopen® is a communication protocol based on CAN. The Lenze system bus (CAN on board) operates with a subset of this communication protocol. CANopen® is a registered community trademark of the CAN user organisation CiA® (CAN in Automation e. V.).
EtherCAT	EtherCAT® (**Ether**net for **C**ontroller and **A**utomation **T**echnology) is an Ethernet-based fieldbus system which fulfils the application profile for industrial real-time systems. EtherCAT® is a registered trademark and patented technology, licenced by Beckhoff Automation GmbH, Germany.
ETHERNET	Ethernet specifies the software (protocols) and hardware (cables, plugs, etc.) for wired data networks. In the form of "Industrial Ethernet", the Ethernet standard is used in industrial production systems. On the basis of IEEE 802.3, standard Ethernet is specified by the Institute of Electrical and Electronics Engineers (IEEE), USA.
EtherNet/IP	EtherNet/IP™ (EtherNet Industrial Protocol) is an Ethernet-based fieldbus system that uses Common Industrial Protocol™ (CIP™) to exchange data. EtherNet/IP™ and Common Industrial Protocol™ (CIP™) are brand labels and patented technologies, licensed by the ODVA user organisation (Open DeviceNet Vendor Association), USA.
PROFIBUS	PROFIBUS® (Process Field Bus) is a widely used fieldbus system for the automation of machines and production lines. PROFIBUS® is a registered trademark and patented technology licensed by the PROFIBUS & PROFINET International (PI) user organisation.
PROFINET	PROFINET® (Process Field Network) is a real-time capable fieldbus system based on Ethernet. PROFINET® is a registered trademark and patented technology licensed by the PROFIBUS & PROFINET International user organisation (PI).

1.4 Definition of the notes used

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

Safety instructions

Layout of the safety instructions:

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	**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

Please observe the safety instructions in this documentation when you want to commission an automation system or a plant with a Lenze Controller.

The device documentation contains safety instructions which must be observed!

Read the documentation supplied with the components of the automation system carefully before you start commissioning the Controller and the connected devices.

In particular, please observe the Product-specific safety instructions (📖 19) in this documentation!

Danger!

High electrical voltage

Injury to persons caused by dangerous electrical voltage

Possible consequences

Death or severe injuries

Protective measures

Switch off the voltage supply before working on the components of the automation system.

After switching off the voltage supply, do not touch live device parts and power terminals immediately because capacitors may be charged.

Observe the corresponding information plates on the device.

Danger!

Injury to persons

Risk of injury is caused by ...

- unpredictable motor movements (e.g. unintended direction of rotation, too high velocities or jerky movement);
- impermissible operating states during the parameterisation while there is an active online connection to the device.

Possible consequences

Death or severe injuries

Protective measures

- If required, provide systems with installed inverters with additional monitoring and protective devices according to the safety regulations valid in each case (e.g. law on technical equipment, regulations for the prevention of accidents).
- During commissioning, maintain an adequate safety distance to the motor or the machine parts driven by the motor.

Stop!

Damage or destruction of machine parts

Damage or destruction of machine parts can be caused by ...

- Short circuit or static discharges (ESD);
- unpredictable motor movements (e.g. unintended direction of rotation, too high velocities or jerky movement);
- impermissible operating states during the parameterisation while there is an active online connection to the device.

Protective measures

- Always switch off the voltage supply before working on the components of the automation system.
- Do not touch electronic components and contacts unless ESD measures were taken beforehand.
- If required, provide systems with installed inverters with additional monitoring and protective devices according to the safety regulations valid in each case (e.g. law on technical equipment, regulations for the prevention of accidents).

2.1 General safety instructions

Stop!

Controller c300 and p300

Depending on the system, sporadic cycle time extensions beyond the set cycle time or jitters may occur.

Especially the use of the »EASY Starter«, »Engineer«, »WebConfig« engineering tools, and an online change or data access may cause such an extension of the cycle time and must only be carried out in a machine-safe state.

Scope

The following general safety instructions apply to the Lenze drive and automation components.

In particular, please observe the Product-specific safety instructions (📖 19) in this documentation!

Also for your own safety

Danger!

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

- Lenze drive and automation components ...
  ... must only be used as directed;
  ... must never be commissioned if they display signs of damage;
  ... must never be technically modified;
  ... must never be commissioned if they are not fully mounted;
  ... must never be operated without the required covers;
  ... can have live, moving and rotating parts during and after operation, depending on their degree of protection. Surfaces can be hot.
- Lenze drive and automation 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 condition for safe and troublefree operation and the achievement of the specified product features.
  The specifications, processes, and circuitry described in this document are for guidance only and must be adapted to your own specific application. Lenze does not take responsibility for the suitability of the process and circuit proposals.

- Only qualified personnel may work with and on Lenze drive and automation components.
  According to IEC 60364 or CENELEC HD 384 these are persons who ...
  ... are familiar with installing, mounting, commissioning, and operating the device;
  ... have the corresponding qualifications for their work;
  ... know and can apply all regulations for the prevention of accidents, directives, and laws applicable on site.

Transport, storage

Transport and storage of the Lenze drive and automation components in a dry, low-vibration environment without aggressive atmosphere, preferably in the packaging provided by the manufacturer. If required, use carrying aids for transport.

- Protect devices against dust and impacts.
- Observe climatic conditions according to the "Operating conditions" section in the "Technical data" chapter of the product catalogue.
- Printed-circuit boards, such as communication cards (MC-Cards), ...
  ... may only be transported and stored in ESD packaging;
  ... may only be touched at contact-free positions;
  ... may only be positioned on suitable underlays (e.g. on ESD packaging or conductive foamed material).

Mechanical installation

- Install the Lenze drive and automation components according to the instructions given in the corresponding documentation.
  Select the mounting location so that the "Operating conditions" in the "Technical data" chapter of the product catalogue are guaranteed.
- In the installation space, continuous and sufficient air circulation is absolutely required to dissipate the heat of the device. The ventilation slots must not be covered.
- Provide for careful handling and avoid mechanical overload. During handling neither bend components, nor change the insulation distances.
- The devices contain electrostatic sensitive devices that can be easily damaged by short circuit or static discharge (ESD). Thus, only touch electronic components and contacts if ESD measures were taken before.
- The fixing rail and the mounting plate in the control cabinet have to be conductive and free of lacquer. The mechanical connections have to be ensured.

Electrical installation

- The electrical installation must be carried out according to the appropriate regulations (e.g. cable cross-sections, fuses, PE connection).

  Additional information can be obtained from the documentation.
- When working on live components, applicable national regulations (e.g. BGV 3) must be observed.
- The documentation includes notes about wiring according to EMC regulations (shielding, earthing, filters and cable routing). The compliance with limit values required in conjunction with the EMC legislation is the responsibility of the manufacturer of the machine or system.

  Warning: The Lenze drive and automation components can be used in industrial environments according to EN 61000-6-4. These devices can cause radio interferences in residential areas. In this case, protective measures may be required.

  ▸ Notes on wiring according to EMC (📖 22)
- If specified in the technical data, the components must be installed in housings (e.g. control cabinets) to meet the limit values for radio interferences valid at the site of installation. The housings must enable an EMC-compliant installation. Observe in particular that e.g. the control cabinet doors should have a circumferential metal connection to the housing.

  Reduce housing openings and cutouts to a minimum.
- All pluggable connection terminals must only be connected or disconnected when no voltage is applied.

Commissioning

If required, provide systems with additional monitoring and protective devices according to the safety regulations (e.g. law on technical equipment, regulations for the prevention of accidents).

Maintenance and servicing

- The Lenze drive and automation components are maintenance-free. Nonetheless, you have to carry out a visual inspection at regular and sufficiently short intervals considering the ambient conditions.

  Check the following:
  - Does the environment still meet the operating conditions specified in the "Technical data" chapter of the product catalogue?
  - Is the heat dissipation impeded by dust or dirt?
  - Are the mechanical and electrical connections still okay?
- If the ambient air is polluted, the cooling surfaces may become dirty or the air vents may be obstructed. Therefore, clean the cooling surfaces and air vents periodically under these operating conditions. Do not use sharp or pointed tools for this purpose!
- Heatsinks get very hot during operation.

  Before working on the devices, check the heatsink temperature.

  Flammable material or substances must not be placed near the heatsink or get to it.
- After disconnecting the system from the supply voltage, do not touch live device parts and power terminals immediately because capacitors may be charged.

  Observe the corresponding information plates on the device.

Cleaning

- Deenergise the complete system before cleaning.
- Heatsinks get very hot during operation.
  Before working on the devices, check the heatsink temperature.
- The Lenze drive and automation components can be damaged if they are not appropriately cleaned.
  Housings will get scratched or dull if cleaning agents containing alcohol, solvents or abrasives are used.
  Electrical components will be damaged if humidity enters in the housing.
- Wipe the housing using a clean, lintfree, soft cloth.
- For stubborn dirt, only use water and an ordinary household cleaning agent or a detergent declared especially for flat screens.
  Do not spray the detergent directly on the device. Moisten the cloth only slightly with the detergent.

Disposal

Recycle or dispose of the Lenze drive and automation components according to the applicable regulations.

2.2 Product-specific safety instructions

2.2.1 Controller c300 and p300

Stop!

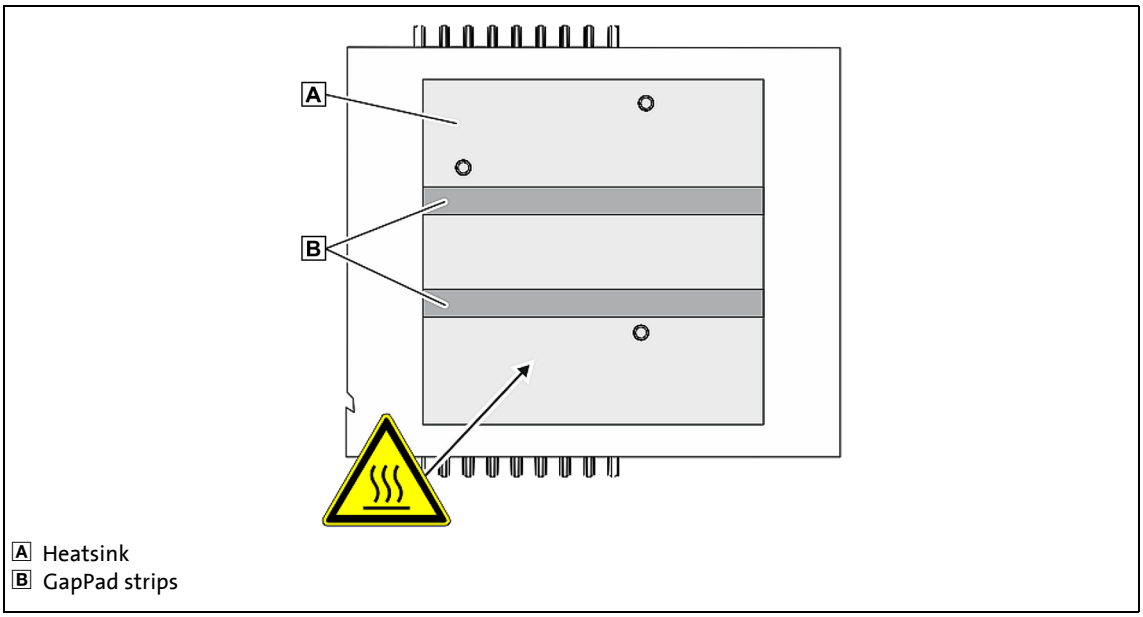
Depending on the system, sporadic cycle time extensions beyond the set cycle time or jitters may occur.

Especially the use of the »EASY Starter«, »Engineer«, »WebConfig« engineering tools, and an online change or data access may cause such an extension of the cycle time and must only be carried out in a machine-safe state.

2.2.2 Panel Controller/HMI p300 and p500

- When selecting the installation site, be sure to observe an ergonomic position of the screen and pay regard to the incidence of light, which may cause reflections on the screen.
  Protect the device from direct sunlight since the housing may heat up strongly.
- During installation, there is a danger that the controller will fall out of the mounting cutout. You should therefore secure it to prevent this happening until all screw clamps have been fitted.
- During mounting, the gasket of the front frame is exposed and can be damaged.
  Check the gasket to make sure it is undamaged before you install the device.
  Handle the gasket with care during mounting.
  Protect the gasket from UV radiation.
- The device must be securely seated in the mounting cutout and the front panel seal must be correctly fitted. Otherwise, class of protection IP65 will not be achieved on the front side of the device! (IP rating is not UL-approved.)
- A touchscreen does not comply with the Ergonomics Directive ZH 1/618. This is why it is only designed for shorttime inputs and control functions. For longer inputs, connect an external keyboard.

2.2.3 Heatsink and GapPad strips for Controller 3200 C



[2-1] Heatsink and GapPad strips on the rear side of the Controller 3200 C

- The heatsink on the rear side of the Controller gets very hot during operation.
  Before working on the device, check the heatsink temperature.
  Flammable material or substances must not be placed near the heatsink or get to it.
- On the rear side of the Controller, there are two GapPad strips. These strips serve to thermally connect the device to the DIN rail. If the strips are defective, they must be replaced.
  Mounting of the device on the DIN rail is limited to 20 plug cycles. Afterwards, you have to exchange the GapPad strips (Lenze order number: EPCZMEG).

2.2.4 I/O system 1000

- Attach and detach Controllers and modules of the I/O system 1000 only when the supply voltage is switched off. Otherwise, they could be damaged by short circuits.
- Always arrange the modules from left to right starting with the Controller directly followed by a power supply module EMPS701 on the right side.
- The module must always be installed directly next to each other. Free slots between the modules are not permissible because otherwise the backplane bus would be interrupted.
- The side contacts of the last module always must be covered with the supplied contact cover. Otherwise, the modules may be damaged by short circuit or static discharge.
- In connection with the EPM-S130 bus coupler module (EtherCAT), only EPM-Sxxx I/O compound modules from hardware version 1B onwards are supported.

2.2.5 Voltage supply (24 V DC) of the Controllers

- The voltage input is not fused internally. The Controller can be destroyed when the input voltage is too high.
  Observe the maximum possible input voltage.
  Professionally fuse the device on the input side against voltage fluctuations and voltage peaks.
- The Controller starts as soon as the supply voltage is applied. After the operating system has been shut down, the controller switches off automatically. For restarting, the supply voltage has to be disconnected for a short time.
- In the event of an error, the device must be switched to a deenergised state immediately. For this, disconnect the supply connector and a possibly available UPS pack. Afterwards, send the device to the manufacturer. The address can be found on the back cover of this documentation. Please use the original packaging for the return!

2.2.6 RJ45 plug connections

If the RJ45 plug connection is exposed to oscillating or vibrating stress:

- Use a strain relief in the immediate vicinity of the RJ45 socket.
- Select the contact surface on which the device is mounted as fixing point of the strain relief.
- Comply with the related minimum bending radius of the cable used.

2.2.7 Optional capacitor pack (CAPS pack)

- Connect the capacitor pack before switching on the Controller.
- The Controller is only deenergised if the supply cable and the capacitor pack connecting cable have been disconnected.
- The capacitor pack is only deenergised if its capacitors are discharged.
- The capacitor pack must not be charged by means of external battery chargers.

2.3 Notes on wiring according to EMC

General information

- The electromagnetic compatibility of the system depends on the type of installation and care taken. Especially consider the following:
  - Setup
  - Shielding
  - Earthing
- For diverging installations, the conformity to the CE EMC Directive requires a check of the system regarding the EMC limit values.
  This is valid, for instance, when unshielded cables are used.
- The compliance of the EMC Directive is in the responsibility of the user.
  If you observe the following measures, you can assume that the machine will operate without any EMC problems and that compliance with the EMC Directive and the EMC law is achieved.
  If devices which do not comply with the CE requirement concerning noise immunity EN 61000-6-2 are operated close to the system, these devices may be electromagnetically affected by the system.

Setup

- Provide electrical contact between the DIN rail and the earthed mounting plate:
  Mounting plates with conductive surfaces (zinc-coated, stainless steel) allow permanent contact.
  Painted plates are not suitable for an EMC-compliant installation.
- If you use several mounting plates:
  Connect as much surface of the mounting plates as possible (e.g. with copper strips).
- Install data cables separately from the mains cables.
- Lay the cables as close as possible to the reference potential; freely suspended cables act like aerials.

Shielding

- If possible, only use cables with braided shield.
- The overlap rate of the shield should be higher than 80%.
- For data cables for serial connection, always use metal or metallised connectors. Connect the shield of the data cable to the connector shell.

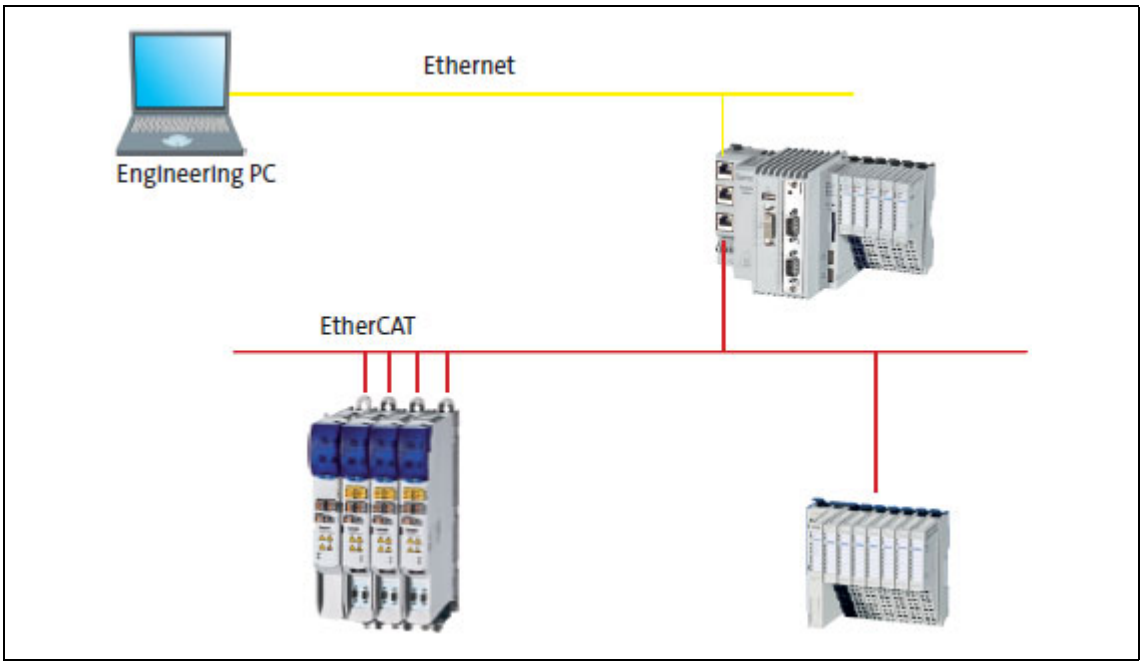
Earthing

- Earth all metallically conductive components using suitable cables connected to a central earthing point (PE bar).
- Maintain the minimum cross-sections prescribed in the safety regulations:
  For EMC not the cable cross-section is important, but the surface of the cable and the contact with a cross-section as large as possible, i.e. large surface.

3 Controller-based Automation: Central motion control

The Lenze automation system "Controller-based Automation" serves to create complex automation solutions with central motion control. Here, the Controller is the control centre of the system.

System structure of the Controller-based Automation



[3-1] **Example:** EtherCAT with Controller 3231 C, I/O system 1000 and Servo-Inverter i700

Lenze provides especially coordinated system components:

- Engineering software
  The Lenze Engineering tools (📖 27) on your Engineering PC (Windows® operating system) serve to parameterise, configure and diagnose the system. The Engineering PC communicates with the Controller via Ethernet.
  The Lenze engineering tools are available for download at:
  www.lenze.com → **Download → Software Downloads**
- Controllers
  The Lenze Controller is available as Panel Controller with integrated touch display and as Cabinet Controller in control cabinet design.
  Cabinet Controllers provide a direct coupling of the I/O system 1000 via the integrated backplane bus.
- Bus systems
  EtherCAT is the standard "on-board" bus system of the Controller-based Automation. EtherCAT enables the control of all nodes on one common fieldbus.
  Optionally, CANopen, PROFIBUS and PROFINET (Slave) can be used as extended topologies.
  With Controllers 3200 C and p500 it is also possible to use EtherNet/IP via the Ethernet interfaces. The controller provides the Ethernet/IP adapter (slave).
  Controllers c300 and p300 are provided with an "on board" CANopen interface (in addition to EtherCAT).
- Inverter (e.g. Servo-Inverter i700)

"Application software" of the Lenze Controllers

The "application software" of the Lenze Controllers enables the control and/or visualisation of motion sequences.

FAST technology modules allow for the easy development of a modular machine control in the »PLC Designer«.

The following "Application Software" versions are available:

- "FAST Runtime"
  The sequence control takes place (by logically combined control signals) in the Controller.
  The motion control takes place in the inverter.
- "FAST Motion"
  The sequence control and the motion control take place in the controller.
  The inverter merely serves as actuating drive.
  Motion applications make special demands on the cycle time and real-time capability of the bus system between the Controller and the subordinate fieldbus nodes. This is the case, for instance, if the nodes are to be traversed in a synchronised way or position setpoints are to be transferred.
- "Visualisation"
  The optional visualisation of the automation system can be used separately or additionally to "FAST Runtime" or "FAST Motion".
  For this purpose, an external monitor panel/display can be connected to the Cabinet Controller 3231 C/3241 C/3251 C.

Fieldbus communication

The Lenze controllers have different interfaces for fieldbus communication:

Range	Cabinet Controller		Panel Controller	
	c300	3200 C series	p300	p500
Interfaces (on board)				
Ethernet	1	2	1	2
EtherNet/IP	-		-	
EtherCAT	1 [1)]	1	1 [1)]	1
CANopen	1	-	1 [2)]	-
Optional interfaces (communication cards)				
CANopen MC-CAN2	-	●	-	● [2)]
PROFIBUS master MC-PBM	-	●	-	●
PROFIBUS slave MC-PBS	-	●	-	●
PROFINET device MC-PND	●	●	●	●
Ethernet MC-ETH	-	●	-	●
Serial interfaces MC-ISI	-	●	-	●

1) Only the master functionality is supported.

2) Up to release 3.9: "EL 100 CAN" driver / from release 3.10: "Lenze CAN driver"

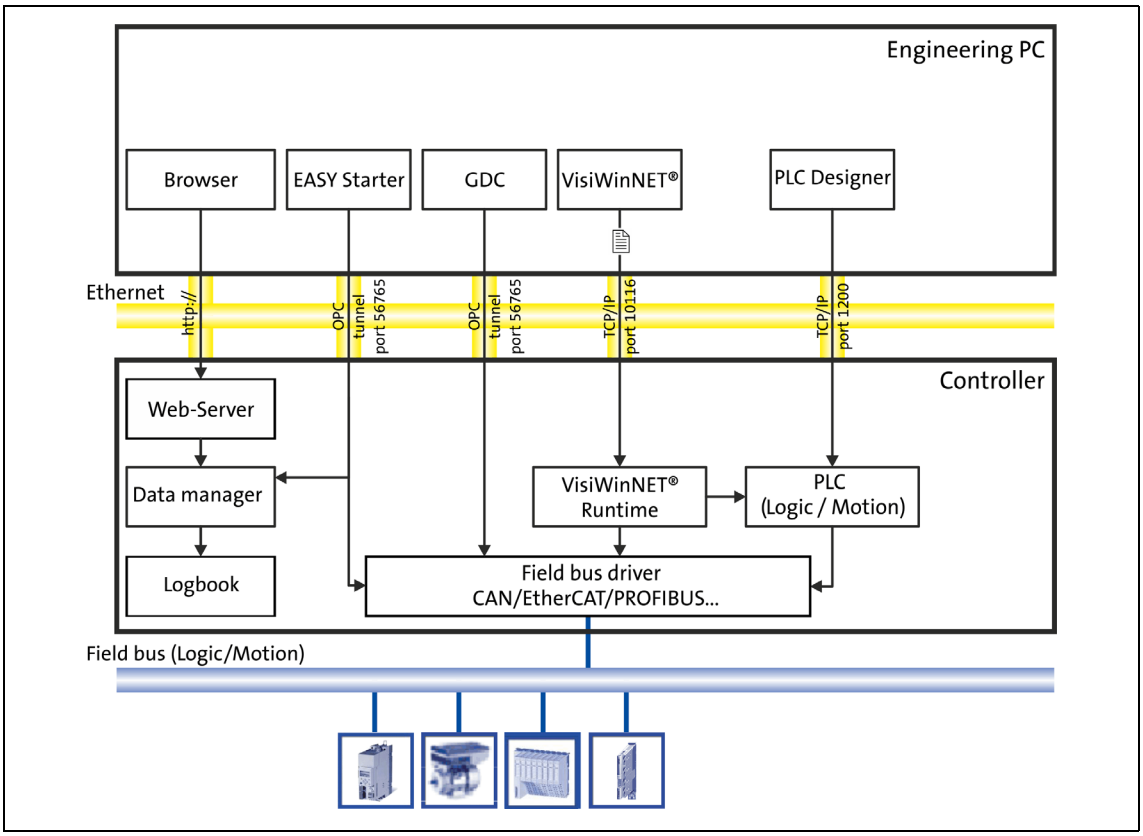
Ethernet interface

The Ethernet interface serves to connect the Engineering PC or to create line topologies (no integrated switch for Controller c300/p300).

With Controllers 3200 C and p500, the Ethernet interfaces also provide for EtherNet/IP communication.

4 System structure

This chapter provides you with an overview of the basic system structure of the Lenze "Controller-based Automation" system. The system consists of an **Engineering PC**, a **Controller** and the devices communicating with the Controller via the **fieldbus**.



[4-1] System structure of the "Controller-based Automation" Lenze automation system

Controllers and field devices form the automation system to be commissioned via the Engineering PC. The Engineering PC is a PC/Laptop with Windows® operating system and network connection. The Engineering PC comes installed with the Lenze Engineering tools (📖 27) for parameter setting, configuration, programming and diagnostics.

The Controller with the PLC (Logic/Motion) is the central control unit, consisting of the Lenze FAST application software (📖 30) with the running PLC application.

Device-internally, the Controller comes with a data manager for configuring and managing the data of the automation system. The data manager and the fieldbus driver enable the PLC (Logic/Motion) to access the system components and the field devices (inverter).

The fieldbus enables the Controller to read and write the parameters of the connected field devices.

Note!

There is no OPC server available for **PROFIBUS** and **PROFINET**.

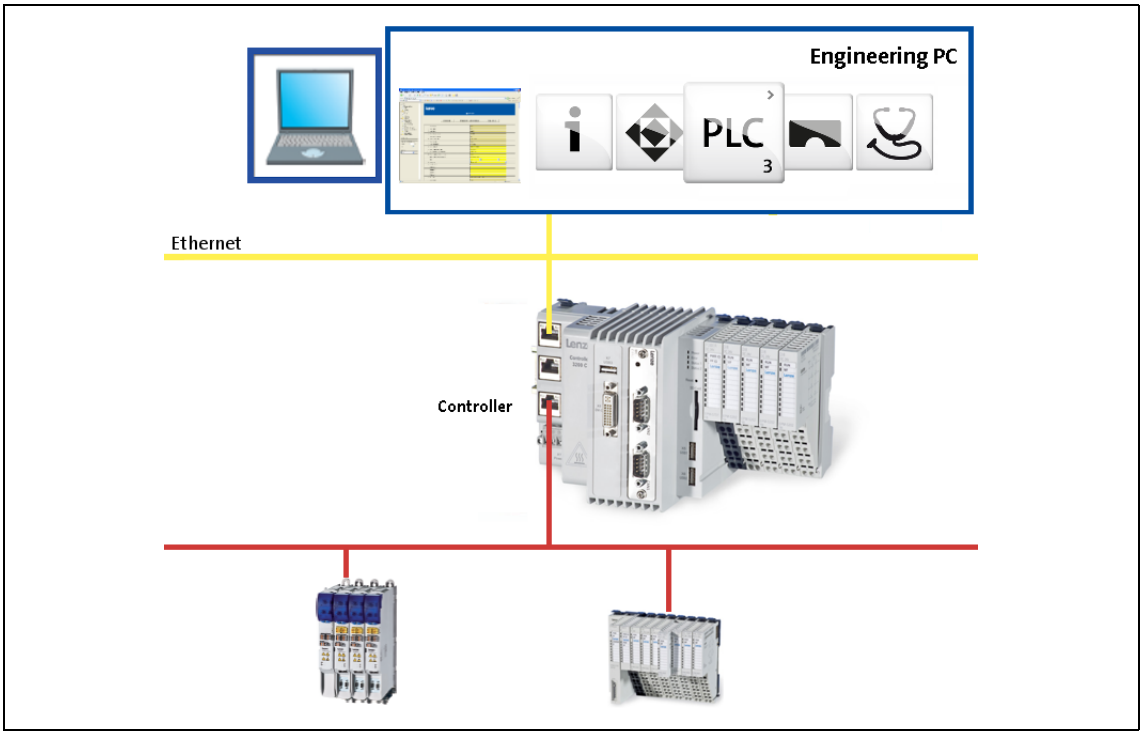
The **PROFIBUS** fieldbus driver can only be accessed via the PLC (Logic/Motion). Access via »EASY Starter« and »VisiWinNET®« is not provided.

4.1 Engineering tools

The Engineering PC is a PC/Laptop with Windows® operating system and network connection.

The Engineering PC comes installed with the Lenze Engineering tools which enable the desired automation solution to be ...

- parameterised/configured,
- programmed,
- diagnosed.



[4-2] Engineering tools for the "Controller-based Automation" Lenze automation system

The Lenze engineering tools are available for download at:

www.lenze.com → **Download → Software Downloads**

»EASY Navigator«: Starting the suitable Engineering tool

The Lenze Engineering software consists of the Engineering tools optimised for the respective Engineering stage.

The »EASY Navigator« represents the Lenze Engineering tools installed on the Engineering PC. Start the desired Engineering tool via the corresponding button:

The »EASY Navigator« ...

- simplifies the selection of the Engineering tool, depending on the Engineering phase.
- simplifies starting the desired Engineering tool (depending on the application case).
- makes it possible to select the Engineering tool suitable for the Engineering phase.

The overview displays the respective function of the Engineering tools:

What would you like to do?	Button	Engineering tool
Programming • Program the controller • Parameterise/commission the Servo-Inverter i700 • Parameterise the I/O system 1000		»PLC Designer«
Parameterising/configuring the inverter • Parameterising and configuring the automation/drive system • Parameterising Inverter Drives 8400/Servo Drives 9400		»Engineer«
Visualisation • Visualising the applications of the automation system • Creating the visualisation/user interfaces		»VisiWinNET®«
Online diagnostics • Easy online diagnostics of the controllers (from »EASY Starter« V1.2) and other Lenze devices		»EASY Starter« (reading parameters)
Online parameterisation • Online parameterisation/commissioning of Lenze devices • Direct online parameterisation when the online connection to the Lenze devices is active.		»EASY Starter« (reading/writing parameters)
Loading data into the Controller • Load PLC programs, parameter sets and application data (LFL file) into the Controller.		»EASY Starter« Application Loader
Engineering tools that are not included in the »EASY Navigator«:		
Controller parameterisation/diagnostics • »WebConfig« can be used on the controller without commissioning (integrated web server). • By the use of »WebConfig«, the parameters of the controller can be accessed via web browser. • »WebConfig« can also be started in the »PLC Designer«.		»WebConfig«
Backup of controller data • Create data backups • Restore data after device replacement • Carry out software update of the Controller		»Backup & Restore«

4.2 Controller: The control centre of the Controller-based Automation

Cabinet controllers: Compact control cabinet design

Cabinet controllers are designed for the demanding continuous use in industrial applications. Compared to panel controllers, they are not equipped with an integrated display. The Controllers 3231 C and 3241 C are provided with a DVI interface for the connection of an external monitor panel.

Mounting is carried out in a control cabinet or a corresponding built-in housing on a standard DIN rail (35 mm).

The device-internal backplane bus provides for a direct connection of the I/O system 1000.

Panel controllers: controlling and visualising

Panel controllers are designed for the installation into control cabinets, machine panels, or other mounting cutouts. They are equipped with rear bolts and clamping screws which provide for easy mounting and reliable sealing (front panel enclosure IP65/rear panel IP20) in rough industrial environments. They can be operated easily by directly touching the screen.

From Lenze control technology release 3.10 onwards, the Panel Controllers are provided with PDF viewer, WordPad text editor, Microsoft® Office viewer and web browser. These tools can be executed from the desktop.

Product catalogue for the Controller

Here, further information on the device-specific features and technical data can be found.

4.3 Lenze FAST application software

The **Lenze FAST** is installed on the Lenze Controller by default, in the **"FAST Runtime"** version with **"FAST Motion"** for the central control of PLC applications.

"FAST Motion" enables an extensive motion control of motion functions. Then inverter then only acts as an actuating drive.

For Panel Controllers, the **"Visualisation"** mode is available in addition, enabling a central visualisation with the Controller.

The application software consists of:

- Windows® CE operating system
- Application Software "FAST Runtime" with "FAST Motion" for controlling motion sequences via standardised "FAST technology modules"
- Optional visualisation software (»VisiWinNET®« Compact CE).

Differences between "FAST Runtime" and "FAST Motion"

FAST Runtime (formerly "L-force Logic" (LPC 1000))	**FAST Motion** (formerly "L-force Motion" (MPC 1000))
The Controller controls simple motion sequences by logically combined control signals.	The controller controls extensive motion sequences. The "FAST Motion" application software... • contains the PLCopen library; • supports "SoftMotion" applications
Logic applications are suitable for the control of inverters without a Motion functionality which ... • execute simple motion sequences; • can only be controlled via PLC functionality.	Motion applications are suitable... • for the control of inverters executing complex motion sequences of multi-axes in several dimensions; • ...for the control of devices that are to traverse synchronously; • for the transfer of setpoints.

Note!

Lenze FAST in case of Controller c300 and p300

- The Motion Control libraries are not loaded by default into the library manager.
- FAST Motion for "Coordinated Motion" (robot kinematics) and axes groups are not supported.
- Technology modules "Pick & Place" and "Track Pick & Place" are not supported.

Fieldbus communication

Depending on the application software used (FAST Runtime/Motion), it may be the case that a fieldbus can only be used to a limited extent for a Lenze device series.

Details can be found in the **communication manuals**:

- Controller-based Automation EtherCAT®
- Controller-based Automation CANopen®
- Controller-based Automation PROFIBUS®
- Controller-based Automation PROFINET®

4.4 "Visualisation" application software

Engineering tool required: »VisiWinNET®«

The "Visualisation" application software extends the Controller to be a visualisation device and thus provides for a central visualisation of the system.

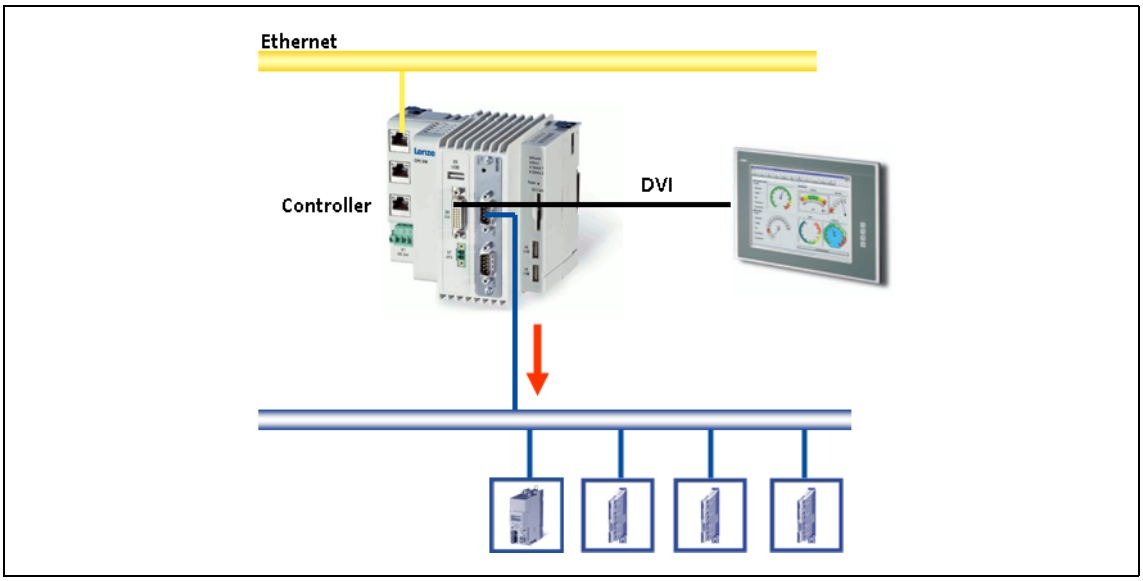
The visualisation can either run on a separate Controller or monitor panel or parallel to the "Runtime" or "Motion" application software on the Controller.

Various options described in the following sections are available for the communication link.

Note!

There is no OPC server available for **PROFIBUS** and **PROFINET**.

4.4.1 Sample topology 1: External monitor panel/display for cabinet controllers



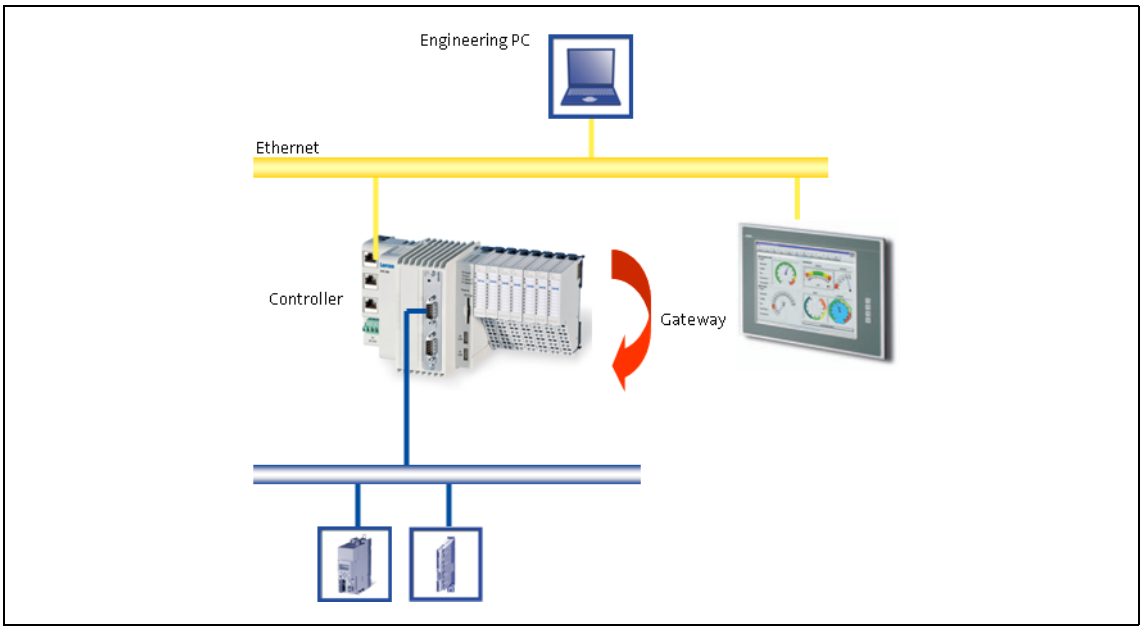
[4-3] **Sample topology:** Controller 3231 C with an external monitor panel (connected to the DVI interface)

This topology with regard to its performance corresponds to the implemented solution (control/visualisation on the same controller). The external monitor panel/display shows the visualisation.

Advantages

- Small amount of cabling
- Protected operating conditions
- Extensible topology

4.4.2 Sample topology 2: Separate control and visualisation



[4-4] **Sample topology:** Controller 3200 C as gateway for the Visualisation Controller (IPC)

The Visualisation Controller (IPC) accesses the field devices via the Controller 3200 C as gateway.

In order to separate the control and visualisation, the integrated gateway function of the controller can be used.

The use of this topology is advisable...

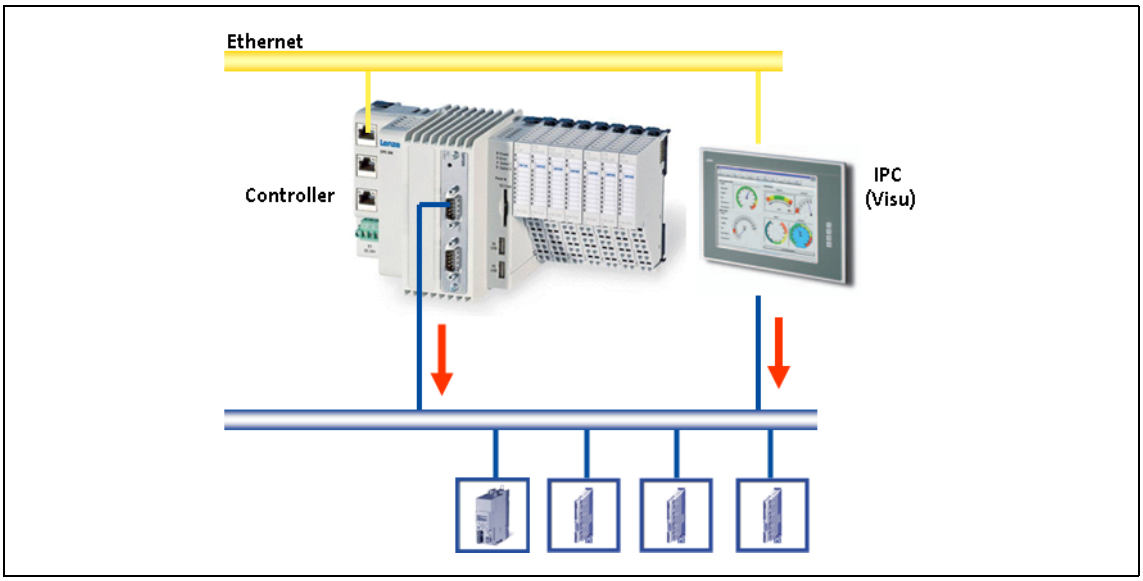
- to achieve a higher performance;
- for the use of different operating systems within one automation system.

Engineering tools required: »EASY Starter«, »Engineer«

Advantages

- Several visualisations can access the controller.
- Most suitable for extensive visualisation processes.

4.4.3 Sample topology 3: Independent control and visualisation (CANopen)



[4-5] **Sample configuration:** Parallel access of Controller 3200 C and Visualisation Controller (IPC)

If this topology is used, the Controller 3200 C and the Visualisation Controller (IPC) access the fieldbus independently of each other.

Note!

The configuration with a control and configuration independent of each other is only available for the **CANopen** bus system!

- CANopen enables (several) fieldbus master independent of each other.
- In connection with EtherCAT, no configuration with two fieldbus masters is possible.

Advantages

- Spatially separate control and visualisation.
- The visualisation has access to the parameters of the field devices.

Disadvantage

- The visualisation may disrupt the real-time capability of the fieldbus. This topology therefore is only suitable for Motion systems to a limited extent (depending on the bus system used).

5 Commissioning the controller

This chapter provides some general information on the commissioning of a controller. Depending on the actual hardware installed, different settings are required for integrating the controller into a network.

Note!

Please observe the predefined IP address of the controller for the initial commissioning: **192.168.5.99** (Lenze setting).

Further information on how to set the IP address of the Controller can be found here:

▸ Entering the IP address of the controller (📖 38)

5.1 Identification

Every controller is provided with a nameplate containing the device data. The device data are helpful for identifying the technical equipment of the controller. Detailed information relating to the nameplate data can be found in the product catalogue for the Controller.

Web-based diagnostics/parameter setting

Via »WebConfig« the configuration of the controller can be identified. The parameter values of the controller can be represented using the web browser.

▸ Online connection from the Engineering PC to the controller (📖 57)

Assigning a unique name to the controller

In order to be able to clearly identify a Controller, the desired name has to be assigned to parameter 13 *"System identification: Name"* C0013. The name assigned can then be used in the corresponding engineering tool (e.g. »PLC Designer«) to identify the Controller.

5.2 Control elements of the controllers

Depending on the type and equipment, the Lenze Controllers are provided with various control elements (e.g. function keys for external monitor panels) and status LEDs for diagnostic purposes.

▸ Status LEDs of the Controllers (📖 92)

The controllers can be operated via external input devices (keyboard/mouse). This makes it possible to carry out comprehensive diagnostics and configuration tasks directly on the controller.

5.3 Starting the controller

Note!

All Controllers only work with a plugged-in SD card!

The SD card must not be provided with an additional sticker!

During the starting process of the controller

If a non-bootable USB flash drive is connected during the starting sequence, it will be stopped!

- Remove the USB stick and restart the Controller.
- Alternatively, the USB stick can be prepared using the »Backup & Restore« software. Further information can be found in the online help of the »Backup & Restore« software.

When the controller is running

Removal of the SD card will lead to a system failure!

- The SD card must not be removed while the controller is running (no "Hot Plugging" of the SD card possible).
- The SD card is required for the system start since it contains the system files for the starting process.

The internal flash memory and the SD card are the storage media of the controller.

The operating system of the Controller and the Lenze FAST application software (📖 30) are stored in the internal flash memory.

The SD card is used as memory for the following application data:

- PLC boot project
- "Application Credit" for the Lenze FAST application software (📖 30)
- Visualisation
- Databases of the data manager
- prestart.txt/poststart.txt
- Retain and logbook data
- User data (projects and individual data)

The combination of control technology software and application data on the SD card ensures that the data match the prevailing application in the present version.

The SD card serves to easily exchange data in a different device. This serves to avoid automatic, possibly unwanted and difficult-to-master update/downgrade processes.

How to change the SD card:

1. For unlocking the SD card, push in lightly and then release.
2. Carefully pull out the SD card.
3. Gently push another SD card into the slot until it clicks into place.

IP configuration

The Controller has the preset standard IP address **192.168.5.99**.

The preset IP configuration can be changed in the »WebConfig«.

- Setting IP addresses on the Engineering PC (example: Windows® XP) (📖 57)
- Entering the IP address of the controller (📖 38)

After 15 seconds, the network configuration dialog box will close automatically; the controller continues with the starting process.

5.4 Error case: Controller does not start

If the Controller does not start, you can load the Lenze standard settings with the **Reset button**.

- Reset Controller / Load Lenze standard setting (📖 44)

5.5 Configuring the controller

This chapter provides information on how to configure the Controller during initial commissioning.

The IP address setting is preserved after a restart of the system.

5.5.1 Establishing an automatic dial-up connection

Further information on how to establish an automatic dial-up connection, remote maintenance and diagnostics options can be found under:

▸ Remote maintenance and diagnostics (📖 91)

In order to carry out a remote maintenance on the controller different mechanisms are provided:

▸ Diagnostics via Telnet (📖 96)
▸ Data transfer via FTP (📖 98)
▸ Activate Windows® CE interface (📖 104)
▸ Diagnostics with the logbook (📖 101)

5.5.2 Entering the IP address of the controller

The controller has the following network settings by default:

Address	Lenze setting
IP address	192.168.5.99
Subnetwork	255.255.255.0
Default gateway	192.168.5.1

During initial commissioning of the Controller, the desired IP address has to be entered.

Optionally, the network settings can be selected via a file:

▸ Specifying the IP address of the controller via file (optional) (📖 41)

5.5.2.1 Cabinet Controller with external monitor panel (3231 C/3241 C)

Note!

If an external display (monitor panel) is used, the switch-on sequence of display/ controller must be observed so that it can be correctly controlled by the controller:

- Connect the external display to the DVI output of the controller and switch it on before switching on the controller.

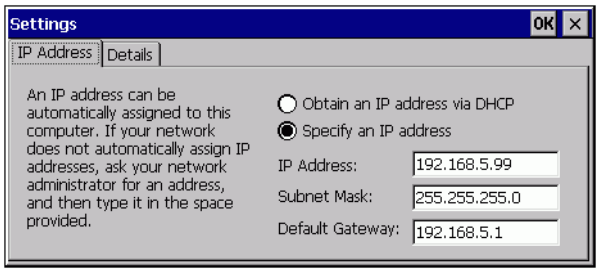
After connection of a monitor panel/an external display to a running controller, the display resolution is VGA .

- Calibrate the monitor panel/ display connected, so that the screen content can be displayed correctly.

Tip!

Connect a keyboard to the Controller to be able to enter the IP address.

Then you can make the entries:



[5-1] IP settings of the controller by default

- Start the control panel with **<Shift>+<F4>**.
- Start the network connections by double-click and enter the IP address, subnet mask, and the default gateway.
- After clicking the OK button the IP address is saved and need not be entered again when the system is restarted.

5.5.2.2 Cabinet Controller without an external monitor panel (c300/3221 C/3251 C)

The configuration of a Cabinet Controller without a connected monitor panel requires a PC/laptop with the relevant addresses (IP address, subnet mask, default gateway).

- Connect the PC/laptop to the controller by means of a "crossed" network cable.
- Change the settings on an HTML compliant browser:
  ▸ Setting IP addresses on the Engineering PC (example: Windows® XP) (📖 57)
- Connection establishment: enter the IP address of the controller in the browser: **192.168.5.99** (Lenze default setting).
- In »WebConfig«, click the **Ethernet** button.
- Enter the desired IP address, subnet mask and default gangway of the Controller.
- Click **Accept & Save all**.
- Set **Use IP configuration** to the value **"Activate device"**.
- Click again **Accept & Save all** in order to save the network settings permanently.

5.5.3 Specifying the IP address of the controller via file (optional)

How to proceed:

1. Create file "ip.txt" on the Engineering PC.
2. Save file "ip.txt" to the SD card of the controller by connecting the SD card to the Engineering PC using a memory card reader.

File "ip.txt"

```
172.31.207.88
255.255.255.0
172.31.201.1
```

[5-2] Example of an "ip.txt" file for selecting the IP address

In ASCII file "**ip.txt**" an IP address is defined which can be selected for the controller.

- Copy file "**ip.txt**" to the root directory of the SD card.
- Insert the SD card into the controller. Then start the controller.
  ▸ Starting the controller (📖 36)
- When the system is started ...
  - the controller reads in the IP address file **"ip.txt"** from the SD card;
  - the controller writes the result (`Result`) to the **ip.txt** file:

```
172.31.207.88
255.255.255.0
172.31.201.1

Result: 2010-9-24 14:42:23 :Success: IP Settings taken from file.
```

[5-3] Example of an "ip.txt" file for IP address selection with result entry

- Then, the Controller renames the file: **"ip_old.txt"**.
- To select the IP address once again using the file, the file must be renamed to **"ip.txt"**.

Tip!

The "ip.txt" file can be used to select the use of the DHCP. For this, write "DHCP" into the first line of the file. Then, the following lines will no longer be considered.

5.5.4 Establishing Windows® CE access rights

In order to be able to establish a connection to the controller, each user has to be assigned access rights. For this the respective user has to be set up as a Windows® CE user with a user name and a password. Windows® CE users can be set up via »WebConfig« and the »EASY Starter«:

▸ Setting up Windows® CE users in »WebConfig« (📖 42)

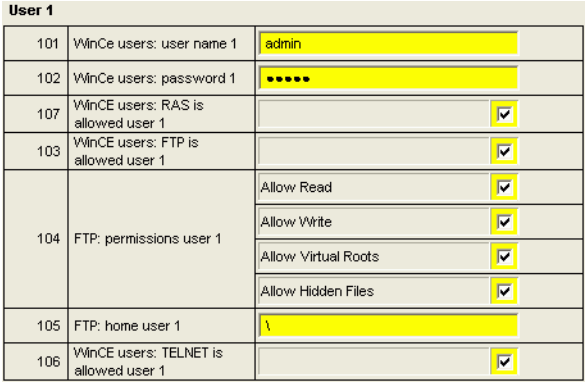
The representation for user 1 is displayed. The users 2 to 10 are displayed analogously.

5.5.4.1 Setting up Windows® CE users in »WebConfig«

Note!

You have to be set up as Windows® CE user to have authorisations for further services like FTP, telnet, or web server access.

- Up to ten Windows® CE users can be set up in »WebConfig« the **User management** 10 area.
- Use parameters 101 to 169 to set up the user name, password, and various authorisations for a maximum of ten users.



User 1		
101	WinCe users: user name 1	admin
102	WinCe users: password 1	•••••
107	WinCE users: RAS is allowed user 1	☑
103	WinCE users: FTP is allowed user 1	☑
104	FTP: permissions user 1	Allow Read ☑
		Allow Write ☑
		Allow Virtual Roots ☑
		Allow Hidden Files ☑
105	FTP: home user 1	\
106	WinCE users: TELNET is allowed user 1	☑

The representation for user 1 is displayed. The users 2 to 10 are displayed analogously.

Detailed information on the parameters can be found here:

▸ Basic parameters of the Controllers (📖 146)

5.5.5 Use your own background image (Windows® CE)

The standard wallpaper of the panel controller can be replaced by your own wallpaper.

The wallpaper must meet the following conditions:

- File format:
  - p500, 3231 C, 3241 C, 3251 C: Bitmap (*.bmp)
  - p300: Bitmap ([Width]_[Height]_*.bmp, z. B. 480_272_Roboter.bmp)
- The resolution of the image must correspond to the resolution of the monitor panel to achieve a correct representation:

Screen sizes	Panel Controller					
	p300			p500 / Monitor panel for 3231 C/3241 C/3251 C		
Diagonal measurement	10.9 cm (4.3")	17.8 cm (7.0")	26.4 cm (10.4")	17.8 cm (7.0")	26.4 cm (10.4")	38.1 cm (15.0")
Resolution [pixel]	480 x 272 (PSP)	800 x 480 (WVGA)	800 x 600 (SVGA)	800 x 480 (WVGA)	800 x 600 (SVGA)	1024 x 768 (XGA)

- The display of the panel controller p300 can be rotated in 90° steps.
  Setting via code: C0427 (📖 178)

How to proceed:

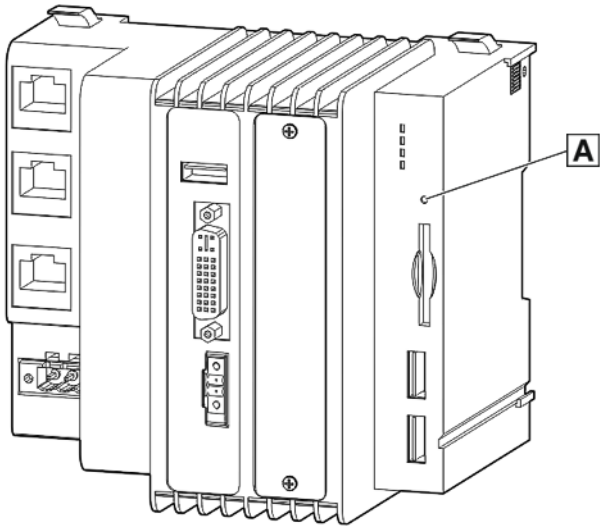
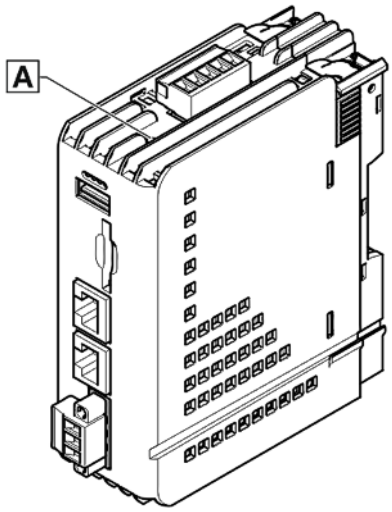
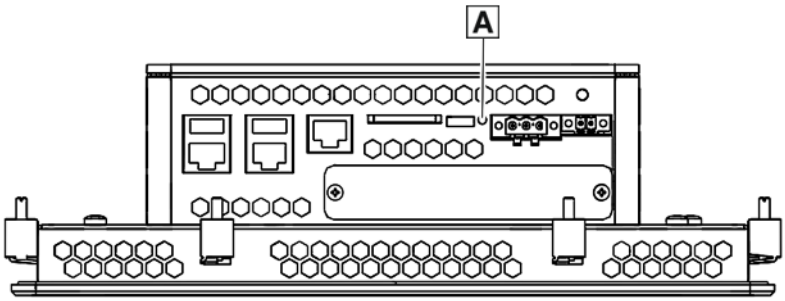
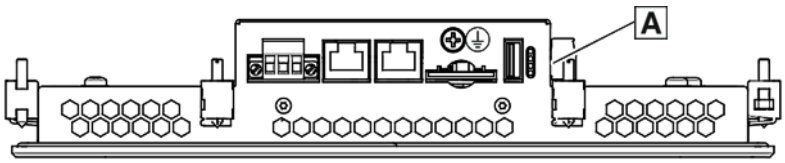
Copy the desired bitmap file to the SD card of the controller, directory: `\CustomBitmap`.

Directory name on the controller if the SD card has been inserted into the controller:

- **3200 C/p500:** `\USBStorage\CustomBitmap`
- **p300:** `\sdcard\CustomBitmap`

5.6 Reset Controller / Load Lenze standard setting

In order to reset the Controller, press the reset pushbutton.

Position of the reset button (A)	
Cabinet Controller	
3200 C	**c300**
	
Panel Controller	
p500	
	
p300	
	

Resetting the Controller:

- Press the reset pushbutton for 4 ... 10 s.
- All LEDs are off during the reset.
- When reset has been executed successfully, the Power LED is lit, depending on the Controller, in green or in blue.
  ▸ Status LEDs of the Controllers (📖 92)

Loading the last internally saved firmware of the controller:

- Switch off voltage supply.
- Press Reset button.
- Switch on the voltage supply while the Reset button is pressed and keep the Reset button pressed for at least 10 s.
  If the Error-LED is blinking (green/red) after this action, switch off the voltage supply again. The Controller must be disconnected from the mains until all LEDs have gone off.
  Then switch on the voltage supply again.

5.7 I/O system 1000 at the backplane bus of the Cabinet Controller

Note!

EPM-S130 (EtherCAT) bus coupler module

Only **EPM-Sxxx I/O compound modules from hardware version 1B onwards** are supported.

The Cabinet Controllers 3200 C and c300 allow for a direct connection of the I/O system 1000 to the integrated backplane bus.

The modules of the I/O system connected to the backplane bus of the Controller can be parameterised in the »PLC Designer«.

Reference manual for the I/O system 1000

Here, further information on the parameter setting/configuration can be found.

5.7.1 Limits on the backplane bus

- 3 different update tasks can be executed at a maximum.
- Memory area for the I/O process image: 1792 bytes
- Electronic supply
  - for the Controller c300 maximum 650 mA
  - for the Controller 3200 C maximum 1.7 A

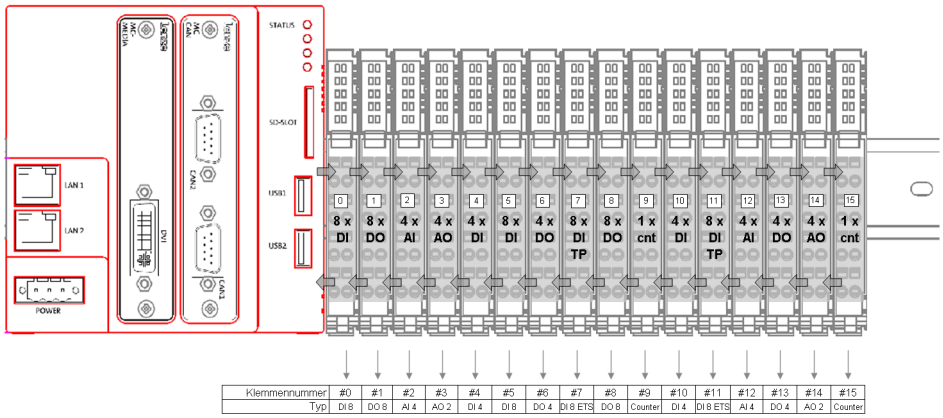
If the power of the bus coupler main supply is not sufficient for supplying the I/O level and/or the electronics, power supply modules (EPM-S701, EPM-S702) can be used.

System manual for the I/O system 1000

Here you'll find more information regarding the system structure with power supply modules (EPM-S701, EPM-S702).

5.7.2 Configuring I/O modules at the backplane bus

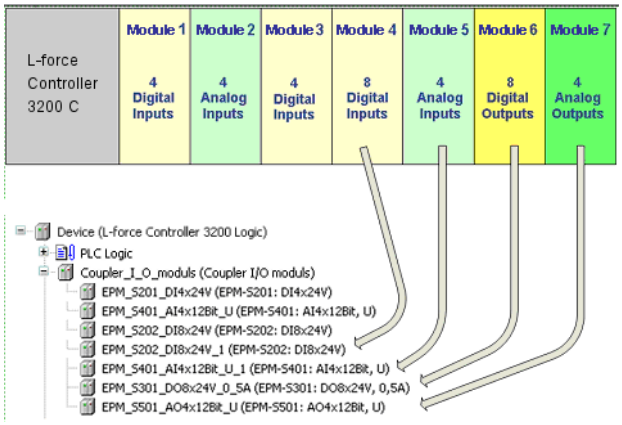
The following illustration is a schematic representation of the controller hardware structure including I/O modules.



The I/O system 1000 includes the following components:

- I/O module coupler for voltage supply of the I/O compound modules
- I/O compound modules:
  Up to 64 modules are possible which are connected to the Controller 3200 C via the Lenze backplane bus.

In order to be able to access the modules by means of a PLC program (read input signals/write output signals), the modules have to be configured in the »PLC Designer«. For this, map the physical arrangement of the I/O modules in the »PLC Designer«.

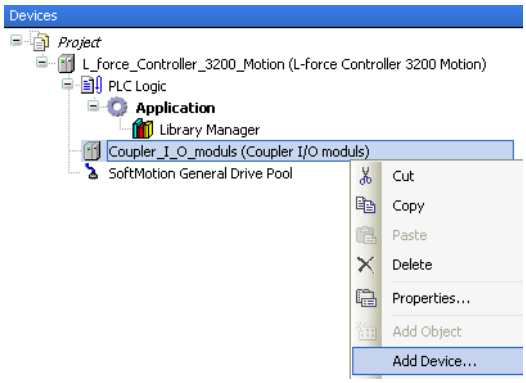


[5-4] Example: mapping the physical arrangement of modules 1...7 in the »PLC Designer«

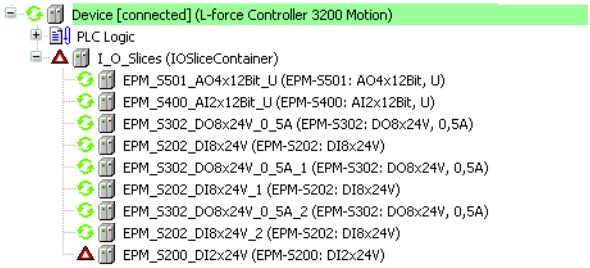
How to configure the I/O modules in the »PLC Designer«:

1. Go to the context menu of the I/O module coupler and add the used I/O modules with the **Device Add** menu command.

   Note: The sequence of the I/O modules in the device tree must comply with the physical arrangement.



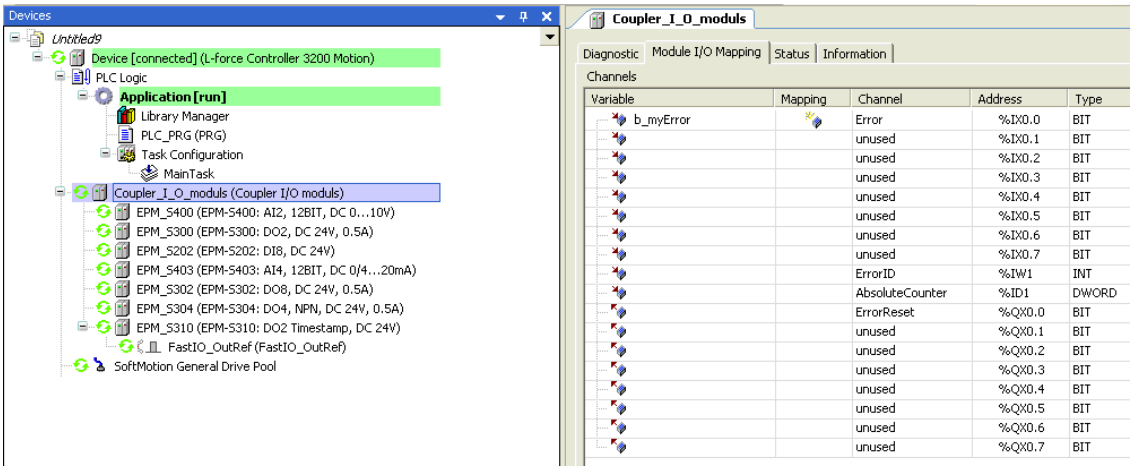
2. View in the device tree/*Device view*:



   - If everything is configured correctly, all modules are marked with the symbol in the device tree after going online and starting the PLC.
   - In the event of an error, i.e. if the configuration deviates from the physical arrangement, the modules are marked with the symbol.

Use the **I/O module coupler** tab for diagnostics purposes using the PLC application.

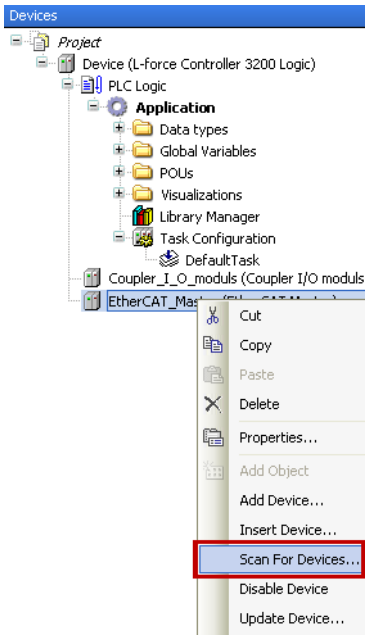
Example: Insert the *b_myError* variable in this tab. The variable is globally declared and the PLC application is able to evaluate it.



5.7.3 Determining the topology of the I/O modules automatically

In addition to appending devices manually, the »PLC Designer« allows for the automatic recognition of I/O modules connected (fieldbus scan).

For this purpose, execute the **Start Search** command in the context menu of the *I/O module coupler*:



5.8 Tabs of the I/O modules at the backplane bus

The *Workspace* ...

- uses various tabs to display the properties and settings of the module selected from the *Device view*.
- serves to edit the parameters of the individual I/O compound modules.

Depending on the module selected from the *Device view*, different tabs are available in the *Workspace*.

I/O module coupler (backplane bus)

Tab	Contents
Diagnostics	Error status of the modules. ▸ Error messages (backplane bus) (📖 52)
Module I/O coupler	List of all objects available for the parameterisation of the I/O compound modules - digital I/O.
Status	Status information of the module coupler.
Information	Project information and catalogue information of the module coupler.

Each I/O module on the backplane bus is represented by the following tab:

I/O compound modules

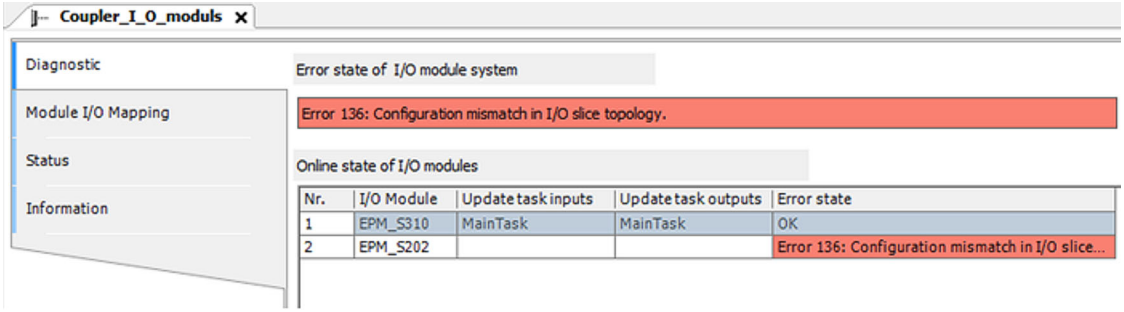
Tab	Contents

Parameter	• Offline configuration of the I/O module
	• All parameters of the I/O compound module
	  • Parameterising digital modules:
	  Polarity of the control signals, status in the event of an error for digital output modules.
	  • Parameterising analog modules:
	  Signal functions, status in the event of an error.
	Depending on the type of I/O module, specific settings are possible.
	More information regarding the I/O system 1000 can be found in the online help.

Module I/O image	Process image of the I/O module
Status	Status information of the I/O compound module.
Information	Designation and layout plan of the I/O compound module

5.9 Error messages (backplane bus)

Error messages are shown under the **Diagnostics** tab of the I/O module coupler.



[5-5] Example: Topology error '136', the EPM-S202 module cannot be reached at the backplane bus.

Error description and remedy

If the remedies described do not manage to eliminate the error causes and you have to contact Lenze, provide the following information:

- PLC project (»PLC Designer«)
- Bus structure at the backplane bus of the Controller (number and type of all modules connected including the passive modules EPM-S7xx/EPM-S9xx)
- Status of the RUN and MF-LEDs of all modules connected

Error number	Description and remedy
11	Too many I/O modules for the task cycle time selected. • Remedy: Increase the cycle time.

12	FIFO response full.
	• The Controller could not access all parameters of the I/O modules. The process data communication (PDO) is not limited.
	• This warning occurs if ...
	  • the task utilisation at the start of the Controller is near the cycle time and a great many configurable I/O modules are connected to the backplane bus of the Controller;
	  • the task utilisation during operation is near the cycle time and, at the same time, the tabs of configurable I/O modules are shown in the "PLC Designer".
	• Remedy: increase cycle time of the bus cycle tasks.
	• The warning can be acknowledged in the »PLC Designer« using the "Reset error" button.

32	Timeout reset • Contact Lenze.
33	Timeout reset error • Contact Lenze.
96 ... 98	Too many I/O modules for the task cycle time selected. • These errors occur at the start of the PLC application. Possible causes and remedies:
	Too many tasks for the processing of I/O modules. • Remedy: check device tree. A maximum of 3 different tasks must be assigned to the individual I/O modules at the backplane bus as update task.
	After having updated the Controller firmware: the firmware has not been fully updated. • Remedy: update or restore the Controller again.
	Controller is defective. • Remedy: replace the Controller.

Error number	Description and remedy
99	Too many I/O modules for the task cycle time selected. • The error occurs at the start of the PLC application. • Error when creating the task assigned to the backplane bus. • The number of I/O modules or the size of the process image cannot be processed by the Controller. • Remedy: reduce the number of I/O modules.
100 ... 103	Too many I/O modules for the task cycle time selected. • These errors occur during ongoing operation. • Error in the processing of the backplane bus telegrams. Possible causes and remedies:
	Error in the PLC application (Monitoring the task configuration): • The task runtime is exceeded. The runtime of the task is longer than the set task interval. • The jitter of the backplane bus task is too high (>120 µs). Remedy: Die SPS-Applikation auf mögliche Ursachen der Laufzeitverlängerung oder des Jitter prüfen und ggf. korrigieren. Check the PLC application for possible causes of the runtime extension or the jitter and correct it if necessary.

	EMC impacts (transmission failures):
	• The telegram transmission quality is poor.
	• Remedy:
	  • check the shielding.
	  • Check whether the error is connected to specific events (e.g. starting torque of the drives).

	Mechanical impact: • short circuits of the signal cables by canted sockets. • The telegram transmission quality is poor due to missing or soiled contacts. • Remedy: check and clean the contacts between the I/O modules and the sockets.
	I/O module is defective. • Remedy: replace the I/O modules separately in order to find the defective module.
	The number of I/O modules or the size of the process image cannot be processed by the Controller. • Remedy: reduce the number of I/O modules.
	Controller is defective. • The MF-LEDs of all modules are lit. • Measure voltage at the 5V contacts of the last backplane bus module (pins 3 and 5). • Remedy: replace the Controller.
104 ... 106 **116 ... 117**	Read semaphore time-out • The data exchange between the backplane bus and the PLC application cannot be implemented within the time specified. Possible causes and remedies:
	Subsequent error of errors 100 ... 103: • Check the error sequence in the logbook. • Remedy: eliminate errors 100 ... 103.
	Error in the PLC application: • The task runtime is violated. • Remedy: correct the PLC application.
	Backplane bus structure: • many passive modules (EPM-S7xx/EPM-S9xx) are plugged between the I/O modules • Remedy: remove passive I/O modules, change structure.

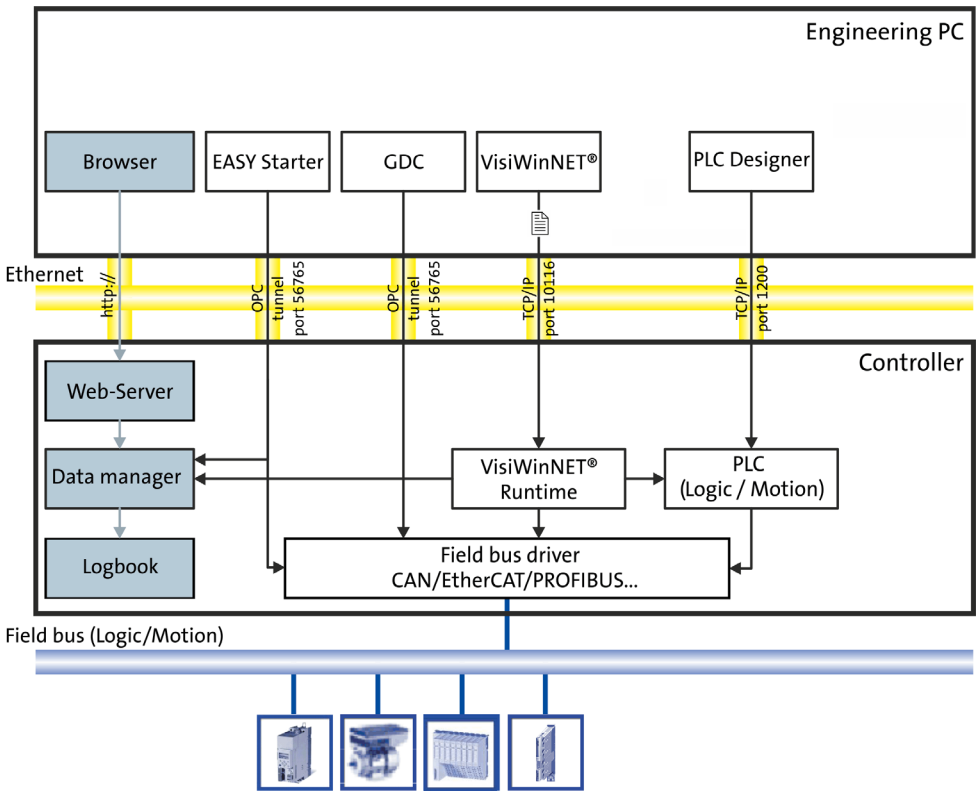
Error number	Description and remedy
107 ... 109 **119 ... 121**	Write semaphore time-out • The data exchange between the backplane bus and the PLC application cannot be implemented within the time specified. Possible causes and remedies:
	Subsequent error of errors 100 ... 103: • Check the error sequence in the logbook. • Remedy: eliminate errors 100 ... 103.
	Error in the PLC application: • The program processing duration is longer than the task cycle time set (task overrun). • Remedy: increase the task cycle time set, optimise the program code.
	Backplane bus structure: • many passive modules (EPM-S7xx/EPM-S9xx) are plugged between the I/O modules • Remedy: remove passive I/O modules, change structure.
110	Internal hardware error at the backplane bus • Contact Lenze.
136	Configuration error in the I/O module topology • The I/O modules configured in the PLC application were not found at the backplane bus. Possible causes and remedies:
	The bus structure in the PLC application do not comply with the actual bus structure. • Remedy: adapt the PLC application to the actual bus structure.
	There is no contact between the electronic module and the base module of the I/O module. • Remedy: plug the electronic module tightly onto the base module.
	There is no contact between two adjacent base modules of the I/O system. • Remedy: plug in the base modules correctly.
	An I/O module is defective. • The MF-LEDs of the module affected are lit. • Remedy: replace the I/O module.
	The voltage supply of the I/O modules has been interrupted. • When using EPM-S702 modules, check the voltage supply of the modules. • Remedy: restore the voltage supply of the EPM-S702 modules.
	Controller is defective. • The MF-LEDs of all modules are lit. • Measure voltage at the 5V contacts of the last backplane bus module (pins 3 and 5). • Remedy: replace the Controller.
137	Too many tasks for the processing of I/O modules. • Maximum: 3 tasks
138	The device description does not contain any device type. • Contact Lenze
139	Error while writing the initialisation parameters. • Contact Lenze.
140	No definition for the number of channels in the device description. • Contact Lenze
181	The synchronisation of the I/O system is incorrect. • Contact Lenze.
200	SDO timeout • Contact Lenze.
220	SDO communication error • Contact Lenze.
221	The physical I/O module topology could not be read. • Contact Lenze.

Error number	Description and remedy
222	The I/O system driver (backplane bus driver) could not be started. Possible causes and remedies:
	After having updated the Controller firmware: • Remedy: update or restore the Controller again.
	Controller is defective. • Remedy: replace the Controller.

6 Parameter setting using the »WebConfig«

This chapter contains information on how to parameterise the Controller via »WebConfig«.

6.1 System structure



6.2 Parameter setting of the Controller

All settings that can be used for parameterising the controller are included in a numbered parameter list.

»WebConfig« can be remotely called via http by an external Engineering PC which can be reached via network. The Engineering PC is a desktop computer with a Windows® (XP/7) operating system.

▸ Basic parameters of the Controllers (📖 146)

6.3 Online connection from the Engineering PC to the controller

Connect the Engineering PC to the Controller using a network cable or connect the Controller to the network which is accessed to the Engineering PC.

Note!

In the case of a direct connection between the Engineering PC and the controller, a **crossed** network cable is required.

The settings of the static IP address of the Engineering PC are only to be carried out for the direct connection between the Engineering PC and controller.

6.3.1 Setting IP addresses on the Engineering PC (example: Windows® XP)

Note!

Recommended setting for the Engineering PC:

IP address: **<192.168.5.100>**

Default settings of the controller:

IP address: **<192.168.5.99>**, subnetwork **<255.255.255.0>**.

Setting for the direct connection between Engineering PC and controller:

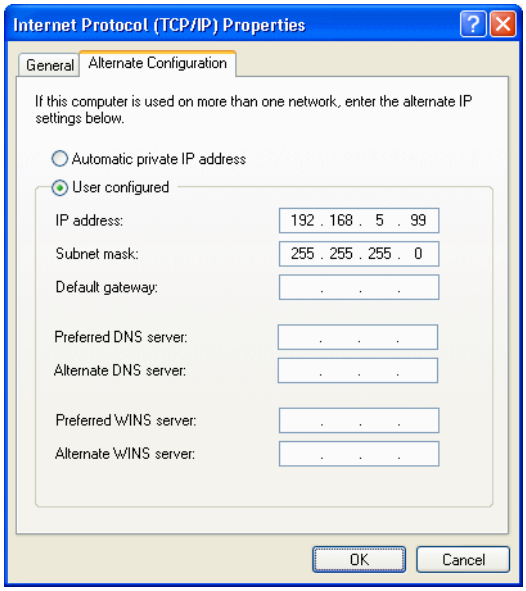
How to set the static IP address of the Engineering PC:

1. Open the *Network connections* dialog box.

   Start → Settings → Network connections
2. Select the network interface which is connected to the Controller.

   Right-click **Properties**.
3. Select **Internet protocol (TCP/IP)**.
4. Click the **Properties** button.
5. Select the **Alternate configuration** tab.
6. Select the **User configured** option.
   - Enter the IP address. The subnet range of this IP address and the one of the IP address of the controller must be the same, example: **<192.168.5.100>** (Lenze setting of the controller: **<192.168.5.99>**).
   - Enter the subnet mask of the Engineering PC (standard setting: **<255.255.255.0>**)
7. Close the individual dialog boxes with **OK**/**Close**.

The **Properties of internet protocol (TCP/IP)** dialog window

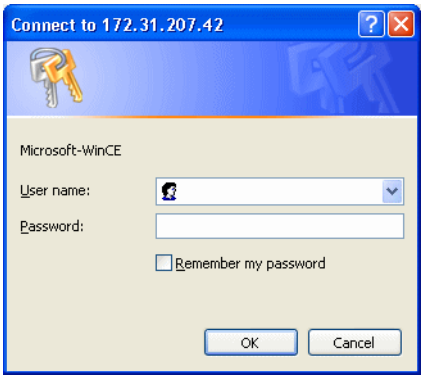


How to set the browser:

1. Open the browser at the Engineering PC.
   (This setting refers to the Microsoft Internet Explorer.)
2. Select the *Proxy settings* dialog window:
   Tools → Internet Options → Connections → Settings → Advanced
3. Position the cursor in the **Exceptions** field at the end of the entries available.
4. Enter the IP address of the controller: **<;192.168.5*>** (Lenze setting)
5. Close the individual dialog windows with **OK**.

6.4 Start »WebConfig«

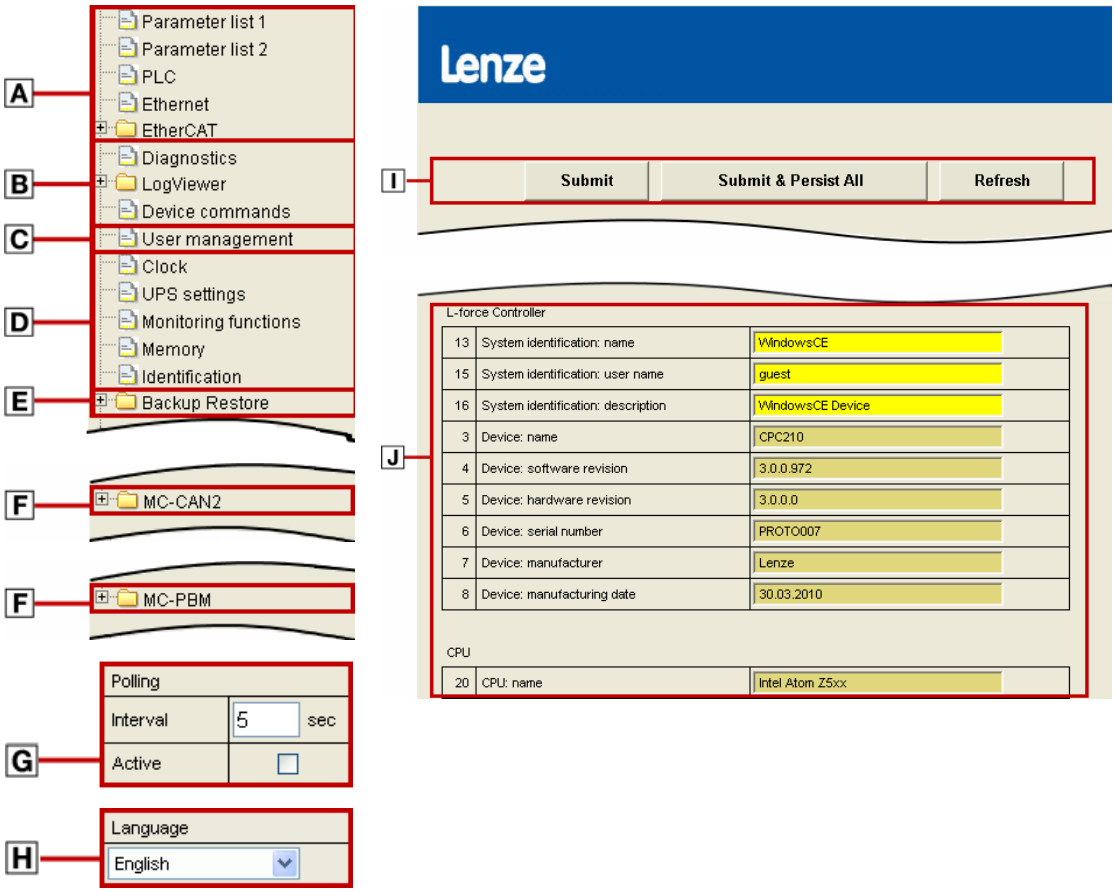
Start a browser at the Engineering PC and enter the IP address of the controller.



1. Enter **<User name:password>**. As default setting, **admin:admin** is preselected. Any user set up on the controller can log in.
   ▸ User management (📖 66)
2. Confirm with **OK** .
3. Afterwards, »WebConfig« is visible.
   ▸ User interface of »WebConfig« (📖 59)

6.5 User interface of »WebConfig«

The user interface of »WebConfig« is divided into the following areas A - J:



Note!

The representation of the user interface in area F depends on the respective system configuration!

Range		Information
Menu buttons	A	Device parameters of the controller (📖 61) • **Parameter list 1**: All parameters of the standard device • **Parameter list 2**: All parameters of the installed communication cards • PLC parameters • Ethernet (on board) parameters • EtherCAT parameters
	B	Diagnostic/device commands (📖 62) • Logbook parameters • Logbook of the controller • Device commands
	C	User management (📖 66) ... for settings of the users 1 - 10
	D	General parameters (📖 66) • Time • UPS settings • Monitoring functions • Memory • Diagnostics
	E	**»Backup & Restore«** ... for carrying out a backup, restore or software updates Detailed information regarding the parameters of the »Backup & Restore« can be found here: ▸ Backup & Restore (📖 183) Further information on how to carry out a backup, restore or software updates can be found in the »Backup & Restore« software manual.
	F	Parameters of the communication cards (MC cards) (📖 67) **Note:** • The represented parameters of slots 1 and 2 depend on the corresponding communication cards that are installed! • The additional buttons for the actually installed communication cards are automatically added to the menu buttons. • The top-down order of the buttons corresponds to the order in which the communication cards have been installed (slot 1, slot 2). Detailed information regarding the parameters of the communication cards can be found here: ▸ Parameter reference (📖 142)
	G	Polling (📖 67)
	H	Language selection (📖 67)
Buttons	I	Parameter list buttons (📖 67)
Display range	J	**Parameter display** Depending on the selected menu button, the parameters can be viewed in this area. • Parameter numbers • Name of the parameter • Representation of the display, entry, selection, control and list fields.

Depending on the equipment of the controller, deviating components are shown by use of the menu control fields.

Detailed information on the parameters of the Controller can be found here:

▸ Basic parameters of the Controllers (📖 146)

Representation of parameter values

In the display area of »WebConfig«, settings of device parameters are represented with different background colours which have the following meaning:

Colour	Example	Meaning
Pale yellow	1,2345	Parameter (read only) • Display of status information and actual values.
yellow	1,2345	Parameter (read and write) • The current parameter value of the device is displayed. Changes with regard to a parameter have to be transmitted to the device with **Accept** or **Accept & Save All**.
red	0	Entry of a value beyond the valid range • Via **Refresh** the original value is shown again. • A correct value can be entered in the red input field and transmitted to the device with **Accept** or **Accept & Save All** .

In the following the individual menus of the web-based parameterisation »WebConfig« are described.

6.5.1 Device parameters of the controller

Button	Function
Parameter list 1	Displays all parameters of the standard device of the controller in numerically ascending order. This user interface helps you to e.g. ... • find system properties and version numbers (read-only parameters); • set the system time; • Activate the USB connection at the front of the monitor panel. ▸ Basic parameters of the Controllers (📖 146) The other menu buttons of the areas Ⓐ, Ⓒ and Ⓓ are a filtered view of parameter list 1.
Parameter list 2	Displays all parameters of the installed communication cards in numerically ascending order. The top-down order of the parameters corresponds to the order in which the communication cards have been installed (slot 1, slot 2). Detailed information on the parameters of the communication cards can be found here: ▸ Parameter reference (📖 142) **The other menu buttons of area Ⓔ are a filtered view of parameter list 2.**
PLC	Displays the PLC parameters in numerically ascending order. From this user interface can e.g. be seen: • PLC status • Information on a PLC project Detailed information on the parameters of the PLC can be found here: ▸ PLC (Logic/Motion) (📖 181)
Ethernet	Displays the Ethernet parameters in numerically ascending order. On this user interface, the network settings of the network connection are displayed/set. Detailed information on the Ethernet parameters can be found here: ▸ Ethernet (📖 187)
EtherCAT	Displays the EtherCAT parameters (information on EtherCAT master and EtherCAT slaves). Detailed information on the EtherCAT parameters can be found here: ▸ EtherCAT (📖 189)

6.5.2 Diagnostic/device commands

Button	Function
Diagnostics	Displays parameters of the following areas: • Diagnostics • Logbook In the *Logbook* area you can configure settings regarding the **Logbook**. Further information on remote maintenance options of the Controller can be found here: ▸ Remote maintenance and diagnostics (📖 91)
Logbook	Displays logbook contents. • Different filter settings display, for instance, only the oldest or only the most recent logbook entries. ▸ Logbook (📖 63)
Device commands	Displays the commands of the Controller to be executed. The available commands can be found in the following section under **18** (C0018) ▸ Basic parameters of the Controllers (📖 146)

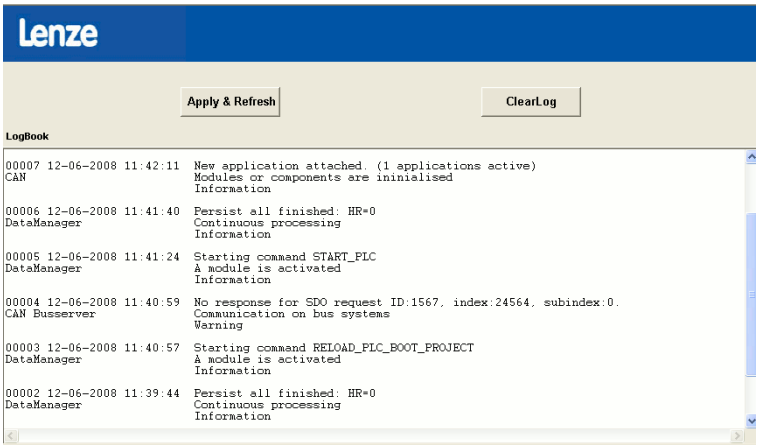
6.5.3 Logbook

This user interface displays the logbook information of the Controller.

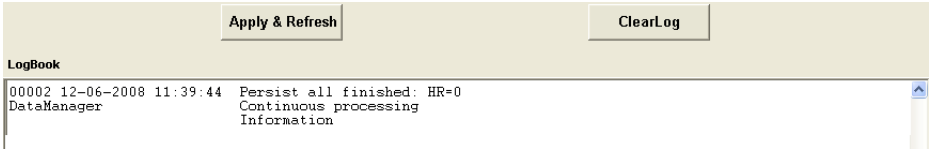
The logbook offers various filter options to systematically display specific logbook contents.

Note!

If the **ClearLog** button is clicked, the entire logbook contents of the controller are deleted without further query!



6.5.3.1 Structure of a logbook entry: example

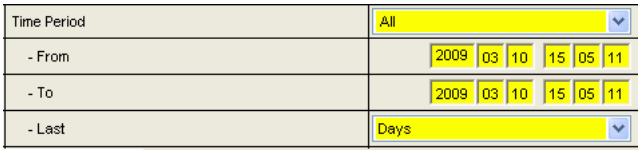


Logbook entry, example	Meaning
00001	Consecutive number of the entry
2009-03-24 14:45:26	Date (year/month/day) and time (hour/minute/second) on the Controller when the logbook entry was made
Log service	Application that has triggered the entry (application)
Logbook deleted	Description of the event
Continuous processing.	Event origin within the application (area)
Warning	Severity of the event

6.5.3.2 Filter options

Section	Information
Logbook	Display logbook entries ▸ Structure of a logbook entry: example (📖 63)
Time period	Select filter for the time period of the logbook entries shown • The logbook will only display entries which are in the selected time period.
Application	Set filter for the application • The logbook will only display entries for the selected applications.
Severity	Set filter for the severity of the error messages displayed • The logbook will only display entries that correspond to the severity selected. • The "Information" severity is deactivated by default. In order to show all logbook entries, the "Information" option is to be activated
Range	Set filter for the origin of the event • The logbook will only display entries that correspond to the selected area.

6.5.3.3 Time filter for the display of logbook entries



Range	Filter option	Function
Time period	1: All	Display all entries
	2: From - to	Filter entries according to date specified
	3: Last	Display last entries only. Possible filter options: • 1: Days • 2: Weeks • 3: Months • 4: Years
-from	Time zone: • Date (year/month/day) • Time (hour/minute/second) **Example**: 10th March 2009, 15.05 hours, 11 seconds: **UTC 2009 03 10 15 05 11**	Date specification for filtering the entries to be displayed • Starting date from which the entries are to be displayed
-to	Time zone: • Date (year/month/day) • Time (hour/minute/second)	Date specification for filtering the entries to be displayed • Target date up to which the entries are to be displayed
-last	1: Days 2: Weeks 3: Months 4: Years	Display entries according to filter options. • To activate this filter option, in the Time period area of the selection list the **last** item must be selected!

6.5.3.4 Saving log files with mains failure protection

The log files are persisted automatically at certain events.

▸ Diagnostics with the logbook (📖 101)

You can also persist the log files manually by means of the »EASY Starter« and »WebConfig«.

How to proceed:

1. Click the **Device commands** button.
2. Select the entry "1282: Persist logbook" from the **Commands** list field.
3. Click the **Accept** button.

   OK appears in the "Status" field.

6.5.3.5 Exporting logbook entries

How to export the logbook entries to a text file (without using the »EASY Starter«):

1. Establish online connection to the controller.

   ▸ Entering the IP address of the controller (📖 38)
2. Available logbook entries can be seen on the **Logbook** tab.
3. Click the **ExportLog** button in the header of the logbook to export the logbook entries to a file.

   The contents of the logbook is exported to a German (*_de) and English file (*_en) to the memory card in the directory `\USBStorage\export\log` (with 3200 C/p500) or `\sdcard\export\log` (with c300/p300).

   The directory is already preinstalled on the SD card by default.

   Notes:
   - The contents of the logbook can also be exported to a USB stick (connected to the Controller). To be able to export the contents of the logbook to the USB stick, create the `\export\log` subdirectory manually on the USB stick prior to export.
   - The execution of an **ExportLog** is entered into the logbook as "information". Entries of the "information" type can only be seen in the logbook if the corresponding filter options are set in the **logbook**.

Export logbook entries via device command

The logbook export can also be started by writing to command parameter **18** (C0018) via PLC or »VisiWinNET®«.

In the section **Device commands** (parameter 18), execute the **304: Export complete logbook** command to export the logbook entries.

6.5.4 Device commands

In this area, the available device commands of parameter **18** (C0018) can be executed.

Parameter **19** (C0019) shows status information relating to the executed command.

▸ Basic parameters of the Controllers (📖 146)

Saving parameters of the controller

The parameters of the controller can be saved with the **Persist all data** device command.

How to proceed:

1. Click the **Device commands** button.
2. Select the entry "279: Persist all data" from **Commands** list field.
3. Click the **Accept** button.

   OK appears in the "Status" field.

6.5.5 User management

This section sets up the Windows® CE users (users 1-10) and defines their access authorisations.

Button	Function
User management	Set up Windows® CE user, enter user-specific data • Enter user name and password, and the home directory. • Enter access authorisation of the user. Standard value for user 1: **admin:admin**

6.5.6 General parameters

Button	Function
Clock	Displays the parameters for setting the time, date, system time, and time zone.
UPS settings	Shows the UPS settings for the parameterisation of the UPS (provided depending on the device/with UPS option).
Monitoring functions	Displays hardware/temperature data.
Memory	Displays information on program/Flash memories.
Diagnostics	Displays information on system diagnostics.

6.5.7 Parameters of the communication cards (MC cards)

Basically we distinguish between parameters of the on-board interfaces and parameters of the communication cards.

This area of »WebConfig« displays the parameters of the installed communication cards. The following communication cards can be used:

- MC-ETH (Ethernet)
- MC-ETC (EtherCAT)
- MC-CAN2 (CAN)
- MC-PBM (PROFIBUS master)
- MC-PBS (PROFIBUS slave)
- MC-PND (PROFINET device)
- MC-ISI (serial interfaces RS-232/422/485)

A communication card can be equipped with several interfaces, such as the MC-CAN2 communication card.

Detailed information regarding the parameters of the communication cards can be found here: ▸ Parameter reference (📖 142)

6.5.8 Polling

This menu can be used to activate the automatic, interval-controlled update of the screen contents:

Polling	
Interval	5 sec
Active	☐

Interval:
Specify period of time in seconds, defining the intervals in which the screen content is automatically updated.
Sample value '5': Update is carried out every 5 seconds.

Activation:
Tick the checkmark (☑) to activate the automatic update.

6.5.9 Language selection

The desired language settings can be selected in the *Language* section.

The language settings take immediate effect.

6.5.10 Parameter list buttons

Button	Function
Apply	Accept data. After a system restart changed data is lost, as it is not persisted automatically.
Accept & Save all	Accept and save all changed data. The data will remain on your PC after a system restart.
Build	Reload data and update screen content.

7 Programming with the »PLC Designer«

This chapter provides you with general information on the programming of the control function of the controller.

The »PLC Designer« is a Lenze Engineering tool for the creation of PLC programs according to IEC 61131.

The following programming languages can be used:

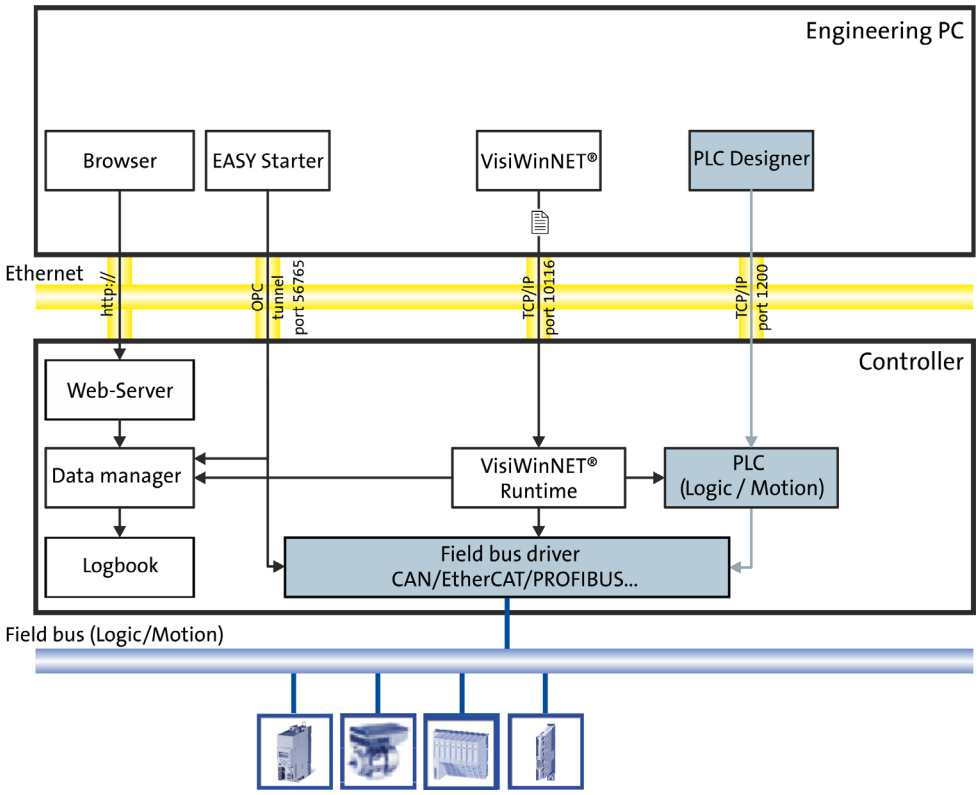
- Instruction list (IL),
- Ladder diagram (LD),
- Function block diagram (FBD),
- Structured text (ST),
- Sequential function chart (SFC),
- Function block diagram (CFC).

The completely created and compiled PLC program can be transferred to the controller by means of the »PLC Designer«.

The PLC program can then be executed on the Controller using the "Runtime" or "Motion" Lenze FAST application software (📖 30).

7.1 System structure

Install the »PLC Designer« on the Engineering PC. Via Ethernet, the »PLC Designer« accesses the Controller:



7.2 Function blocks

The »PLC Designer« contains function blocks which enable the PLC program to directly access the parameters of the Controller and the connected field devices.

Parameters which can be accessed are ...

- device parameters or logbook entries of the Controller;
- device parameters of the field devices (example: Servo Inverter i700).

Memory sizes of the Lenze Controllers

Memory area/data	Controllers	Value
Total RAM memory (Program memory/data memory)	3221 C 3231 C 3251 C	2 GB DDR3-RAM
	3241 C	1 GB DDR2-RAM
	c300	512 MB DDR3-RAM
	p300	
	p500	2 GB DDR3-RAM
Retain and persistent data	3221 C 3231 C 3251 C	60 kB
	3241 C	1 MB (with external battery pack/capacitor pack)
	c300	128 kB
	p300	
	p500	1 MB
Fixed memory (flash)	4 GB	
Flag	4 kB	
Maximum number of tasks	32	
Shortest task time	3221 C 3231 C 3241 C 3251 C	1 ms (default setting: 4 ms)
	c300	**EtherCAT:** 4 ms (a 2 ms reserve of which cannot be used.) **CAN:** 10 ms (a 5 ms reserve of which cannot be used.)
	p300	
	p500	1 ms (default setting: 4 ms)
Watchdog monitoring time (Lenze standard setting)	3221 C 3231 C 3241 C 3251 C	3.2 ms
	c300	10 ms
	p300	
	p500	3.2 ms
Maximum input / output area	8 kB	

Windows® operating systems of the Lenze Controllers

Operating systems					
Cabinet Controller	**c300**	**3221 C**	**3231 C**	**3251 C**	**3241 C**
	Windows® Embedded Compact 7	Windows® CE 6.0			Windows® Embedded Standard 2009
Panel Controller	**p300**		**p500**		
	Windows® Embedded Compact 7		Windows® CE 6.0		

The operating systems and the PLC applications use the available RAM memory area of the Controller together (see above).

7.3 Configuring and parameterising the controller using the control application

For the creation of a control application, Lenze provides function blocks in standardised libraries (e.g.: motion functions according to PLCopen). Further function blocks can for instance be used to access controller parameters.

By means of the »PLC Designer«, the compiled PLC program has to be loaded to the controller via Ethernet, where it processes the operating system.

Information regarding the commissioning, configuration, and diagnostics

More information regarding the commissioning, configuration, and diagnostics of the Controller can be found in these **communication manuals**:

- Controller-based Automation EtherCAT®
- Controller-based Automation CANopen®
- Controller-based Automation PROFIBUS®
- Controller-based Automation PROFINET®

7.4 Controller c300/p300: Access to odd Controller addresses

Note!

Due to the processor type (Cortex™-A8), write/read access of variables is only possible to memory addresses that are divisible by the variable size.

Examples:

- When variables of the DWORD/DINT data type are accessed (read/write), the memory address must be divisible by 4.
- When variables of the WORD-/INT data type are accessed (read/write), the memory address must be divisible by 2.

Access to other memory addresses causes exception handling of the runtime (exception).

Different response of the PLC program (3200 C/p500 and c300/p300)

1. In the case of the Controllers 3200 C/p500 with x86 processors, unlimited access to the memory addresses is possible. Due to the different processor (Cortex™-A8), PLC programs cause exception handling of the runtime on the Controllers A8c300/p300, although they run without fault on the Controllers 3200 C/p500.

```
PROGRAM PLC_PRG
VAR
   aByteArray : ARRAY [0..20] OF BYTE;
   dwDword    : DWORD;
   wWord      : WORD;
   pDwordPtr  : POINTER TO DWORD;
   pWordPtr   : POINTER TO WORD;
END_VAR

// Prerequisite: pDwordPtr is divisible by 4
// DWORD-access to an address which is not divisible by 4 => crash on ARM
// processor
pDwordPtr := ADR(aByteArray[2]);
dwDword := pDwordPtr^;

// WORD-access to an address which is not divisible by 2 => crash on ARM
// processor
pWordPtr := ADR(aByteArray[1]);
pWordPtr^ := wWord;
```

2. In the case of many functions/function blocks, a pointer is transferred to a byte array and then the content of the byte array is for instance interpreted as DWORD. This requires manual conversion before the data are used:

```
PROGRAM PLC_PRG
PROGRAM PRG_Logic
VAR
   mySDO_READ : CIA405.SDO_READ4;
   aReadData  : ARRAY [1..4] OF BYTE;
   dwDword    : DWORD;
END_VAR

mySDO_READ(NETWORK:= 1,
           ENABLE:= TRUE,
           TIMEOUT:= 10000,
           CONFIRM=>,
           ERROR=> ,
           DEVICE:= 1001,
           CHANNEL:= 1,
           INDEX:= 16#5FE7,
           SUBINDEX:= 0,
           DATA=> aReadData,
           DATALENGTH=>,
           ERRORINFO=>);

// Manually create a DWORD from a Byte array
dwDword := aReadData[1]
           + 256 * aReadData[2]
           + 65536 * aReadData[3]
           + 16777216 * aReadData[4];
```

General information on how to use pointers can be found in the "Pointer" section.

7.5 Creating remanent variables (retain/persistent)

Retain variables ...

- are variables of the PLC which are automatically saved by the controller in the case of a voltage failure.
- are variables which are necessary to restart the production process.

The values of a drive system which cannot be read out from the machine due to the lack of a sensor system should be persistent. These values should also be persistent if the corresponding value only changes through the influence of the PLC.

Examples

Temperature: Changes, requires a sensor system

Position: Selection preferably via absolute value encoder

Number of parts within buffer inventory: Reasonable for RETAIN.

```
VAR RETAIN
    remvar1: INT; (* 1st remanent variable*)
END_VAR
```

Persistent variables ...

can be created in the device tree in the »PLC Designer«:

Right-click **Application → New object → Persistent variables**.

```
VAR_GLOBAL PERSISTENT RETAIN
    uiPerRetain : ARRAY[0..1000] OF UNIT; (* declaration of the persistent variable*)
END_VAR
```

7.6 Storing retain data on the SD card (only Controllers 3221 C/3231 C/3251 C)

In the case of Controllers 3221 C, 3231 C, and 3251 C, by default, the values of the retain variables are only stored in the device.

In order to avoid a loss of the retain data, or in order to provide for further use of the data (e.g. if the device is replaced), save the retain data on the SD card of the Controller. For this purpose, use the **L_Util_Retain** function from the **L_Util.lib** library.

Note!

- The SD card is only suitable for storing retain data if the RETAIN values do not change very often.
- It is not possible to save the RETAIN values to the SD card during every PLC cycle.
- SD cards only have a limited number of write/read cycles. Thus, the retain variables should not be saved at very short time intervals.
- Please avoid calling the **L_Util_Retain()** function in a motion task. The creation of the RETAIN file prolongs the current PLC cycle of the calling task by several 100 ms.
- The **SysSaveRetains()** and **SysRestoreRetain()** functions included in the **SysPlcCtrl23.lib** library are not supported and must not be used.

Program example for the use of the L_Util_Retain() function

```
PROGRAM PLC_PRG

VAR
        FB_LUtilRetain: L_Util_Retain;
        xRetainsIntoFile_LUtilRetain: BOOL;
        instSetRetainValues: SetRetainValues;
        xSetRetain: BOOL;
        xStoreRetains_LUtilRetain: BOOL;
END_VAR
```

When being called, the **L_Util_Retain()** function saves the retain/persistent variables to the SD card to the **retains.ret** file (directory: `IPC\PLC`).

Re-use of the retain data after a device replacement

- Plug the SD card of the Controller that has been replaced into the new device.
- The boot application starts with the retain values saved last by the **L_Util_Retain()** function.
- When the PLC is started, the retain file is generated once. In order to generate the retain file again or to generate it manually, the **xStoreRetains** input must be set to TRUE.

▸ Subsequent use of retain data on the new Controller (📖 89)

8 »Backup & Restore« (data backup/restore)

»Backup & Restore«

The Lenze »Backup & Restore« software makes it possible to ...

- create backups (data backup);
- restore backups (data recovery);
- the installation of updates.

The Lenze software »Backup & Restore« is only available for the Lenze control technology.

Documentation for the Lenze »Backup & Restore« software

More information can be found in the software manual (PDF) or in the online help of the Lenze »Backup & Restore« software.

9 »EASY Starter - Application Loader« (data transfer)

»EASY Starter - Application Loader«

The Lenze software »EASY Starter - Application Loader« makes standard set-up easier.

This software serves to transmit PLC programs, parameter sets, and application data (LFL file) to the Lenze Controller from the PC.

Note!

When the application data is downloaded, the retain data gets lost.

Export PLC programs/application data in the »PLC Designer«

In the »PLC Designer«, you can export the PLC program or the application into an LFL file using the **Project → Export L-force Loader file** menu command.

10 UPS function (backup in case of voltage failure)

Thanks to the UPS function (uninterrupted current supply), the Controller is provided with a backup function. If the supply voltage fails, the user data (retain variables, logbook data) is saved before the device is switched off.

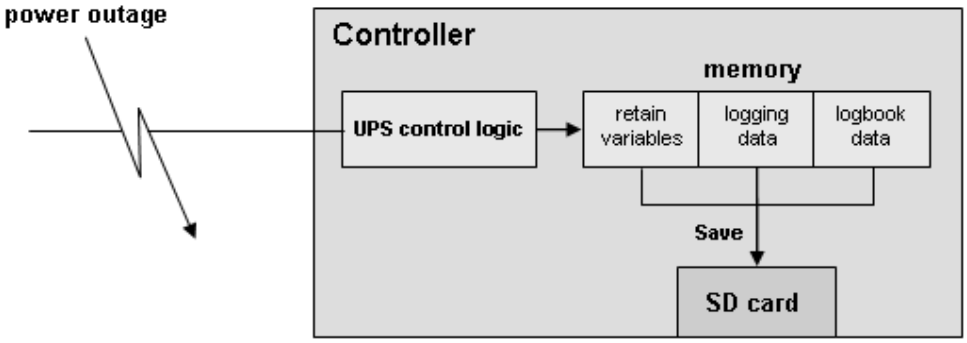
In order to minimise the power input during the buffer time and increase the safety in the buffer times, circuit sections that are not required can be switched off in case of a supply voltage failure (e.g. supply of the backplane bus, supply of the devices connected to the USB ports).

Controllers	UPS functionality via ...	Memory for backup files
3221 C	Internal capacitor for the short-time buffering of data	MRAM (Magnetoresistive Random Access Memory)
3231 C		
3251 C		
3241 C	External capacitor pack (CAPS-PACK)	Memory card
c300	Internal capacitor	
p300		
p500		

10.1 Internal UPS (for Controllers without UPS connection)

In case of a voltage failure, retain/persistent variables, logbook data and visualisation data (e.g. trends alarms) are saved.

Controllers **3221 C**, **3231 C**, and **3251 C** are provided with an internal buffer capacitor for short-time buffering of the data.



Controllers **c300**, **p300**, and **p500** are equipped with a high-capacity, internal UPS for the storage of data in the event of a voltage failure. This makes external energy storage dispensable. Voltage fluctuations cannot be compensated for.

The UPS behaviour of the internal UPS is preset. Parameter setting is not possible or required.

10.2 External UPS (for Controllers 3241 C with UPS connection)

The Controllers 3241 C provide for the connection of an external capacitor pack (CAPS-PACK) to the X9 socket. Like this, voltage fluctuations of up to five seconds can be compensated.

In the case of a voltage failure, the external UPS saves the following content to the memory card of the Controller 3241 C:

- Retain/persistent variables of the PLC
- Logbook data
- Visualisation data (e.g. trends, alarms)

When the data have been saved, the PLC stops. The log service does not accept any further log messages and deactivates itself.

The UPS behaviour of the external UPS can be parameterised via »WebConfig«:

▸ Parameter setting using the »WebConfig« (📖 56)

Detailed information on the parameters of the UPS can be found here:

▸ Voltage buffering by external UPS (optional for Controller 3241 C) (📖 174)

10.3 Storage of »VisiWinNET® Smart« visualisation data

Controllers **3221 C**, **3231 C**, and **3251 C** cyclically save »VisiWinNET® Smart« visualisation data (user-specific trends, alarms, recipes) every 60 seconds. After a voltage failure, the visualisation data saved are not exactly up to date.

In the event of a voltage failure, the Controllers **3241 C** store the »VisiWinNET® Smart« visualisation data (user-specific trends, alarms, recipes) exactly isochronously to the SD card.

In the event of a voltage failure, Controllers **c300**, **p300**, and **p500** store the »VisiWinNET® Smart« visualisation data (user-specific trends, alarms, recipes) exactly isochronously to the memory card. This is made possible by the high-capacity UPS that is integrated.

10.4 Storage of retain/persistent variables of the PLC

For the storage of retain/persistent variables, a defined storage capacity is available:

Controllers	Storage capacity
3221 C 3231 C 3251 C	60 kB
3241 C	1 MB (with external capacitor pack (CAPS-Pack))
c300	128 kB
p300	128 kB
p500	1 MB

Tip!

You can create retain variables in the »PLC Designer« by marking the variables with the keyword `RETAIN`.

Further information on how to create retain variables in the »PLC Designer« can be found here:

▸ Creating remanent variables (retain/persistent) (📖 75)

11 RTC function (Real Time Clock)

The operating system receives the CMOS-RTC time via a maintenance-free clock chip.
In case of the Controller 3200 C, the CMOS-RTC time is stored internally for at least 14 days.
In case of the Controllers c300, p300 and p500, the internal storage lasts for at least 28 days.
Afterwards, the time needs to be reset manually via the »WebConfig« (parameter 91).
A battery is not required.

12 Replacing the Controller (in the event of service)

Which replacement device is suitable for the Controller?

Principally, a defective Controller can only be replaced by a device of the same product type.

Panel Controllers of the same product type but with different screen diagonals can be exchanged against each other. If the mounting dimension is to be identical, use a Panel Controller with identical screen diagonal.

The replacement device has to be provided with the same features such as integrated communication cards and connections.

Defective Controller	Replacement device						
	3221 C	3231 C	3241 C	3251 C	c300	p300	p500
3221 C	●	●	-	●	-	-	-
3231 C	-	●	-	-	-	-	-
3241 C	-	-	●	-	-	-	-
3251 C	-	-	-	●	-	-	-
c300	-	-	-	-	●	-	-
p300	-	-	-	-	-	●	-
p500	-	-	-	-	-	-	●

●: compatible
-: incompatible

12.1 Removing the connected (defective) Controller

Danger!

High electrical voltage

Injury to persons caused by dangerous electrical voltage

Possible consequences

Death or severe injuries

Protective measures

Switch off the voltage supply before working on the components of the automation system.

After switching off the voltage supply, do not touch live device parts and power terminals immediately because capacitors may be charged.

Observe the corresponding information plates on the device.

Mounting instructions for the Controller and I/O system 1000 (EPM-Sxxx)

Please observe ...

- the safety instructions contained therein;
- the information provided on mounting/dismounting.

How to remove the connected controller:

1. Switch off the voltage supply of the entire system and the Controller.
2. Remove the supply connections, bus connections and all other connections from the Controller.
3. When an I/O system 1000 (EPM-Sxxx) is connected to the Controller:

   Remove the first electronic module of the I/O system.
4. Dismount the Controller.
5. Remove the SD card from the card slot.

12.2 Connecting the new Controller/replacement device

How to connect a new Controller:

1. Insert the SD card of the removed Controller into the new one.
2. Mount the new Controller.
3. Optional: Mount and connect the electronic module of the I/O system 1000 (EPM-Sxxx).
4. Connect supply connections , bus connections and all other connections to the Controller.
5. Switch on voltage supply.

   The Controller starts the **automatic update**:
   - The data of the SD card of the defective Controller such as an executable boot project and a visualisation are reused in the replacement device. Thus, a quick commissioning is possible.
   - The progress of the update process can be followed in the logbook of the Controller and is also indicated by the Status LEDs of the Controllers (📖 92).

Note!

Prevent voltage failure

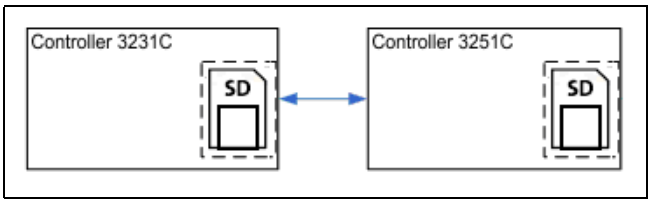
A voltage failure during the update aborts the process.

During the next system start the update process will automatically restart.

Free memory location is required on the memory card

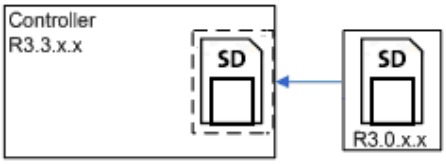
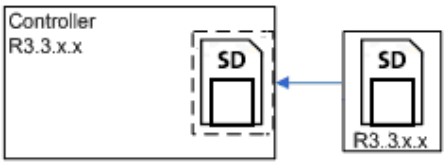
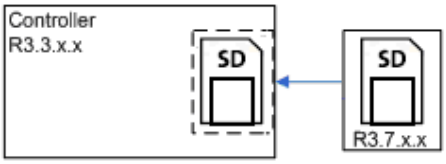
The controllers require an SD card for operation.
- For a successful data update, the memory card of the Controllers must be provided with a sufficient amount of free memory space.
- Guide value for the size of a backup file:
  size of the data to be updated **+ 1 MB**

12.3 Device replacement against an incompatible replacement device (exceptional case)



[12-1] **Example:** Incompatible replacement device

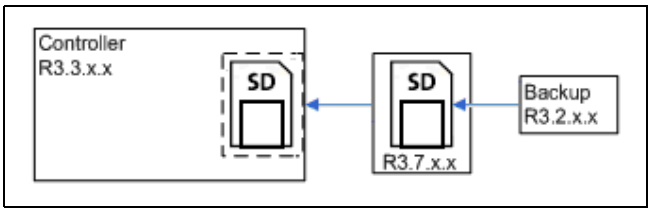
If a device replacement involves an incompatible replacement device, an error message will be entered into the logbook of the Controller.

Scenario (version of replacement device/SD card)	Description
The firmware version of the replacement device is higher than the software version on the SD card. **Example:**  	This is the standard case. • The controller's version is more up-to-date than the software version on the SD card of the replaced/ defective controller. • Automatic data update is started.
The firmware version of the replacement device is identical with the software version on the SD card. **Example:**  	The data remains unchanged since a data update is not required.
The firmware version of the replacement device is lower than the software version on the SD card. **Example:**  	This is no case of application for an automatic data update. • An automatic update is only possible if the software version is identical or more up-to-date. • Remedy: Update the Controller firmware. Use a USB stick to update the Controller. Further information on the update is provided in the documentation on the Lenze »Backup & Restore« software.

12.4 Undo update of data (exceptional case)

In the event of an accidental update, the initial state (version before the update) can be restored manually if a suitable backup is available.

An "accidental" update takes place if an SD card has been plugged into a Controller which is not scheduled for replacement.



[12-2] **Example:** Undo update manually (exceptional case).

Copy the contents of the backup directory to the basic directory of the SD card:

- 3200 C/p500: `\USBSTORAGE`
- c300/p300: `\sdcard`).

12.5 Subsequent use of retain data on the new Controller

Note!

Depending on the used controller, the retain data may no longer be available after a voltage failure/device replacement.

- Controllers **3221 C**, **3231 C** and **3251 C** save the retain data internally (in the device, i.e. not on the SD card). The retain data of the replacement device therefore correspond to the output values (default values).
- Controllers **3241 C**, **c300**, **p300**, and **p500** save the retain data on the SD card.

How to proceed with Controllers 3221 C, 3231 C, and 3251 C:

In order to be able to use the retain data after a device replacement, ...

- save the desired data to the SD card from the application;
- restore the desired data from the application.

Further information on the use of retain variables.

▸ Creating remanent variables (retain/persistent) (📖 75)
▸ Storing retain data on the SD card (only Controllers 3221 C/3231 C/3251 C) (📖 75)

12.6 Error messages after a device replacement

Message	Information / remedy
`Backup/restore cannot be copied. Not enough free memory on the data medium.`	The installed SD card has not enough free memory space to execute a safety backup. Delete non-required data from the SD card and try it again.
`The replacement device is not compatible with the original device. Device migration was not successful.`	In order to replace a device, the devices have to be compatible. ▸ Replacing the Controller (in the event of service) (📖 84)
`Inserted SD card has higher version than the system. Please update the controller first.`	Update the Controller firmware. Afterwards, you can replace the device. ▸ Device replacement against an incompatible replacement device (exceptional case) (📖 87)
`Error while creating the backup for device replacement. Please try again.`	An error has occurred while creating a backup. Please try again.
`Migration failed. Please check your configuration.`	The migration of the databases failed. Please contact your manufacturer.

13 Remote maintenance and diagnostics

This chapter contains information regarding the Status LEDs of the Controllers (📖 92) and the various diagnostics options for remote maintenance:

- Diagnostics via Telnet (📖 96)
- Data transfer via FTP (📖 98)
- Activate Windows® CE interface (📖 104)
- Diagnostics with the logbook (📖 101)

Note!

Error case: Controller does not start

Information on error correction can be found here:

- Error case: Controller does not start (📖 37)

Tip!

Lenze Controllers can be diagnosed with »WebConfig« via web browser and by means of the »EASY Starter«.

13.1 Status LEDs of the Controllers

The Controllers are provided with LEDs which indicate the current operating status. Depending on the Controller used, the colouring of the LEDs may vary.

[13-1] Example: Cabinet Controller 3200 C

- **Power:** green/blue*, yellow
- **Error:** green, red
- **Status 1:** green, yellow
- **Status 2:** no function

* Device-dependent LED colour: either green or blue

Depending on the running software application, different control modes of the LEDs are possible.

Online help for »Backup & Restore«

Here, further information on the »Backup & Restore« specific LED signals can be found.

13.1.1 Status LEDs of the Controller 3200 C

LED Colour 1 / colour 2		Interval	Meaning
Power			
green		is lit constant	Starting sequence completed successfully. • Controller is switched on and is ready for operation. • Supply voltage OK. • System clock is synchronised. • No error pending.
yellow		is lit constant	The supply voltage has fallen below the minimum value. ▸ UPS function (backup in case of voltage failure) (📖 79) ▸ Voltage buffering by external UPS (optional for Controller 3241 C) (📖 174)
		blinking (2.0 Hz)	State after switch-on/restart or reset
green	yellow	blinking (5.0 Hz)	System clock is not synchronised" (missing time information). **Note:** If the Controller is switched off for more than two weeks, the time information set will be lost. • The next starting process generates a logbook entry (power LED blinking green/blue). • Set the current time manually via the »WebConfig« (parameter 91).
Only for Controller 3241 C:			
green		blinking (5.0 Hz)	Capacitor pack (CAPS-PACK) not fully charged. The length of the dark bar indicates the charge condition: • CAPS-PACK almost empty: long dark phase • CAPS-PACK almost full: short dark phase
green	yellow	blinking (5.0 Hz)	Error status of the capacitor pack (CAPS-PACK) UPS function not available, possible cause: • Connection to the CAPS-PACK interrupted. • CAPS-PACK not connected, cable break/short circuit.
Error			
red		blinking (5.0 Hz)	Error • Fatal error (Abort) • SD card not available/not inserted correctly. • No operating system licence available.
green	red	blinking (5.0 Hz)	Mains switching required.
			LED **"Error" and "Status 1"** flash simultaneously: • Controller in test mode • SD licence card with higher "Application Credit" required.
Status 1			
green		is lit constant	Operating status: • Controller is running. • PLC project is running.
		blinking (0.5 Hz)	Starting sequence of the Controller active.
green	yellow	blinking (0.5 Hz)	PLC project (e.g. the boot project) is loaded. After being loaded successfully, the LED is lit constantly green. Or user action required: • Load PLC project: PLC started, project is not running • Remove USB device.
			LED **"Error" and "Status 1"** flash simultaneously: • Controller in test mode • SD licence card with higher "Application Credit" required.

LED Colour 1 / colour 2	Interval	Meaning
Status 2		
-	-	No function

13.1.2 Status LEDs of the Controllers c300/p300

LED				Meaning
Power	**Error**	**Status 1**	**Status 2**	
is lit blue	Off	Off	Off	Starting sequence completed successfully. • Controller is switched on and is ready for operation. • Supply voltage OK. • System clock is synchronised. • No error pending.
is lit blue	Off	blinking yellow	Off	Operating system is running and the control technology (PLC project) is started.
is lit blue	blinking red	blinking yellow	Off	SD card not available/not inserted correctly.
is lit yellow	Off	Off	Off	Input voltage has fallen below a minimum value (voltage failure). The UPS function is triggered. ▸ UPS function (backup in case of voltage failure) (📖 79)
blinking yellow	Off	Off	Off	State after switch-on/restart or reset
blinking blue/ yellow	Off	Off	Off	System clock not synchronised.
Off	Off	Off	Off	Reset has been triggered.
Off	blinking red/green	Off	Off	LED **"Error" and "Status 1"** flash simultaneously: • Controller in test mode • SD licence card with higher "Application Credit" required.
Off	Off	blinking green/ yellow	Off	PLC project (e.g. the boot project) is loaded. After being loaded successfully, the LED is lit constantly green. Or user action required: • Load PLC project: PLC started, project is not running • Remove USB device.

13.1.3 Status LEDs of the Controllers p500

LED				Meaning
Power	Error	Status 1	Status 2	
is lit blue	Off	Off	Off	Starting sequence completed successfully. • Controller is switched on and is ready for operation. • Supply voltage OK. • System clock is synchronised. • No error pending.
is lit yellow	Off	Off	Off	Input voltage has fallen below a minimum value (voltage failure). The UPS function is triggered. ▸ UPS function (backup in case of voltage failure) (📖 79)
blinking yellow	Off	Off	Off	State after switch-on/restart or reset
blinking blue/ yellow	Off	Off	Off	System clock not synchronised.
Off	Off	Off	Off	Reset has been triggered.
Off	blinking red/green	Off	Off	LED **"Error" and "Status 1"** flash simultaneously: • Controller in test mode • SD licence card with higher "Application Credit" required.
Off	Off	blinking green/ yellow	Off	PLC project (e.g. the boot project) is loaded. After being loaded successfully, the LED is lit constantly green. Or user action required: • Load PLC project: PLC started, project is not running • Remove USB device.

13.2 Diagnostics via Telnet

Telnet is a standard mechanism for experts to change system settings.

Telnet ...

- enables the access to the Controller data (example: Contents of the SD card);
- requires an existing local connection or remote connection.

Settings in the »WebConfig«

Telnet settings		
180	Telnet: use authentication	☑
181	Telnet: enabled	☑

The telnet settings can be configured via telnet parameters 180 and 181 by clicking the **Remote maintenance** button of the web-based parameterisation function.

- Parameter 180 activates authentication of the telnet user.
- Parameter 181 activates the telnet access to the controller.

Note!

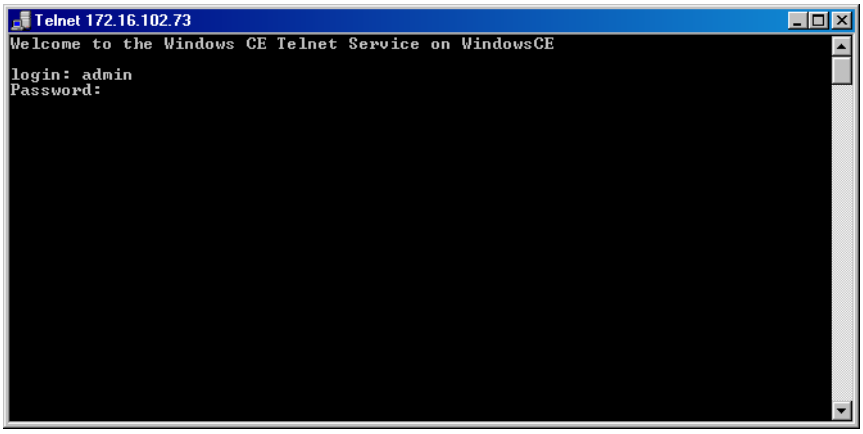
Access via telnet must only be used for diagnostic purposes. Changing system data may result in controller faults.

The corresponding Windows® CE user must have a telnet authorisation.

▸ Setting up Windows® CE users in »WebConfig« (📖 42)

Standard access data:

- Login: **admin**
- Password: **admin**



How to establish a telnet connection to the controller:

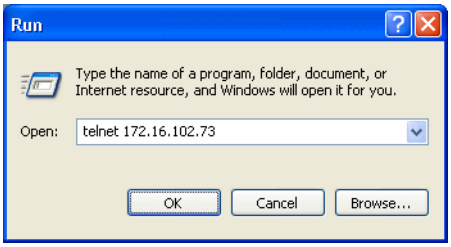
1. Start the command line on the PC with which you want to log in:

   Start button → Execute

2. Establish telnet connection to the Controller:

   Start **telnet <IP address>** of the Controller.

3. The user name and password for the authentication must correspond to the data stored in the user management (parameters 101 to 170).



13.3 Data transfer via FTP

The File Transfer Protocol (FTP) is a network protocol for the transmission of data within networks.

- FTP makes it possible to exchange files between the controller and other PCs.
- The controller data can be accessed via FTP connection.
- FTP requires an existing connection or a remote connection.
- In order to be able to transfer files with Windows® via FTP, the Windows® Explorer can be used which comes with an integrated FTP support.

Note!

FTP must be used for system-diagnostic purposes only. Deleting or changing system files causes malfunctions of the controller!

13.3.1 FTP settings with the »WebConfig«

The settings of the FTP connection can be managed via the web-based parameterisation. From parameters 171 to 174 the FTP access for the controller can be activated and user rights can be specified. Click the **Remote control** button to call the FTP settings:

FTP settings

171	FTP: use authentication	☑
172	FTP: allow anonymous	☐
173	FTP: allow anonymous upload	☑
174	FTP: enabled	☑

- Parameter 171 activates authentication of the FTP user,
- Parameter 172 enables log-on of the anonymous FTP user "Anonymous",
- Parameter 173 activates the upload of files by anonymous FTP users,
- Parameter 174 activates the FTP service.

The user management, the **User management** button, specifies the following:

- The Windows® CE users who may use the FTP access.
- Which authorisations the Windows® CE users have.

The access rights are required to establish a connection to the Controller via FTP.

Note!

Restart the FTP server to accept the changed settings: click the **Device commands** button.

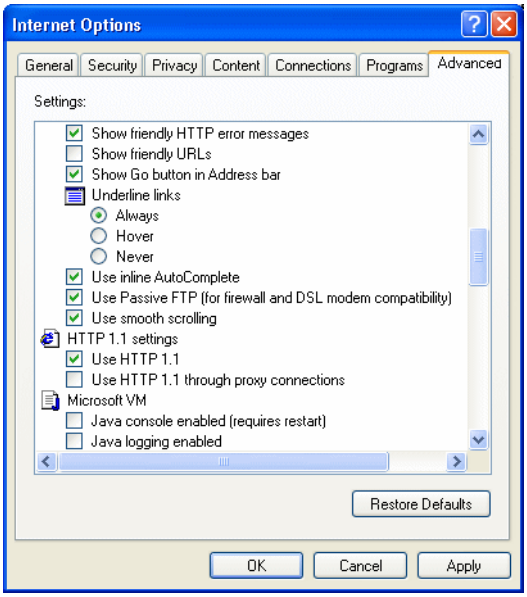
- Send the "Stop FTP server" command. The FTP server is stopped.
- Send the "Start FTP server" command. The FTP server is started with the changed settings.
- Send the "Update FTP server" command to update information to the FTP server.

13.3.2 FTP and web settings in the Internet Explorer

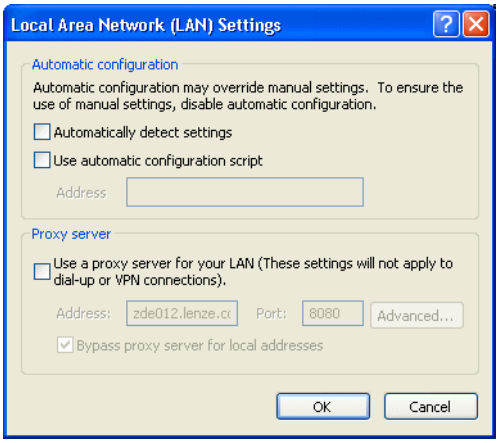
Note!

- You must change your browser settings to be able to establish an FTP / web connection to the controller.
- Your firewall settings may be blocking your access via FTP and HTTP. Change your firewall settings or deactivate your firewall.
- You need administrator rights to be able to change your firewall settings.

- Open browser settings via **Extras→Internet Options→Advanced**.
- Activate **folder view for FTP and passive FTP**.



- Open the settings for the local area network via **Extras→Internet Options→Connections→Settings** .
- Switch off proxy server or delete the Controller from the proxy settings.



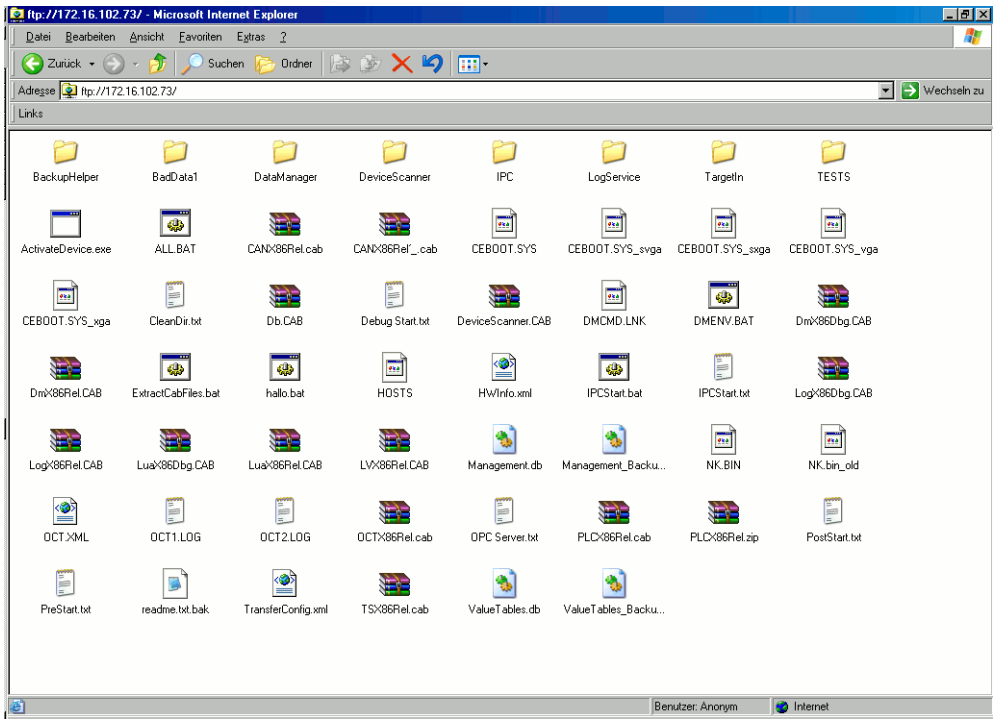
Note!

The settings for the local area network and the proxy settings depend on your own network settings on site.

How to start an FTP connection to the controller:

1. Select the file transfer protocol in the input line of the web browser or in the command line via **Start→Execute...**:
2. Enter **FTP://<user name>:<password>@<IP address>**.
   - The standard setting is **FTP://admin:admin@<IP address>**.
   - As an alternative, the IP address can also be entered directly: **FTP://<IP address>**
3. Enter the user name and password in the input window opening now.
4. When the entry is correct, click the **Log in** button.

   The Controller can now be accessed by the Engineering PC.



13.4 Diagnostics with the logbook

Lenze controllers are equipped with a logbook function which records system events and error messages. The entries in the logbook of the controller make it easier to diagnose the automation system if malfunctions occur.

The logbook of the controller...

- displays error messages and events of the applications;
- automatically stores the information on the SD card.

Structure of a logbook entry

Each logbook entry contains the following information:

- Numbering in ascending order
- Date / time
- Application triggering the logbook entry
- Severity of the event in four categories
  - Information
  - Warning
  - Error
  - Fatal error
- Area as the event origin of the error message triggered

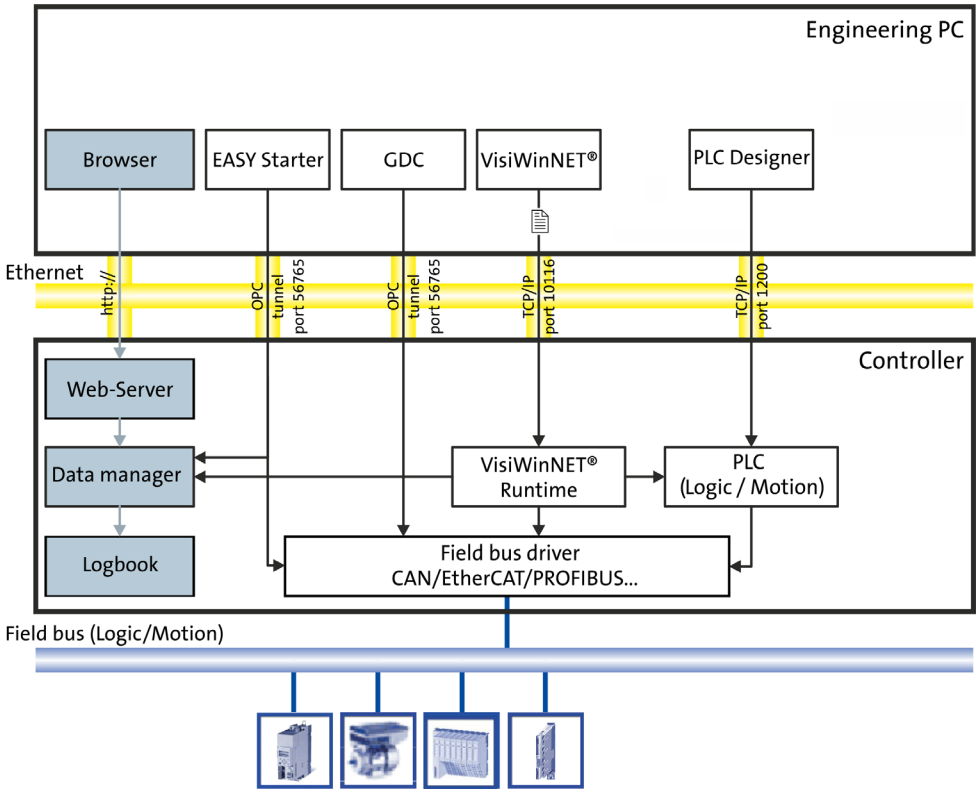
The logbook of the controller can be called via »WebConfig« and the »EASY Starter«:

▸ Logbook query via »WebConfig« (📖 102)

13.4.1 Logbook query via »WebConfig«

The logbook entries can be called via »WebConfig«.

- The browser of the Engineering PC accesses the web server of the controller via Ethernet connection (http://).
- The data manager of the Controller ensures the access to the logbook contents.



How to call the logbook in »WebConfig«:

1. Start your browser on the Engineering PC,
2. Enter the IP address of the controller: **http://<IP address>**,
3. Enter your user name and password,
4. Click the **logbook** button.

The logbook of the controller can be displayed via the **Logbook** button in »WebConfig«.

Note!

The **ClearLog** command deletes all logbook entries on your controller without further query!

Tip!

The display of the logbook entries can be filtered according to the period, application, severity, and area.

More information on how to use the logbook function in the »WebConfig« can be found here:

▸ Logbook (📖 63)

13.4.2 Logbook parameters

The logbook settings can be called in »WebConfig« via the **Diagnostics** button.

Further information on the parameters of the logbook (from parameter C0048) can be found here:

▸ Basic parameters of the Controllers (📖 146)

13.5 Activate Windows® CE interface

During normal operation the Windows® CE functions are hidden on the controller. All controller functions can be controlled via the Engineering PC.

For diagnostic purposes and maintenance activities you can use the standard functions of the controller operating system Windows® CE.

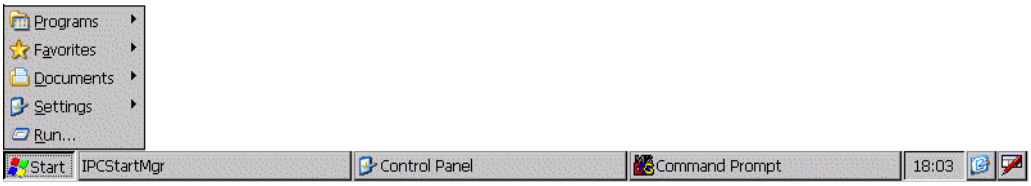
You can access the Windows® CE functions ...

- via the service mode if the Controller is operated directly, or ...
- via a telnet connection with the corresponding administrator rights.

How to activate the user interface of Windows® CE on the controller:

1. Start the control panel with **<Shift>+<F4>**.
   - The entry can be made via the on-screen keyboard or a keyboard that is optionally connected.
   - When the green LED is blinking, you can start the Control panel with function key **<F1>** on the monitor panel.
2. Start the **Service command** by double-click.
3. Activate the task bar by entering `explorer` in the command line box.

The taskbar facilitates the navigation by providing the basic functions of Windows® CE:



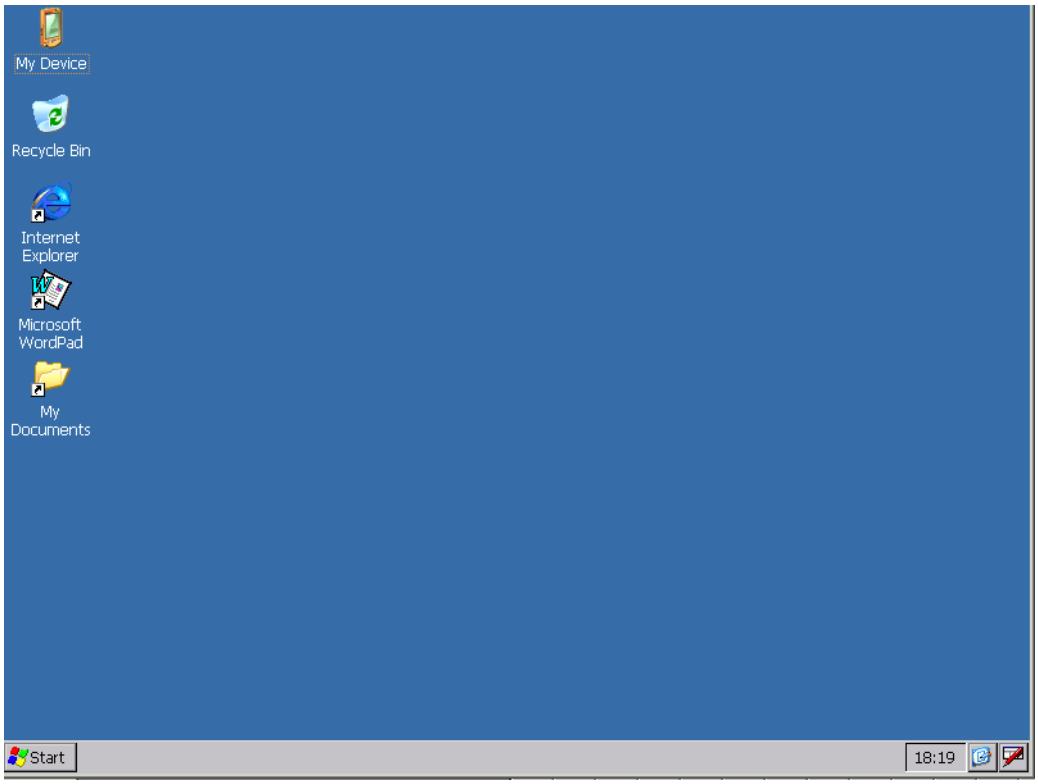
Note!

In order to be able to use a telnet connection, you have to provide a telnet authorisation to the corresponding Windows® CE user.

How to activate the user interface of Windows® CE via telnet:

Log in on the controller which requires a diagnostics via Diagnostics via Telnet.

- The standard settings of the Windows® CE User 1 are: User name: admin, password
- `explorer` activates the Windows® CE interface on the controller



13.5.1 Remote Display: Remote control of Controller via Internet or LAN

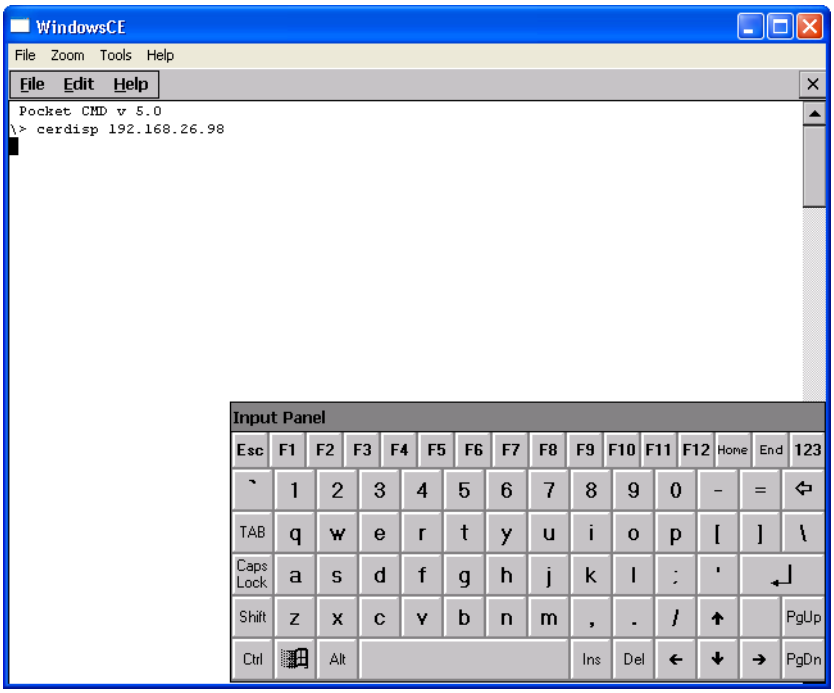
Remote Display Control for Windows® CE (cerhost/cerdisp)

The Engineering PC requires the "Remote Display Control" software (Cerhost.exe). It can be procured from the download area of the Lenze homepage:

www.lenze.com → **Download → Application Knowledge Base**

How to establish a remote display connection to the controller:

1. Identify the IP address of the Engineering PC, e.g. by means of the **IPConfig** command.
2. Start "Remote Display Control" (cerhost.exe) on the Engineering PC.
3. Start Cerdisp.exe on the Controller with the previously established IP address of the Engineering PC: **cerdisp <IP address>**



13.5.2 Virtual Network Computing (VNC)

For the Engineering PC, you need the "Virtual Network Computing" (VNC) software.

- VNC is preinstalled on the Controller. (directory: `\windows\VNC.exe`)
- VNC allows you to operate the controller by remote control from the Engineering PC. In this way, you will work on a remote PC as if you were sitting directly in front of the controller.

Conditions

- The controller is switched on and connected to the network/Internet.
- The VNC server is started on the controller.
- A VNC client (e.g. VNCviewer) is installed on the Engineering PC.

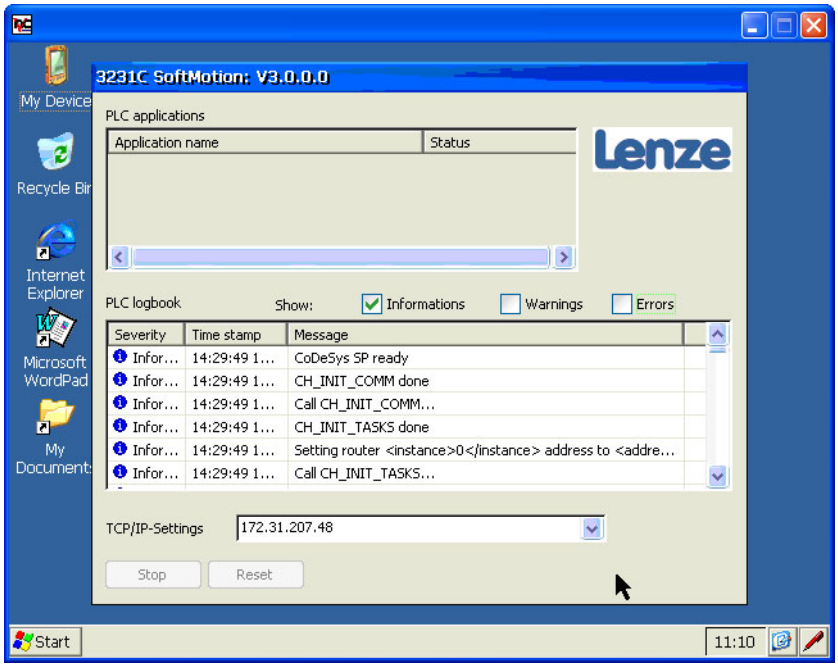
Note!

The VNC server is not protected by a password. To protect data from unauthorised access, the server should be deactivated whenever the connection is not needed.

How to establish a remote display connection to the controller:

1. Start the VNC server on the controller
   - In the »WebConfig«, set the "Activate VNC server" ☑ (CS 95) **or**
   - Execute the `\windows\VNC.exe` file
2. Start VNC client on the Engineering PC.
3. Enter the IP address of the controller.

   Tip: To display the IP address of the controller, go to the **Control Panel** (**Start→Settings→Control Panel**) of the controller and select "Network Connections".



13.5.3 Script commands in PreStart.txt/PostStart.txt

The script files **prestart.txt** and **poststart.txt** are automatically started by the system. The **prestart.txt** file is executed before the Soft PLC is started and the **poststart.txt** file is executed after the Soft PLC is started.

Automation Panel Script Control

This tool is a script engine for Windows® CE. In the following sections, the following functions and commands will be described in detail:

- Starting programs by the "Open" command
- Copying files and/or directories
- Starting the "Script control"
- System functions

The **IpcScriptCtrl.exe** program (with parameters) is started via the prompt.

Script files are text files in Unicode format. All Unicode files can be used as script by adding the path in the command line.

Example: `\Windows\IpcScriptCtrl.exe \storage\IpcScript.txt`

The first line of the script file must be a comment. Comments are marked by a preceding "`;`".

Example: `; This is a comment`

13.5.3.1 "Script control" functions

Note!

When using the functions, please note that entered text is case-sensitive.

Function/command	Description

Open	The open command is used like an ordinary instruction in the prompt.
	Syntax:
	`open "<source path\file>" "<parameter>"`
	Example:
	`open "\Storage\VWOPC\VWOPCDemoCE.exe" "/regserver"`
	• The VWOPCDemoCE.exe program in the VWOPC directory is executed with the "/regserver" parameter.
	• Directory path and parameter must be given in quotation marks.

mkdir	This command serves to create subdirectories in the main directory.
	Syntax:
	`mkdir <path>`
	Example:
	`mkdir "\VWOPCDemo"`

copy	This command is used to copy a file from a source directory to a target directory. The total source and target directory path must be given in quotation marks. The source file name does not need to be identical to the target file name.
	Syntax:
	`copy "<source path\file>" "<target path\file>"`
	Example:
	`copy "\VWOPC\VWOPCDemoCE.exe" "\VWOPCDemo\VWOPCDemoCE.exe"`
	`copy "\VWOPC\VWOPCDemoCE.exe" "\VWOPCDemo\Demo.exe"`

copypath	All files of a source directory are copied to a target directory. The total source and target directory path must be given in quotation marks.
	Syntax:
	`copypath "<source path>" "<target path>"`
	Example:
	`copypath "\Storage\VWOPC" "\VWOPCDemo"`

13.5.3.2 System functions

Note!

When using the functions, please note that entered text is case-sensitive.

Function/command	Description
SILENT	No output signals are sent to the console.
ENDMESSAGE	A message box is displayed at the end.

WAITFORRUNNINGPROCESS	This command causes a waiting until all programs are completed.
	The time is given in milliseconds.
	If no time is given, the script waits for a standard time of 30 seconds.
	Syntax:
	`WAITFORRUNNINGPROCESS <Time> <Program file>`
	Examples:
	`WAITFORRUNNINGPROCESS 7000 Test01.exe`
	• Maximally 7 seconds must pass until the "Test01.exe" program is completed.
	`WAITFORRUNNINGPROCESS Test02.exe`
	• Maximally 30 seconds must pass until the "Test02.exe" program is completed.

NOWAITFORPROCESS	This command does not cause a waiting for started programs to be completed.
	Syntax:
	`NOWAITFORPROCESS <Program file>`
	Example:
	`NOWAITFORPROCESS Test03.exe`
	• The script starts the "Test03.exe" program and proceeds the processing of the following commands without any waiting time.

WAIT	The script is interrupted for a certain time in ms.
	Syntax:
	`WAIT <time>`
	Example:
	`WAIT 1000`
	• The waiting time is 1000 ms.

BOOTSCREEN	Shows a blue overlaying message screen with a hidden mouse pointer. The message screen can only be closed with BOOTSCREEN OFF.
	Syntax:
	`BOOTSCREEN <Text>`
	Example:
	`BOOTSCREEN Loading Application...`
	• The "Loading Application..." message is displayed on the screen.

WAITFOREVENT	Waiting for an event signalised by an application.
	Syntax:
	`WAITFOREVENT <Event name>`
	Example:
	`WAITFOREVENT MYEVENT`
	• Waiting for an event with the "MYEVENT" name. The maximum waiting time is 30 seconds.

ENDEVENT	After script processing, an "APSCRIPTEND" event signalises that the script can be used in applications.

14 Visualisation with »VisiWinNET®«

This chapter provides you with some basic information regarding the use of »VisiWinNET®« in connection with the "Controller-based Automation" Lenze automation system.

»VisiWinNET®« ...

- is a visualisation software for mechanical and systems engineering.
- can be used to create complex visualisation applications, the possibilities range from classical operate and monitor functions through to sophisticated SCADA systems.

Online help for »VisiWinNET®«

Here, further information on the use can be found.

Licensing

The Controllers can be ordered with a factory-set licence which enables the use of »VisiWinNET®«.

The licence level installed can be found in »WebConfig« under: **Diagnostics → Licence**

14.1 Visualisation on the Controller: Local and remote

Note!

Controllers 3221 C, 3251 C, and c300

Controllers 3221 C, 3251 C, and c300 can only be accessed by a remote connection via »VisiWinNET®« as these devices do not have a display interface (DVI).

Controller 3231/3241 C and p500

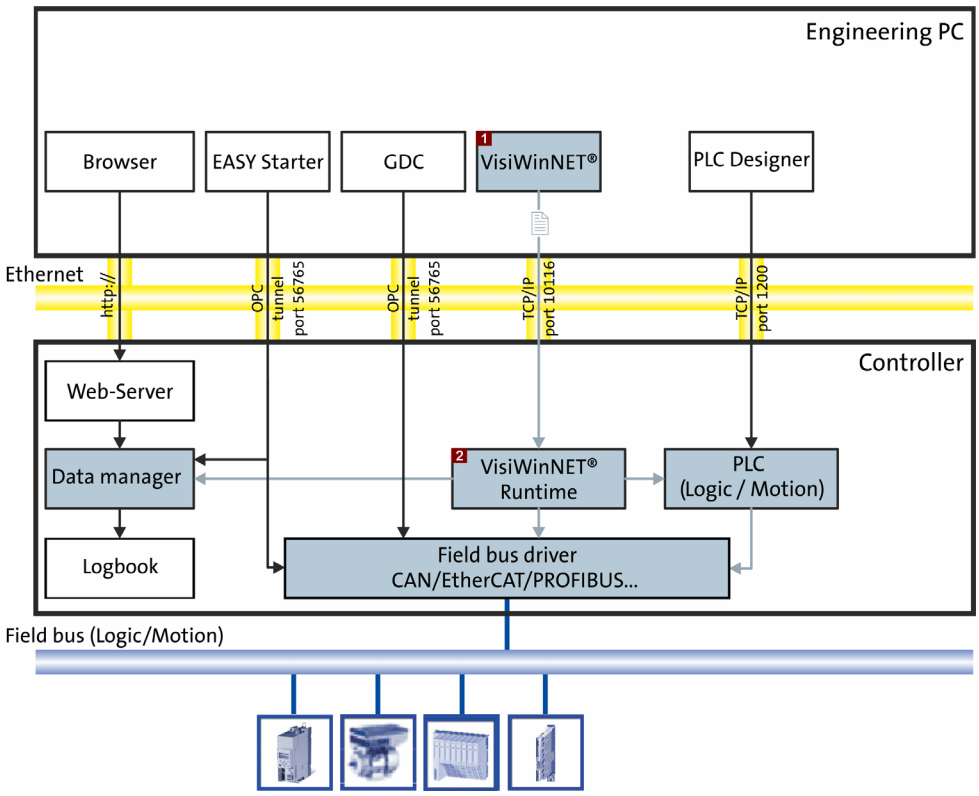
During the DHCP configuration with an unplugged Ethernet cable, the local visualisation cannot be operated for approx. 20 s.

A visualisation can either run **locally** on a controller, or via **remote** connection on an additional controller.

The following cases are distinguished:

- **Local visualisation - integrated control system**
  Controlling and visualising on the same Controller.
  The following runs on the Controller: »VisiWinNET®«-Runtime, PLC (Logic/Motion), the data manager and the fieldbus driver.
  Local visualisation can be carried out...
  - on a panel controller.
  - on a cabinet controller with a connection facility for a monitor panel.
- **Remote access - external visualisation**
  Control and visualisation on separate controllers.
  The »VisiWinNET®« runtime runs on a separate visualisation controller. This controller solely undertakes visualisation tasks. The external visualisation controller accesses the process data of an additional controller which controls the system.
  The control program runs on the first controller. The »VisiWinNET®« runtime runs on the second controller.
  - External "Visu" on the controller
  - External "Visu" on a Windows® XP or Windows® Embedded XP PC.

14.2 System structure



»VisiWinNET®« consists of...

- the »VisiWinNET®« engineering tool on the Engineering PC 1 and
- the »VisiWinNET®« runtime on the Controller 2.

By means of the »VisiWinNET®« engineering tool, you create the visualisations on the Engineering PC.

- »VisiWinNET®« executes the corresponding »VisiWinNET®« runtime of the Controller.
- By means of the »VisiWinNET®« **Remote Access Manager**, you transfer the visualisations to the controller.
  - Activate parameter 97 "*Activate VisiWinNET Remote Access* ☑" in »WebConfig« to start the **Remote Access Manager**.
  - TCP/IP serves as a standard for data transmission.
- The »VisiWinNET®« Runtime is able to access the following variables:
  - PLC variables (Logic/Motion),
  - parameters of the Controller (data manager)
  - Parameters of the devices (via the fieldbus driver).

14.3 Using the visualisation to access data of the control/parameters

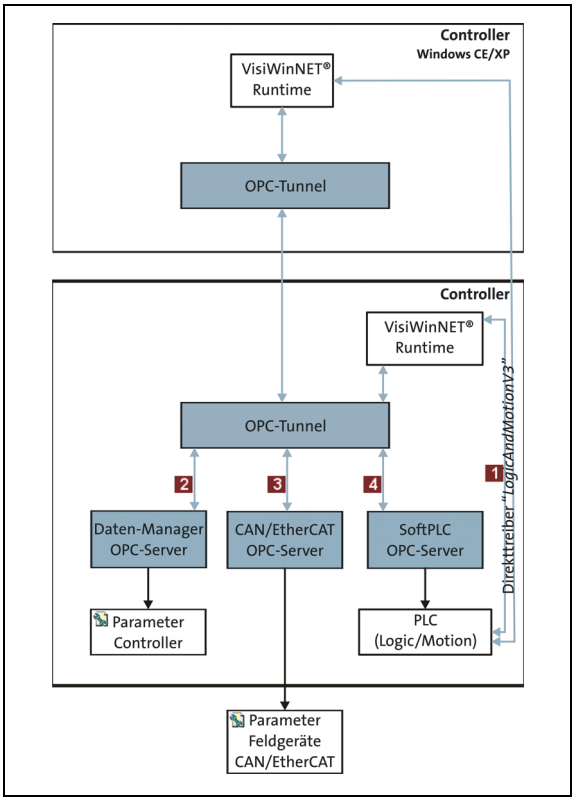
Variables of the PLC (Logic/Motion) can be accessed with the **"LogicAndMotionV3"**. Here, the »VisiWinNET®« Runtime may be on a local controller or on an external controller.

Note!

We recommend the use of the **"LogicAndMotionV3"** direct driver for easy commissioning.

▸ Local visualisation with the "LogicAndMotionV3" direct driver (📖 116)

There is no OPC server available for **PROFIBUS** and **PROFINET**.



Use the **"LogicAndMotionV3"** direct driver to access the following parameters:

- PLC (Logic/Motion) data
- Lenze recommends the use of the **"LogicAndMotionV3"** direct driver.
- Alternatively, you can access the following data via the OPC tunnel:
  - **Data Manager OPC-Server**
    → Controller parameters
  - **CAN/EtherCAT OPC server**
    → Field device parameters (CAN/EtherCAT)
  - **SoftPLC OPC server**
    → Variables of the PLC (Logic/Motion)

	Communication type / description	Access to ...
1	Direct driver **"LogicAndMotionV3"** (Recommended connection type!) ▸ Local visualisation with the "LogicAndMotionV3" direct driver (📖 116)	PLC (Logic/Motion) data
2	• Data Manager OPC tunnel • Data Manager Remote OPC tunnel (remote access)	Parameters of the Controller

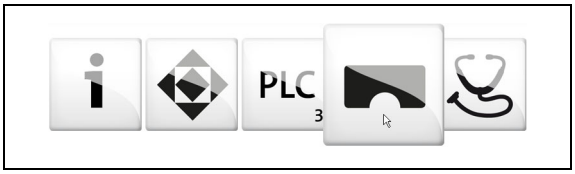
	Communication type / description	Access to ...
3	• CAN OPC tunnel • CAN Remote OPC tunnel (remote access) • EtherCAT OPC tunnel • EtherCAT Remote OPC tunnel (remote access)	Field device parameters at the CAN bus Field device parameters at the EtherCAT bus
4	**Note:** The **(Remote) SoftPLC OPC Tunnel** communication type requires a separate configuration of the controller (experts only - please contact Lenze if required!). • SoftPLC OPC tunnel • SoftPLC Remote OPC tunnel (remote access)	PLC (Logic/Motion) data

14.4 Local visualisation with the "LogicAndMotionV3" direct driver

We recommend the use of the **"LogicAndMotionV3**" direct driver for easy commissioning.

Start »VisiWinNET®«


Start the EASY »Navigator«



Start »VisiWinNET® Smart« by clicking the **Visualisation** button.

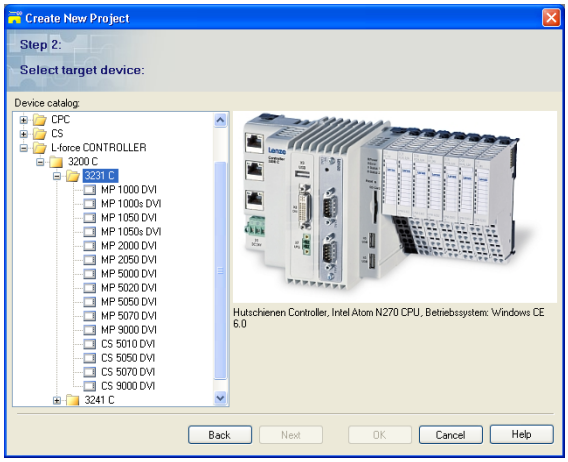
Note!

There is no OPC server available for **PROFIBUS** and **PROFINET**.

14.4.1 Selecting the target device using the Windows® CE operating system (example 3200 C/ p500)

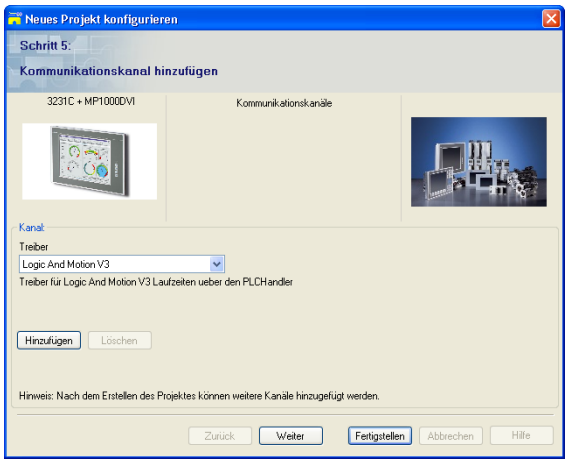
How to use the "LogicAndMotionV3" direct driver:

1. Execute the **File → New project** menu command to create a new project in »VisiWinNET®«.
2. Select the desired target device.

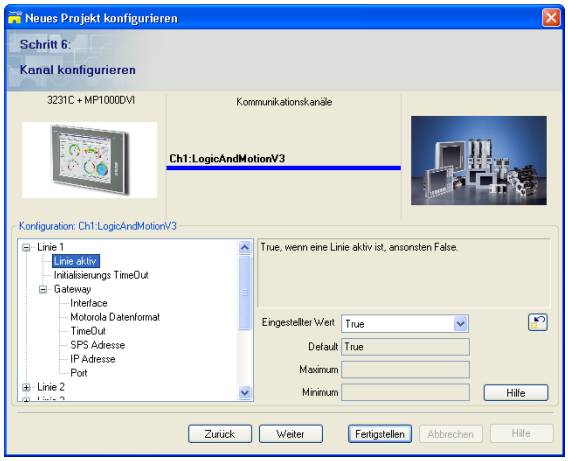


- Example: Controller 3231 C
- For cabinet controllers: select connected monitor panel.

3. Add the **"LogicAndMotionV3"** direct driver as communication channel.



4. Configure the communication channel added.



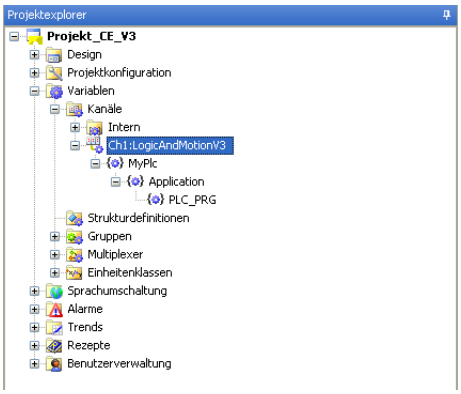
- Activate a **Line**.
- Specify the PLC address (node address) and IP address of the Controller. (Default IP address: 192.168.5.99)

Note: The PLC address can be found in the »PLC Designer« in the context menu of the device: **Device → Communication settings → IPC:Node address**

Further information on the configuration of the communication channel can be found in the »VisiWinNET®« online help. Click the **Help** button to call the online help.

5. In a next step you can do the following: Using the variables browser to access variables (📖 120).

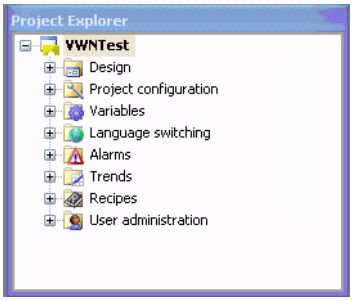
6. After completion of the project configuration, the Project Explorer is provided with a new channel: **"LogicAndMotionV3"**.



14.4.2 Project Explorer

The project Explorer enables central access to controller data in »VisiWinNET®«.

With the **View → Project Explorer** menu command, you open the project explorer.



14.4.3 Using the variables browser to access variables

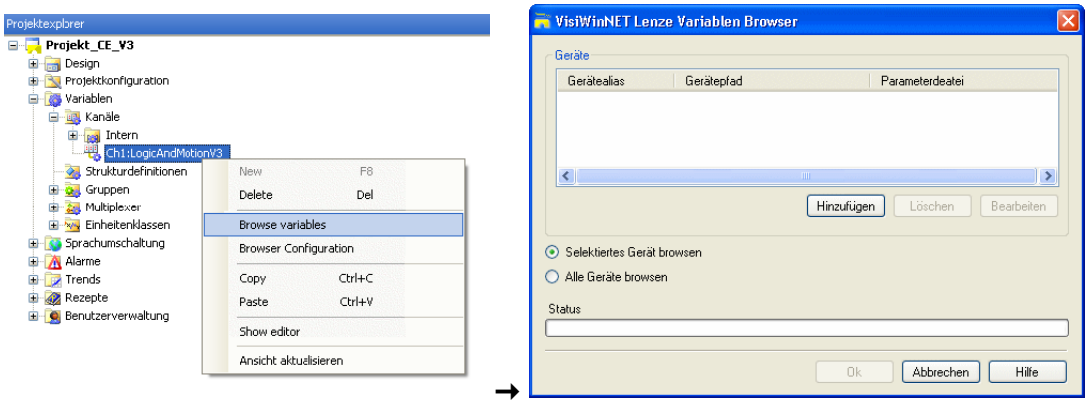
The variables browser can be used to browse for variables on the devices connected to the controller and to transfer them to a project subsequently. For this purpose, a connection between the integrated »VisiWinNET®« development environment and the controller is not required. The data is read from the locally available symbol description files, which have been exported from the »EASY Starter« in advance.

»PLC Designer« Online help

More information about this topic can be found in the "Icon configuration editor" section.

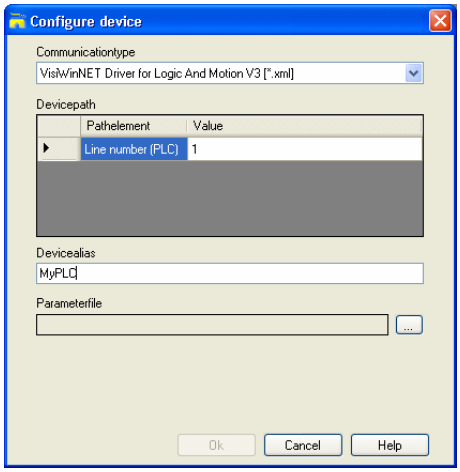
How to call up the variables browser:

1. Open the **Variables → Channels** folder in the Project Explorer.
2. Execute the **Browse variables** command in the context menu of the intended communication channel.



In the **VisiWinNET Lenze Variables Browser** dialog box, all available devices for reading variable definitions can be seen in the **Devices** selection list.

3. Click the **Add** button to select the desired communication type.



Required information:

- Line number set
- Device alias (freely selectable)
- Parameter file (XML icon configuration file exported from the »PLC Designer«)

▸ Browsing variable definitions (📖 129)

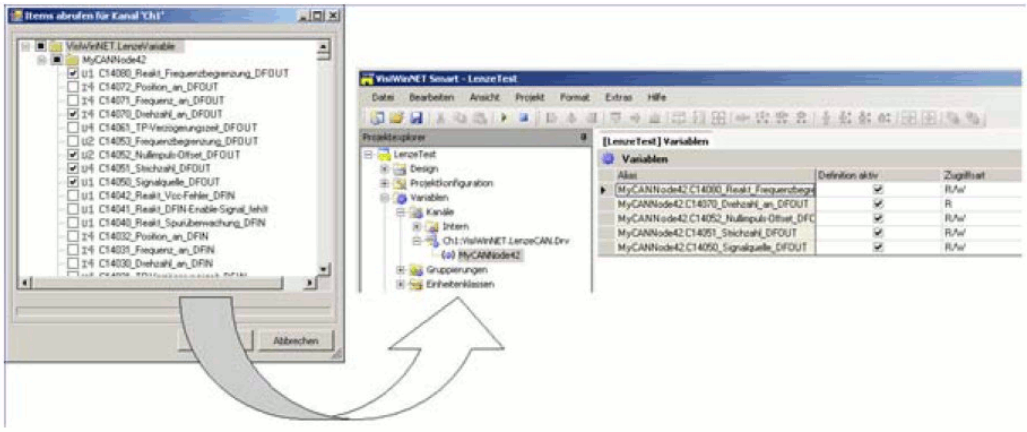
14.4.4 Accept variable definitions to project

You can transfer one or more "browsed" variable definitions to your »VisiWinNET®« project.

How to transfer the variable definitions to the project:

1. Highlight the desired device in the **Devices** selection list of the variables browser.
2. Click the **OK** button.

   A tree view of the read variable definitions appears.



3. Select the variable definitions required.
4. Click the **OK** button.

   The variable definitions are transferred to the project database.

14.4.5 Creating control elements/linking them to variables

A user /visualisation interface created with »VisiWinNET®« consists of different control elements (e.g. buttons, checkboxes and selection fields).

To be able to use control elements, the desired control elements must be linked to the available variables of the target device.

How to create control elements:

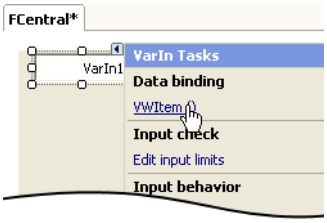
1. In the Project Explorer double-click an existing form in the **Design** folder.

   The "FCentral" form is created for a new project.
2. Open the tool box using the **View → Tool box** menu command or via the tab on the right of the screen.
3. Move the desired control elements using the **Tool box** via drag&drop to the desired position in the workspace.

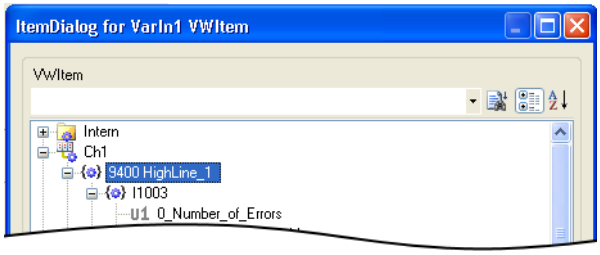
How to link control elements with variables:

1. Highlight the desired control element (example: `VarIn1`).

   Click the arrow icon ▶.



2. Click the **VWItem()** process variable to open the **ItemDialog**.
3. Select the desired variable from the tree structure.



4. Click **OK** to assign the variable to the control element.
5. Repeat steps 1 to 4 for all control elements.

14.4.6 Transferring an application to the target device

In order to be able to transfer an application to the target device, you have to start the »VisiWinNET®« Remote Access Manager.

For this purpose, activate parameter 97, "*Activate VisiWinNET Remote Access* ☑" in »WebConfig«.

Alternatively, the »VisiWinNET®« Remote Access Manager can be started via the user interface of an optional monitor panel:

1. Change to the service mode.

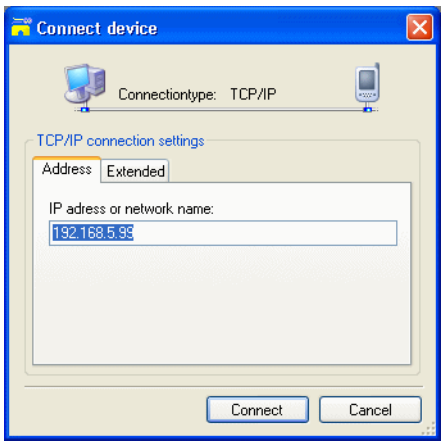
   Start the control panel: **F1** key on the monitor panel or key combination: **<Shift>+<F4>**
2. Double-click the **»VisiWinNET®« Remote Access** icon to start the Remote Access Manager.

How to transfer an application to the target device:

1. Go to the »VisiWinNET®« menu bar

   and select **Project → Transmit to target device**.

   The **Connect device** window appears.



2. Enter the **IP address or network name**.

   You can view and alter the IP address of the controller in the "Network Connections" program.

   ▸ Configuring the controller (📖 38)
3. Click the **Connect** button.

   The application is transferred to the target device.

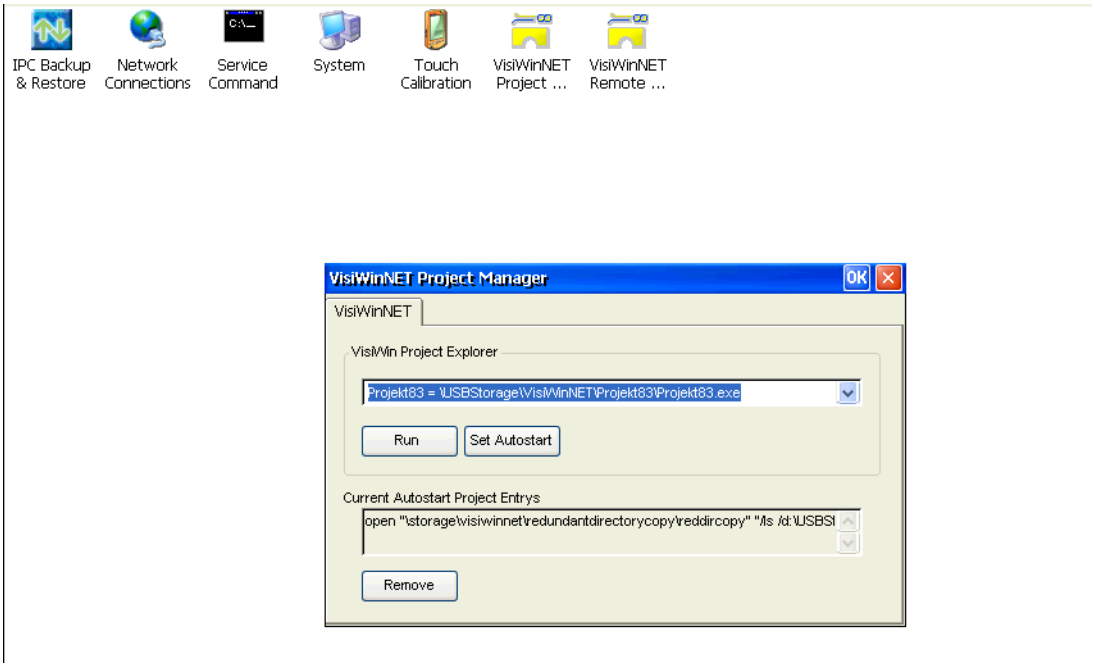
Note!

If the firewall of Windows®XP/7 is active, you have to enable a port for »VisiWinNET®«. In the standard setting this is port 10116.

14.4.7 Start the »VisiWinNET®«

The »VisiWinNET®« project manager manages the »VisiWinNET®« project data of the visualisation Controller (IPC).

Click the **»VisiWinNET®« Project Manager** icon to start the Project Manager.



[14-1] »VisiWinNET®« Project Manager on the controller (Windows® CE)

- Click the **Run** button to start the selected project. (Corresponds to the **Start project** command in »VisiWinNET®«)
- The **Set AutoStart** button sets the project as start project in »VisiWinNET®«.
  This will cause the controller to load this project automatically when the system is started.

14.5 Remote access with the "LogicAndMotionV3" direct driver

Select the target device (Windows® XP operating system)

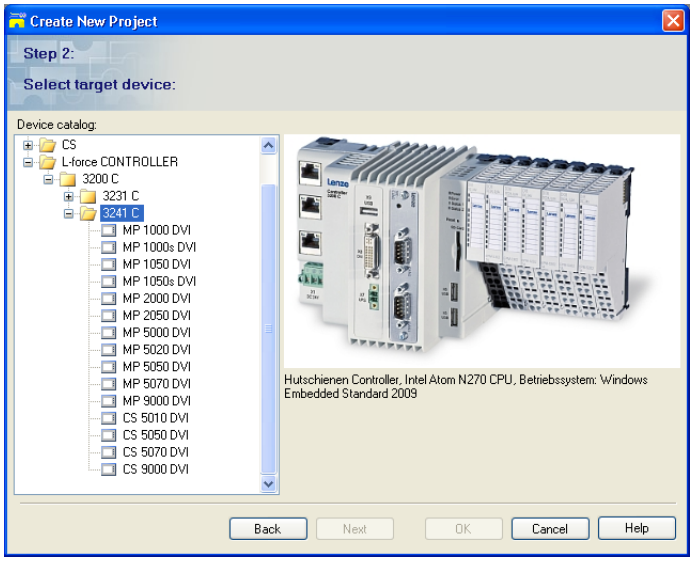
Use of the **"LogicAndMotionV3"** direct driver under »VisiWinNET® Smart«.

Note!

The access of external visualisations is limited to a maximum of 10 by the Controller.

How to use the direct driver:

1. Select new project with the desired target device, example: **Controller 3241C.**



   For cabinet controllers: select connected monitor panel.

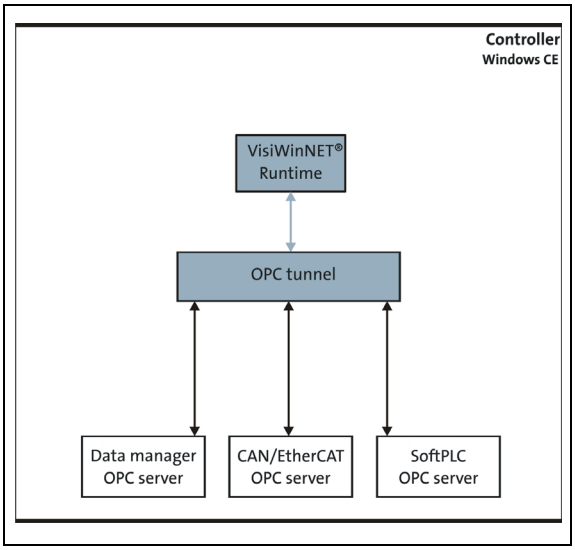
2. For the configuration of the **"LogicAndMotionV3"** channel, the address of the target device (Controller - control PC) has to be specified.
3. The further procedure is identical to steps 2 to 5 of the **"LogicAndMotionV3"** direct driver under Windows® CE:

   ▸ Selecting the target device using the Windows® CE operating system (example 3200 C/p500) (📖 117)

14.6 OPC tunnel for local visualisation (integrated control system)

Note!

There is no OPC server available for **PROFIBUS** and **PROFINET**.



[14-2] Local visualisation on a controller

- The local »VisiWinNET®« Runtime on the Controller uses the local **OPC tunnel** to access the respective **OPC server (Data Manager, CAN/EtherCAT, SoftPLC)** .
- For a local visualisation, the **OPCServer.ini** configuration file has to be adapted. The configuration file is on the memory card of the Controller in the directory `\USBStorage` (in case of 3200 C/p500) or `\sdcard` (in case of c300/p300).
  ▸ Configure OPC tunnel (📖 134)

14.6.1 Integrating the OPC tunnel in »VisiWinNET®«

The OPC tunnel is the communication channel between »VisiWinNET®« and the OPC servers of the controller. The desired OPC tunnel must be integrated into the project.

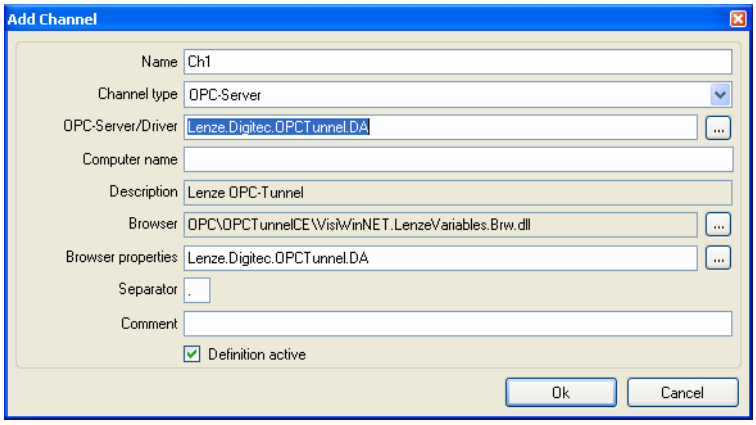
Note!

The OPC tunnel cannot be integrated by means of the menu navigation (during the creation of a new project).

Integrate the OPC tunnel by means of the Project Explorer. Then the OPC tunnel can be configured.

How to integrate the OPC server into the project:

1. Open the Project Explorer.
2. Select the **New** entry in the context menu of the **Variables → Channels** node.



   - Select "OPC server" as **Channel type**.
   - Select the **OPC server/driver** by clicking the button.
   - Select the Lenze OPC tunnel (**Lenze.Digitec.OPCTunnel.DA**).
3. Confirm your selection by clicking the **OK** button.

   The OPC tunnel can be selected in the Project Explorer.

14.6.2 Browsing variable definitions

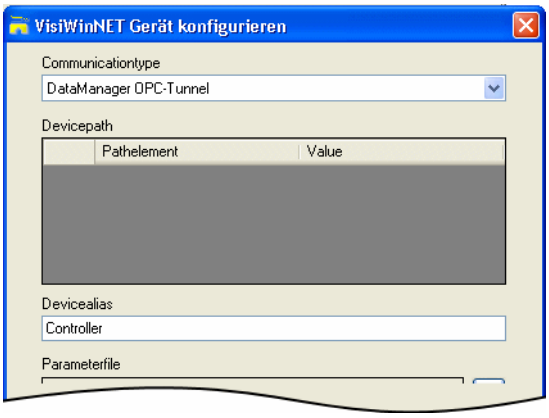
When you have started the variables browser, you can configure one or more devices and then import the variable definitions.

How to browse for variable definitions:

1. Click the **Add** button in the Lenze variables browser:

2. Select the communication type from the **Configure device** dialog box depending on the variables you want to access.

   ▸ Communication types (📖 130)



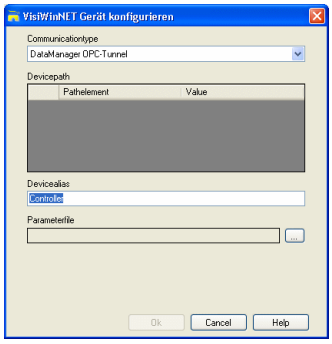
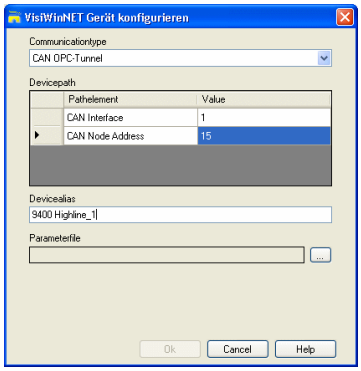
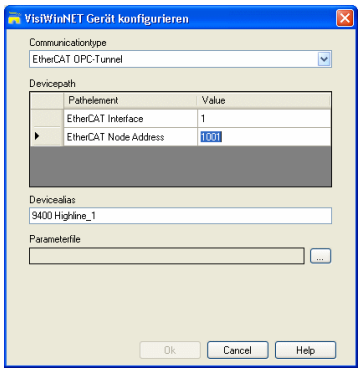
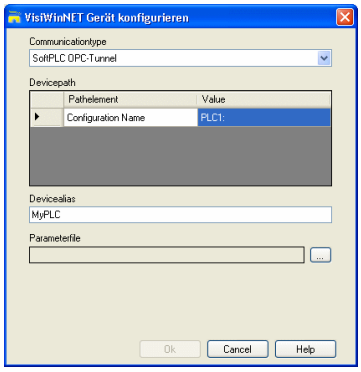
   - Select the desired **Communicationtype**.
   - Select the desired **Parameterfile** (variable definition file).
   - Click the **...** button to search for a parameter file on a data carrier.

3. Enter the name into the **Devicealias** text field (freely selectable).

   The device alias is a »VisiWinNET®«-internal name for the device.

4. Click the **OK** button.

Communication types

Communication type	Description
Data Manager OPC tunnel  	Required information: • Devicealias • Parameterfile Supported file formats: • Device description files (*.dcf, *.eds) **Suitable device description files (*.eds) for the Controller 32xx can be found in the Lenze Application Knowledge Base (AKB) under:** www.Lenze.com
CAN OPC tunnel  	Required information: • CAN interface (**CAN Interface**) • CAN node address (**CAN Node Address**) • Devicealias • Parameterfile Supported file formats: • Device description files (*.dcf, *.eds) • Parameter description (*.pdb) • »Global Drive Control« file(*.gdc)
EtherCAT OPC tunnel  	Required information: • EtherCAT interface (**EtherCAT Interface**) • EtherCAT address (**EtherCAT Node Address**) • Devicealias • Parameterfile Supported file format: • Device description files (*.dcf, *.eds) • Parameter file (*.pdb) • »Global Drive Control« file (*.gdc) **Note:** EtherCAT device description files (*.xml) are not supported!
SoftPLC OPC tunnel  	Required information: • The configuration name (**Configuration Name**) must be entered manually. Default value of the Controller: `PLC1` . **Note:** The configuration name must be identical to the specification in the **OPCServer.ini** file! • The **OPCServer.ini** file is on the memory card of the Controller (directory `\USBStorage` (in case of 3200 C/p500) or `\sdcard` (in case of c300/p300)). Supported file format: • Symbol file (*.sym) **Note:** XML symbol configuration files exported from the »PLC Designer« V3.x are not supported! ▸ Configure OPC tunnel (📖 134) ▸ Manual integration of variables (experts only - background knowledge required!) (📖 131)

14.6.3 Manual integration of variables (experts only - background knowledge required!)

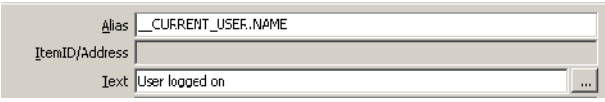
If no suitable parameter file is available, the Item ID can also be entered manually (as an alternative to the variables browser).

Depending on the server and type of connection (local or remote), a defined syntax must be observed (see below).

How to enter a variable manually:

1. Open the Project Explorer.
2. Activate the variable editor by double-clicking the desired channel in the **Variables → Channels** node.
3. Select the **New** entry from the context menu.
4. Enter the ItemID in the **ItemID/address** input field. Alternatively, enter the variable name in the variable editor.

   The given syntax of the Item ID must be observed!



Syntax of the Item ID

The ItemID must be used according to the table, depending on the desired OPC tunnel.

Data types used: ▸ Data types (📖 133)

Access to ...	Syntax of the ItemID
Data Manager OPC tunnel	1. Put the prefix, `<DM>`, in front. DM = "Data Manager". 2. The index results from 0x5FFF minus <*Code*> of the Data Manager. Example: (code = **5**): 0x5FFF - **5** = 0x5FFA = 24570 3. Specify the variable as follows: `DM.pari<0x5FFF` "minus" *Code*`>d<`*Data type*`>`. 4. If an additional reference to a subindex is provided, supplement the following entry: • **Example** with subindex "1": DM.pari24572**s1**d8
Data Manager Remote OPC tunnel	1. In the ItemID, put the prefix, `<RemoteIPC>`, in front. 2. Specify the variable as follows: `.pari<0x5FFF` "minus" <*Code*>`d<`*Data type*`>`. • **Example: `RemoteIPC.DM.pari24572d8`** 3. If an additional reference to a subindex is provided, supplement the following entry: • **Example** with subindex "1": **`RemoteIPC.`**`DM.pari24572`**`s1`**`d8`
CAN OPC tunnel	• Put the prefix, `CAN`, in front of the variable: `CAN.can<`*Number of the CAN interface*`>.dev<`*Device CAN address*`>.pari<0x5FFF` "minus" *Code*`>d<`*Data type*`>` • **Example** (CAN interface 2, CAN address 18, code 1, subcode 2, data type unsigned INT): **`CAN.can2.dev18.pari24576s2d17`**

Access to ...	Syntax of the ItemID
CAN Remote OPC tunnel	1. In the ItemID, put the prefix, `<RemoteIPC>`, in front. 2. Specify the variable as follows: `CAN.can<`*Number of the CAN interface*`>.dev<`*Device CAN address*`>.pari<0x5FFF` "minus" *Code*`>d<`*Data type*`>`. • **Example** (CAN interface 2, CAN address 18, code 1, subcode 2, data type unsigned INT): **`RemoteIPC.CAN.can2.dev18.pari24576s2d17`**
EtherCAT OPC tunnel	1. Put the prefix, `ECAT`, in front of the variable. 2. Specify the variable as follows: `ECAT.ecat1.dev<`*Device address*`>.pari<0x5FFF` "minus" *Code*`>d<`*Data type*`>` • **Example** (EtherCAT address 1001, code 1, subcode 2, data type unsigned INT):**`RemoteIPC.ECAT.ecat1.dev1001.pari24576s2d17`**
EtherCAT Remote OPC tunnel	1. In the ItemID, put the prefix, `<RemoteIPC>`, in front. 2. Specify the variable as follows: `.ecat1.dev<`*Device address*`>.pari<0x5FFF` "minus" *Code*`>d<`*Data type*`>`. • **Example** (EtherCAT address 1001, code 1, subcode 2, data type unsigned INT):**`RemoteIPC.ECAT.ecat1.dev1001.pari24576s2d17`**
SoftPLC OPC tunnel	1. Put the prefix, `<PLC.PLC1.>`, in front of the variable. **Note:** The prefix, `PLC1`, must be identical to the specification in the **OPCServer.ini** file! • The **OPCServer.ini** file is on the memory card of the Controller (directory `\USBStorage` (in case of 3200 C/p500) or `\sdcard` (in case of c300/p300)). 2. Specify the variable as follows: `<`*Application*`>.<POU>.<`*Symbol name*`>`. • **Example**: **`PLC.PLC1.Application.PLC_Prg.`***`My_Variable`*
SoftPLC Remote OPC tunnel	1. In the ItemID, put the prefix, `<RemoteIPC>`, in front. 2. Specify the variable as follows: `<RemoteIPC> <PLC.PLC1.>` + `<`*Application*`>.<`*POU*`>.<`*Symbol name*`>`. • **Example**: `RemoteIPC.PLC.PLC1.Application.GVL.byGlobalByte`

Data types

The following data types are available for query:

Data type		Description
»VisiWinNET®«	OPC tunnel	
VT_BOOL	d11	Truth value (TRUE/FALSE)
VT_BSTR	d8	String STRING
VT_DATE	d7	Date / time format
VT_EMPTY	d0	The data type is not specified. • This data type is e.g. returned if no process variable has been specified.
VT_I1	d16	Integer 1-byte value; signed (-128 ... 127)
VT_I2	d2	Integer 2-byte value; signed (-32768 ... 32767)
VT_I4	d3	Integer 4-byte value; signed (-2147483648 ... 2147483647)
VT_INT	d22	Integer value; signed; machine type-dependent
VT_R4	d4	Floating-point number simple accuracy (4 bytes)
VT_R8	d5	Floating-point number double accuracy (8 bytes)
VT_UI1	d17	Integer 1-byte value; unsigned (0 ... 255)
VT_UI2	d18	Integer 2-byte value; unsigned (0 ... 65535)
VT_UI4	d19	Integer 4-byte value; unsigned (0 ... 4294967295)
VT_UINT	d23	Integer value; unsigned; machine type-dependent

14.6.4 Configure OPC tunnel

The OPC tunnel ...

- permits »VisiWinNET®« access to the OPC servers of the Controller
- "tunnels" all accesses via a special Ethernet port and hence offers the possibility of remote access by security systems.

Note!

If the Windows® XP firewall is activated, the port (standard setting: port 56765) needs to be activated for the OPC tunnel!

The OPCServer.ini configuration file

Note!

- The **OPCServer.ini** configuration file contains parameters which must be observed/ edited if the SoftPLC OPC server is to be used for communication.
- After edition of the configuration file, the Controller must be restarted for the changes to take effect.

To be able to access the SoftPLC OPC server, the ...

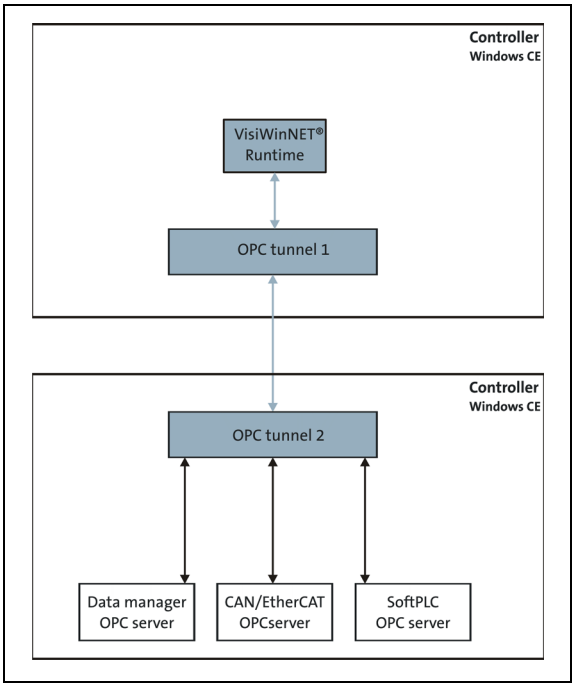
- ... configuration name (standard value: `PLC1`) specified in the **OPCServer.ini** file must be used.
- ... respective node address of the device must be entered into the **OPCServer.ini** file (value0=<*Node address*>).

```
PLC0=PLC1 <-- Configuration name (standard value: PLC1)
...
[PLC:PLC1]
...
value0=0731 <-- Node address (example: 731)
```

The **OPCServer.ini** file is on the memory card of the Controller in the directory `\USBStorage` (in case of 3200 C/p500) or `\sdcard` (in case of c300/p300)

14.7 OPC tunnel for external visualisation (remote access)

14.7.1 Windows® CE operating system



The »VisiWinNET®« Runtime of the external Controller **Controller(Visu)** accesses the OPC servers of the control system Controller via the OPC tunnels (1, 2).

[14-3] Remote access with one visualisation controller ("Visu") and one controller

Note!

There is no OPC server available for **PROFIBUS** and **PROFINET**.

14.7.1.1 Configure OPC tunnel for remote access (Windows® CE)

For the configuration of the OPC tunnel, the **oct.xml** configuration file must be edited.

In our example, the IP address of the **Controller** controller is: **192.168.5.99**

- For configuring **OPC tunnel 1**, use the **oct.xml** configuration file in the directory \USBStorage\OCT (in case of 3200 C/p500) or \sdcard\OCT (in case of c300/p300). Enter the corresponding IP address of the control system Controller in the configuration file (as described in the following section).
- For configuring **OPC tunnel 2**, standard settings need **not** be changed (configuration file: **oct.xml**).

Preparation

Import the SD card of the visualisation Controller (IPC) on your PC using a card reader.

or

Establish an FTP connection between your PC and the visualisation Controller (IPC).

▸ FTP settings with the »WebConfig« (📖 98)

How to set up an external visualisation on the controller:

1. Change to the directory \USBStorage\OCT (in case of 3200 C/p500) or \sdcard\OCT (in case of c300/p300).
2. Rename the oct.xml file to **oct_save.xml**
3. Rename the octvisu.xml file to **oct.xml**
4. Open the **oct.xml** file using an editor.

   This is a text file. Use the Software Microsoft Editor, for instance, for edition.
5. Go to the following section:

```
<Server ID="RemoteIPC" URL="tpda://172.31.207.56:56765" ProvideItems="dynamic"
ItemPre-fix="RemoteIPC" EstablishConnection="on demand"/>
```

6. Enter the IP address of the controller (with the control function).
7. Line contents (example):

```
<Server ID="RemoteIPC" URL="tpda://192.168.5.99:56765" ProvideItems="dynamic" ItemPre-
fix="RemoteIPC" EstablishConnection="on demand"/>
```

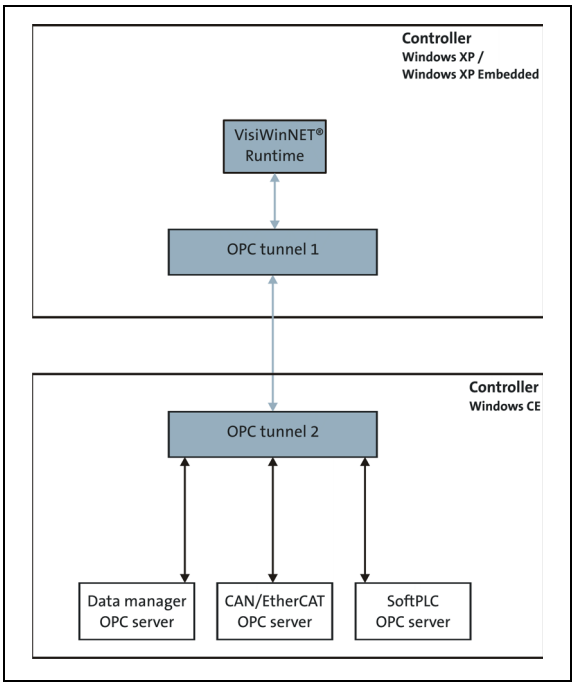
8. Save changed file on the SD card.
9. Restart the controller (with the visualisation function).

   The OPC servers of the control controller can now be accessed.

Tip!

To undo faulty changes in the configuration files, the original state of the configuration files can be restored. For this purpose, delete all configuration files from the directory \USBStorage\OCT (in case of 3200 C/p500) or \sdcard\OCT (in case of c300/p300) and restart the Controller.

14.7.2 Windows® XP/XP Embedded operating system



The »VisiWinNET®« runtime of the external Windows® XP/XP Embedded controller accesses (via **OPC tunnel 1**) the OPC servers of the **Controller**.

Note!

There is no OPC server available for **PROFIBUS** and **PROFINET**.

14.7.2.1 Configure OPC tunnel for remote access (Windows® XP/XP Embedded)

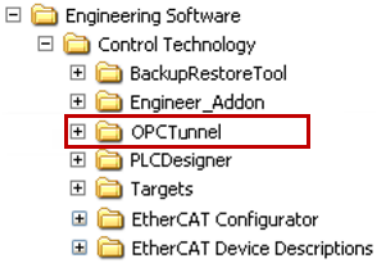
In our example, the IP address of the Controller is: `192.168.5.99`

- For the configuration of **OPC tunnel 1** (external Controller), the `oct.xml` configuration file is used which can be found in the `\Programs\Lenze\Lenze Digitec OPC Tunnel` directory.
- The suitable IP address of the control system Controller must be entered into the configuration file as described in the following section.

Preparation

Install the OPC tunnel on the Windows® XP PC.

1. The required installation files are provided on the Lenze installation CD in the following directory:



2. Execute the installation file: **Lenze_L-force_OPC_Tunnel_x.x.x.x_setup.exe**.

How to set up the external visualisation:

1. Open the Windows® Explorer on the visualisation IPC
2. Go to the following directory: `... \Programs\Lenze\Lenze Digitec OPC Tunnel`
3. Open the **oct.xml** file using an editor.

   The file can for instance be edited using the Microsoft Editor.
4. Go to the following file section:

```
<!--     <Server ID="RemoteIPC" URL="tpda://172.31.207.16:56765" ProvideItems="dynamic"
ItemPre-fix="RemoteIPC" EstablishConnection="on demand"> <FilterFile Path=""/>
</Server>-->
```

   Remove the "`<!-`" and "`->`" comment characters at the beginning and at the end of the section.
5. Enter the IP address of the Lenze controller (with the control function).

   In the example, the line contents is now as follows:

```
<Server ID="RemoteIPC" URL="tpda://192.168.5.99:56765" ProvideItems="dynamic" ItemPre-
fix="RemoteIPC" EstablishConnection="on demand"> <FilterFile Path=""/>
</Server>
```

6. Save the changed file.
7. Restart visualisation IPC.

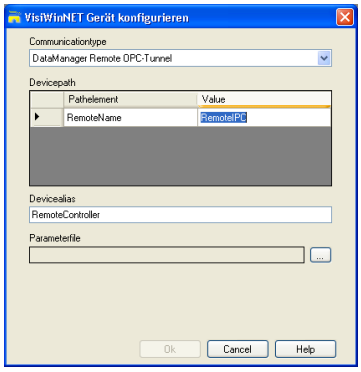
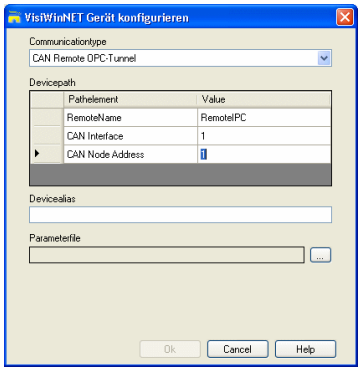
   The OPC servers of the controller can now be accessed.

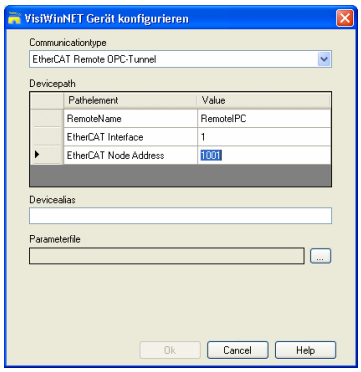
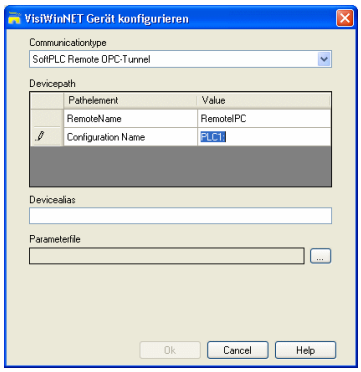
14.7.3 Browsing variable definitions

How to browse for variable definitions:

1. Click the **Add** button to import the variable definition file which has been previously exported from the »PLC Designer«.
2. Select the communication type (Remote OPC server) from the **Configure device** dialog box depending on the variables you want to access.

Possible communication types

Communication type	Description
Remote Data Manager OPC tunnel  	Required information: • Remote name of the target device (standard value: **RemoteIPC**) **Note:** The Remote name must be identical to the value specified in the **oct.xml** file. • The **oct.xml** file is on the SD memory card of the Controller (directory: `\USBStorage\OCT` (in case of 3200 C/p500) or `\sdcard\OCT` (in case of c300/p300)). • Devicealias • Parameterfile Supported file formats: • Device description files (*.dcf, *.eds) **EDS device description files can be found in the Lenze Application Knowledge Base (AKB):** http://www.Lenze.com
CAN Remote OPC tunnel  	Required information: • Remote name of the target device (example: "RemoteIPC") • CAN interface (**CAN Interface**) • CAN node address (**CAN Node Address**) • Devicealias • Parameterfile Supported file formats: • Device description files (*.dcf, *.eds) • »Global Drive Control« file(*.gdc) • Parameter file (*.pdb)

Communication type	Description
EtherCAT Remote OPC tunnel  	Required information: • Remote name of the target device (example: "RemoteIPC") • EtherCAT interface (**EtherCAT Interface**) • EtherCAT address (**EtherCAT Node Address**) • Devicealias • Parameterfile Supported file format: • Device description files (*.dcf, *.eds) • »Global Drive Control« file(*.gdc) • Parameter file (*.pdb) **Note:** EtherCAT device description files (*.xml) are not supported!
SoftPLC Remote OPC tunnel  	Required information: • Remote name of the target device (example: "RemoteIPC") • The configuration name (**Configuration Name**) must be entered manually. Default value of the Controller: `PLC1` . **Note:** The configuration name must be identical to the specification in the **OPCServer.ini** file! • The **OPCServer.ini** file is on the memory card of the Controller (directory `\USBStorage` (in case of 3200 C/p500) or `\sdcard` (in case of c300/p300)) Supported file format: • Symbol file (*.sym) **Note:** XML symbol configuration files exported from the »PLC Designer« V3.x are not supported! ▶ Manual integration of variables (experts only - background knowledge required!) (📖 131)

14.8 Lenze specifications

14.8.1 Install additional fonts

Copy additional font files onto the SD card:

- Directory `\USBStorage\Fonts` in case of Controller 3200 C/p500
- Directory `\sdcard\Fonts` in case of Controller c300/p300

14.8.2 Timeout (waiting position) of the CAN OPC server influences the time response of the visualisation

When the visualisation directly accesses the parameters of an inverter and does not get any response afterwards, this will cause a timeout (waiting position) of the CAN OPC server.

Note!

The timeout occurs if...

- `VWGET` / `VWSET` is used to read / write a variable via the CAN OPC server and the node does not respond to it (SDO);
- alarms or trends are connected to a variable which is retrieved via the CAN OPC server and the node does not respond to it (SDO);
- ...no node is connected and no feedback takes place, a timeout is caused.

The timeout of the CAN OPC server affects the display speed of the visualisation. This may, for instance, cause a time delay for the page changeover in the visualisation.

Remedy

When the timeout is changed in the registry, the visualisation can be operated again. For this purpose you must enter the following data in the `PostStart.txt` file. This sets the timeout to 200 ms.

```
[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\CANXBusY]
"SDOTimeout"=dword:0xc8
"Timeout"=dword:0xc8
```

The designation `CANXBusY` designates the respective CAN interface.

Examples:

- The first CAN interface is called: `CAN2Bus1`
- The second CAN interface is called: `CAN2Bus2`

15 Parameter reference

This chapter provides a list of all parameters of the Lenze Controllers, fieldbus interfaces and optional (fieldbus) communication cards in numerically ascending order.

Note!

Depending on the equipment and configuration of your Controller, the parameter lists may vary.

This chapter describes the following parameters:

15.1 Structure of the parameter description

Each parameter is described in the parameter list in the form of a table which consists of the following three areas:

Table header

The table header contains the following general information:

- Parameter number (Cxxxxx)
- Name of the parameter
- Data types
- Decimal and hexadecimal parameter index for access via bus systems

Table contents

The table contains further general explanations and notes on the parameter and the possible settings. The representation depends on the parameter type:

- Parameters with read access (📖 144)
- Parameters with write access (📖 144)

Table footer

The table footer contains the Parameter attributes.

15.1.1 Data types

The following data types are available for parameters:

Data type	Meaning
INTEGER_8	8-bit value with sign
INTEGER_16	16-bit value with sign
INTEGER_32	32-bit value with sign
INTEGER_64	64-bit value with sign
UNSIGNED_8	8-bit value without sign
UNSIGNED_16	16-bit value without sign
UNSIGNED_32	32-bit value without sign
UNSIGNED_64	64-bit value without sign
FLOAT_32	32-bit floating point number
FLOAT_64	64-bit floating point number
VISIBLE_STRING	String of characters of printable characters
OCTET_STRING	String of characters of any characters
BITFIELD_8	8-bit value bit-coded
BITFIELD_16	16-bit value bit coded
BITFIELD_32	32-bit value bit coded
DATE	Date

15.1.2 Parameters with read access

Parameters without the "Write access" attribute are read only/not editable.

Description structure

Parameter | Name: **Cxxxxx | _____**			Data type: _____ Index: _____
Description			
Display range (min. value | unit | max. value)			
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

15.1.3 Parameters with write access

Parameters with a checkmark (☑) in front of the "Write access" attribute are editable. The preset Lenze setting for these parameters is **printed in bold**.

- The settings can either be changed ...
  - ... via a selection list or
  - ... by entering a value directly.

15.1.3.1 Parameters with setting range

Description structure

Parameter | Name: **Cxxxxx | _____**			Data type: _____ Index: _____
Description			
Setting range (min. value | unit | max. value)			**Lenze setting**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

15.1.3.2 Parameters with selection list

Description structure

Parameter | Name: **Cxxxxx | _____**		Data type: _____ Index: _____
Description		
Selection list(Lenze setting printed in bold)		
1		
2		
3		
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

15.1.3.3 Parameters with bit-coded setting

Description structure

Parameter | Name: **Cxxxxx | _____**		Data type: _____ Index: _____
Description		
Value is bit-coded:		
Bit 0		
...		
Bit 31		
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

15.1.4 Parameter attributes

Attribute	Meaning	
☑ Read access	Read access to parameter possible.	
☑ Write access	Write access to parameter possible.	
	☑ CINH	**This attribute is not required for the parameter setting of the controllers!**
	☑ PLC STOP	**This attribute is not required for the parameter setting of the controllers!**
☑ No transfer	**This attribute is not required for the parameter setting of the controllers!**	

15.2 Basic parameters of the Controllers

In this chapter all parameters of the controller standard devices (Cabinet Controller/Panel Controller) are listed in numerically ascending order.

C0001

Parameter | Name: **C0001 | Device: Type key**	Data type: VISIBLE_STRING Index: $24574_d = 5FFE_h$
Device identification of the Controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0002

Parameter | Name: **C0002 | Device: Type version**	Data type: VISIBLE_STRING Index: $24573_d = 5FFD_h$
Version of the Controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0003

Parameter | Name: **C0003 | Device: Name**	Data type: VISIBLE_STRING Index: $24572_d = 5FFC_h$
Device name of the controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0004

Parameter | Name: **C0004 | Device: Software**	Data type: VISIBLE_STRING Index: $24571_d = 5FFB_h$
Software version of the controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0005

Parameter | Name: **C0005 | Device: Hardware**	Data type: VISIBLE_STRING Index: $24570_d = 5FFA_h$
Hardware version of the controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0006

Parameter | Name: **C0006 | Device: Serial number**	Data type: VISIBLE_STRING Index: $24569_d = 5FF9_h$
Serial number of the controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0007

Parameter | Name: **C0007 | Device: Manufacturer**	Data type: VISIBLE_STRING Index: $24568_d = 5FF8_h$
Manufacturer of the controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0008

Parameter | Name: **C0008 | Device: Manufacturing date**	Data type: VISIBLE_STRING Index: $24567_d = 5FF7_h$
Manufacturing date of the controller	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0013

Parameter | Name: **C0013 | System identification: Name**	Data type: VISIBLE_STRING Index: $24562_d = 5FF2_h$
Assign device names to the controller, in order to be able to identify it in the Engineering tool more easily.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0015

Parameter | Name: **C0015 | System identification: User name**	Data type: VISIBLE_STRING Index: $24560_d = 5FF0_h$
User name for the identification on the system	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0016

Parameter | Name: **C0016 | System identification: Description**	Data type: VISIBLE_STRING Index: $24559_d = 5FEF_h$
Description for the identification on the system	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0018

Parameter | Name: **C0018 | Command**		Data type: UNSIGNED_16 Index: $24557_d = 5FED_h$
Load PLC program command. Here the PLC boot project is reloaded.		
Selection list(Lenze setting printed in bold)		**Info**
0	**No command**	
279	Persist all	Save the data from the following tables to the management data base: • Data of the object table • Data of all address tables • Data of the file table
302	Delete logbook	
304	Export complete logbook	
512	Start PLC	
513	Stop PLC	
515	PLC: Reload boot project	
1282	Persist logbook	Save the logbook including all entries to a logbook file.
1538	Start FTP server	
1539	Stop FTP server	
1560	Update FTP server	
1540	Start telnet server	
1541	Stop telnet server	
1561	Update telnet server	
1542	Start web server	
1543	Stop web server	
1562	Update web server	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer		

C0019

Parameter | Name: **C0019 | Command status**	Data type: UNSIGNED_16 Index: $24556_d = 5FEC_h$
Parameter with the status of the running command	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0020

Parameter | Name: **C0020 | CPU: Name**	Data type: VISIBLE_STRING Index: $24555_d = 5FEB_h$
CPU type designation	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0025

Parameter | Name: **C0025 | CPU: Firmware version**	Data type: VISIBLE_STRING Index: $24550_d = 5FE6_h$
CPU firmware version	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0030

Parameter | Name: **C0030 | CPU: Temperature**			Data type: UNSIGNED_8 Index: $24545_d = 5FE1_h$
Processor temperature [°C]			
Display range (min. value | unit | max. value)			
0	°C	255	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0036

Parameter | Name: **C0036 | Bootloader: Type version**	Data type: VISIBLE_STRING Index: $24539_d = 5FDB_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0040

Parameter | Name: **C0040 | Activate front USB**			Data type: UNSIGNED_8 Index: $24535_d = 5FD7_h$
Activation of the front USB socket at the monitor panel • 0: USB socket not activated. • 1: USB socket activated. • **Applies to the Controllers 3200 C with external monitor panels (optionally available)**			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0041

Parameter | Name: **C0041 | Operating time**			Data type: UNSIGNED_32 Index: $24534_d = 5FD6_h$
Total operating time since the device has been switched on [s]			
Display range (min. value | unit | max. value)			
0	H	16777215	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0042

Parameter | Name: **C0042 | Number of reboots**			Data type: UNSIGNED_32 Index: $24533_d = 5FD5_h$
Number of boot processes of the device			
Display range (min. value | unit | max. value)			
0		65535	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0043

Parameter | Name: **C0043 | Activate Explorer**			Data type: UNSIGNED_8 Index: $24532_d = 5FD4_h$
Unhiding/hiding the Windows® CE interface/task bar on the Controller. • 0: Windows® CE interface/task bar hidden. • 1: Windows® CE interface/task bar unhidden. • The VisiWinNet Remote Access Manager remains visible.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0048

Parameter | Name: **C0048 | Logbook: Time to auto persist**			Data type: UNSIGNED_32 Index: $24527_d = 5FCF_h$
The time for the timer is entered in minutes. The timer is restarted when the log service has saved data. If the time has expired and no logbook entries have been saved in the meantime, the saving process will be activated.			
Setting range (min. value | unit | max. value)			**Lenze setting**
	min		**2 min**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0049

Parameter | Name: **C0049 | Entry count to auto persist**			Data type: UNSIGNED_32 Index: $24526_d = 5FCE_h$
Enter the number of logbook entries after which the saving process is to be activated. Counting starts with the last saving.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		150	**150**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0050

Parameter | Name: **C0050 | Logbook: Max. entries**			Data type: UNSIGNED_32 Index: $24525_d = 5FCD_h$
Enter the maximum number of logbook entries. The logbook entries are taken from the main memory and from the SD memory card.			
Setting range (min. value | unit | max. value)			**Lenze setting**
100		10000	**3000**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0051

Parameter | Name: **C0051 | Logbook: Size on CF**	Data type: UNSIGNED_32 Index: $24524_d = 5FCC_h$
Size of the memory space occupied on the SD memory card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0052

Parameter | Name: **C0052 | Logbook: Number of entries in RAM**	Data type: UNSIGNED_32 Index: $24523_d = 5FCB_h$
Actual number of entries in the RAM	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0053

Parameter | Name: **C0053 | Logbook: Time of oldest entry**	Data type: DATE Index: $24522_d = 5FCA_h$
Date of the oldest entry in the logbook	
Display range (min. value | unit | max. value)	
(Local time	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0054

Parameter | Name: **C0054 | Logbook: Index of oldest entry**	Data type: UNSIGNED_32 Index: $24521_d = 5FC9_h$
Number of the oldest entry in the logbook	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0055

Parameter | Name: **C0055 | Logbook: Time of last entry on CF**	Data type: DATE Index: $24520_d = 5FC8_h$
Time of the last entry on the SD card	
Display range (min. value | unit | max. value)	
(Local time	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0056

Parameter | Name: **C0056 | Logbook: Index of last entry on CF**	Data type: UNSIGNED_32 Index: $24519_d = 5FC7_h$
Number of the last entry on the SD memory card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0057

Parameter | Name: **C0057 | Logbook: Index of last entry**	Data type: UNSIGNED_32 Index: $24518_d = 5FC6_h$
Number of the last entry in the logbook	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0058

Parameter | Name: **C0058 | Logbook: Time of last entry**			Data type: DATE Index: $24517_d = 5FC5_h$
Time of the last entry in the logbook			
Display range (min. value | unit | max. value)			
	(Local time		
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0064

Parameter | Name: **C0064 | Logbook: Time of last error entry**			Data type: DATE Index: $24511_d = 5FBF_h$
Time stamp of the latest error entry in the logbook			
Display range (min. value | unit | max. value)			
	(Local time		
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0070

Parameter | Name: **C0070 | Ratio: Data/program memory**			Data type: UNSIGNED_32 Index: $24505_d = 5FB9_h$
• A part of the available memory is provided to the current programs as main memory. • The other part is available as object store for saving files in the RAM. • The percentage value indicated shows the ratio between object store (MemoryVirtualFilesAll) and total memory.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0	%	27	**27 %**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0071

Parameter | Name: **C0071 | Allocated program memory**			Data type: UNSIGNED_32 Index: $24504_d = 5FB8_h$
Size of the reserved program memory			
Display range (min. value | unit | max. value)			
0	Bytes	4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0072

Parameter | Name: **C0072 | Used program memory**			Data type: UNSIGNED_32 Index: $24503_d = 5FB7_h$
Size of the occupied program memory			
Display range (min. value | unit | max. value)			
0	Bytes	4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0075

Parameter | Name: **C0075 | Allocated virtual file memory**			Data type: UNSIGNED_32 Index: $24500_d = 5FB4_h$
Object store reserved for saving of virtual files			
Display range (min. value | unit | max. value)			
0	Bytes	4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0076

Parameter | Name: **C0076 | Used virtual file memory**			Data type: UNSIGNED_32 Index: $24499_d = 5FB3_h$
Object store occupied by virtual files			
Display range (min. value | unit | max. value)			
0	Bytes	4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0078

Parameter | Name: **C0078 | Allocated flash memory**			Data type: UNSIGNED_32 Index: $24497_d = 5FB1_h$
Flash memory reserved			
Display range (min. value | unit | max. value)			
0	Bytes	4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0079

Parameter | Name: **C0079 | Used flash memory**			Data type: UNSIGNED_32 Index: $24496_d = 5FB0_h$
Flash memory occupied			
Display range (min. value | unit | max. value)			
0	Bytes	4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0085

Parameter | Name: **C0085 | NTP: Activate network time protocol AutoUpdate**			Data type: UNSIGNED_32 Index: $24490_d = 5FAA_h$
Activation of a global time levelling with an NTP server. Internet connection of the Controller is required. • 0: Global time levelling not activated. • 1: Global time levelling activated.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0086

Parameter | Name: **C0086 | NTP: NTP server**	Data type: VISIBLE_STRING Index: $24489_d = 5FA9_h$
Address of the NTP server to be used by the controller for global system time levelling. Example: 172.10.1.123	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0090

Parameter | Name: **C0090 | System: Date and time**	Data type: DATE Index: $24485_d = 5FA5_h$
Date and time	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer	

C0091

Parameter | Name: **C0091 | Local date and time**	Data type: DATE Index: $24484_d = 5FA4_h$
Local date and time.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer	

C0092

Parameter | Name: **C0092 | Time zone**	Data type: VISIBLE_STRING Index: $24483_d = 5FA3_h$
Time zone of the device. Possible values: "Central European Standard Time", "North Pacific Standard Time", "GMT Standard Time", ...	

Selection list(Lenze setting printed in bold)		**Info**
Afghanistan Standard Time	Afghanistan Standard Time	
Alaskan Standard Time	Alaska Standard Time	
Arab Standard Time	Arab Standard Time	
Arabian Standard Time	Arabian Standard Time	
Arabic Standard Time	Arabic Standard Time	
Atlantic Standard Time	Atlantic Standard Time	
AUS Central Standard Time	AUS Central Standard Time	
AUS Eastern Standard Time	AUS Eastern Standard Time	
Azerbaijan Standard Time	Azores Standard Time	
Azores Standard Time	China Standard Time	
Canada Central Standard Time	Dateline Standard Time	
Cape Verde Standard Time	E. Africa Standard Time	
Caucasus Standard Time	E. Australia Standard Time	
Cen. Australia Standard Time	E. Europe Standard Time	
Central America Standard Time	E. South America Standard Time	

Parameter | Name: **C0092 | Time zone**		Data type: VISIBLE_STRING Index: $24483_d = 5FA3_h$
Central Asia Standard Time	Eastern Standard Time	
Central Brazilian Standard Time	Egypt Standard Time	
Central Europe Standard Time	Ekaterinburg Standard Time	
Central European Standard Time	Fiji Standard Time	
Central Pacific Standard Time	Malay Peninsula Standard Time	
Central Standard Time	Mexico Standard Time	
Central Standard Time (Mexico)	Mexico Standard Time 2	
China Standard Time	Mid-Atlantic Standard Time	
Dateline Standard Time	Mountain Standard Time	
E. Africa Standard Time	Myanmar Standard Time	
E. Australia Standard Time	N. Central Asia Standard Time	
E. Europe Standard Time	Nepal Standard Time	
E. South America Standard Time	New Zealand Standard Time	
Eastern Standard Time	Newfoundland Standard Time	
Egypt Standard Time	SE Asia Standard Time	
Ekaterinburg Standard Time	South Africa Standard Time	
Fiji Standard Time	Sri Lanka Standard Time	
FLE Standard Time	Taipei Standard Time	
Georgian Standard Time	Tasmania Standard Time	
GMT Standard Time	Tokyo Standard Time	
Greenland Standard Time	Tonga Standard Time	
Greenwich Standard Time	US Eastern Standard Time	
GTB Standard Time	US Mountain Standard Time	
Hawaiian Standard Time	Vladivostok Standard Time	
India Standard Time	India Standard Time	
Iran Standard Time	Iran Standard Time	
Israel Standard Time	Jerusalem Standard Time	
Jordan Standard Time	Jordan Standard Time	
Korea Standard Time	Korea Standard Time	
Mid-Atlantic Standard Time	Mid-Atlantic Standard Time	
Middle East Standard Time	Middle East Standard Time	
Mountain Standard Time	Mountain Standard Time	
Mountain Standard Time (Mexico)	Mountain Standard Time (Mexico)	
Myanmar Standard Time	Myanmar Standard Time	

Parameter | Name: **C0092 | Time zone**		Data type: VISIBLE_STRING Index: $24483_d = 5FA3_h$
N. Central Asia Standard Time	N. Central Asia Standard Time	
Namibia Standard Time	Namibia Standard Time	
Nepal Standard Time	Nepal Standard Time	
New Zealand Standard Time	New Zealand Standard Time	
Newfoundland Standard Time	Newfoundland Standard Time	
North Asia East Standard Time	North Asia East Standard Time	
North Asia Standard Time	North Asia Standard Time	
Pacific SA Standard Time	Pacific SA Standard Time	
Pacific Standard Time	Pacific Standard Time	
Pacific Standard Time (Mexico)	Pacific Standard Time (Mexico)	
Romance Standard Time	Romance Standard Time	
Russian Standard Time	Russian Standard Time	
SA Eastern Standard Time	SA Eastern Standard Time	
Singapore Standard Time	Malay Peninsula Standard Time	
SA Pacific Standard Time	SA Pacific Standard Time	
SA Western Standard Time	SA Western Standard Time	
Samoa Standard Time	Samoa Standard Time	
SE Asia Standard Time	SE Asia Standard Time	
South Africa Standard Time	South Africa Standard Time	
Sri Lanka Standard Time	Sri Lanka Standard Time	
Taipei Standard Time	Taipei Standard Time	
Tasmania Standard Time	Tasmania Standard Time	
Tokyo Standard Time	Tokyo Standard Time	
Tonga Standard Time	Tonga Standard Time	

Parameter | Name: **C0092 | Time zone**		Data type: VISIBLE_STRING Index: $24483_d = 5FA3_h$
US Eastern Standard Time	US Eastern Standard Time	
US Mountain Standard Time	US Mountain Standard Time	
Vladivostok Standard Time	Vladivostok Standard Time	
W. Australia Standard Time	W. Australia Standard Time	
W. Central Africa Standard Time	W. Central Africa Standard Time	
W. Europe Standard Time	W. Europe Standard Time	
West Asia Standard Time	West Asia Standard Time	
West Pacific Standard Time	West Pacific Standard Time	
Yakutsk Standard Time	Yakutsk Standard Time	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0093

Parameter | Name: **C0093 | Locale**		Data type: UNSIGNED_32 Index: $24482_d = 5FA2_h$
Selection of regional and language options		
Selection list(Lenze setting printed in bold)		**Info**
1030	Danish (Denmark)	
1043	Dutch (Netherlands)	
1033	English (United States)	
2057	English (United Kingdom)	
1036	French (France)	
1031	**German (Germany)**	
1037	Hebrew (Israel)	
1040	Italian (Italy)	
1044	Norwegian (Norway, Bokmål)	
2070	Portuguese (Portugal)	
3082	Spanish (Spain, International Sort)	
1053	Swedish (Sweden)	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0095

Parameter | Name: **C0095 | Activate VNC server**			Data type: UNSIGNED_8 Index: $24480_d = 5FA0_h$
Activation of the parameter to start the VNC server on the Controller. • 0: Parameter not activated. • 1: Parameter activated.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0097

Parameter | Name: **C0097 | Activate VisiWinNET Remote Access**			Data type: UNSIGNED_8 Index: $24478_d = 5F9E_h$
Activation of the parameters to start the VisiWinNET Remote Access Manager on the Controller. • 0: Parameter not activated. • 1: Parameter activated.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0100

Parameter | Name: **C0100 | WinCE users: Number**			Data type: UNSIGNED_8 Index: $24475_d = 5F9B_h$
Number of users registered			
Display range (min. value | unit | max. value)			
0		10	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0101

Parameter | Name: **C0101 | WinCE users: User name 1**	Data type: VISIBLE_STRING Index: $24474_d = 5F9A_h$
Name of the user Default setting: admin	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0102

Parameter | Name: **C0102 | WinCE users: Password 1**	Data type: VISIBLE_STRING Index: $24473_d = 5F99_h$
Password of the user Default setting: admin	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0103

Parameter | Name: **C0103 | WinCE users: User 1 with FTP permissions**			Data type: UNSIGNED_8 Index: $24472_d = 5F98_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0104

Parameter | Name: **C0104 | FTP: Permissions user 1**	Data type: UNSIGNED_32 Index: $24471_d = 5F97_h$
FTP rights of the user.	
Value is bit-coded:	
Bit 0	Read
Bit 1	Write
Bit 2	Virtual Roots
Bit 3	Allow Hidden Files
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0105

Parameter | Name: **C0105 | FTP: Home user 1**	Data type: VISIBLE_STRING Index: $24470_d = 5F96_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0106

Parameter | Name: **C0106 | WinCE users: User 1 with telnet permissions**	Data type: UNSIGNED_8 Index: $24469_d = 5F95_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.	

Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0108

Parameter | Name: **C0108 | WinCE users: User name 2**	Data type: VISIBLE_STRING Index: $24467_d = 5F93_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0109

Parameter | Name: **C0109 | WinCE users: Password 2**	Data type: VISIBLE_STRING Index: $24466_d = 5F92_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0110

Parameter | Name: **C0110 | WinCE users: User 2 with FTP permissions**			Data type: UNSIGNED_8 Index: $24465_d = 5F91_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0111

Parameter | Name: **C0111 | FTP: Permissions user 2**		Data type: UNSIGNED_32 Index: $24464_d = 5F90_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0112

Parameter | Name: **C0112 | FTP: Home user 2**	Data type: VISIBLE_STRING Index: $24463_d = 5F8F_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0113

Parameter | Name: **C0113 | WinCE users: User 2 with telnet permissions**			Data type: UNSIGNED_8 Index: $24462_d = 5F8E_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0115

Parameter | Name: **C0115 | WinCE users: User name 3**	Data type: VISIBLE_STRING Index: $24460_d = 5F8C_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0116

Parameter | Name: **C0116 | WinCE users: Password 3**	Data type: VISIBLE_STRING Index: $24459_d = 5F8B_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0117

Parameter | Name: **C0117 | WinCE users: User 3 with FTP permissions**			Data type: UNSIGNED_8 Index: $24458_d = 5F8A_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0118

Parameter | Name: **C0118 | FTP: Permissions user 3**		Data type: UNSIGNED_32 Index: $24457_d = 5F89_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0119

Parameter | Name: **C0119 | FTP: Home user 3**	Data type: VISIBLE_STRING Index: $24456_d = 5F88_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0120

Parameter | Name: **C0120 | WinCE users: User 3 with telnet permissions**			Data type: UNSIGNED_8 Index: $24455_d = 5F87_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0122

Parameter | Name: **C0122 | WinCE users: User name 4**	Data type: VISIBLE_STRING Index: $24453_d = 5F85_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0123

Parameter | Name: **C0123 | WinCE users: Password 4**	Data type: VISIBLE_STRING Index: $24452_d = 5F84_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0124

Parameter | Name: **C0124 | WinCE users: User 4 with FTP permissions**			Data type: UNSIGNED_8 Index: $24451_d = 5F83_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0125

Parameter | Name: **C0125 | FTP: Permissions user 4**		Data type: UNSIGNED_32 Index: $24450_d = 5F82_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0126

Parameter | Name: **C0126 | FTP: Home user 4**	Data type: VISIBLE_STRING Index: $24449_d = 5F81_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0127

Parameter | Name: **C0127 | WinCE users: User 4 with telnet permissions**			Data type: UNSIGNED_8 Index: $24448_d = 5F80_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0129

Parameter | Name: **C0129 | WinCE users: User name 5**	Data type: VISIBLE_STRING Index: $24446_d = 5F7E_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0130

Parameter | Name: **C0130 | WinCE users: Password 5**	Data type: VISIBLE_STRING Index: $24445_d = 5F7D_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0131

Parameter | Name: **C0131 | WinCE users: User 5 with FTP permissions**			Data type: UNSIGNED_8 Index: $24444_d = 5F7C_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0132

Parameter | Name: **C0132 | FTP: Permissions user 5**		Data type: UNSIGNED_32 Index: $24443_d = 5F7B_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0133

Parameter | Name: **C0133 | FTP: Home user 5**	Data type: VISIBLE_STRING Index: $24442_d = 5F7A_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0134

Parameter | Name: **C0134 | WinCE users: User 5 with telnet permissions**			Data type: UNSIGNED_8 Index: $24441_d = 5F79_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0136

Parameter | Name: **C0136 | WinCE users: User name 6**	Data type: VISIBLE_STRING Index: $24439_d = 5F77_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0137

Parameter | Name: **C0137 | WinCE users: Password 6**	Data type: VISIBLE_STRING Index: $24438_d = 5F76_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0138

Parameter | Name: **C0138 | WinCE users: User 6 with FTP permissions**			Data type: UNSIGNED_8 Index: $24437_d = 5F75_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0139

Parameter | Name: **C0139 | FTP: Permissions user 6**	Data type: UNSIGNED_32 Index: $24436_d = 5F74_h$
FTP rights of the user.	
Value is bit-coded:	
Bit 0	Read
Bit 1	Write
Bit 2	Virtual Roots
Bit 3	Allow Hidden Files
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0140

Parameter | Name: **C0140 | FTP: Home user 6**	Data type: VISIBLE_STRING Index: $24435_d = 5F73_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0141

Parameter | Name: **C0141 | WinCE users: User 6 with telnet permissions**	Data type: UNSIGNED_8 Index: $24434_d = 5F72_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.	

Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0143

Parameter | Name: **C0143 | WinCE users: User name 7**	Data type: VISIBLE_STRING Index: $24432_d = 5F70_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0144

Parameter | Name: **C0144 | WinCE users: Password 7**	Data type: VISIBLE_STRING Index: $24431_d = 5F6F_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0145

Parameter | Name: **C0145 | WinCE users: User 7 with FTP permissions**			Data type: UNSIGNED_8 Index: $24430_d = 5F6E_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0146

Parameter | Name: **C0146 | FTP: Permissions user 7**		Data type: UNSIGNED_32 Index: $24429_d = 5F6D_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0147

Parameter | Name: **C0147 | FTP: Home user 7**	Data type: VISIBLE_STRING Index: $24428_d = 5F6C_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0148

Parameter | Name: **C0148 | WinCE users: User 7 with telnet permissions**			Data type: UNSIGNED_8 Index: $24427_d = 5F6B_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0150

Parameter | Name: **C0150 | WinCE users: User name 8**	Data type: VISIBLE_STRING Index: $24425_d = 5F69_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0151

Parameter | Name: **C0151 | WinCE users: Password 8**	Data type: VISIBLE_STRING Index: $24424_d = 5F68_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0152

Parameter | Name: **C0152 | WinCE users: User 8 with FTP permissions**			Data type: UNSIGNED_8 Index: $24423_d = 5F67_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0153

Parameter | Name: **C0153 | FTP: Permissions user 8**		Data type: UNSIGNED_32 Index: $24422_d = 5F66_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0154

Parameter | Name: **C0154 | FTP: Home user 8**	Data type: VISIBLE_STRING Index: $24421_d = 5F65_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0155

Parameter | Name: **C0155 | WinCE users: User 8 with telnet permissions**			Data type: UNSIGNED_8 Index: $24420_d = 5F64_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0157

Parameter | Name: **C0157 WinCE users: User name 9**	Data type: VISIBLE_STRING Index: $24418_d = 5F62_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0158

Parameter | Name: **C0158 | WinCE users: Password 9**	Data type: VISIBLE_STRING Index: $24417_d = 5F61_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0159

Parameter | Name: **C0159 | WinCE users: User 9 with FTP permissions**			Data type: UNSIGNED_8 Index: $24416_d = 5F60_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0160

Parameter | Name: **C0160 | FTP: Permissions user 9**		Data type: UNSIGNED_32 Index: $24415_d = 5F5F_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0161

Parameter | Name: **C0161 | FTP: Home user 9**	Data type: VISIBLE_STRING Index: $24414_d = 5F5E_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0162

Parameter | Name: **C0162 | WinCE users: User 9 with telnet permissions**			Data type: UNSIGNED_8 Index: $24413_d = 5F5D_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0164

Parameter | Name: **C0164 | WinCE users: User name 10**	Data type: VISIBLE_STRING Index: $24411_d = 5F5B_h$
Name of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0165

Parameter | Name: **C0165 | WinCE users: Password 10**	Data type: VISIBLE_STRING Index: $24410_d = 5F5A_h$
Password of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0166

Parameter | Name: **C0166 | WinCE users: User 10 with FTP permissions**			Data type: UNSIGNED_8 Index: $24409_d = 5F59_h$
Permissions for using the FTP • 0: User must not use FTP. • 1: User may use FTP.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0167

Parameter | Name: **C0167 | FTP: Permissions user 10**		Data type: UNSIGNED_32 Index: $24408_d = 5F58_h$
FTP rights of the user.		
Value is bit-coded:		
Bit 0	Read	
Bit 1	Write	
Bit 2	Virtual Roots	
Bit 3	Allow Hidden Files	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0168

Parameter | Name: **C0168 | FTP: Home user 10**	Data type: VISIBLE_STRING Index: $24407_d = 5F57_h$
Home directory of the user	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0169

Parameter | Name: **C0169 | WinCE users: User 10 with telnet permissions**			Data type: UNSIGNED_8 Index: $24406_d = 5F56_h$
Permissions for using the Telnet • 0: User must not use Telnet. • 1: User may use Telnet.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0172

Parameter | Name: **C0172 | FTP: Allow anonymous**			Data type: UNSIGNED_32 Index: $24403_d = 5F53_h$
An unregistered user is allowed to log in. The user name is "anonymous" • 1: Activates the login. • 0: Deactivates the login.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0173

Parameter | Name: **C0173 | FTP: Allow anonymous upload**			Data type: UNSIGNED_32 Index: $24402_d = 5F52_h$
1: An anonymous user is allowed to upload data to the controller if parameter ... • FtpAllowAnonymousUpload = TRUE and • FtpAllowAnonymous = true. 0: An anonymous user must not load any data to the Controller.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0174

Parameter | Name: **C0174 | FTP: Enabled**			Data type: UNSIGNED_32 Index: $24401_d = 5F51_h$
Activation of the FTP service • 0: FTP service not activated. • 1: FTP service activated.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0180

Parameter | Name: **C0180 | Telnet: Use authentication**			Data type: UNSIGNED_32 Index: $24395_d = 5F4B_h$
The telnet user has to identify himself/herself with name and password when connecting. • 0: Login not activated. • 1: Login activated.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0181

Parameter | Name: **C0181 | Telnet: Enabled**			Data type: UNSIGNED_32 Index: $24394_d = 5F4A_h$
Activation of the Telnet service • 0: Telnet not activated. • 1: Telnet activated.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0182

Parameter | Name: **C0182 | 0x100a: Software version**	Data type: VISIBLE_STRING Index: $24393_d = 5F49_h$
Software version of the backplane bus Controller • **Applies to Controllers 3200 C**	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0183

Parameter | Name: **C0183 | 0x1009: Hardware version/FPGA firmware version**	Data type: VISIBLE_STRING Index: $24392_d = 5F48_h$
Hardware version of the backplane bus Controller • **Applies to Controllers 3200 C**	
Version of the FPGA (Field Programmable Gate Array) • **Applies to Controllers p500**	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0184

Parameter | Name: **C0184 | 0x100a: Software version**	Data type: VISIBLE_STRING Index: $24391_d = 5F47_h$
Software version of the backplane bus master • **Applies to Controllers 3200 C**	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0185

Parameter | Name: **C0185 | 0x1009: Hardware version**	Data type: VISIBLE_STRING Index: $24390_d = 5F46_h$
Hardware version of the backplane bus master • **Applies to Controllers 3200 C**	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0186

Parameter | Name: **C0186 | PLC: Licence**	Data type: VISIBLE_STRING Index: $24389_d = 5F45_h$
Licence level of the PLC. Possible licence levels are: • No licence • Logic (LPC1000) • Motion (MPC1200)	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0187

Parameter | Name: **C0187 | Visualisation licence**	Data type: VISIBLE_STRING Index: $24388_d = 5F44_h$
Visualisation licence (relevant for the visualisation in VisiWinNET). Possible licence levels are: • Compact CE • Compact XP	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0188

Parameter | Name: **C0188 | Visualisation: Number of power tags**	Data type: UNSIGNED_32 Index: $24387_d = 5F43_h$
Max. number of variables that can be represented in VisiWinNET	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0189

Parameter | Name: **C0189 | VNC: Password**	Datentyp: VISIBLE_STRING Index: $24386_d = 5F42_h$
Password used for authentication (C0190) via VNC. **Note**: To activate the code location, the VNC server must be stopped and restarted each time.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0190

Parameter | Name: **C0190 | VNC: Used Authentification**	Datentyp: VISIBLE_STRING Index: $24385_d = 5F41_h$
Enable authentication using a password entered in C0189. **Note**: To activate the code location, the VNC server must be stopped and restarted.	

Selection list(Lenze setting printed in bold)		**Info**
0	**Authentification not activated**	
1	Authentification aktivated	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0191

Parameter | Name: **C0191 | VNC: Maximum number of clients**			Datentyp: UNSIGNED_32 Index: $24384_d = 5F40_h$
Definition of the maximum number of simultaneously connected clients **Note**: To activate the code location, the VNC server must be stopped and restarted.			
Setting range (min. value | unit | max. value)			**Lenze setting**
1		3	**1**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0192

Parameter | Name: **C0192 | VNC: Automatic log out**		Datentyp: VISIBLE_STRING Index: $24383_d = 5F3F_h$
Automatic disconnection **Note**: To activate the code location, the VNC server must be stopped and restarted.		
Selection list(Lenze setting printed in bold)		**Info**
0	**Auto switch-off not activated**	
1	Auto switch-off activated	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0193

Parameter | Name: **C0193 | VNC: Maximum session time [s]**	Datentyp: UNSIGNED_32 Index: $24382_d = 5F3E_h$
Lenze setting: 7200 s **Note**: To activate the code location, the VNC server must be stopped and restarted.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0194

Parameter | Name: **C0194 | VNC: Port**	Datentyp: UNSIGNED_32 Index: $24381_d = 5F3D_h$
Free choice of ports Lenze setting: 5900 **Note**: To activate the code location, the VNC server must be stopped and restarted.	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0195

Parameter | Name: **C0195 | VNC: Maximum idle time [s]**	Datentyp: UNSIGNED_32 Index: $24380_d = 5F3C_h$
The connection is automatically terminated if the client does not send a request to the VNC server for the set time. The function depends on C0192. Lenze setting: 0 s (the session is not automatically interrupted)	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

15.3 Voltage buffering by external UPS (optional for Controller 3241 C)

This chapter lists all UPS parameters in numerically ascending order.

▸ UPS function (backup in case of voltage failure) (📖 79)

C0203

Parameter | Name: **C0203 | UPS: UPS monitoring**		Data type: UNSIGNED_8 Index: $24372_d = 5F34_h$
Enable monitoring via an external UPS (optional).		
Selection list (Lenze setting printed in bold)		**Info**
0	Off	
1	**On**	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0204

Parameter | Name: **C0204 | UPS: Status**		Data type: UNSIGNED_8 Index: $24371_d = 5F33_h$
Status of the external UPS		
Selection list (read only)		**Info**
0	ACU Controller is missing	
85	Battery / capacitor is loaded	
86	Battery / capacitor is being loaded	
87	-	
88	-	
89	UPS is buffering the system	
90	Battery / capacitor short circuit	
91	Battery / capacitor is missing	
92	Battery / capacitor is defective	
93	ACU Controller is defective	
94	-	
95	Undefined status of battery / capacitor	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C0205

Parameter | Name: **C0205 | UPS: Supply voltage**			Data type: FLOAT_32 Index: $24370_d = 5F32_h$
Supply voltage of the external UPS in [V]			
Display range (min. value | unit | max. value)			
0	V	34	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0207

Parameter | Name: **C0207 | UPS: Battery / capacitor voltage**	Data type: FLOAT_32 Index: $24368_d = 5F30_h$
Voltage of the battery/capacitor in [V]	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0208

Parameter | Name: **C0208 | UPS: Display lighting after voltage failure**		Data type: UNSIGNED_8 Index: $24367_d = 5F2F_h$
Behaviour of the display lighting after a voltage failure.		
Selection list (Lenze setting printed in bold)		**Info**
0	**Off**	Display lighting activated.
1	On	Display lighting not activated.
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0209

Parameter | Name: **C0209 | UPS: Number of voltage dips**			Data type: UNSIGNED_8 Index: $24366_d = 5F2E_h$
Indicates the number of voltage failures.			
Display range (min. value | unit | max. value)			
0		255	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0210

Parameter | Name: **C0210 | UPS: Supply voltage OK**		Data type: UNSIGNED_8 Index: $24365_d = 5F2D_h$
Status of supply voltage (present/not present)		
Selection list (read only)		**Info**
0	No	
1	Yes	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C0211

Parameter | Name: **C0211 | UPS: Voltage failure**		Data type: UNSIGNED_8 Index: $24364_d = 5F2C_h$
Status of voltage failure (present/not present)		
Selection list (read only)		
0	No	
1	Yes	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C0212

Parameter | Name: **C0212 | UPS: Firmware version**	Data type: VISIBLE_STRING Index: $24363_d = 5F2B_h$
Version of the UPS firmware	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0213

Parameter | Name: **C0213 | UPS: Buffer time without action**		Data type: UNSIGNED_16 Index: $24362_d = 5F2A_h$
The UPS buffers the system without any further action. If the voltage dip lasts longer than the time set here: • The PLC is stopped. • The PLC saves the retain variables, logbook entries and visualisation data (trends and alarms). • The timer C00214 is started.		
Selection list (Lenze setting printed in bold)		**Info**
0	0	
250	250	
500	500	
750	750	
1000	**1000**	
1250	1250	
1500	1500	
1750	1750	
2000	2000	
2250	2250	
2500	2500	
2750	2750	
3000	3000	
3250	3250	
3500	3500	
3750	3750	
4000	4000	
4250	4250	
4500	4500	
4750	4750	
5000	5000	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0214

Parameter | Name: **C0214 | UPS: Buffer time until shutdown**			Data type: UNSIGNED_8 Index: $24361_d = 5F29_h$
After expiration of the time set here, the system is shut down. If the voltage is applied once again, the system is restarted automatically.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0	s	255	**10 s**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

15.4 Monitor panel (integrated/external)

This chapter lists all parameters of the monitor panel (panel controller) and the parameters of an external, optional panel in numerically ascending order.

The parameters are available depending on the panel variant.

C0420

Parameter | Name: **C0420 | Panel: Width**			Data type: UNSIGNED_16 Index: $24155_d = 5E5B_h$
Horizontal resolution of the panel			
Display range (min. value | unit | max. value)			
160		2400	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0421

Parameter | Name: **C0421 | Panel: Height**			Data type: UNSIGNED_16 Index: $24154_d = 5E5A_h$
Vertical resolution of the panel			
Display range (min. value | unit | max. value)			
100		2000	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0422

Parameter | Name: **C0422 | Dimout: Actual value**			Data type: UNSIGNED_8 Index: $24153_d = 5E59_h$
Enter the actual brightness value of the display. The numerical value ranges from the • Maximum = 0 and the • Minimum = 63 **Note:** In the case of a Cabinet Controller with an external monitor panel, this parameter is saved in the panel. This requires connecting the Controller and the panel to each other using a USB cable.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		63	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer			

C0423

Parameter | Name: **C0423 | Brightness: Upper limit**			Data type: UNSIGNED_8 Index: $24152_d = 5E58_h$
Enter the maximum brightness value of the display. The numerical value ranges from the • Maximum = 0 and the • Minimum = 63 **Note:** In the case of a Cabinet Controller with an external monitor panel, this parameter is saved in the panel. This requires connecting the Controller and the panel to each other using a USB cable.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		63	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0424

Parameter | Name: **C0424 | Automatic dimout: Switch-on after**			Data type: UNSIGNED_8 Index: $24151_d = 5E57_h$
Enter the time until automatic dimout of the display. The values range between ... • 0 (maximum value = no dimout of the display) and • 255 (minimum value) **Note:** • To deactivate an active dimout of the display, an entry must be made (by activation of the touch display/mouse-click/shortcut). Then the controller is ready to accept input. • In the case of a Cabinet Controller with an external monitor panel, this parameter is saved in the panel. This requires connecting the Controller and the panel to each other using a USB cable.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0	min	255	**0 min**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0425

Parameter | Name: **C0425 | Automatic dimout: Brightness value**			Data type: UNSIGNED_8 Index: $24150_d = 5E56_h$
Brightness value of the monitor panel in its dimmed state after automatic dimout in [%]. • **Applies to the integrated monitor panel (panel controller).**			
Setting range (min. value | unit | max. value)			**Lenze setting**
10	%	80	**10 %**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0426

Parameter | Name: **C0426 | Brightness: Actual value**			Data type: UNSIGNED_8 Index: $24149_d = 5E55_h$
Actual brightness value of the monitor panel in [%] • **Applies to the integrated monitor panel (panel controller).**			
Setting range (min. value | unit | max. value)			**Lenze setting**
10	%	100	**100 %**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer			

C0427

Parameter | Name: **C0427 | Current rotation of the display**		Data type: UNSIGNED_16 Index: $24148_d = 5E54_h$
The display of the monitor panel (Panel Controller) can be rotated in 90° steps. • **Valid for Panel Controller p300.** Name/format for your own background image: [Width]_[Height]_*.bmp (e.g. 480_272_Roboter.bmp) ▸ Use your own background image (Windows® CE) (📖 43)		
Selection list(Lenze setting printed in bold)		**Info**
0	**0°**	
1	90°	
2	180°	
3	270°	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer		

C0432

Parameter | Name: **C0432 | F1 key: Function**	Data type: UNSIGNED_32 Index: $24143_d = 5E4F_h$
Function assignment of the F1 key. The individual functions are assigned from a selection list. • **Applies to external monitor panels with function keys.**	

Selection list(Lenze setting printed in bold)		**Info**
0	None	
1	Start program	
2	**Touch keyboard**	
3	Right-hand mouse button	
4	Execute AP script	
5	Start control panel	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0433

Parameter | Name: **C0433 | F1 key: Parameter**	Data type: VISIBLE_STRING Index: $24142_d = 5E4E_h$
Name of the program or script to be executed • **Applies to external monitor panels with function keys.**	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0434

Parameter | Name: **C0434 | F2 key: Function**	Data type: UNSIGNED_32 Index: $24141_d = 5E4D_h$
Function assignment of the F2 key. The individual functions are assigned from a selection list. • **Applies to external monitor panels with function keys.**	

Selection list(Lenze setting printed in bold)		**Info**
0	None	
1	Start program	
2	Touch keyboard	
3	**Right-hand mouse button**	
4	Execute AP script	
5	Start control panel	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0435

Parameter | Name: **C0435 | F2 key: Parameter**	Data type: VISIBLE_STRING Index: $24140_d = 5E4C_h$
Name of the program or script to be executed • **Applies to external monitor panels with function keys.**	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0436

Parameter | Name: **C0436 | F3 key: Function**	Data type: UNSIGNED_32 Index: $24139_d = 5E4B_h$
Function assignment of the F3 key. The individual functions are assigned from a selection list. • **Applies to external monitor panels with function keys.**	

Selection list(Lenze setting printed in bold)		**Info**
0	None	
1	**Start program**	
2	Touch keyboard	
3	Right-hand mouse button	
4	Execute AP script	
5	Start control panel	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0437

Parameter | Name: **C0437 | F3 key: Parameter**	Data type: VISIBLE_STRING Index: $24138_d = 5E4A_h$
Name of the program or script to be executed • **Applies to external monitor panels with function keys.**	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0438

Parameter | Name: **C0438 | F4 key: Function**	Data type: UNSIGNED_32 Index: $24137_d = 5E49_h$
Function assignment of the F4 key. The individual functions are assigned from a selection list. • **Applies to external monitor panels with function keys.**	

Selection list(Lenze setting printed in bold)		**Info**
0	None	
1	Start program	
2	Touch keyboard	
3	Right-hand mouse button	
4	Execute AP script	
5	**Start control panel**	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C0439

Parameter | Name: **C0439 | F4 key: Parameter**	Data type: VISIBLE_STRING Index: $24136_d = 5E48_h$
Name of the program or script to be executed • **Applies to external monitor panels with function keys.**	

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

15.5 PLC (Logic/Motion)

In this chapter the parameters of the PLC (Logic/Motion) are listed in numerically ascending order.

C0619

Parameter | Name: **C0619 | Boot application loaded**			Datentyp: UNSIGNED_8 Index: $23956_d = 5D94_h$
Display range (min. value | unit | max. value)			
0		1	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0620

Parameter | Name: **C0620 | PLC: Status**	Data type: VISIBLE_STRING Index: $23955_d = 5D93_h$
Status of the PLC application	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0630

Parameter | Name: **C0630 | Display Soft PLC window**			Data type: UNSIGNED_8 Index: $23945_d = 5D89_h$
Display of the SoftPLC dialog box on the Controller • 0: SoftPLC dialog box is not displayed. • 1: SoftPLC dialog box is displayed.			
Display range (min. value | unit | max. value)			
0		1	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C0640

Parameter | Name: **C0640 | Activate field device firmware update**			Data type: UNSIGNED_8 Index: $23935_d = 5D7F_h$
Activation of the firmware update of the field devices: The Controller writes the parameters to the connected field devices. **This function is available depending on the device!** These settings are valid for devices with a firmware version < 3.20: • 0: Firmware update is not activated. • 1: Firmware update is activated. These settings are valid for devices with a firmware version ≥ 3.20: • 0: Deactivated • 1: Activated. Field device: Main version = configurated version. • 2: Activated. Field device: Main version > configurated version. (**Lenze setting**)			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		2	**2**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0650

Parameter | Name: **C0650 | Start Field Device parameter storage**		Data type: UNSIGNED_16 Index: $23925_d = 5D75_h$
Storage of the parameters of the connected field devices on the Controller. • **This function is available depending on the device!**		
Selection list(Lenze setting printed in bold)		**Info**
0	**No Operation**	
1	Start parameter storage	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer		

C0651

Parameter | Name: **C0651 | Status Field Device parameter storage**	Data type: VISIBLE_STRING Index: $23924_d = 5D74_h$
Current status of the storage of the field device parameters on the Controller. • **This function is available depending on the device!**	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0660

Parameter | Name: **C0660 | Available application credits**	Data type: UNSIGNED_16 Index: $23915_d = 5D6B_h$
Display of the available application credits	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0661

Parameter | Name: **C0661 | Application credits used**	Data type: UNSIGNED_16 Index: $23914_d = 5D6A_h$
Display of the application credits used	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

15.6 Backup & Restore

In this chapter, all parameters for carrying out a »Backup & Restore« (using »WebConfig«) are listed in numerically ascending order.

C0809

Parameter | Name: **C0809 | Select a main action for the Lenze software**		Data type: UNSIGNED_16 Index: $23766_d = 5CD6_h$
Selection list (Lenze setting printed in bold)		**Info**
0	**Backup**	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0810

Parameter | Name: **C0810 | Select a main action for the Lenze software**		Data type: UNSIGNED_16 Index: $23765_d = 5CD5_h$
Carry out a backup or restore by means of the WebConfig.		
Selection list (Lenze setting printed in bold)		**Info**
2	**Restore**	Carry out restore: • Select this process to restore the data bases of a backup on an individual Controller.
3	Auto-restore	Carry out auto restore: • Restore (restoring a backup) at any number of Controllers. • If you connect the USB stick to another Controller, the same process is carried out automatically (standard set-up).
4	Update	Carry out update: • Updates the software of the Controller (the data is transferred from the USB flash drive to the internal flash memory of the Controller). • In the case of a **Controller c300/p300**, the update takes several minutes, since several restart processes are taking place.
5	Auto update	Carry out auto update: • Multiple restore of an update at any number of Controllers. • If you connect the USB stick to another Controller, the same process is carried out automatically (standard set-up). • In the case of a **Controller c300/p300**, the update takes several minutes, since several restart processes are taking place.
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0811

Parameter | Name: **C0811 | Assign a name for the backup**	Data type: VISIBLE_STRING Index: $23764_d = 5CD4_h$
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0813

Parameter | Name: **C0813 | Display of the backup or update files**		Data type: UNSIGNED_16 Index: $23762_d = 5CD2_h$
Selection list(Lenze setting printed in bold)		**Info**
1	**Display 1 to 10**	
2	Display 11 to 20	
3	Display 21 to 30	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0814

Parameter | Name: **C0814 | Backup or update file 1**	Data type: VISIBLE_STRING Index: $23761_d = 5CD1_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0815

Parameter | Name: **C0815 | Backup or update file 2**	Data type: VISIBLE_STRING Index: $23760_d = 5CD0_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0816

Parameter | Name: **C0816 | Backup or update file 3**	Data type: VISIBLE_STRING Index: $23759_d = 5CCF_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0817

Parameter | Name: **C0817 | Backup or update file 4**	Data type: VISIBLE_STRING Index: $23758_d = 5CCE_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0818

Parameter | Name: **C0818 | Backup or update file 5**	Data type: VISIBLE_STRING Index: $23757_d = 5CCD_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0819

Parameter | Name: **C0819 | Backup or update file 6**	Data type: VISIBLE_STRING Index: $23756_d = 5CCC_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0820

Parameter | Name: **C0820 | Backup or update file 7**	Data type: VISIBLE_STRING Index: $23755_d = 5CCB_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0821

Parameter | Name: **C0821 | Backup or update file 8**	Data type: VISIBLE_STRING Index: $23754_d = 5CCA_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0822

Parameter | Name: **C0822 | Backup or update file 9**	Data type: VISIBLE_STRING Index: $23753_d = 5CC9_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0823

Parameter | Name: **C0823 | Backup or update file 10**	Data type: VISIBLE_STRING Index: $23752_d = 5CC8_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0824

Parameter | Name: **C0824 | Select a backup or update**		Data type: UNSIGNED_16 Index: $23751_d = 5CC7_h$
Selection list(Lenze setting printed in bold)		**Info**
0	**Nothing is selected**	
1	Backup or update file 1	
2	Backup or update file 2	
3	Backup or update file 3	
4	Backup or update file 4	
5	Backup or update file 5	
6	Backup or update file 6	
7	Backup or update file 7	
8	Backup or update file 8	
9	Backup or update file 9	
10	Backup or update file 10	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0830

Parameter | Name: **C0830 | Start backup**		Data type: UNSIGNED_16 Index: $23745_d = 5CC1_h$
Selection list(Lenze setting printed in bold)		**Info**
0	**No action**	
1	Start backup	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0831

Parameter | Name: **C0831 | Start restore update**		Data type: UNSIGNED_16 Index: $23744_d = 5CC0_h$
Selection list(Lenze setting printed in bold)		**Info**
0	**No action**	
2	Start restore update	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer		

C0832

Parameter | Name: **C0832 | Backup status**	Data type: VISIBLE_STRING Index: $23743_d = 5CBF_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C0833

Parameter | Name: **C0833 | Restore update status**	Data type: VISIBLE_STRING Index: $23742_d = 5CBE_h$
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

15.7 Ethernet

This chapter provides a list of all parameters of the Ethernet interface (on board) of the Controllers in numerically ascending order.

The parameters of the MC-ETH communication card (C1078 ... C1086) are not included in this chapter.

C0238

Parameter | Name: **C0238 | Apply IP configuration**		Data type: UNSIGNED_16 Index: $24337_d = 5F11_h$
Parameter for the activation of the set IP configuration.		
Selection list (Lenze setting printed in bold)		**Info**
1	Activate device	
0	**No command**	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer		

C0240

Parameter | Name: **C0240 | Enable Dhcp**			Data type: UNSIGNED_32 Index: $24335_d = 5F0F_h$
Activation of the DHCP • 0: DHCP not activated. • 1: DHCP activated. If DHCP is active, the codes C0241 ... C0245 do not have any function **Note regarding the visualisation for Controller 3231/3241 C and p500:** During the DHCP configuration with an unplugged Ethernet cable, the local visualisation cannot be operated for approx. 20 s.			
Setting range (min. value | unit | max. value)			**Lenze setting**
0		1	**0**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C0241

Parameter | Name: **C0241 | IP address**	Data type: VISIBLE_STRING Index: $24334_d = 5F0E_h$
IP address of the interface	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0242

Parameter | Name: **C0242 | Subnet mask**	Data type: VISIBLE_STRING Index: $24333_d = 5F0D_h$
Subnet mask of the interface	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0243

Parameter | Name: **C0243 | Default gateway**	Data type: VISIBLE_STRING Index: $24332_d = 5F0C_h$
Default gateway of the interface	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0244

Parameter | Name: **C0244 | Domain**	Data type: VISIBLE_STRING Index: $24331_d = 5F0B_h$
Domain name of the interface	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer	

C0246

Parameter | Name: **C0246 | MAC address**	Data type: VISIBLE_STRING Index: $24329_d = 5F09_h$
MAC address (6 8-bit hexadecimal numbers) (e.g. 00:af:13:42:01:a8)	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

15.8 EtherCAT

EtherCAT is the "on board" standard bus system of the Lenze Controllers.

This chapter provides a list of all parameters of the EtherCAT interface (on board) of the Controllers and the MC-ETC communication card in numerically ascending order.

C280/4

Parameter | Name: **C280/4 | ECAT bus scan result**		Data type: UNSIGNED_8 Index: 24295.4_d = $0x5EE7.0x04_h$
Brief information on whether the master configuration corresponds to the physical bus structure. The master configuration of the stack is compared to the actual bus structure.		
Selection list(Lenze setting printed in bold)		**Info**
0	**No match**	The master configuration does not correspond to the bus structure.
1	OK	The master configuration corresponds to the bus structure.
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C281/2

Parameter | Name: **C281/2 | ECAT Master: State**		Data type: UNSIGNED_8 Index: 24294.2_d = $0x5EE6.0x02_h$
Display of the current state of the master		
Selection list (read only)		
0	Unknown	
1	Init	
2	Pre-Operational	
3	Bootstrap mode	*Bootstrap mode* is not supported.
4	Safe-operational	
8	Operational	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer		

C281/5

Parameter | Name: **C281/5 | ECAT master: State information**	Data type: UNSIGNED_32 Index: 24294.5_d = $0x5EE6.0x05_h$
Display of additional information on the current state of the master The bits are set to value 1 if the respective states are reached.	

Value is bit-coded:	
Bit 0	Master ok
Bit 1	Reserved 1
Bit 2	Reserved 2
Bit 3	Reserved 3
Bit 4	Init
Bit 5	Pre-Operational
Bit 6	Safe-operational
Bit 7	Operational
Bit 8	Slaves in requested state
Bit 9	Master in requested state
Bit 10	Bus Scan Match
Bit 11	Reserved 4
Bit 12	DC: Activated
Bit 13	DC: Synchronised
Bit 14	DC: Busy
Bit 15	Reserved 5
Bit 16	Link Up
Bit 17	Reserved 6
...	...
Bit 31	Reserved 20

☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer

C281/6

Parameter | Name: **C281/6 | ECAT bus scan**	Data type: UNSIGNED_8 Index: 24294.6_d = $0x5EE6.0x06_h$
Activation of the fieldbus scan The fieldbus scan updates all EtherCAT codes.	

Selection list(Lenze setting printed in bold)	
0	**No Operation**
1	The bus is scanned

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer

C282/2

Parameter | Name: **C282/2 | ECAT DC: Perm. dev. slave sync**			Data type: UNSIGNED_32 Index: 24293.2_d = $0x5EE5.0x02_h$
Permissible deviation of the distributed clocks of all devices in nanoseconds. If the permissible deviation is exceeded, the master will initiate a resynchronisation of the distributed clocks.			
Display range (min. value | unit | max. value)			
0	ns	4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C282/3

Parameter | Name: **C282/3 | - ECAT DC: Current deviation**			Data type: INTEGER_32 Index: 24293.3_d = $0x5EE5.0x03_h$
Current maximum deviation of the distributed clocks of all devices in nanoseconds.			
Display range (min. value | unit | max. value)			
-2147483647	ns	2147483647	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/3

Parameter | Name: **C286/3 | ECAT bus: No. of slaves**			Data type: UNSIGNED_32 Index: 24289.3_d = $0x5EE1.0x03_h$
Number of slaves connected to the fieldbus			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/4

Parameter | Name: **C286/4 | ECATBus: No. of slaves with DC**			Data type: UNSIGNED_32 Index: 24289.4_d = $0x5EE1.0x04_h$
Number of slaves connected to the fieldbus and supported by distributed clocks			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/5

Parameter | Name: **C286/5 | ECAT config.: No. of slaves**			Data type: UNSIGNED_32 Index: 24289.5_d = $0x5EE1.0x05_h$
Number of slaves configured in the master configuration file			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/6

Parameter | Name: **C286/6 | ECAT config.: No. of mailbox slaves**			Data type: UNSIGNED_32 Index: 24289.6_d = $0x5EE1.0x06_h$
Number of mailbox slaves configured in the master configuration file			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/7

Parameter | Name: **C286/7 | ECAT counter: Tx frames**			Data type: UNSIGNED_32 Index: 24289.7_d = $0x5EE1.0x07_h$
Number of sent frames			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/8

Parameter | Name: **C286/8 | ECAT counter: Rx frames**			Data type: UNSIGNED_32 Index: 24289.8_d = $0x5EE1.0x08_h$
Number of received frames			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/9

Parameter | Name: **C286/9 | ECAT counter: Lost frames**			Data type: UNSIGNED_32 Index: 24289.9_d = $0x5EE1.0x09_h$
Number of lost frames			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/10

Parameter | Name: **C286/10 | ECAT counter: Cyclic frames**			Data type: UNSIGNED_32 Index: 24289.10_d = $0x5EE1.0x0A_h$
Number of cyclic frames			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/11

Parameter | Name: **C286/11 | ECAT counter: Cyclic datagrams**			Data type: UNSIGNED_32 Index: 24289.11_d = $0x5EE1.0x0B_h$
Number of cyclic datagrams			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/12

Parameter | Name: **C286/12 | ECAT counter: Acyclic frames**			Data type: UNSIGNED_32 Index: 24289.12_d = $0x5EE1.0x0C_h$
Number of acyclic frames			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/13

Parameter | Name: **C286/13 | ECAT counter: Acyclic datagrams**			Data type: UNSIGNED_32 Index: 24289.13_d = $0x5EE1.0x0D_h$
Number of acyclic datagrams			
Display range (min. value | unit | max. value)			
0		4294967295	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer			

C286/14

Parameter | Name: **C286/14 | ECAT: Reset individual counters**		Data type: UNSIGNED_32 Index: 24289.14_d = $0x5EE1.0x0E_h$
Reset frame and datagram counters (C1086/7 ... 13)		
Selection list(Lenze setting printed in bold)		
0	**No Operation**	
1	Reset - All counters	
2	Reset - Tx frame counters	
4	Reset - Rx frame counters	
8	Reset - Lost frame counters	
16	Clear Cyclical Frame Counter	
32	Clear Cyclical Datagram Counter	
64	Reset - Acyclic frame counters	
128	Reset - Acyclic datagram counters	
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☑ no transfer		

15.9 CAN

This chapter provides a list of all parameters of the CAN interface (on board) of the Controllers c300 and p300 and the MC-CAN2 communication card in numerically ascending order.

The MC-CAN2 communication card ...

- has two CAN interfaces;
- is not supported by Controller c300/p300 (CAN on board).

Note!

If an MC-CAN2 card is replaced, the parameters of the card previously used must be checked and deviant settings will have to be adjusted!

C1031

Parameter | Name: **C1031 | Device: Type key**	Data type: VISIBLE_STRING Index: $23544_d = 5BF8_h$
Identification of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1032

Parameter | Name: **C1032 | Device: Type version**	Data type: VISIBLE_STRING Index: $23543_d = 5BF7_h$
Version number of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1033

Parameter | Name: **C1033 | Device: Name**	Data type: VISIBLE_STRING Index: $23542_d = 5BF6_h$
Device name of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1034

Parameter | Name: **C1034 | Device: Software**	Data type: VISIBLE_STRING Index: $23541_d = 5BF5_h$
Software version of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1035

Parameter | Name: **C1035 | Device: Hardware**	Data type: VISIBLE_STRING Index: $23540_d = 5BF4_h$
Hardware version of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1036

Parameter | Name: **C1036 | Device: Serial number**	Data type: VISIBLE_STRING Index: $23539_d = 5BF3_h$
Serial number of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1037

Parameter | Name: **C1037 | Device: Manufacturer**	Data type: VISIBLE_STRING Index: $23538_d = 5BF2_h$
Manufacturer of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1038

Parameter | Name: **C1038 | Device: Manufacturing date**	Data type: VISIBLE_STRING Index: $23537_d = 5BF1_h$
Manufacturing date of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

15.9.1 Parameters of the first CAN interface

C1073

Parameter | Name: **C1073 | Device: Driver index**	Data type: UNSIGNED_32 Index: $23502_d = 5BCE_h$
Index of the device driver. Since there can be more than one CAN interface, several instances can be run via the driver.	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1081

Parameter | Name: **C1081 | Sync master: Interface index**			Data type: UNSIGNED_32 Index: $23494_d = 5BC6_h$
Note: Restart the Controller after changing this parameter!			
Setting range (min. value | unit | max. value)			**Lenze setting**
			4294967295
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C1082

Parameter | Name: **C1082 | Baud rate**	Data type: UNSIGNED_32 Index: $23493_d = 5BC5_h$
Baud rate of the CAN interface. The value is assigned from a selection list.	

Selection list(Lenze setting printed in bold)	
7	5
6	10
5	20
3	50
8	100
2	125
1	250
0	**500**
4	1000

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C1090

Parameter | Name: **C1090 | Tx PDO counter**	Data type: UNSIGNED_32 Index: $23485_d = 5BBD_h$
PDO counter for sent CAN messages	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1091

Parameter | Name: **C1091 | Rx PDO counter**	Data type: UNSIGNED_32 Index: $23484_d = 5BBC_h$
PDO counter for received CAN messages	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1092

Parameter | Name: **C1092 | Bus load**	Data type: UNSIGNED_32 Index: $23483_d = 5BBB_h$
Specification of the average bus load. The bus load is calculated as follows: **Bus load = Value in percent x 1000**	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1093

Parameter | Name: **C1093 | Error counter**	Data type: UNSIGNED_32 Index: $23482_d = 5BBA_h$
Error counter since last initialisation of the CAN interface	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1094

Parameter | Name: **C1094 | Last error code**	Data type: UNSIGNED_32 Index: $23481_d = 5BB9_h$
Code of the last error that occurred	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1096

Parameter | Name: **C1096 | CAN node ID**			Data type: UNSIGNED_8 Index: $23479_d = 5BB7_h$
Setting range (min. value | unit | max. value)			**Lenze setting**
0		128	**63**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C1098

Parameter | Name: **C1098 | Channel**			Data type: UNSIGNED_32 Index: $23477_d = 5BB5_h$
Setting range (min. value | unit | max. value)			**Lenze setting**
			0
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

15.9.2 Parameters of the second CAN interface

C1113

Parameter | Name: **C1113 | Device: Driver index**	Data type: UNSIGNED_32 Index: $23462_d = 5BA6_h$
Index of the device driver. Since there can be more than one CAN interface, several instances can be run via the driver.	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1121

Parameter | Name: **C1121 | Sync master: Interface index**			Data type: UNSIGNED_32 Index: $23454_d = 5B9E_h$
Note: Restart the Controller after changing this parameter!			
Setting range (min. value | unit | max. value)			**Lenze setting**
			4294967295
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C1122

Parameter | Name: **C1122 | Baud rate**	Data type: UNSIGNED_32 Index: $23453_d = 5B9D_h$
Baud rate of the CAN interface. The value is assigned from a selection list.	

Selection list(Lenze setting printed in bold)	
7	5
6	10
5	20
3	50
8	100
2	125
1	250
0	**500**
4	1000

☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer

C1130

Parameter | Name: **C1130 | Tx PDO counter**	Data type: UNSIGNED_32 Index: $23445_d = 5B95_h$
PDO counter for sent CAN messages	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1131

Parameter | Name: **C1131 | Rx PDO counter**	Data type: UNSIGNED_32 Index: $23444_d = 5B94_h$
PDO counter for received CAN messages	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1132

Parameter | Name: **C1132 | Bus load**	Data type: UNSIGNED_32 Index: $23443_d = 5B93_h$
Indication of the mean bus load The bus load is calculated as follows: **Bus load = value in percent x 1000**	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1133

Parameter | Name: **C1133 | Error counter**	Data type: UNSIGNED_32 Index: $23442_d = 5B92_h$
Error counter since last initialisation of the CAN interface	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1134

Parameter | Name: **C1134 | Last error code**	Data type: UNSIGNED_32 Index: $23441_d = 5B91_h$
Code of the last error that occurred	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1136

Parameter | Name: **C1136 | CAN node ID**			Data type: UNSIGNED_8 Index: $23439_d = 5B8F_h$
Setting range (min. value | unit | max. value)			**Lenze setting**
0		128	**63**
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

C1138

Parameter | Name: **C1138 | Channel**			Data type: UNSIGNED_32 Index: $23437_d = 5B8D_h$
Setting range (min. value | unit | max. value)			**Lenze setting**
			0
☑ Read access ☑ Write access ☐ CINH ☐ PLC-STOP ☐ no transfer			

15.10 PROFIBUS / PROFINET / Serial interfaces

This chapter lists all parameters of the PROFIBUS and PROFINET communication cards and the communication card with serial interfaces in numerically ascending order:

- Communication card MC-PBM (PROFIBUS master)
- Communication card MC-PBS (PROFIBUS slave)
- MC-PND communication card (PROFINET device)
- MC-ISI communication card (serial interfaces RS-232/422/485)

C1031

Parameter | Name: **C1031 | Device: Type key**	Data type: VISIBLE_STRING Index: $23544_d = 5BF8_h$
Identification of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1032

Parameter | Name: **C1032 | Device: Type version**	Data type: VISIBLE_STRING Index: $23543_d = 5BF7_h$
Version number of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1033

Parameter | Name: **C1033 | Device: Name**	Data type: VISIBLE_STRING Index: $23542_d = 5BF6_h$
Device name of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1034

Parameter | Name: **C1034 | Device: Software**	Data type: VISIBLE_STRING Index: $23541_d = 5BF5_h$
Software version of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1035

Parameter | Name: **C1035 | Device: Hardware**	Data type: VISIBLE_STRING Index: $23540_d = 5BF4_h$
Hardware version of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1036

Parameter | Name: **C1036 | Device: Serial number**	Data type: VISIBLE_STRING Index: $23539_d = 5BF3_h$
Serial number of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1037

Parameter | Name: **C1037 | Device: Manufacturer**	Data type: VISIBLE_STRING Index: $23538_d = 5BF2_h$
Manufacturer of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

C1038

Parameter | Name: **C1038 | Device: Manufacturing date**	Data type: VISIBLE_STRING Index: $23537_d = 5BF1_h$
Manufacturing date of the card	
☑ Read access ☐ Write access ☐ CINH ☐ PLC-STOP ☐ No transfer	

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FEEDBACK

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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