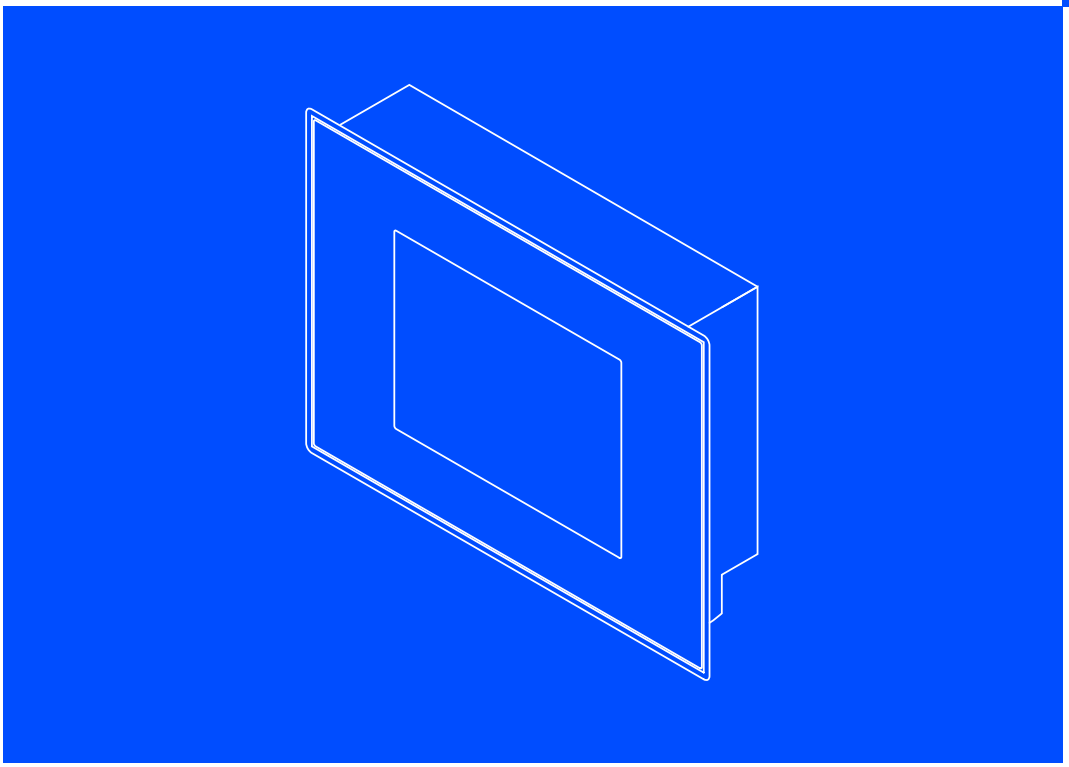
LDCDS-EL100
13434945

Operating Instructions

HMI with Windows® CE



EL 1xx ECO, EL 1xx ECO PLC, EL 1xx CAN, EL 1xx PLC, EL 1xx MPI

HMI for visualisation / with control technology

Lenze

Please read these instructions before you start working!
Follow the enclosed safety instructions.

1 About this documentation

1.1 Validity information

These instructions are valid for

HMI with CAN interface	HMI with CAN interface, integrated PLC and UPS	HMI with MPI interface
EL 103 ECO	EL 103 ECO PLC	-
EL 105M CAN	EL 105m PLC	EL 105M MPI
EL 105 CAN	EL 105 PLC	EL 105 MPI
EL 106 CAN	EL 106 PLC	EL 106 MPI
EL 108 CAN	EL 108 PLC	EL 108 MPI
EL 110 CAN	EL 110 PLC	EL 110 MPI
EL 110s CAN	EL 110s PLC	EL 110s MPI

The nameplate is on the back of the device.

1.2 Target group

This documentation is directed at qualified skilled personnel according to IEC 60364.

Qualified skilled personnel are persons who have the required qualifications to carry out all activities involved in installing, mounting, commissioning, and operating the product.

1.3 Document history

Material number	Version			Description
13434945	9.0	11/2013	TD29	Safety instructions for the installation according to UL added and other revisions
13398591	8.0	01/2012	TD29	New chapter ”Install fonts”
13349601	7.1	07/2011	TD29	Pin assignment SUB-D plug corrected
13349601	7.0	06/2011	TD29	UL approval and other revisions
13346004	6.0	08/2010	TD29	Corrected CAN connection drawing for EL 103 ECO
13327978	5.0	05/2010	TD29	Amended by description of type EL 103 ECO; description of type EL 112 deleted; adapted BA according to the new specifications regarding the Lenze classification and the new specifications of the units of measurement regulation
13273430	4.0	01/2009	TD29	Amended by description of type EL 112
13236340	3.0	04/2008	TD29	Description of type EL 110s and all types with integrated PLC has been added
13227672	2.0	11/2007	TD29	The ”Commissioning” chapter has been expanded by descriptions on server functionalities
13200039	1.0	03/2007	TD29	First edition

Tip!

Information and auxiliary devices related to the Lenze products can be found in the download area at

http://www.Lenze.com

1.4 Terminology used

Term	In the following text used for
EL 1xx	HMI of the EL 100 or EL 100 ECO series
HMI	Human Machine Interface
MPI	Interface for the SIMATIC S7 automation system from Siemens AG
SD/SDHC card	Memory card in the SD/SDHC format
Touchscreen	Touch screen terminal

1.5 Conventions used

Type of information	Identification	Examples/notes
Spelling of numbers		
Decimal separator	Point	In general, the decimal point is used. For instance: 1234.56
Text		
Program name	» «	PC software For example: »Engineer«, »Global Drive Control« (GDC)
Icons		
Page reference	🕮	Reference to another page with additional information For instance: 🕮 16 = see page 16
Documentation reference	🕭	Reference to another documentation with additional information For example: 🕭 EDKxxx = see documentation EDKxxx

1.6 Notes used

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

Safety instructions

Structure of safety instructions:

Danger!

(characterises the type and severity of danger)

Note

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

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

Application notes

Pictograph and signal word	Meaning
 **Note!**	Important note to ensure troublefree operation
 **Tip!**	Useful tip for simple handling
	Reference to another documentation

Special safety instructions and application notes

Pictograph and signal word	Meaning
 **Warnings!**	**Safety note or application note for the operation according to UL or CSA requirements.** The measures are required to meet the requirements according to UL or CSA.
 **Warnings!**	

2 Safety instructions

2.1 General safety instructions

Danger!

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

- Lenze drive and automation components ...
  - ... must only be used for the intended purpose.
  - ... must never be operated if damaged.
  - ... must never be subjected to technical modifications.
  - ... must never be operated unless completely assembled.
  - ... must never be operated without the covers/guards.
  - ... can - depending on their degree of protection - have live, movable or rotating parts during or after operation. Surfaces can be hot.
- For Lenze drive components ...
  - ... only use permitted accessories.
  - ... only use original manufacturer spare parts.
- All specifications of the corresponding enclosed documentation must be observed.
  - This is vital for a safe and trouble-free operation and for achieving the specified product features.
  - The procedural notes and circuit details provided in this document are proposals which the user must check for suitability for his application. The manufacturer does not accept any liability for the suitability of the specified procedures and circuit proposals.
- Only qualified skilled personnel are permitted to work with or on Lenze drive and automation components.
  - According to IEC 60364 or CENELEC HD 384, these are persons ...
  - ... who are familiar with the installation, assembly, commissioning and operation of the product,
  - ... possess the appropriate qualifications for their work,
  - ... and are acquainted with and can apply all the accident prevent regulations, directives and laws applicable at the place of use.

Transport, storage

- Transport and storage in a dry, low-vibration environment without aggressive atmosphere; preferably in the packaging provided by the manufacturer.
  - – Protect against dust and shocks.
  - – Comply with climatic conditions according to the technical data.

Mechanical installation

- Install the product according to the regulations of the corresponding documentation. In particular observe the section ”Operating conditions” in the chapter ”Technical data”.
- Provide for a careful handling and avoid mechanical overload. During handling neither bend components, nor change the insulation distances.
- The product contains electrostatic sensitive devices which can easily be damaged by short circuit or static discharge (ESD). Thus, electronic components and contacts must not be touched unless ESD measures are taken beforehand.

Electrical installation

- Carry out the electrical installation according to the relevant regulations (e. g. cable cross-sections, fusing, connection to the PE conductor). Additional notes are included in the documentation.
- When working on live products, observe the applicable national regulations for the prevention of accidents (e.g. BGV 3).
- The documentation contains information about EMC-compliant installation (shielding, earthing, arrangement of filters and laying cables). The system or machine manufacturer is responsible for compliance with the limit values required by EMC legislation.

  Warning: The controllers are products which can be used in category C2 drive systems as per EN 61800-3. These products may cause radio interference in residential areas. If this happens, the operator may need to take appropriate action.
- For compliance with the limit values for radio interference emission at the site of installation, the components - if specified in the technical data - have to be mounted in housings (e. g. control cabinets). The housings have to enable an EMC-compliant installation. In particular observe that for example control cabinet doors preferably have a circumferential metallic connection to the housing. Reduce openings or cutouts through the housing to a minimum.
- Only plug in or remove pluggable terminals in the deenergised state!

Commissioning

- If required, you have to equip the system with additional monitoring and protective devices in accordance with the respective valid safety regulations (e. g. law on technical equipment, regulations for the prevention of accidents).

Maintenance and servicing

- The components are maintenance-free if the required operating conditions are observed.
- If the cooling air is polluted, the cooling surfaces may be contaminated or the air vents may be blocked. Under these operating conditions, the cooling surfaces and air vents must be cleaned at regular intervals. Never use sharp objects for this purpose!
- After the system has been disconnected from the supply voltage, live components and power connections must not be touched immediately because capacitors may be charged. Please observe the corresponding notes on the device.

Disposal

- Recycle metals and plastic materials. Ensure professional disposal of assembled PCBs.
- This device contains a battery. According to European legislation you are obliged to dispose of batteries separately via the take-back systems specified.

2.2 Product-specific safety instructions

- Before working on the HMI, the supply connector must be unplugged. This is particularly important before opening the enclosure and connecting/removing connectors.
- The voltage input is not internally fused and may be destroyed if the input voltage is too high. Observe the maximally permissible input voltage and professionally fuse the device on the input side against voltage fluctuations and peaks.
- During installation, see that the maximally permissible ambient temperature is not exceeded. Corresponding measures for active or passive cooling must be taken if required.
- The HMI is a device of class A and can cause radio interference in residential areas. In this case, the operator may have to take special measures. Any costs arising from these measures have to be paid by the operator.
- In the case of an error, send the HMI to the manufacturer. The address is provided on the return envelope of this documentation. Please use the original packaging if you return the HMI!

2.3 Safety instructions for the installation according to UL

GB

Approval

Underwriter Laboratories (UL), UL508 and CSA C22.2 No. 142-M1987, (UL File Number E236341)

Ratings

- Input 24 V DC, 12 W
- Max. Ambient Temperature 50 °C
- Enclosure ratings:
  - Front Panel Mounted UL Type 1, 2 and 5 Enclosure
  - Except:
    EL108 STD: Front Panel Mounted Type 1 Enclosure
    EL108 KSTG: Panel mounted Type 1 Enclosure

UL

Warnings!

Field Wiring Markings

Wiring Terminal MSTB 2,5/3-STF-5,08:

- Use 60/75°C copper wire only.
- AWG 18 ... AWG 12 (0.82 mm^2... 3.3 mm^2)
- Torque 5...7 lb-in (0.5 ... 0.6 Nm)

Device

- For use in surrounding air temperature 50 °C.
- Use in a pollution degree 2 environment.
- For use on a flat surface of a Type 1, 2 and 5 enclosure.
  - Except:
    EL108 STD: Front Panel Mounted Type 1 Enclosure
    EL108 KSTG: Panel mounted Type 1 Enclosure
- EL 108 KSTG:

  The device shall be supplied by an isolating source protected by a fuse with max. rating 8 A.

Battery

- Replace battery with any from the list below, part No. CR 2450 only. Use of another battery may present a risk of fire or explosion.

  Recommended CR2450 (R/C, BBVC2) types:

  Renata Part.no. CR2450N, Sony Corp. part no. CR2450B, Toshiba part no. CR2450, Varta part no. CR2450, Matsushita part no. CR2450
- Battery may explode if mistreated. Do not recharge, disassemble, dispose of in fire or heat above 100 °C (212 °F).
- Dispose of used battery according to the regulation of recycling or waste.

(F)

Homologation

Underwriter Laboratories (UL), UL508 et CSA C22.2 n° 142-M1987, (n° de dossier UL E236341)

Caractéristiques assignées

- Entrée 24 V CC, 12 W
- Température ambiante maximale : 50 °C
- Classification du coffret de protection :
  – Montage sur panneau avant, coffret UL de type 1, 2 et 5
  – Exception :
    EL108 STD : coffret de type 1 monté sur le panneau avant
    EL108 KSTG : coffret de type 1 monté sur panneau

(UL)

Warnings!

Marquage du câblage à pied d'oeuvre

Bornier de câblage MSTB 2,5/3-STF-5,08 :

- Utiliser exclusivement des conducteurs en cuivre 60/75°C.
- AWG 18 ... AWG 12 (0,82 mm^2... 3,3 mm^2)
- Couple de 5 à 7 lb-in (0,5 ... 0,6 Nm)

Appareil

- Destiné à une utilisation à une température ambiante maximale de 50 °C.
- Destiné à une utilisation dans un environnement caractérisé par le degré de pollution 2.
- Conçu pour une utilisation sur une surface plane, coffret de type 1, 2 et 5.
  – Exception :
    EL108 STD : coffret de type 1 monté sur le panneau avant
    EL108 KSTG : coffret de type 1 monté sur panneau
- EL 108 KSTG :

  L'équipement doit être alimenté par une source de tension avec isolation galvanique protégée par un fusible de 8 A maximum.

Batterie

- Remplacer la batterie par l'un des types répertoriés dans la liste ci-dessous, n° de référence CR 2450 uniquement. L'utilisation d'une autre batterie présente un risque d'incendie ou d'explosion.

  Types CR2450 recommandés (R/C, BBVC2) :

  Renata référence CR2450N, Sony Corp. référence CR2450B, Toshiba référence CR2450, Varta référence CR2450, Matsushita référence CR2450
- Toute utilisation non conforme de la batterie entraîne un risque d'explosion. Ne pas recharger, démonter, jeter au feu ni exposer la batterie à une chaleur supérieure à 100 °C (212 °F).
- Eliminer la batterie conformément à la réglementation en vigueur en matière de recyclage ou de traitement des déchets.

3 Product description

3.1 Application as directed

HMIs of the EL 1xx series

- are Human Machine Interfaces (HMIs) for the implementation of operating concepts or the provision of information in common industrial and commercial areas.
- must only be operated if the operating conditions specified in these operating instructions are met.
- are no household appliances. They are components intended to be used exclusively for commercial purposes.

Systems with HMI devices

- The user is responsible for the compliance of his application with the EC Directives.

Any other use shall be deemed inappropriate!

A **use that is not intended** also includes a use harbouring fatal risks or dangers which, without the provision of exceptionally high safety measures, may result in death, injury or damage to material assets.

The HMI must in particular **not** be used ...

- in private areas.
- in potentially explosive atmosphere.
- in areas with harmful gases, oils, acids, radiation, etc.
- for performing safety functions, for instance
  – in air traffic control / in flight-control systems
  – for the monitoring/control of nuclear reactions
  – for the monitoring/control of means of mass transport
  – for the monitoring/control of medical systems
  – for the monitoring/control of weapons systems

  Higher-level safety systems must be used to guarantee the protection of persons and material assets!

Note!

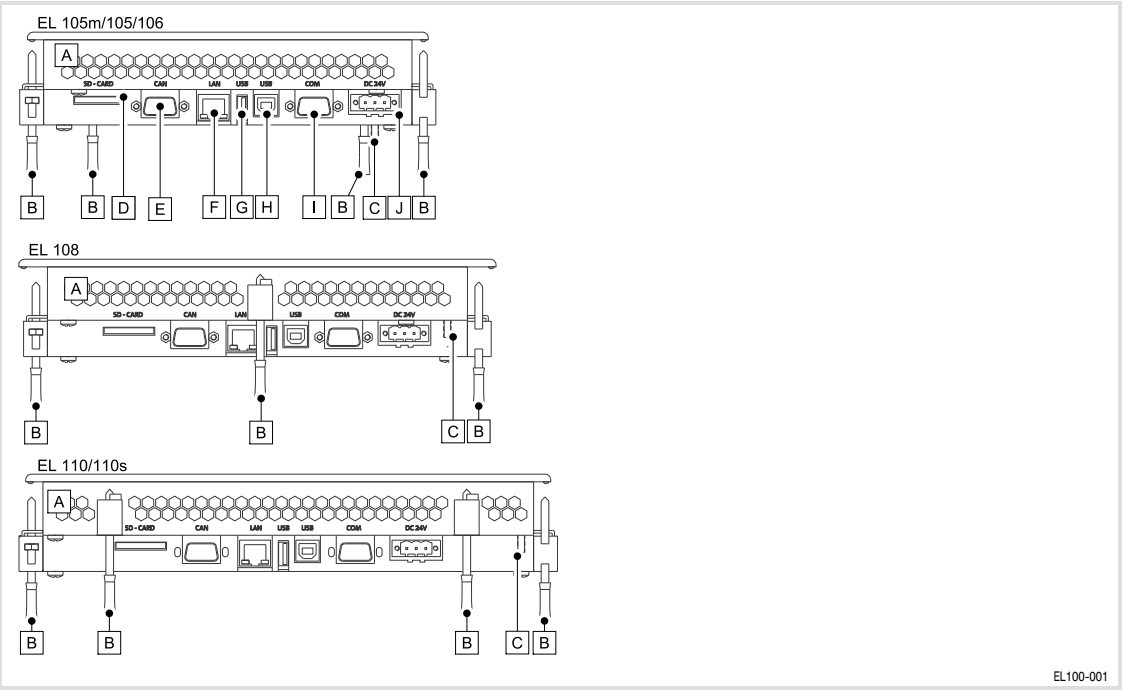
The touchscreen does not comply with the Ergonomics Directive ZH 1/618. Therefore, it is only designed for short-time inputs and monitoring functions. For longer inputs, connect an external keyboard.

3.2 Scope of supply

Number	Description
1	HMI
	Screw clamp fixings
4	for EL 103 ECO (PLC)
4	for EL 105(m) CAN/PLC/MPI
4	for EL 106 CAN/PLC/MPI
6	for EL 108 CAN/PLC/MPI
8	for EL 110(s) CAN/PLC/MPI
1	Mounting instructions
1	DVD ”PC-based Automation”

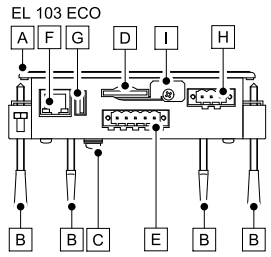
3.3 Overview

3.3.1 EL 1xx CAN/PLC/MPI



Pos.	Description
A	HMI
B	Screw clamp fixings
C	PE connection
D	SD/SDHC card slot
E	CAN or MPI port
F	Ethernet port
G	USB-A port
H	USB-B port
I	Serial RS232 interface
J	Connection supply

3.3.2 EL 1xx ECO (PLC)



EL100e-001

Pos.	Description
A	HMI
B	Screw clamp fixings
C	PE connection
D	SD/SDHC card slot
E	CAN interface
F	Ethernet port
G	USB-A port
H	Connection supply
I	SD/SDHC card protection (eject protection)

4 Technical data

4.1 General data and operating conditions

Conformity and approval		
Conformity		
CE	EN 61000-6-1 (-3), VDE 0839-6-1 (-3)	2002 residential area
	EN 61000-6-2 (-4), VDE 0839-6-2 (-4)	2006 industrial premises
	EN 55022	
	EN 55024	Equipment of information technology
Approbation		
UL	UL 508 CSA C22.2	Programmable Controllers (File-No. E236341)
Other		
RoHS	-	Products lead-free in accordance with CE Directive 2011/65/EU

Protection of persons and equipment		
Safety	VDE0805 (EN60950), VDE0870, UL	
Type of protection		IP65 (front) / IP20 (back) Type 1, 2 and 5 enclosure
Class of protection		3

Ambient conditions		
Climatic		
Temperature		
Storage/Transport		0 ... +60 °C
Operation		
EL 1xx ECO EL 1xx CAN/MPI		0 ... +50 °C
EL 1xx ECO PLC EL 1xx PLC		5 ... +45 °C
Relative humidity		10 ... 90 %, no condensation
Site altitude		
Storage/Transport		< 12.000 m amsl
Operation		< 3.000 m amsl
Vibration test according to EN 61131-2 (programmable controllers)		
Vibration	EN 60068-2-6	1 g
Shock	EN 60068-2-27	15 g

Mounting conditions		
Mounting place		Control cabinet door
Mounting position		Terminals at the bottom

4.2 Electrical data

4.2.1 EL 1xx CAN/PLC/MPI

Supply		Type EL xxx					
		105m	105	106	108	110	110s
Voltage	[V]	DC 24 (+18 ... 30)					
Current at 24 V	[A]	0.25	0.3	0.3	0.5	0.5	
Power at 24 V	[W]	6.0	7.2	7.2	12.0	12.0	

Buffer for real-time clock dated		Typ EL xxx					
		105m	105	106	108	110	110s
Battery Service life	[year]	7 (at 25 °C)					

CPU and operating system		Typ EL xxx					
		105m	105	106	108	110	110s
CPU type		Intel® Xscale PXA 270					
Operating system		Windows® CE 5.0					

Memory		Typ EL xxx CAN/MPI					
		105m	105	106	108	110	110s
RAM	[MB]	64					
Flash	[MB]	32					
Exchangeable disk storage		SD/SDHC card slot [1)]					

Memory		Typ EL xxx PLC					
		105m	105	106	108	110	110s
RAM	[MB]	128					
Flash	[MB]	64					
Exchangeable disk storage		SD/SDHC card slot [1)]					

1) Due to the great variety of SD/SDHC cards available on the market, compatibility cannot be ensured. We do not know about any restrictions.

Screen		Typ EL xxx		
		105m	105	106
Type		Touch screen, resistive		
Colours		16 grey tones	64 K	64 K
Display diagonal	[cm]	14.5 (5.7”)		16.3 (6.4”)
Visible size	[mm]	115 x 86		131 x 98
Resolution	[pixels]	320 x 240		640 x 480
Pixel size	[mm]	0.33 x 0.33		0.07 x 0.07
Contrast		-	400:1	400:1
Brightness	[cd/m²]	180	250	250
Angle of view				
right	[°]	-	60	65
left		-	60	65
top		-	40	50
bottom		-	50	60
Illumination		Cathode-ray tube, adjustable		
Service life at 25°C	[h]	40000	45000	50000

Screen (continued)		Typ EL xxx		
		108	110	110s
Type		Touch screen, resistive		
Colours		64 K		
Display diagonal	[cm]	20.3 (8”)	26.4 (10.4”)	
Visible size	[mm]	162 x 122	216 x 163	
Resolution	[pixels]	640 x 480	640 x 480	600 x 800
Pixel size	[mm]	0.25 x 0.25	0.33 x 0.33	
Contrast		250:1	300:1	
Brightness	[cd/m²]	400		
Angle of view				
right	[°]	65	60	
left		65	60	
top		55	40	
bottom		65	50	
Illumination		Cathode-ray tube, adjustable		
Service life at 25°C	[h]	50000		

PLC functions (EN 61131-3)		Typ EL xxx PLC					
		105m	105	106	108	110	110s
Editor		AWL, FUP, KOP, ST, AS, CFC					
Program code	[kB]	2048					
Data memory Variables Global Var.	 [kB] [kB]	 1024 512					
Memory location	[kB]	4					
Process image Input Output	 [kB] [kB]	 4 4					
Retain data	[kB]	128					
UPS		Integrated to save retain data to the flash memory					
Target L-force Logic EL1xx		V1.x					
Task runtime	[ms]	≥10					

Ports		
COM 1	Type	RS232
	Connection	SUB-D, 9-pole, connector
LAN	Type	Ethernet
	Protocol	TCP/IP
	Baud rate	10/100 Mbits
	Connection	RJ45, socket
USB	Type	2.0 (1.1-compatible)
	Connection	Type A and type B, socket
CAN [1)]	Type	CAN, ISO11898
	Protocol	Lenze system bus CAN
	Topology	Line, terminated on both sides with 120 Ω
	Node	Master or slave
	Number of nodes	Max. 63
	Baud rate	See CAN communication manual
	Bus length	See CAN communication manual
	Connection	SUB-D, 9-pole, connector
MPI [1)]	Type	RS485
	Protocol	MPI
	Topology	Line, terminated on both sides with 200 Ω
	Node	Master
	Number of nodes	Max. 32 per segment Max. 127 with RS485 repeaters
	Baud rate	19.2 kBaud ... 12 MBaud
	Bus length	Max. 50 m
	Connection	SUB-D, 9-pole, connector

1* optionally CAN or MPI

4.2.2 EL 1xx ECO (PLC)

Supply		Type EL xxx ECO
		103
Voltage	[V]	DC 24 (+18 ... 30)
Current at 24 V	[A]	0.21
Power at 24 V	[W]	5.0

Buffer for real-time clock dated		Typ EL xxx ECO
		103
Capacitor Max. buffer time	[week]	2

CPU and operating system		Typ EL xxx ECO
		103
CPU type		Intel® Xscale PXA 270
Operating system		Windows® CE 5.0

Memory		Typ EL xxx ECO CAN
		103
RAM	[MB]	64
Flash	[MB]	32
Exchangeable disk storage		SD/SDHC card slot [1)]

Memory		Typ EL xxx ECO PLC
		103
RAM	[MB]	64
Flash	[MB]	32
Exchangeable disk storage		SD/SDHC card slot [1)]

1) Due to the great variety of SD/SDHC cards available on the market, compatibility cannot be ensured. We do not know about any restrictions.

Screen		Typ EL xxx ECO
		103
Type		Touch screen, resistive
Colours		64 K
Display diagonal	[cm]	8.9 (3.5")
Visible size	[mm]	70 x 53
Resolution	[pixels]	320 x 240
Pixel size	[mm]	0.7 x 0.22
Contrast		400:1
Brightness	[cd/m²]	300
Angle of view right left top bottom	[°]	 65 65 50 60
Illumination		LED
Service life at 25°C	[h]	-

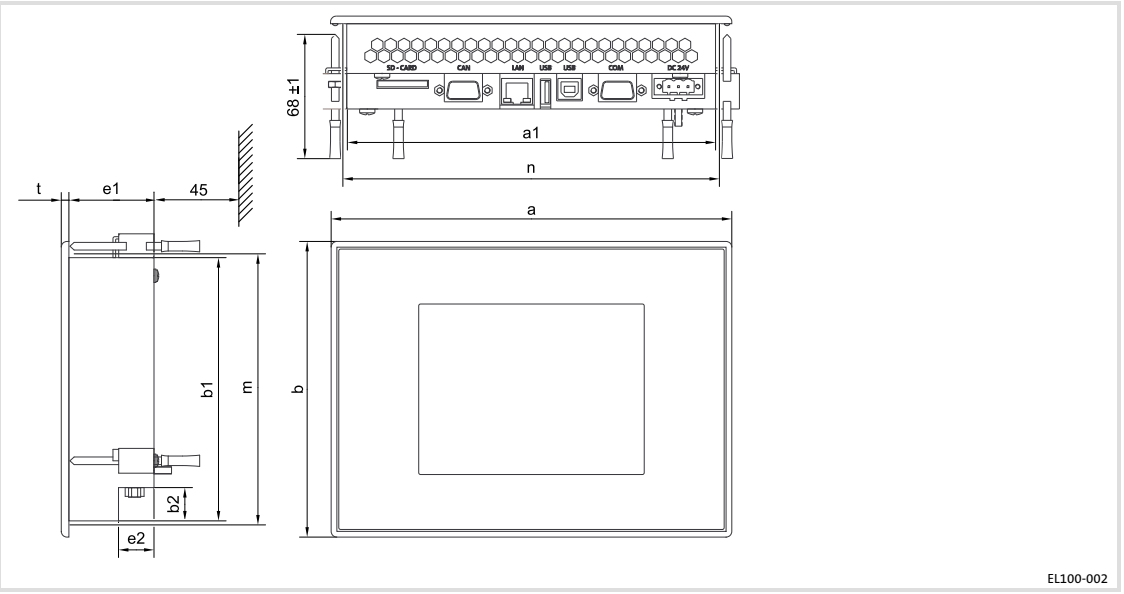
PLC functions (EN 61131-3)		Typ EL xxx ECO PLC
		103
Editor		AWL, FUP, KOP, ST, AS, CFC
Program code	[kB]	256
Data memory Variables Global Var.	 [kB] [kB]	 64 64
Memory location	[kB]	4
Process image Input Output	 [kB] [kB]	 1 1
Retain data	[kB]	16
UPS		Integrated to save retain data to the flash memory
Target L-force Logic EL1xx		V2.x
Task runtime	[ms]	≥100

Ports		
LAN	Type	Ethernet
	Protocol	TCP/IP
	Baud rate	10/100 Mbits
	Connection	RJ45, socket
USB	Type	2.0 (1.1-compatible)
	Connection	Type A, socket
CAN	Type	CAN, ISO11898
	Protocol	Lenze system bus CAN
	Topology	Line, terminated on both sides with 120 Ω
	Node	Master or slave
	Number of nodes	Max. 63
	Baud rate	See CAN communication manual
	Bus length	See CAN communication manual
	Connection	SUB-D, 9-pole, connector

4.3 Mechanical data

4.3.1 EL 1xx CAN/PLC/MPI

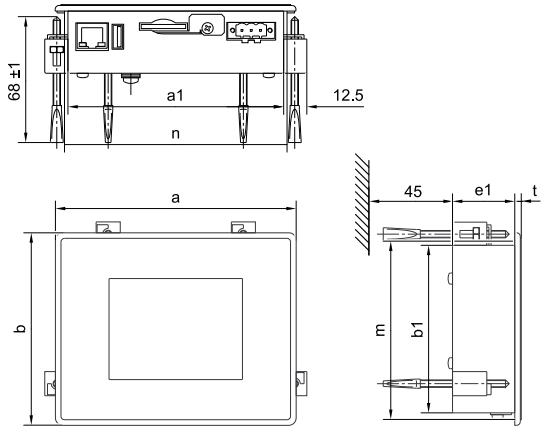
Design and weight		Type EL xxx					
		105m	105	106	108	110	110s
Front		Aluminium with polyester film to DIN 42115					
Cover		Sheet steel, galvanised					
Weight	[kg]	1.1	1.1	1.2	1.5	2.0	



Type	Dimensions [mm]								Mounting cutout [mm]	
	a	a1	b	b1	b2	e1	e2	t	n ±0.5	m ±0.5
EL 105	210	193	155	138	17.5	43.6	17.6	4	197	142
EL 105M										
EL 106										
EL 108	250	220	180	156.5	33.7	46	18	4	224	160.5
EL 110	275	257	220	201	75.5	46	18	4	261	205
EL 110s										

4.3.2 EL 1xx ECO (PLC)

Design and weight		Type EL xxx ECO
		103
Front		Aluminium with polyester film to DIN 42115
Cover		Sheet steel, galvanised
Weight	[kg]	0.4



Type	Dimensions [mm]						Mounting cutout [mm]	
	a	a1	b	b1	e1	t	n ±0.5	m ±0.5
EL 103 ECO	130	116.5	104	90.5	33.6	3	120	94

5 Mechanical installation

5.1 Important notes

The installation must be carried out by qualified, skilled personnel familiar with the applicable national standards.

Stop!

Sensitive front frame gasket

During mounting, the gasket of the front frame is exposed and can be damaged.

Possible consequences:

► The degree of protection provided by the enclosure mentioned in the technical data is not attained.

Protective measures:

► Handle the gasket with care during mounting.

► Protect the gasket against ultraviolet rays.

► Each time before you mount the device, check whether the gasket is intact.

Stop!

Sensitive touchscreen surface

The touchscreen foil is very sensitive to external forces and can be damaged by improper handling.

Possible consequences:

► The touchscreen foil becomes damaged, scratched or dull.

Protective measures:

► Avoid contact of the touchscreen foil with pointed or hard objects.

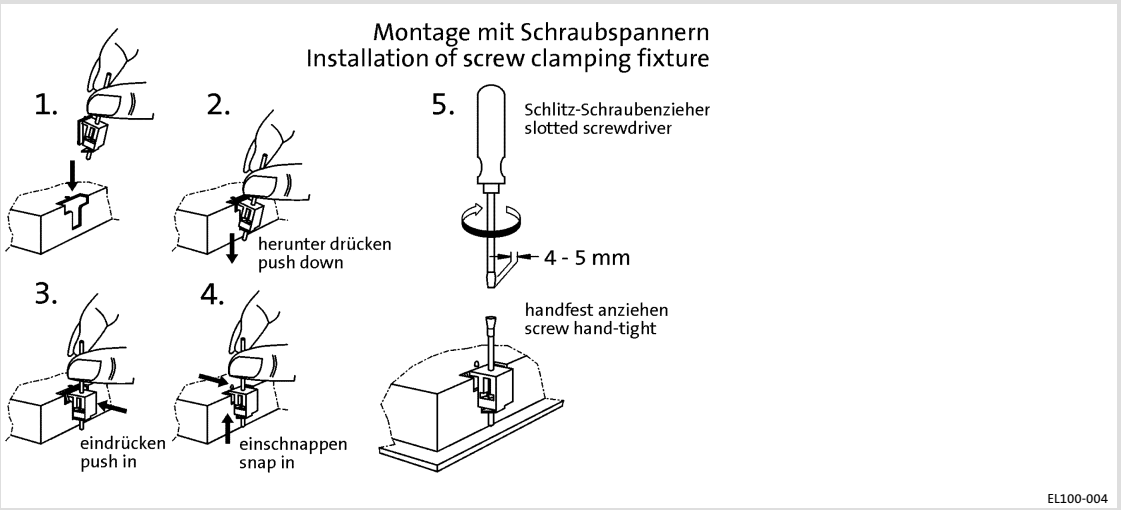
► Always use a touch pen or your fingers to operate the touchscreen. Never use objects such as ballpoint pens, pencils, etc.

► When removing dirt and fingerprints, observe the notes given in the chapter ”Cleaning” (📖 90).

Note!

When selecting the place where the PC is to be installed, pay attention to an ergonomic positioning of the screen and to the incidence of light which might cause reflections on the screen.

5.2 Mounting steps



How to assemble the HMI:

1. Cut the mounting cutout out of the control cabinet door.
2. Assemble the upper screw clamping fixtures (see figure).
3. Check if the gasket under the front panel is located correctly.
4. Insert the device into the mounting cutout, secure it by hand against falling down and tighten the assembled screw clamping fixtures hand-tight.
5. Secure the device by hand, assemble the remaining screw clamping fixtures and tighten them hand-tight.
6. Check if the device is securely located in the mounting cutout and if the front panel gasket is located correctly.
   – If necessary, loosen the screw clamping fixtures, re-align the device or gasket and tighten the screw clamping fixtures hand-tight.
   – If the gasket is not located correctly, protection class IP65 is not reached on the front of the device!

6 Electrical installation

6.1 Important notes

The installation must be carried out by qualified, skilled personnel familiar with the applicable national standards.

Stop!

Short circuit and static discharge

The device contains components which are endangered in the case of short circuit or static discharge.

Possible consequences:

► The device or parts of it will be destroyed.

Protective measures:

► Always switch off the voltage supply when working on the device. This particularly applies:
  – Before connecting / disconnecting connectors.
  – Before plugging in / plugging out modules.

► All persons handling printed circuit boards have to take account of ESD measures.

► Contacts of plug connectors must not be touched.

► Printed circuit boards may be touched only at places free from electrical contacts and may be placed only on appropriate materials (e.g. on ESD packaging or conductive foam material).

► Printed circuit boards may only be transported and stored in ESD packaging.

6.2 Wiring according to EMC

General notes	● The electromagnetic compatibility of the system depends on the type and accuracy of the installation. Please especially note the following: – Structure – Shielding – Earthing ● In the case of a differing installation it is required for evaluating the conformity to the EMC Directive to check the system with regard to compliance with the EMC limit values. This for instance applies to: – The use of unshielded cables ● **The end user is responsible for compliance with the EMC Directive.** – If you observe the following measures, you can be sure that no EMC problems will occur during operation and that the EMC Directive or the EMC law is met. – If devices which do not meet the CE requirement with regard to noise immunity EN 61000-4-2 are actuated near the system, these devices can be affected electromagnetically by the system.
Structure	● Connect device to the earthed mounting plate: – Mounting plates with an electroconductive surface (zinc-coated or stainless steel) allow for continuous contacting. – Coated plates are not suitable for an EMC-compliant installation. ● If you use several mounting plates: – Connect mounting plates to each other on a large surface and in a conductive manner (e.g. by means of copper strips). ● When installing the cables, observe a spatial separation of signal and mains cables. ● Route the cables as near to the reference potential as possible. Freely suspended cables act like aerials.
Shielding	● Preferably only use cables with a braid. ● The coverage of the shield should be more than 80%. ● In the case of data lines for a serial coupling, always use metallic or metallised plugs. Connect the shield of the data line on the connector shell.
Earthing	● Earth all metallically conductive components by the use of corresponding cables from a central earthing point (PE rail). ● Comply with the minimum cross-sections defined in the safety instructions: – With regard to EMC, however, not the cable cross-section, but the surface of the cable and of the extensive contacting is decisive.

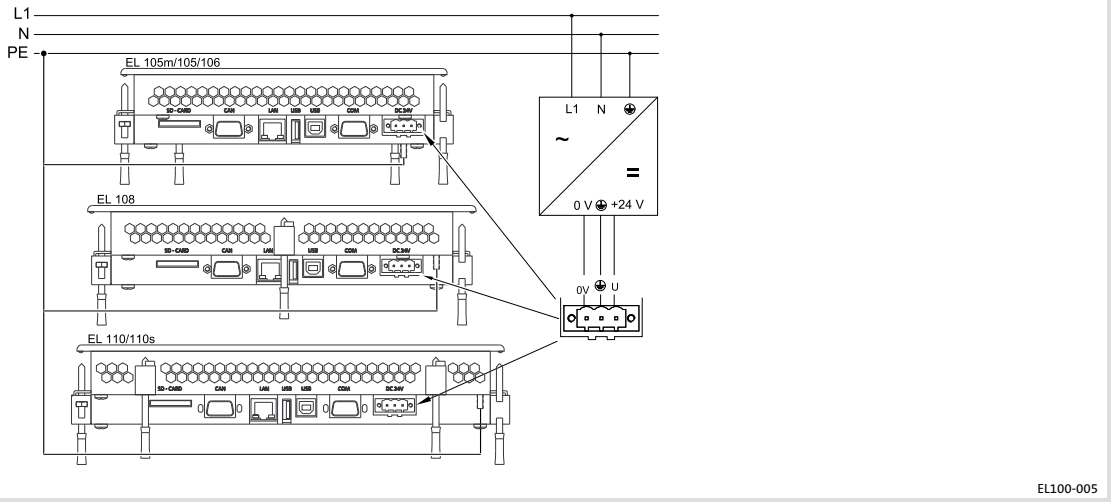
6.3 Wiring

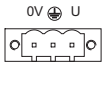
6.3.1 EL 1xx CAN/PLC/MPI

Mains connection

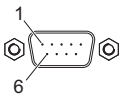
Note!

- ► Observe the max. permissible input voltage.
  Professionally fuse the device on the input side against voltage fluctuations and voltage peaks.
- ► The HMI boots up as soon as the supply voltage is applied.
  After the operating system has been shut down, the HMI switches off automatically. For restarting, the supply voltage has to be disconnected for a short time.



	Description	Connection type	Cable type
 IPC001	DC 24 V connection	3-pole Phoenix Combicon socket	Cable (conductor cross-section max. 2.5 mm²) with Phoenix Combicon plug, MSTB 2.5 / 3-STF-5.08
 IPC001	PE connection	Threaded bolt M4	Separate earthing conductor (min. 2.5 mm²) with ring cable lug

Serial interface

	Description	Connection type	Cable type
 IPC001	RS232 connection Pin 1: DCD Pin 2: RxD Pin 3: TxD Pin 4: DTR Pin 5: GND Pin 6: DSR Pin 7: RTS Pin 8: CTS Pin 9: RI	9-pin Sub-D plug	Control cable, shielded, with 9-pin Sub-D socket

Ethernet interface

	Description	Connection type	Cable type
 IPC001	Ethernet connection 10/100 Mbps Green LED (SPEED): on = 100 MBPS off = 10 Mbps Yellow LED (LINK/ACTIVITY): on or blinking = LINK /ACTIVITY off = no LINK	RJ45 socket	Network cable CAT5 S/UTP or CAT5e S/FTP (recommended), cable length: max. 100 m

Note!

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.

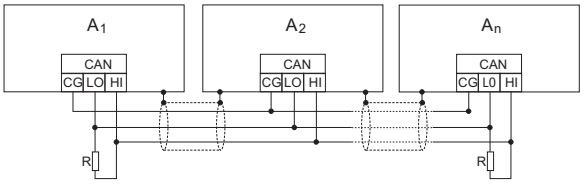
USB interface

	Description	Connection type	Cable type
 IPC001	USB 2.0 host connection Max. load: 5 V/500 mA	USB-A socket	USB cable with USB-A plug
USB  DVI/USB-010	USB device connection	USB-B socket	USB cable with USB-B plug

CAN interface

Note!

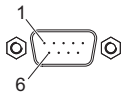
- ► Only connect terminals of the same signal type.
- ► For further information with regard to the CAN bus system please refer to the CAN Communication Manual.



A1	Node 1
A2	Node 2
An	Node n
CG	CAN-GND
LO	CAN-LOW
HI	CAN-HIGH
R	120 Ω-bus terminating resistor

We recommend the use of CAN cables in accordance with ISO 11898-2:

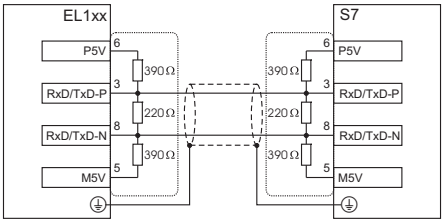
CAN cable in accordance with ISO 11898-2	
Cable type	Paired with shielding
Impedance	120 Ω (95 ... 140 Ω)
Cable resistance/cross-section	
Cable length ≤ 300 m	≤ 70 mΩ/m / 0.25 ... 0.34 mm² (AWG22)
Cable length 301 ... 1000 m	≤ 40 mΩ/m / 0.5 mm² (AWG20)
Signal propagation delay	≤ 5 ns/m

	Description	Connection type	Cable type
 IPC001	CAN bus connection Pin 1: Not assigned Pin 2: CAN-LOW (LO) Pin 3: CAN-GND (CG) Pin 4 ... 6: Not assigned Pin 7: CAN-HIGH (HI) Pin 8 ... 9: Not assigned	9-pole Sub-D plug	CAN cable acc. to ISO 11898-2 with 9-pole Sub-D socket

MPI interface

Note!

► For more information on the MPI port, please see the Siemens S7 System Manual.

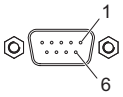


EL100-019

Note!

Only use cables complying with the listed specifications of the PROFIBUS user organisation.

Field	Values
Specific resistance	135 ... 165 Ω/km, (f = 3 ... 20 MHz)
Capacitance per unit length	≤ 30 nF/km
Loop resistance	< 110 Ω/km
Core diameter	> 0.64 mm
Core cross-section	> 0.34 mm^2
Cores	Twisted double, insulated and shielded

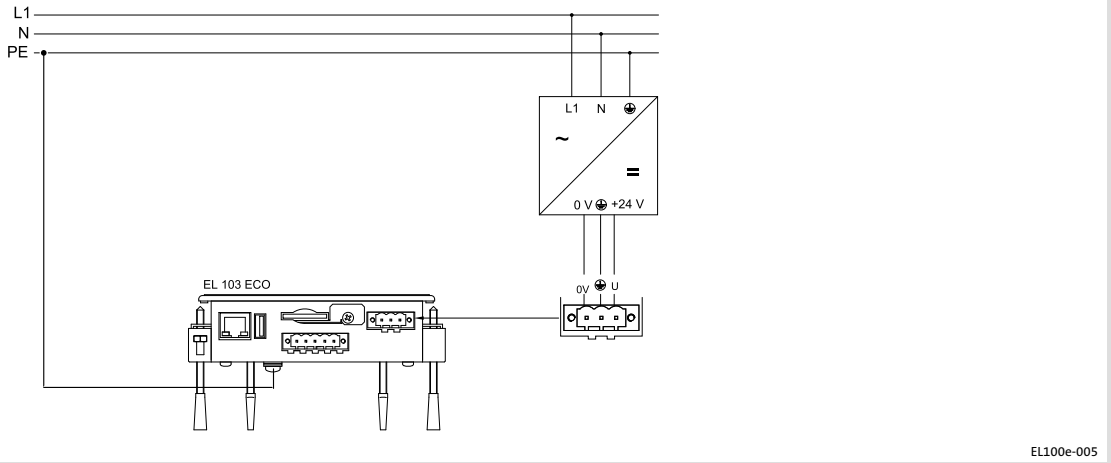
	Description	Connection type	Cable type
 IPC001	MPI connection Pin 1 ... 2: Not assigned Pin 3: RxD/TxD-P (B) Pin 4: RTS Pin 5: M5V Pin 6: P5V Pin 7: Not assigned Pin 8: RxD/TxD-N (A) Pin 9: Not assigned	9-pole Sub-D socket	According to specification of the Siemens company

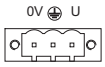
Cable fixing and strain relief

Realise external strain relief.

6.3.2 EL 1xx ECO (PLC)

Mains connection



	Description	Connection type	Cable type
 IPC001	DC 24 V connection	3-pole Phoenix Combicon socket	Cable (conductor cross-section max. 2.5 mm²) with Phoenix Combicon plug, MSTB 2.5 / 3-STF-5.08
 IPC001	PE connection	Screw M4	Separate earthing conductor (min. 2.5 mm²) with ring cable lug

Ethernet interface

	Description	Connection type	Cable type
 IPC001	Ethernet connection 10/100 Mbps Green LED (SPEED): on = 100 MBPS off = 10 Mbps Yellow LED (LINK/ACTIVITY): on or blinking = LINK /ACTIVITY off = no LINK	RJ45 socket	Network cable CAT5 S/UTP or CAT5e S/FTP (recommended), cable length: max. 100 m

Note!

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.

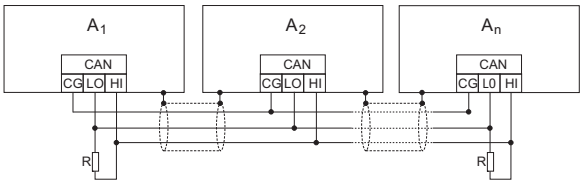
USB interface

	Description	Connection type	Cable type
 IPC001	USB 2.0 host connection Max. load: 5 V/500 mA	USB-A socket	USB cable with USB-A plug

CAN interface

Note!

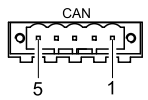
- ► Only connect terminals of the same signal type.
- ► For further information with regard to the CAN bus system please refer to the CAN Communication Manual.



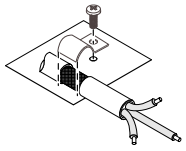
A1	Node 1
A2	Node 2
An	Node n
CG	CAN-GND
LO	CAN-LOW
HI	CAN-HIGH
R	120 Ω-bus terminating resistor

We recommend the use of CAN cables in accordance with ISO 11898-2:

CAN cable in accordance with ISO 11898-2	
Cable type	Paired with shielding
Impedance	120 Ω (95 ... 140 Ω)
Cable resistance/cross-section	
Cable length ≤ 300 m	≤ 70 mΩ/m / 0.25 ... 0.34 mm² (AWG22)
Cable length 301 ... 1000 m	≤ 40 mΩ/m / 0.5 mm² (AWG20)
Signal propagation delay	≤ 5 ns/m

	Description	Connection type	Cable type
 EL100-011	CAN bus connection Pin 1: CAN-GND (CG) Pin 2: CAN-LOW (LO) Pin 3: CAN-SHIELD Pin 4: CAN-HIGH (HI) Pin 5: Not assigned	5-pole Phoenix Combicon socket	CAN cable acc. to ISO 11898-2 with Phoenix Combicon plug, MSTB 2.5 / 5-STF-5.08

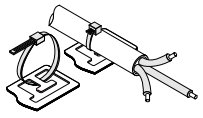
CAN cable shield connection via cable clamp on the back of the device:



EL100-033

Cable fixing and strain relief

Fix the cable bundles on the back of the EL 103 using cable ties.

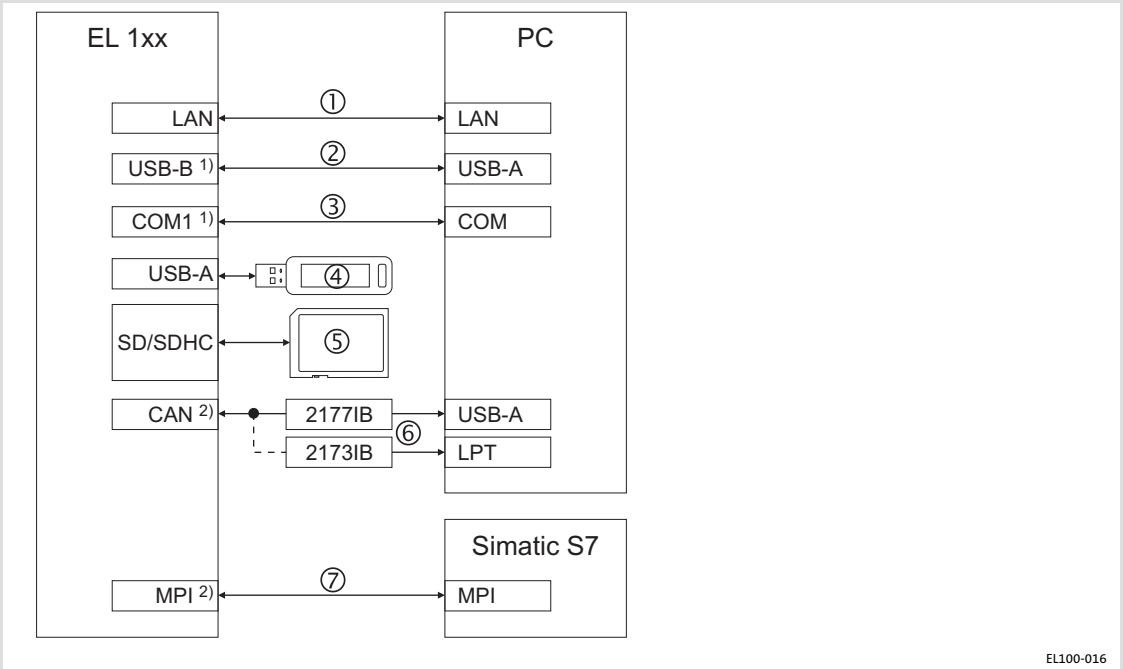


EL100-034

7 Commissioning

7.1 Connecting external devices

The HMI can communicate with other devices via different interfaces, e.g. to exchange data or transfer projects:



1) Not for EL 1xx ECO (PLC)
2) Optionally CAN or MPI (EL 1xx ECO: CAN only)

①	EL 1xx ↔ PC	Ethernet connection, e.g. via cross-link cable
②	EL 1xx ↔ PC	USB connection device-host (the Microsoft® "ActiveSync" software must be installed on the PC.)
③	EL 1xx ↔ PC	Serial connection via serial cross-link cable
④		USB stick, external keyboard/mouse
⑤		SD/SDHC card
⑥	EL 1xx ↔ PC	CAN bus connection with 2177IB (CAN to USB-A) or 2173IB (CAN to LPT interface) PC bus adapter
⑦	EL 1xx ↔ S7	MPI connection

7.2 Initial switch-on

How to proceed:

1. Check the whole wiring for completeness and correct installation.

   For comprehensive inputs, we recommend to connect an external keyboard and mouse to the USB port.

2. Switch on the voltage supply of the EL 1xx.
   – The EL 1xx boots up, the operating system is started.
   – If the EL 1xx is protected by a password, it will be queried.
   – If the Show Explorer control field in the StartUp Control Panel Applet is marked (📖 47), the Windows CE desktop will be displayed.
   – If an autostart of the Remote Access Manager is specified in the VisiWinNET® Control Panel Applet (📖 49), it will be started.
   – If an autostart is specified for a project in the VisiWinNET® Control Panel Applet (📖 49), it will be started.

7.3 Establish Ethernet connection

The EL 1xx can be connected to a LAN or to a PC directly (peer-to-peer) via Ethernet interface.

7.3.1 Configure Ethernet interface

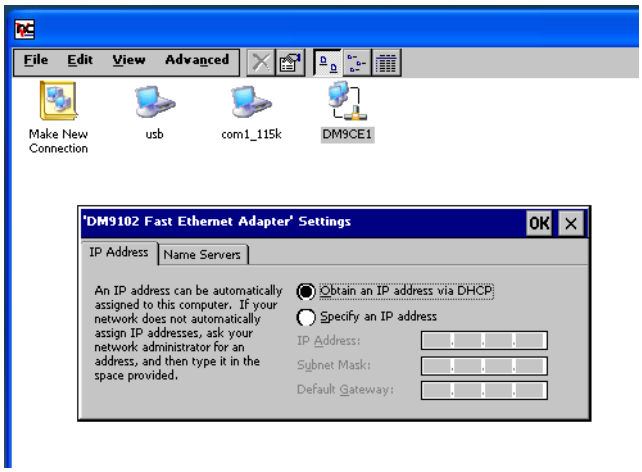
Prerequisite:

► The EL 1xx is physically connected to the fieldbus via Ethernet interface.
  – Network (with router): via Ethernet cable
  – Peer-to-peer (without router): via crossed Ethernet cable (cross-over)

► The EL 1xx is switched-on.

How to proceed:

1. Click **Start** → **Settings** → **Network and Dial-up Connections** on your EL 1xx.
2. Click the **Dm9CE1** connection and configure the following dialogue via network interface.



EL100-021

3. Click **OK**.

Note!

Modifications are not stored automatically in the Registry. This means that they will be lost after a restart.

If you wish to make permanent modifications, proceed as follows:

► Click **Start** → **Settings** → **Control Panel** → **Registry** on your EL 1xx.

► Click **Save**.

4. If an IP address assignment via DHCP Server was specified when configuring the interface (only available for networks with router), restart the EL 1xx.
5. Double-click the network symbol down right in the status bar and check the settings.

7.3.2 Activate communication between EL 1xx and VisiWinNet® Smart

The following settings are required if you wish to transmit a VisiWinNET® Smart project to the EL 1xx via Ethernet. They are not required to establish a general TCP/IP connection.

How to proceed:

Note!

If an autostart of the Remote Access Manager is specified in the VisiWinNET® Control Panel Applet (📖 49), the **VisiWinNET Remote Access** dialogue is displayed automatically after starting the HMI.

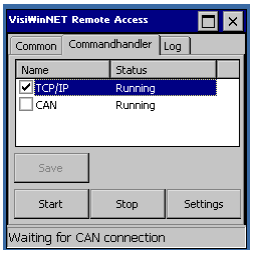
Proceed as follows if that dialogue is not displayed:

► **Start** → **Programs** → **Windows Explorer**

► Folder **Flashdisk/VisiWinNET**

► Double-click the **VisiWinNET.RemoteAccessManager** Application.

1. Activate the **Commandhandler** Registry in the VisiWinNET Remote Access Dialogue.



EL100-020

2. If the TCP/IP control field is selected and the status is displayed as Running, communication has been enabled. Elsewise, proceed as follows:
3. Select the **TCP/IP** control field.
4. Click **Start**.
   The status changes to Running. TCP/IP communication has been enabled.
5. Click **Save** to store this setting.

See VisiWinNET® Smart software manual, Getting Started, for further information on project transmission.

7.4 Establish CAN fieldbus connection

An EL 1xx CAN or EL 1xx ECO can be connected to a CAN fieldbus system via CAN interface.

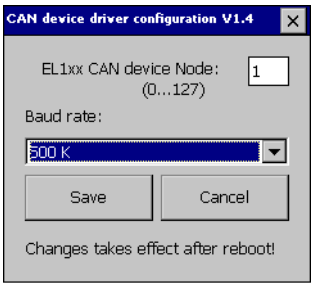
7.4.1 Configure CAN interface

Prerequisite:

- ► The EL 1xx is physically connected to the fieldbus via CAN interface.
- ► The EL 1xx is switched-on.

How to proceed:

1. Click **Start** → **Settings** → **Control Panel** → **Fieldbus** on the EL 1xx and configure the CAN interface in the following dialogue.



EL100-028

EL 1xx CAN Device Node: The EL 1xx node address within a CAN fieldbus network.

Baud Rate: Transmission speed of the fieldbus. The baud rate must be identical for each fieldbus node within the same network. The fieldbus parameters are set according to the baud rate.

2. Click **Save**.

7.5 Establish MPI connection

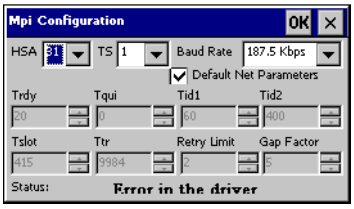
An EL1xx MPI is able to communicate with a S7 PLC via MPI (Multi Point Interface).

Prerequisite:

- ► The EL 1xx is physically connected to the fieldbus via MPI interface.
- ► The EL 1xx is switched-on.

How to proceed:

1. Click **Start** → **Settings**.→ **Control Panel**.→ **MPI Configuration** on your EL 1xx.
   The MPI Configuration Dialogue will be opened.



EL100-029

HSA: Set the highest MPI address (Highest Station Address) here. The highest MPI address must be identical within an MPI network!

TS (This Station): Set the local MPI address for the EL 1xx here.

Baud Rate: Transmission speed of the MPI network. The baud rate must be identical for each MPI node within the same network. The MPI parameters are set according to the baud rate.

Default Net Parameters: Default Net Parameters specified due to the baud rate. We recommend not to modify them.

Status: The status of the MPI interface is displayed as ”Offline”, ”Online” or ”Error” in the status bar.

2. Click **OK**.

Note!

Modifications are not stored automatically in the Registry. This means that they will be lost after a restart. If you wish to make permanent modifications, proceed as follows:

- ► Click **Start** → **Settings** → **Control Panel** → **Registry**.
- ► Click **Save**.

7.6 UPS functionality

An ”EL 1xx PLC” is equipped with an internal UPS which - in the event of a supply voltage failure - keeps the EL 1xx alive until the values of the retain variables have been saved fail-safe.

Note!

The PLC program indicates retain variables by the keyword RETAIN. The value of these variables remains unchanged both after an uncontrolled and a normal PLC exit. After restarting the PLC, the values will be available again.

An application example is a unit counter in a production plant which is to continue counting after a restart.

After a supply voltage failure, the following steps will be carried out automatically:

1. To bridge voltage fluctuations, the system waits for a defined time and sees if the supply voltage is applied again (delay time = 500 ms).

   If the supply voltage is applied again within this time, the system continues operation as usual.
2. Otherwise, the background light of the display is switched off, the run-time system/controller is stopped and the CAN telegram only transmits zeros.
3. All retain variables are saved within the buffer time of 2 seconds.
4. After the buffer time, the system checks cyclically whether the supply voltage is applied again.

   When the supply voltage is applied again, the system is restarted.

   Otherwise, the system continues running until the buffer capacitors have drained.

7.7 Installing fonts

If you want to use additional fonts, for instance containing Asian characters, on the EL 1xx, you can implement them by means of the ”AddFont.exe” tool.

Note!

Please observe the size of the font files, in particular for Asian fonts. To begin with, check whether the files still fit into the internal flash memory of the EL 1xx or if they have to be swapped out to an SD/SDHC card.

How to proceed:

1. Depending on the memory location, create the following directory for the additional fonts:

   Internal flash memory: \Flashdisk\Fonts

   SD/SDHC card: \Storage\Fonts
2. Copy the ”Addfont.exe” file from the ”L-force PC-based Automation” DVD to this directory.
3. Also copy the font files to this directory.
4. Extend the ”\Flashdisk\Autostart.txt” file according to the following example:

```
;============================================================
; use API addfont in Flashdisk\Fonts!!!!!
; Example: ;\Storage\Fonts\AddFont.exe Storage\Fonts\
;============================================================
\Flashdisk\Fonts\AddFont.exe Flashdisk\Fonts\
```

5. Save the ”Autostart.txt” file.
6. Restart the EL 1xx.

8 Operation

8.1 Operating system components

The following table shows the components of the optional versions of the Windows® CE operating system.

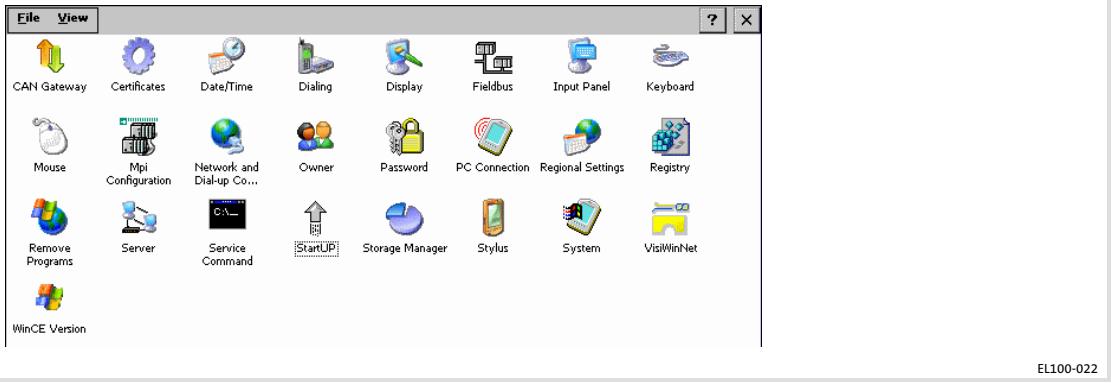
Component	Description	Version	
		Core	ProPlus
Web Server		X	X
Remote Desktop (VNC)		X	X
FTP Server		X	X
RAS Server		-	X
Telnet		X	X
Active Sync File Transfer		X	X
Internet Explorer 6.0		-	X
Registry Editor		X	X
Word Pad		-	X
Mouse Pointer		X	X
USB Keyboard Driver		X	X
HP Printer Driver (PCL)		X	X
HMI Start Manager		X	X
File Viewer	Excel/Image/PDF/PowerPoint/Word Viewer	-	X
.NET Compact Framework 2.0		X	X
USB Support		X	X
Touch Driver		X	X
TCP/IP		X	X
CAN	Driver, Control Panel Applet	X	X
MPI	Driver, Control Panel Applet	X	X
Soft Keyboard	Software Input Panel	X	X
Control Panels		X	X
Network Tools	Ping, Tracert, Netstat, Net	X	X
Visual Studio Communication Components	ConmanClient2, Clientshutdown	X	X

8.2 Control Panel Applets

The Control Panel Applets adjusted or advanced by LENZE are described in the following.

Note!

A description of the standard Windows® CE applets can be found in the Windows® CE literature.



How to open the Control Panel:

1. Click **Start** → **Settings** → **Control Panel** on your EL 1xx.
   The Control Panel window will be opened.

8.2.1 StartUp

EL100-023

Show Explorer: After the booting, the Windows CE desktop (Explorer) will be started if this control field has been selected. Programs and settings cannot be accessed if this control field has not been selected.

Note!

A disabled desktop can only be re-enabled via USB keyboard:

► Press **Shift + F4** on the keyboard. The Control Panel will be opened.
► Open **StartUP** dialogue.
► Select **Show Explorer** control field.
► Click **OK**.
► Restart the EL 1xx. The desktop will be re-enabled after a restart.

VNC Server Autostart: After the booting, the VNC Server will be started automatically if this control field has been selected.

Note!

The VNC Server is not protected by a factory-set password. If the connection is not required, the server should be disabled to prevent unauthorised access. Alternatively, establish a password-protected connection.

An active VNC connection means additional load for the system. Hence, we recommend to start the VNC Server manually via your Web Server if need be instead of selecting the ”Autostart” control field (📖 76).

Start: Start VNC Server manually.

Password: Assign password for a password-protected connection (max. 15 characters).

8.2.2 Registry

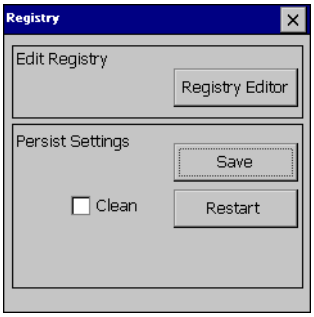
Note!

The modifications of some Applets are automatically stored in the Registry when you click **OK** (message ”Saving”).

The modifications of other Applets are not stored automatically in the Registry, which means that they are lost after a restart. If you wish to make permanent modifications to these Applets, proceed as follows:

► Click **Start** → **Settings** → **Control Panel** → **Registry** on your EL1xx.

► Click **Save**.



EL100-024

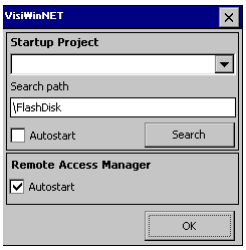
Registry Editor: Opens the Registry Editor.

Save: Saves the Registry.

Restart Device: Restarts the EL 1xx.

Clean: After a restart, the Registry is reset to the default setting if this control field has been selected.

8.2.3 VisiWinNET®



EL100-025

Startup Project: Display of the VisiWinNET® start project entered in the registry. The EL 1xx can be searched for installed projects via the **Search** button. (Note: The search function is only able to find those projects whose file extension (".vwn") exclusively consists of lower case letters.)

Search Path: Path that is searched for VisiWinNET® projects. The search process can be accelerated via this preselection if the data carrier is very large or full.

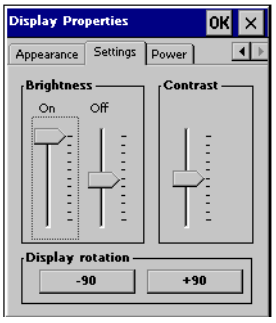
Autostart: Startup Project will be started automatically when the system is started.

Search: VisiWinNET® project search.

Remote Access Manager "Autostart": When the system is started, the VisiWinNET® Connection Manager will be started automatically if this control field has been selected.

OK: The settings are saved. The registration is stored.

8.2.4 Display



EL100-026

Brightness: Changing the brightness of the display. (For EL 105m without function.)

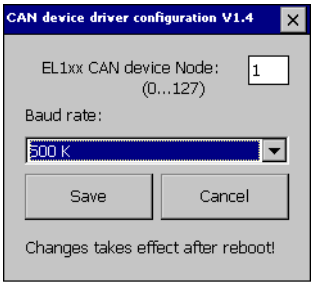
Contrast: Changing the contrast of the EL 105m display. (For all other devices without function.)

Display rotation: The "-90" and "+90" buttons can be used to rotate the EL 1xx screen in 90-degree steps.

8.2.5 Server

Find more information later in this chapter (📖 72).

8.2.6 Fieldbus

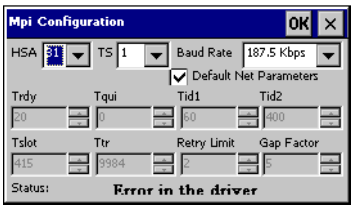


This Applet is only relevant for an EL1xx CAN. It has no function in an EL1xx MPI.

EL1xx CAN Device Node: EL1xx node address within a CAN fieldbus network.

Baud Rate: Transmission speed of the fieldbus. The baud rate must be identical for each fieldbus node within the same network. The fieldbus parameters are set according to the baud rate.

8.2.7 MPI Configuration



EL100-029

This Applet is only relevant for an EL 1xx MPI.

HSA: Set the highest MPI address (Highest Station Address) here. The highest MPI address must be identical within an MPI network!

TS (This Station): Set the local MPI address for the EL 1xx here.

Baud Rate: Transmission speed of the MPI network. The baud rate must be identical for each MPI node within the same network. The MPI parameters are set according to the baud rate.

Default Net Parameters: Default Net Parameters specified due to the baud rate. We recommend not to modify them.

Status: The status of the MPI interface is displayed as ”Offline”, ”Online” or ”Error” in the status bar.

See VisiWinNET® Smart software manual for further information.

8.2.8 CAN Gateway

The CAN gateway function is used to implement data transmission from an Ethernet network to the Lenze ”CAN system bus” fieldbus. The following functions are supported:

- Data transmission via SDO
- Parameter data exchange
- Program download from PC to Lenze drive components

Communication between the PC and the Lenze drive components connected to the CAN system bus is possible via the following programs:

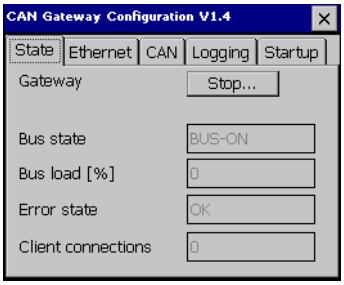
- DriveServer, Global Drive Control, Global Drive Loader
- Global Drive PLC Developer-Studio
- L-force Engineer

Note!

The CAN gateway function is only supported if CAN communication software from version 2.2.2.0 is installed on the PC.

Further information is provided elsewhere in this manual (📖 78).

”State” register



EL100-032

Gateway: Start and stop gateway function

Bus state: Current state of the CAN system bus (BUS-ON or BUS-OFF)

Bus load (%): Current bus load

Error state: Current error

Client connections: Number of connected Ethernet nodes

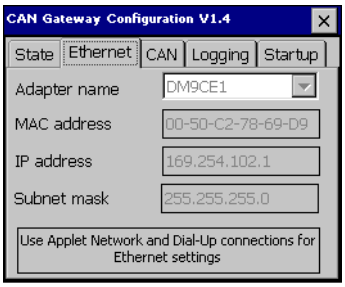
Status message interpretation (bus state and error state):

BUS-ON and OK: CAN communication is alright.

BUS-ON and ERROR: The warning limit of the CAN controller has been reached or exceeded (too many error frames). CAN communication is still possible.

BUS-OFF and ERROR: The CAN controller has reached the BUS-OFF state. CAN communication is not possible. A reset of the device is required.

”Ethernet” register

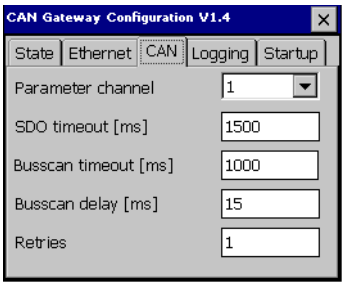


EL100-033

Adapter name: Select the adapter here whose settings are to be displayed.

MAC address, IP address, Subnet mask: Settings from the ”Network and Dial-up Connections for Ethernet” applet.

”CAN” register



EL100-034

Parameter channel: The parameter channel for data transmission is selected here if the drive component has more than one parameter channel.

Selection	Selectable address range
0	1 ... 127 (parameter channel 1 acc. to CANopen)
1	1 ... 63 (parameter channel 1 acc. to Lenze system bus (CAN))
2	64 ... 127 (parameter channel 2 acc. to Lenze system bus (CAN))

The address of e.g. parameter data channel 2 can be calculated as follows:

Address of parameter data channel 2 = Address of parameter data channel 1 + offset 64.

By selecting a value of ”0”, the bus is ”CanOpen” compliant. There is no restriction to the address range.

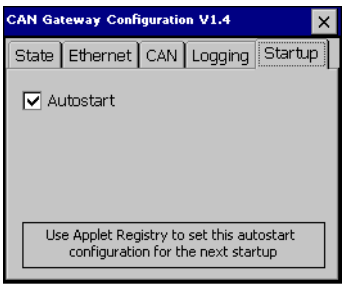
SDO timeout [ms]: The time set here defines the time slot a CAN node has to respond to a request. If there is no response within the set time, the requesting component will assume that the node is unavailable.

Busscan timeout [ms]: During a bus scan, the system is waiting for the nodes to respond. On the one hand, the busscan timeout must be large enough to provide all nodes with sufficient time to respond. On the other hand, the search will be slowing down if the busscan timeout is too large.

Busscan delay [ms]: Under a heavy CAN bus load, searching the CAN bus for connected nodes may cause faults. A delay time between the transmission messages can be set to avoid this situation, thereby causing the search to take more time to finish.

”Logging” register

This register displays errors that may be pending.



EL100-050

Autostart: If this option is selected, the CAN gateway is automatically activated when the device is started. Alternatively, the CAN gateway must be activated manually on the ”State” register.

8.3 Creating a PLC sample program

The following description is only valid for types with integrated PLC (EL 1xx PLC).

In the following sections you will find a description of the basics for creating a PLC program using the Lenze PLC Designer. For more information about the PLC Designer, please see the online help for the PLC Designer.

The example describes how to program a simple counter, how to create a .sym file and how to transfer the program to the PLC of the EL 100 PLC.

To follow the steps described in the following sections, the ”PLC Designer” software must have been installed on your system.

8.3.1 General information on PLC programming

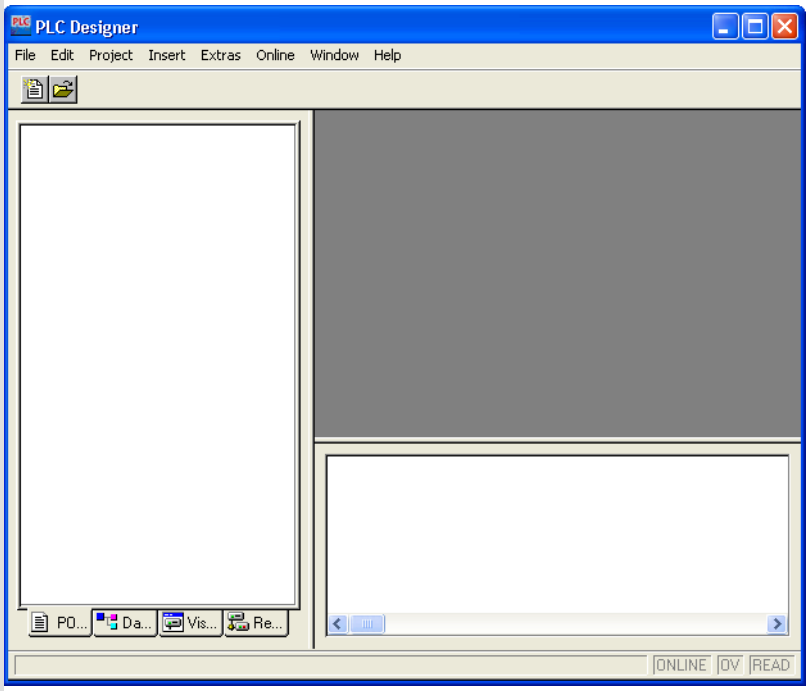
Please observe the following when configuring your EL 1xx:

- The variable type LREAL does not exist.
- For direct addresses (%I / Q / M), a natural alignment must be used; i.e.
  - BYTEs to any addresses
  - 16-bit values (WORD, INT) to even addresses
  - 32-bit values (DWORD, DINT) to addresses divisible by 4
- Avoid floating-point operations because they will be emulated and therefore take much longer than on an X86 with FPU.
- Avoid task runtimes < 100 ms because short task runtimes have disadvantages regarding visualisation (long reversing times).

8.3.2 Start PLC Designer

How to proceed:

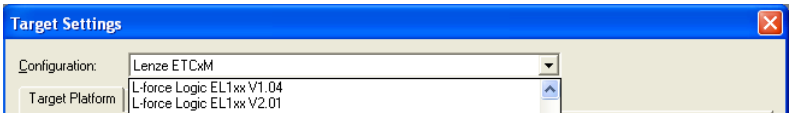
1. With a standard installation, the PLC Designer is started via **Start → Lenze → PLC Designer Vx.x.x.x → PLC Designer**.



8.3.3 Create PLC program

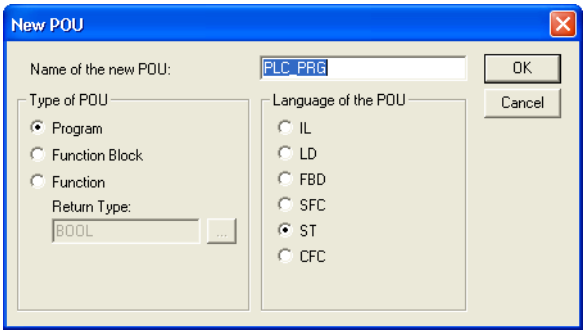
How to proceed:

1. Open the menu **File** in the PLC Designer menu bar and select the menu item **New**.
   The "Target Settings" dialogue will be opened.

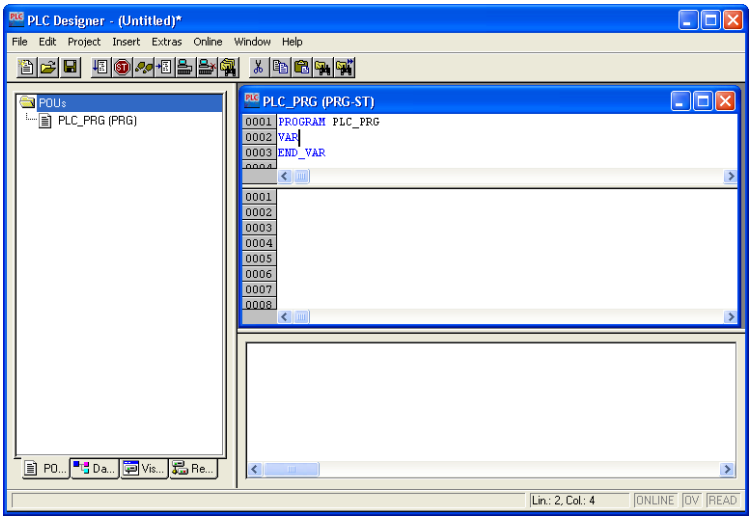


2. Select the target system depending on the HMI used from the *Configuration* selection list:
   EL 1xx: L-force Logic EL1xx v1.09
   EL 1xx ECO: L-force Logic EL1xx v2.06
   If the target system is not available in the *Configuration* selection list, you can download it from the download area of the Lenze homepage (www.lenze.com).
3. Click **OK** to close the dialogue.
   The "Target settings" dialogue will be expanded.

4. Enable the *General* register and select the *Download symbol file* control field.
   This enables data exchange between the visualistion and the PLC.
5. Click **OK** to close the dialogue.
   The ”New POU” dialogue will be opened.

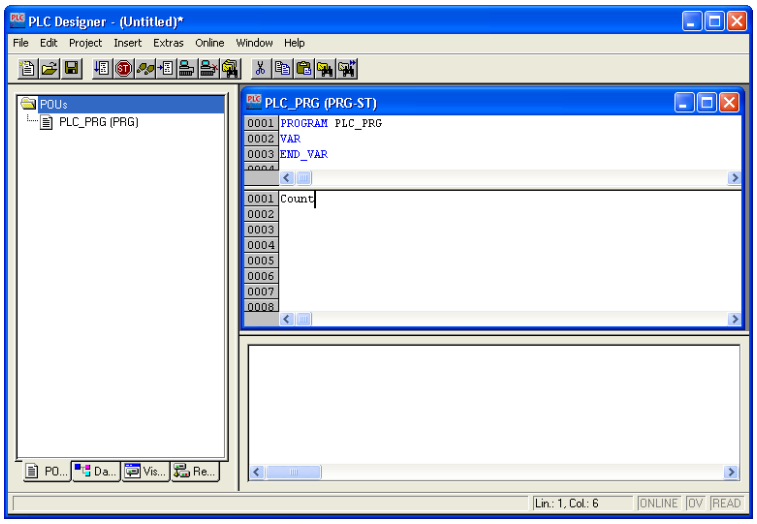


6. Select the *ST* (structured text) control field.
7. Click **OK** to close the dialogue.
   The ”PLC_PRG (PRG-ST)” programming window will be opened.

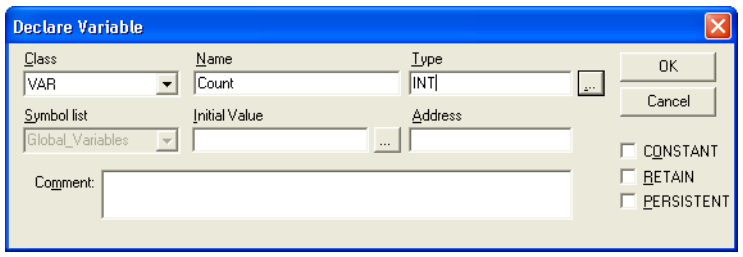


In the next step, we will declare a local variable.

8. Enter the word ”Count” in the lower half of the divided ”PLC_PRG (PRG-ST)” programming window.

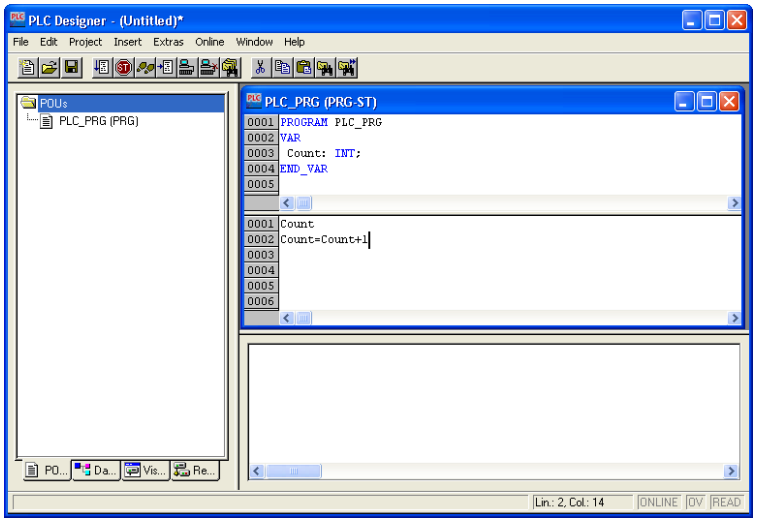


9. Press **[Enter]**
   The ”Declare Variable” dialogue will be opened.



10. Use [...] to the select the variable type ”INT”.
11. Click **OK** to close the dialogue.
    After this, we will enter the code for a simple counter in our example program.

12. Enter the following code in the lower half of the divided ”PLC_PRG (PRG-ST)” programming window: Count:=Count+1



Our PLC program is now complete and can be saved.

13. Go to the menu bar, open the menu **File** and select the menu item **Save as**.
14. Enter an optional program name (e.g. ”example project”) in the ”Save as” dialogue, select a memory location and click **Save**.

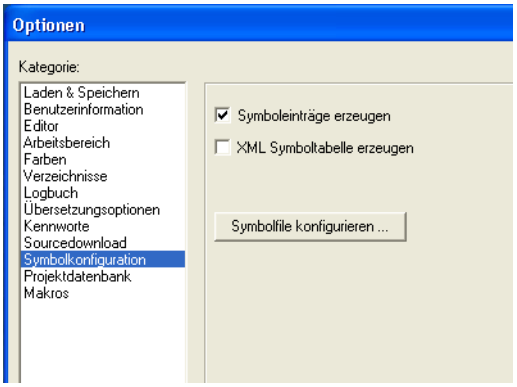
    After this, we will transfer the program to the HMI. Before doing so, a sym file must be created.

8.3.4 Create sym file

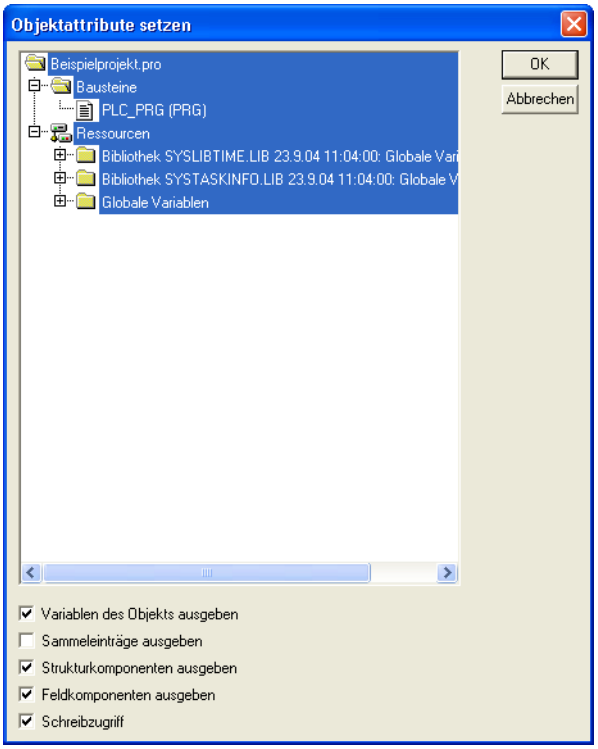
A sym file is required if the visualisation, e.g. VisiWinNet® Smart is to access the PLC program. A sym file contains all variables and declarations of the PLC program.

How to proceed:

1. Open the menu **Project** in the PLC Designer and select the menu item **Options**.
   The ”Options” dialogue will be opened.



2. Select the ”Symbol configuration” category from the ”Options” dialogue.
3. Select the **Dump symbol entries** control field and click the **Configure symbol file** button.
   The ”Set object attributes” dialogue will be opened.



4. Select the *Export variables of object* control field in the ”Set object attributes” dialogue. Do not change the other control field selections.
5. Go to the object tree and select all objects which contain variables for the visualisation and are enabled via the variables of the object.

   Only export those variables required for visualisation. The smaller the sym file the shorter the baud rate to the target system.
6. Close the ”Set object attributes” dialogue and the ”Options” dialogue with **OK**.
7. Go to the menu bar, open the menu **Project** and select the menu item **Clean all**.
8. Open the menu **Project** once again and select the menu item **Rebuild all**.

   The project is checked, compiled and saved under the file name ”ExampleProject.sym” at the selected memory location.

Note!

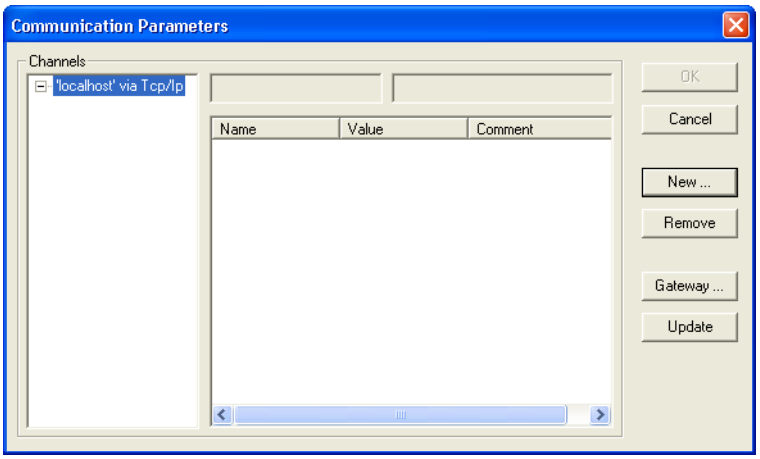
If the Download symbol file control field is checked when the variable is created (📖 57), the sym file will be transferred automatically when the project is downloaded to the EL 100.

If you create new variables for the visualisation in the PLC program, a new sym file must be created.

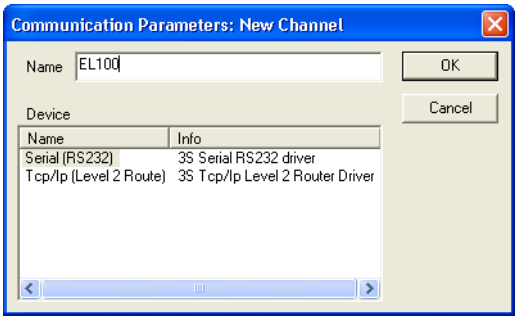
8.3.5 Transfer program to HMI

How to proceed:

1. Go to the menu bar, open the menu **Online** and select the menu item **Communication Parameters**.
   The ”Communication Parameters” dialogue will be opened.



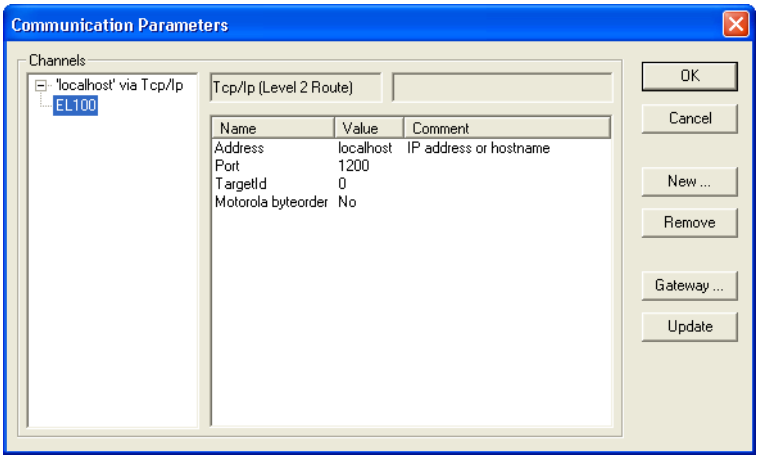
2. Click the **New** button.
   The ”Communication Parameters: New Channel” dialogue will be opened.



3. Enter a name for the new communication channel (e.g. EL100) and select the entry ”Tcp/Ip (Level 2 Route)”.

4. Click **OK** to close the dialogue.

   After this, the ”Communication Parameters” dialogue will be active again. The name of the new channel is indicated in the left dialogue field. If you select the entry, the corresponding data will be indicated in the right dialogue field.



5. Click the field with the entry ”localhost” (”Address” line, ”Value” column) and enter the IP address of the HMI.

   The HMI IP address will be displayed if you double-click the network symbol in the status bar of your EL1xx.

   Since the HMI does not include a Motorola processor, the entry ”Motorola byteorder = No” must be indicated.

6. Click **OK** to close the dialogue.

   Communication between PLC Designer and HMI has now been configured. In the next step, we will establish the connection to the HMI.

7. Go to the menu bar, open the menu **Online** and select the menu item **Login**.

8. Confirm the question if the program is to be saved with **Yes**.

   The project is transferred to the HMI. While the project is being transferred, a dialogue will be displayed. After the dialogue has disappeared, you can start the program on your HMI.

8.3.6 Start program on HMI

How to proceed:

1. Go to the menu bar, open the menu **Online** and select the menu item **Run**.
   The project is started on the HMI.

Note!

If the project is to be loaded automatically after every restart of the HMI, you can define it as a ”boot project”. For this, proceed as follows:

► Go to the menu bar, open the menu **Online** and select the menu item **Create boot project**.
   A dialogue will be opened which indicates the files created.
► Click **OK** to close the dialogue.

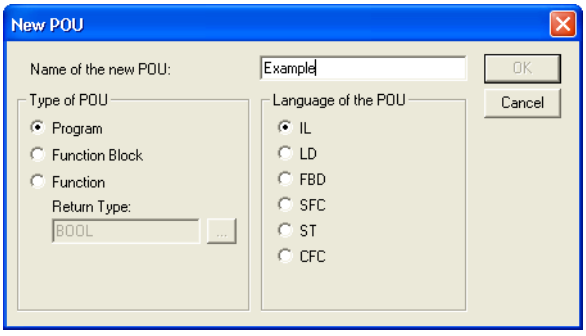
   If you want to use the project again later, save the project.

2. For this, go to the menu bar, open the menu **File** and select the menu item **Save**.

8.3.7 Build up CAN communication with distributed I/O module

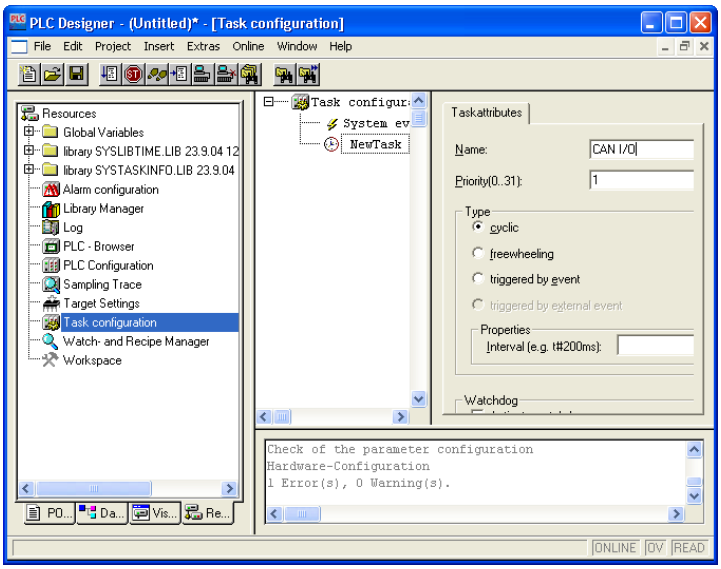
How to proceed:

1. Open the project from which you want to access the I/O module.
2. Go to the Project Explorer, enable the *POUs* registry, click the right mouse button and select the menu item **Add Object** from the context menu to create a new object.
   The ”New POU” dialogue will be opened.



3. Enter the name for the object and select the *IL* control field.
4. Click **OK** to close the dialogue.
5. For creating a new task, change to the *Resources* registry in the Project Explorer.
6. Double-click the entry **Task configuration**.
   The ”Task configuration” window will be opened.

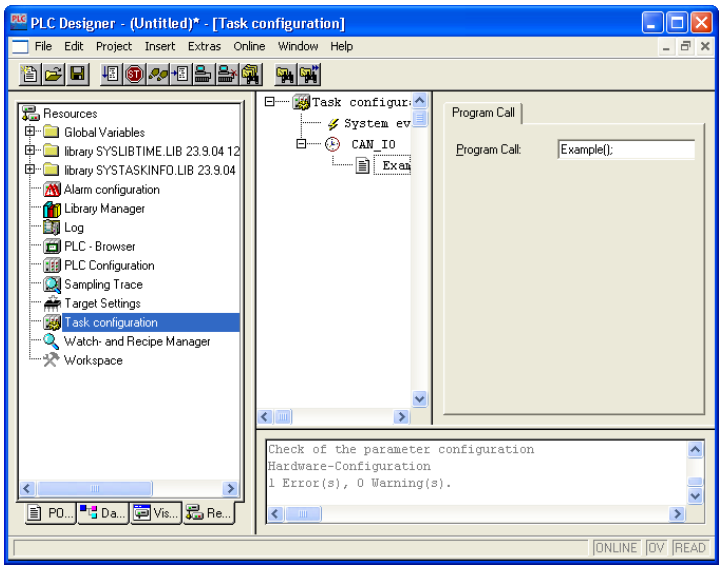
7. Right-click the Explorer area of the window and select **Insert Task** from the context menu.



8. Configure your task:
   – Name: Optional name
   – Priority: 1 (highest priority)
   – Type: Cyclic
   – Properties/Interval: T#100 ms

   After this, a program call must be added to the task. The program will then be called cyclically every 100 ms.

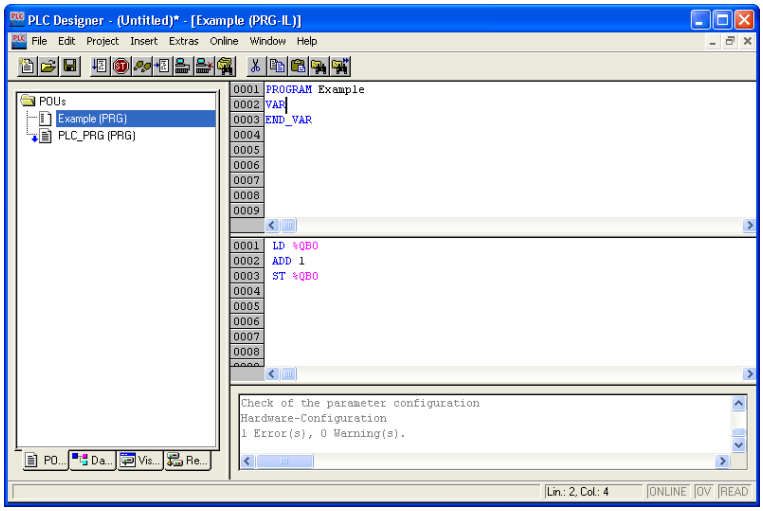
9. For this, right-click the new task in the Explorer area of the ”Task configuration” window and select **Append Program Call** from the context menu.



10. Click the **...** button and select the object which you have created in step 2 in the following dialogue.
11. Close the dialogue with **OK** and change to the *POUs* registry in the Project Explorer.

12. Go to the *POUs* registry and write your program.

    The following example program has the function of a simple counter: the value of the I/O module byte ”QB0” is incremented.



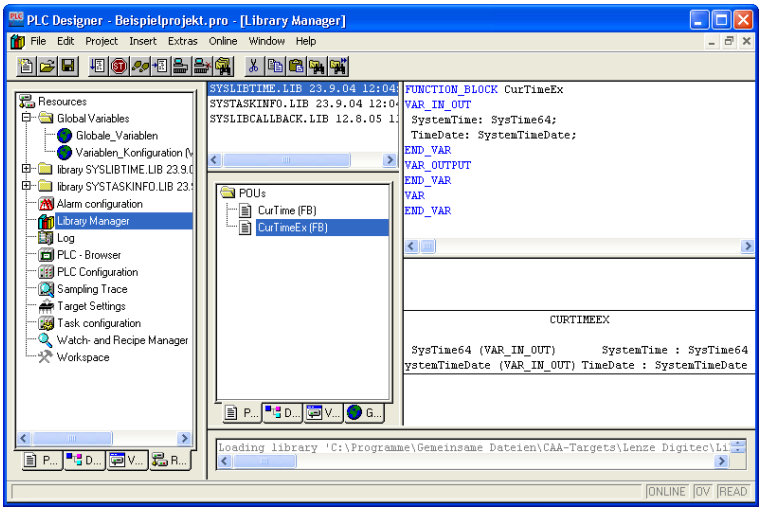
Note!

Leave an instruction in the main program, otherwise, compile errors will occur.

For establishing a CAN connection with the I/O module, some libraries must have been loaded.

13. For this, go to the *Resources* registry in the Project Explorer and double-click the entry **Library Manager**.

    The ”Library Manager” window will be opened. The libraries which have been loaded will be displayed in the upper area on the left.



14. Right-click the upper, left window pane and select **Additional Library** from the context menu to load the libraries.

    Load the following libraries one after the other:

    – 3S_CanDrv.lib

    – 3S_CANopenManager.lib

    – 3S_CANopenMaster.lib

    For adding a module to the network, its device-specific configuration file must be added to the project. The settings possible for a CAN module are described in an EDS file. The EDS files can be found under http://www.lenze.de

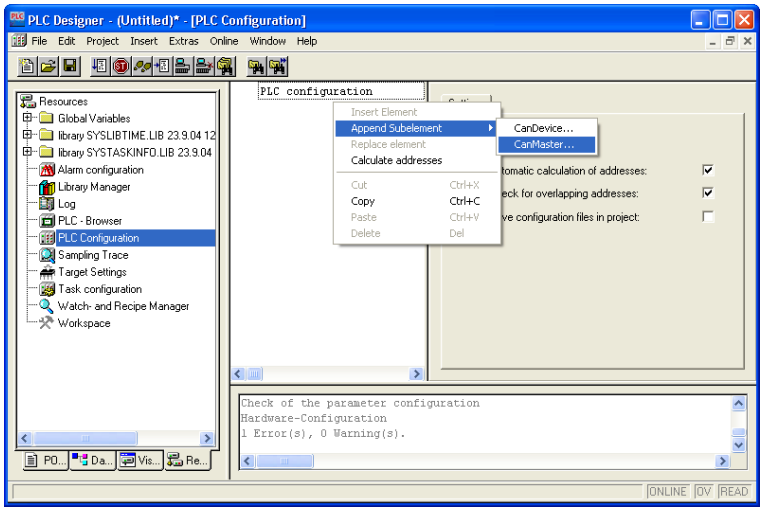
15. Go to the *Resources* registry in the Project Explorer and double-click the entry **PLC Configuration** to add the configuration file to your project.

    The ”PLC Configuration” window will be opened.

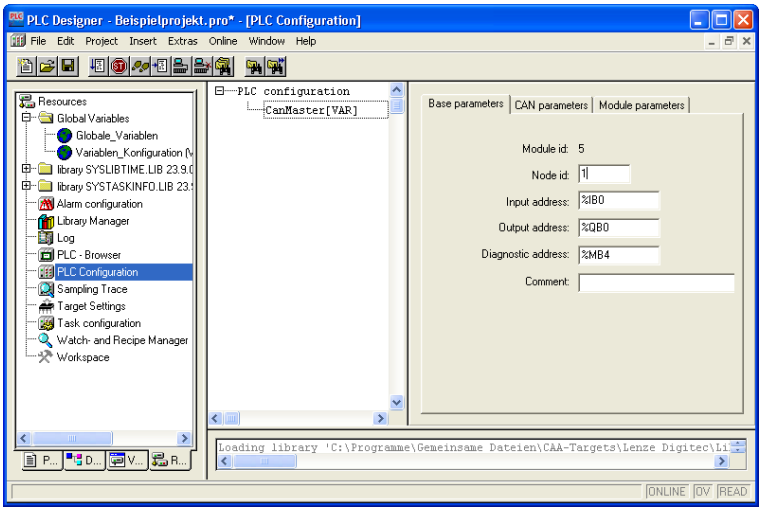
16. Click the menu item **Extras → Add configuration file** and select the EDS file for your CAN module in the following dialogue.

    In the next step, we will add a subelement to the PLC configuration; in our example, ”CanMaster” is the PLC.

17. For this, right-click the Explorer area of the ”PLC Configuration” window and select **Append Subelement → CANMaster** from the context menu.



18. Assign the node address ”1” to the CanMaster.



After this, we will add a ”CanDevice”.

19. Go to the Explorer area and select the entry ”CanMaster”, click the right mouse button and select **Append Subelement → CANDevice** from the context menu.
20. Assign the node address selected at the I/O module to the CanDevice.
21. Change to the *CAN parameters* registry in the ”PLC Configuration” window and enter the ”Node ID” of the I/O module.

    Now, the project can be compiled and loaded into the PLC.

8.4 Access EL 1xx via server functionality

Various servers are integrated into the HMI of the EL1xx series allowing access to the device via LAN or WLAN (internet).

- FTP Server
- Web Server (WebAdmin connection, SysAdmin connection)
- Telnet Server
- VNC Server
- RAS Server (only available in the Professional Plus operating system)

Precondition for accessing a server:

- The EL1xx must have a LAN / Internet connection (📖 38)
- If the server is accessed via a firewall, both a ”Ping” and the port mentioned below must be enabled in the firewall.

Ports used:

Application / protocol	Port
CoDeSys	1200
VisiWinNet	135 / 10116
FTP	20 / 21
http	80
VNC Server	5900

8.4.1 Enable Server Access

Before the servers of the EL 1xx can be accessed via network, they must be enabled.

How to proceed with regard to the **VNC Server**:

1. Click **Start** → **Settings** → **Control Panel** → **Startup** on your EL 1xx.

EL100-023

2. Click **Start**.
   If the VNC Server is to be started after every restart of the EL 1xx, select the **Autostart** control field.

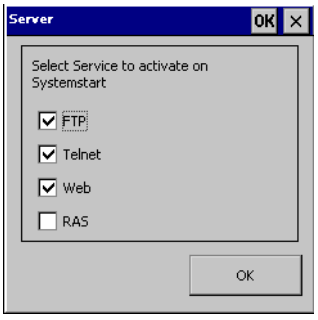
Note!

The VNC Server is not protected by password. If the connection is not required, the server should be disabled to prevent unauthorised access.

We recommend to start the VNC Server manually via Web Server if need be instead of selecting the "Autostart" control field (📖 76).

How to proceed with regard to **other** servers:

1. Click **Start** → **Settings** → **Control Panel** → **Server** on your EL 1xx.
2. Select the server control fields that you wish to use.



EL100-030

   If you enable the RAS Server, a dialogue box will pop up allowing you to specify connection data.

Note!

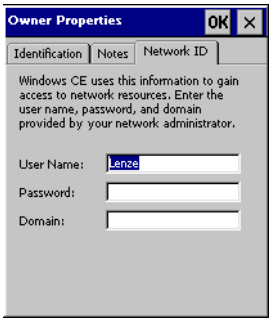
Only enable the servers that you are actually intending to use! This will lead to higher data integrity since it excludes the access of unauthorised computers to your EL 1xx via that connection.

Enter the password for accessing the server

The access to all servers (except for the VNC Server) is protected by a common password which must be assigned as described in the following.

How to proceed:

1. Click **Start** → **Settings** → **Control Panel** → **Owner** on your EL1xx.
2. Enable the **Network_ID** Registry.



EL100-031

3. Enter a **User Name** and a **Password**. If the EL1xx is connected to a network domain, enter its name, too.

Note!

- ► Memorise the user name and the password since this data will be queried when logging into the server.
- ► If you are using an unsafe password or no password at all, data integrity cannot be guaranteed.

4. Click **OK** to confirm your entries.

Note!

If a password has been assigned and this dialog is opened again, the ”Password” field will be cleared. However, the password has been saved.

8.4.2 FTP Server - Transmit Data

The access to the server via Microsoft Internet Explorer is described in the following. This procedure and the procedures via other web browsers are similar.

Prerequisite:

- ► The EL 1xx is switched-on and connected to the network/internet (📖 38).
- ► The access to the server has been enabled on the EL 1xx (📖 72).
- ► A user and a password have been created on the EL 1xx (📖 73).
- ► In the internet options of the PC, the ”Folder View for FTP Sites” and ”Use Passive FTP (for firewall and DSL modem compatibility)” settings have been selected

How to proceed:

1. Start the **Internet Explorer** on your PC.
2. Enter the following address: ftp://*user name@IP address*
   User name: (📖 73)
   IP address: The IP address of the EL 1xx will be displayed if you double-click on the network symbol in the status bar of your EL 1xx.
3. Enter the **User Name** and the **Password** in the subsequent dialogue.
4. Open the menu **Page** in the Internet Explorer and select **Open FTP Site in Windows Explorer**.
   The connection will be established.

8.4.3 Web Server (SysAdmin) - Manage Processes, Files, Registry

Processes, files and Registry entries can be managed via SysAdmin connection. Furthermore, system information is provided.

The access to the server via Microsoft Internet Explorer is described in the following. This procedure and the procedures via other web browsers are similar.

Prerequisite:

- ► The EL 1xx is switched on and connected to the network/internet (📖 38).
- ► The access to the server has been enabled on the EL 1xx (📖 72).
- ► A user and a password have been created on the EL 1xx (📖 73).

How to proceed:

1. Start the **Internet Explorer** on your PC.
2. Enter the following address: http://*IP Address*/sysadmin
   IP Address: The EL 1xx IP address will be displayed if you double-click the network symbol in the status bar of your EL 1xx.
3. Enter the **User Name** and the **Password** in the subsequent dialogue (📖 73).
4. Select **No Frames** or **Internet Explorer 4.0 +**.
   The connection will be established.

8.4.4 Telnet Server - Manage files at the Windows Command Prompt

The Teletype Network Server (Telnet Server) is based on a client-server protocol on TCP/IP level. The server can be accessed via Telnet client. A Telnet client is e.g. the Windows Command Prompt.

File or folder functions such as Create, Copy, Move To, Delete, etc. can be executed via Telnet connection.

Prerequisite:

- ► The EL 1xx is switched on and connected to the network/internet (📖 38).
- ► The access to the server has been enabled on the EL 1xx (📖 72).
- ► A user and a password have been created on the EL 1xx (📖 73).

How to proceed:

1. Click **Start** → **Execute** on your PC.
2. Enter the following address: Telnet *IP Address*
   IP Address: The EL 1xx IP address will be displayed if you double-click the network symbol in the status bar of your EL 1xx.
3. Enter the **User Name** in the subsequent dialogue box (📖 73) and press **Enter**.
4. Enter the **Password** (📖 73) and press **Enter**.
   The connection will be established.
   Enter **help** to obtain a list of the commands available.
   Enter **exit** to close the connection.

8.4.5 VNC-Server - Operate the EL 1xx by remote control via Internet or LAN

The EL 1xx can be operated by remote control from a PC via Virtual Network Computing (VNC). This allows you to work on a remote PC as if you were sitting in front of your EL 1xx.

Prerequisite:

- ► The EL 1xx is switched on and connected to the network/Internet (📖 38).
- ► A VNC client is installed on the PC.
- ► Access to the server has been enabled on the EL 1xx (**Start** → **Settings** → **Control Panel** → **Startup**)

Note!

How to proceed if you wish to enable/disable the VNC Server via Web Server:

- ► Start the Web Server in SysAdmin mode on the PC (📖 74).
- ► Click **System tools** → **Processes**.
- ► Enter **cevncsvr** in the ”Launch Process” field and click **Execute** to activate the VNC server.

  Click **Kill** beside the ”cevncsvr” entry in the list of current processes to deactivate the VNC server.

How to proceed:

1. Start the VNC client on the PC.
2. Enter the IP address of the EL 1xx.

   The HMI IP address of the EL 1xx will be displayed if you double-click the network symbol in the status bar of your EL 1xx.

   If the connection is password-protected, your password will be queried.

   The connection will be established.

8.4.6 RAS Server - Operate your EL 1xx by remote control via telephone line

This server is only available in the ”Professional Plus” operating system.

Using Remote Access Service (RAS), the EL 1xx can be accessed from a PC via telephone line. The FTP/Telnet/WEB/VNC Servers can be used for remote maintenance via RAS connection.

Prerequisite:

- The EL 1xx is connected to a modem via RS232 interface. The modem is connected to the telephone network and switched-on.
- The PC is also connected to the telephone network via modem and switched-on.
- The access to the RAS Server is enabled and configured on the EL 1xx. (📖 72).
- A user and a password have been created on the EL 1xx (📖 73).
- In the modem properties dialogue box of the PC device manager, the option ”Wait For The Dial Tone Before Dialing” has been selected.
  (Start Menu →Control Panel →System →Device Manager→Modems)
- An automatic dial-up connection has been established on the PC.
  (Start Menu → Control Panel → Network Connections → ”Create New Network Connection” Assistent)

How to proceed:

1. Open the automatic dial-up connection on your PC.
   (Start Menu → Control Panel → Network Connections → Double-click Automatic Dial-Up Connection)
2. In the subsequent dialogue, enter the **User Name**, the **Password** (📖 73)and the **Telephone Number** of the connection that the EL 1xx modem has been connected to.
3. Click **Dial**.
   The connection will be established. A symbol for this connection is displayed in the information area of the task bar.
4. Click the automatic dial-up connection symbol in the information area of the task bar to verify successful dial-up.
   The status of the automatic dial-up connection is displayed in a dialogue box. The IP address of the server corresponds to the IP address of the EL 1xx.

8.5 Communicating via the CAN gateway function

8.5.1 Important notes

Note!

Devices with integrated PLC (EL 1xx PLC) may have troubled communication if the following is not observed:

Before the CAN gateway function is used

► Stop PLC by a reset.

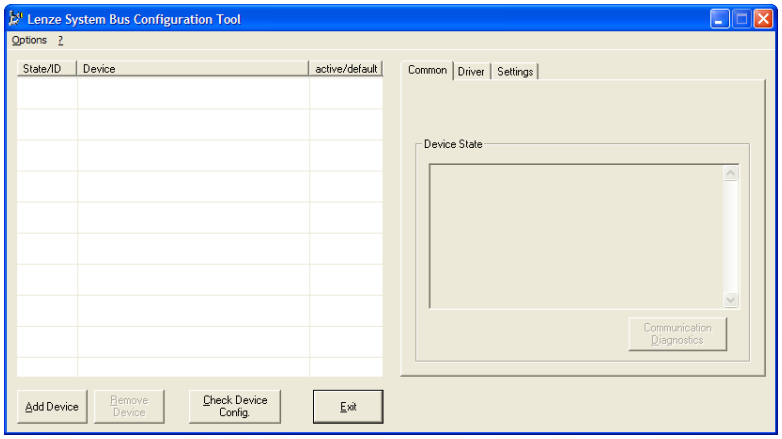
► Stop corresponding visualisation.

8.5.2 Establishing communication using the system bus configurator

How to proceed:

Start the system configurator.

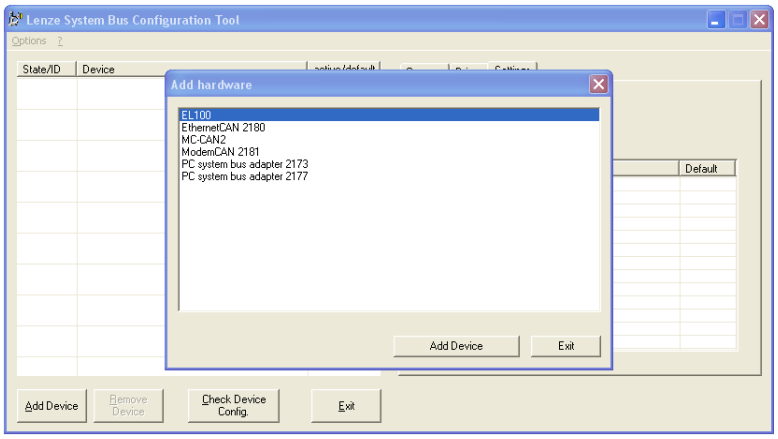
1. Select **Start** → **Programs** → **Lenze** → **Communication** → **System Bus Configurator** on your PC.



EL100-035

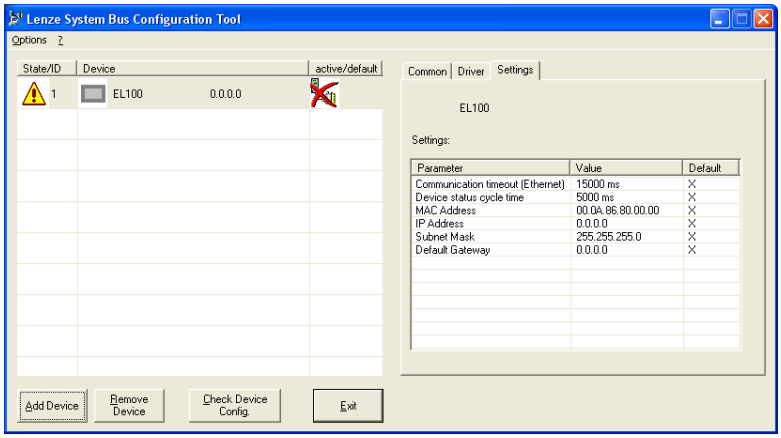
Adding and configuring a module

2. Click **Add device**.
   The ”Add hardware” dialog is displayed.



EL100-036

3. Here, select ”EL100” from the list and click **Add device**.
   The ”EL100” communication module is displayed in the system bus configurator and can be parameterised.
4. Open the ”Settings” tab to parameterise the communication between your PC and the EL100 communication module.



EL100-037

Communication Timeout (Ethernet): Here, set a timeout which is larger than all the timeouts in the EL100 communication module.

IP Address, Subnet Mask, Default Gateway: Adjust these settings to your network and the communication module. If the IP address and the subnet mask have already been assigned to the EL100, these data can be seen from the ”CAN Gateway Configuration” applet (📖 51). Please also observe the following note.

MAC Address: The MAC address of the communication module serves for clear identification of a device and is unique in the world. The MAC address is fixed in the device and cannot be changed. The MAC address can be seen from the ”CAN Gateway Configuration” applet. (📖 51). Please also observe the following note.

Note!

Alternatively, the Ethernet settings from the EL100 communication module can also be read in online. Please ensure that the communication module is not positioned behind routers or firewalls so that the Ethernet settings can be read in.

Reading in Ethernet settings:

► Left-click the value of the MAC address.

► In the ”Edit MAC address”, click **Search**.

After a while, the ”Identified communication modules” dialog is displayed.

► Select the module to be used for communication.

► You can either accept only the MAC address or all Ethernet settings by clicking the corresponding button.

Activating and diagnosing communication

Note!

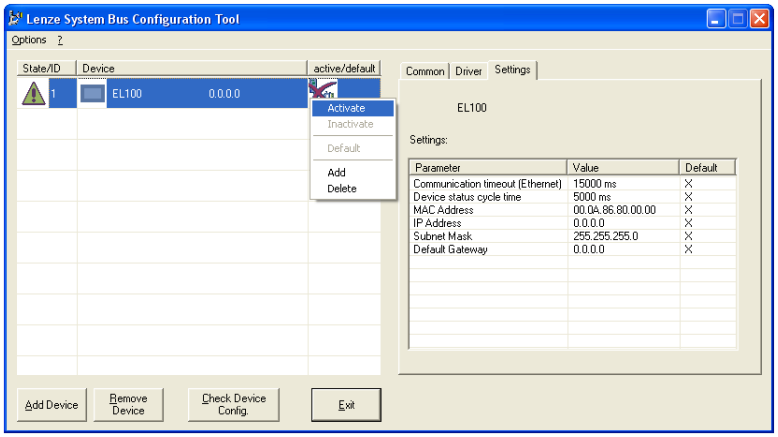
Communication via the Global Drive Control (GDC) or the L-force Engineer only works if the EL1xx has been defined as the standard device.

5. Right-click the communication module and select **Activate** from the context menu to activate communication.

   An activated device is indicated by a red check mark in the ”active/default” column.

6. Define the EL1xx communication module as the standard device by another right-click on the communication module in the system bus configurator and selecting **Default** from the context menu.

   The standard device is indicated by a black check mark in the ”active/default” column.

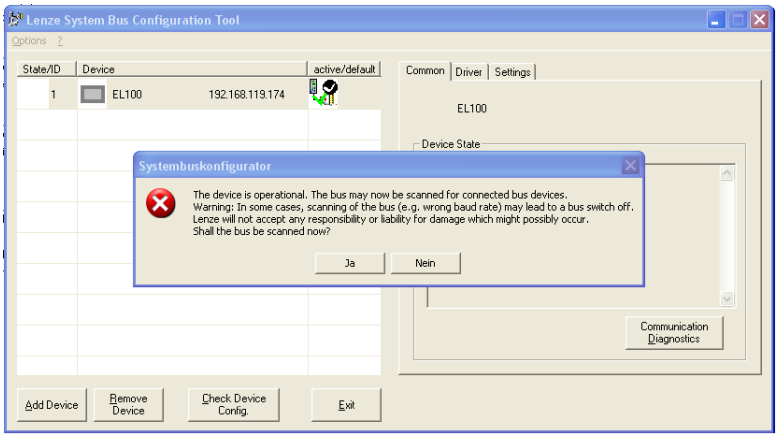


EL100-038

7. Select the new module in the system bus configurator.

8. For communication diagnostics, open the ”Common” tab and click the **Communication diagnostics** button.

   A message is displayed. Please observe the note contained therein saying that wrong settings may lead to a bus switch-off and that Lenze will not accept any responsibility or liability for damage which might possibly occur.

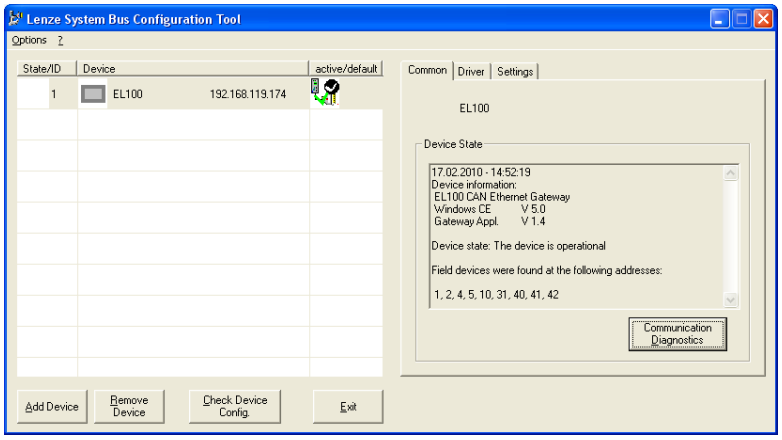


EL100-039

9. If you are positive that your communication settings are correct, confirm the message by clicking **Yes**, otherwise click **No**.

   If you have clicked ”Yes”, the communication module starts searching the bus for connected devices. If the communication module was able to successfully communicate with the connected devices, the ”Device state” field will list the system bus node addresses of the found devices.

   If the communication module should not be able to communicate with the nodes, an error message will be displayed. The communication module itself is listed with its CAN address. However, the data telegrams regarding communication with the communication module are not visible on the CAN bus.



EL100-040

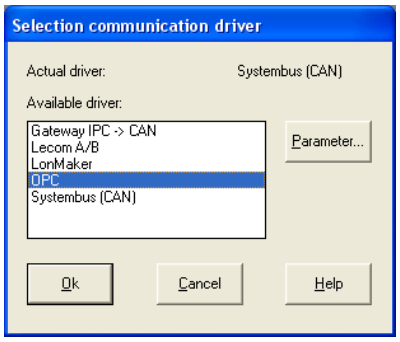
In the case of successful configuration, the Lenze tools (e.g. GDC, Engineer, ...) are able to communicate via the gateway function.

8.5.3 Establishing communication using the Global Drive Control (GDC)

The used bus system must be selected for the communication via the EL100 communication module. System bus-specific settings can be made on the EL100 module in the ”CAN Gateway” applet. The communication module can only be selected via the system bus configurator.

How to proceed:

1. Start the **Global Drive Control (GDC)** program.
2. Activate the **Options** → **Communication** menu item.
   In the ”Selection communication driver” dialog, a selection of communication drivers available for the communication module is displayed.

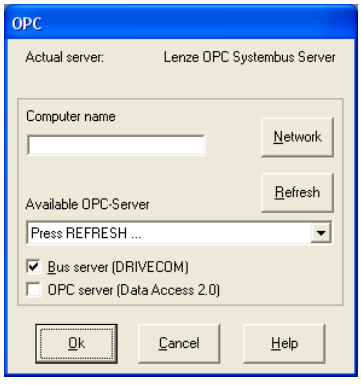


EL100-041

Note!

We recommend to select the ”OPC” communication driver in preference to the also available ”Systembus (CAN)” communication driver because the latter causes a longer bus scan (approx. 2 min.).

3. Select ”OPC” and click the **Parameter...** button.
   The ”OPC” dialog is displayed.



EL100-042

4. Click **Refresh** first.
   The selection field displays all available OPC servers now.

5. Select ”Lenze OPC Systembus Server” from the ”Available OPC Server” selection field and click **OK**.
6. Confirm your communication driver selection by clicking **OK**, too.

Now the GDC can be used to access the system bus via the EL100 communication module.

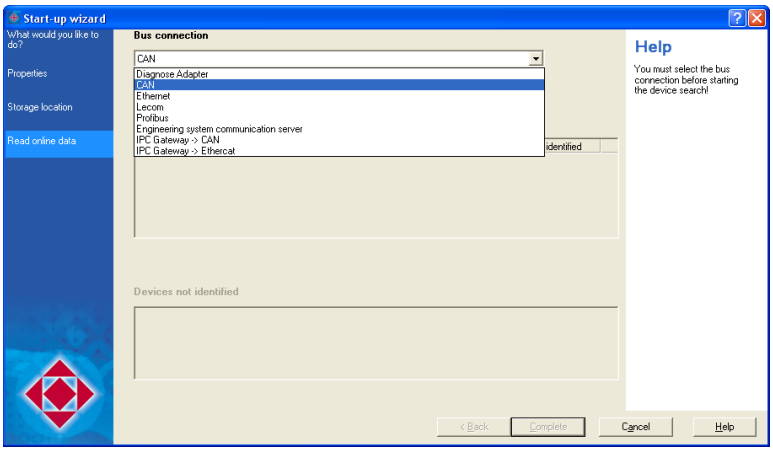
8.5.4 Establishing communication using the L-force Engineer

The used bus system must be selected for the communication via the EL100 communication module. System bus-specific settings can be made on the EL100 module in the ”CAN Gateway” applet. The communication module can only be selected via the system bus configurator.

Commissioning is illustrated by the following example. The parameter data of an 8400 frequency inverter are to be displayed using the Engineer.

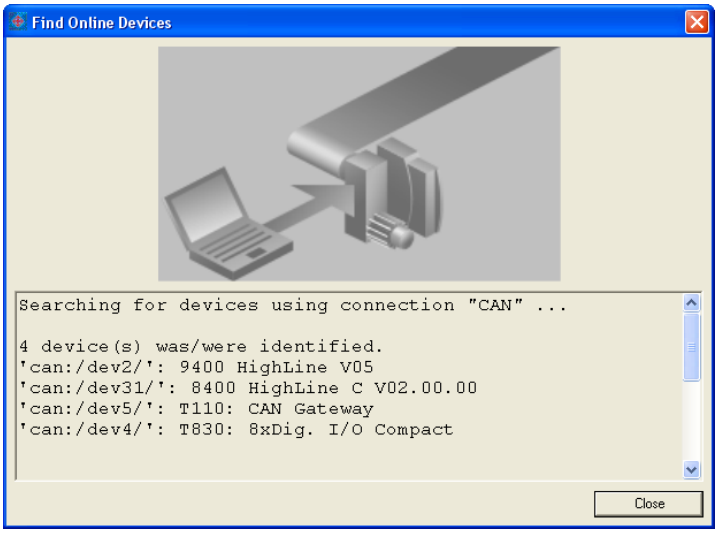
How to proceed:

1. Start the **L-force Engineer** program and create a new program.
   Information on how to proceed is provided in the L-force Engineer documentation.
2. Start the search for connected devices.
3. Define the project properties and click **Next**.
4. Define the storage location of the project and click **Next**.
5. To be able to access the 8400 frequency inverter via the EL100 communication module, select the ”CAN” bus connection.



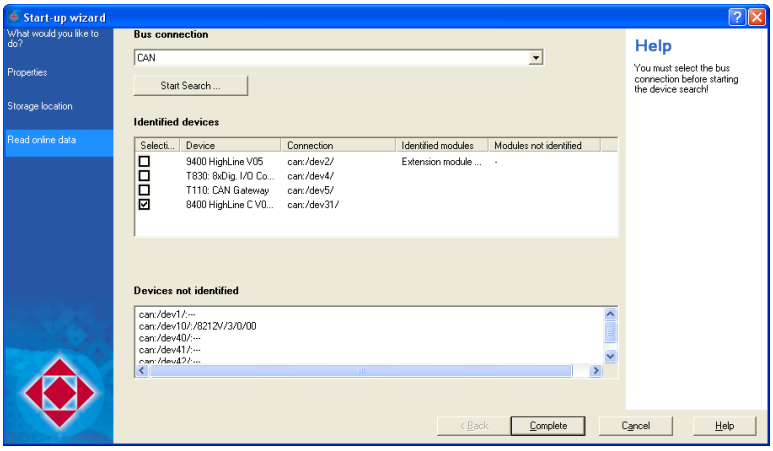
EL100-044

6. Click the **Device search** button to find connected devices.
   In the case of a successful search, all devices are identified.



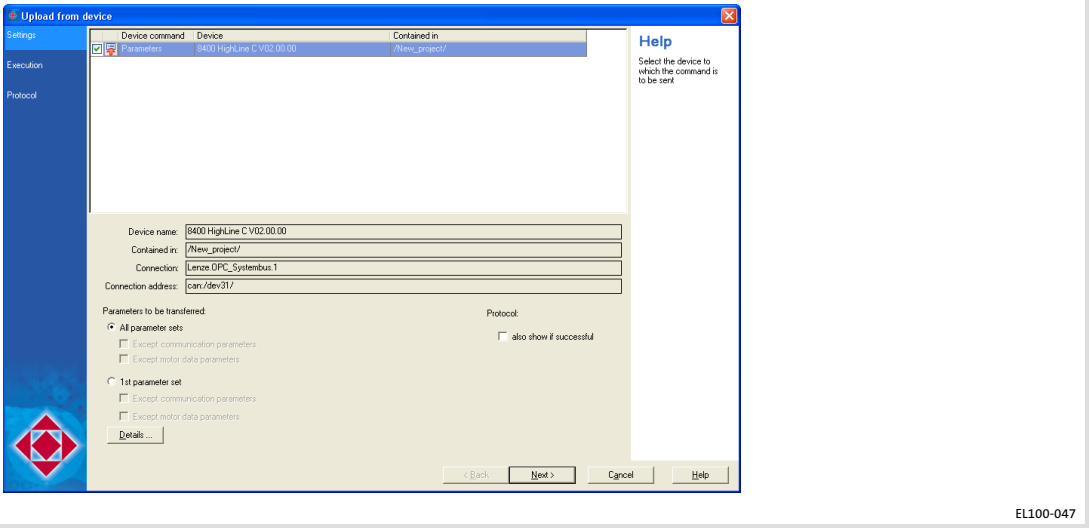
EL100-045

7. Click **Close**.
8. In the ”Selection” column, deselect all devices that you do not wish to parameterise.



EL100-046

9. Click **Complete**.
   The ”Upload from device” window is displayed.



10. Set the parameters to be transmitted here.
11. Click **Next**.

    The parameters are transmitted. In the case of a successful transmission, an online connection to the 8400 frequency inverter has been established.

The frequency inverter can now be parameterised.

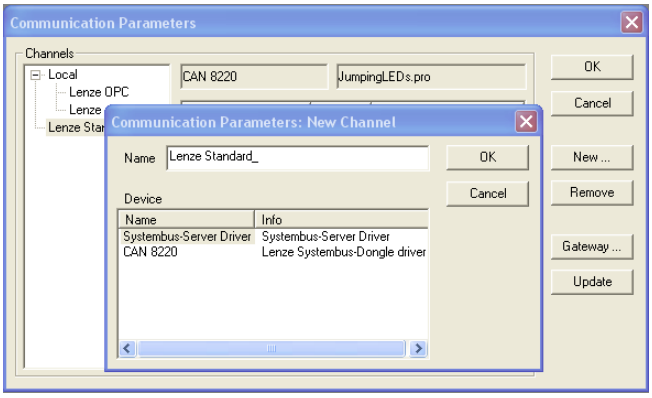
8.5.5 Establishing communication using the Drive PLC Developer Studio (DDS)

The used bus system must be selected for the communication via the EL100 communication module. System bus-specific settings can be made on the EL100 module in the ”CAN Gateway” applet. The communication module can only be selected via the system bus configurator.

Commissioning is illustrated by the following example. The parameter data of an 8400 frequency inverter are to be displayed using the Engineer.

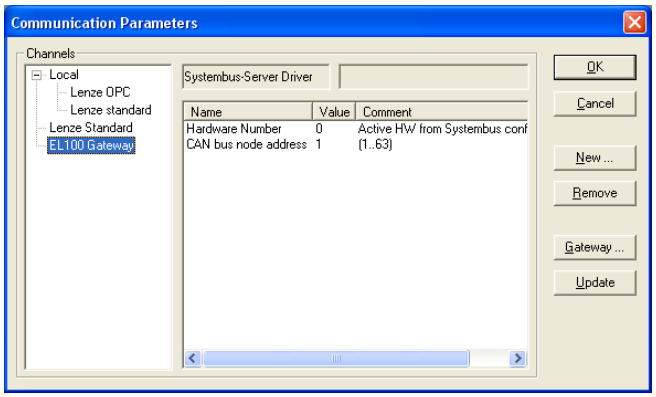
How to proceed:

1. Start the **Drive PLC Developer Studio (DDS)** program and open the project to be transferred via the EL100 communication module.
2. Activate the **Online** → **Communication parameters** menu item.
   The ”Communication parameters” window is displayed. Here, the settings regarding communication via the EL100 module can be made.
3. Click **New** to set a new channel.
4. Select the ”Systembus Server Driver” for the EL100 communication module.



EL100-048

5. Assign an arbitrary name to the channel (e.g. EL100 Gateway).
6. Click **OK**.
   A new channel is created.

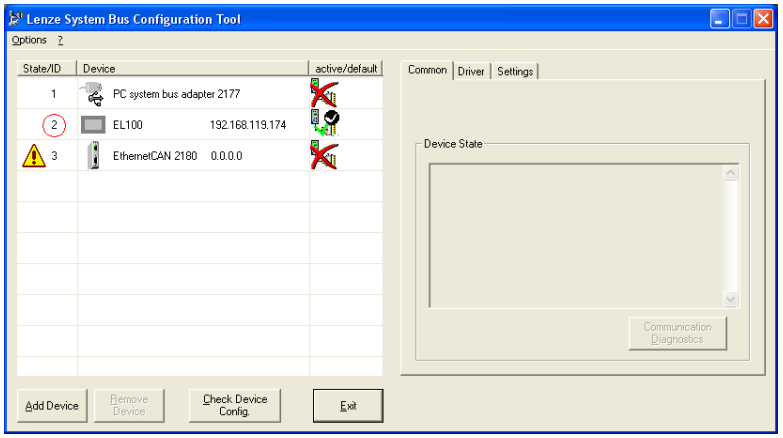


EL100-049

7. Set the hardware number of the EL100 communication module and the node address of the node to be programmed.

   The hardware number can be found in the system bus configurator. This number is assigned to the communication module.

   If you have added several communication modules in the system bus configurator, you must specify the number of the module via which you would like to communicate. For this purpose, double-click the value (highlighted in red).



EL100-050

8. Please also enter the node address of the node via which you would like to access the EL100 communication module.

Communication between the DDS and the system bus node via the communication module has now been established.

9 Maintenance

9.1 General notes

Stop!

Short circuit and static discharge

The device contains components which are endangered in the case of short circuit or static discharge.

Possible consequences:

► The device or parts of it will be destroyed.

Protective measures:

► Always switch off the voltage supply when working on the device. This particularly applies:
  – Before connecting / disconnecting connectors.
  – Before plugging in / plugging out modules.

► All persons handling printed circuit boards have to take account of ESD measures.

► Contacts of plug connectors must not be touched.

► Printed circuit boards may be touched only at places free from electrical contacts and may be placed only on appropriate materials (e.g. on ESD packaging or conductive foam material).

► Printed circuit boards may only be transported and stored in ESD packaging.

9.2 Regular checks

The device is free of maintenance. Nevertheless, visual inspections should be carried out at regular intervals which must not be too long, depending on the ambient conditions.

Please check the following:

► Does the environment of the device meet the operating conditions specified in the Technical data?

► Is the heat dissipation of the device not impeded by dust or dirt?

► Are the mechanical and electrical connections o.k.?

9.3 Cleaning

Stop!

Sensitive surfaces and components

The device can be damaged if it is not appropriately cleaned.

Possible consequences:

► The housing or the screen gets scratched or dull if you use alcoholic, solvent-containing or scouring cleaning agents.

► Electrical components can be damaged ...
  – by a short circuit caused by humidity.
  – by static discharge.

Protective measures:

► Observe the following notes.

► Before cleaning, disconnect the device from the power supply as otherwise unintentional commands may be activated via the touchscreen, for example a response of the control.

► Clean the device front (screen and frame) as follows:
  – Use a clean, lint-free and soft cloth.
  – Moisten the cloth with the detergent. Do not spray the detergent directly on the device.
  – Only use water with a fluid addition as detergent or a detergent declared especially for flat screens.

► Clean the rear side of the device with a clean, lint-free and soft cloth. Do not use liquid or foaming detergent since it may enter the housing or terminals.

9.4 Battery replacement

Danger!

Danger of fire and explosion

On the baseboard there is a battery for buffering the clock (RTC) when the device has been switched off.

Possible consequences:

► The use of other batteries than the approved ones or improper handling can result in a fire, explosion, or environmental damage.

Protective measures:

► The battery may only be replaced by an approved battery type according to the following list.

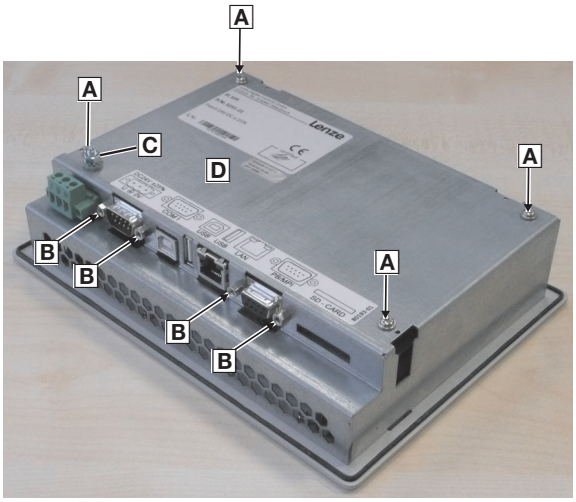
► The battery may not be recharged or opened. Furthermore it may not be thrown into a fire or be heated above 100 °C (212 °F).

Approved types:

► Matsushita CR2450, Renata CR2450N, Sony Corp. CR2450B, Toshiba CR2450, Varta CR2450

How to proceed:

1. Remove all connected cables and the SD card.
2. Remove the device and put it face-down on a table.
   Make sure that the display is not damaged by parts on the table.
3. Remove PC housing:



EL100-035

   – Loosen 4 screws A. Do not loosen screw C!
   – Loosen 4 screws B.
   – Carefully remove the housing D. Please observe that the housing is connected to the baseboard by a cable (PE connection C).
4. Exchange battery:

EL100-036

   – Remove the dead battery E from the unit.
   – Insert new battery Ewith the positive pole up.
5. Mount PC housing:
   – Carefully put the housing Donto the baseboard. The PE cable must not be bent in the process.
   – Insert and tighten 4 screws Aand 4 screws B.

According to European legislation you are obliged to dispose of batteries separately, using the take-back systems specified.

10 Index

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