Lenze

Manual

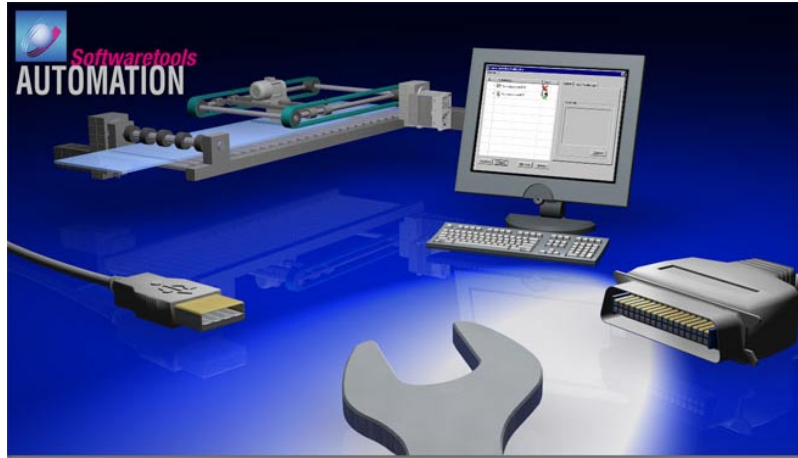**Global Drive**
PC system bus adapter
2173 / 2177
Software installation & configuration

CAUTION:

The software is supplied to the user as described in this document. Any risks resulting from its quality or use remain the responsibility of the user. The user must provide all safety measures protecting against possible maloperation.

We do not take any liability for direct or indirect damage, e.g. profit loss, order loss or any loss regarding business.
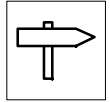
Version	ID no.	Changes
1.1 09/2003 TD11		Revised edition

Contents

1 Preface and general information

The **PC system bus adapter** is a communication module for data transfer between a target system (drive controller, Drive PLC, etc.) and a PC via the system bus (CAN). Two types are available:

- The **PC system bus adapter 2173** is the classic type. It is connected to the parallel interface (LPT port/printer connection) of the PC or notebook.
- The **PC system bus adapter 2177** can be used for PCs & notebooks with a USB port (*Universal Serial Bus*).
  This type is recommended for notebooks which do not have a parallel interface for printer connection.

Note!

This Manual contains information

- about the **software installation** of the device drivers required for the PC system bus adapters and
- the **software configuration** of the PC system bus adapters using **the system bus configuration tool** from Lenze.

Information about the mechanical/electrical connection of the PC system bus adapters can be found in the corresponding Mounting Instructions for the PC system bus adapters.

1.1 Conventions used

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

Type of information	Marking	Example
Names of dialog boxes, input fields and selection lists	*italics*	The dialog box *Options*
Buttons	**bold**	Click **Ok** to...
Menu commands	**bold**	Use the command **Copy** you can...
		If several commands must be used in sequence to carry out a function, then the individual commands are separated by an arrow: Select **File →Open** to...
Keyboard commands	**<bold>**	Use **<F1>** to open the online help.
		If a command requires a combination of keys, the commands are linked with "+": Use **<Shift>+<ESC>** to...

Lenze

1.2 Terminology used

Term	In the following text used for
DDS	Drive PLC Developer Studio
GDC	Global Drive Control
System bus adapter	PC system bus adapter 2173 or PC system bus adapter 2177
USB	*Universal Serial Bus*

1.3 Layout of the safety information

- All safety information have a uniform layout:
    - The pictograph characterises the type of danger.
    - The signal word characterises the severity of danger.
    - The note describes the danger and suggests how to avoid the danger.

Signal word
Note

	Pictographs used		Signal words	
Warning of danger to persons		Warning of hazardous electrical voltage	**Danger!**	Warns of **impending danger**. Consequences if disregarded: Death or severe injuries.
		Warning of a general danger	**Warning!**	Warns of **potential, very hazardous situations**. Possible consequences if disregarded: Death or severe injuries.
			Caution!	Warns of **potential, hazardous situations**. Possible consequences if disregarded: Light or minor injuries.
Warning of damage to material	STOP		**Stop!**	Warns of **potential damage to material**. Possible consequences if disregarded: Damage to the controller/drive system or its environment.
Other notes	i		**Tip!** **Note!**	Indicates a tip or note. If observed, it will make handling the product easier.

2 System requirements

The following minimum requirements on hardware and software must be met in order to use the system bus adapters:

PC system bus adapter 2173	PC system bus adapter 2177
• Microsoft Windows 95/98/Me/NT/2000/XP • IBM compatible PC (Pentium 90 processor or higher) • 32 MB RAM • Parallel interface (LPT port) **Note:** Please make sure that the operating mode "ECP" (*Extended Capability Port*) is selected for the parallel interface in the PC BIOS.	• Microsoft Windows 98/Me/2000/XP • IBM compatible PC (Pentium 266 processor or higher) • 64 MB (RAM) (128 MB RAM with Windows 2000/XP) • Free USB port with 200 mA power supply **Note:** If the PC internal power supply is insufficient for the USB port a USB hub with external power supply is required to ensure the power supply of the system bus adapters!

The following Lenze tools can be used for communication via the system bus adapters:
- Drive Server
- Global Drive Control (PC system bus adapter 2177: as from GDC version 4.3)
- Global Drive Loader
- Global Drive PLC Developer Studio (PC system bus adapter 2177: as from DDS version 1.4)

3 Hardware installation

Information about the mechanical/electrical connection of the system bus adapters can be found in the corresponding Mounting Instructions for the system bus adapters.

Tip!

System bus adapter LED:
- **PC system bus adapter 2173**: The LED lights up as soon as the system bus adapter is connected to the PC and the PC is switched on. If the LED does not light up the system bus adapter does not work properly.
- **PC system bus adapter 2177**: The LED only lights up if the operating system has identified the system bus adapter and found an appropriate driver. The LED flashes as soon as a Lenze tool communicates via the system bus adapter.

4 Software installation

A driver has to be installed to ensure that the system bus adapter can be recognised by the operating system.
- The following section describes the installation of the drivers required for the individual system bus adapters.

4.1 Driver installation

Note!

Windows NT/2000/XP requires administrator rights for installing the drivers!

4.1.1 PC system bus adapter 2173

The driver required for PC system bus adapter 2173 is part of the Lenze tools.

It is automatically installed when the corresponding Lenze tools are installed or can be manually selected for installation.

You need not install any additional software for the system bus adapter.

4.1.2 PC system bus adapter 2177

The driver required for PC system bus adapter 2177 is part of the Lenze tools.

It is automatically installed when the corresponding Lenze tools are installed or can be manually selected for installation.

Note!

The installation program of the following Lenze tools does not yet include the driver required for PC system bus adapter 2177. A separate driver update has to be installed here:
- Drive Server 1.0
- Global Drive Control 4.4
- Global Drive Loader 1.0
- Global Drive PLC Developer Studio 1.4

The driver updates can be found at the Lenze homepage in the Internet:

http://www.Lenze.de ➔ *Downloads* ➔ *Update versions*

Please proceed as follows:
1. Download the driver update from the Lenze homepage to your local hard disk. (File "UPDATE_CAN_DRIVER.EXE")
2. Install the Lenze tools you want to communicate via the system bus adapter.
3. Select the file "UPDATE_CAN_DRIVER.EXE" to install the driver update.
4. Follow the instructions of the installation program.

Windows 98/Me/2000

When the system bus adapter is plugged into a free USB port the new hardware will be automatically recognised and the required driver will be loaded.

Windows XP

When the system bus adapter is plugged into a free USB port the *Hardware update wizard* will be automatically displayed.

- Open the dialog box *Hardware update wizard*, go to "Automatic software installation" and press the button **Next** to install the software for the system bus adapter.

The driver for PC system bus adapter 2177 has now been installed.

Note!

If the *Hardware update wizard* does not automatically find the required driver, indicate the below directory:

[Drive] **:\Programs\Lenze\Drivers**

Enter the letter of the hard disk drive selected for the installation of the Lenze tool as "[Drive]".

4.2 Installation of the system bus configuration tool

The Lenze **system bus configuration tool** for a convenient configuration of the system bus adapters is installed together with the driver for PC system bus adapter 2177.

Note!

If PC system bus adapter 2173 is used with older versions of the Lenze tools the system bus configuration tool might not yet be available on your PC.

In this case, a separate driver update has to be installed which can be found at the Lenze homepage in the Internet:

http://www.Lenze.de ➔ *Downloads* ➔ *Update versions*

Please proceed as follows:

1. Download the driver update from the Lenze homepage to your local hard disk. (File "UPDATE_CAN_DRIVER.EXE")
2. Install the Lenze tools you want to communicate via the system bus adapter.
3. Select the file "UPDATE_CAN_DRIVER.EXE" to install the driver update.
4. Follow the instructions of the installation program.

5 Software configuration

The system bus adapter has to be configured to allow communication of the Lenze tools via the system bus adapter.

Select **Programs→Lenze→Communication→System bus configuration tool** in the start menu to open the system bus configuration tool:
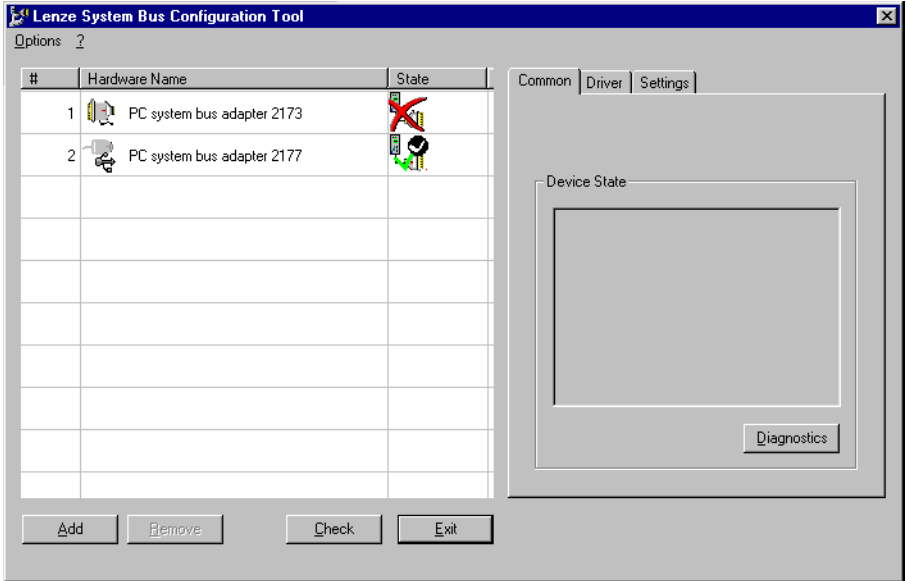
Under "Hardware Name" you will find a list of all system bus adapters installed. The status of the individual system bus adapters is indicated under "State":

| Symbol	Meaning
	The system bus adapter is active and used by Lenze tools.
	The system bus adapter is active and used by Lenze tools. It is defined as a standard. • Lenze tools which can only access one system bus adapter use the standard system bus adapter. • Lenze tools which can access more than one system bus adapter at the same time can use all active system bus adapters.
	The system bus adapter is inactive and not used by Lenze tools.
	The system bus adapter could not be accessed without error. • For more information see FAQ (*Frequently Asked Questions*) in the appendix. 📖 14

5.1 Activation / deactivation / definition of the system bus adapter as a standard

When positioning the pointer over an entry and clicking the right mouse key a context menu opens via which you can activate or deactivate the system bus adapter.

You can also use the context menu to define the system bus adapter as a standard.

Activate
Inactivate
Default
Add
Delete
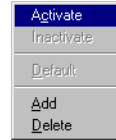
Note!

It is possible to use several PC system bus adapters of type 2177 at the same time. It is, however, not possible to use a PC system bus adapter of type 2177 together with a PC system bus adapter of type 2173. This is why it may happen that certain combinations cannot be activated in the system bus configuration tool.

5.2 Addition / deletion of system bus adapters

If additional system bus adapters are to be configured for your PC you can add them to the list by clicking the button **Add**.

By clicking the button **Remove** you can remove a system bus adapter from the list.

- The commands **Add** and **Remove** are also available in the context menu.

5.3 Configuration of the system bus adapter

Depending on the type of system bus adapter used different communication parameters have to be set. Select the corresponding system bus adapter from the list and set the parameters on the right-hand side in the register **Settings**.

5.3.1 Configuration of PC system bus adapter 2173

The following communication parameters have to be set for PC system bus adapter 2173:

Parameter	Presetting	Meaning
Baud rate	500 kbit/s	System bus (CAN) baud rate selected in the target system. • Lenze controllers are default set to 500 kbit/s.
I/O address	0x378h (LPT1)	Base address of the parallel interface (LPT port). • LPT port1: Address 0x378h • LPT port2: Address 0x278h
Interrupt	7 (LPT1)	Interrupt (IRQ) for the parallel interface (LPT port).
Time limit for finding the bus participants	1000 ms	Time during which the bus participants are expected to react when identifying the bus participants connected to the system bus.
Communication timeout	800 ms	Time after which an attempt to communicate with a bus participant will be aborted.
Parameter channel	2	Parameter channel for data transfer via the system bus. • Lenze controllers have 2 parameter channels (SD01 & SD02).
Repeat attempts	1	Number of communication attempts repeated when an error occurred. • Setting range: 1 ... 10

- The standard settings for the LPT1 port and the default baud rate setting for Lenze controllers are preset.
- If you want to use an interface different from LPT1 for the system bus adapter or if the settings for I/O address and/or interrupt differ from the standard settings, follow the instructions given in chapter 5.3.1.2 to find out about the actual settings. (□ 10)
- Please make sure that the operating mode "ECP" (*Extended Capability Port*) is selected for the parallel interface in the PC BIOS.

5.3.1.1 Interrupt assignment to the LPT port

Only required for Windows 2000/XP!

Under Windows 2000/XP there is no standard interrupt assignment to the parallel interface.

Proceed as follows to assign an interrupt to the parallel interface under Windows 2000/XP:

1. Select **Settings→Control panel** to open the control panel.
2. Double-click the entry **System** to open the system properties.
3. Select the register **Hardware** and press **Controller manager**.
4. Select the parallel interface (LPT port) and press the button **Properties**.
5. Go to the register **Connection settings**, choose "Use every interrupt assigned to the connection" as resource method and select the parallel interface under **LPT connection number**.

5.3.1.2 Detection of system settings for the LPT interface

Windows 9x/Me

1. Select **Settings➜Control panel**.
2. Double-click the symbol **System**.
3. Select the register card **Controller manager**.
4. Select **Ports (COM and LPT)** and select the LPT port which is used by the system bus adapter and click **Properties**.
5. Select the register card **Resources** to get a list of the settings for the I/O section and interrupt (IRQ).
   – The I/O address is the first number of the I/O section:
6. Accept the settings for **Interrupt** and **I/O address** in the system bus configuration tool.

Windows NT

1. Select **Programs➜Administration (general)➜Windows NT diagnostics**
2. Select the register card **Resources**
3. Click **IRQ** to get a list of all interrupts assigned.
   – Use the IRQ indicated for the entry **Parport** in the system bus configuration tool. If the entry **Parport** is not available, enter an interrupt between 1 and 15 in the system bus configuration tool which is **not** indicated in this list.
4. Click **I/O port** to get a list of all drivers.
5. Go to **Device** and click the entry **Parport**.
   – The I/O range used for the LPT interface is indicated directly in front of the entry. The I/O address is the first number of the I/O section:

Tip!

If a PC has several LPT interfaces, the entry **Parport** is also available several times.

- Select the entry **Parport** for the LPT interface which is used by the system bus adapter.
- The entry with the highest I/O range is designed for the LPT interface with the lowest connection number. (Standard setting: LPT1 = I/O address 378, LPT2 = I/O address 278)

6. Accept the settings for **Interrupt** and **I/O address** in the system bus configuration tool.

Windows 2000/XP

1. Select **Programs➜Accessories➜System programs➜System information**
2. Select **Hardware resources** and click the entry **IRQ** to get a list of all interrupts assigned.
   – Use the IRQ indicated for the entry **Printer connection (LPTx)** in the system bus configuration tool.
3. Select **Hardware resources** and click the entry **I/O** to get a list of all drivers.
4. Select the **Printer connection (LPTx)** for the LPT interface to which the system bus adapter is connected.
   – The I/O range used for the LPT interface is indicated directly in front of the entry. The I/O address is the first number of the I/O section:
5. Accept the settings for **Interrupt** and **I/O address** in the system bus configuration tool.

5.3.2 Configuration of PC system bus adapter 2177

The following communication parameters have to be set for PC system bus adapter 2177:

Parameter	Presetting	Meaning
Baud rate	500 kbit/s	System bus (CAN) baud rate selected in the target system. • Lenze controllers are default set to 500 kbit/s.
Time limit for finding the bus participants	1000 ms	Time during which the bus participants are expected to react when identifying the bus participants connected to the system bus.
Communication timeout	800 ms	Time after which an attempt to communicate with a bus participant will be aborted.
Parameter channel	2	Parameter channel for data transfer via the system bus. • Lenze controllers have 2 parameter channels (SDO1 & SDO2).
Device number	255	USB device number. • If several PC system bus adapters of type 2177 are connected to the PC different USB device numbers have to be assigned to them to distinguish between the adapters.
Repeat attempts	1	Number of communication attempts repeated when an error occurred. • Setting range: 1 ... 10

5.3.2.1 Assignment of different USB device numbers

If several PC system bus adapters of type 2177 are connected to the PC different USB device numbers have to be assigned to them to distinguish between the adapters.

Please proceed as follows:

1. Make sure that the system bus adapter to which a new USB device number is to be assigned is the only PC system bus adapter of type 2177 connected to the PC.
2. Enter the corresponding USB device number in the input field **Device number**.
   – The device number will be immediately transmitted to the system bus adapter. For initialization, the system bus adapter has, however, to be disconnected for a short time from the USB port.
   – **Note:** Under Windows 2000/XP, a USB device may only be removed from the USB port after logging off over the *Tray icon* "Safely remove hardware" in the task bar. For the system bus adapter select the entry "PCAN-USB".
3. Remove the system bus adapter for a short time from the USB port. When the adapter is plugged in again, it will be reinitialized and the new device address will become effective.
4. Repeat the first three steps for all PC system bus adapters of type 2177 which are to be used on the PC.
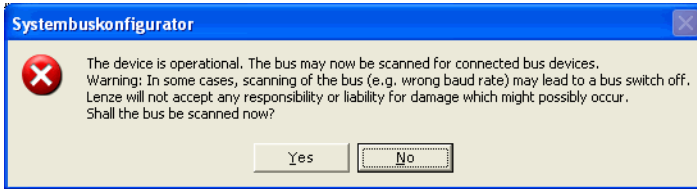
5.4 Diagnostics

After configuring the connected system bus adapters a diagnostics can be made to check whether communication is possible with all bus participants.

For diagnostics proceed as follows:

1. Select the system bus adapter from the list of system bus adapters in the system bus configuration tool for which you want to make a diagnostics.
2. Go to the register **Common** and press the button **Diagnostics**.

If the system bus adapter is ready for operation the below dialog field will be displayed:

3. Confirm the dialog field with **Yes** to scan the system bus (CAN) for connected bus participants or select **No** to cancel the diagnostics.

After scanning the system bus (CAN), the system bus node addresses of the identified bus participants will be listed.

5.5 Display of driver information

For diagnostics you can also display information about the system bus adapter drivers.

Proceed as follows to display driver information:

1. Select the system bus adapter from the list of system bus adapters in the system bus configuration tool for which you want to display driver information.
2. Select the register **Driver**.

The driver files required for the individual system bus adapters including version number and date are listed in the register **Driver**.

5.6   Checking and saving of the configuration

Click the button **Check** to check the current configuration.
- Only consistent configurations should be saved!

Press the button **Exit** to close the system bus configuration tool. The current configuration will be saved automatically.
- When the configuration tool is closed the current configuration will be checked for consistency.

5.7   What's coming next?

After the system bus adapter configuration has been completed, the Lenze tools can communicate via the adapter.
- The Lenze tools only select the bus system. All system bus specific settings including the selection of the communication module are made by the system bus configuration tool.

Note!

Some of the older program versions of the Lenze tools still include possible settings for interrupt and I/O address. When the driver update for PC system bus adapter 2177 is installed these settings will become void. (📖 5)

6 Appendix

6.1 FAQ - Frequently asked questions and answers

6.1.1 PC system bus adapter 2173

Question	Answer
The system bus configuration tool indicates that the system bus adapter is ready for operation, but there are no bus participants found. For what reason?	1. Check, if the wiring is correct and all bus participants are switched on. 2. If so, the PC interrupt for the parallel interface might be deactivated. (📖 9) 3. Also check the BIOS and control panel settings. (📖 10)

6.1.2 PC system bus adapter 2177

Question	Answer
Is it possible to use the system bus adapter under Windows NT or Windows 95?	No, it isn't. Windows NT and Windows 95 do not support USB.
Is it possible to operate several PC system bus adapters of type 2177 on a PC at the same time?	Yes, it is. But you have to select different USB device numbers for the individual system bus adapters in the system bus configuration tool. (📖 11)
Is it possible to operate the system bus adapter together with other USB devices?	Yes, it is. The PC-internal power supply might, however, not be sufficient for the USB bus. In this case, you have to use a USB hub with external power supply.
The power supply of my notebook is not sufficient for the system bus adapter. What can I do?	Connect a USB hub between notebook and system bus adapter. The USB hub has its own power supply via which the connected USB devices are supplied.
Where can I get a USB hub?	USB hubs are available in specialised computer shops.
How can I see if the PC has recognised the connected system bus adapter?	The system bus adapter LED only lights up if the operating system has identified the system bus adapter and found an appropriate driver.
May I remove the system bus adapter from the PC any time?	Basically, yes, you can. • Under Windows 98, the system bus adapter can be removed from the PC any time. • Under Windows 2000/XP, a USB device may only be removed from the USB port after logging off over the *Tray icon* "Safely remove hardware" in the task bar. For the system bus adapter select the entry "PCAN-USB". • If Lenze tools are open when pulling off the system bus adapter, they have to be started again if you want to communicate with them.

6.2 Glossary

CAN	Abbreviation for *Controller Area Network*: International bus system standardised as ISO 11898
CANopen	A bus system with optimised communication facilities based on CAN technology and the application layer CAL (CAN Application Layer).
I/O base address	I/O base addresses define special memory areas for data exchange between operating system and devices such as keyboard controller, hard disk controller, parallel interface, graphics card, ...
ECP	Abbreviation for *Extended Capability Port*: Mode for data transfer via the parallel interface defined in the IEEE 1284-1994 standard which is mainly used by modern printers and scanners and to be set in the PC BIOS.
Interrupt	Signal from a peripheral to the processor used to ask for calculation time. On receipt, the processor will interrupt the running program and take care of the peripheral.
IRQ	Abbreviation for *Interrupt ReQuest*: English for interrupt request (see Interrupt).
LPT	Abbreviation for *Line PrinTer* (line printer)
Parallel interface	PC interface which, unlike the serial interface (COM port), supports data transfer over 8 lines (i.e. 8 bits are transmitted at the same time). The printer is usually connected to the parallel interface. The parallel interface is also called LPT port or centronics interface.
System bus	A Lenze standard bus system similar to CANopen.
USB	Abbreviation for *Universal Serial Bus*: Serial bus system which is becoming increasingly important in the field of PC peripherals. Notably because USB is an easy and universal interface for almost any kind of device.
USB hub	A USB hub is a kind of "distributor" which makes it possible to connect several (usually 4 -6) USB devices to one USB port. If the PC-internal power supply is not sufficient the USB devices can also be supplied via the USB hub.

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