



Quickstart Guide

NXSB-PCA

Hardware Description and Installation Instructions

Edition: 2

Language: English (EN)

Hilscher Gesellschaft für Systemautomation mbH

Web: www.hilscher.com

List of Revisions

| Index | Date | Chapter | Revisions |
|-------|------------|---------|--|
| 1 | 2006-10-16 | all | created |
| 2 | 2007-03-28 | 2 | revised according to ANSI Z 535.6, |
| 3 | 2007-04-02 | all | Revised, added information on NXSB-PCA-TRM |
| | | | |

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1 Introduction

1.1 About the Quick Start Guide

This Quick Start Guide contains a short description for the installation of NXSB-PCA cards under Windows[®] 2000/Windows[®] XP.

1.2 Documentation for NXSB-PCA

The following table provides an overview on further available documentation related to this product.

| Manual | Contents | Document name |
|------------------------------|---|---------------------------------|
| Quickstart Guide NXSB-PCA | Hardware Description and Installation Instructions | NXSB-PCA_quickstart_en.pdf |
| Installation Instruction | Installation Instruction for cifX Device Driver | cifX Driver_installation_en.pdf |

Table 1: Documentations NXSB-PCA

1.3 Contents of the Product CD

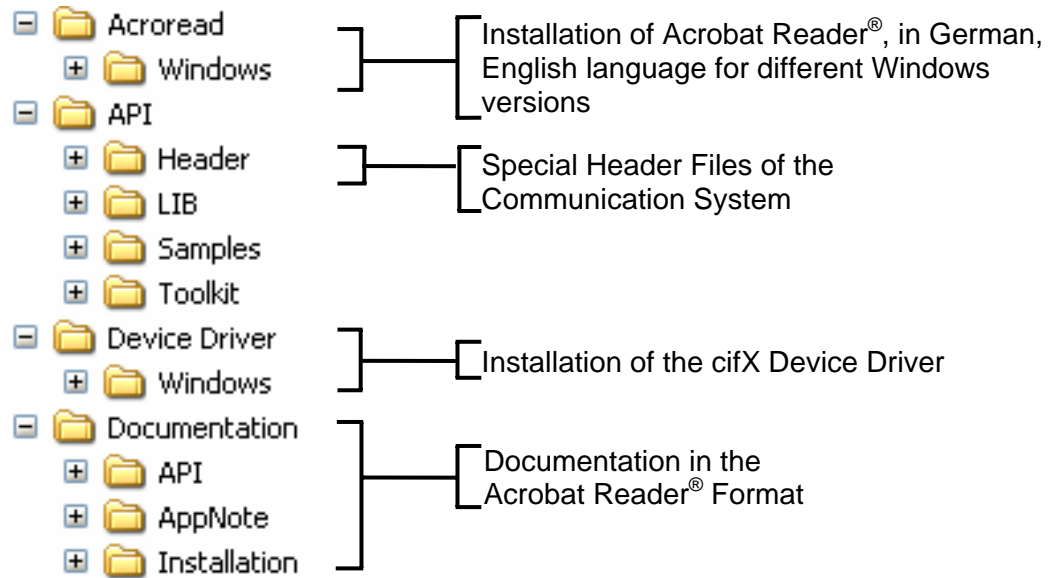
The Product CD contains:

- cifX Device Driver
- Documentation

for the NXSB-PCA and the NXSB100 for slave applications.

1.4 Directory Structure of the CD

All manuals on this CD are delivered in the Adobe Acrobat Reader® format (PDF). A runtime version of this reader can be found in the ACROREAD directory.



1.5 Reference on Hardware

| Card Type | Device |
|-----------|------------|
| NXSB-PCA | Revision 2 |

Table 2: Reference on Hardware

1.6 Conventions in this Manual

Operation Instructions:

Operation instructions are marked as follows:

➤ text text text

or

1. text text text

2. text text text

Results:

A result of an operation step is marked as follows:

⇒ text text text

Safety- and Warning Notes:

Safety and warning notes are pinpointed particularly.



DANGER!

[Name of the Danger]

- Text of the safety note

For information on how safety and warning notes are designed, refer to section 2 on page 7.

Important Notes:



Note: text text text

Important notes are indicated with the signal word "Note" and by a symbol.

1.7 Legal Notes

1.7.1 Warranty

Although the NXSB-PCA has been developed with great care and has been intensively tested, Hilscher Gesellschaft für Systemautomation mbH cannot guarantee the suitability of this board for any purpose not confirmed by us in writing.

Warranty claims shall be limited to the right to require rectification. Liability for any damage which may have arisen from the use of this board or its documentation shall be limited to cases of intent.

1.7.2 Registered Trademarks

Windows® 2000/Windows® XP are registered trademarks of Microsoft Corporation.

1.8 Support

If you have any question please contact our subsidiaries, your local distributor or our technical support:

| Country | E-Mail | Phone |
|---------------|--|----------------------|
| Germany | de.support@hilscher.com | +49 (0) 6190 9907-99 |
| | netxsupport@hilscher.com | +49 (0) 6190 9907-97 |
| Switzerland | ch.support@hilscher.com | +49 (0) 6190 9907-99 |
| Italy | it.support@hilscher.com | +39 / 0225007068 |
| France | fr.support@hilscher.com | +33 (0) 472379840 |
| North America | us.support@hilscher.com | +1-630-505-5301 |
| Japan | jp.support@hilscher.com | +81 (0) 3-5362-0521 |

2 Safety

2.1 Intended Use

The purpose of the NXSB-PCA board is to provide a software development platform for netX applications, using the dual-port memory (DPM) interface of the netX. A standard PC is used in place of the host CPU in the later design and the netX 100 Starter Board provides the target for slave applications. In this setup, the virtual netX DPM is mapped into the memory of the PC.

2.2 Personnel Qualification

The NXSC-PCA card must only be installed, configured and removed by qualified personnel.

2.3 Labeling of Safety Instructions

The safety instructions are pinpointed particularly. The instructions are highlighted with a specific safety symbol, a warning triangle and a signal word according to the degree of endangerment. Inside the note the danger is exactly named. Instructions to a property damage note do not contain a warning triangle.




| Symbol | Sort of Warning or Principle |
|---|--|
|  | Safety symbol for the warning to personal injury |
|  | Warning of danger by electrical current |
|  | Warning of damages by electrostatic discharge |

Table 3: Safety Symbols and Sort of Warning or Principle

| Signal Word | Meaning |
|----------------|--|
| DANGER | Indicates a hazardous situation, which, if not avoided, will result in death or serious injury. |
| WARNING | Indicates a hazardous situation, which, if not avoided, could result in death or serious injury. |
| CAUTION | Indicates a hazardous situation, which, if not avoided, may result in minor or moderate injury. |
| NOTICE | Indicates a property damage note. |
| Note | Indicates an important note in the manual. |

Table 4: Signal Words

2.4 Safety Instructions

This manual contains instructions which must be observed to ensure your own personal safety and to avoid damage to devices.

2.4.1 Electrical Current



CAUTION**Electrocution**

- Disconnect the power plug of the PC and make sure, that the PC is current-free.
 - Only after disconnecting power, open the PC cabinet and install or remove the cifX card.
-

2.4.2 Electrostatic Discharge

Adhere to the necessary safety precautions for components that are vulnerable with electrostatic discharge (EN 61340-5-1 und EN 61340-5-2 as well as IEC 61340-5-1 und IEC 61340-5-2).



NOTICE**Electrostatic Discharge**

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
 - Wear an approved grounding wriststrap.
 - Do not touch connectors or pins on component boards.
 - Do not touch circuit components inside the equipment.
 - If available, use a static-safe workstation.
 - When not in use, store the equipment in appropriate static-safe packaging.
-

2.4.3 Hardware Damage

NOTICE**Hardware Damage**

- To avoid hardware damage to the the NXSB-PCA card and the NXSB100 card, only connect the ribbon cable as described in section Connect NXSB-PCA to NXSB 100. If the ribbon cable is connected incorrectly, the cards will be damaged.
-

3 Overview NXSB-PCA

3.1 Description NXSB-PCA

The NXSB-PCA described in this quickstart guide is a PCI adapter card, designed for the connection to the virtual dual-port memory (DPM) of the netX. It is equipped with a non removable 64-pin ribbon cable that connects the NXSB-PCA to the netX 100 Starter Board. Along with the appropriate driver (cifX Driver), the NXSB-PCA provides a memory window within the PC memory which allows access to the virtual 64k netX DPM.



Note: To perform a firmware download via DPM, different preconditions must be met. For further details see sections 3.3.



Note: To work with the NXSB-PCA card, the **cifX Device Driver** is required.

The NXSB-PCA card does not store netX configuration data or firmware, however during start-up of the **cifX Device Driver**, the driver can download the firmware, the configuration and the warmstart parameters to the netX as configured by the the user.

The (firmware and parameter related) NXSB-PCA configuration and set up can be done by one of the following options:

- **cifX Driver Setup Utility** configuration program
- Application program

For it's hardware configuration (the netX side, bus configuration), the NXSB-PCA provides two non volatile configuration memories, that hold two parameter sets, one for 8 Bit DPM mode and one for 16 Bit DPM mode.

The appropriate setting is selected by a sliding switch, located at the upper edge of the board, close to ribbon cable connector. The position labelled "Word" selects 16 Bit mode, while the other position, labelled "Byte" selects 8 Bit mode.



Note: The NXSB-PCA reads the selected configuration when booting the PC, hence the switch position should only be changed when the PC is turned off, or the PC must be rebooted after selecting a different mode.

3.2 Description NXSB-PCA-TRM

The NXSB-PCA adapter card now comes with an additional adapter board that plugs on to the NXSB100 and connects it to the NXSB-PCA (this adapter is also subsequently delivered to all customers that have purchased an NXSB-PCA in the past).

This adapter board provides some pull-down, pull-up and serial resistors to improve signal quality and reduce crosstalk when using the NXSB100 in DPM mode along with the NXSB-PCA. Further it drives all unused host interface signals to a valid signal level.



Note: The use of this adapter card is mandatory when operating in 16 Bit mode!

As an additional feature, the 64 pin header on the top side of this board provides access to all host interface signals, even when the NXSB is connected to the NXSB-PCA, allowing to perform measurements (all signals on the header are labelled for easier identification) or use signals that are not used for the DPM interface (e.g. address lines A16 and higher) for other purposes.

The NXSB-PCA-TRM is further equipped with a red LED, which allows a quick and convenient display of the bus width selected on the NXSB-PCA, without having to inspect the switch on the NXSB-PCA board. When the LED is lit, 16 Bit mode is selected, otherwise the board has been switched to 8 Bit mode.



Note: The LED does only reflect the position of the bus width switch, which is not necessarily identical to the actual bus width configuration (when changing the switch position after the PC has booted, this will affect the LED status but not the loaded bus width configuration)!

3.3 Preconditions for NXSB-PCA Card Operation

For NXSB-PCA card operation the following preconditions must be met:

1. The card must be installed in a PCI Slot (3.3V or 5V) of a standard PC, running Windows® 2000 or Windows® XP
2. The **cifX Device Driver** must be installed.
3. The NXSB100 board must be connected.
4. The NXSB100 must either already run an appropriate firmware (e.g. started from its flash memory or downloaded through its JTAG port) that configures the netX host interface and the DPM layout or it must be ready for a firmware download by the cifX driver.

This allows basic operation of the card, by providing a PC memory window to the netX virtual DPM.

When working with Hilscher (slave-) firmware, that expects parameters (configuration file) to be downloaded from the host (PC), this can be achieved by one of the following options:

- **cifX Driver Setup Utility** configuration program
- User Application

If the netX firmware does not reside in the flash memory of the NXSB100, it has to be downloaded from the host, which can be done by the **cifX Device Driver**. In that case, the **cifX Driver Setup Utility** is also used to select the appropriate firmware file, which will then be downloaded by the driver during the next start-up of the driver, along with the selected parameters.



Note: Please mind the following preconditions for firmware download:

- NXSB100 devices of revision 1 to 3 require a hardware modification in order to be able to activate the DPM boot mode on these boards (board must be upgraded with a DPM boot mode jumper, according to netX Product Brief, chapter 2.3)
 - Firmware download via the cifX Driver is only possible when the NXSB-PCA is switched to 8-Bit mode.
 - Firmware download requires a revised (released 26/04/07) NXSB-PCA EEPROM configuration. If you purchased your NXSB-PCA before this date, please contact netX Support for information on how to update this configuration.
-

3.4 Device Drawing NXSB-PCA

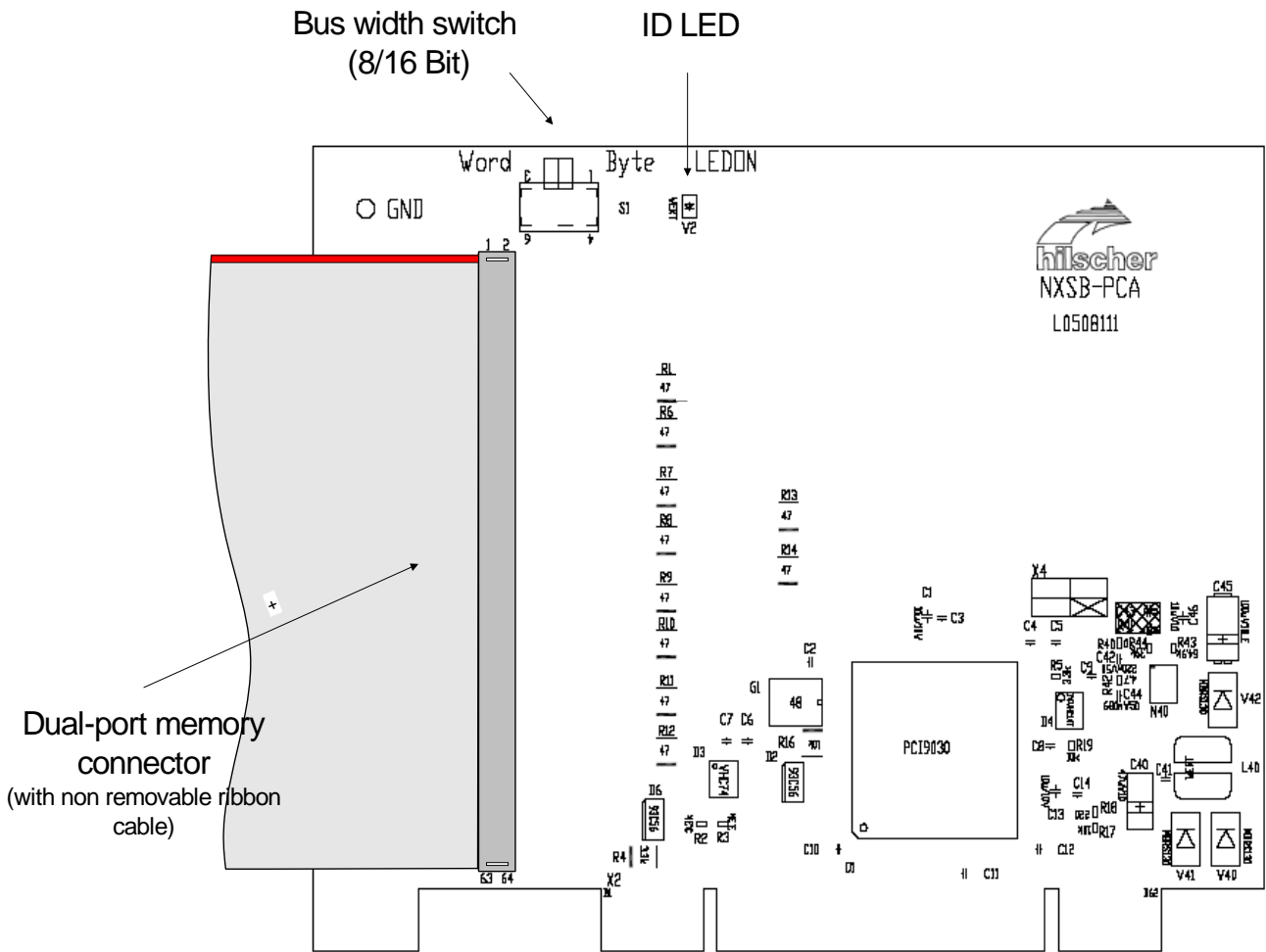
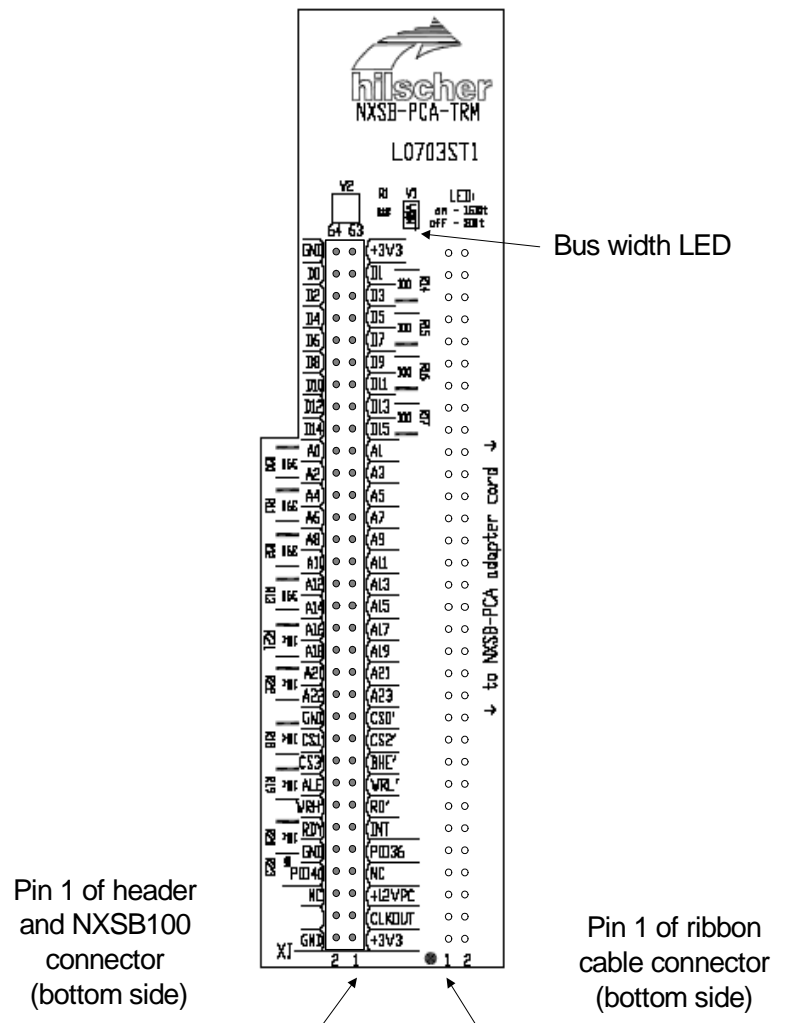


Figure 1: Device Drawing NXSB-PCA

3.5 Device Drawing NXSB-PCA-TRM



4 Installing the NXSB-PCA Card



Note: Consider the safety instructions in chapter 2 before proceeding with installation!

1. First pull the power plug of the PC and all connected devices.
2. Open the cabinet of the PC and plug the NXSB-PCA into a free PCI slot. Retain the NXSB-PCA by screwing the cards mounting bracket to the appropriate mounting hole.
3. Close the PC housing, connect the PC to the power supply and turn on the PC.
4. Install the driver software (see section *Installing cifX Device Driver*)
5. Connect the PC adapter card NXSB-PCA to the netX 100 Starter Board (see section *Connect NXSB-PCA to NXSB 100*).

Further information can be found in subsequent sections.

4.1 Connect NXSB-PCA to NXSB 100 and NXSB-PCA-TRM

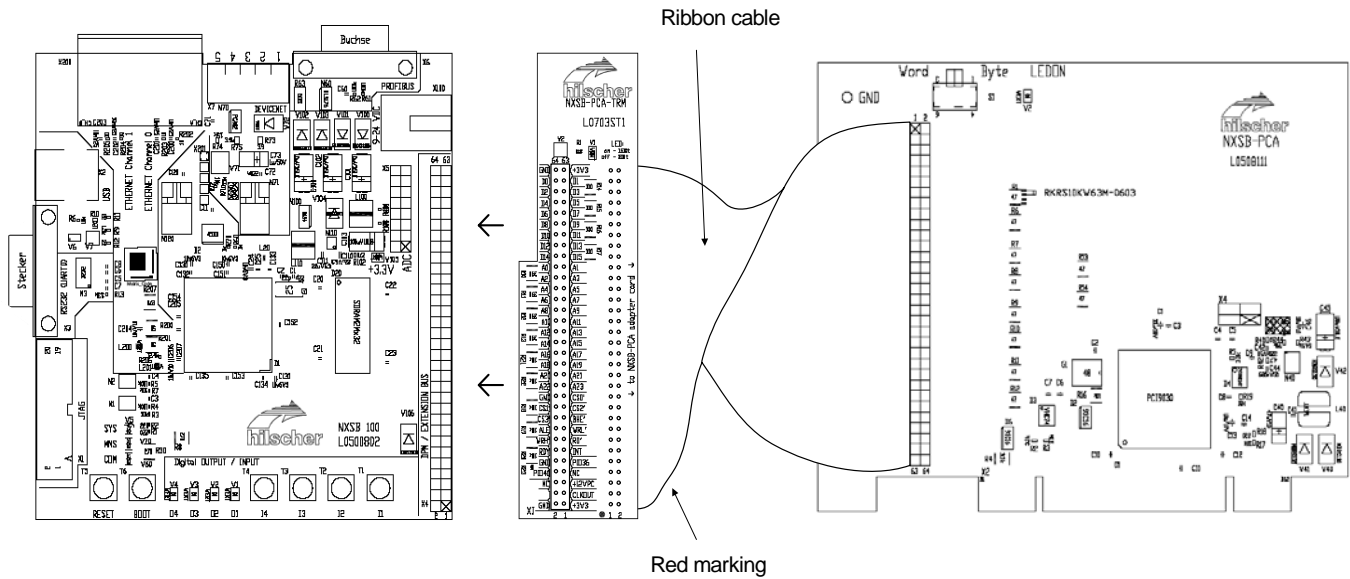


Figure 3: Connect NXSB-PCA to NXSB 100 and NXSB-PCA-TRM



Note: The power supply of the netX 100 Starter Board is provided by the NXSB-PCA via the ribbon cable, hence no further external power supply is required. If however an external power supply is connected, the netX 100 Starter Board and the NXSB-PCA will NOT be damaged.

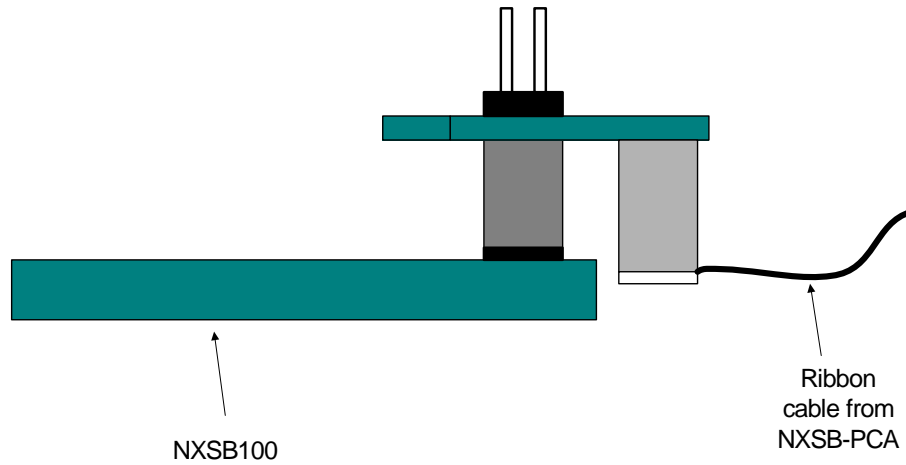
NOTICE

Hardware Damage

- To prevent hardware damage to the the NXSB-PCA card and the NXSB100 card, connect the ribbon cable exactly as described below, otherwise, both cards may be damaged.
- Shut down the PC and turn off the PC power.
- Put the square post female connector (socket) at the end of the ribbon cable with the arrow mark (red marked cable) matching pin 1 of the male connector (plug) located at the bottom side of the NXSB-PCA-TRM card.
- Now plug the NXSB-PCA-TRM with the second connector (female) on the bottom side of the card to connector X4 of the NXSB100 as shown above.
- Double check the cabling of the whole setup before turning on the PC.

The pictures on the following page show a schematic side view of the NXSB100, the NXSB-PCA-TRM and the ribbon cable when connected all together:

**New production lot of NXSB-PCA
(NXSB-PCA-TRM adapter enclosed with NXSB-PCA):**



**Previous production lot of NXSB-PCA
(NXSB-PCA-TRM adapter delivered subsequently):**

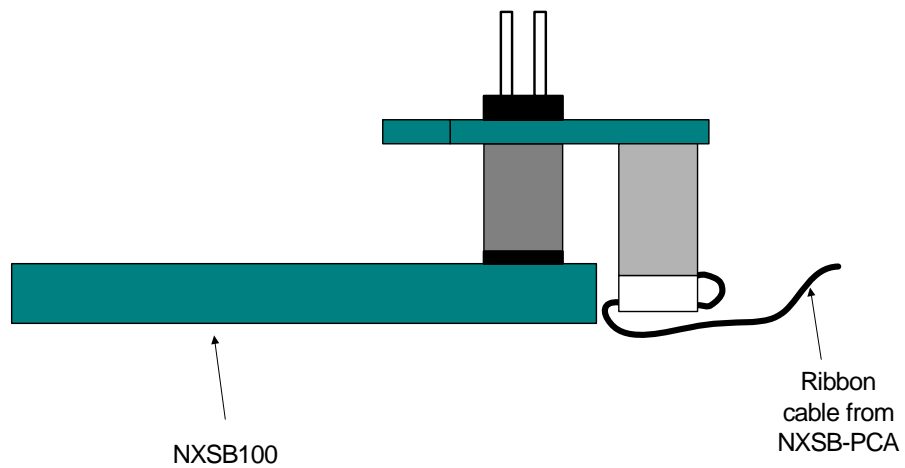


Figure 4: Schematic side view of setup

In order to achieve a more convenient cable routing, users of older NXSB-PCA adapter cards can remove the strain relief clamp on the cable connector to avoid the double loop of the ribbon cable.

5 Installing Software

5.1 Installing cifX Device Driver

To install the **cifX Device Driver**, proceed as follows:

1. After installation of the NXSB-PCA card turn on your PC.

Windows® 2000 / Windows® XP will recognize the NXSB-PCA card automatically.

⇒ The message **Found New Hardware** is displayed and the **Found new Hardware Wizard** is started.

2. Select **Install from a list or specific location (Advanced)**.

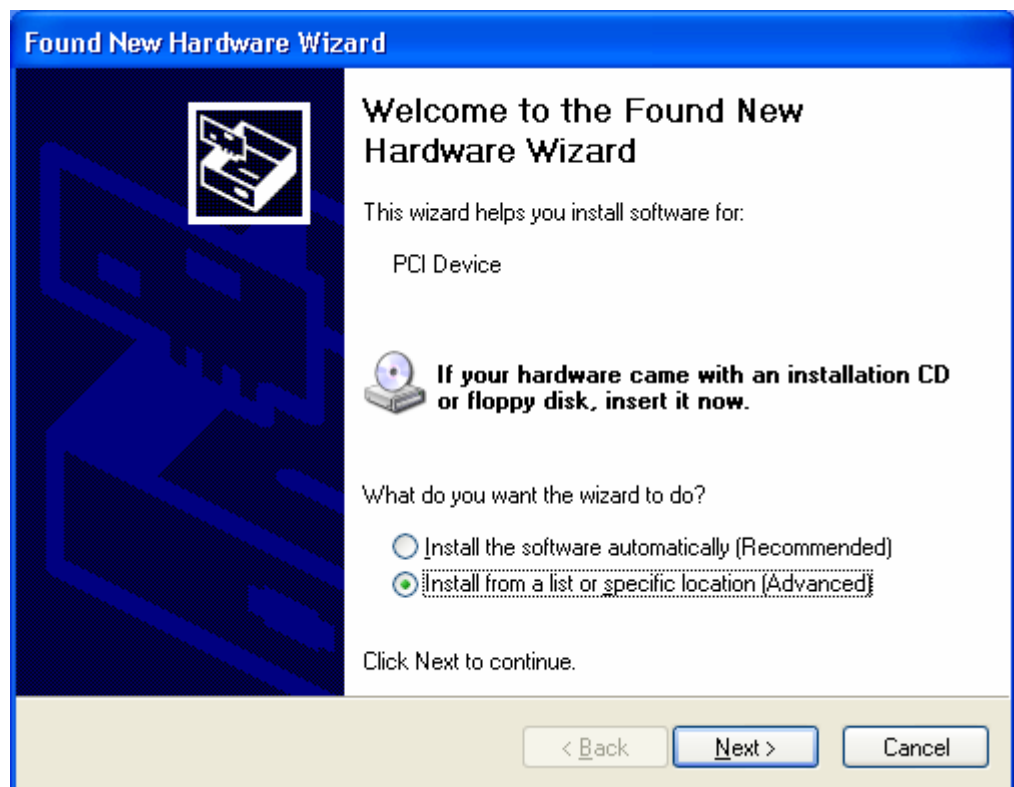


Figure 5: Found new Hardware Wizard - Indicate Software Source

3. Insert the installation CD now.

4. Click to the button **Next >**.

⇒ The **Found new Hardware Wizard** asks for selection of the search- and installation options.

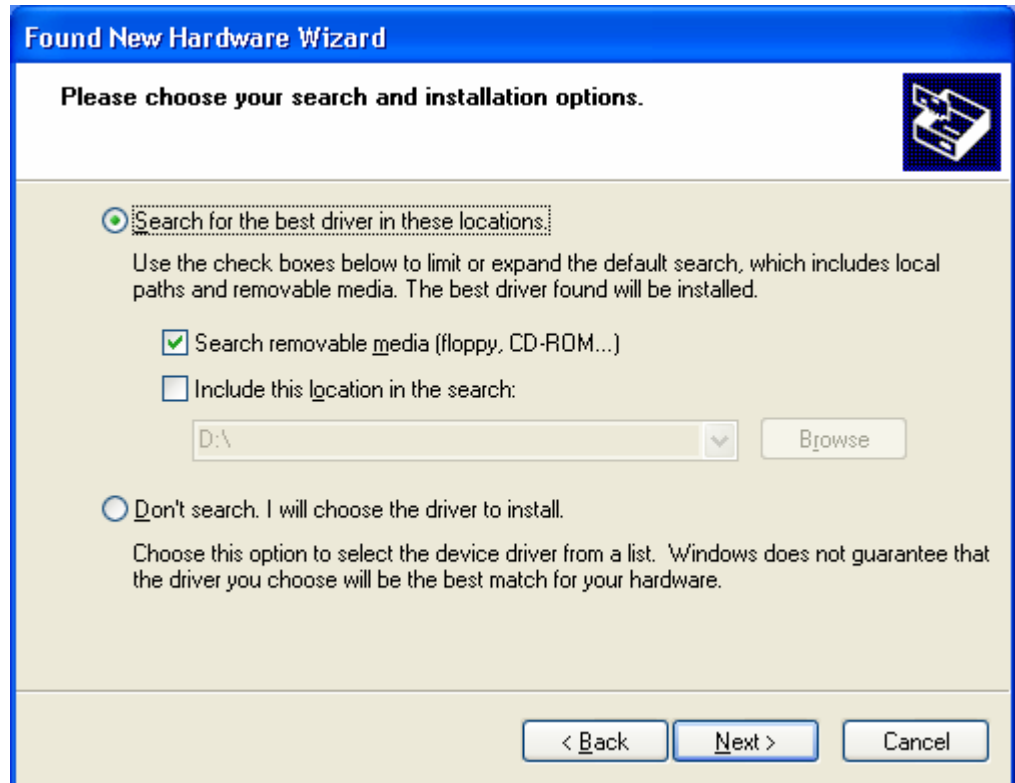


Figure 6: Found new Hardware Wizard - Select research- and installation options

5. Select **Search for the best driver in these locations.**
 6. Activate the checkbox **Search removable media (floppy, CD-ROM...).**
 7. Click to the button **Next >.**
- ⇒ The appropriate files for the **cifX Device Driver** are being installed.

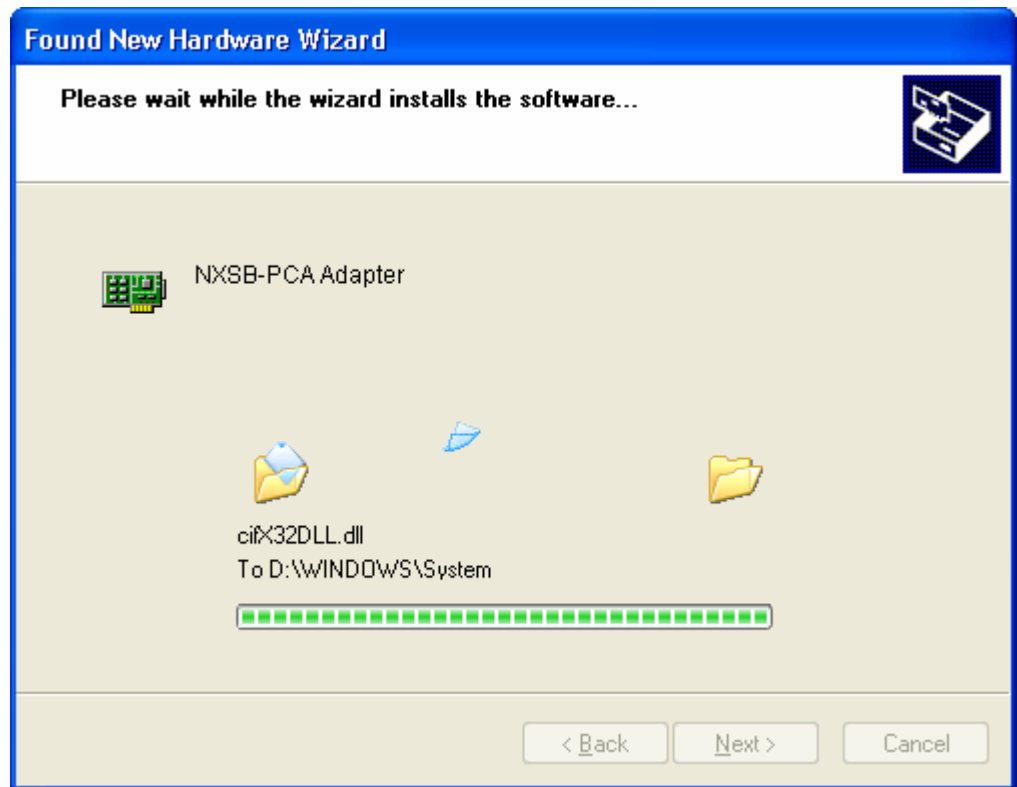


Figure 7: Found new Hardware Wizard - Software installs

- ⇒ The **Found new Hardware Wizard** indicates the **cifX PCI/PCle Device** software installation is complete.

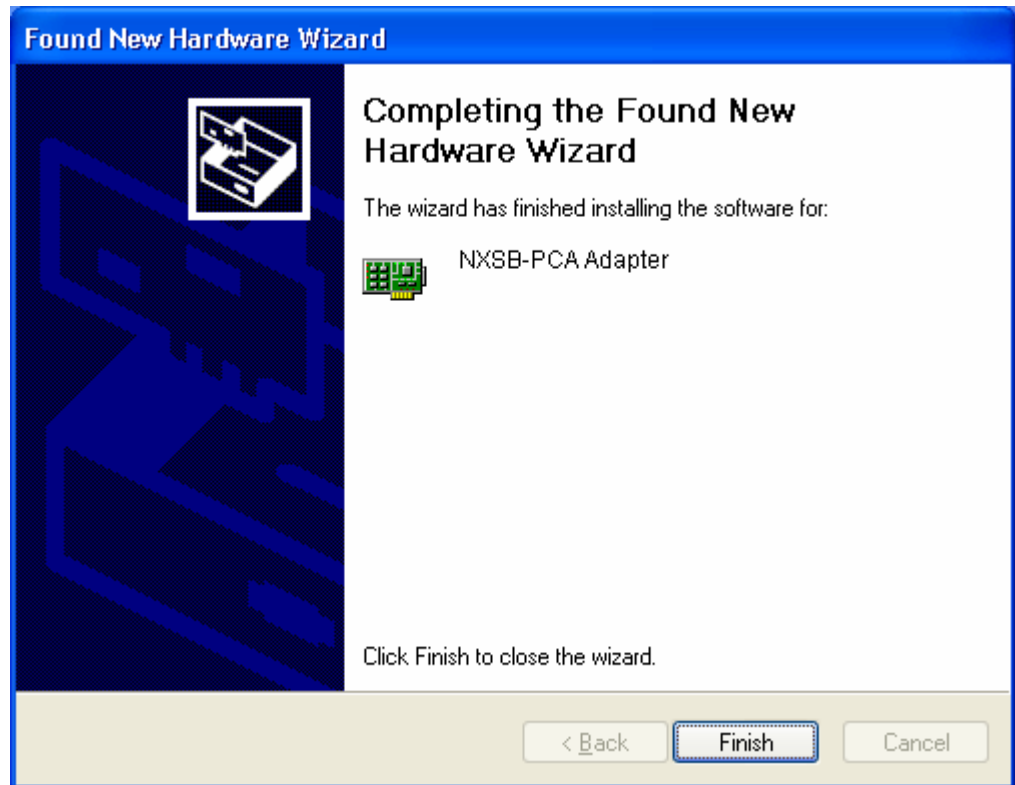


Figure 8: Found new Hardware Wizard - Software installation has been completed

8. Click at the **Finish** button.

- ⇒ The installation of the **cifX Device Driver** is complete.

9. Check the **Computer Manager**, to see if the NXSB-PCA card installed correctly:
 - Open the **Computer Manager** as follows:
 - Desktop symbol **My Computer** >
 - rightclick **Properties** >
 - window **System Properties** >
 - tab **Hardware** >
 - button **Computer Manager**.
 - Check, if the view of your **Computer Manager** corresponds to the marked area in the following picture.

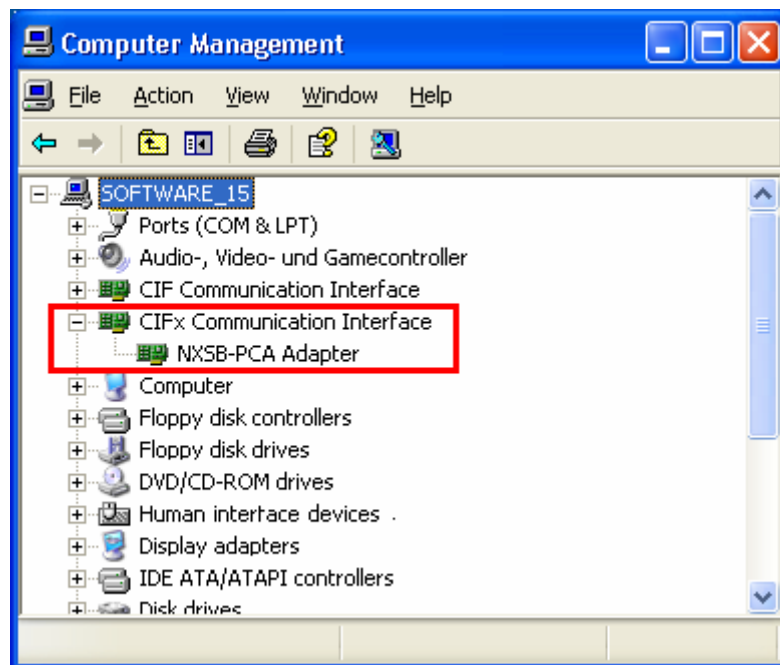


Figure 9: Device Manager > NXSB-PCA Adapter - correctly installed



Note: The card may still have to be configured (firmware / parameter).



Note: Detailed information on how to setup and configure the **cifX Device Driver** using the **cifX Driver Setup Utility** program, can be found in the installation instruction **cifX Device Driver**.

6 Troubleshooting

The power LED on the NXSB100 is not lit:

- Turn off the PC immediately and recheck the correct position of the ribbon cable connector (does the red marked cable lead to Pin 1 of the connector?) and the NXSB-PCA-TRM board.

The NXSB-PCA board does not show up in the Device Manager:

- Check if the board is properly plugged into the slot.
- If other CIF cards are being used in the PC, make sure, the NXSB-PCA has not been erroneously detected by an existing CIF driver. If in doubt, remove all other CIF cards and check the Device Manager again.

The NXSB-PCA board shows up as an unknown device in the Device Manager:

- Try to (re)install the cifX driver
- If the driver won't install/load, move the bus width switch to its other position and reboot the PC. If the driver installs/loads now, the hardware configuration data in the NXSB-PCA may have become corrupted. Please contact netX support.

The NXSB-PCA shows up in the PC correctly, but the netX DPM can't be accessed:

- Check, if the NXSB100 runs a firmware that correctly configured the netX host interface or if an appropriate firmware has been successfully downloaded by the driver.
- Check, if the bus width, selected on the NXSB-PCA matches the bus width configured in the netX (Remember to reboot the PC when after changing the switch position).

Firmware download to the NXSB100 is not possible:

- Check, if **all** applicable conditions stated in chapter 3.3 are met

7 LEDs

7.1 ID LED

The NXSB-PCA is equipped with an LED that is controlled by an appropriate PCI Register of the device. It is currently not supported by the cifX driver and can for example be used to identify a certain NXSB-PCA card when more than one of these cards is used in a system.

| LED | Color | State | Meaning |
|-----|-------|-------|----------|
| ID | red | On | Reserved |
| | - | Off | Reserved |

Table 5: ID LED

7.2 Bus width LED

The NXSB-PCA-TRM provides an LED that displays the setting of the Bus width switch of a connected NXSB-PCA-TRM. See also chapter 3.3 for further remarks and information.

| LED | Color | State | Meaning |
|-----------|-------|-------|--|
| Bus Width | red | On | Bus width switch in "Word" position (16 Bit) |
| | - | Off | Bus width switch in "Byte" position (8 Bit) |

Table 6: Bus switch LED

8 Annex

8.1 Dual Port Memory Connector Pinout

| Pin | Signal | | Pin | Signal |
|-----|----------|--|-----|---------|
| 1 | n.c. | | 33 | DPM_A13 |
| 2 | GND | | 34 | DPM_A12 |
| 3 | n.c. | | 35 | DPM_A11 |
| 4 | n.c. | | 36 | DPM_A10 |
| 5 | +12V | | 37 | DPM_A9 |
| 6 | n.c. | | 38 | DPM_A8 |
| 7 | n.c. | | 39 | DPM_A7 |
| 8 | n.c. | | 40 | DPM_A6 |
| 9 | n.c. | | 41 | DPM_A5 |
| 10 | GND | | 42 | DPM_A4 |
| 11 | DPM_INT | | 43 | DPM_A3 |
| 12 | DPM_RDY | | 44 | DPM_A2 |
| 13 | DPM_RDn | | 45 | DPM_A1 |
| 14 | n.c. | | 46 | DPM_A0 |
| 15 | DPM_WRLn | | 47 | DPM_D15 |
| 16 | DPM_WIFn | | 48 | DPM_D14 |
| 17 | DPM_BHEn | | 49 | DPM_D13 |
| 18 | n.c. | | 50 | DPM_D12 |
| 19 | n.c. | | 51 | DPM_D11 |
| 20 | n.c. | | 52 | DPM_D10 |
| 21 | DPM_CSn | | 53 | DPM_D9 |
| 22 | GND | | 54 | DPM_D8 |
| 23 | n.c. | | 55 | DPM_D7 |
| 24 | n.c. | | 56 | DPM_D6 |
| 25 | n.c. | | 57 | DPM_D5 |
| 26 | n.c. | | 58 | DPM_D4 |
| 27 | n.c. | | 59 | DPM_D3 |
| 28 | n.c. | | 60 | DPM_D2 |
| 29 | n.c. | | 61 | DPM_D1 |
| 30 | n.c. | | 62 | DPM_D0 |
| 31 | DPM_A15 | | 63 | n.c. |
| 32 | DPM_A14 | | 64 | GND |

Table 7: Pinning Dual Port Memory Connector, X2

8.2 Contacts

8.2.1 Hilscher Europe

| Contact | Germany | France |
|----------------|---|--|
| Address | Hilscher Gesellschaft für Systemautomation mbH Rheinstraße 15 D-65795 Hattersheim | Hilscher France s.a.r.l. 12 rue du 35ième Régiment d'Aviation Miniparc du Chêne FR-69500 Bron |
| Phone | +49 (0) 6190 9907-0 | +33 (0) 472379840 |
| Phone Sales | +49 (0) 6190 9907-90 | +33 (0) 472379840 |
| Phone Support | +49 (0) 6190 9907-99 | +33 (0) 472379840 |
| Fax | +49 (0) 6190 9907-50 | +33 (0) 478268327 |
| E-Mail | info@hilscher.com | info@hilscher.fr |
| E-Mail Sales | sales@hilscher.com | info@hilscher.fr |
| E-Mail Support | de.support@hilscher.com | fr.support@hilscher.com |
| Web | www.hilscher.com | www.hilscher.com |

| Contact | Italy | Switzerland |
|----------------|--|--|
| Address | Hilscher Italia s.r.l. Via Grandi, 25 IT-20090 Vimodrone (MI) | Hilscher Swiss GmbH Hubelmattstraße 29 CH-4500 Solothurn |
| Phone | +39 / 0225007068 | +41 (0) 32 6236 633 |
| Phone Sales | +39 / 0225007068 | +41 (0) 32 6236 633 |
| Phone Support | +39 / 0225007068 | +49 (0) 6190 9907-99 |
| Fax | +39 / 0225029973 | +41 (0) 32 6236 632 |
| E-Mail | info@hilscher.it | info@hilscher.ch |
| E-Mail Sales | sales@hilscher.it | sales@hilscher.com |
| E-Mail Support | it.support@hilscher.com | ch.support@hilscher.com |
| Web | www.hilscher.com | www.hilscher.com |

8.2.2 Hilscher North America

| Contact | United States of America |
|----------------|--|
| Address | Hilscher North America, Inc. 2443 Warrenville Road, Suite 100 Lisle, Illinois 60532, USA |
| Phone | (+1) 630 505 5301 |
| Phone Sales | (+1) 630 505 5301 |
| Phone Support | (+1) 630 505 5301 |
| Fax | (+1) 630 505 7532 |
| E-Mail | info@hilscher.us |
| E-Mail Sales | info@hilscher.us |
| E-Mail Support | us.support@hilscher.com |
| Web | www.hilscher.com |

8.2.3 Hilscher Asia

| Contact | China | Japan |
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