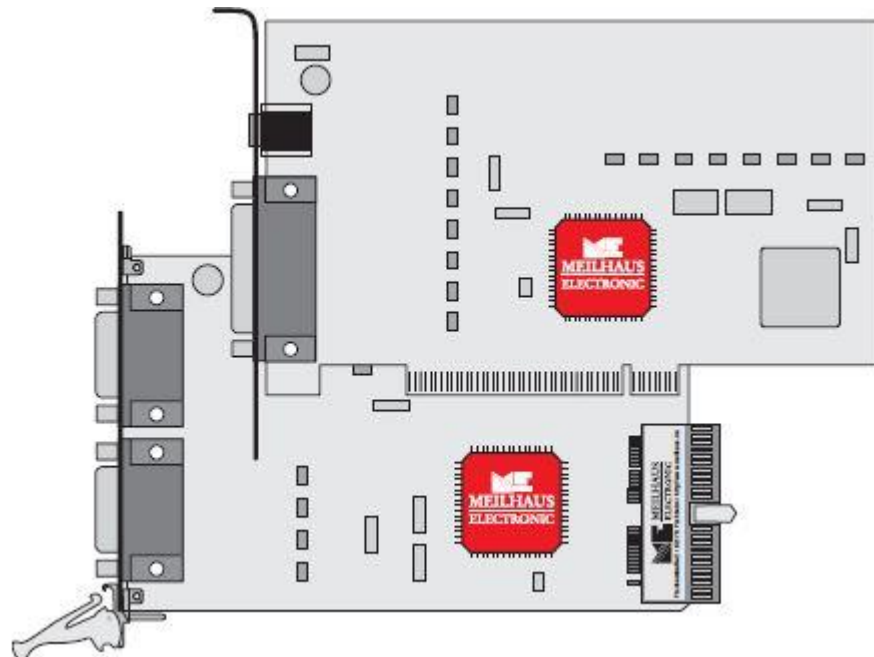


Meilhaus Electronic Manual

ME-94, ME-95, ME-96 6.0E

(PCI- and CompactPCI-Versions)



Opto-Isolated Digital-I/O Boards

Imprint

Manual ME-94, ME-95, ME96

Revision 6.0

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1 Introduction

Valued customer,

Thank you for purchasing this device from Meilhaus Electronic. You have chosen an innovative high technology product that left our premises in a fully functional and new condition.

Please take the time to carefully examine the contents of the package for any loss or damage that may have occurred during shipping. If there are any items missing or if an item is damaged, please contact us immediately.

Before installing the board in your computer, we recommend you read this manual carefully, especially the chapter describing board installation.

The descriptions in this manual concern PCI- and CompactPCI-versions of the ME-94, ME-95, ME-96 series, if not otherwise noted.

1.1 Important Notes

1.1.1 Use in Accordance with the Requirements

The PC-boards of the ME-series are designed for acquisition and output of analog and digital signals with a PC. Depending on type install the models of the ME-series into:

- a free PCI-slot (PCIe versions) or
- a free CompactPCI-slot (3 HE cPCI versions).

For information on how to install a plug-in board or connect a USB device, please read the manual of your PC.

Please note the instructions and specifications as presented in this manual (Appendix A, Specifications):

- Please ensure sufficient heat dissipation for the board within the PC housing.
- All unused inputs should be connected to the ground reference of the appropriate functional section. This avoids cross talk between the input lines.
- The opto-isolated inputs and outputs achieve an electrical isolation of the application relative to PC ground.

- Note that the computer must be powered up prior to connecting signals by the external wiring of the board.
- As a basic principle, all connections to the board should only be made or removed in a powered-down state of all components.
- Ensure that no static discharge occurs while handling the board or while connecting/disconnecting the external cable.
- Ensure that the connection cable is properly connected. It must be seated firmly on the D-Sub connector and must be tightened with both screws, otherwise proper operation of the board cannot be guaranteed.

1.1.2 Improper Application

PC plug-in boards for the PCI- or CompactPCI-bus may not be taken into operation outside of the PC. Never connect the devices with voltage-carrying parts, especially not with mains voltage.

Make sure that no contact with voltage-carrying parts can happen by the external wiring of the device. As a basic principle, all connections should only be made or removed in a powered-down state.

1.1.3 Unforeseeable Misapplications

The device is not suitable to be used as a children's toy, in the household or under unfavourable environmental conditions (e.g. in the open). Appropriate precautions to avoid any unforeseeable misapplication must be taken by the user.

1.2 Package Contents

We take great care to ensure your delivery is complete. Nonetheless, please check the list enclosed to verify the contents of your delivery. You should find included:

- Opto-isolated digital-I/O board (depending on the package of the PCI or cPCI board of ME-94, ME-95 or ME-96)
- Manual in PDF format on CD-ROM
- Driver software on CD-ROM
- For the PCI versions only: DIN-connector sourcing the optocoupler's power
- ME-94 and ME-95: one DB25 female connector
ME-96: two DB15 female connectors

1.3 Features

Model Overview

Model	IRQ	Inputs	Outputs
ME-94 PCI ME-94 cPCI	*	16 opto-isolated** (24 V)	
ME-95 PCI ME-95 cPCI	*	-	16 opto-isolated (24 V)
ME-96 PCI ME-96 cPCI	*	8 opto-isolated** (24 V)	8 opto-isolated (24 V)

Table 1: Model overview ME-9x series

* The interrupt function is not supported by the ME-iDS.

** Input port PC is not supported by ME-iDS.

The ME-9x board family includes opto-isolated digital-I/O boards for the PCI- and cPCI-bus. The same boards on different buses are functionally equivalent, pin-compatible, and software-compatible.

The electrical isolation on the boards prevents interference and high voltages (e.g. voltage peaks on the ground lines) from reaching the PC electronics. The inputs have been designed for a voltage of typical 24 V used in control engineering.

Using the ME-iDS you can program the ME-9x series for simple input/output operations.

- ME-94: 2 x 8-bit input ports.
- ME-95: 2 x 8-bit output ports.
- ME-96: 1 x 8-bit input ports, 1 x 8-bit output port.

1.4 System Requirements

The ME-series may be installed into any PC (Intel® Pentium® processor) with a free standard PCI- and CompactPCI-slot (32 bit, 33 MHz, 5 V). The board is supported by the Meilhaus Electronic Intelligent Driver System (ME-iDS).

1.5 Software Support

The ME-series is supported by the Meilhaus Electronic Intelligent Driver System (ME-iDS). The ME-iDS is a unique driver system covering different devices and operating systems. It supports Windows XP/Vista and Windows 7, 8.1, 10 and contains a universal function library (API) for all common programming languages.

A detailed description of the functions can be found in the ME-iDS manual on the CD/DVD enclosed.

Please also note the corresponding README-files.

2 Starting up

Please read your computer's instruction manual on how to install new hardware components **before installing the board**.

2.1 Software Installation

- Installation under Windows

The following basic procedure should be used:

If you have received the driver software as an archive file, please unpack the software **before installing the board**. First choose a directory on your computer (e.g. `C:\Temp\Meilhaus\ME-iDS`).

Use the Meilhaus Electronic Intelligent Driver System (ME-iDS) for programming your new data acquisition hardware. For installation and operation of the driver system, please follow the documentation in electronic form included with the software package.

2.2 Test Program

For simple testing of the board use the corresponding test program provided with the ME-iDS.

3 Hardware

3.1 Block Diagrams

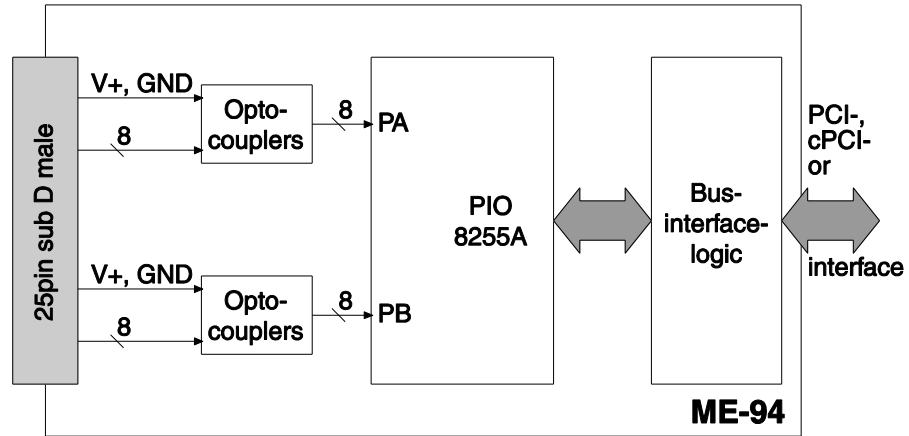


Diagram 1: Block diagram of ME-94

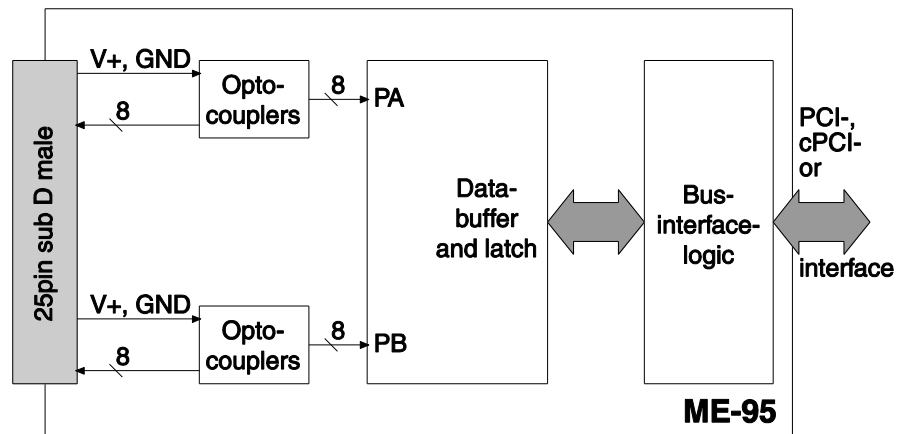


Diagram 2: Block diagram of ME-95

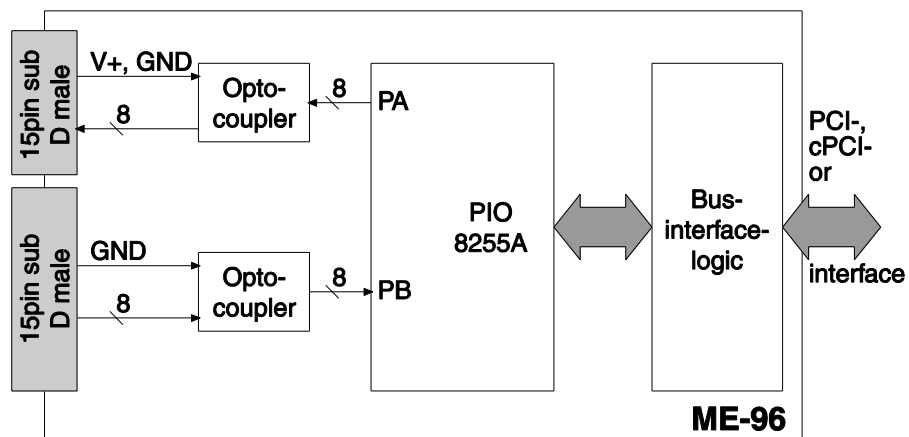


Diagram 3: Block diagram of ME-96

3.2 Digital I/O

The inputs and outputs of the ME-9x series are electrically isolated by optocouplers. There is no electrical connection between the hardware connected to the board and the PC.

The inputs and outputs are designed for 24 V level used in control engineering.

For programming please read chapter 4.0 "Digital-I/O Section" on page 12. For pin out diagrams of the connectors, see page 16.

3.2.1 External Power Supply

In order to run the ME-9x boards properly, an external power supply is required for the optocouplers. The power supply must be connected to the D-Sub connector of the boards (pins „ext. GND“ and „ext. V+“, see chapter "B Pinout" on page 16 ff). Alternatively, the external power can be supplied via a low-voltage connector (DIN 45323) on the standard PCI versions. The power supply is connected to the „V+“ pins at the D-Sub connector(s) on the board.

The external supply voltage can be within 20 V and 28 V, so that small alterations in the voltage will have no effect on the board's function.

3.2.2 Opto-Isolated Inputs

The opto-isolated inputs of the ME-94 and ME-96 are connected to the optocouplers through resistors R_v . These resistors are sized for an input high level of typical 24 V. For over-voltage protection of the optocouplers a protection diode is provided. The digital lines must be referenced to the external ground (ext. GND).

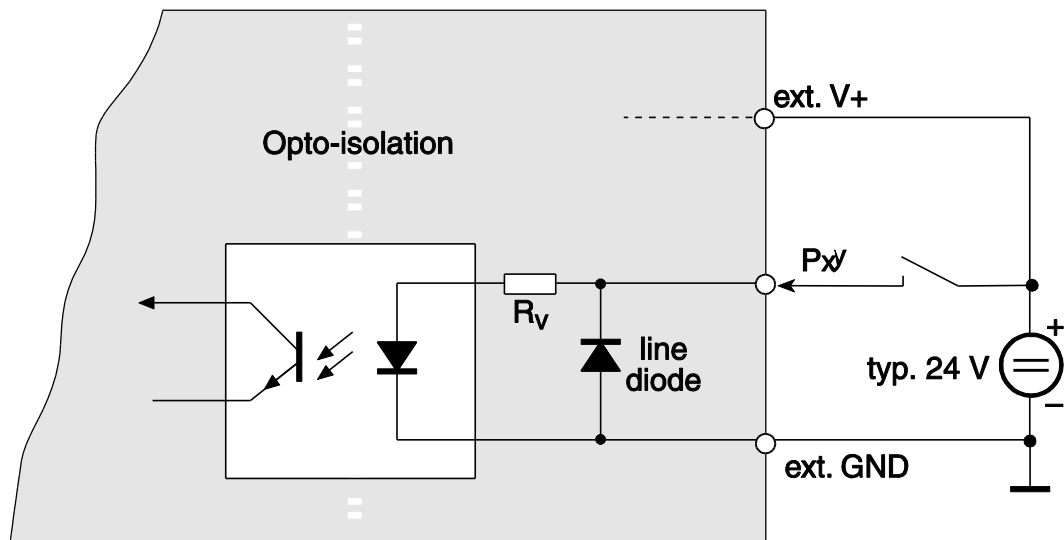


Diagram 4: Input wiring of ME-94, ME-96

3.2.3 Opto-Isolated Outputs

The opto-isolated output channels of the ME-95 and ME-96 provide special output drivers. After power-up, the outputs are set to a defined, high-impedance state. A reference to external ground (ext. GND) must be done. The output current may not exceed $I_{Out} = 100$ mA per channel.

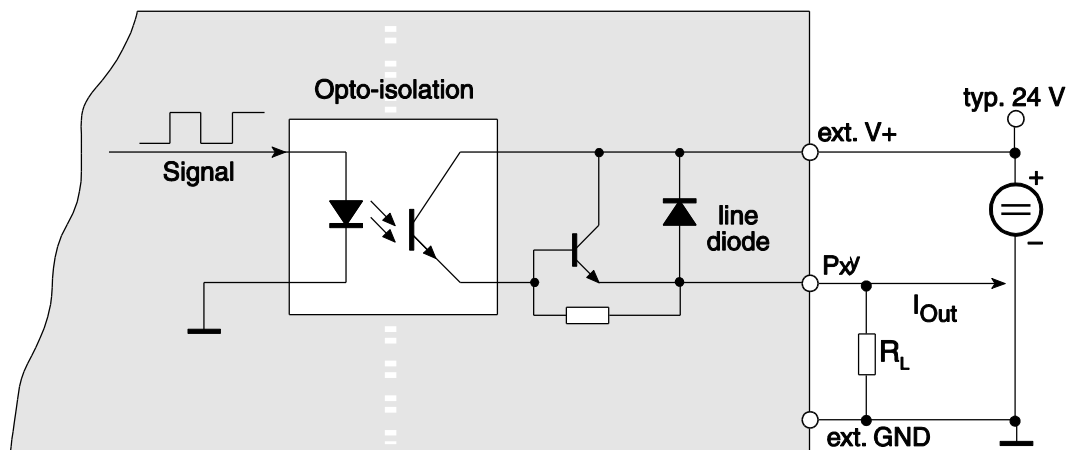


Diagram 5: Output wiring of ME-95, ME-96

On all ME-96 versions the input port is always the lower one and the output the upper one.

4 Programming

For programming the device please use the Meilhaus Electronic Intelligent Driver System (ME-iDS) included in your package. The ME-iDS is a unique driver system covering different devices and operating systems. It supports Windows XP and higher and contains a universal function library (API) for all common programming languages (the extent of the current software support can be found in the README-files of the ME-iDS).

A detailed description of the functions can be found in the ME-iDS manual (see CD/DVD enclosed or online:

www.meilhaus.de/download/ME-iDS.

Further details regarding the assignment of the subdevices and device specific arguments can be found in the help file (help file format under Windows, *.chm) which can be accessed via the „ME-iDS Control Center“ in the info area of the task bar (as a rule in the lower right corner of the screen) or via the Windows start menu.

Digital-I/O Section

The ME-94 and ME-96 use an 8255 compatible PIO-device. Both boards can be exclusively programmed in the operation mode „without interrupt“ (mode 0) of this component. The digital-I/O ports on the ME-95 are designed with a simple data buffer (latch).

Each digital port of the ME-9x boards is considered to be an independent functional group (subdevice) in the Meilhaus Intelligent Driver System (ME-iDS). The following table shows the assignment of subdevices:

Port	Port width	ME-94	ME-95	ME-96
PA0...7	8 bit	subdevice 0 (ME_TYPE_DI)	subdevice 0 (ME_TYPE_DO)	subdevice 0 (ME_TYPE_DI)
PB0...7	8 bit	subdevice 1 (ME_TYPE_DI)	subdevice 1 (ME_TYPE_DO)	subdevice 1 (ME_TYPE_DO)

Table 2: Assignment port to subdevice

For switching the digital ports please read chapter 3.2 on page 10.

Simple Input/Output

The input/output of single digital values is done in operation mode „Single“. Each digital port is accessed as a unique subdevice of type ME_TYPE_D resp. ME_TYPE_DO, subtype ME_SUBTYPE_SINGLE. Note the order of operation as described in the ME-iDS manual. The following parameters can be configured by the functions *meIOSingleConfig* and *meIOSingle*:

- Subdevice: see Table 2: Assignment port to subdevice.
- Port direction: fixed by the hardware.
- Port width: bit or byte operation.

5 Appendix

A Specification

PCI Interface

Bus system	Standard PCI (32 bit, 33 MHz, 5 V)
(depending on model)	CompactPCI (32 bit, 33 MHz, 5 V)
Plug&Play	automatic assignment of resources

Digital opto-isolated Inputs (ME-94 and ME-96)

Number	ME-94: 16; ME-96: 8
PIO device	8255-compatible
Input voltage	low: 0... 12 V (PCI, cPCI) high: 13...24 V (PCI, cPCI)
Input current	at 24 V input voltage PCI, cPCI: 10 mA
Electrical isolation	500 V DC (referenced to PC-GND)
Transfer rate	Max. 1 kHz

Digital opto-isolated Outputs (ME-95 and ME-96)

Number	ME-95: 16; ME-96: 8
PIO Device	ME-95: discrete components ME-96: 8255-compatible
Power-up	Output transistors disabled, output pins are tristate after power-up.
Ext. power supply	24 V nominal
Output current	max. 100 mA per line
Electrical isolation	500 V DC
Transfer rate	max. 1 kHz symmetrically

General Information

Power consumption at +5 V	ME-94 PCI/cPCI: typ. 250 mA ME-95 PCI/cPCI: typ. 400 mA ME-96 PCI/cPCI: typ. 380 mA
Fuse for external power	F1: 1,6 AT/250 V (only ME-95, ME-96)
Physical size (mm)	100 x 160 (cPCI models) 174 x 98 (PCI models)
Connectors	25-pin D-Sub male connector ME-94 and ME-95); 2 x 15-pin D-Sub connector (ME-96); 2-pin low-voltage female connector DIN 45323 (not for cPCI, supply over cPCI slot connector there)
Operating temperature	0...70 °C
Storage temperature	-40...100 °C
Relative humidity	20...55 % (non-condensing)
Certification	CE

B Pinout

B1 ME-94

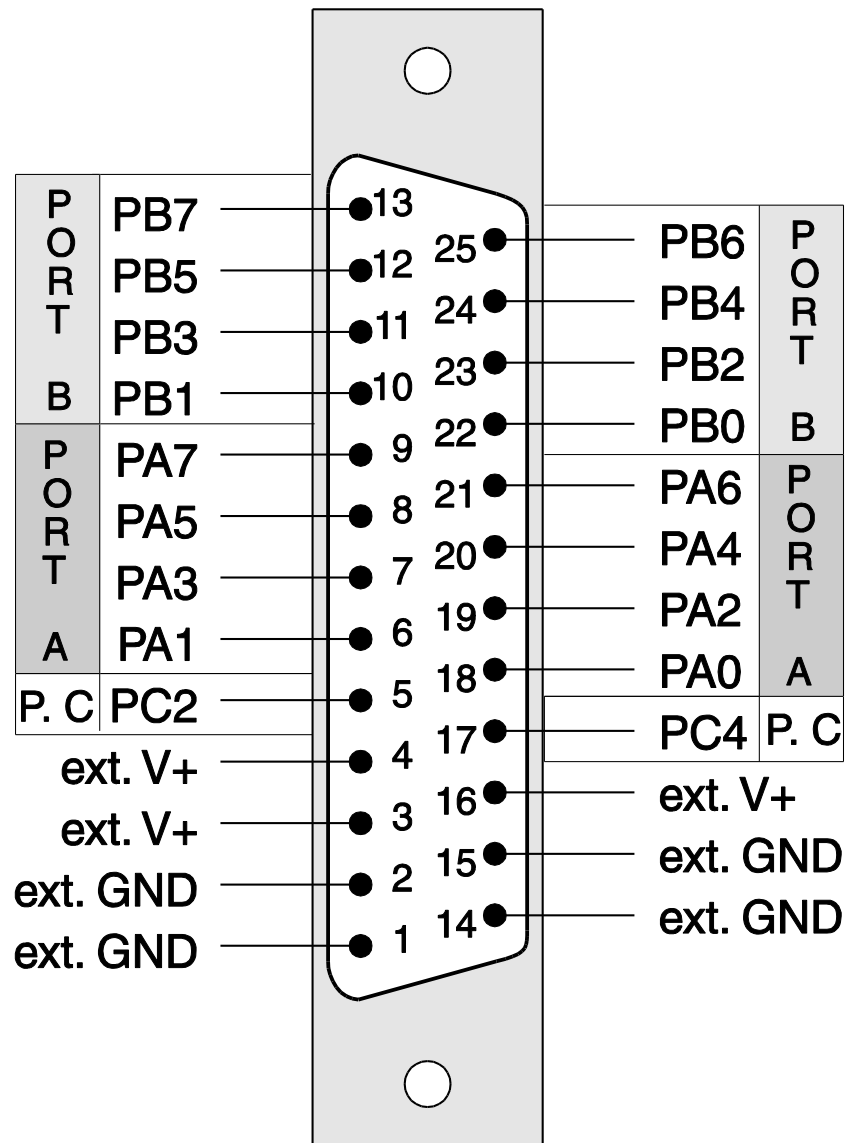


Diagram 6: Pinout of 25-pin D-Sub male connector for the ME-94 (input port)

*Pin not supported by ME-iDS

B2 ME-95

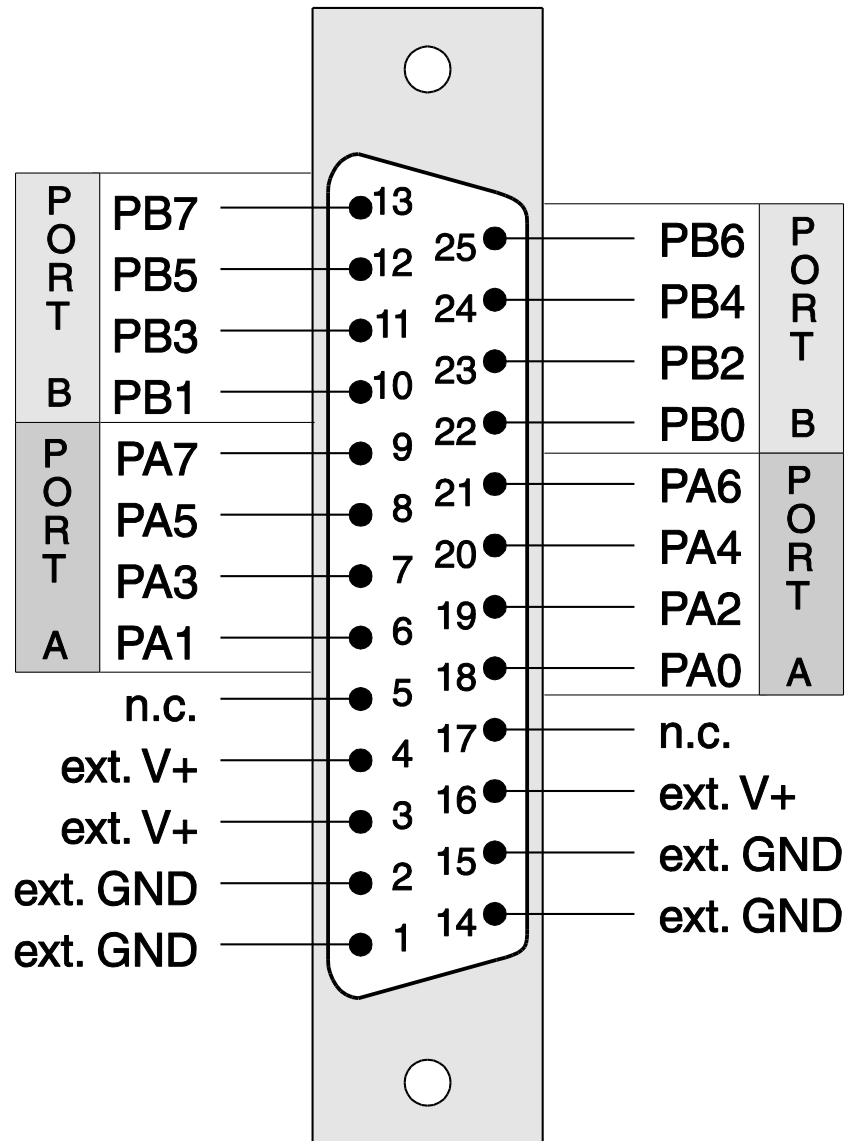


Diagram 7: Pinout of 25-pin D-Sub male connector for the ME-95 (output port)

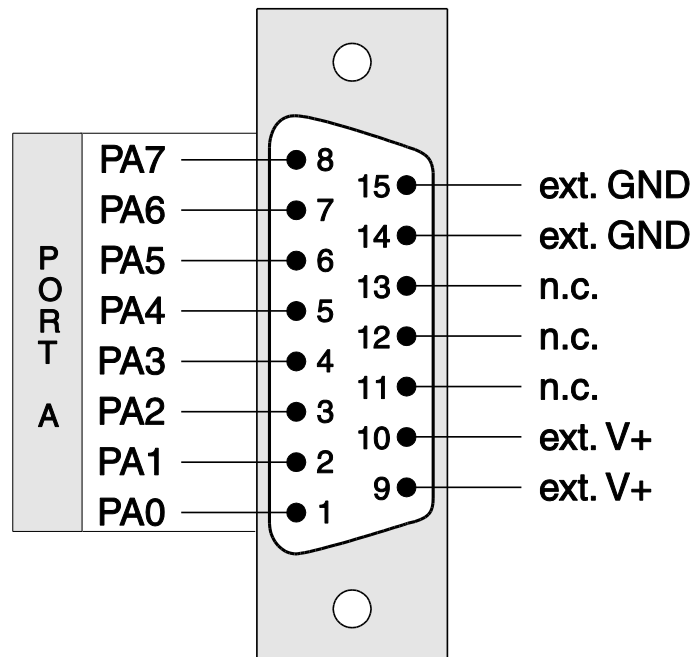
B3 ME-96**Output Port of the ME-96 (top)**

Diagram 8: Pinout of 15-pin D-Sub male connector for the output port of the ME-96

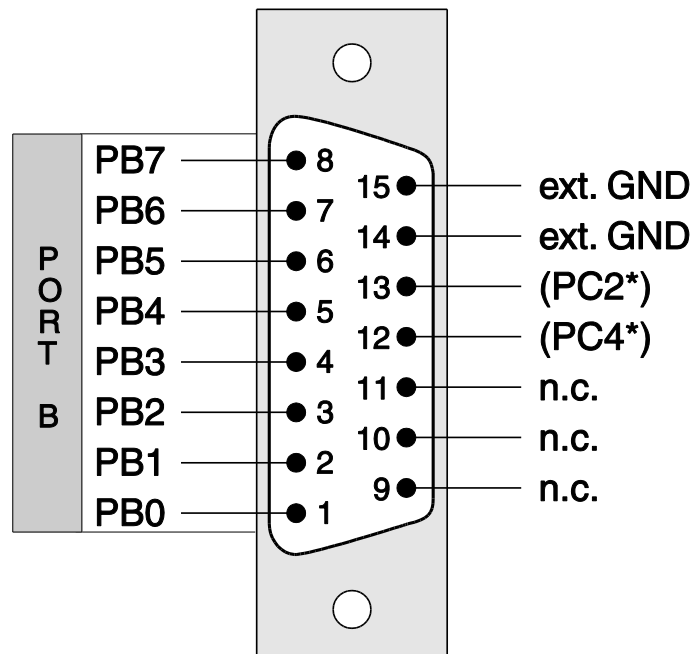
Input Port of the ME-96 (bottom)

Diagram 9: Pinout for 15-pin D-Sub male connector for the input port of the ME-96

*Pin not supported by ME-iDS.

B4 External Power Connector

...for the optocouplers (only standard PCI models)

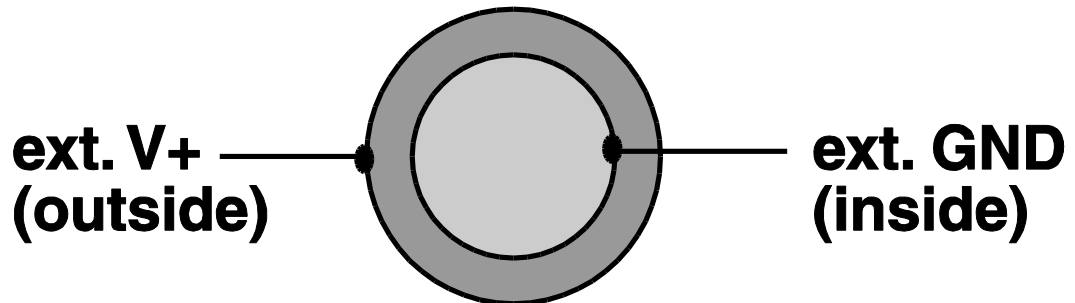


Diagram 10: Low-voltage power connector

C Accessories

We recommend to use high-quality connector cables with single-shielded lines per channel.

For further accessories please refer to the current Meilhaus Electronic catalog and the internet:

www.meilhaus.de/en/pc-boards/accessories/

D Technical Questions

D1 Hotline

Should you have questions or inquiries concerning your Meilhaus device, please contact us:

Meilhaus Electronic GmbH

Repair & Service
Am Sonnenlicht 2
D-82239 Alling

Sales:

Tel.: (08141) 52 71 – 0
Fax: (08141) 52 71 – 129

eMail: sales@meilhaus.de

Support:

Tel.: (08141) 52 71 – 188
Fax: (08141) 52 71 – 169

eMail: support@meilhaus.de

Download-Server and Driver Update:

To download current driver versions for Meilhaus Electronic devices as well as manuals in PDF format, please go to:

www.meilhaus.org/driver

Service Department with RMA Process:

In case you need to return a board for repair purposes, we strongly ask you attach a detailed description of the error as well as information regarding your computer/system and the software used. Please register online using our RMA process:

www.meilhaus.de/en/infos/service/rma.htm.

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