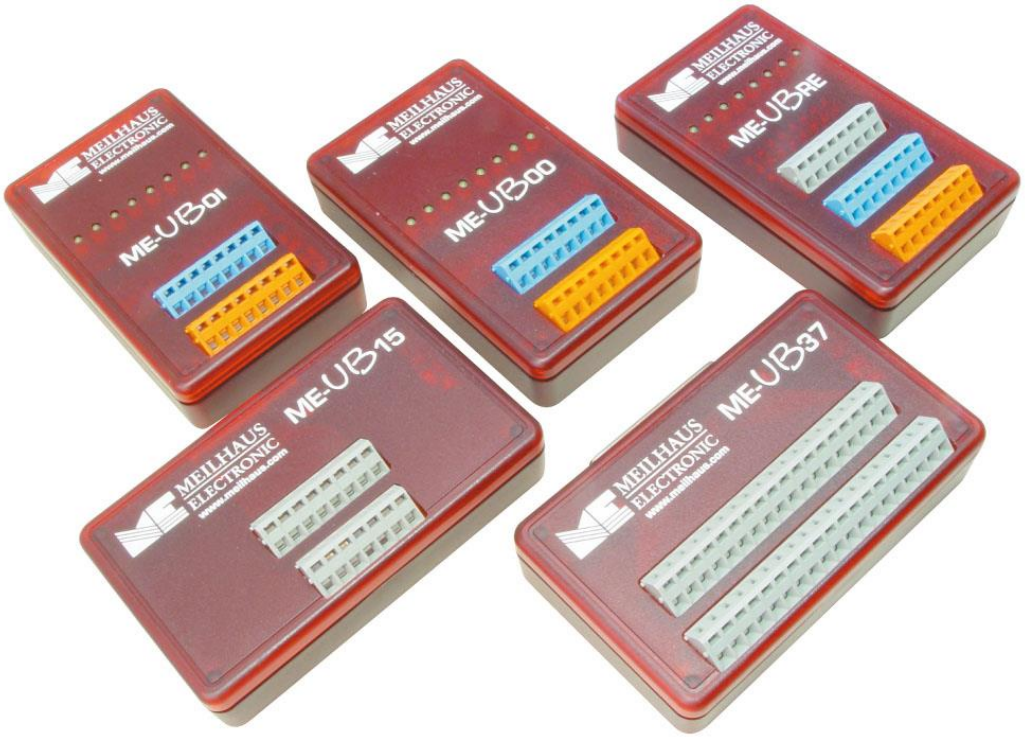
Meilhaus Electronic Manual

ME-UB Terminal Boxes



Terminal Boxes from 15-pin/37-pin D-Sub with and without Additional Functions

Imprint

Manual ME-UB Terminal Boxes

Revision 3.0

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Content

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 ME-UB if not otherwise noted.

1.1 Important Notes

1.1.1 Use in Accordance with the Requirements

The ME-UB can be connected to the following measurement boxes resp. boards:

Model Overview

Model	Sub-D	Connections	I/O	For Digital Boards/Boxes
Terminal boxes				
ME_UB15	15-pin D-Sub female	terminal strip		boards with 15-pin D-Sub male, e.g. ME-96 or (together with other ME-UB) at ME-630, ME-8200, ME-1400, ME-Jekyll/ME-4610, ME-FoXX/ME-46xx, ME-6x00, MEphisto Scope (UM20x), LabJack U12, RedLab-1008 and others
ME-UB37	37-pin D-Sub female	terminal strip		RedLab 1008 and other with 37-pin D-Sub

Terminal boxes with additional functions				
ME-UBRE	15-pin D-Sub female	terminal strip	8 relays	ME-8200 and MEphisto Opto, ME-6x00, ME-FoXX/ME-46x0, ME-Jekyll/ME-4610, ME-1400 and MEphisto Digi, ME-630 and MEphisto Opto as well as USB modules: MEphisto Scope UM20x, RedLab 1008, LabJack U12
ME-UBOI	15-pin D-Sub female	terminal strip	8 opto inputs	ME-8200 and MEphisto Opto, ME-6x00, ME-FoXX/ME-46x0, ME-Jekyll/ME-4610, ME-1400 and MEphisto Digi, ME-630 and MEphisto Opto as well as USB modules: MEphisto Scope UM20x, RedLab 1008, LabJack U12
ME-UBOO	15-pin D-Sub female	terminal strip	8 opto outputs	ME-8200 and MEphisto Opto, ME-6x00, ME-FoXX/ME-46x0, ME-Jekyll/ME-4610, ME-1400 and MEphisto Digi, ME-630 and MEphisto Opto as well as USB modules: MEphisto Scope UM20x, RedLab 1008, LabJack U12

1.1.2 Improper Application

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. Basically 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.

1.1.4 Warnings

The device was developed and produced in accordance with the EMC low-voltage directive 73/23/EWG. When putting the device into operation especially with voltages greater than 42 V, please follow the appropriate standards, installation instructions and national safety standards. Meilhaus Electronic GmbH assumes no responsibility for damage in case of faulty installation, operation or handling.

Note: The index „in“ refers to the connected values at the clamps; the index „out“ refers to the connected values at the D-Sub connector.

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:

- Connectivity box 15-pin/37-pin D-sub female plus clamps
- ME-Power-DVD with operating instructions (PDF).

Note: Cables not included, available as an option. An external power supply is required for the ME-UBRE, ME-UBOI, ME-UBOO (not included, available as an option, see chapter: Accessories).

1.3 Features ME-UB15 and ME-UB 37

Maximum Ratings

Conditions: TA = 25 °C, 0 – 3000 m above sea level

Measurement Value	Test Conditions	MIN	MAX	Unit
Contact voltage DC	non-destructive		48*	V_{dc}
Contact voltage AC	non-destructive		42*	$V_{ac,pp}$
Contact current	non-destructive		2,0	$A_{dc,}$ $A_{ac,rms}$
Cross-sectional area to be clamped		0,08	2,5	mm^2
Stripping length	protected against contact (IP20)	5	6	mm

**higher contact voltage on request.*

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2 ME-UB Terminal Boxes

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

2.1 Terminal Boxes

The ME-UB modules are available as simple mini terminal boxes with spring-terminals or with additional opto-couplers or relays: Connected to the TTL digital lines of a DAQ board or USB minilab, they expand these I/O lines with opto-isolation or relays. They are the ideal solution for lab or mobile applications with USB modules at a laptop PC.

- 15- or 37-pin D-sub female connector, for connection to digital-I/O lines of DAQ board/USB minilab.
- Spring terminals for the I/O lines, easy to open. Ideal for permanent wiring or flexible wiring during system development.
- Compact desktop boxes.

2.2 Boxes with Additional Functions

Terminal Boxes with additional functions for digital-I/O channels:

- ME-UBRE
- ME-UBOI
- ME-UBOO

The digital channels with relays or opto-isolation are characterized:

- 8 channels per module. Available with opto-inputs, opto-outputs or relays.
- Matching, reliable expansion, low price and very compact.
- 1 status LED per channel.
- No changes in software required.
- An external power supply (not included, see accessories) is always required for use with models ME-UBRE, ME-UBOI and ME-UBOO and USB DAQ boxes or DAQ boards.

3 Connection to USB DAQ Boxes

3.1 Contact Protection Circuit

On the ME-UBRE electro-mechanical power relays are used. They can switch currents up to 5 A. During switching the relays induced voltages and high transient currents occur. Therefore the use of a protection circuit for the contacts is urgently needed. To guarantee the efficiency of the protection circuit the distance should not exceed more than 20 cm.

The diagram 1 shows a typical circuitry that could be used.

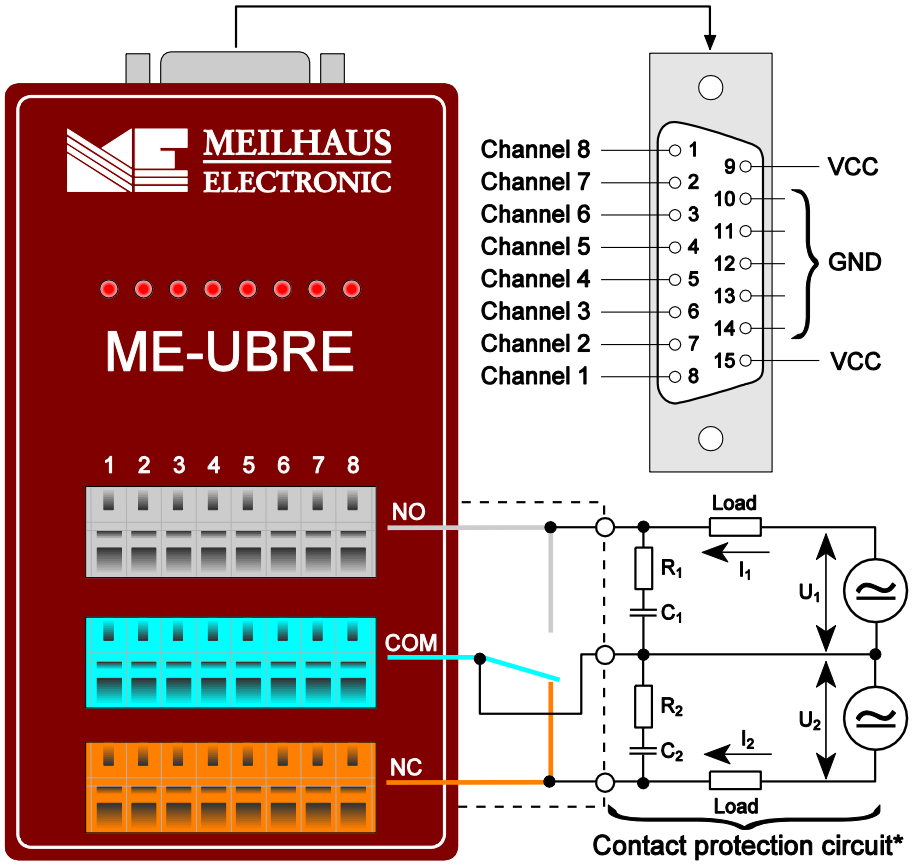


Diagram 1: Pinout ME-UBRE

The values of the compand the relay properties. The condensator C suppresses the discharge when contact opens and the resistor R limits the current when switching the next time. The circuitry can be used for DC and AC operation. The ME-UBRE offers a make-contact as well as a break-contact. Therefore the protection circuit must be provided for every contact switching a considerable load.

As a rule for selection of R_x and C_x use:

R_x: 0.5…1 Ω per 1 V of switching voltage U_x

C_x: 0.5…1 µF per 1 A of switching current I_x

3.1.1 Connection to USB DAQ Boxes with ME-UBRE

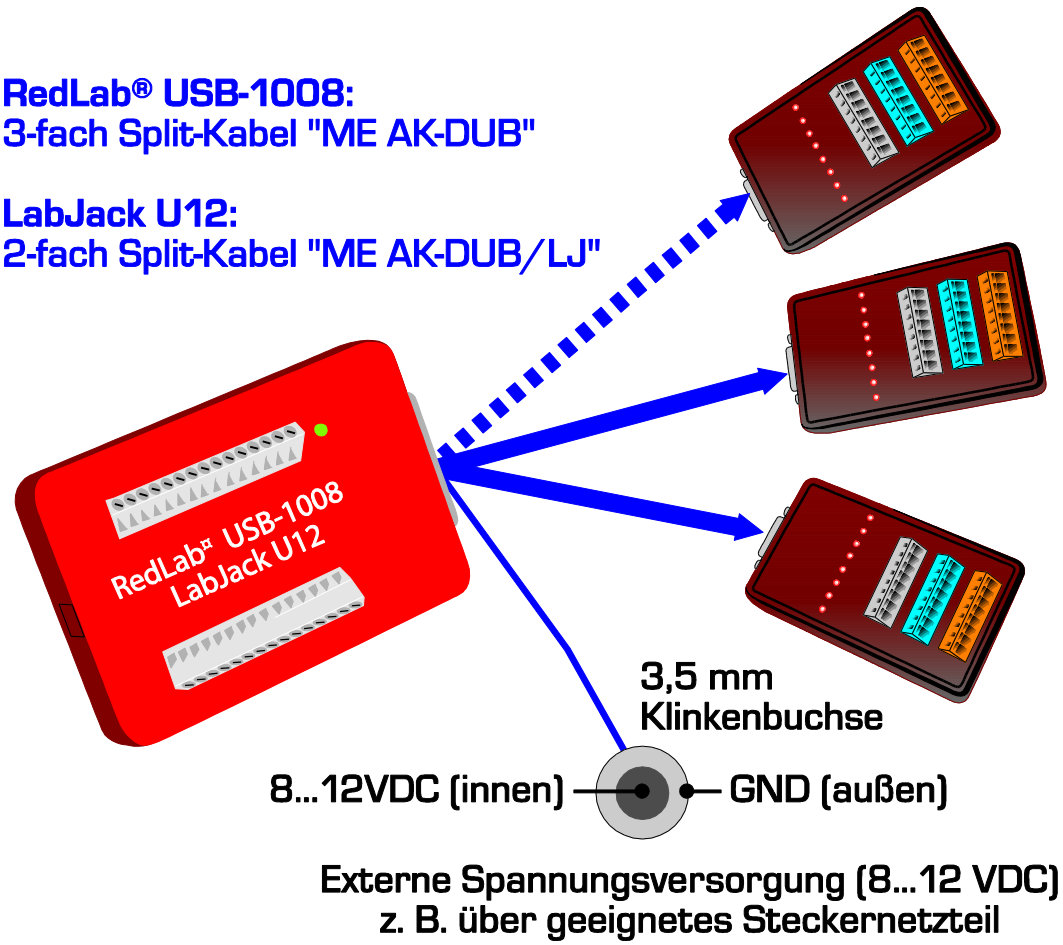


Diagram 2: Connection USB DAQ boxes

3.1.2 Connection to ME1400 A/B with ME-UBRE

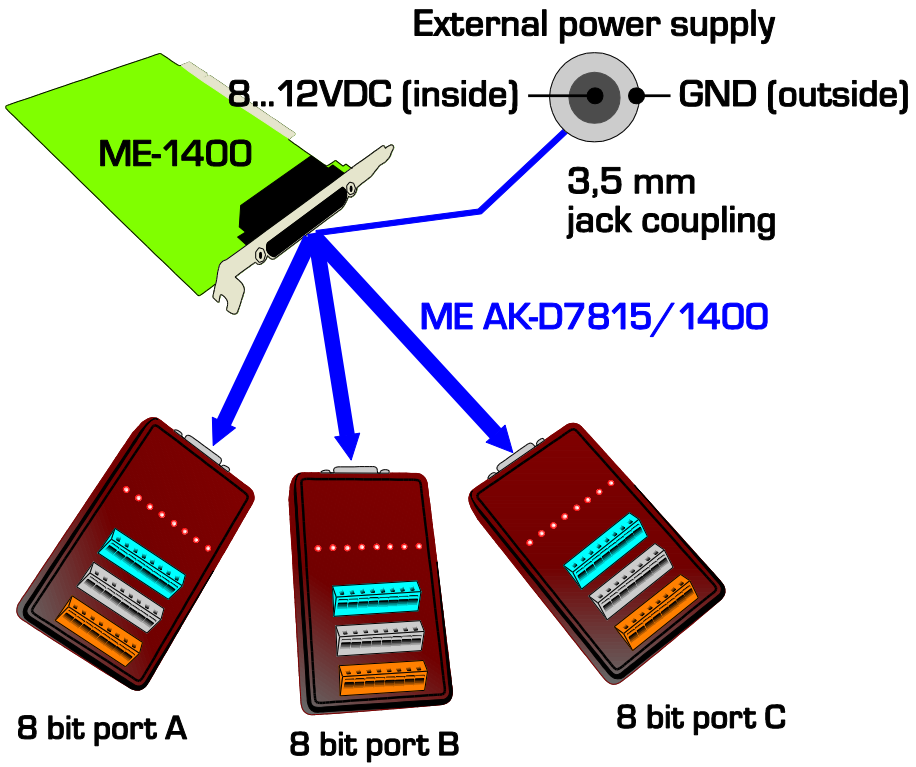


Diagram 3: Connection ME-1400 A/B

3.1.3 Connection to ME-Boards with ME-UBRE

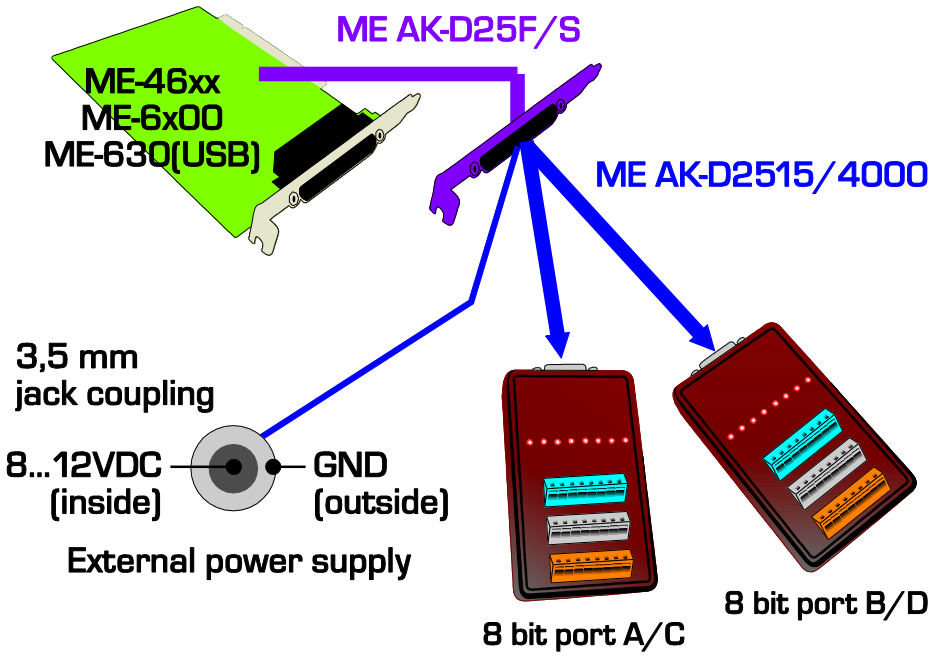


Diagram 4: Connection ME-Boards with ST2

3.2 Input switching inside the box ME-UBOI

3.2.1 Connection to USB DAQ Boxes with ME-UBOI

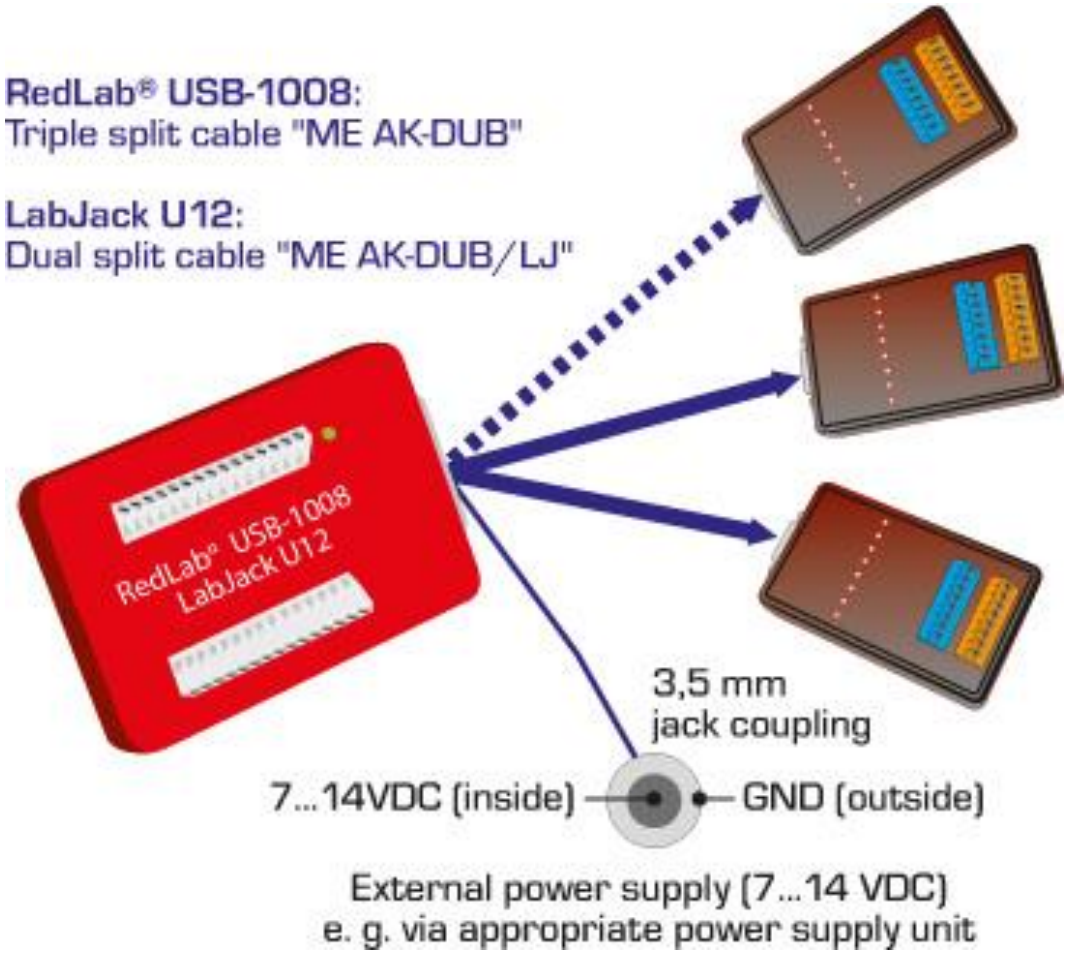


Diagram 5: Connection USB DAQ boxes

3.2.2 Connection to ME-1400 A/B with ME-UBOI

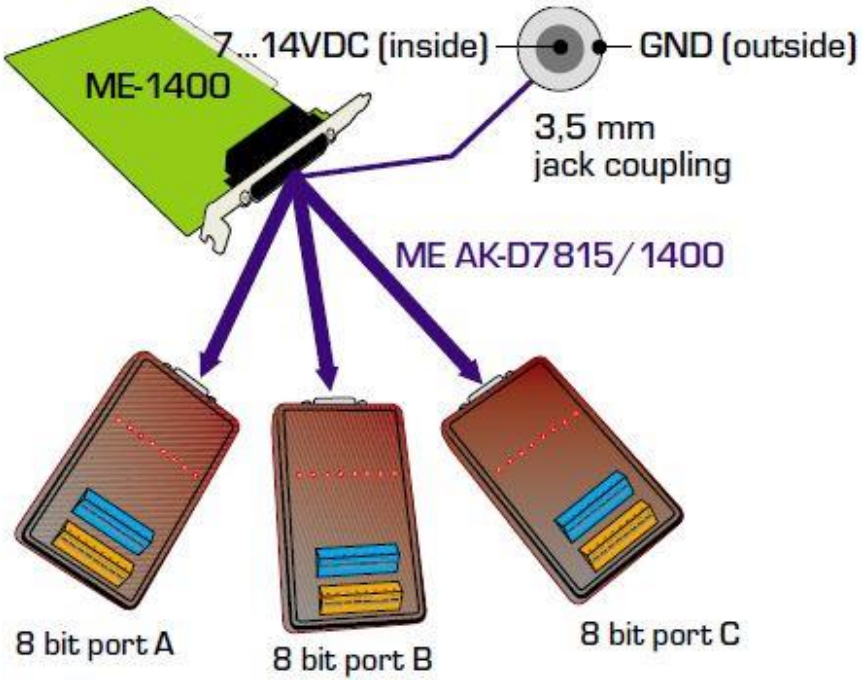


Diagram 6: Connection ME-1400 A/B

3.2.3 Connection to ME-Boards with ST2 - ME-UBOI

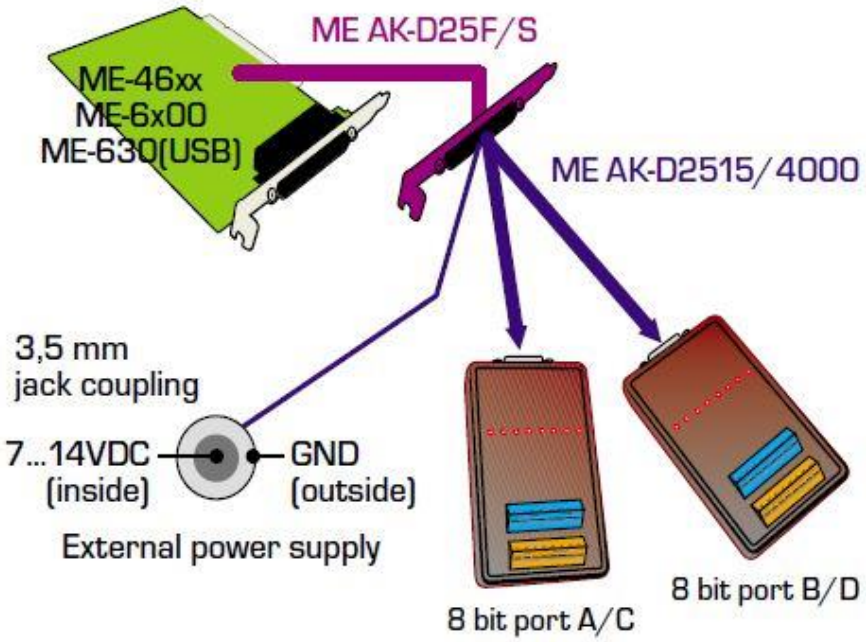


Diagram 7: Connection ME-Boards with ST2

3.3 Output Switching inside the Box

3.3.1 Connection to USB DAQ Boxes with ME-UB00

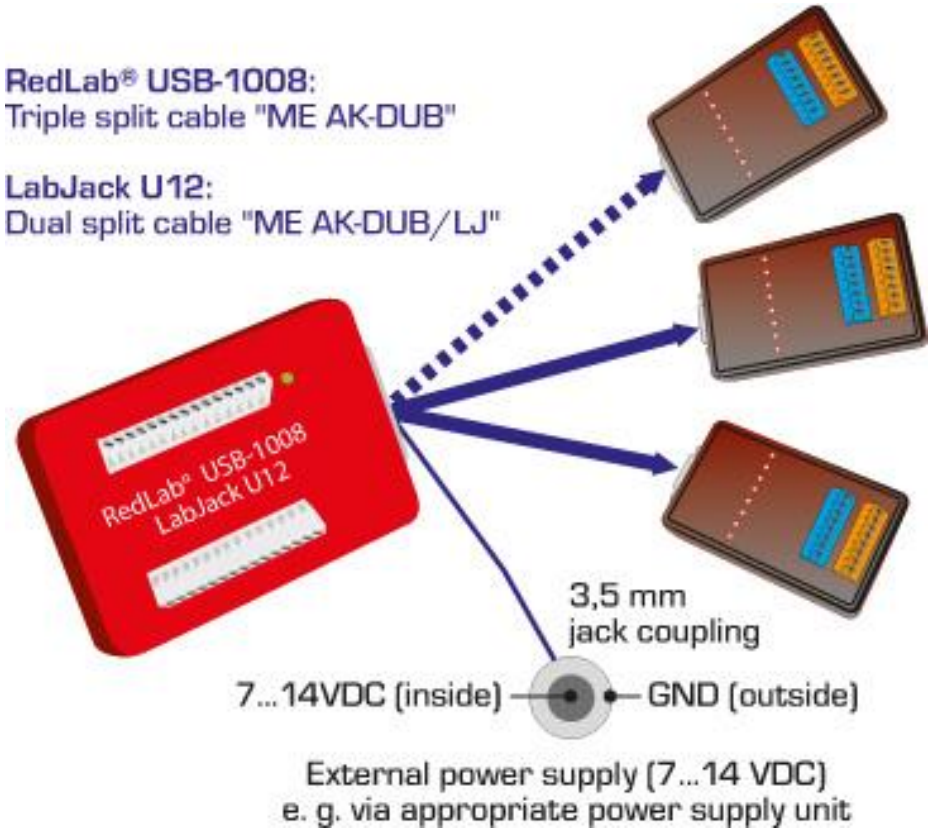


Diagram 8: Connection USB DAQ boxes

3.3.2 Connection to ME-1400 A/B with ME-UB00

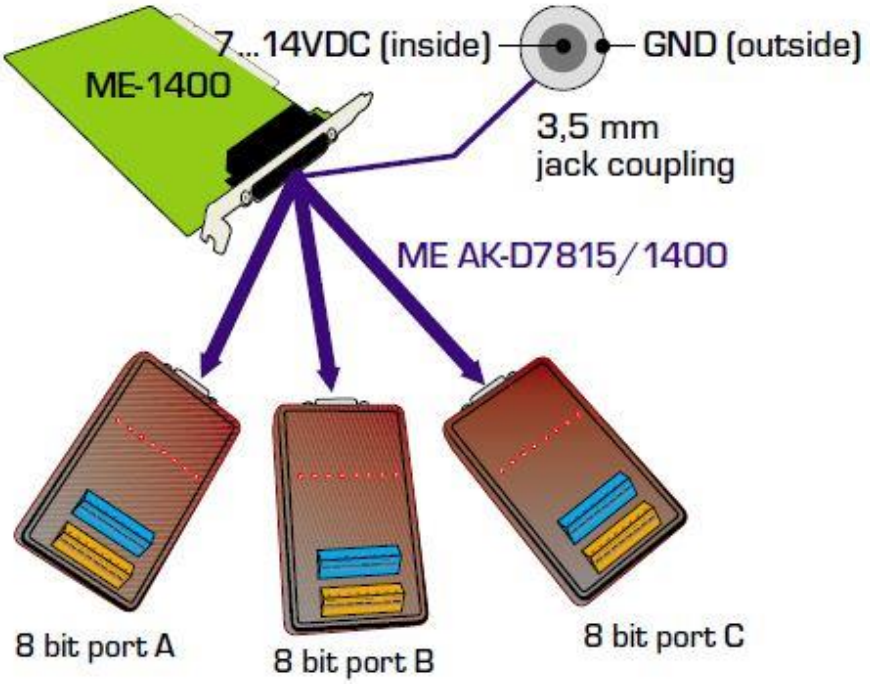


Diagram 9: Connection ME-1400 A/B

3.3.3 Connection to ME-Boards with ST2 - ME-UB00

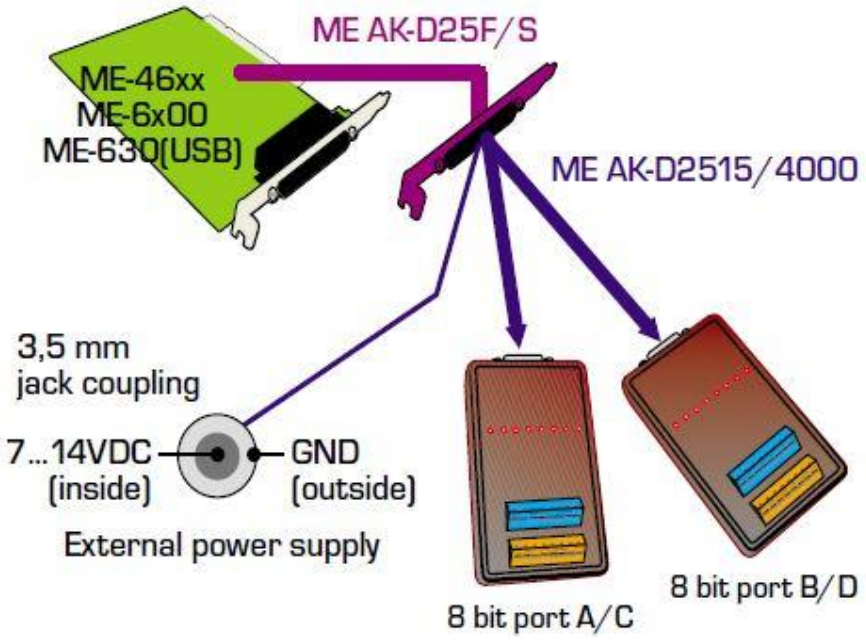


Diagram 10: Connection ME-Boards with ST2

4 Appendix

A Specification

A1 ME-UBRE

Maximum Ratings

Conditions: T_A = 25 °C

Measurement Values	Test Conditions	MIN	MAX	Unit
Operating voltage U_b	non-destructive	-0.5	+16	V
Input voltage U_{in}	non-destructive	-0.5	30	V
Switching voltage U_{out}	non-destructive		240	VAC
Switching voltage U_{out}	non-destructive		30	VDC
Permanent current I_{out}	non-destructive		5	A
Isolation voltage coil/contact U_{ISO}			4.000	$V_{ac,rms}$
Certification	CE			

Recommended Operating Conditions

Conditions: U_b= 8...12 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	MAX	Unit
U_{out}		12	240	VAC
I_{out}	time unlimited, all channels	100	5.000	mA
Stripping length	protected against contact (IP20)	5	6	mm

Static Values

Conditions: U_b= 8...12 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,H}$		3.5		5	V
$U_{in,L}$				1.5	V
$I_{in,H}$	U_{in}=3.85 V		0.93	1.35	mA

Dynamic Values

Conditions: U_b= 8...12 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
f_{in}	without load			20	Hz
$t_{pd,on}$			5		ms
$t_{pd,off}$			2.5		ms
bounce time make contact			1.5		ms
bounce time break contact			5		ms
Contact life time	I_{out}=5 A, U_{out}=250 VAC, cosφ=1	1 x 10^5		1 x 10^7	
Contact life time	I_{out}=2 A, U_{out}=250 VAC, cosφ=0,4	2 x 10^5			
Contact life time	I_{out}=1 A, U_{out}=24 VDC	2 x 10^5			

A2 ME-UBOI

Maximum Ratings

Conditions: T_A = 25 °C

Measurement Values	Test Conditions	MIN	MAX	Unit
U_b	non-destructive	-0.5	+16	V
U_{in}	non-destructive	-5	70	V
I_{out}	non-destructive, 1 channel	-25	+25	mA
U_{ISO}	f=60 Hz, t=1 min		2.500	$V_{ac,rms}$

Recommended Operating Conditions

Conditions: U_b= 7...14 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,max}$		0		60	V
$I_{out,\ max}$	t=1 s, 1 channel			±10	mA
$I_{out,\ max}$	time unlimited, all channels		±1	±1.5	mA

Static Values

Conditions: U_b= 7...14 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,H}$		2.3		60	V
$U_{in,L}$				2.2	V
$I_{in,H}$	U_{in}=3.85 V		0.93	1.35	mA
$U_{out,H}$	I_{out}=-1 mA	3.7	4.2	4.5	V
$U_{out,L}$	I_{out}=1 mA		0.3	0.5	V
R_{in}	U_{in}=24 V		4.3		kΩ
I_{in}	U_{in} = 60 V		6.5	10	mA

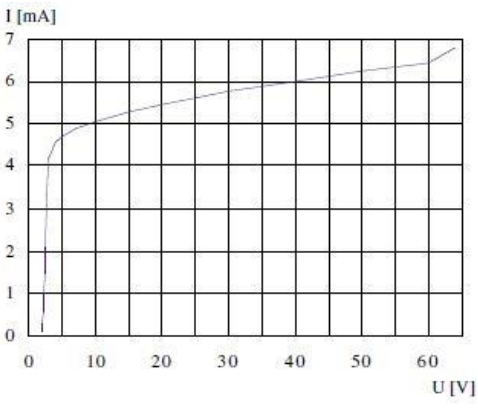
Dynamic Values

Conditions: U_b= 7...14 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
f_{in}	Output switching, duty cycle 12 %, U_{in} = 10 V		20		kHz
f_{in}	Output switching, duty cycle 50 %, U_{in} = 10 V		10		kHz
f_{in}	Output switching, duty cycle 50 %, U_{in} = 2.35 V		60		kHz
$t_{pd,HL}$	f_{in}=1 kHz, U_{in}=10 V		36		µs
$t_{pd,LH}$	$f_{in=}$1 kHz, U_{in}=10 V		2		µs

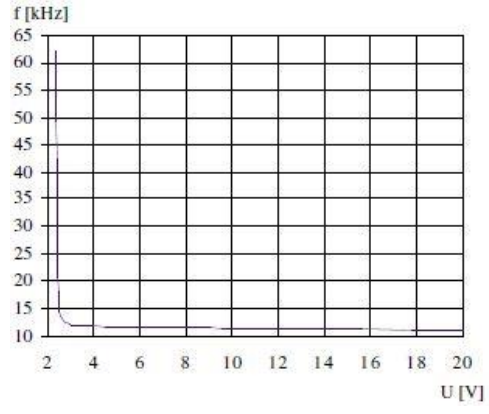
Input Current Related To Input Voltage

T_A = 25 °C, U_b= 12 V, f= 0 Hz



Maximum Input Frequency Related To Input Voltage

T_A = 25 °C, U_b= 12 V, output switching



A3 ME-UB00

Maximum Ratings

Conditions: T_A = 25 °C

Measurement Values	Test Conditions	MIN	MAX	Unit
U_b	non-destructive	-0,5	+16	V
U_{in}	non-destructive	-0,5	30	V
U_{out}	non-destructive	-0,8	70	V
I_{out}	non-destructive	-200	1000	mA
U_{ISO}	f=60 Hz, t=1 min		2.500	$V_{ac,rms}$

Recommended Operating Conditions

Conditions: U_b= 7...14 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
U_{out}	$I_{out,on}$>100 µA	0,6		60	V
$I_{out,\ max}$	zeitlich unbegrenzt, alle Kanäle	0		300	mA
$I_{out,\ peak}$	t=1 s, 1 Kanal			400	mA

Static Values

Conditions:U_b= 7...14 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,H}$		3.5		5	V
$U_{in,L}$				1.5	V
$U_{out,on}$	I_{out}=100 mA		0.86		V
$U_{out,on}$	I_{out}= $I_{out,\ max}$	1.00	1.03	1.2	V
R_{on}		3	10	700	mΩ
R_{off}	U_{out} = $U_{out,\ max}$		600		MΩ

Dynamic Values

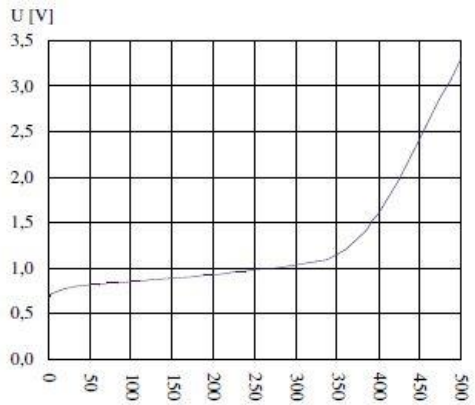
Conditions: U_b= 7...14 V, T_A = 25 °C

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
f_{in}	U_{out}=90 %, I_{out}=100 mA	5.0	5.5	5.7	kHz
$f_{pd,HL}$	I_{out}=100 mA, f_{out}=1 kHz		90		µs

$t_{pd,LH}$	I_{out} = 100 mA, f_{out} = 1 kHz		2.2		µs
$t_{tr,HL}$	I_{out} = 100 mA, f_{out} = 1 kHz		1.4		µs
$t_{tr,LH}$	I_{out} = 100 mA, f_{out} = 1 kHz		62		µs

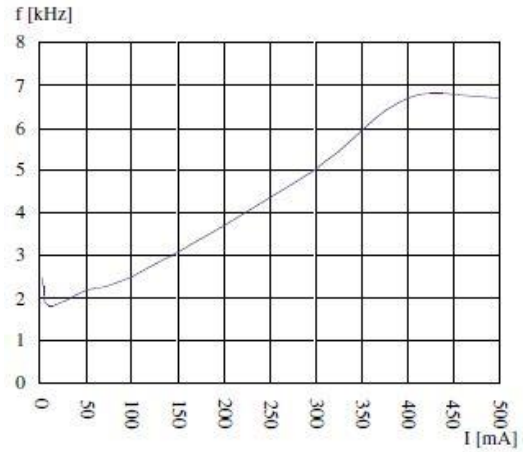
Forward Voltage Related To Load Current

T_A = 25 °C, U_b = 12 V, f = 0 Hz



Maximum Input Frequency Related To Load Current

T_A = 25 °C, U_b = 12 V, ΔU = 1 %



B Pinout

B1 Pinout ME-UBRE

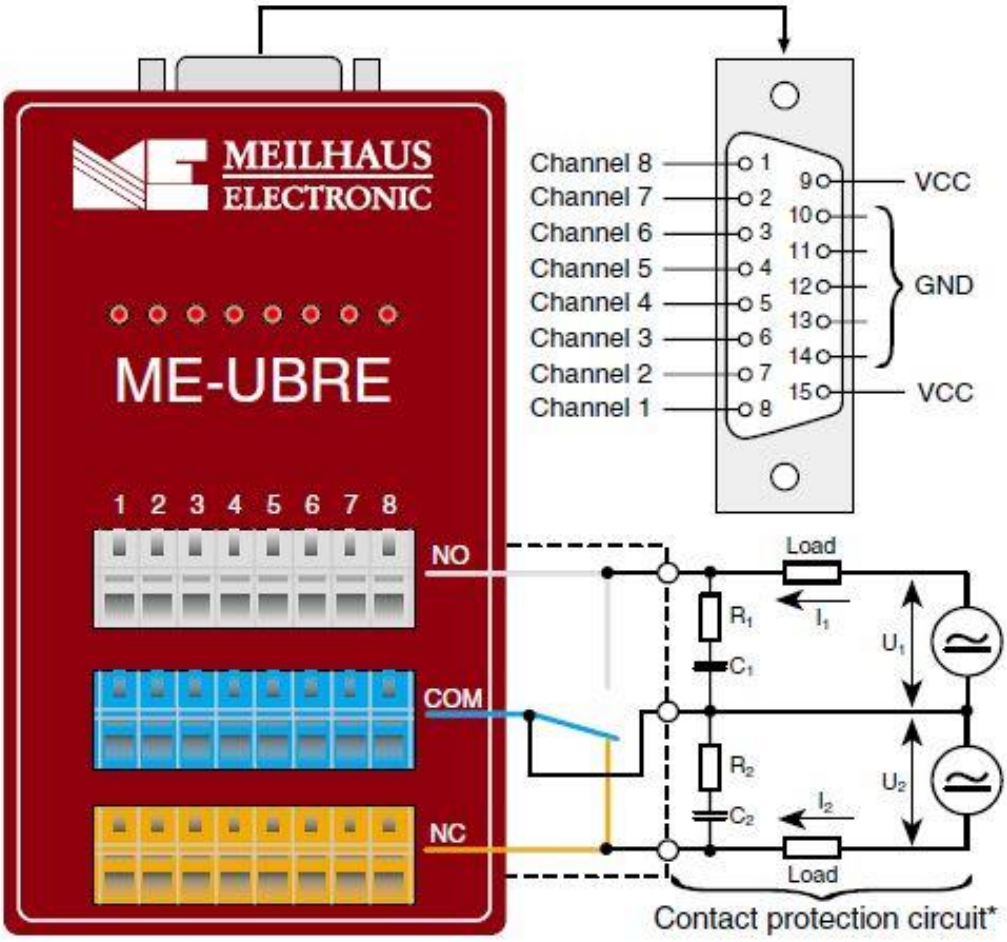


Diagram 11: Pinout ME-UBRE

B2 Pinout ME-UBOO

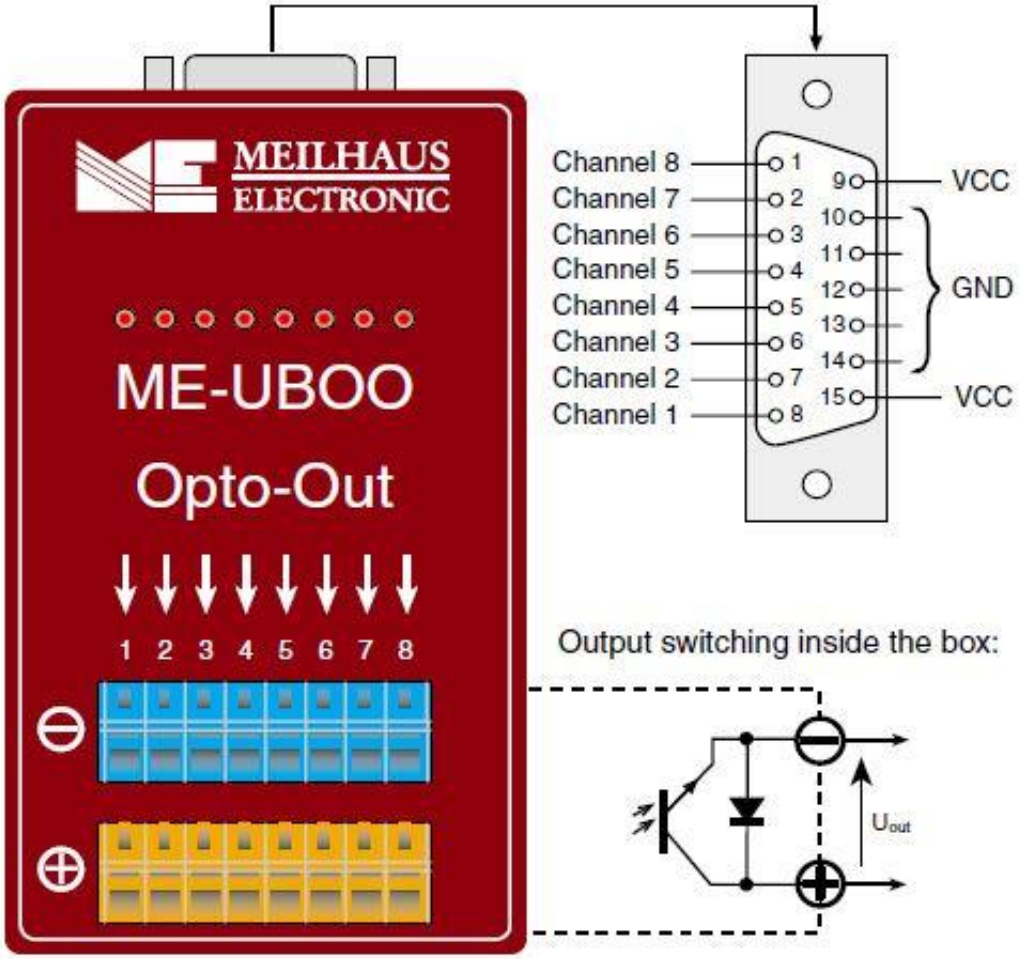


Diagram 12: Pinout ME-UBOO

B3 Pinout ME-UBOI

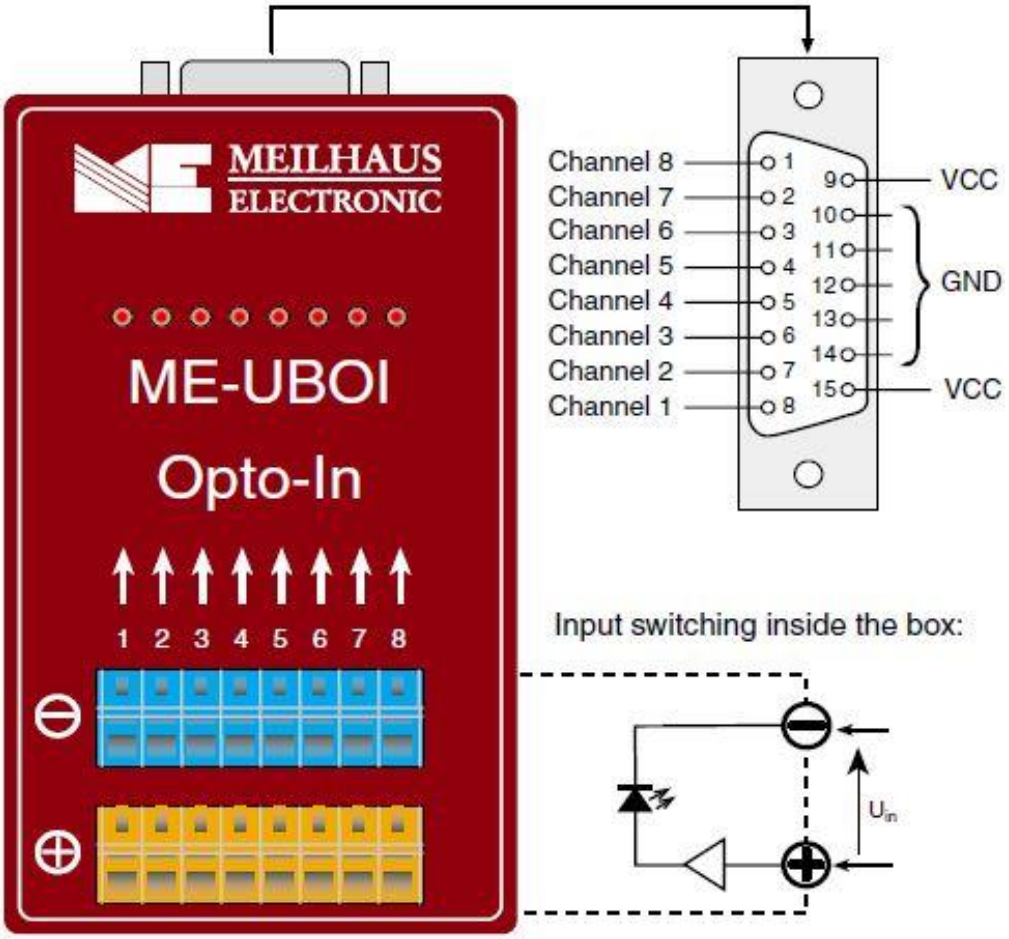


Diagram 13: Pinout ME-UBOI

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:		**Support:**	
Tel.:	(08141) 52 71 – 0	Tel.:	(08141) 52 71 – 188
Fax:	(08141) 52 71 – 129	Fax:	(08141) 52 71 – 169
eMail:	sales@meilhaus.de	eMail:	support@meilhaus.de

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

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