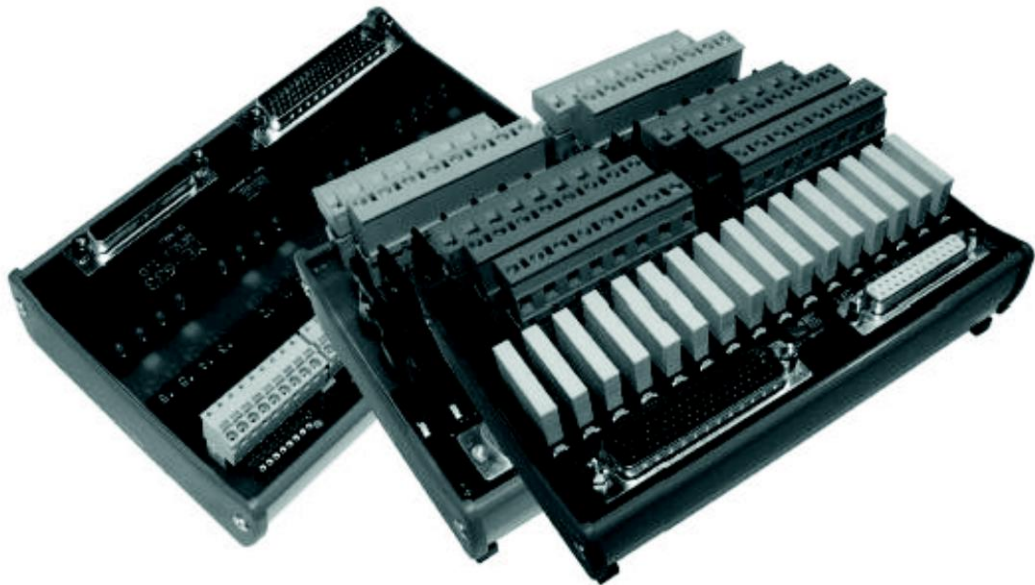


Meilhaus Electronic Manual

ME-63Xtend Series 3.0E



External Extension Board Series

Imprint

Manual 63Xtend Series

Revision 3.0

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Content

1	Introduction	5
1.1	Important Notes	5
1.1.1	Use in Accordance with the Requirements	5
1.1.2	Improper Application.....	6
1.1.3	Unforeseeable Misapplications.....	6
1.2	Package Contents	6
1.3	System Requirements	6
2	Hardware.....	9
2.1	ME-631	10
2.1.1	Block Diagram	11
2.1.2	Protection Circuit	12
2.1.3	Pinout	13
2.2	ME-632	14
2.2.1	Block Diagram	15
2.2.2	Jumper Settings.....	15
2.2.3	Pinout	17
2.3	ME-633	18
2.3.1	Block Diagram	19
2.3.2	Jumper Settings.....	19
2.3.3	Pull-Up Resistors.....	20
2.3.4	Pinout	21
2.4	ME-634	21
2.4.1	Block Diagram	23
2.4.2	Jumper Settings.....	23
2.4.3	Pull-Up Resistors.....	24
2.4.4	Pinout	25
2.5	ME-635	26
2.5.1	Block Diagram	27
2.5.2	Pinout	28
2.6	Connection Options	28
2.6.1	Connection to ME-1000/ME-5310	29
2.6.2	Connection to ME-1400/ME-5314	30
2.6.3	Connection to ME-Boards with Extra Port	30

3	Appendix	32
A	Specification	32
A1	Pinouts ST1.....	32
A2	Pinout ST2	33
B	Specification	34
B1	ME-63Xtend Series (all models).....	34
B2	ME-631.....	34
B3	ME-632.....	35
B4	ME-633.....	38
B5	ME-634.....	40
B6	ME-635.....	40
C	Accessories	42
D	Technical Questions	43
D1	Hotline	43
E	Index.....	44

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.

1.1 Important Notes

1.1.1 Use in Accordance with the Requirements

The external extension boards of the ME series are designed for acquisition and output of analog and digital signals with a PC.

Please follow the notes and the specifications from page 32 on.

- 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

Never connect the devices with voltage-carrying parts, especially not with mains voltage. As power supply of the USB models only an authorized power adapter may be used.

Make sure, that no contact with voltage-carrying parts happens 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:

- External extension board of the ME-63Xtend series
- Manual in PDF format on CD/DVD
- additionally:
 - ME-632: 19 jumpers.
 - ME-633: 19 jumpers, 4 resistor arrays.
 - ME-634: 18 jumpers, 2 resistor arrays.

1.3 System Requirements

The external extension boards of the ME-63Xtend series may be fitted with the following boards (more detail see page 34):

ME-boards	Connected to...	Required cables
ME-630 (all versions)	on-board 20-pin field with adapter ME AK-D25F/S (included with board) to 25-pin D-Sub female connector	ME AK-D2578/4000 (optional)

ME-1400/ ME-5314	78-pin D-Sub female connector	ME AK-D78 (optional) for 1x ME-63Xtend, additional ME AK-D25 (optional) for direct connection to a terminal block ME AB-D25M (optional) for remaining channels of ME-1400/ME-5314
ME-1400A/ ME-5314A	78-pin D-Sub female connector	ME AK-D78 (optional) for 1x ME-63Xtend, additional ME AK-D25 (optional) for direct connection to a terminal-block ME AB-D25M (optional) for remaining channels of ME-1400A/ME-5314A
ME-1400B/ ME-5314B	78-pin D-Sub female connector	ME AK-D78/1400 (optional) for 3x ME-63Xtend and 1x ME AB-D25M (optional)
ME-1000/64 / ME-5310/64	78-pin D-Sub female connector	1x ME AK-D78/1000 (optional) for 2x ME-63Xtend*, up to 2x ME AK-D2578/1000 (optional) for further 2x ME-63Xtend*
ME-1000/128 / ME-5310/128	on-board 2x 78-pin D-Sub female connector and extension ME-1001	2x ME AK-D78/1000 (optional) for 4x ME-63Xtend*, up to 4x ME AK-D2578/1000 (optional) for further 4x ME-63Xtend*
ME-4600 series (all versions)	on-board 20-pin field with adapter ME AK-D25F/S (included with board) to 25-pin D-Sub female connector	ME AK-D2578/4000 (optional)
ME-6000 series (all versions)	on-board 20-pin field with adapter ME AK-D25F/S (included with board) to 25-pin D-Sub female connector	ME AK-D2578/4000 (optional)
ME-8200 series (all versions)	on-board 20-pin field with adapter ME AK-D25F/S (included with board) to 25-pin D-Sub female connector	ME AK-D2578/4000 (optional)

Suitable digital channels with screw terminals	78-pin D-Sub connector of the ME-63Xtend	ME AK-D78/63X-1-OE (optional)
---	--	-------------------------------

***Note:** ME-634 cannot be used with ME1000.

2 Hardware

The ME-63Xtend series consists of external extension boards for DIN-rail mounting. The series includes the following models:

Model	Description	Page
ME-631	16 relays form C, up to 6 A, 30 VDC/240 VAC	10
ME-632	16 opto-isolated digital inputs (2.5...60 V)	14
ME-633	16 opto-isolated digital outputs, up to 60 V (Open Collector)	18
ME-634	8 opto-isolated digital inputs (2.5...60 V), 8 opto-isolated digital outputs up to 60 V (Open Collector)	21
ME-635	16 electronic power relays 5 A/240 VAC	26

Table 1: Model overview ME-63Xtend Series

The opto-isolated I/Os of the models ME-632, ME-633 and ME-634 are isolated up to 2500 VAC_{eff}.

The ME-63Xtend series can be connected with many multi-I/O and digital-I/O boards using appropriate connection cables. The I/O-board requires at least two 8-bit TTL input resp. output ports. For the following boards pre-configured cables are available:

ME-1000/ME-5310	special cable ME AK-D78/1000 (ME-1000/ME-5310 cannot be combined with the ME-634!)
ME-1400 (A/B) / ME-5314 (A/B)	1:1 connection cable e.g. ME AK-D78 (/1)
ME-630 series ME-4600 series ME-6000 series ME-8000 series	special cable ME AK-D2578/4000 via additional mounting bracket for bi-directional ports (ME-630 USB: direct connection to the 25-pin D-Sub jack of the device)
Note:	A detailed description of the connection can be found in chapter 2.6 on page 28. Many other multi-I/O and digital-I/O boards with appropriate TTL ports can be connected by special cables.

Table 2: Compatible I/O boards

Attention: Make sure that no contact with voltage carrying parts can happen by the wiring of the board. The external connections to the board should only be made or removed in a powered-down state.

Look for proper connection of the cable. It must join the Sub-D jack completely and must be fixed with the both screws. Otherwise, proper operation of the board cannot be guaranteed!

2.1 ME-631

The ME-631 is an external relay board with 16 change-over relays (form C). The relays can switch up to 30 VDC/6A or 240 VAC/6A (specifications see page 34). To drive the relays a buffer circuit is inserted. For status control one LED per channel is assembled. It is connected in parallel to the relay coil. Depending on the I/O-board further signals are fed through to the 25-pin D-Sub female connector ST2 (see Table 3).

For relay control the following assignment is valid:

	Relay 1...8	Relay 9...16	ST2
ME-1000/ME-5310	Px0...7	Px8...15	Px16...31
ME-1400 (A/B) / ME-5314 (A/B)	PA0...7	PB0...7	PC0...7 counter 0...2 (only ME- 1400 A/B / ME-5314 A/B)
ME-630 series	DIO_C0...7	DIO_D0...7	--
ME-4600 series	DIO_C0...7	DIO_D0...7	--
ME-6000 series	DIO_A0...7	DIO_B0...7	--
ME-8200 series	DIO_C0...7	DIO_D0...7	--

Table 3: Controlling the ME-631

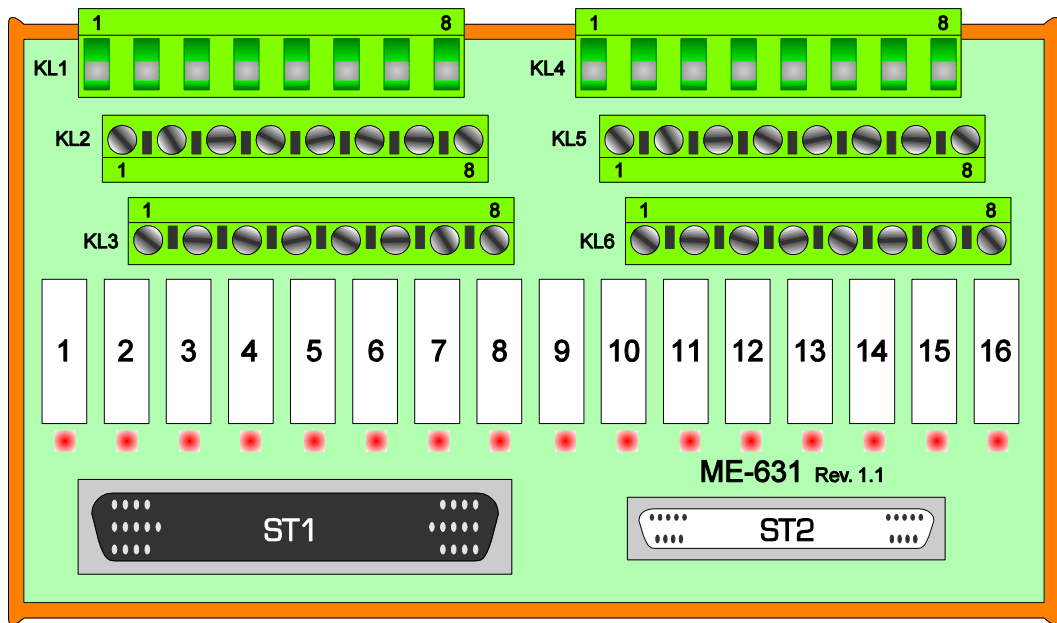


Diagram 1: ME-631

2.1.1 Block Diagram

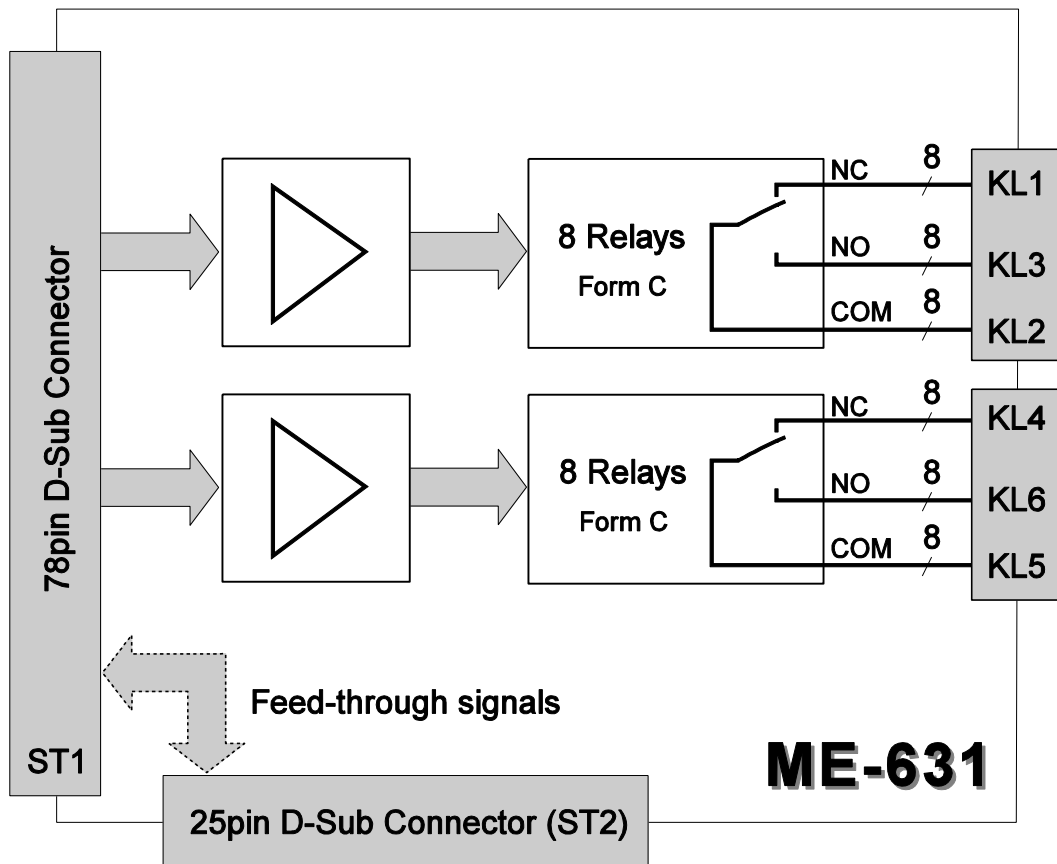


Diagram 2: Block diagram ME-631

2.1.2 Protection Circuit

On the ME-631 electro-mechanical power relays are used. They can switch currents up to 6 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 following diagram shows a typical circuitry that could be used. The values of the components used depend on the load and the relay properties. The capacitor C suppresses the discharge when contact opens and resistor R limits the current when switching the next time. The circuitry can be used for DC and AC operation. The ME-631 offers a make-contact as well as a break-contact. Therefore the protection circuit must be provided for every contact switching a considerable load.

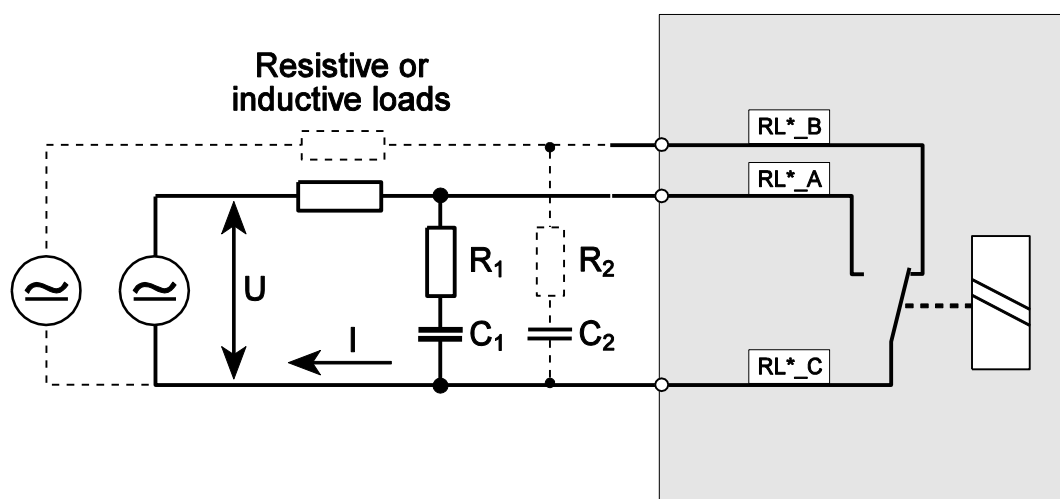


Diagram 3: Protection circuit

As a rule for selection of R_x and C_x use:

R_x : 0.5 up to 1 Ω per 1 V of switching voltage U

C_x : 0.5 up to 1 μF per 1 A of switching current I

2.1.3 Pinout

Clamping-block	Pin	Signal	Clamping-block	Pin	Signal
KL1	1	Relay 1, NC	KL4	1	Relay 9, NC
	2	Relay 2, NC		2	Relay 10, NC
	3	Relay 3, NC		3	Relay 11, NC
	4	Relay 4, NC		4	Relay 12, NC
	5	Relay 5, NC		5	Relay 13, NC
	6	Relay 6, NC		6	Relay 14, NC
	7	Relay 7, NC		7	Relay 15, NC
	8	Relay 8, NC		8	Relay 16, NC
KL2	1	Relay 1, COM	KL5	1	Relay 9, COM
	2	Relay 2, COM		2	Relay 10, COM
	3	Relay 3, COM		3	Relay 11, COM
	4	Relay 4, COM		4	Relay 12, COM
	5	Relay 5, COM		5	Relay 13, COM
	6	Relay 6, COM		6	Relay 14, COM
	7	Relay 7, COM		7	Relay 15, COM
	8	Relay 8, COM		8	Relay 16, COM
KL3	1	Relay 1, NO	KL6	1	Relay 9, NO
	2	Relay 2, NO		2	Relay 10, NO
	3	Relay 3, NO		3	Relay 11, NO
	4	Relay 4, NO		4	Relay 12, NO
	5	Relay 5, NO		5	Relay 13, NO
	6	Relay 6, NO		6	Relay 14, NO
	7	Relay 7, NO		7	Relay 15, NO
	8	Relay 8, NO		8	Relay 16, NO

Table 4: Pinout ME-631

NC: "Normally Closed"

NO: "Normally Open"

COM: "Common"

2.2 ME-632

The ME-632 is an external extension board with 16 opto-isolated digital input channels. The voltage high level can be in the range of 2.5...60 V (specifications see page 35). For each channel the positive and negative input is connected with the clamp. The 4 channels of a clamp are combined in a group. For status control one LED per channel is assembled after the input buffer. Depending on the I/O-board further signals are fed through to the 25-pin D-Sub female connector ST2 (see Table 5).

For the inputs the following assignment is valid:

	Input 1...8	Input 9...16	ST2
ME-1000/ME-5310	Px0...7	Px8...15	Px16...31
ME-1400 (A/B) / ME-5314 (A/B)	PA0...7	PB0...7	PC0...7 counter 0...2 (only ME-1400A/B / ME-5314A/B)
ME-630 series	DIO_C0...7	DIO_D0...7	--
ME-4600 series	DIO_C0...7	DIO_D0...7	--
ME-6000 series	DIO_A0...7	DIO_B0...7	--
ME-8200 series	DIO_C0...7	DIO_D0...7	--

Table 5: Controlling the ME-632

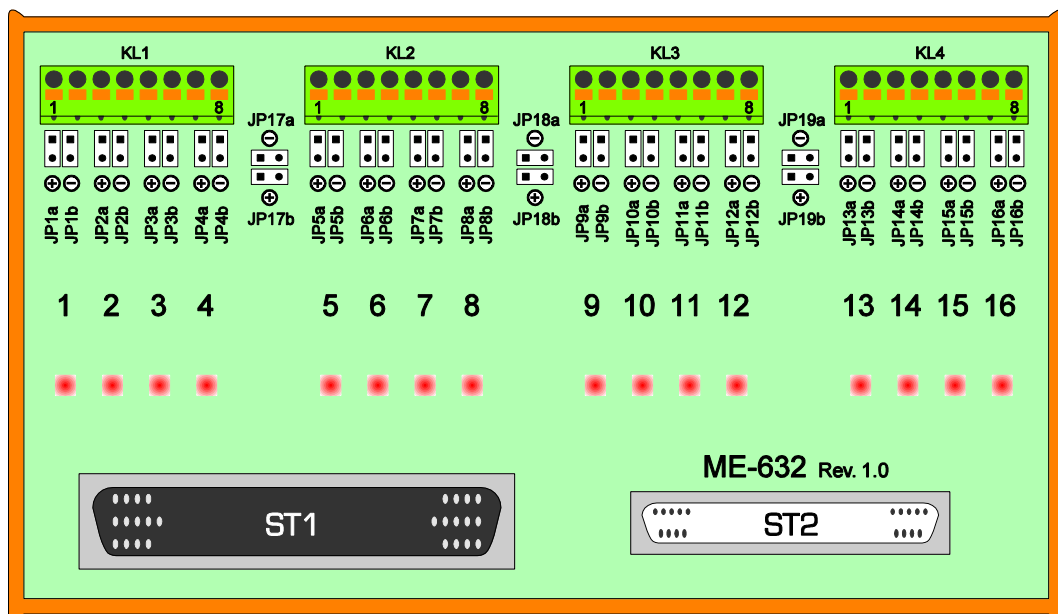


Diagram 4: ME-632

2.2.1 Block Diagram

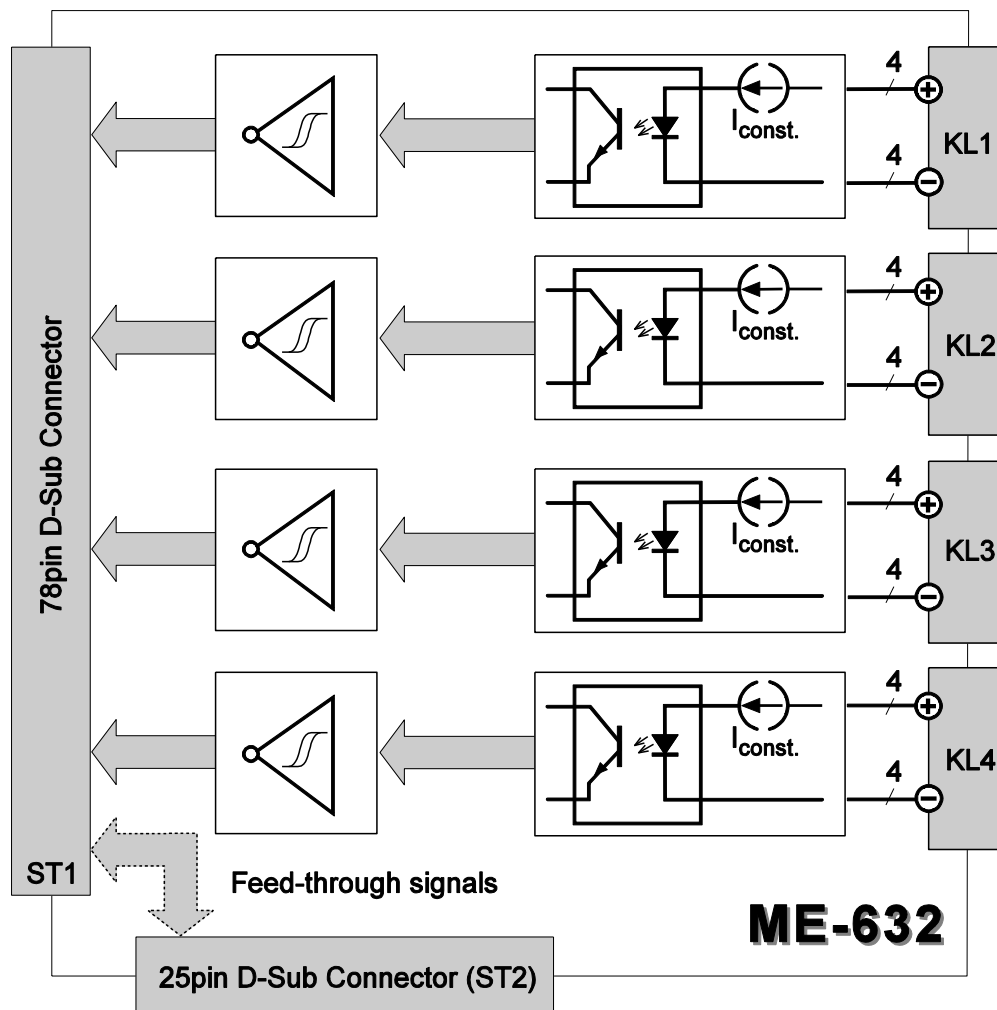


Diagram 5: Block diagram ME-632

2.2.2 Jumper Settings

By jumper a common reference can be made between the involved channels of a group (see Diagram 6).

The input channels can be referred alternatively to a positive reference voltage or to a common ground. For every channel that should be referred to a positive reference, the corresponding jumper JP_xa must be set. For every channel that should be referred to ground, the corresponding jumper JP_xb must be set. For example: if the jumpers JP1a and JP3a are set, you can connect the positive reference of group KL1 to the clamps KL1.1 or KL1.5.

Please note that out of each pair of jumpers only one jumper (e.g. JP1a, JP1b) may be set!

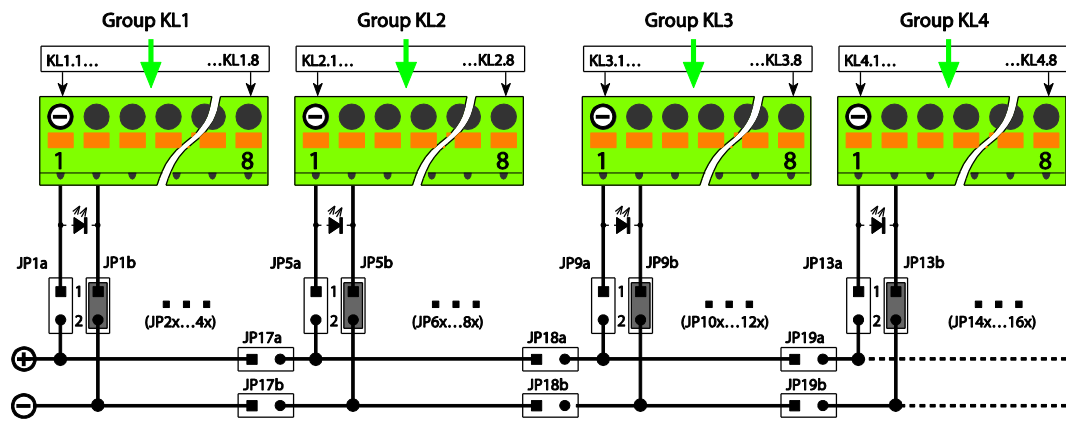


Diagram 6: Jumper ME-632

If required, alternatively the positive references (JP17a, JP18a, JP19a) or the ground references (JP17b, JP18b, JP19b) of adjacent groups can be connected with one another.

2.2.3 Pinout

Clamping-block	Pin	Signal	Clamping-block	Pin	Signal
KL1	1	Input 1, positive	KL2	1	Input 5, positive
	2	Input 1, negative		2	Input 5, negative
	3	Input 2, positive		3	Input 6, positive
	4	Input 2, negative		4	Input 6, negative
	5	Input 3, positive		5	Input 7, positive
	6	Input 3, negative		6	Input 7, negative
	7	Input 4, positive		7	Input 8, positive
	8	Input 4, negative		8	Input 8, negative
KL3	1	Input 9, positive	KL4	1	Input 13, positive
	2	Input 9, negative		2	Input 13, negative
	3	Input 10, positive		3	Input 14, positive
	4	Input 10, negative		4	Input 14, negative
	5	Input 11, positive		5	Input 15, positive
	6	Input 11, negative		6	Input 15, negative
	7	Input 12, positive		7	Input 16, positive
	8	Input 12, negative		8	Input 16, negative

Table 6: Pinout ME-632

2.3 ME-633

The ME-633 is an external extension board with 16 opto-isolated digital output channels. The outputs are designed as open collector outputs and can switch up to 60 V (specifications see page 38). For each channel the positive and negative output is connected with the clamp. The 4 channels of a clamp are combined in a group. For status control one LED per channel is assembled before the opto-isolation. Depending on the I/O-board further signals are fed through to the 25-pin D-Sub female connector ST2 (see Table 7).

For the outputs the following assignment is valid:

	Output 1...8	Output 9...16	ST2
ME-1000/ME-5310	Px0...7	Px8...15	Px16...31
ME-1400 (A/B) / ME-5314 (A/B)	PA0...7	PB0...7	PC0...7 counter 0...2 (only ME-1400A/B / ME-5314A/B)
ME-630 series	DIO_C0...7	DIO_D0...7	--
ME-4600 series	DIO_C0...7	DIO_D0...7	--
ME-6000 series	DIO_A0...7	DIO_B0...7	--
ME-8200 series	DIO_C0...7	DIO_D0...7	--

Table 7: Controlling the ME-633

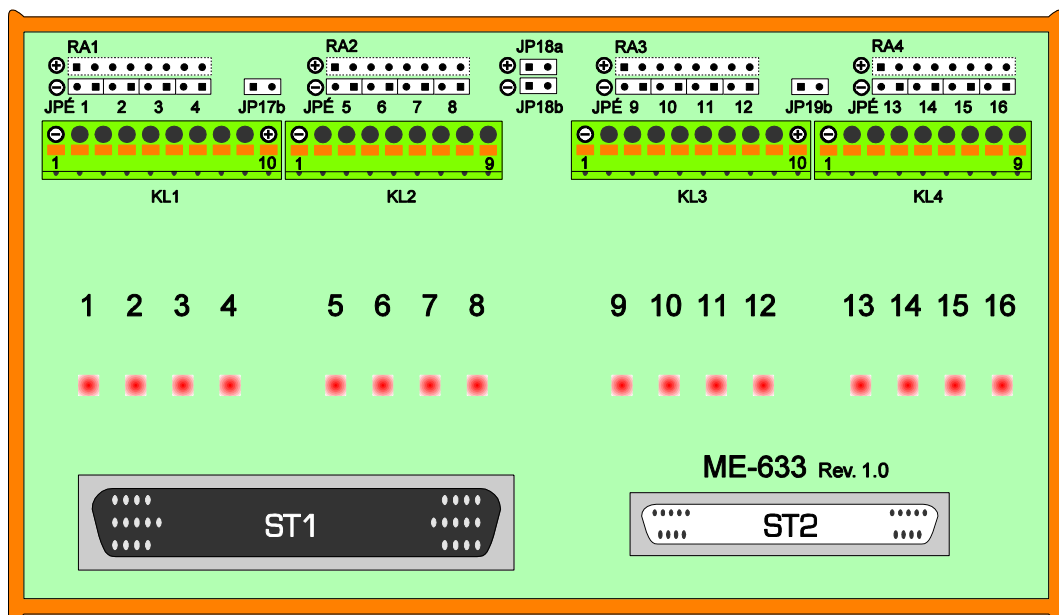


Diagram 7: ME-633

2.3.1 Block Diagram

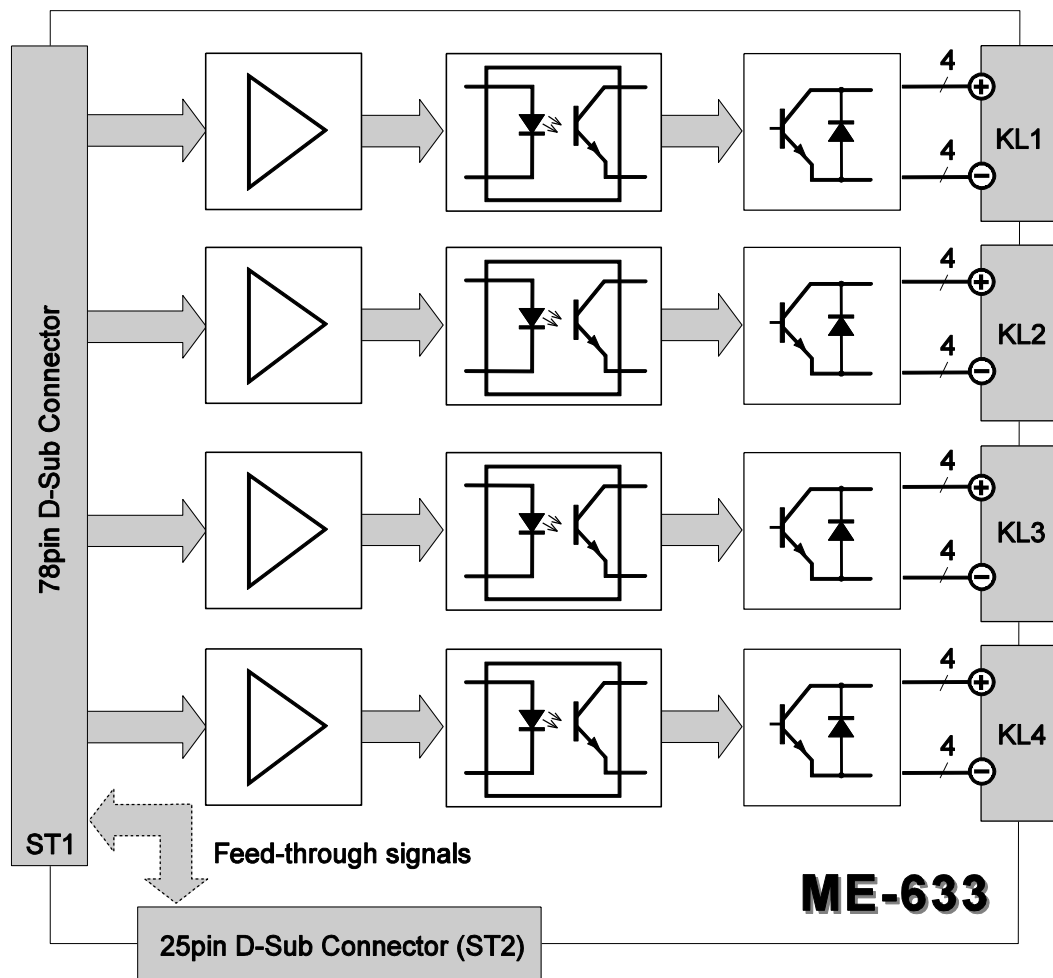


Diagram 8: Block diagram ME-633

2.3.2 Jumper Settings

By jumper a common reference can be made between the involved channels of a group (see Diagram 9).

For the output channels a common ground can be defined for each group. For every channel that should be referred to it, the corresponding jumper JPx must be set. By the clamps KLx1 the ground reference for each group must be done. For example: if the jumpers JP1 and JP4 are set, you can connect the ground reference of group KL1 to the clamp KL1.1.

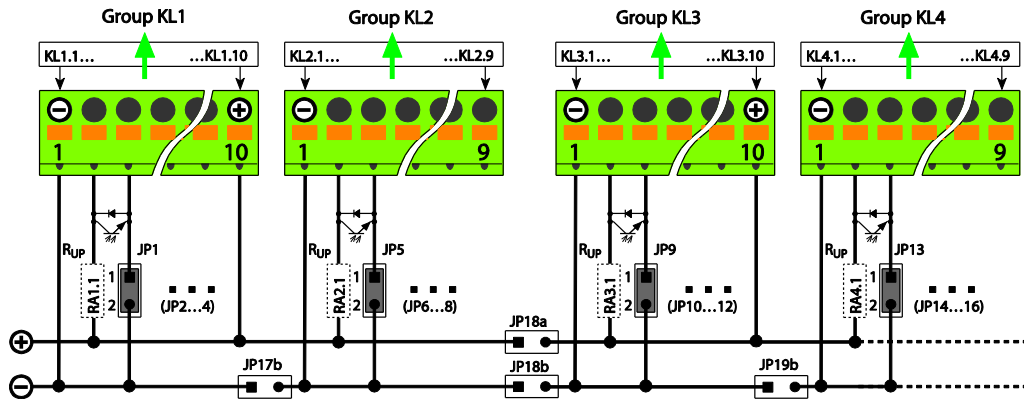


Diagram 9: Jumper ME-633

If required, the grounds of adjacent groups (JP17a, JP18a, JP19a) can be connected with one another. Additionally, the positive references between the groups KL2 and KL3 (JP18a) can be connected.

2.3.3 Pull-Up Resistors

As pull-up resistors R_{UP} (see Diagram 9) resistor arrays with 4 separate resistors come with the package.

If you want to use pull-up resistors, a positive reference for the groups KL1 and KL2 must be done by clamp KL1.10. For the groups KL3 and KL4 a positive reference must be done by clamp KL3.10. If necessary, you can use different resistor values for each channel.

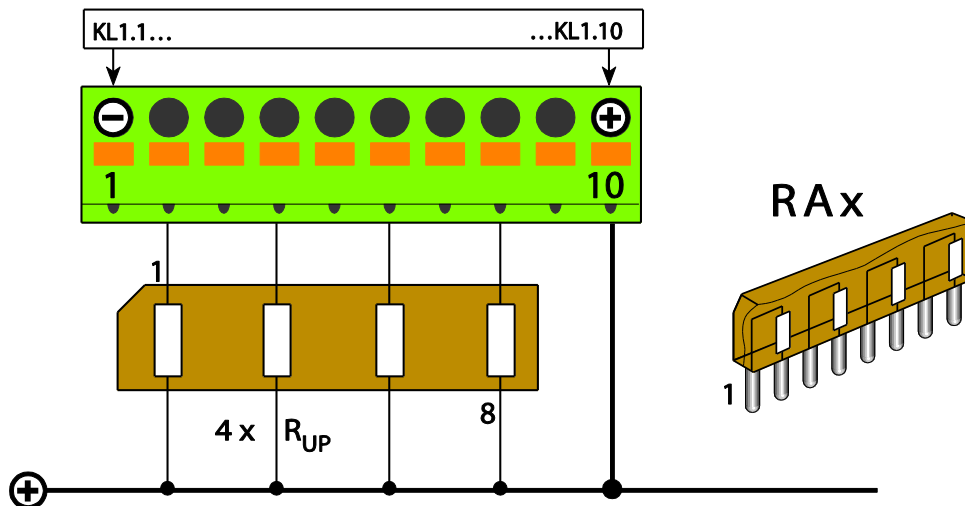


Diagram 10: Jumper ME-633

If required, the grounds of adjacent groups (JP17a, JP18a, JP19a) can be connected with one another. Additionally, the positive references between the groups KL2 and KL3 (JP18a) can be connected.

2.3.4 Pinout

Clamping-block	Pin	Signal	Clamping-block	Pin	Signal
KL1	1	Ground KL1	KL2	1	Ground KL2
	2	Output 1, positive		2	Output 5, positive
	3	Output 1, negative		3	Output 5, negative
	4	Output 2, positive		4	Output 6, positive
	5	Output 2, negative		5	Output 6, negative
	6	Output 3, positive		6	Output 7, positive
	7	Output 3, negative		7	Output 7, negative
	8	Output 4, positive		8	Output 8, positive
	9	Output 4, negative		9	Output 8, negative
	10	positive reference KL1 and KL2			
KL3	1	Ground KL3	KL4	1	Ground KL4
	2	Output 9, positive		2	Output 13, positive
	3	Output 9, negative		3	Output 13, negative
	4	Output 10, positive		4	Output 14, positive
	5	Output 10, negative		5	Output 14, negative
	6	Output 11, positive		6	Output 15, positive
	7	Output 11, negative		7	Output 15, negative
	8	Output 12, positive		8	Output 16, positive
	9	Output 12, negative		9	Output 16, negative
	10	positive reference KL3 and KL4			

Table 8: Pinout ME-633

2.4 ME-634

The ME-634 is an external extension board with 8 opto-isolated digital output and 8 opto-isolated digital input channels. The outputs are designed as open-collector outputs and can switch up to 60 V. The voltage high level of the inputs can be in the range of 2.5...60 V (specifications see page 40). For each channel the positive and negative input resp. output is connected with the clamp. The 4 channels of a clamp are combined in a group. For status control one LED per channel is assembled. Depending on the I/O-board further signals are fed through to the 25-pin D-Sub female connector ST2 (see Table 9).

For inputs resp. outputs the following assignment is valid:

	Output 1...8	Input 9..16	ST2
ME-1000/ME-5310	combination not possible		
ME-1400 (A/B) / ME-5314 (AB)	PA0...7	PB0...7	PC0...7 counter 0...2 (only ME-1400 (A/B /ME-5314 A/B)
ME-630 series	DIO_C0...7	DIO_D0...7	--
ME-4600 series	DIO_C0...7	DIO_D0...7	--
ME-6000 series	DIO_A0...7	DIO_B0...7	--
ME-8200 series	DIO_C0...7	DIO_D0...7	--

Table 9: Controlling the ME-634

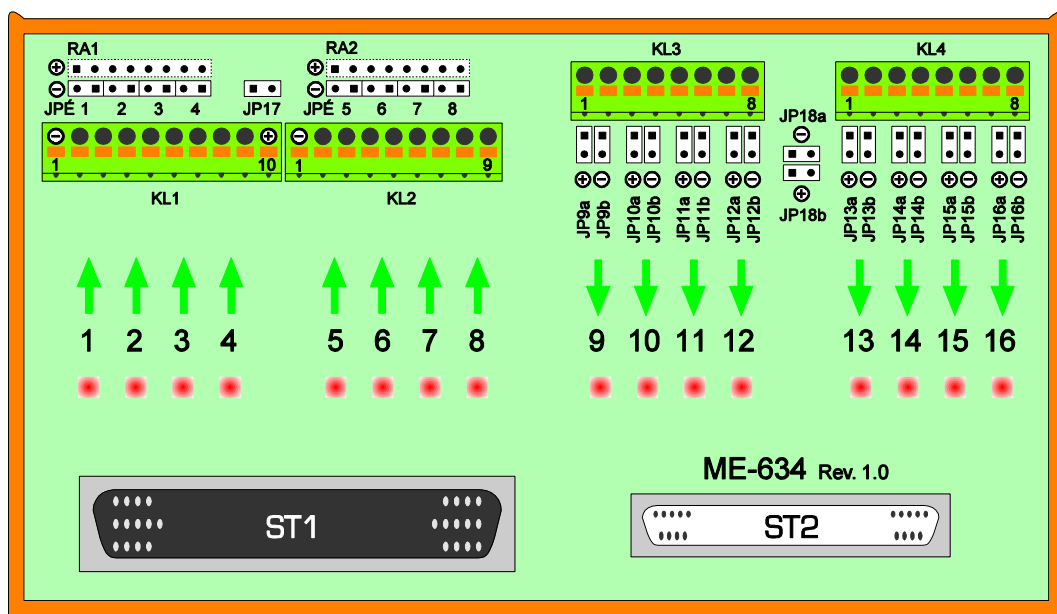


Diagram 11: ME-634

2.4.1 Block Diagram

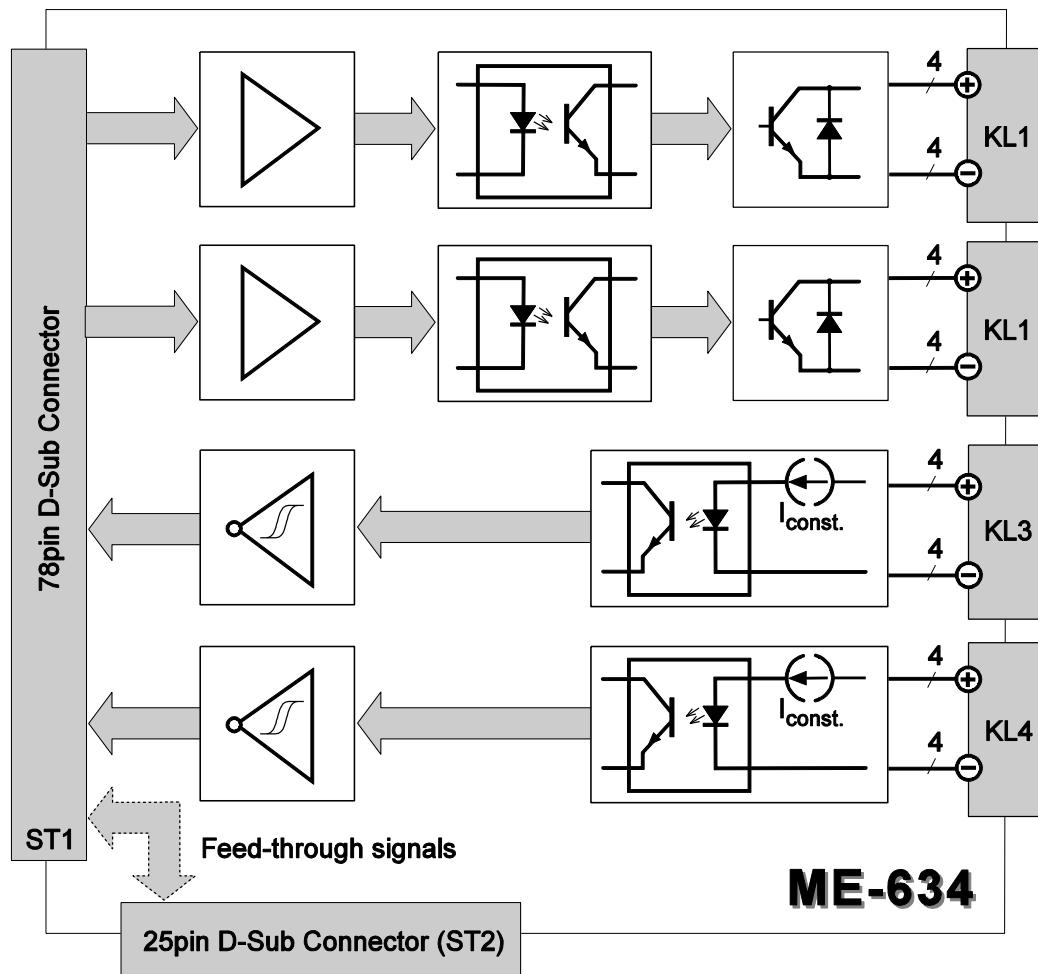


Diagram 12: Block diagram ME-634

2.4.2 Jumper Settings

By jumper a common reference can be made between the involved channels of a group (see Diagram 13).

For the output channels a common ground can be defined for each group (KL1 resp. KL2). For every channel that should be referred to it, the corresponding jumper JPx must be set. By the clamps KL1.1 resp. KL2.1 the ground reference for each group must be done. For example: if the jumpers JP1 and JP4 are set, you can connect the ground reference of group KL1 to the clamp KL1.1.

The input channels can be referred alternatively to a positive reference voltage or to a common ground. For every channel that should be referred to a positive reference, the corresponding jumper JPxa must be set. For every channel that should be referred to ground, the corresponding jumper JPxb must be set. For example: if the jumpers JP13b and JP16b are set

you connect the ground reference of group KL4 to the clamps KL4.2 or KL4.8.

Please note out of each pair of jumpers JP_xa,b only one jumper may be set!

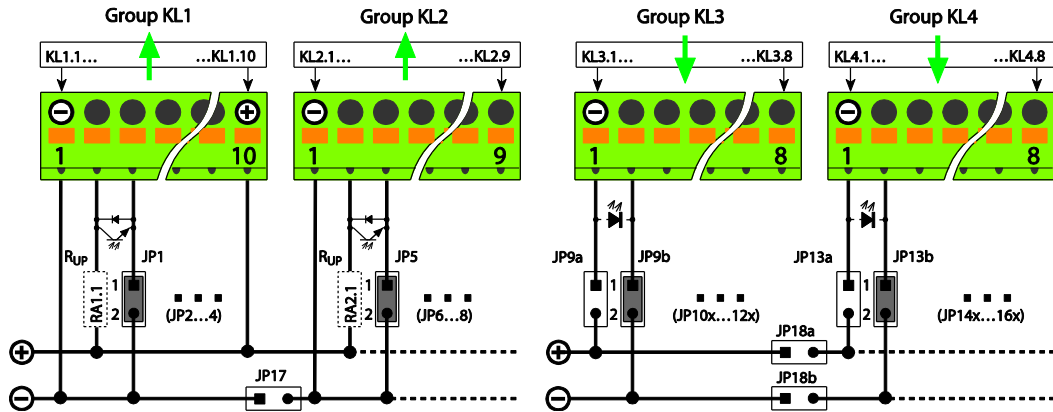


Diagram 13: Jumper ME-634

If required, the grounds of group KL1 and KL2 (JP17) can be connected. Additionally, the positive references (JP18a) or the ground references (JP18b) of KL3 and KL4 can be connected with one another.

2.4.3 Pull-Up Resistors

As pull-up resistors R_{UP} for the output channels (see Diagram 14) resistor arrays with 4 separate resistors come with the package.

If you want to use pull-up resistors, a positive reference for the groups KL1 and KL2 must be done by clamp KL1.10. If necessary you can use different resistor values for each channel.

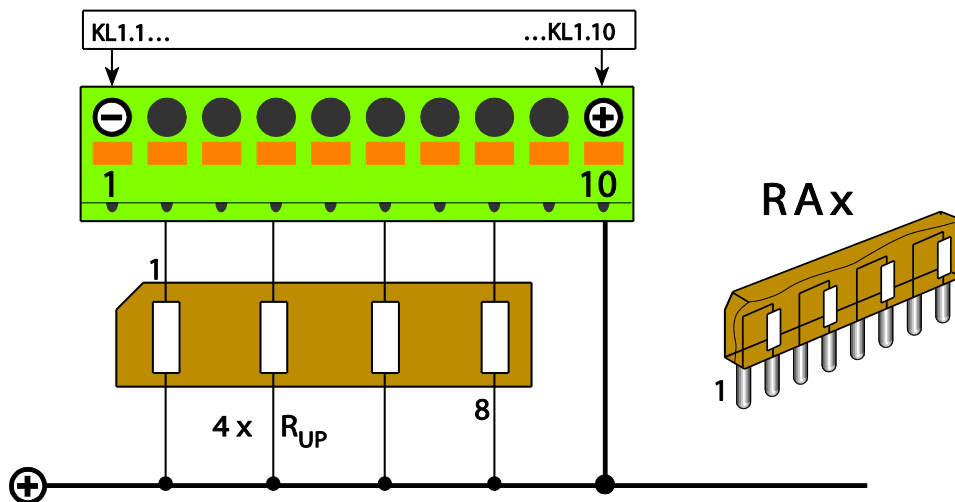


Diagram 14: Pull-up resistors

2.4.4 Pinout

Clamping-block	Pin	Signal	Clamping-block	Pin	Signal
KL1	1	Ground KL1	KL2	1	Ground KL2
	2	Channel 1 (Output), positive		2	Channel 5 (Output), positive
	3	Channel 1 (Output), negative		3	Channel 5 (Output), negative
	4	Channel 2 (Output), positive		4	Channel 6 (Output), positive
	5	Channel 2 (Output), negative		5	Channel 6 (Output), negative
	6	Channel 3 (Output), positive		6	Channel 7 (Output), positive
	7	Channel 3 (Output), negative		7	Channel 7 (Output), negative
	8	Channel 4 (Output), positive		8	Channel 8 (Output), positive
	9	Channel 4 (Output), negative		9	Channel 8 (Output), negative
	10	positive reference KL1 and KL2			
KL3	1	Channel 9 (Input), positive	KL4	1	Channel 13 (Input), positive
	2	Channel 9 (Input), negative		2	Channel 13 (Input), negative
	3	Channel 10 (Input), positive		3	Channel 14 (Input), positive
	4	Channel 10 (Input), negative		4	Channel 14 (Input), negative
	5	Channel 11 (Input), positive		5	Channel 15 (Input), positive
	6	Channel 11 (Input), negative		6	Channel 15 (Input), negative
	7	Channel 12 (Input), positive		7	Channel 16 (Input), positive
	8	Channel 12 (Input), negative		8	Channel 16 (Input), negative

Table 10: Pinout ME-634

2.5 ME-635

The ME-635 is an external relay board with 16 solid-state relays. The relays can switch up to 5A/240VAC (specifications see page 40). An automatic detection of zero-axis crossing guarantees that the load is always switched on zero-axis crossing of your signal. However, phase-synchronized switching is not possible with the ME-635. For status control one LED per channel is assembled. Depending on the I/O-board further signals are fed through to the 25-pin D-Sub female connector ST2 (see Table 11).

	Relays 1...8	Relays 9...16	ST2
ME-1000/ME-5310	Px0...7	Px8...15	Px16...31
ME-1400 (A/B) / ME-5314 (A/B)	PA0...7	PB0...7	PC0...7 counter 0...2 (only ME-1400 A/B / ME-5314 A/B)
ME-630 series	DIO_C0...7	DIO_D0...7	--
ME-4600 series	DIO_C0...7	DIO_D0...7	--
ME-6000 series	DIO_A0...7	DIO_B0...7	--
ME-8200 series	DIO_C0...7	DIO_D0...7	--

Table 11: Controlling the ME-635

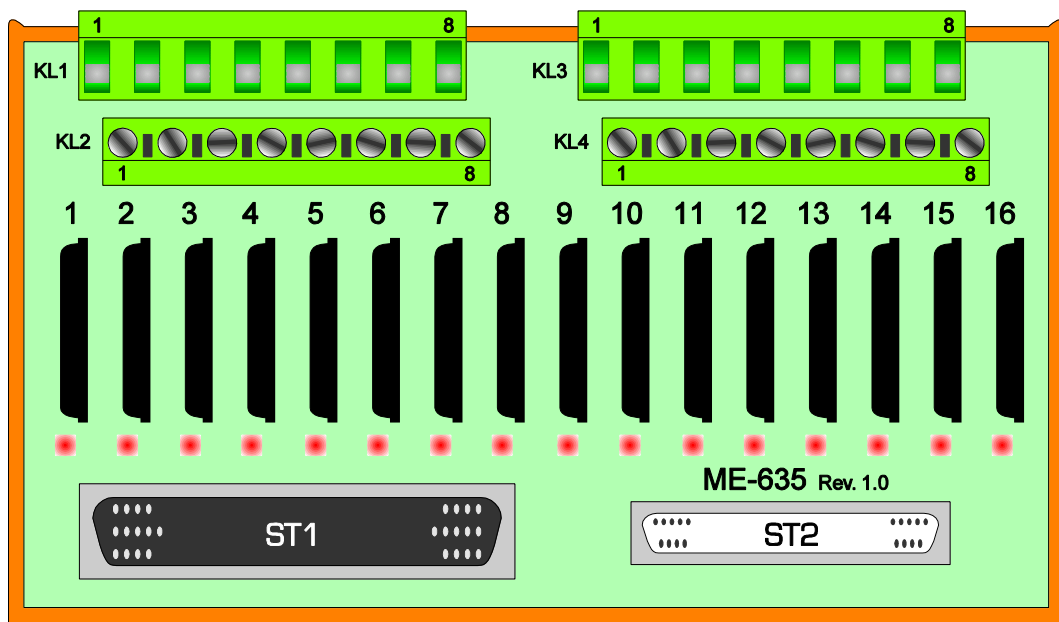


Diagram 15: ME-635

2.5.1 Block Diagram

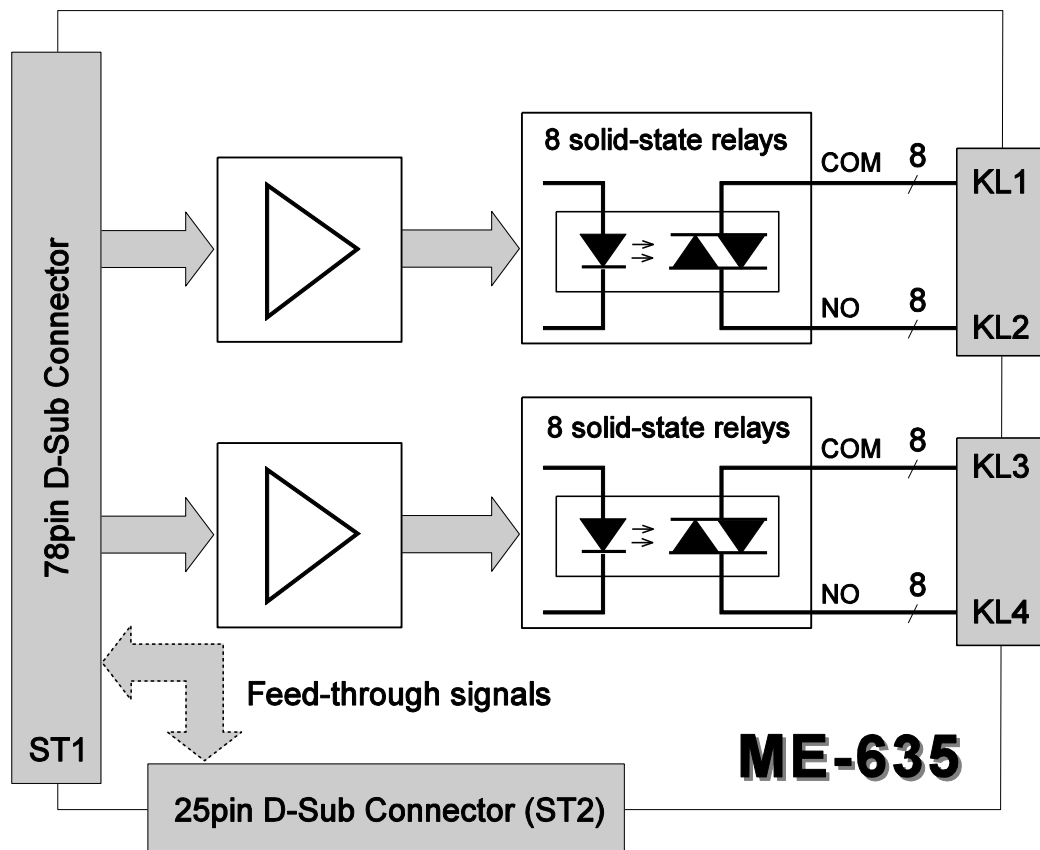


Diagram 16: Block diagram ME-635

2.5.2 Pinout

Clamping-block	Pin	Signal	Clamping-block	Pin	Signal
KL1	1	Relay 1, COM	KL2	1	Relay 1, NO
	2	Relay 2, COM		2	Relay 2, NO
	3	Relay 3, COM		3	Relay 3, NO
	4	Relay 4, COM		4	Relay 4, NO
	5	Relay 5, COM		5	Relay 5, NO
	6	Relay 6, COM		6	Relay 6, NO
	7	Relay 7, COM		7	Relay 7, NO
	8	Relay 8, COM		8	Relay 8, NO
KL3	1	Relay 9, COM	KL4	1	Relay 9, NO
	2	Relay 10, COM		2	Relay 10, NO
	3	Relay 11, COM		3	Relay 11, NO
	4	Relay 12, COM		4	Relay 12, NO
	5	Relay 13, COM		5	Relay 13, NO
	6	Relay 14, COM		6	Relay 14, NO
	7	Relay 15, COM		7	Relay 15, NO
	8	Relay 16, COM		8	Relay 16, NO

Table 12: Pinout ME-635

NO: "Normally Open"

COM: "Common"

2.6 Connection Options

For the connection of the ME-63Xtend series to the ME-1000/ME-5310, ME-1400/ME-5314, ME-630, ME-4600 series, ME-6000 series and ME-8200 series ready-made cables are available as accessories from Meilhaus Electronic (see the following chapters).

Using individual connection cables, the ME-63Xtend series can also be connected to many multi-I/O and digital-I/O boards. The I/O board requires at least two 8-bit TTL input resp. output ports.

2.6.1 Connection to ME-1000/ME-5310

By a special connection cable of type ME AK-D78/1000 two ME-63Xtend boards can be connected to an ME-1000/ME-5310/64 directly. If you are using an ME-1000/ME-5310/128: with one more connection cable of type ME AK-D78/1000 two additional ME-63Xtend boards can be connected to the ME-1001.

With up to 4 special connection cables ME AK-D2578/1000 you can connect one more ME-63Xtend board to the previous ME-63Xtend board (ST2) in daisy-chain operation. (**Note:** Only one additional board can be connected).

With that you can control up to four ME-63Xtend boards (64 channels) with one ME-1000/ME-5310/64 and up to eight ME-63Xtend boards (128 channels) with one ME-1000/ME-5310/128. Of course smaller extension boards are also possible.

Please note that the digital-I/O lines of the ME-1000/ME-5310 are organized in 32-bit-wide ports that can be configured for input or output by port only. Because of this the ME-634 cannot be used in combination with the ME-1000/ME-5310. ME-63Xtend boards used in daisy chain configuration must be of type input (ME-632) or output (ME-631/633/635).

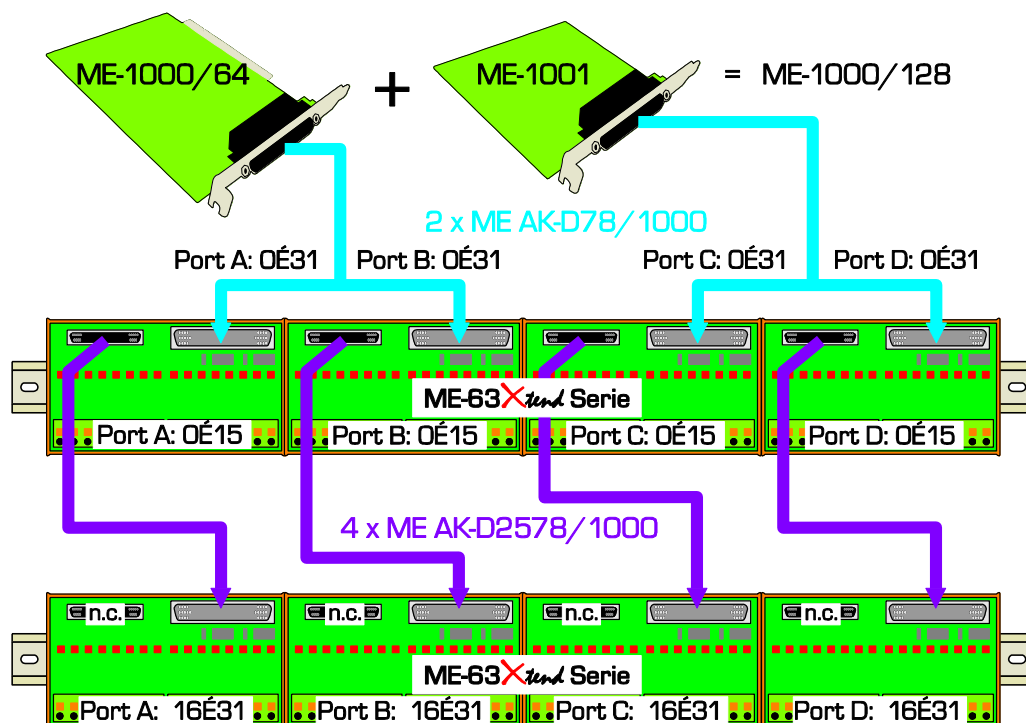


Diagram 17: Connection to ME-1000/ME-5310

2.6.2 Connection to ME-1400/ME-5314

By a 1:1 connection cable of type ME AK-D78 (or ME-AK-D78/1) a ME-63Xtend board can be connected to a ME-1400 (A/B) / ME-5314 (A/B) directly.

The 8-bit port C as well as the counters 0...2 (not on ME-1400/ME-5314) are fed-through to the 25-pin D-Sub connector (ST2). On demand you can use a connection block (ME AB-D25M) and a 25-pin D-Sub cable (ME AK-D25).

Basically the boards of the ME-63Xtend series can also be used with the ME-1400B / ME-5314B. However the digital ports D, E and F as well as the counters 3...5 are not fed through to the 25-pin D-Sub connector.

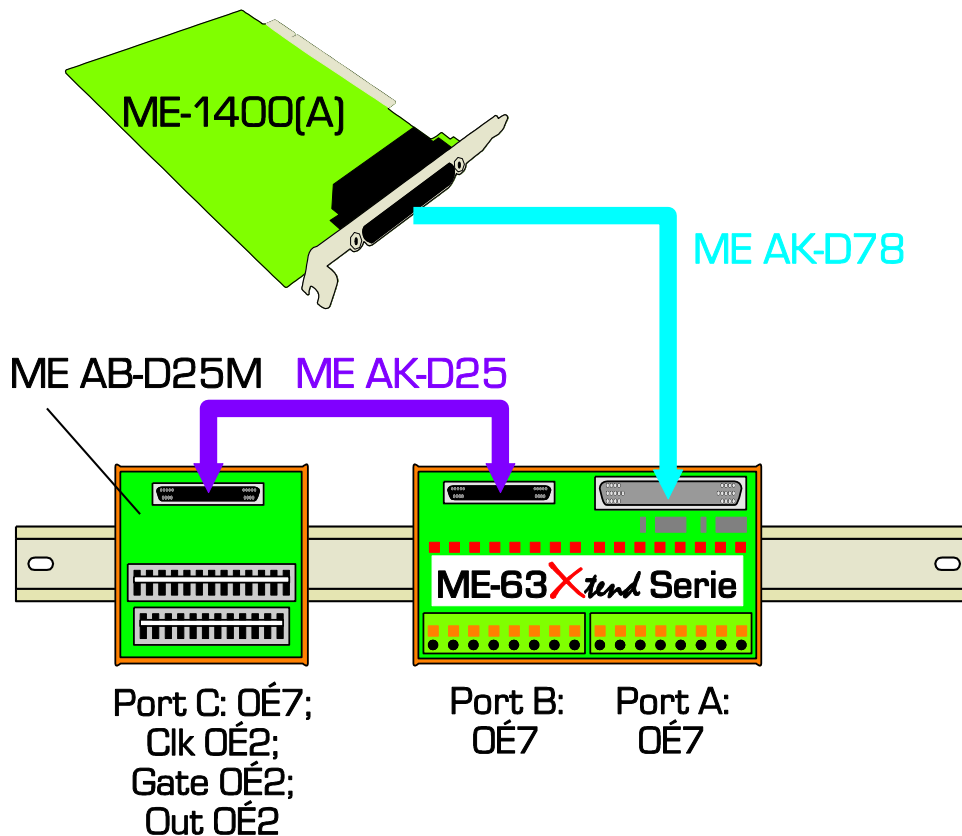


Diagram 18: Connection to ME-1400/ME-5314

2.6.3 Connection to ME-Boards with Extra Port

Connect the boards of the ME-63Xtend series to the bi-directional TTL ports (ST2) of the ME-630 series, ME-4600 series, ME-6000 series and ME-8200 series. The extra mounting bracket ME AK-D25F/S included in the package must be installed (see manual of the board). With the special

connection cable ME AK-D2578/4000 the ME-63Xtend board is connected to the 25-pin D-Sub jack of the extra mounting bracket.

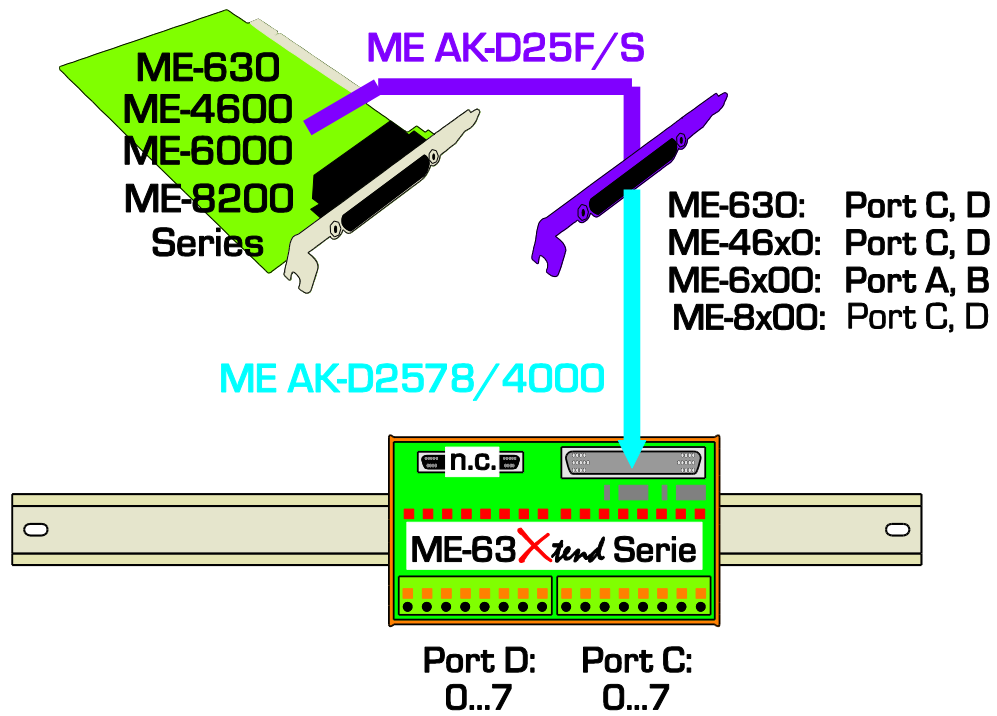


Diagram 19: Connection to extra port

Note: To the 25-pin D-Sub connector (ST2) of the ME-63Xtend series not further signals are attached with exception of VCC and ground (see Diagram 21).

3 Appendix

A Specification

A1 Pinouts ST1

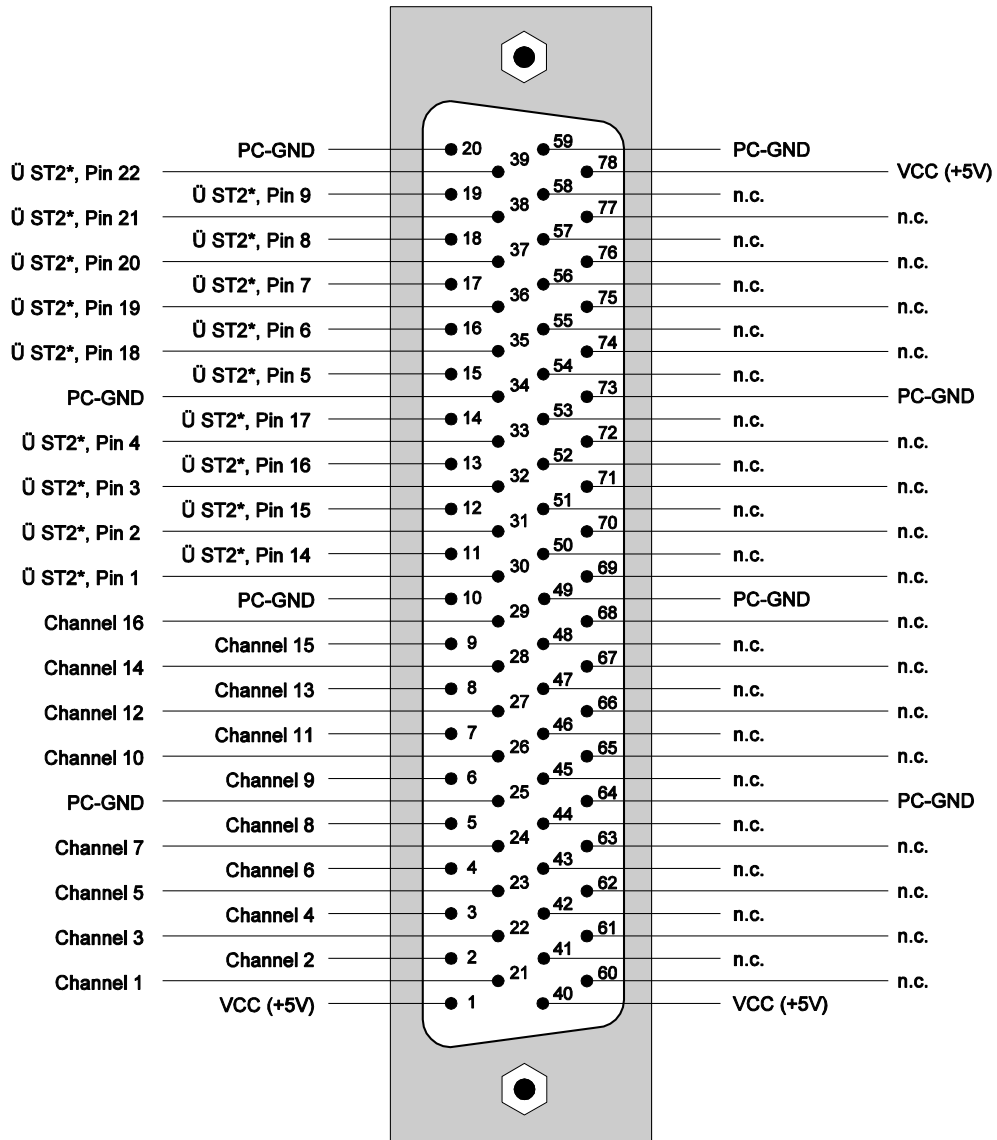


Diagram 20: Pinout 78-pin D-Sub connector ST1

Please note chapter 2.6 “Connection Options” on page 28!

A2 Pinout ST2

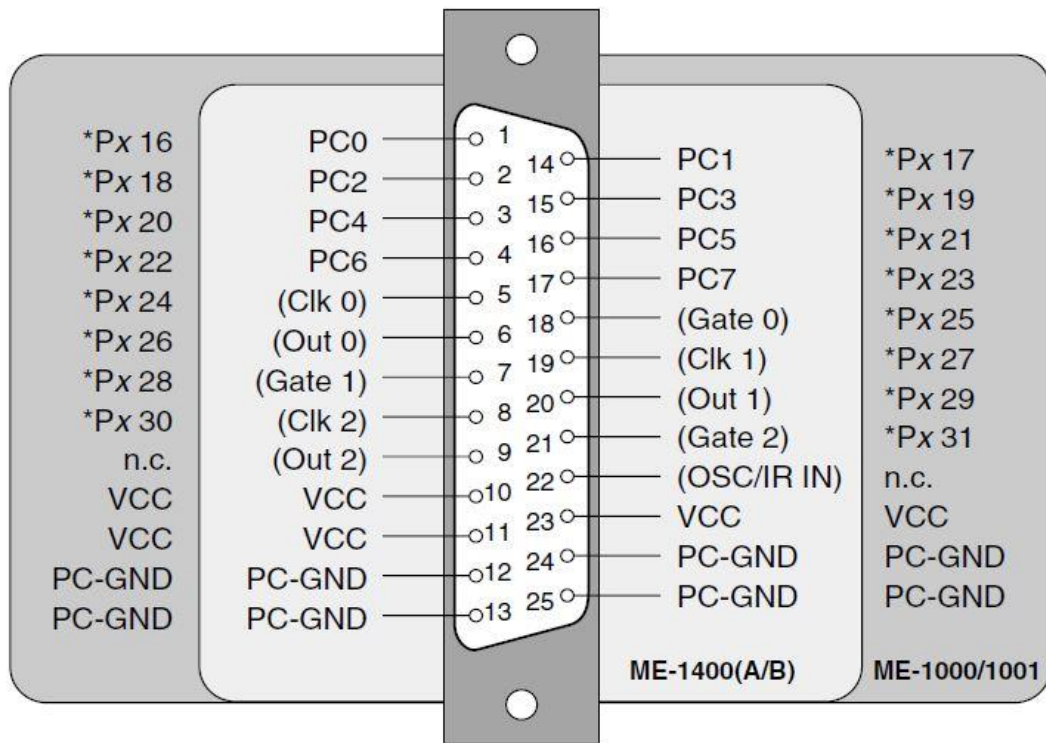


Diagram 21: Pinout of the 25-pin D-Sub connector ST2

Note for boards of ME-630, ME-4600, ME-6000 and ME-8200 series: To the 25-pin D-Sub connector (ST2) of the ME-63Xtend series no further signals are attached with exception of VCC and ground (see also Diagram 19).

***„Daisy-Chain“-operation with the ME-1000/ME-5310:**

If you connect a second board of the ME-63Xtend series to the 25-pin D-Sub connector ST2 using the special connection cable ME AK-D2578/1000 the digital I/Os Px16...31 of each port (A, B, C, D) are attached (see also chapter 2.6 "Connection Options" on page 28).

Condition is using the special connection cable ME AK-D78/1000 to connect boards of the ME-63Xtend series to the ME-1000/ME-5310/64 (up to 64 channels) resp. ME-1000/ME-5310/128 (up to 128 channels).

Note: ME-1000/ME-5310/64 + ME-1001 = ME-1000/ME-5310/128.

B Specification

B1 ME-63Xtend Series (all models)

General Specifications

Physical size)	160 mm x 100 mm
Mounting	DIN-rail mounting kit included
Connectors	78-pin D-Sub female connector (to I/O-board)
	25-pin D-Sub female connector (for feed-through signals)
	detachable clamping blocks for inputs and outputs
Operating temperature	0...70 °C
Storage temperature	0...50 °C
Relative humidity	20...55 % (non-condensing)
Certification	CE

B2 ME-631

Number of relays	16 form C relays
Relay type	Nais APE3014H

Note: The index “out” refers to the clamps KL1...6, the index “in” refers to the 78-pin D-Sub female connector.

Maximum Ratings

Conditions: TA = 25 °C

Measurement Values	Test Conditions	MIN	MAX	Unit
Operating voltage U_b	non-destructive	-0.5	+8	V
Input voltage U_{in}	non-destructive	-0.5	30	V
Switching voltage U_{out}	non-destructive		400	V_{AC}
Switching voltage U_{out}	non-destructive		300	V_{DC}
Permanent current $I_{out, max}$	non-destructive		6	A
Switching power	non-destructive, $\cos\varphi=1$		1500	VA
Isolation voltage			4000	$V_{AC, rms}$

coil/contact U_{ISO}				
Isolation voltage contact/contact U_{Off}			1000	$V_{AC,rms}$

Recommended Operating Conditions

Conditions: $U_b=5 V \pm 10 \%$; $T_A = 25 \text{ }^\circ\text{C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
U_b			5		V
U_{out}	$I_{out} = I_{out, max}$	12 ¹⁾		250	V
U_{out}	$I_{out} = I_{out, max}$	12 ¹⁾		30	V_{DC}
I_{out}	time unlimited, all channels	0.1 ¹⁾		6	A

¹⁾ on small load the lifetime of contacts is decreasing.

Static Values

Conditions: $U_b=5 V \pm 10 \%$; $T_A = 25 \text{ }^\circ\text{C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,H}$		3.5		$U_b 0.6$	V
$U_{in,L}$				1.5	V
$I_{in,H}$	$U_{in,H} = 3.85 \text{ V}$		0.93	1.35	mA

Dynamic Values

Conditions: $U_b=5 V \pm 10 \%$; $T_A = 25 \text{ }^\circ\text{C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
f_{in}	without load			20	Hz
$t_{pd,on}$			5	8	ms
$t_{pd,off}$			2.5	4	ms
Contact life time	$I_{out}=6 \text{ A}$ $U_{out}=250 \text{ VAC}$ $\cos\varphi=1$	3×10^4		5×10^6	

B3 ME-632

Inputs	16 digital inputs
Opto-isolation	up to 2500 VDC

Note: The index „in“ refers to the clamps KL1...4; the index „out“ refers to the 78-pin D-Sub female connector.

Maximum Ratings

Conditions: $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX
U_b	non-destructive	-0,5	+7	V
U_{in}	non-destructive	-5	70	V
I_{out}	non-destructive 1 channel	-60	+150	mA
U_{ISO}	f=60 Hz, t=1 min		2500	$V_{AC,rms}$

Recommended Operating Conditions

Conditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
U_{in}		0		60	V
I_{out}	t=1 s, 1 channel	± 60	± 115	± 200	mA

Static Values

Conditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,H}$		2.30		60	V
$U_{in,L}$		0		2.20	V
U_{outH}	$I_{out}=-24\text{ mA}$ $U_b=4,5\text{ V}$	2.4	3.3		V
$U_{out,L}$	$I_{out}=24\text{ mA}$ $U_b=4,5\text{ V}$		0.3	0.55	V
R_{in}	$U_{in}=24\text{ V}$		4.3		k Ω
I_{in}	$U_{in}=60\text{ V}$		6.5	10	mA

Dynamic Values

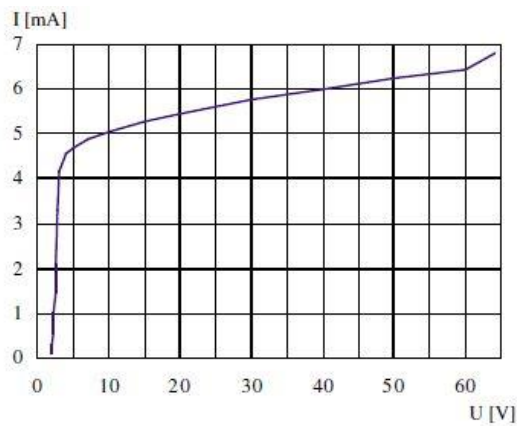
Conditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
f_{in}	output switching, duty cycle 12 %, $U_{in}=10\text{ V}$		23		kHz

f_{in}	output switching, duty cycle 50 %, $U_{in}=10\text{ V}$		10.5		kHz
f_{in}	output switching, duty cycle 50 %, $U_{in}=2,35\text{ V}$		62		kHz
$t_{pd,HL}$	$f_{in}=1\text{ kHz}$, $U_{in}=10\text{ V}$		36		μs
$t_{pd,LH}$	$f_{in}=1\text{ kHz}$, $U_{in}=10\text{ V}$		1.9		μs

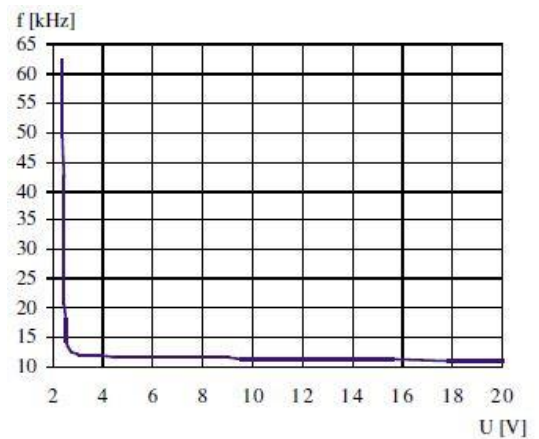
Input current related to input voltage

$T_A=25\text{ }^\circ\text{C}$, $U_b=5,0\text{ V}$, $f=0\text{ Hz}$



Maximum input frequency related to input voltage

$T_A=25\text{ }^\circ\text{C}$, $U_b=5,0\text{ V}$,
output switching



B4 ME-633

Outputs	16 digital outputs
Opto-isolation	up to 2500 VDC

Note: The index “out” refers to the clamps KL1...4; the index “in” refers to the 78-pin D-Sub female connector.

Maximum Ratings

Conditions: $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX
Operating voltage U_b	non-destructive	-0.5	+7	V
Input voltage U_{in}	non-destructive	-5	$U_b + 0.5$	V
U_{out}	non-destructive	-0.8	70	V
I_{out}	non-destructive $t = 10\text{ s}$	-200	1000	mA
U_{ISO}	$f=60\text{ Hz}$, $t=1\text{ min}$		2500	$V_{AC,rms}$

Recommended Operating Conditions

Conditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
U_{out}	$I_{out, on} > 100\text{ }\mu\text{A}$	0.6		60	V
I_{out}	time limited, all channels	0		300	mA
$I_{out, peak}$	$t=1\text{ min}$, 1 channel			400	mA

Static Values

Conditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,H}$		2			V
$U_{in,L}$				0.8	V
U_{outon}	$I_{out}=100\text{ mA}$		0.86		V
$U_{out,on}$	$I_{out}= I_{out, max}$	1.00	1.03	1.2	V

R_{on}		3	10	700	m Ω
R_{off}	$U_{out} = U_{out,max}$		600		M Ω

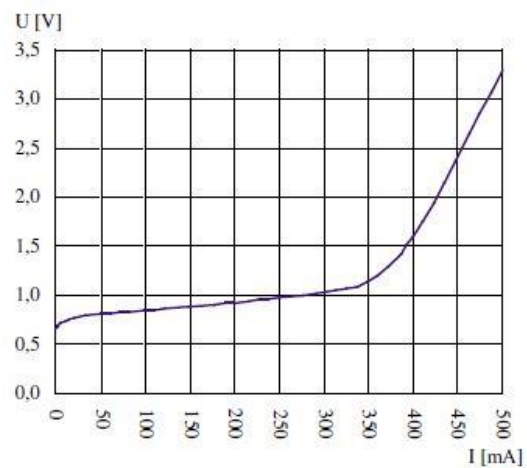
Dynamic Values

Conditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ }^\circ\text{C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
f_{in}	$U_{out}=90\%$ $I_{out}=100\text{ mA}$	5.0	5.5	5.7	kHz
$t_{pd,HL}$	$U_{out}=100\text{ mA}$ $f_{out}=1\text{ kHz}$		90		μs
$t_{pd,LH}$	$U_{out}=100\text{ mA}$ $f_{out}=1\text{ kHz}$		2.2		μs
$t_{tr,HL}$	$U_{out}=100\text{ mA}$ $f_{out}=1\text{ kHz}$		1.4		μs
$t_{tr,LH}$	$U_{out}=100\text{ mA}$ $f_{out}=1\text{ kHz}$		62		μs

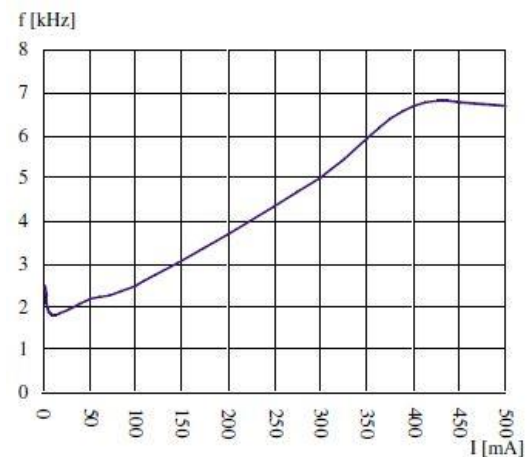
Forward voltage related to load current

$T_A=25\text{ }^\circ\text{C}$, $U_b=5,0\text{ V}$, $f=0\text{ Hz}$



Maximum input frequency related to load current

$T_A=25\text{ }^\circ\text{C}$, $U_b=4,5\text{ V}$, $\Delta U=1\%$



B5 ME-634

Inputs	8 digital inputs
Outputs	8 digital outputs
Opto-isolation	up to 2500 VDC

- Specifications of the input channels see ME-632 on page 35.
- Specifications of the output channels see ME-633 on page 38.

B6 ME-635

Number of relays	16 solid-state relays
------------------	-----------------------

Note: The index “out” refers to the clamps KL1...4; the index “in” refers to the 78-pin D-Sub female connector.

Maximum Ratings

Conditions: $T_A = 25\text{ °C}$

Measurement Values	Test Conditions	MIN	Type	MAX
Operating voltage U_b	non-destructive	-0.5	+8	V
Input voltage U_{in}	non-destructive	-0.5	30	V
Switching voltage U_{out}	non-destructive		280	$V_{AC,rms}$
Switching voltage $U_{out,max}$	transient		600	V_{pp}
Permanent current I_{out}	non-destructive		6	A
Peak current I_{out}	$t = 15\text{ ms}$		250	A
Isolation voltage input/output U_{ISO}	$f = 50/60\text{ Hz}$		4000	$V_{AC,rms}$

Recommended Operating ConditionsConditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ }^\circ\text{C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
Operating voltage U_b			5		
Output voltage U_{out}		12		280	$V_{AC,rms}$
Output current I_{out}	time unlimited, all channels (without forced ventilation)	60		4000	$mA_{AC,rms}$
Output current I_{out}	time unlimited, maximum each second channel in operation (without forced ventilation)	60		5000	$mA_{AC,rms}$

Static ValuesConditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ }^\circ\text{C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
$U_{in,H}$		3.5		$U_b+0.6$	V
$U_{in,L}$				1.5	V
$I_{in,H}$	$U_{in}=3.85\text{ V}$		0.93	1.35	mA
Voltage drop at output	$U_{out}=U_{out,max}$			1.4	V_{AC}

Dynamic ValuesConditions: $U_b=5\text{ V}\pm 10\%$; $T_A = 25\text{ }^\circ\text{C}$

Measurement Values	Test Conditions	MIN	Type	MAX	Unit
f_{in}				1	VAC cycle
$t_{pd,on}$				0.5	VAC cycle
$t_{pd,off}$				0.5	VAC cycle
$\cos\varphi$	Maximum load	0.5		1	

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

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

Support:

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

eMail: sales@meilhaus.de eMail: support@meilhaus.de

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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.

E Index

<hr/>		<hr/>	
A		J	
Accessories	42	Jumper Settings	19
Appendix	32		
<hr/>		<hr/>	
B		M	
Block Diagram	11, 15	ME-631	10, 34
		ME-632	14, 35
		ME-633	18, 38
		ME-634	21, 40
		ME-635	26, 40
<hr/>		<hr/>	
C		P	
Connection Options	28	Package Contents	6
Connection to ME-1000/ME-5310	29	Pinout	13, 17
Connection to ME-1400/ME-5314	30	Protection Circuit	12
Connection to ME-Boards with Extra Port	30	Pull-Up Resistors	20, 24
<hr/>		<hr/>	
H		S	
Hardware	9	Specification	32
Hotline	43	Specifications	34
		System Requirements	6
<hr/>		<hr/>	
I		T	
Important Notes	5	Technical Questions	43
Improper Application	6		
Introduction	5		