MR 8+ / A 32-48 MINI

phytron

Mini Rack
with 8 Stepper Motor Power Stages
and ServiceBus Module

Manual 1233-A006 GB

customized solutions
in motion

MR 8+ / A 32-48 MINI

Minirack with 8 Stepper Motor Power Stages and ServiceBus Module

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Every possible care has been taken to ensure the accuracy of this technical manual. All information contained in this manual is correct to the best of our knowledge and belief but cannot be guaranteed. Furthermore we reserve the right to make improvements and enhancements to the manual and / or the devices described herein without prior notification.

We appreciate suggestions and criticisms for further improvement. Please send your comments to the following e-mail-address: doku@phytron.de

You´ll find the updated version of this manual on the website of www.phytron.de.

Contents

1 MR 8+ Minirack

1.1 Short Overview

MR 8 minirack is a modular power supply unit for wall mounting.

MR 8 is equipped with up to eight plug-in A 32-48 MINI stepper motor power stages and a Power and ServiceBus (PSB) module. One free slot is reserved for further developments.

Cable clamps are mounted for shielding and strain relief at the bottom of the rack.
A fold-away interlock is used to save the plug-in board.

The supply voltage and ServiceBus are connected to the PSB module.

The PSB module can be connected to PC by USB interface, RS 422 or RS 485-4-wire interface depending on the type.

The DIP switches used as address switches allow to operate up to 4 miniracks with 32 power stages on the ServiceBus.

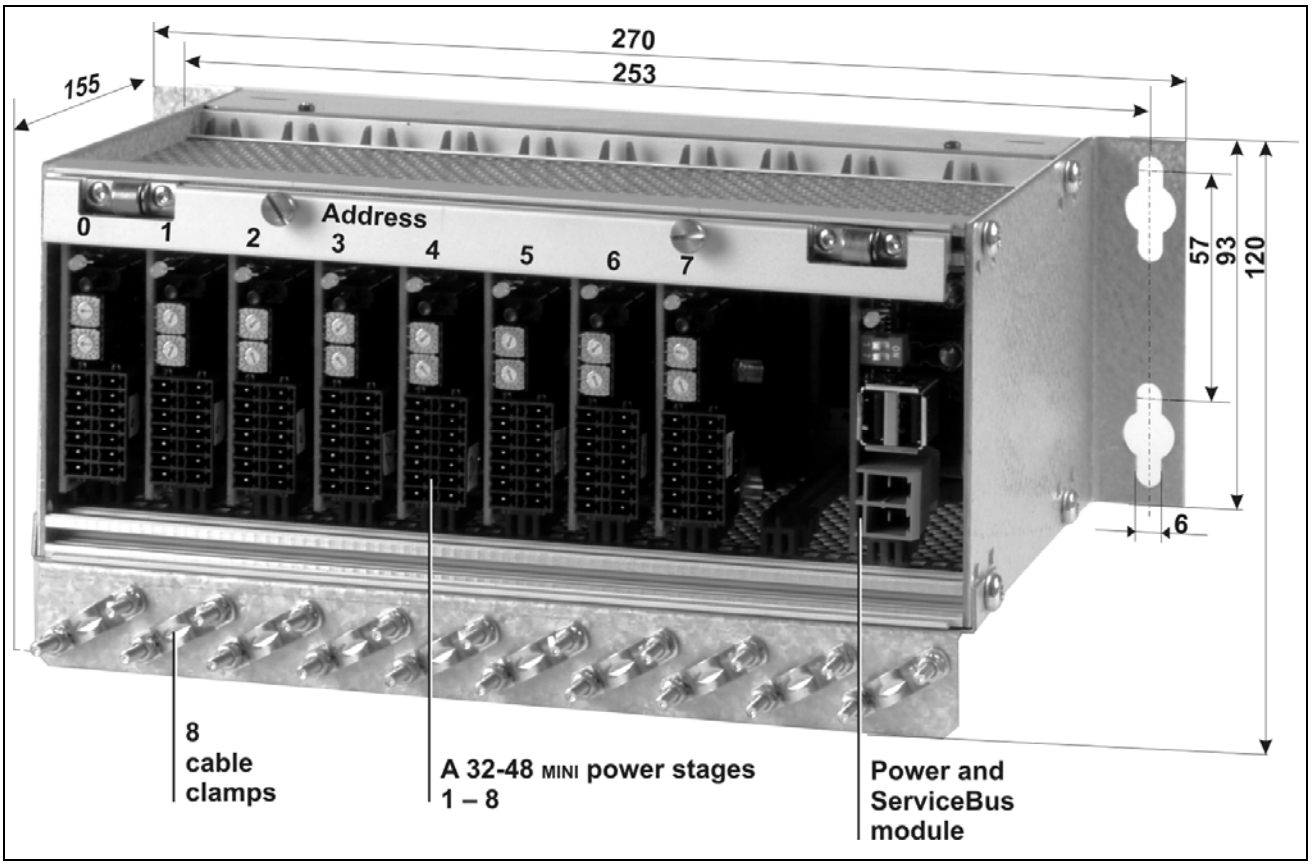


Fig. 1: MR 8 minirack: dimensions

DC Power Supply

The MR 8 supply voltage, 24 to 48 V_{DC} max. 20 A is connected to the Power and ServiceBus (PSB) module and looped through the backplane to the power stages.

The PSB module generates 5 V logic voltage for the A 32-48 MINI power stages.

Interfaces

Every minirack contains a PSB module with 2 interfaces available for connection to PC/controller or another minirack.

- Power and ServiceBus module type PSB-USB: **with** integrated USB-RS 485 converter
- Power- and ServiceBus-module type PSB-RS 485: **without** USB-RS 485 converter, with address switches for max. 32 axes in 4 miniracks

Operation Modes

ServiceBus mode:

The ServiceBus is used for communication with power stages via RS 485 or USB.

The Windows® software can be user-friendly programmed by ServiceBus-Comm®. See manual ServiceBus-Comm®.

Rotary switch mode

In rotary switch mode the parameters of the power stages can be set directly at each power stage by rotary switches.

Remark:
The operating parameters can only be read by ServiceBus in the rotary switch mode.

1.2 LED

The LED on the front of the PSB module shines green, when the module is ready.

1.3 DIP Switches

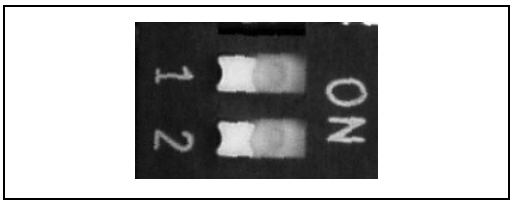


Fig. 2: DIP switches in OFF position

Both DIP switches on the PSB module type RS 485 are used to address the minirack in ServiceBus mode. You can address up to 4 miniracks.

DIP switches		**Minirack address**
1	**2**	
OFF	OFF	0
ON	OFF	1
OFF	ON	2
ON	ON	3

Important: Each address must only be used once!

1.4 Extent of Supply

The MR 8 minirack is available in the following options (#: Ident number):

- MR8 with PSB module type USB, (#10007906)
- MR8 with PSB module type RS 485, (#10006799)
- Power supply mating connector: Phoenix PC5/2-ST-7.62, (#10006748)
- Manual MR 8+ / A 32-48 MINI
- Phytron CD with ServiceBus-Comm® software
- Manual ServiceBus-Comm®

Supplementary parts are available:

- Power stage A 32-48 MINI incl. mating connectors (motor/I/O): (#10008235)
  2 x Phoenix FMC 1.5/2-ST-3.5-RF, (#10007077)
  2 x Phoenix FMC 1.5/5-ST-3.5-RF, (#10006540)
- Ventilator plate with 2 fans (#10008806) incl.
  Phoenix MC1.5/2-ST-3.81 mating connector (#10000285)
- ServiceBus cable (connection A-A) 20 cm (#10006857)
- ServiceBus cable (connection A-A) 100 cm (#10006880)
- USB cable (connection A-B) 200 cm (#10006881)

1.5 Option: A 32-48 MINI Power Stage

A 32-48 MINI is a stepper motor power stage for bipolar control of 2-phase stepper motors, which can be plugged-in the minirack.

The precision current control of the power stage A 32-48 MINI according to the patented SYNCHROCHOP principle effects optimum running performance of the stepper motor.

The parameters – Run current, Step resolution and Motor direction – can be configured by rotary switches or ServiceBus.

Step resolution can be set by the rotary switch:
Full step, half step, 1/4, 1/5, 1/8, 1/10 and 1/20 step.

You can program the following step resolutions in ServiceBus mode:
1/1, 1/2, 1/4, 1/5, 1/8, 1/10, 1/16, 1/20, 1/32, 1/64, 1/128, 1/256, 1/512 of a full step.

Motor currents from 0.24 to 3.5 A_{Peak}

Rotary switch mode:
Run current can be set in 15 steps from 0.15 to 2.00 A_{rms}.

ServiceBus mode:
Phase currents can be programmed from 0.10 to 2.50 A_{rms} in 10 mA steps.

Inputs

The inputs Control pulse, Motor direction, Boost and Activation are designed for push-pull controlling. The inputs are optically insulated from the power stage supply voltage by optocoupler.

Output error

The output error opens in case of short circuit, overcurrent, undervoltage or overtemperature.

1.6 Accessories: Fan

The minirack is prepared for mounting of a ventilator plate with 2 fans.

Type:	DC-fan 80 x 80 x 32, product NMB
Permissible supply voltage:	10 to 25.2 V_{DC}
Current:	210 mA
Air flow:	99.6 m^3/h
Revolutions:	4350 rpm

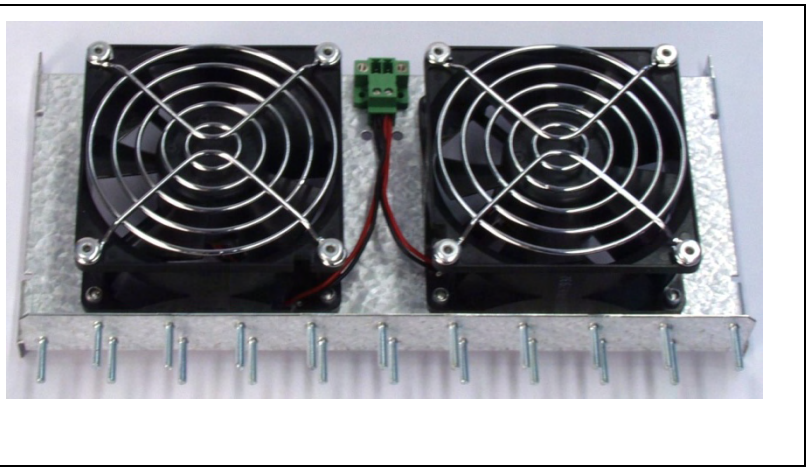


Fig. 3: Ventilator plate

2 To Consider Before Installation

Read this manual very carefully before installing and operating the MR 8.
Observe the safety instructions in the following chapter!

2.1 Qualified Personnel

Design, installation and operation of systems using the MR 8 may only be performed by qualified and trained personnel.

These persons should be able to recognize and handle risks emerging from electrical, mechanical or electronical system parts.

WARNING !

By persons without the proper training and qualification damages to devices and persons might result!

2.2 Safety Instructions

1. Connect the MR 8 to **PE**.
   Use the PE screw, which is fixed on the right side of the device.

2. The MR 8 must only be operated if the unit housing and motor housing are connected to protective earth.

3. Motor and signal cables must be shielded. The cable shielding must be connected conductively to the housing.

4. The transformer **must** be constructed with reinforced or double insulation to avoid dangerous touch voltages (50 V_{AC} and 120 V_{DC}) in case of error.
   The secondary winding of the transformer shouldn't be grounded (SELV supply) (acc. to DIN VDE 0550 or DIN EN 60742).

5. If you want to unplug a power stage from the slot, please note:
   Do not unplug the power stage while powered!
   Danger of destroying the device!
   Up to 3 minutes after turning off the supply voltage, dangerous voltages may still exist within the device.

6. **Be careful handling the motor connectors at the power stage and any motor cable coupling.**
   As long as the power stage is connected to supply voltage, a hazardous voltage level is present at motor connector and motor cable, even if the motor is not wired.

7. Always switch off the supply voltage if you connect or disconnect any wires or connectors at the power stage.
   Most important:
   Do not unplug the motor connector while powered!
   Danger of electric arcing!

8. The maximum voltage of the signal inputs and outputs must not exceed 5 V_{DC} (I/O connectors).

9. Pressing the push-button Reset is no safe separation in the emergency case. The voltage supply has to be interrupted for switching off the drive safely.

10. The surface of the power stage board and the heat sink may reach temperatures of more than 85 °C.
    Danger of injury if touching the surface!

2.3 Putting into Service

Please follow the described order when you put into service the MR 8:

1. Connect the MR 8 to **PE**.
   Use the PE screw, which is fixed on the right side of the device.
2. Connection of the power stage(s) A 32-48:
   Wire the **2- and 5-pole Phoenix connectors** (FMC1.5/2-ST-3.5-RF or FMC1.5/5-ST-3.5-RF) with the required leads (I/O-signals and motor connection) and connect it to the power stage. Please note. For motor connection consider manual A 32-48.

   - Switch positions in the **rotary switch mode**
     For rotary switch setting see manual A 32-48.
     - Set the rotary switch 'Run current' (above) to the required value. The phase current should not exceed the maximum admissible motor current.
     - Set the rotary switch 'Step resolution' (below) to the required step resolution.
   - Switch positions in **ServiceBus mode**
     - **Zero both rotary switches** on all power stage modules**.**
     - Address each minirack by the DIP connection switches (see chap. 1.3).
     - ServiceBus connection (see chap. 5):

       Type PSB module USB:
       Connect an USB port of the PC (type A) to the USB MR 8 power module (type B, below) by an USB cable, type A-B.

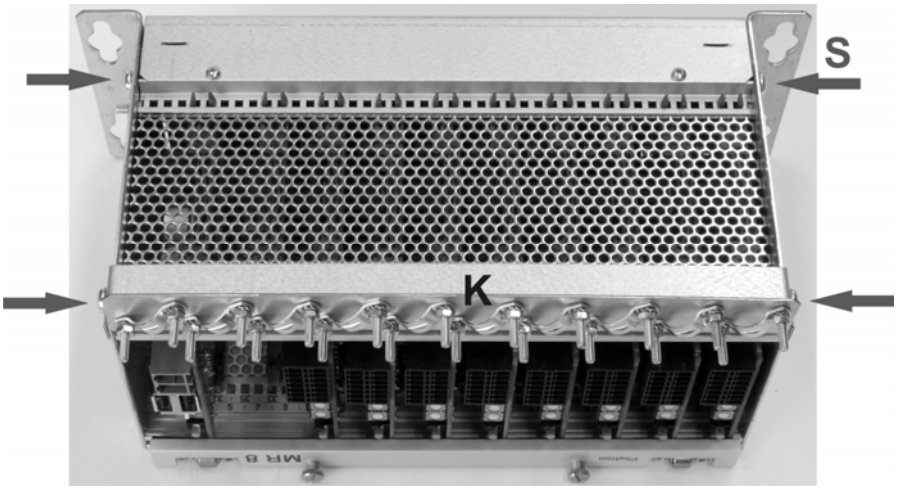
       Type PSB module RS 485:
       Connect the first MR 8 with an adapted ServiceBus cable (type A) from bus output port to the bus input port of the next MR 8.
       Continue until all miniracks (max. 4) are connected with each other.
       RS 422/RS 485 interface:
       Connect the PC to the first MR 8 with an adapted ServiceBus cable.
       Continue as per description Type PSB module RS 485.
   - Connect the input signals at least to the inputs Control pulse and Activation.
3. Connect the **supply voltage** to the PSB module. Use 2-pole Phoenix connector (PC5-7.62). The equivalent male connector (PC4/7.62) is on the front panel of the PSB module (See chap. 3).
4. **Power on** the MR 8.
   The MR 8 is designed for voltages from 24 to 48V_{DC}. As soon as the PSB module is powered on and there is no error, the green LED on the PSB module shines
   The power stage LED shines or blinks green or orange depending on the operating state (see manual A 32-48 MINI).
5. **Accessories Fan:** The supply voltage is connected by the 2-pole Phönix connector (MC 1.5/2-ST-3.81).

2.4 Mounting the Ventilator Plate

Mount the ventilator plate to MR 8 as follows:

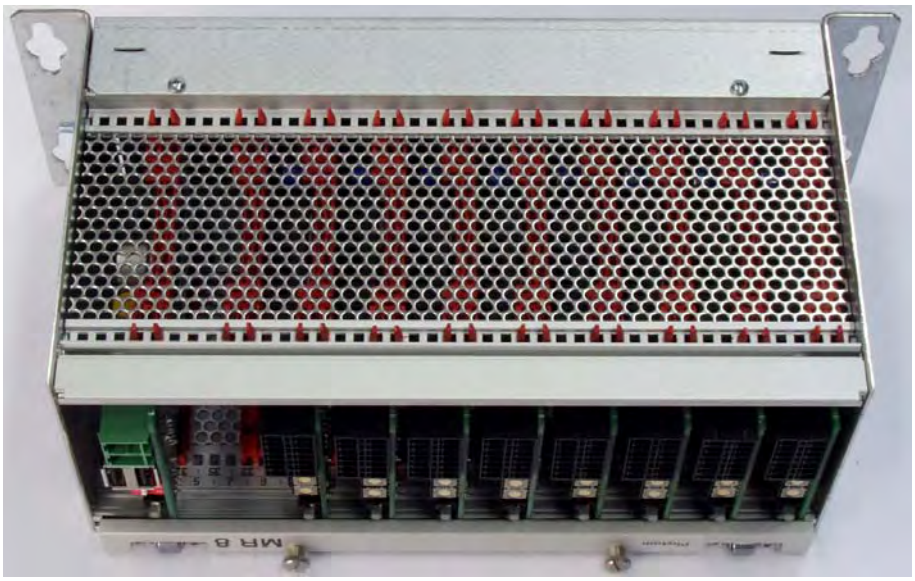
1. Tool: Torx screwdriver

2. Put the minirack on a rigid mat as follows:



3. Unscrew the 4 screws with the Torx screwdriver (S).

4. Remove the plate with the cable clamps (K).



5. Fix the ventilator plate on the perforated plate with the 4 screws (S) on the side.

6. Remove the cable clamps from the demounted plate and screw it on the ventilator plate.

7. Assemble the 2-pole mating connector (Phoenix, MC 1.5/2-ST-3.81) to the cable of the voltage supply.

8. Mount the voltage supply to the fan connector (Phoenix, MCVU1.5/2-GFD-3.81):

Don’t remove all plug-in boards during the ventilator plate mounting to keep the minirack rugged.

3 Power and ServiceBus Module (PSB Module)

Every minirack has a PSB module with 2 interfaces. The minirack can be connected to the PC/Controller or to another minirack.

There are two PSB modules which differ as follows:

1. The PSB module type **USB** (Fig. 4) with an integrated USB-RS 485 converter can directly be connected to the USB port of the PC.
   The rack with PSB module **USB** always gets the internal address 0.

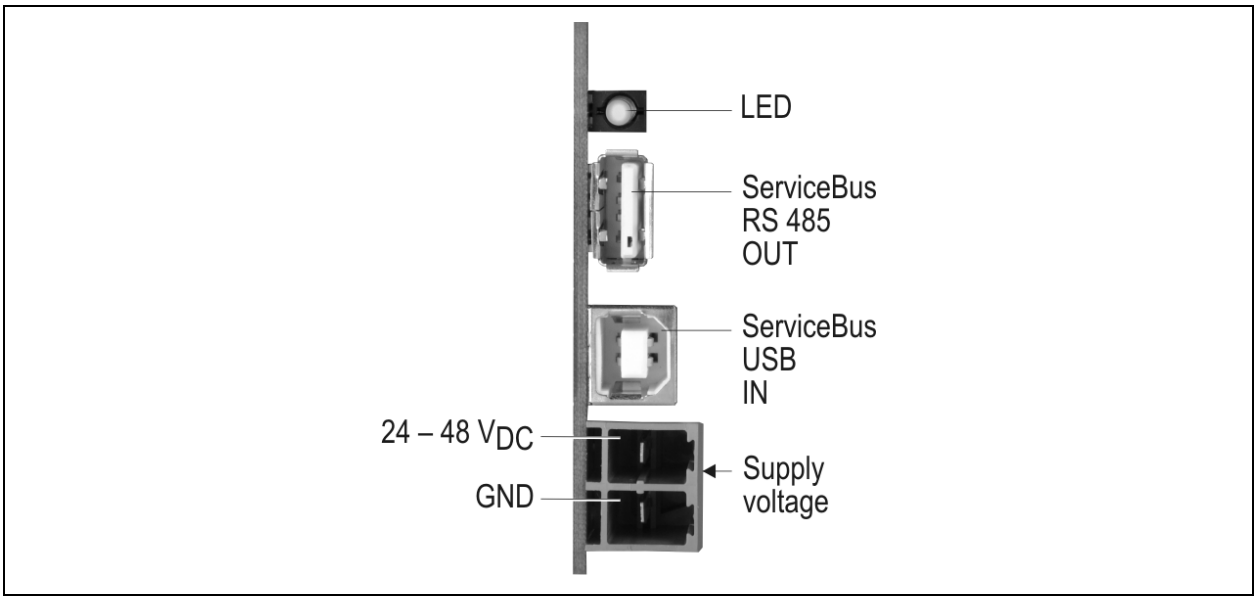


Fig. 4: PSB module type **USB** with **built-in** USB-RS 485 converter

2. The PSB module type **RS 485** (PSB module **without** USB-RS 485 converter) needs an external USB-RS 485 converter for ServiceBus connection to the PC (Fig. 5).
   The MR 8 racks are addressed by DIP switches (address 0 to 3) (also see chap. 1.3).

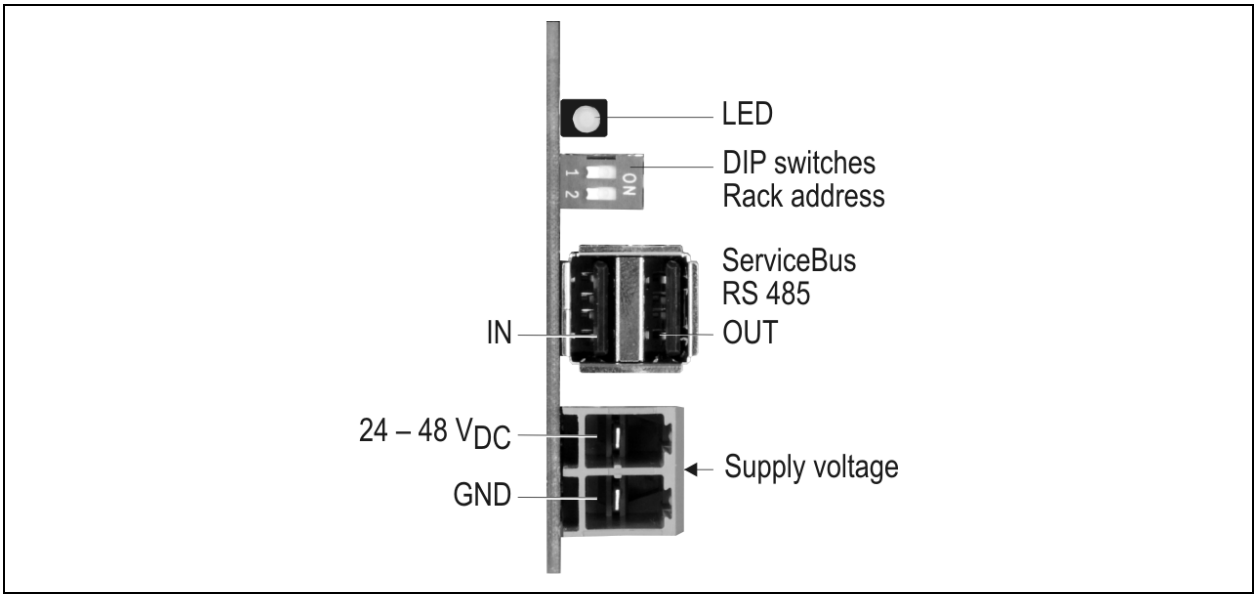


Fig. 5: PSB module type **RS 485 without** USB-RS 485 converter

3.1 Technical Data Table

Technical Data	
Supply voltage	24 to 48 $V_{DC,}$ max. 52 V_{DC} Nominal voltage 48 V_{DC} Up to 2.5 A are required for every plugged-in power stage. Maximum current: 20 A per rack Reinforced or double insulation between mains and secondary circuit is required.
Connector at the power supply cable	2-pole Phoenix Combicon connector, type PC5/2-ST-7.62
LED	LED shines green, if the PSB module is supplied by the operating voltage.
DIP switches	
PSB module type USB	Not available, minirack is always internally addressed by 0
PSB module type RS 485	For addressing the minirack (from address 0 to 3)
ServiceBus connector	
PSB module type USB	1 x ServiceBus USB IN, type DIN IEC 61076-3-108 1 x 4-pole ServiceBus RS 485 OUT, type DIN IEC 61076-3-107
PSB module type RS 485	1 x 4-pole ServiceBus RS 485 IN, type DIN IEC 61076-3-107 1 x 4-pole ServiceBus RS 485 OUT, type DIN IEC 61076-3-107
48-pole male multipoint connector	Connection to the minirack backplane

Technical Data	
Option: **Power stage A 32-48 MINI**	
Step resolution	
Rotary switch mode	The step resolution can be set by the rotary switch: **1/1, 1/2, 1/4, 1/5, 1/8, 1/10, 1/20** of a full step
ServiceBus mode	The step resolution is programmable: **1/1, 1/2, 1/4, 1/5, 1/8, 1/10, 1/16, 1/20**, 1/32, 1/64, 1/128, 1/256, 1/512 of a full step
Phase currents	
Rotary switch mode	Run current can be individually set by the upper rotary switch in 15 steps (1...9, A...F). 0.15 to 2.0 A_{rms} (without Boost) 0.19 to 2.5 A_{rms} (with Boost) 0.24 to 3.5 A_{Peak}
ServiceBus mode	Run current, stop current and boost current can be set independently by program. Programmable from: 0 / 0.1 to 2.5 A_{rms} in 10 mA steps.
Supply voltage	Unregulated filtered DC voltage from 24 to 48 V_{DC} Nominal current: up to 2.5 A_{rms} dependent on the connected motor
Inputs	Control Pulse, Motor Direction, Boost, Activation
Error output	The output opens in case of the following error signals: short circuit, overcurrent, undervoltage, overheat.
Accessories: **Ventilator plate**	
Type:	DC-fan 80 x 80 x 32, product NMB
Permissable supply voltage:	10 to 25.2 V_{DC}
Current:	210 mA
Air flow:	99.6 m^3/h
Revolution:	4350 rpm
Connector at supply voltage cable:	2-pole Phoenix, MC 1.5/2-ST-3.81

3.2 48-pole Male Multipoint Connector

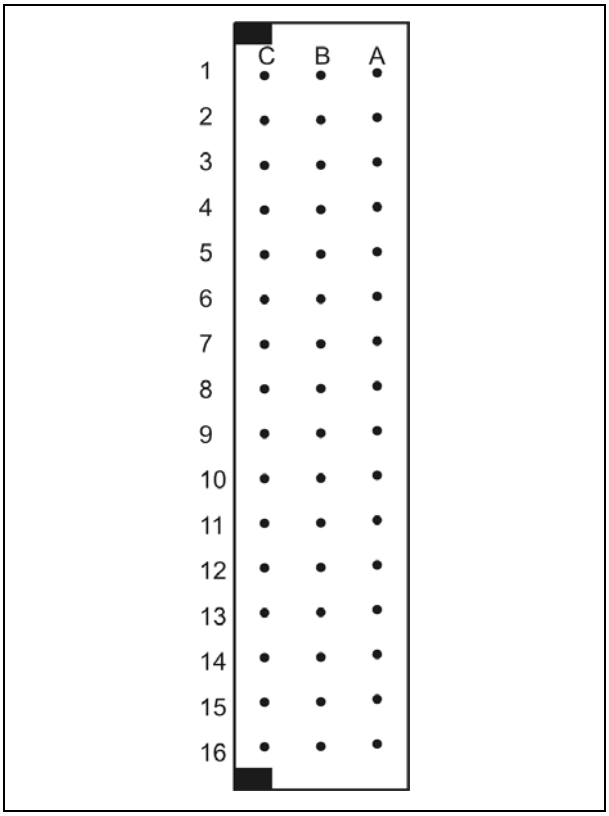


Fig. 6: 48-pole male multipoint connector for PSB module

Pin assignment :

Contact	Function	Contact	Function	Contact	Function
A1	$+U_{B1}$ (slot 0-3)	B1	$+U_{B1}$ (slot 0-3)	C1	$+U_{B1}$ (slot 0-3)
A2	$+U_{B1}$ (slot 0-3)	B2	$+U_{B1}$ (slot 0-3)	C2	$+U_{B1}$ (slot 0-3)
A3	$+U_{B1}$ (slot 0-3)	B3	$+U_{B1}$ (slot 0-3)	C3	$+U_{B1}$ (slot 0-3)
A4	$+U_{B2}$ (slot 4-8)	B4	$+U_{B2}$ (slot 4-8)	C4	$+U_{B2}$ (slot 4-8)
A5	$+U_{B2}$ (slot 4-8)	B5	$+U_{B2}$ (slot 4-8)	C5	$+U_{B2}$ (slot 4-8)
A6	$+U_{B2}$ (slot 4-8)	B6	$+U_{B2}$ (slot 4-8)	C6	$+U_{B2}$ (slot 4-8)
A7	GND Power	B7	GND Power	C7	GND Power
A8	GND Power	B8	GND Power	C8	GND Power
A9	GND Power	B9	GND Power	C9	GND Power
A10	GND Power	B10	GND Power	C10	GND Power
A11	GND Power	B11	GND Power	C11	GND Power
A12	V_{CC}	B12	V_{CC}	C12	V_{CC}
A13	RS 485 +R	B13	RS 485 +T	C13	GND logic
A14	RS 485 -R	B14	RS 485 -T	C14	GND logic
A15	GND logic	B15	GND logic	C15	GND logic
A16	Address 3	B16	Address 4	C16	GND logic

3.3 ServiceBus Connector (Interfaces)

Every minirack has a PSB module with 2 interfaces. The MR 8 can be connected to the PC/Controller or to another minirack:

PSB module type **USB** (Fig.7 and Fig.8)

- Above: 4-pole ServiceBus connector, type A, used as ServiceBus output connector to the next minirack.
- Below: USB connector, type B, used as input connector from PC/controller.

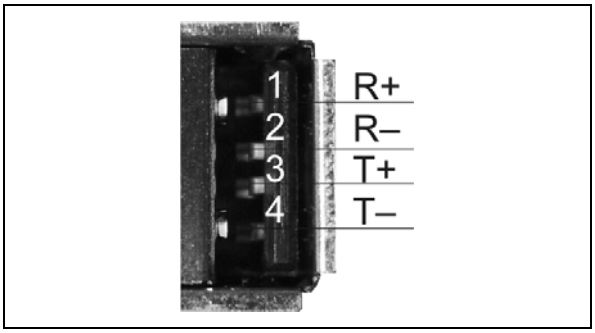


Fig. 7: Female connector for 4-pole ServiceBus connector OUT (above) type A (DIN IEC 61076-3-107)

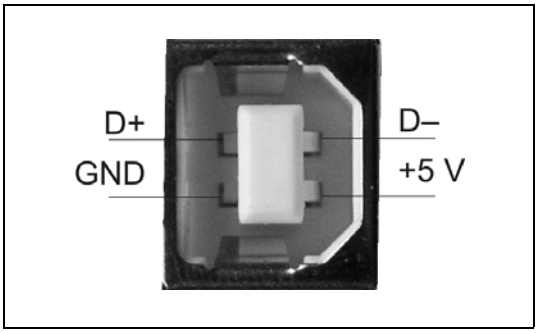


Fig. 8: ServiceBus IN (below) type B (DIN IEC 61076-3-108)

PSB module **RS 485 without** USB-RS 485 converter (Fig. 9)

- Left and right: 4-pole ServiceBus connector, type A for ServiceBus input or output connector.

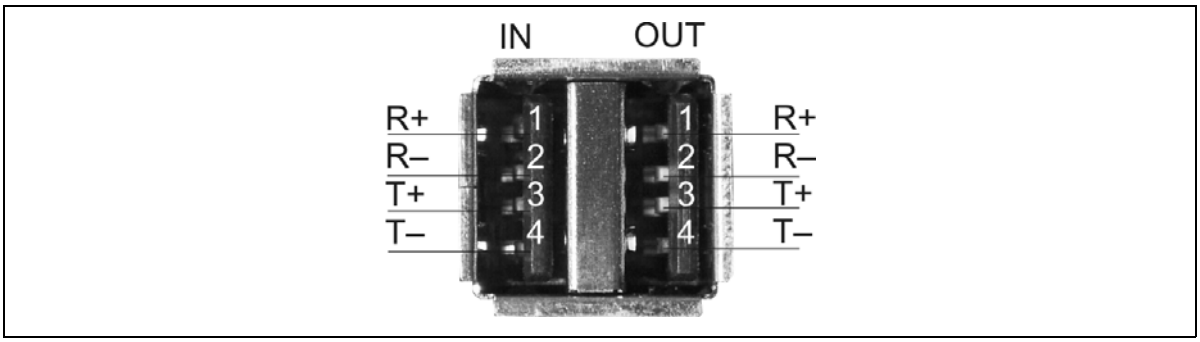


Fig. 9: Female connectors for 4-pole ServiceBus RS485 connector IN and OUT type A (DIN IEC 61076-3-107)

Remark:
The 4-pole ServiceBus connectors are externally similar to the standard USB connectors, but have **no** USB functionality!

3.4 USB Driver Installation

Important: Administrator authorizations are required for the driver installation!

- Power on your PC. When the desktop is ready, insert the phytron CD and open the folder **USB Driver** by the Windows Explorer. Select the .**exe**-program which goes with your system software and start it by double click. The following window is shown on your desktop after a successful installation:

- Connect the PSB module directly or via USB converter to the USB port of your PC by USB cable.

  Important: Only use an USB cable with a maximum length of 2 m!

- For checking the correct USB driver installation, continue as follows:

  Start the device manager by clicking **Start→Settings→System control** and double-click on **System**. Then select the **Device manager** tab. The USB components can be found in **Computer→ Ports** and in **Universal Serial Bus Controller**. Here the new USB component is shown: **USB Serial Port (Com X)**

- **Important:** If you want to test several USB devices, which are identical in construction, you should use the same USB port on the PC. Thus, you avoid to change the COM port number.

- You'll also find information about the driver installation for the chip FT232R on http://www.ftdichip.com.

4 Supply Voltage

MR 8 can be supplied by means of an unregulated filtered DC voltage from 24 to 48 V_{DC}.

Admissible voltage range: 24 to 48 V_{DC}

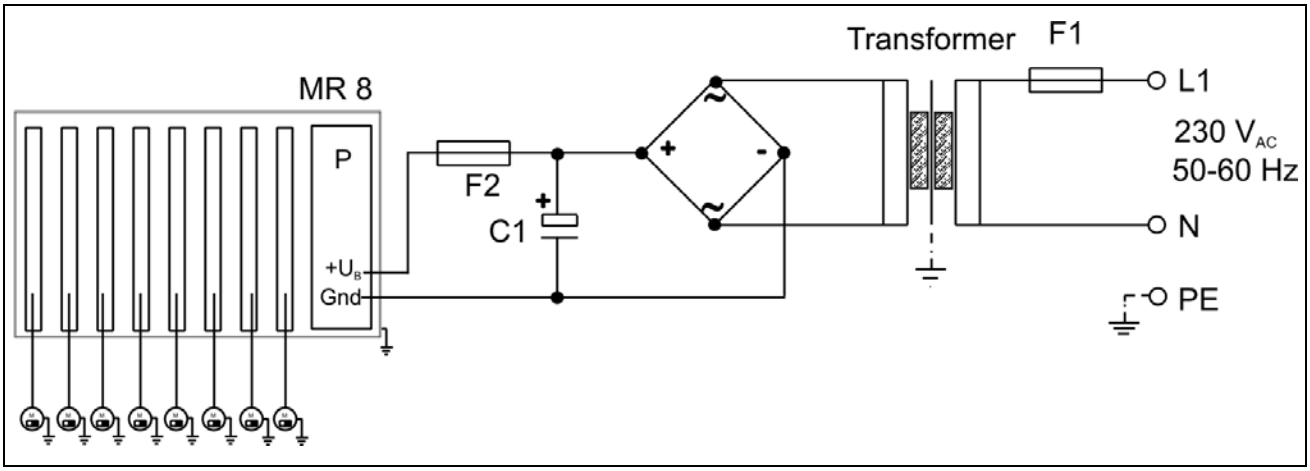


Fig. 10: Power supply unit

The following instructions must be followed for calculation and connection of the supply unit:

- ⚠ The transformer should be constructed with reinforced or double insulation.
- The secondary winding of the transformer should not be grounded (SELV supply).
- The calculation of the fuse F2 depends on the preset phase current and the motor load. T3 A is recommended.
- A value of 1,000 µF per Amp of motor current should be calculated for the load capacitor C1.
- Use a shielded cable for DC supply.

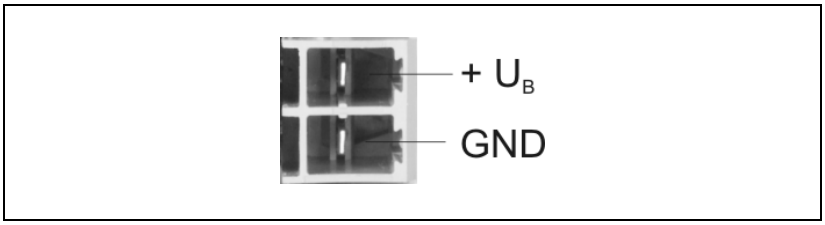


Fig. 11: 2-pole Phoenix connector PC4/7.62

Remark: The MR 8 is **protected** against polarity!

4.1 Isolation Overview

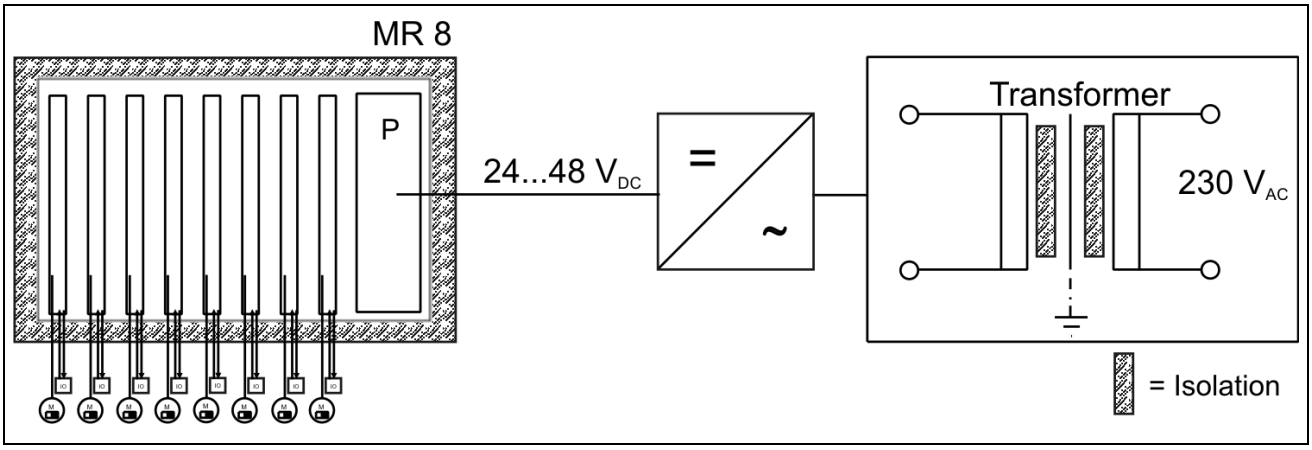


Fig. 12: MR 8 Isolation

The transformer should be constructed with reinforced or double insulation for safe operation of the MR 8 with voltages up to 48 V.

The insulation of the minirack fulfills the requirements of a basic insulation for non-mains-circuits for voltages up to 71 V acc. to EN 50178.

The device has been designed for degree of pollution 2 acc. to EN 50178.

The RS 485 signals at the ServiceBus connector are optically insulated by a separated DC/DC converter from the motor voltage (withstand voltage 1000 V_{DC}).

Devices connected to MR 8 for control or communication should have reinforced or double insulation acc. to EN 50178.

5 ServiceBus

The **ServiceBus** is used to communicate with the power stages by RS 485 or USB.

The ServiceBus mode is activated by the **both** rotary switches on every power stage:

- If **both** rotary switches **of all** power stages A 32-48 are set on position **‚0'**, the operating parameters of the power stage can be read or written.
- If both rotary switches are **sized ‚0'**, the operating parameters can **only** be read.

The addressing of the power stage is specified by the power stage slot in the minirack. Therefore the parameters which are programmed via ServiceBus can be allocated clearly. Every minirack contains up to 8 plugged-in power stages and 4 miniracks can be connected and addressed, i.e. up to 32 axis can be controlled.

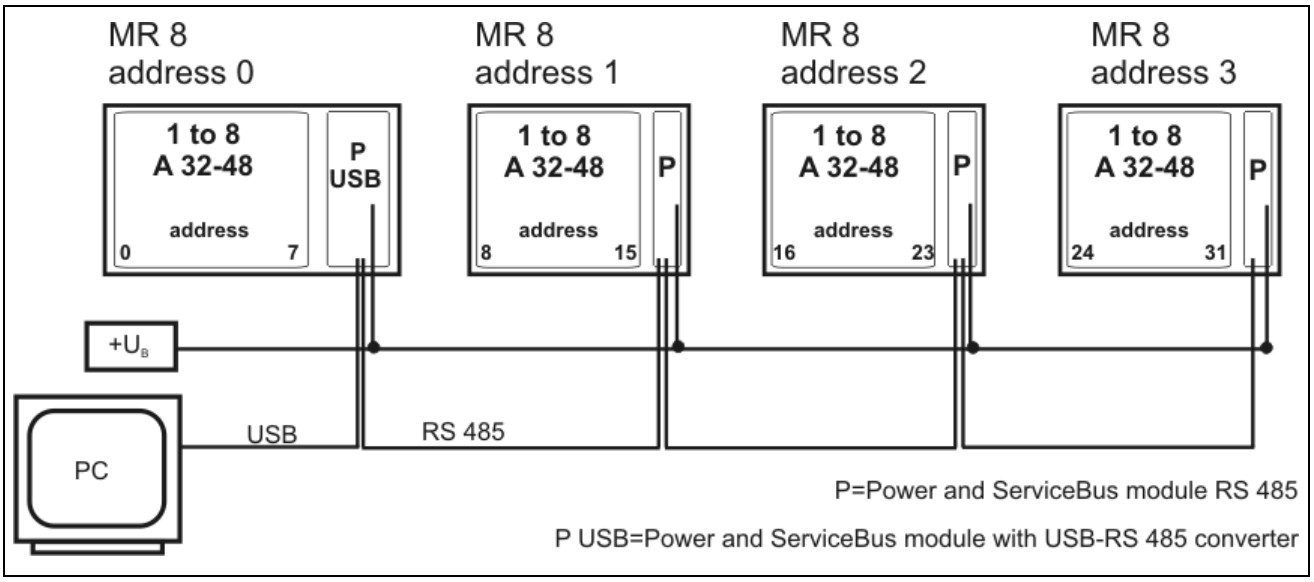


Fig. 13: Connection diagram of MR 8 in ServiceBus mode (option 1)

Important: The rack with PSB module type **USB** is always addressed by address 0. All other racks equipped with PSB module RS485 are addressed continuously by DIP switches (address 1 to 3).

5.1 RS 485 Connection

There are several possibilities for RS 485 connection (4-wire-mode) in the ServiceBus mode:

Option 1: RS 485 connection with **built-in** USB-RS 485 converter

An USB cable A-B connects the USB interface (USB connector type B) of the first MR 8 to PC (USB connector type A). This rack is automatically addressed by 0. The other racks MR 8 are connected by the cable (type A-A) and are continuously addressed by 1 to 3 (Fig. 14).

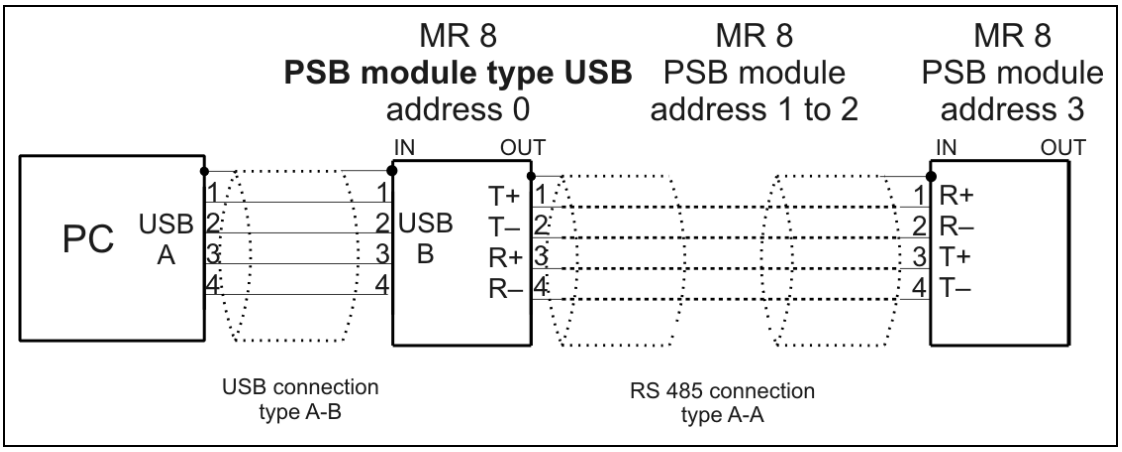


Fig. 14: PC connection → MR 8 with PSB module type **USB**

Option 2: RS 485 connection with **external** USB-RS 485 converter

An USB cable A-B connects the USB interface (USB connector type B) of the USB-RS 485 converter to the PC (USB connector type A). Up to 4 MR 8 racks can be connected one after another by a cable (type A-A). The addresses of all MR 8 are defined by DIP switches (see chap. 1.3).

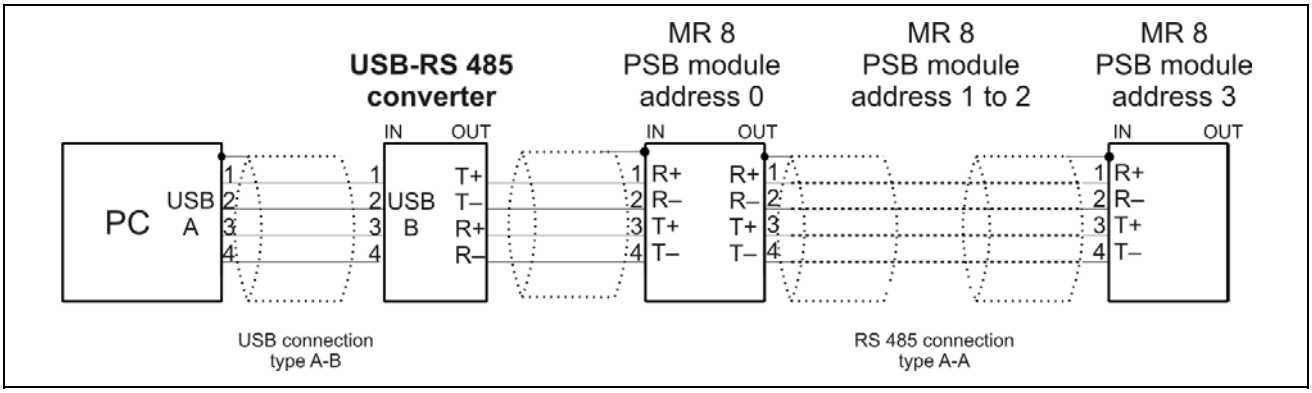


Fig. 15: PC connection → MR 8 with **external** USB-RS 485 converter

Option 3: RS 485 connection with RS 422/RS 485 interface (4-wire mode)

The MR 8 can also be connected to the PC via RS 422/RS 485 interface by a suitable cable.

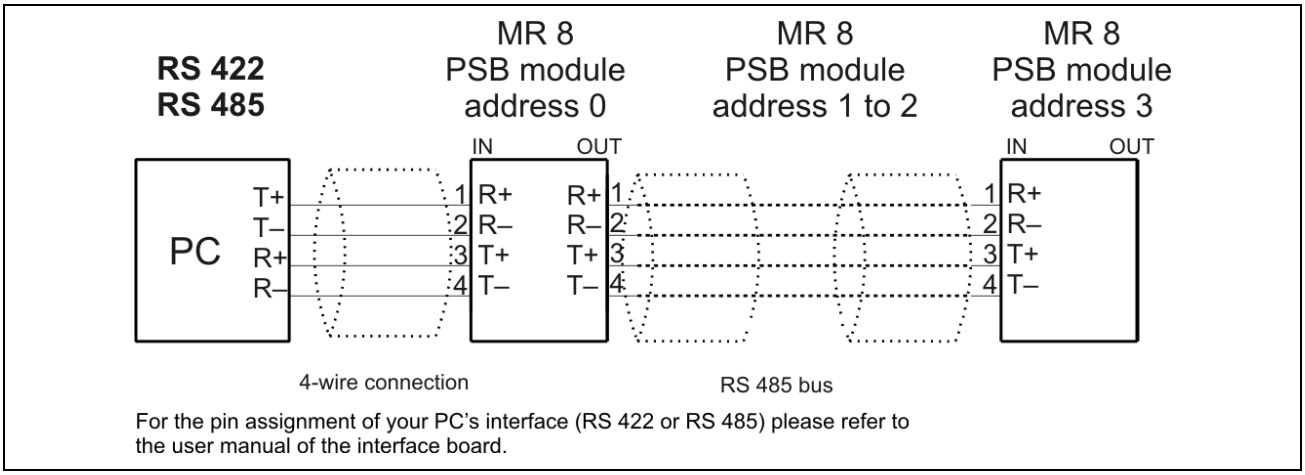


Fig. 16: PC connection → MR 8 with RS 422 or RS 485 interface

Important: When the MR 8 is connected to the PC by USB interface, USB drivers have to be installed on the PC. You find them on the phytron CD (chap. 3.4).

Appendix A

In this chapter warranty, trade marks and ESD protective measures are described.

A1 Warranty

The MR 8 with the A 32-48 MINI power stages are subject to **legal warranty**. Phytron will repair or exchange devices which show a failure due to defects in material or caused by the production process. This warranty does not include damages which are caused by the customer, as there are, for example, not intended use, unauthorized modifications, wrong treatment or wrong wiring.

A2 Trade Marks

In this manual several trade marks are used which are no longer explicitly marked as trade marks within the text. The lack of this signs may not be used to draw the conclusion that these products are free of rights of third parties. Some product names used herein are for instance

- ServiceBus-Comm is a trade mark of the Phytron-Elektronik GmbH.
- Microsoft is a registered trade mark and WINDOWS is a trade mark of the Microsoft Corporation in the USA and other countries.

A2 ESD Protective Measures

All the products which we deliver have been carefully checked and submitted to a longterm test. To avoid the failure of components sensitive to electrostatic discharge (ESD), we apply a great number of protective measures during manufacturing, from the component input check until the delivery of the finished products.

Warning:

Manipulation of ESD sensitive devices must be effected by respecting special protective measures (EN 61340–5). Only return the modules or boards in adapted packaging.

Phytron's warranty is cancelled in case of damages arising from improper manipulation or transportation of ESD modules and components.

Appendix B: Declarations of Conformity

Phytron-Elektronik GmbH

EG-Konformitätserklärung

Declaration of Conformity

Hiermit erklären wir, dass die Bauart der nachfolgend bezeichneten Produkte in der von uns in Verkehr gebrachten Ausführung den unten genannten einschlägigen EG-Richtlinien entspricht.

We, the manufacturer, declare hereby on our own responsibility, that the following products meet all the provisions of the EU directive cited below:

Produktbezeichnung ***Part name***	**Identnummer** ***ID-No.***	**Ab Seriennr.** **From *Serial No***
MR8+ mit 8 A32-48 MINI Typ RS485 MR8+ mit 8 A32-48 MINI Typ USB	10006799, 10007906, 10008235	Alle/all

Angewendete EG-Richtlinie / *EU Directive Applied*:
89/336/EWG vom 3. Mai 1989 (EMV-Richtlinie) *89/336/EEC of May 3rd, 1989 (EMC Directive)*

Angewendete harmonisierte Normen / *Harmonized Standards Applied*:		
EN 61000-3-2	2006-10	Elektromagnetische Verträglichkeit (EMV) Grenzwerte für Oberschwingungsströme *Limits for harmonic current emissions*
EN 61000-6-3	2005-11	Elektromagnetische Verträglichkeit (EMV) Fachgrundnorm Störaussendung - Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe *Electromagnetic compatibility (EMC) - Emission standard for residential, commercial and light-industrial environments*
EN 61000-6-4	2002-08	Elektromagnetische Verträglichkeit (EMV) - Fachgrundnorm Störaussendung für Industriebereich *Electromagnetic compatibility (EMC) - Emission standard for industrial environments*
EN 61000-6-1	2002-08	Elektromagnetische Verträglichkeit (EMV) - Störfestigkeit für Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe *Electromagnetic Compatibility (EMC) - Immunity for residential, commercial and light-industrial environmental*
EN 61000-6-2	2002-08	Elektromagnetische Verträglichkeit (EMV) - Störfestigkeit für Industriebereiche *Electromagnetic compatibility (EMC) - Immunity for industrial environments*

Anmerkung/*Comment:*

Gröbenzell, den 02. Oktober 2007 / Gröbenzell, October 2nd, 2007

Heribert Schmid
Technischer Geschäftsführer/ Managing Director

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Phytron-Elektronik GmbH

EG-Herstellererklärung

gemäß EG-Richtlinie Maschinen 98/37/EG, Anhang II B

Declaration of Conformity
According to EC Directive on Machinery 98/37/EC, Annex II B

Hiermit erklären wir, dass es sich bei dieser Lieferung um die nachfolgend bezeichnete unvollständige Maschine handelt. Die Inbetriebnahme dieser Maschine/des Maschinenteils ist so lange untersagt, bis festgestellt wurde, dass die Maschine, in die sie eingebaut werden soll, den Bestimmungen der EG-Richtlinien Maschinen 98/37/EG entspricht.

We, the manufacturer, declare that this delivery is for an incomplete machinery as defined below. The start-up of this machine/machine part is prohibited until it has been determined that the machine in which it is to be incorporated complies with the requirements of EC machine guidelines 98/37/EC machine guidelines 98/37/EC.

Produktbezeichnung ***Part name***	**Identnummer** ***ID-No.***	**Ab Seriennr.** **From *Serial No***
MR8+ mit 8 A32-48 MINI Typ RS485 MR8+ mit 8 A32-48 MINI Typ USB	10006799, 10007906, 10008235	Alle/all

Angewendete harmonisierte Normen / *Harmonized Standards Applied*:	
EN 12100-1: 2004-04	Sicherheit von Maschinen - Grundbegriffe, allgemeine Gestaltungsleitsätze - Teil 1: Grundsätzliche Terminologie, Methodologie
EN 12100-2: 2004-04	Sicherheit von Maschinen - Grundbegriffe, allgemeine Gestaltungsleitsätze - Teil 2: Technische Leitsätze
EN 60204-1: 1998-11	Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen

Anmerkung/*Comment:*
Diese Erklärung verliert ihre Gültigkeit bei baulicher Veränderung und bei nicht bestimmungsgemäßer Verwendung, sofern nicht ausdrücklich die schriftliche Zustimmung des Herstellers vorliegt.

This declaration loses its validity as a result of structural alterations and/or use other than defined, unless the express written approval of the manufacturer is present.

Gröbenzell, den 02. Oktober 2007 / Gröbenzell, October 2nd, 2007

Heribert Schmid
Technischer Geschäftsführer/ Managing Director

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