

BP2/BP2-BOX

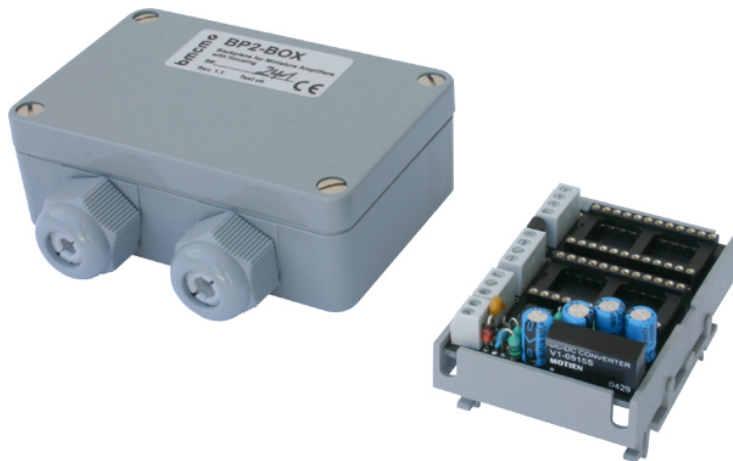
Backplane for Measuring Amplifiers of the MAL Series

Features

- 2 DIL sockets for MAL amplifiers
- screw terminals for all connections
- with isolated power supply
- BP2: incl. DIN rail adapter
- BP2-BOX: incl. IP65 box

Applications

- supervision of processes
- development
- sensor adjustment



The **BP2/BP2-BOX** (BackPlane 2) accommodates

... 2 measuring amplifiers ...

of the **MAL** series or of other manufacturers of miniature amplifiers.

The **BP2/BP2-BOX** provides the plugged amplifiers with

... electrically isolated power supply... .

The measuring amplifier modules required for signal conditioning are

... very reasonable ...

standard amplifiers in type of construction like a 24-pole IC component.

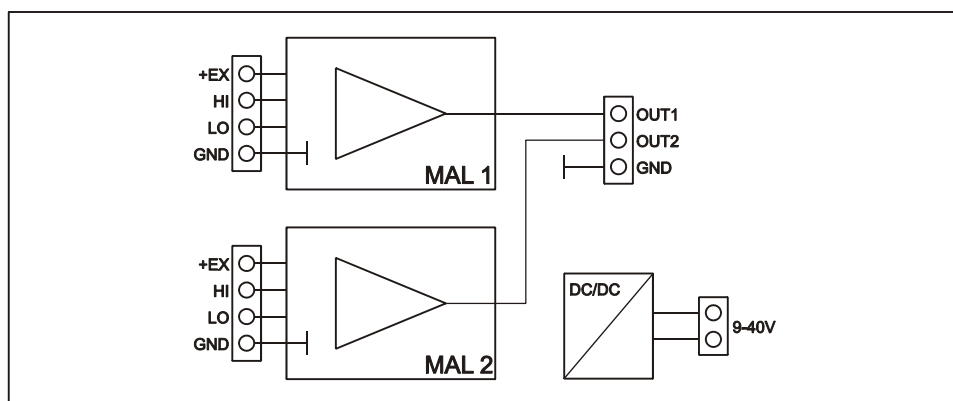
To achieve optimum results a good shared potential of the signals to be measured is necessary, as the measuring amplifiers are not electrically isolated.

The input signals are connected at the 4-pole terminals. The output signals of the measuring amplifiers can be reached at a 3-pole terminal.

A temperature reference component for thermocouple measurements is integrated on the **BP2/BP2-BOX** board already.

The **BP2/BP2-BOX** is especially suitable for remote conditioning of passive sensors.

1 Block diagram



2 Connections of the BP2/BP2-BOX

All connections are accessible directly on the backplane via its terminals.

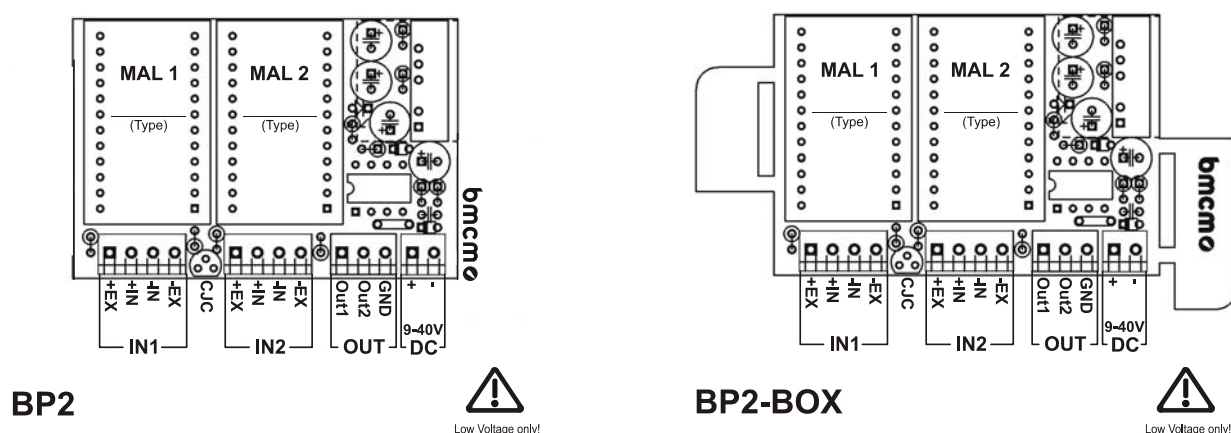
The power supply is electrically isolated and is connected at a 2-pole terminal. With sensors connected it is 9-45V DC and max. 1.5W power.

The 2 analog inputs or sensors are connected at the 4-pole terminals of the **BP2/BP2-BOX**. The backplanes **BP2/BP2-BOX** can be equipped channelwise with measuring amplifiers of the **MAL** series. That means that all inputs can be adjusted to the most different signals and sensors.

The 2 analog outputs are connected at the 3-pole terminal.

3 Layout diagram of the BP2/BP2-BOX

The sockets for the measuring amplifiers on the **BP2/BP2-BOX** are numbered respectively. The assignment of the terminals is shown in the following figure:



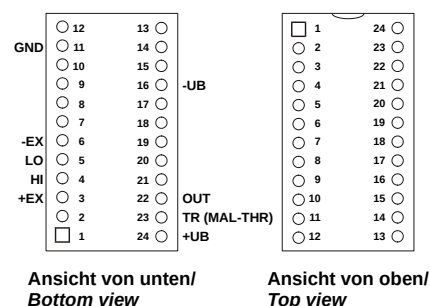
Check for correct poling. Change amplifiers only at no load!

4 Pin assignment of the DIL socket when using MAL amplifiers

The pin assignment of the measuring amplifier DIL sockets is illustrated on the figure on the right and the following table.

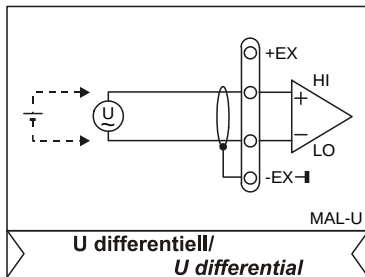
For information about the various measuring amplifier types, please refer to the data sheet of the **MAL**.

It is also possible to use standard measuring amplifiers of other manufacturers together with the **BP2/BP2-BOX**, as it is provided with accessible module configuration jumpers (solder bridges) on the underside of the board for all other functions (A1+2, V1-3) of the standard measuring amplifiers. For further information about their pin assignment please refer to the documentation of your measuring amplifier.



Pin	Name	Function	Pin	Name	Function	Pin	Name	Function
1	n.c.	-	9	n.c.	-	17	n.c.	-
2	n.c.	-	10	n.c.	-	18	n.c.	-
3	+EX	+ sensor supply	11	GND	ground	19	n.c.	-
4	+IN	HI signal input	12	n.c.	-	20	n.c.	-
5	-IN	LO signal input	13	n.c.	-	21	n.c.	-
6	-EX	- sensor supply	14	n.c.	-	22	OUT	amplifier output ($\pm 5V$)
7	n.c.	-	15	n.c.	-	23	TR	temperature reference (MAL-THR only)
8	n.c.	-	16	-UB	neg. supply (-12V)	24	+UB	pos. supply (+12V)

5 Connecting examples for using the BP2/BP2-BOX with MAL-xx



5.1 Voltage DC

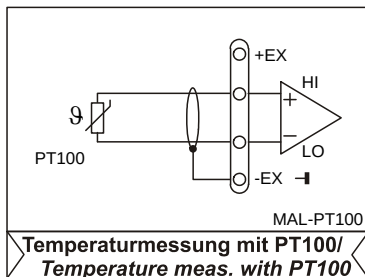
The module output is proportional to the input voltage.

MAL-U01 (PL10 closed): $\pm 1\text{V}$ (input) $\approx \pm 5\text{V}$ (output)

MAL-U05 (PL11 closed): $\pm 5\text{V}$ (input) $\approx \pm 5\text{V}$ (output)

MAL-U10 (PL12 closed): $\pm 10\text{V}$ (input) $\approx \pm 5\text{V}$ (output)

For unipolar measurements LO and -EX must be connected with each other. +EX is without function.

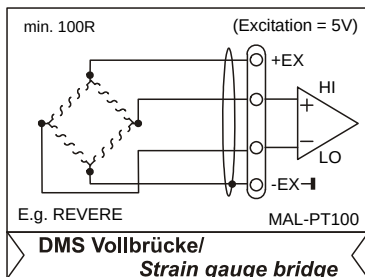


5.2 PT100 in 2-wire measurement

PT100 measuring resistors itself are not linear, but are linearized by the MAL-PT100 measuring amplifier.

Ex works the module is precalibrated for 2-wire measurement (PL3 + PL4 closed).

At temperatures below 0°C the module provides negative output voltages, yet with small linearizing errors.

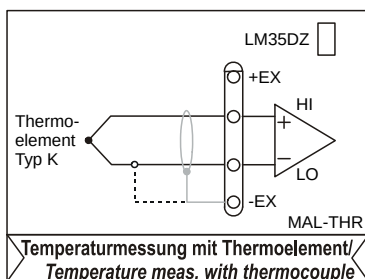


5.3 Strain gauge in full-bridge circuit

The strain gauge bridge is supplied with a +5V DC voltage. The measuring range is $\pm 5\text{mV/V}$. The input amplifier is operated differentially and adjusted with a $1\text{k}\Omega$ bridge resistor. Using bridge resistors higher or lower than $1\text{k}\Omega$ may lead to measuring errors.

To activate the excitation, close solder bridge PL1 (open ex works) of the MAL-DMS.

If connecting a resistor half-bridge, that is not equivalent in value to the strain gauges, offset errors may occur, but which can be calibrated.



5.4 THR with thermocouple compensation

The **THR** amplifier serves for the acquisition of thermocouples type K and is not linearized. The input amplifier is operated differentially, but has a connection to ground with $10\text{k}\Omega$.

The amplifier is prepared for a cold junction compensation and calibrated. Therefore a temperature semi-conductor reference sensor (LM35DZ) with an absolute accuracy of $\pm 1^\circ\text{C}$ is installed at the terminals. The sensor is supplied by the **BP2/BP2-BOX** and works between $0..70^\circ\text{C}$.

6 Important notes for using the BP2/BP2-BOX

- The **BP2/BP2-BOX** is only suitable for extra-low voltages - please observe the relevant regulations!
- For the power supply, an electrically isolated power unit (with CE) must be used.
- All accessible pins are electrostatic devices. Workplace must be conductive during installation.
- For reasons relating to EMC the **BP2/BP2-BOX** must only be operated in closed housings.
- Use screened cables! Connect the shield of the sensor lines at one end only. Close open inputs if possible. ESD voltages on lines might lead to measuring errors.
- The ground of the **BP2/BP2-BOX** is electrically connected to the ground of the measuring system. Usually the ground of the measuring system is earthed, too. Be sure to avoid ground loops since they will cause measuring errors!
- For cleaning use water and mild detergent only. The product is designed to be maintenance-free.
- The product must not be used for any safety-relevant tasks. By using or processing this product the customer becomes manufacturer by law and therefore is responsible for the proper installation, use and handling of the product. In the case of improper use or unauthorized interference our warranty ceases and any warranty claims are excluded.



Do not dispose of the product in the domestic waste or at any waste collection places. It has to be either duly disposed according to the WEEE directive or can be returned to bmcm at your own expense.

7 Technical Data BP2/BP2-BOX (typical at 20°C)

• General Data

Power supply:	+9...45V DC, typ. 0.5W, max. 1.5W
Amplifier supply:	app. $\pm 12V$ max. 40mA, electrically isolated from the power supply
CE standards:	EN61000-6-1, EN61000-6-3, EN61010-1; for decl. of conformity (PDF) visit www.bmcm.de
ElektroG // ear registration:	RoHS and WEEE compliant // WEEE Reg.-No. DE75472248
Max. permissible potentials:	60V DC acc. to VDE , max. 1kV ESD on lines
Analog inputs:	2x 4-pole terminal
Analog outputs	3-pole terminal
Connection for power supply:	2-pole terminal
Temperature range:	-25°C...+70°C
Relative humidity	0 - 90% (not condensing)
Protection type BP2:	IP00
Protection type BP2-BOX:	IP54
Dimensions BP2:	app. 65 x 45 x 35 mm ³
Dimensions BP2-BOX:	app. 100 x 85 x 35 mm ³
Delivery BP2:	BP2 with DIN rail adapter
Delivery BP2-BOX:	BP2 in a plastic housing with 2 PG screws in IP65 construction
Guarantee:	2 years with effect from sales date, damages resulting from improper use excluded

• Available Accessories

Measuring Amplifiers:	miniature measuring amplifiers and converters of the MAL / MAL-ISO series; waterproof housings ZU-PBOX-PG, ZU-PBOX-LAN
Power supply:	power supply ZU-PW10W (12V, 1A)