

# BP104

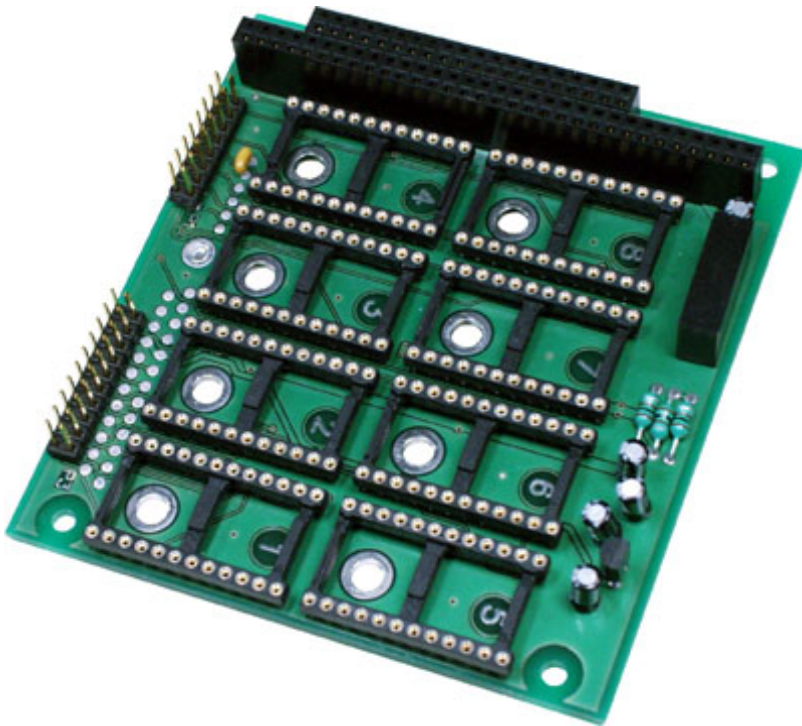
PC/104 carrier board for miniature amplifiers of the MAL series

## Features

- 8 sockets for MAL amplifiers
- integrated power supply
- mounting in PC/104 systems

## Applications

- supervision of processes
- control
- development



The PC/104 carrier board **BP104** provides for 8 DIL sockets to plug in

... 8 measuring amplifiers ...

of the *MAL* series. Integrated into a PC/104 system together with a PC measuring card you get an efficient complete measuring system. The **BP104** provides the plugged *MAL* and connected sensors with

... electrically isolated power supply ...

from the PC/104 system. The measuring amplifiers required for signal conditioning are

... reasonable ...

standard measuring amplifiers.

On account of the missing electrical isolation of the measuring amplifiers remember to have a good shared potential of the measured signals to receive optimum results.

The in- and output signals are connected at one plug each.

The bmcm measuring systems provide for an internal connection for the analog inputs, so that the output signals with short lines can be lead inside the device between the **BP104** and the measuring system.

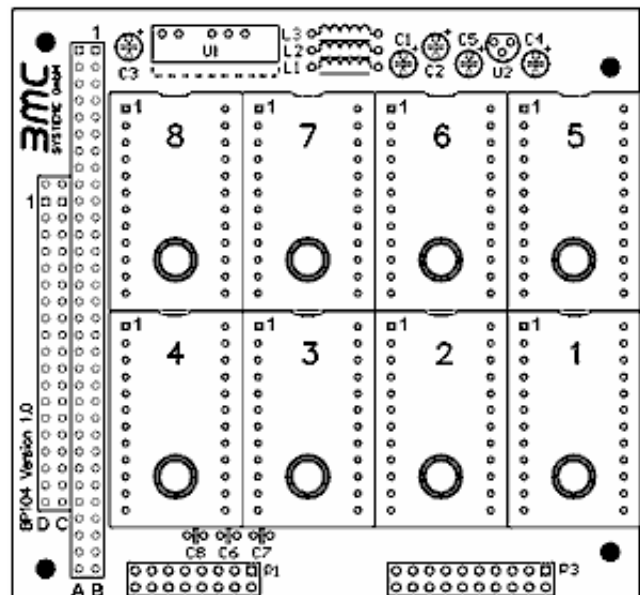
## Connections

The figure on the right gives an overview of the components and the connections of the **BP104**.

P3 is the analog input plug, P1 the analog output plug.

The power supply is lead out at the PC/104 system plug. The 5V DC voltage is electrically isolated by a DC/DC converter on the **BP104**.

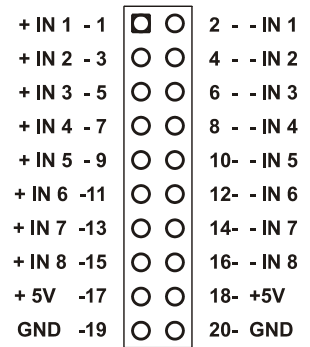
The amplifiers slots are numbered from channel 1 = 1 to channels 8 = 8 on the board. When mounting the MAL measuring amplifiers on the carrier board please observe their correct alignment (Pin1).



### Analog input plug P3

The connection for the 8 analog inputs is realized as a 20 pole pin connector.

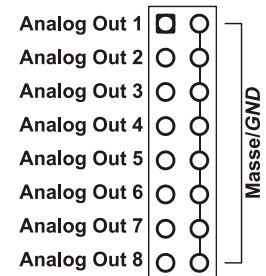
Pin	Analog IN	Function
1/2	+IN1/-IN1	measuring amplifier input 1
3/4	+IN2/-IN2	measuring amplifier input 2
5/6	+IN3/-IN3	measuring amplifier input 3
7/8	+IN4/-IN4	measuring amplifier input 4
9/10	+IN5/-IN5	measuring amplifier input 5
11/12	+IN6/-IN6	measuring amplifier input 6
13/14	+IN7/-IN7	measuring amplifier input 7
15/16	+IN8/-IN8	measuring amplifier input 8
17/18	+5V	current output for sensor supply
19/20	GND	GND potential



### Analog output plug P1

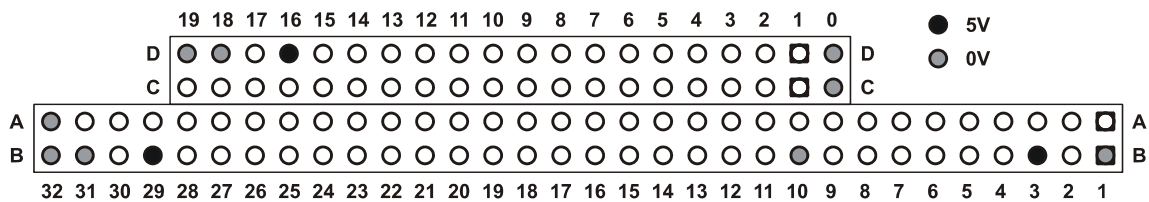
The connection for the 8 analog outputs is realized as a 16 pole pin connector.

Pin	Function
1	measuring amplifier output 1
3	measuring amplifier output 2
5	measuring amplifier output 3
7	measuring amplifier output 4
9	measuring amplifier output 5
11	measuring amplifier output 6
13	measuring amplifier output 7
15	measuring amplifier output 8
2,4,6,8,10,12,14,16	ground (GND)



### PC/104 system connector

The PC/104 system connectors of the **BP104** are used for power supply only. All other lines are just connected through the PC/104 system connector. The pin assignment complies with the PC/104 standards. For further information about the PC104 standard visit the web at [www.pc104.de](http://www.pc104.de).



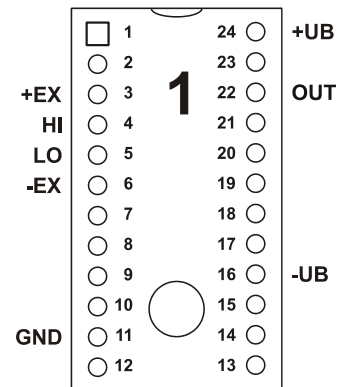
The +5V DC are lead out at pin B3, B29 and D16 of the PC/104 system plug. The 0V can be taken from pin A32, B1, B10, B31, B32, C0, D0, D18, D19 of the PC/104 system plug.

## Measuring amplifier slots

The pin assignment of the measuring amplifier sockets is illustrated in the figure on the right and the following table if using *MAL* amplifiers.

For using the appropriate measuring amplifier we refer to the documentation of the *MAL*.

If you don't need a slot, e.g. if you only measure voltages, you can skip it by closing the two soldering bridges underneath this slot on the bottom side of the backplane.



Pin	Name	Function
1	n.c.	-
2	n.c.	-
3	+EX	+ sensor supply
4	+IN	HI signal input
5	-IN	LO signal input
6	-EX	- sensor supply
7	n.c.	-
8	n.c.	-
9	n.c.	-
10	n.c.	-
11	GND	ground
12	n.c.	-

Pin	Name	Function
13	n.c.	-
14	n.c.	-
15	n.c.	-
16	-UB	negative supply (-12V)
17	n.c.	-
18	n.c.	-
19	n.c.	-
20	n.c.	-
21	n.c.	-
22	OUT	amplifier output ( $\pm 5V$ )
23	n.c.	-
24	+UB	positive supply (+12V)



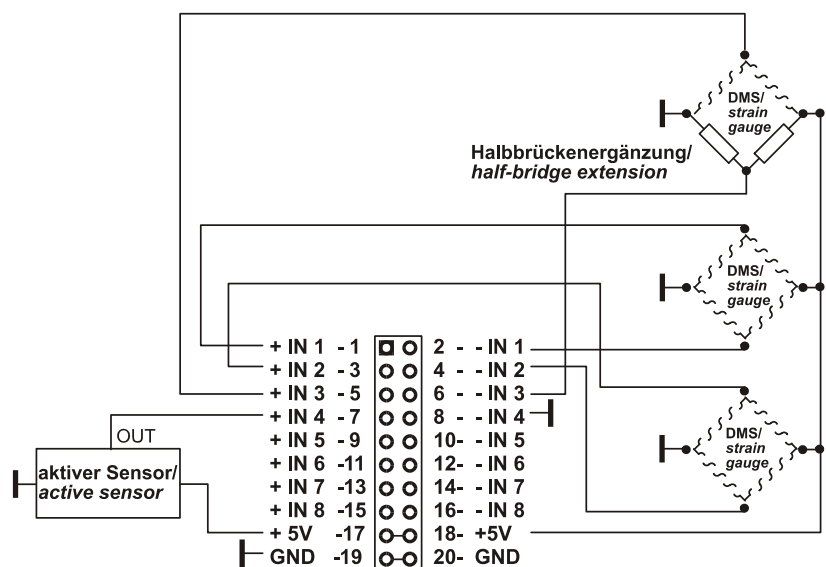
- When mounting the measuring amplifiers on the carrier board please observe their correct alignment and change them only at no load!
- If the BP104 is supplied with MAL measuring amplifiers, the standard construction height of 15mm is exceeded, so that you possibly have to keep more space to the next PC/104 board.
- Please make sure that the BP104 with the amplifiers is not exposed to high temperature changes e.g. by the power supply. This may lead to drift reactions of the amplifiers otherwise.

## Connecting examples for the BP104

The sensor supplies of the measuring amplifiers are not lead out to the input plug of the **BP104** (exception: resistance measurement as 2-wire measurement).

The sensor supply (+5VDV) is produced electrically isolated separately from the measuring amplifiers on the **BP104**.

For half-bridge measurements the half-bridge must be supplemented with precise resistors (e. g. 1k $\Omega$  0.1%).



## Important notes for using the BP104

- The **BP104** is only suitable for extra-low voltages, please observe the relevant regulations!
- Only use an electrical isolated power supply unit (with CE).
- All accessible pins are electrostatic devices. Workplace must be conductive during installation.
- The construction height depends on the height of the used measuring amplifiers.
- The **BP104** must only be used in closed housings (for reasons relating to EMC).
- For cleaning use water and mild detergent only.
- The device is designed to be maintenance-free. To calibrate the board it must be sent in to bmcm.
- The sensors or signals are connected at the input plug. Make sure to use shielded cables.
- For a good noise suppression connect the shield to ground at one end only. Close open inputs if possible.
- The **BP104** ground is electrically connected to the next connected measuring system and therefore also to the ground of the PC, which is usually also connected to earth. Be sure to avoid earth and ground loops during sensor wiring, since they will cause measuring errors!
- The device must not be used for safety-relevant jobs. With the use of the product the customer becomes manufacturer by law and is therefore fully responsible for the proper installation and use of the product. In case of improper use and/or unauthorized interference our warranty ceases and any warranty claim is 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.

## Standard measuring amplifiers available for the BP104

Order number	Physical quantity to be measured	Measuring range
<b>MAL-UI</b>	voltage or current	$\pm 10V$ , $\pm 5V$ , $\pm 1V$ , $\pm 20mA$
<b>MAL-PT100</b>	temperature with PT100 (linearized)	0..300°C
<b>MAL-R1K</b>	resistance	0..1k $\Omega$
<b>MAL-SG2</b>	strain gauge at 5V DC excitation	$\pm 2mV/V$
<b>MAL-SG5</b>	strain gauge at 5V DC excitation	$\pm 5mV/V$
<b>MAL-THR</b>	thermocouple type K (without linearization)	0..1250°C
<b>MAL-ISO10</b>	voltage	$\pm 10V$
<b>MAL-ISO5</b>	voltage	$\pm 5V$
<b>MAL-ISO1</b>	voltage	$\pm 1V$ (factory setting), $\pm 20mA$

Ex works the MAL-UI are configured in the measuring range  $\pm 10V$ . For MAL-THR the cold junction compensation is not realized.

## Technical data BP104 (typical at 20°C)

### • General

Power supply:	+5V DC from the PC/104 power supply
No-load current:	app. 25mA
Operating current:	max. 250mA
Sensor supply:	1x +5V DC, max. 20mA, accuracy typ.: $\pm 0.25\%$ , TK typ.: 20ppm
Amplifier supply:	app. $\pm 12V$ max. 20mA
Dimensions:	app. 90mm x 96mm x 25mm
Temperature range:	-25°C..+70°C
Relative humidity:	0 - 90% (not condensing)
Max. permissible potentials:	<b>60V DC acc. to VDE</b>
CE standards:	EN61000-6-1, EN61000-6-3, EN61010-1; for decl. of conformity (PDF) visit <a href="http://www.bmcm.de">www.bmcm.de</a>
ElektroG // ear registration:	RoHS and WEEE compliant // WEEE Reg.-No. DE75472248
Accessories:	miniature measuring amplifiers and converters of the MAL / MAL-ISO series, PC/104 base board GP
Delivery:	product, bolts M3 x 15mm, description
Guarantee:	2 years with effect from sales date, damages at product caused by improper use excluded

### • Connections

Amplifier inputs:	20-pole pin connector
Power supply:	via PC/104 system plug
Amplifier outputs:	16-pole pin connector