

# BPL-II / BPL-II-PC

Carrier board (with housing) for measuring amplifiers of the MVL and MAL series

## Features

- 16 DIL sockets for MAL / MVLxx amplifiers
- 37-pole Sub-D input socket
- 37-pole Sub-D output socket
- **BPL-II-PC**: for installation in the PC
- **BPL-II**: in external metal housing

## Applications

- controlling of processes
- development
- sensor adjustment



Using the **BPL-II / BPL-II-PC** (**BackPlane Light**)

... 16 measuring amplifiers ...

of the *MAL / MVL* series and of other manufacturers are available. Integrated in a PC together with a PC measuring card (**BPL-II-PC**) you will get a powerful measuring system.

The **BPL-II / BPL-II-PC** provides all included amplifiers with

... electrically isolated supply ...

Those measuring amplifier modules necessary for signal conditioning are

... very reasonable ...

standard amplifiers.

To achieve optimum measuring results, remember to have a good shared potential of the signals to be measured, as there is no electrical isolation of the measuring amplifiers.

The input signals are connected at a 37-pole Sub-D socket. The output signals of the individual measuring amplifiers can also be reached via an additional 37-pole Sub-D socket.

The measuring cards by BMC Messsysteme GmbH have an internal connection for analog input channels, so that measuring signals with short lines can be lead directly from the **BPL-II-PC** to the measuring system.

As the **BPL-II-PC** does not need much space the complete electronic equipment for measuring data acquisition can easily be installed in portable PCs.

If using the appropriate amplifiers also multi-conductor technique can be realized.

## 1 Installation of the BPL-II-PC

The **BPL-II-PC** is installed in a PC next to the BMC Messsysteme GmbH measuring card. Keep in mind to supply the carrier board with the appropriate measuring amplifiers at the respective channels first, before you connect the analog output channels of the **BPL-II-PC** to the internal analog input channels of the measuring card using the enclosed cable (for assignment see fig. 2).

Now connect the power supply cable with the 2-pole plug which is next to the analog input plug and at the other side to the power supply of the PC. Finally mount the card into the PC (see fig. 1).

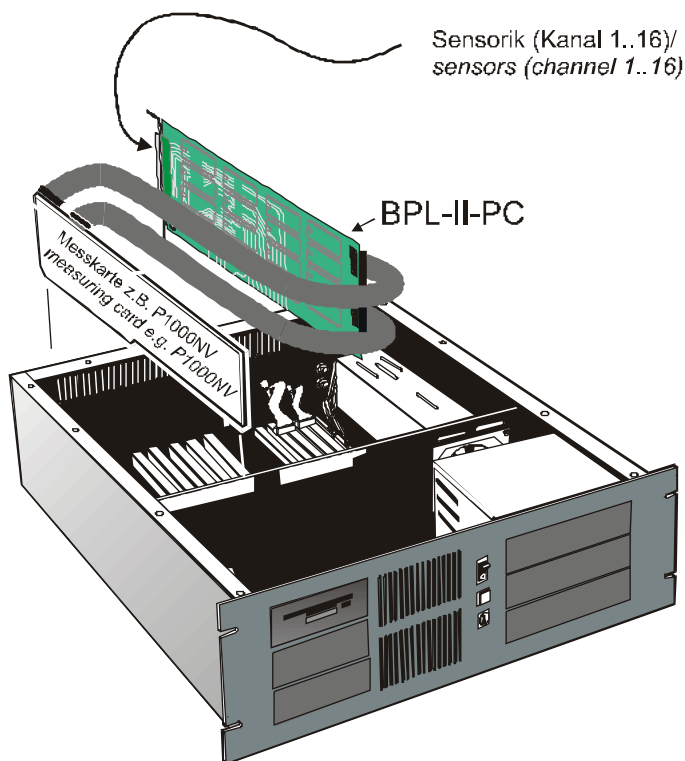


fig. 1

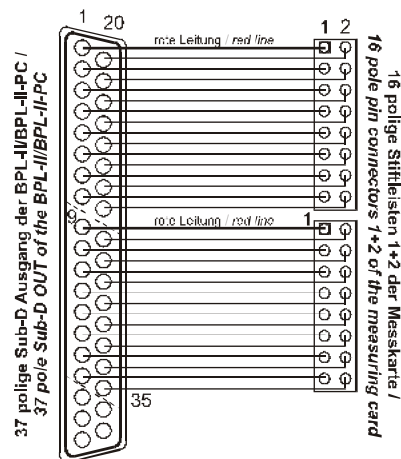


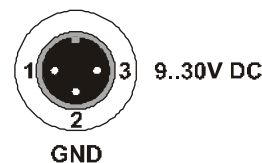
fig. 2

## 2 Connections

All connections of the device are located at the front and the back of the **BPL-II / BPL-II-PC**.

### 2.1 Power Supply

Power of the **BPL-II** is supplied via the 3-pole DIN plug at the front of the device. The input voltage must be in the range of 9..30V DC. The maximum power needed is 5W (ZU-PW6W, jumper J19 closed).



The **BPL-II-PC** board is equipped with a connection cable to be supplied by the PC power supply. The board is then provided with 5V DC (jumper J18 closed).

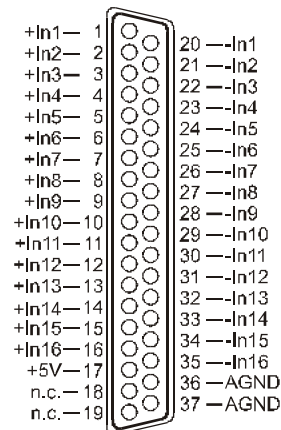
### 2.2 Analog Input Channels

The 16 analog input channels are connected at the 37-pole Sub-D IN socket of the **BPL-II / BPL-II-PC** (**BPL-II**: front of device).

The carrier boards **BPL-II / BPL-II-PC** can be equipped with measuring amplifiers of the **MAL / MVL** series, so that all inputs are connectable to the most different sensors.

The following table shows the pin assignment of the 37-pole Sub-D IN socket:

Pin	Sub-D 37 IN socket
1(+),20(-)	Analog In 1
2(+),21(-)	Analog In 2
...	...
16(+),35(-)	Analog In 16
17	+5V (current output for sensor supply)
18,19	n. c.
36,37	GND for +5V sensor supply

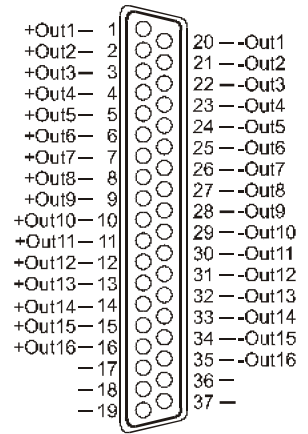


### 2.3 Analog Output Channels

The 16 analog output channels are lead out at the 37-pole Sub-D OUT socket (**BPL-II**: back of device). These are the outputs of the respective *MAL* / *MVL* amplifiers or of the bypassed DIL socket.

The following table shows the pin assignment of the 37-pole Sub-D OUT socket:

Pin	Sub-D 37 OUT socket
1(+),20(-)	Analog Out 1
2(+),21(-)	Analog Out 2
...	...
16(+),35(-)	Analog Out 16



### 3 Assembly Drawing of the BPL-II / BPL-II-PC

The measuring amplifier sockets on the **BPL-II** / **BPL-II-PC** are numbered from channel 1 = 1 to channel 16 = 16 .



When mounting the measuring amplifiers on the carrier board please observe their correct alignment!

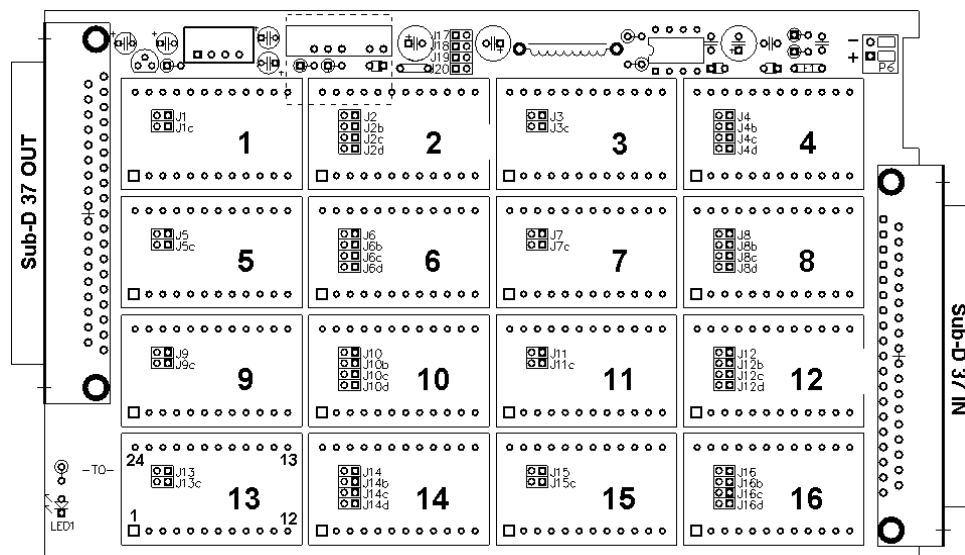


fig. 3

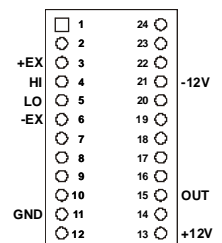
□ = PIN 1

#### 3.1 Pin Assignment of the DIL Sockets when using *MAL*/*MVL* Measuring Amplifiers

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

For using the appropriate measuring amplifier please refer to the documentation of the *MAL* / *MVL*.

It is also possible to combine standard measuring amplifiers of other manufacturers with the **BPL-II** / **BPL-II-PC**, as soldering bridges for the module configuration are included and accessible from the underside of the board. Here you can make all settings concerning additional functions (A1+2, V1-3) of the standard measuring amplifiers. For further information about their pin assignment please see 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	n.c.	-
8	n.c.	-	16	-UB	neg. supply (-7.5V)	24	+UB	pos. supply (+7.5V)

### 3.2 Using of Jumpers

Each DIL socket is provided with two or four jumpers. Those are numbered according to the number of their **BPL-II / BPL-II-PC** DIL socket. The jumpers of one socket have different functions and are distinguished from each other by an additional letter.

Jumper	Function
<b>Jx</b>	bypass +IN of socket x
<b>Jxb</b>	lead out +EX of socket x-1 to 37pole Sub-D socket
<b>Jxc</b>	bypass -IN of socket x
<b>Jxd</b>	lead out -EX of socket x-1 to 37pole Sub-D socket

If socket x is not supplied with a measuring amplifier, as only voltages are to be measured, this socket has to be bypassed by closing jumpers **Jx** and **Jxc**. Please note that this input then can not be operated differentially.

If using long cables, 4-wire technique oder for precise measurements we recommend to lead out the excitation connections of the measuring amplifiers to the 37-pole Sub-D socket, in order to avoid interferences. This is achieved by closing jumpers **Jxb** and **Jxd**, which are located at the **BPL-II / BPL-II-PC** DIL sockets with even numbering. So the excitation connections of channel x-1 are lead out at the 37-pole Sub-D socket replacing the original connections of the following even analog inputs (e.g. +EX1 to pin 2, before: +IN2; -EX1 to pin 21, before: -IN2). That means that the number of available channels in reduced to 50% at the maximum.

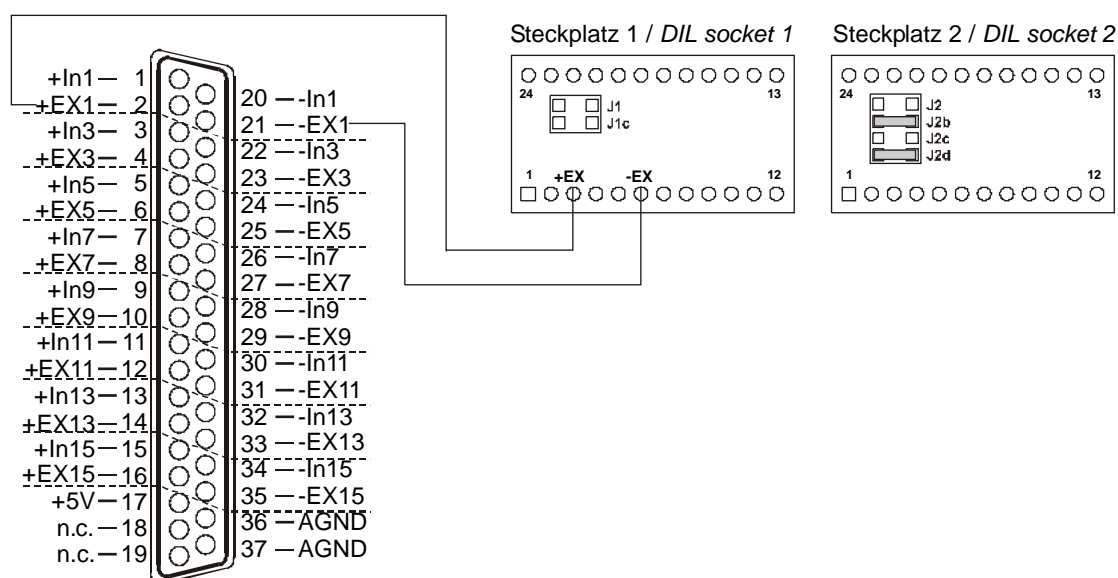


fig. 4



- Always only close either jumpers **Jx**, **Jxc** or **Jxb**, **Jxd**. Never close all 4 jumpers at the same time!
- Do not use any measuring amplifier on a socket where a jumper is set.

The following table shows the pin assignment of the two Sub-D37 sockets, if all excitation connections are used:

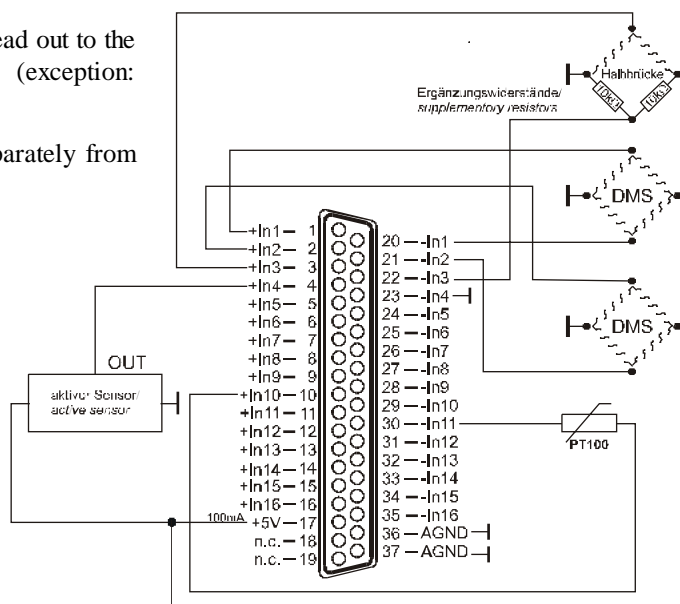
Pin	Sub-D 37 IN socket
1(+), 20(-)	Analog In 1
2(+), 21(-)	excitation voltage for Analog In 1
3(+), 22(-)	Analog In 3
4(+), 23(-)	excitation voltage for Analog In 3
...	...
15(+), 34(-)	Analog In 15
16(+), 35(-)	excitation voltage for Analog In 15
17	+5V (current output for sensor supply)
18,19	n. c.
36,37	analog ground for +5V output
	<b>Analog In 2, 4, ..., 14, 16 not available!</b>

## 4 Interfacing Examples for Using the BPL-II

### 4.1 2-wire Technique with joint Supply

The sensor supplies of the measuring amplifiers are not lead out to the 37-pole Sub-D socket of the **BPL-II / BPL-II-PC** (exception: resistance measurement as 2-wire measurement).

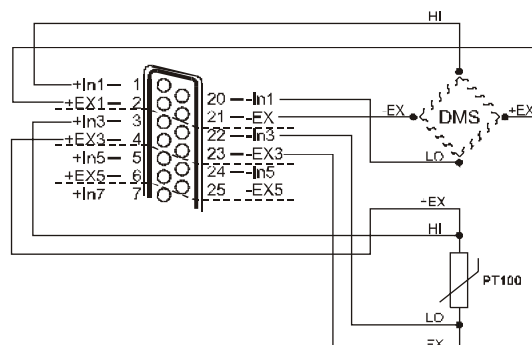
The sensor supply is produced electrically isolated separately from the measuring amplifiers on the **BPL-II / BPL-II-PC**.



### 4.2 4-wire Technique

For 4-wire technique the sensor supplies are used by the respective measuring amplifier.

Cable shields can be connected at AGND (analog ground) at one end only.



## Important Notes for Using the BPL-II / BPL-II-PC

- The **BPL-II / BPL-II-PC** 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 **BPL-II / BPL-II-PC** must only be used in closed housings (for reasons relating to EMC).
- For reasons relating to CE use shielded cables. Connect the shield to ground at one end only. Close open inputs if possible. ESD voltages on lines may cause malfunction during operation.
- For cleaning use water and mild detergent only. The device is designed to be maintenance-free.
- The device ground and the chassis are electrically connected to the chassis of the PC, which is usually also connected to ground. Be sure to avoid ground loops, 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.

## Technical Data BPL-II / BPL-II-PC (typical at 20°C)

### • Sensor Supply

Supply voltage // current:	+5V DC, accuracy $\pm 0.25\%$ , TK 100ppm // max. 100mA (short-circuit proof until 1s)
Amplifier supply:	app. $\pm 7.5V$ max. 70mA

### • General Data

Power supply:	+9..30V DC, min. 1W, max. 5W
CE standards:	EN50081T1, EN50082T1, EN61010-1
Max. permissible potentials:	<b>60V DC acc. to VDE</b> , max. 1kV ESD on lines
Analog connections:	37-pole Sub-D socket each for in- and output
Connection for power supply:	3-pole DIN plug
Temperature range // relative humidity:	working temp. 0°C..70°C, storage temp. -25..85°C // 0 - 90% (not condensing)
Dimensions BPL-II:	167 x 113 x 30 mm <sup>3</sup> / IP50
Dimensions BPL-II-PC:	167 x 100 x 25 mm <sup>3</sup>
Delivery BPL-II:	BPL-II device in aluminum housing, 3-pole coupling for power supply, 37-pole analog out cable
Delivery BPL-II-PC:	BPL-II-PC board, PC blende, cable for power supply, analog out cable for internal PC connection
Guarantee:	2 years with effect from sales date, damages at product caused by improper use excluded

### • Accessories

Measuring amplifier:	I, U, R, DMS, PT100, THR of the series MAL / MVL
Power supply:	power plug ZU-PW6W (12V, 0,5A)
Plugs:	ZU3DIN, ZU37ST
Cables:	ZUKA37SB, ZUKA37SS
Connector box:	ZU37BNC
Hatrail set:	ZU-SCHI