MDA D/A converter modules for PCI-BASE1000

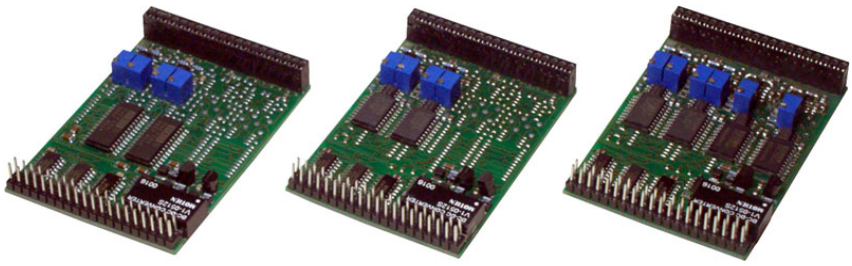
bmc messsysteme gmbh

Features

- D/A converter module
- 12 or 16 Bit resolution
- 2 or 4 analog outputs

Applications

- analog controls



The analog output modules **MDA** of the bmcm module series are designed for the

... individual equipment ...

of the PCI-BASE plate *PCI-BASE1000*.

The modules are plugged on the PCI-BASE plate providing for two module slots. The modules of the **MAD/MDA/MCAN** series can be

... combined with each other ...,

so that you can profit of the specific features of different modules at the same time.

The D/A converter modules have

... 2 or 4 (MDA12-4) analog outputs ...

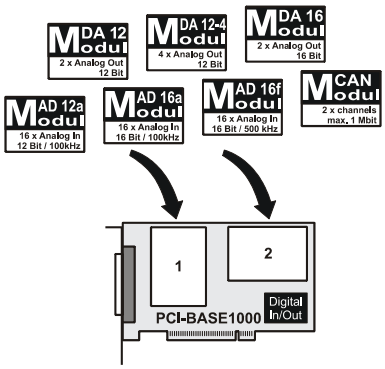
with a resolution of 12 or 16 Bit, which can be accessed via the relevant plug of the measuring card.

The output range can be jumped to

... ±5V or ±10V ...

via soldering bridges.

All modules are supplied by their own DC/DC converters thus ensuring a decoupled voltage supply for maximum measuring results.



Available MDA modules

Product	Type	Number of channels	Resolution
MDA12	Analog output module	2	12 Bit
MDA12-4	Analog output module	4	12 Bit
MDA16	Analog output module	2	16 Bit

In addition we offer analog intput modules **MAD12a**/**MAD16a**/**MAD16f** and the CAN interface module **MCAN**. For further information please have a look at our products on our website at www.bmcm.de .

Installation on the PCI-BASE1000

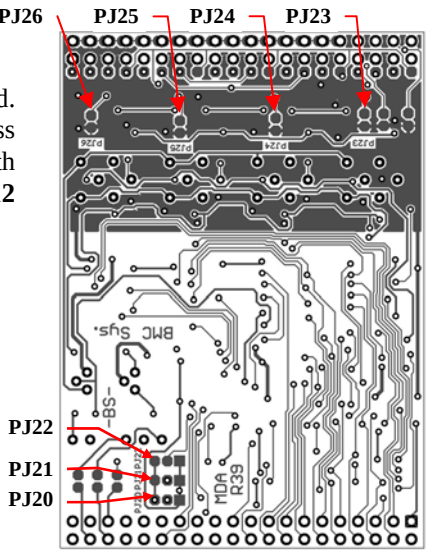
The **MDA** modules plug on any location of the *PCI-BASE1000*. When using both **MAD** and **MDA** modules the best solution is to plug the **MAD** on M1 and the **MDA** module on M2. In this way all analog in- and outputs of the Sub-D 37 socket of the PCI-BASE plate are available. When using two **MDA** modules the channnels of the module on slot M2 can only be accessed at the internal pin connectors P9 and P10 of the *PCI-BASE1000* plate and can be lead out from the PC using the *ZUKA16* cable. Plug the modules on the desired slot and ensure that the plugs and sockets fit together exactly (connect channel 1 (red marked line) of ZUKA16 with pin 1 of the pin connector P9 (square pad)). If the modules are not plugged correctly, the modules and/or the *PCI-BASE1000* may be damaged! The modules are electrostatic sensitive devices - please provide for a conductive pad connected to ground during installation.

Addressing the MDA modules

All **MDA** modules are pre-jumpered to address 2. Addresses 6 and 7 are reserved. When using two modules two different addresses must be assigned! The address determines the assignment of the channels. The **MDA12** module (2 outputs) with the lower address for example is assigned to pin 1+2 of the Sub-D37, the **MDA12** module with the higher address to the channel 18+19.

Address	0	1	2	3	4	5
PJ22	○●■	○●■	○●■	○●■	●●□	●●□
PJ21	○●■	○●■	●●□	●●□	○●■	○●■
PJ20	○●■	●●□	○●■	●●□	○●■	●●□

Address 2 is the factory setting



Output voltage range of the MDA modules

With the jumpers PJ23 for channel 1 and PJ24 for channel 2 (MDA12-4: add. PJ25 for channel 3, PJ26 for channel 4) the output voltage range is set (make settings on the "component-free" side of the module). With the jumper open, the range is ±5V, with the jumper closed ±10V (factory setting). The **MDA** modules do not have a controller and are controlled via software. While booting up the PC the output voltages of the **MDA16** are 0V and of the **MDA12** and **MDA12-4** 5V or 10V depending on the selected output range and is reset to 0V as soon as the hardware driver or the software is started.

Important notes for using the MDA modules

- The modules are only suitable for extra-low voltages - please observe the relevant regulations!
- The modules must only be used in closed PC housings (for reasons relating to EMC).
- All accessible pins are electrostatic sensitive devices. Provide for a grounded conductive work place. Wrong installation of the modules on the *PCI-BASE1000* can damage the modules and/or the *PCI-BASE1000*. To remove the module first loosen it on one plugged side by levering the module with the utmost caution using a blunt object (e.g. plastic ballpoint pen). Then carefully lift up the other side with your hand moving it back and forth. Exposing the card to strong vibrations requires additional protection of the modules.
- The module ground is 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!
- For cleaning use water and mild detergent only. The modules are designed to be maintenance-free.
- The modules must not be used for safety-relevant tasks. 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 the 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.

Technical data MDA modules (typ. at 20°C, 5V, after 10min.)

- **Analog output modules**

	MDA12	MDA12-4	MDA16
Resolution // relative accuracy :	12 Bit // 0.025%	12 Bit // 0.025%	16 Bit // 0.0015%
Converter rate // output channels:	10µs // 2	10µs // 4	10µs // 2
Voltage ranges // output current::	±10V or ±5V to be set for each channel via soldering jumper; factory setting: ±10V // max. 10mA		
Zero shift // gain drop:	max. ±50ppm/°C // max. ±50ppm/°C		
Analog OUT R_i // settling time:	51Ω // max. 10µs		
Error // noise in the relevant range:	max. ±4 LSB // max. ±4 LSB		

The values for accuracy always relate to the respective output range. Errors might add at worst.

- **General data**

Power supply // temperature ranges :	+4.5V..+5.5V from PCI-BASE1000, max 250mA // operation: –25°C..+50°C, storage: –25°C..+70°C
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. perm. potentials // rel. humidity:	**60V DC acc. to VDE**, max. 1kV ESD on open lines // 0-90% (not condensing)
Dimensions // delivery:	~ 74 x 52 x 13 mm^3 // product, description
Guarantee:	2 years with effect from sales date, damages at product resulting from improper use excluded

Manufacturer: BMC Messsysteme GmbH. Subject to change due to technical improvements. Errors and printing errors excepted. Rev. 1.1 01/14/2004