



BMD1204 input/output module

Application

The input/output module with 12 binary inputs and 4 binary outputs receives DDC4000 binary signals in the automation system and activates binary control functions.

Manual/automatic rotary switch for automatic and manual operation of the Auto/On/Off binary outputs.

LED displays for the operating states of the inputs and outputs.

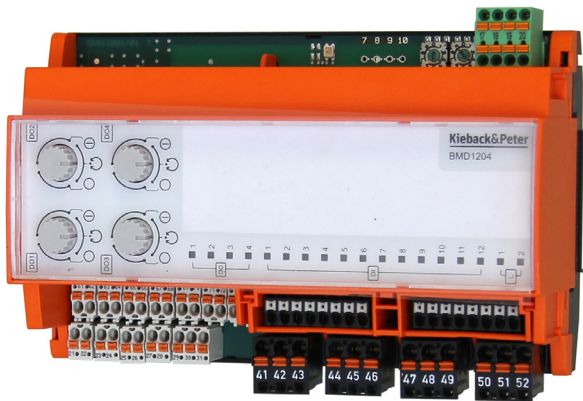
Communication is controlled via LED.

Label carrier for system-specific description.

The power supply and the CAN bus are electrically isolated.

Data is transferred between the central unit and the input/output module via CAN bus.

The input/output module can be connected to an existing switch cabinet bus or fieldbus.



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Important Information on Product Safety

Safety instructions

This document contains information on installing and commissioning the product “BMD1204”. Each person who carries out work on this product must have read and understood this document. If you have any questions that are not resolved by this document, you can obtain further information from the supplier or manufacturer.

If the product is not used in accordance with this document, the protection provided could be impaired.

The applicable regulations must be observed when installing and using the devices. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (German Association for Electrical, Electronic & Information Technologies). If the device is used outside of the EU, it is the responsibility of the plant engineer or operator to comply with local regulations.

Mounting, installation and commissioning work on the devices may only be carried out by qualified technicians. Qualified technicians are persons who are familiar with the described product and who can assess given tasks and recognize possible dangers based on their technical training, knowledge and experience, as well as their knowledge of the applicable regulations.

Symbol meanings



WARNING

Indicates a hazard of medium risk which can result in death or serious bodily injury if not avoided.



CAUTION

Indicates a hazard of low risk which can result in minor or medium bodily injury if not avoided.



CAUTION

Indicates a hazard which can result in material damage or malfunctions if not avoided.



NOTE

Indicates additional information that can simplify working with the product.

Notes on disposal

In accordance with the applicable laws and directives of the European Union countries, the product should not be disposed of with household waste. This ensures environmental protection and sustainable recycling or raw materials.

Commercial users should contact their supplier and observe the conditions of the purchase agreement. This device may not be disposed of together with other commercial waste.

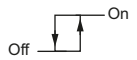
The local and currently applicable laws must be observed.

Item

BMD1204	Input/output module with 12 binary inputs and 4 binary outputs with manual/automatic rotary switch for the Auto/On/Off binary outputs
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Technical Data

Nominal voltage	DC 12..24 V $\pm$ 10%; 3.2 W
Inputs and outputs	■ 12 binary inputs, also as pulse counter inputs up to 80 Hz - Switching threshold Off DC $\leq$ 2.5 V; On DC $\geq$ 5.0 V; 5 mA. - Supported by NAMUR sensors (proximity initiator) ■ 4 binary outputs as potential-free change-over contacts, max. AC 230 V; 6 A (3 A) - Relay contact for direct switch on for AC voltage according to utilization category AC-3 (classification according to DIN EN 60947-1, Appendix A). The associated protective devices for the motor must be provided in the switchboard. - Further rating data of the relay contact when used according to utilization category AC-3: - Switching voltage AC 230 V - Switching capacity: 350 W - Continuous current: Max. 2.5 A - Minimum on/off time 5 s on / 5 s off - Maximum switching frequency 50,000 cycles ■ Supporting terminal blocks terminal "81" to "88 and terminal "91" to "98" max. current load AC 230 V; 6 A (3 A)
Indicators and Controls	■ 16 LED status of inputs and outputs ■ 2 freely programmable LEDs ■ 1 LED for displaying bus communication - See chapter "LED indicators", page 13. ■ 4 manual/automatic rotary switches for automatic and manual operation of the Auto/On/Off binary outputs.
Address switch	Two rotary switches for addressing from 01 to 63
Interfaces	CAN bus as: ■ Fieldbus, F-bus: 2000 m; 20 kBaud or ■ Switch cabinet bus, SBM bus: 200 m, 40 kBaud (Observe specific CAN bus settings. Further information can be found in the DDC4000 project planning documentation)
Housing	Plastic housing
Overvoltage category	III
Rated impulse voltage	4000 V
Level of contamination	2
Method of operation	Type 1
Degree of protection	IP20 (when installed)
Ambient temperature	0..55 °C
Ambient humidity	20% to 80% r.h., non-condensing





Product description
BMD1204

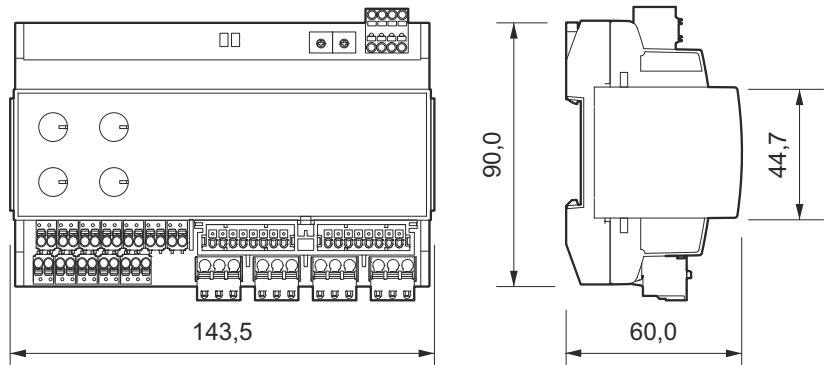
Mounting	TH 35x7.5 top hat rail in closed housing This device is intended for installation in a wall-mounted enclosure or switch cabinet with protection class I or II.
Weight	0.282 kg
Dimensions	WxHxD 143.5 x 90 x 67 mm

Connection terminal

- Spring-loaded terminals, printers
- All terminals can be inserted with conductor end sleeves of 10 mm length
- Twisting two conductors is not permitted, twin wire-end ferrules can be used

	 Terminal 21..31 and 61..74	 Terminal 41..52	 Supporting terminals Terminal 81..88 and 91..98	 Terminal 17..20
Stripping length	8..9 mm	10 mm	10 mm	10 mm
Conductor cross-section single-wire conductor	0.2..1.5 mm ²	0.08..2.5 mm ²	0.08..1.5 mm ²	0.2..1.5 mm ²
Conductor cross-section fine-wire conductor	0.25..1.5 mm ²	0.08..2.5 mm ²	0.08..1.5 mm ²	0.25..1.5 mm ²
Conductor cross-section fine-wire conductor with wire-end ferrules	0.25..0.75 mm ²	0.08..2.5 mm ²	0.8..1.5 mm ²	0.25..0.75 mm ²
Recommended crimping tools	Square hex	Square hex	Square hex	Square hex

Dimensions





Connection



NOTE

Previously, the binary inputs in our devices were triggered by a potential-free connection to the GND. In the new device concept that is now implemented, the DC +12 V auxiliary voltage generated by the device is applied on each of the 2-pole input terminals. The binary inputs are now triggered by a connection between the two input terminals (binary message "ON").

This prevents there from being an unwanted connection to earth or the reference potential in secondary earthed systems (PELV) and prevents an active signal at the input/output module from being generated.



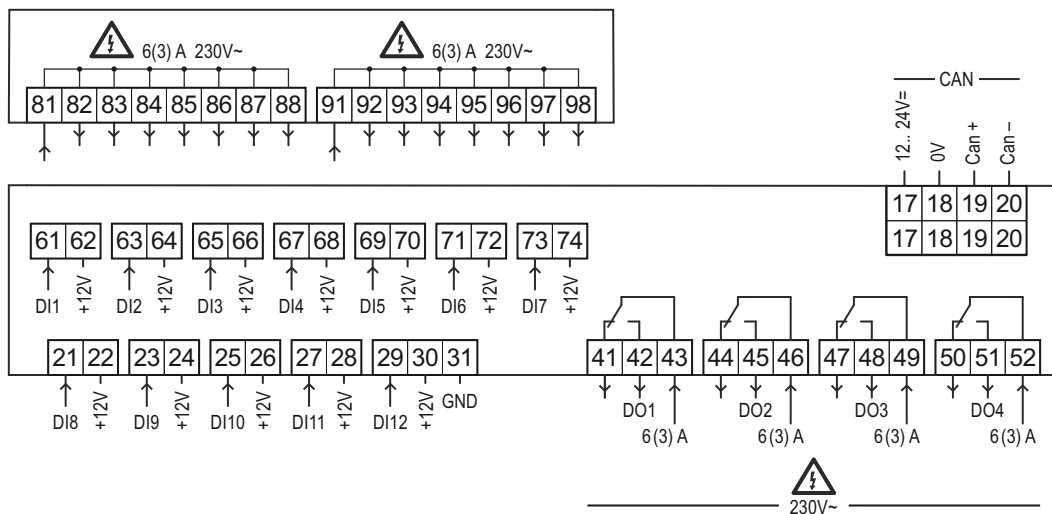
NOTE

The devices have galvanic isolation between the bus voltage supply and the inputs and outputs. This is a separation of duties that prevents unwanted ground loops.

Thanks to this functional separation, each module can provide its own ground plane that structurally prevents mass loops and potential shifts between the modules.

If the system layout requires it, however, the ground planes of the modules can also be connected without any issues.

- Two support terminal blocks: blocks "81" to "88" and terminals "91" to "98"

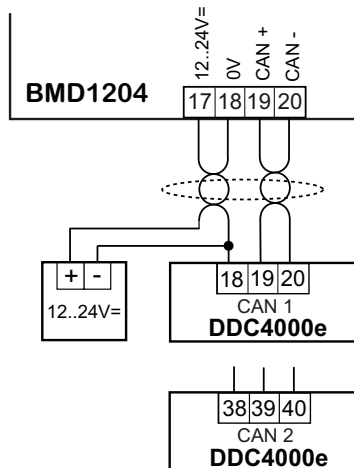




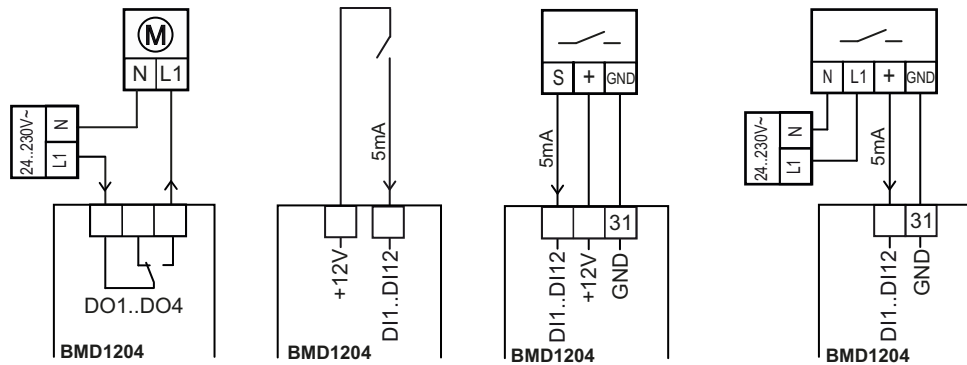
Product description

BMD1204

DDC4000e connection



Connection of binary inputs and outputs



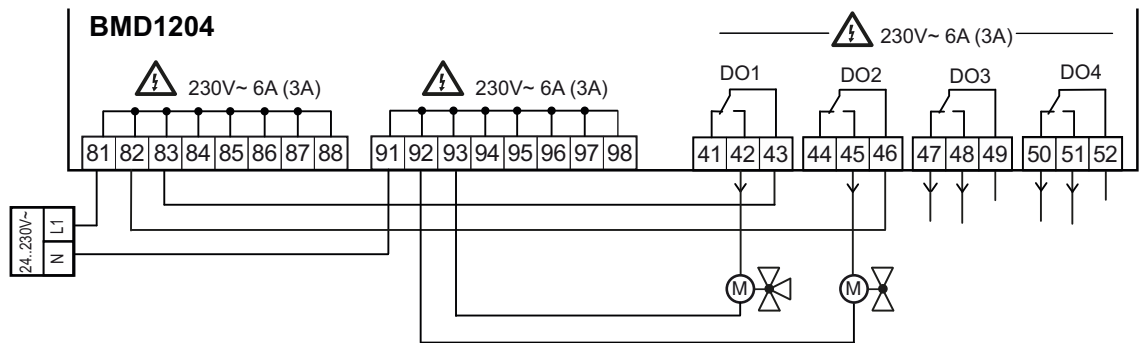
NOTE

Terminal 31 provides GND for all inputs DI1..DI12.

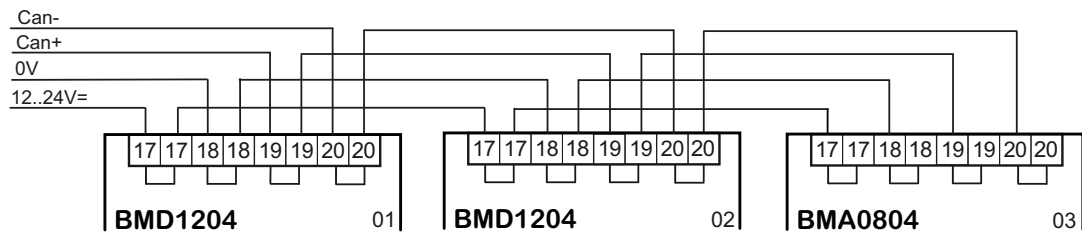
If switching sensors are supplied by the module, note that the voltage provided by the BMD1204 is +12V and the maximum current is 5 mA (e.g. 3-pole Namur sensors).

Sample connection

- Sample connection of valves with two-point control and the use of support terminals



- Connection of several input/output modules via CAN bus



NOTE

The terminal block terminal “17” through terminal “20” (feed-through terminals) can be inserted and disconnected without interruption.



Installation



CAUTION

This product description contains the specific settings and functions of the input/output module. In addition to these instructions, the product descriptions of other system components, such as the DDC4000e automation station, are to be observed.



CAUTION

Switching on the power supply of unparameterized products can lead to unforeseen consequences such as malfunctions or material damage.

Switch on the power only after the device has been configured by the commissioning technician.



NOTE

The input/output module can be connected to an existing fieldbus or switch cabinet bus. Further information can be found in the DDC4000 project planning documentation

Switch cabinet bus

When connecting the switch cabinet bus, use a cable of at least type JY(St)Y 2x2x0.8 Lg: two x two leads stranded into a pair, plastic insulation and an electrostatic shield with a lead diameter of at least 0.8 mm. Use a stranded pair of leads for the data lines (+ and -) and another free lead for the ground (0).

At the end of the switch cabinet bus (farthest point from the DDC controller), install a terminating resistor of about 180 ohms between both data lines (+ and -). The terminating resistor is included with the DDC controller

The maximum cable length for the switch cabinet bus is 200 m.

Fieldbus

When connecting the fieldbus, use a cable of at least type JY(St)Y 2x2x0.8 Lg: two x two wires, twisted to a pair with plastic insulation and an electrostatic shield with a wire diameter of at least 0.8 mm. Use a stranded pair of wires for the data lines (+ and -) and another free wire for the ground connection (0).

At the end of the fieldbus (furthest point from the DDC controller), install a terminating resistor of about 180 ohms between both data lines (+ and -). The terminating resistor is included with the DDC controller.

The maximum cable length for the Fieldbus is 2000 m.

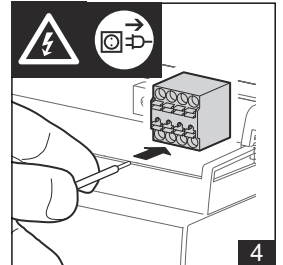
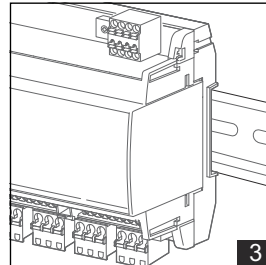
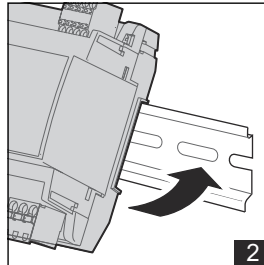
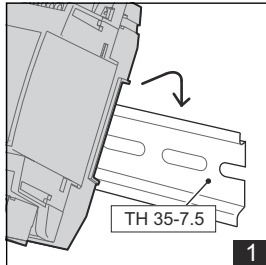


Mounting



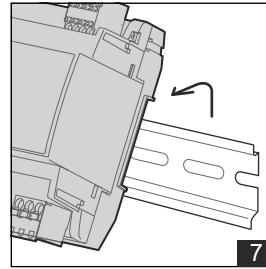
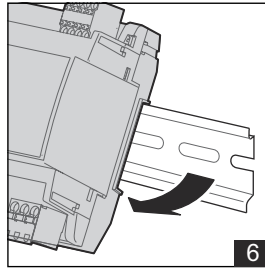
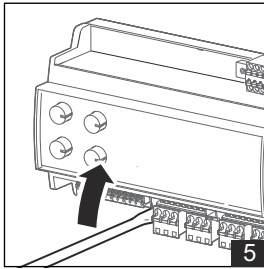
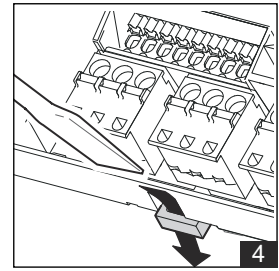
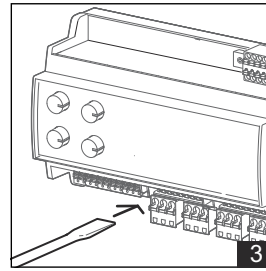
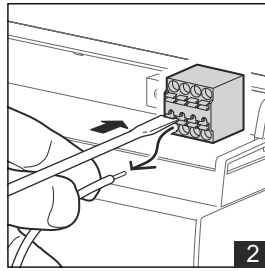
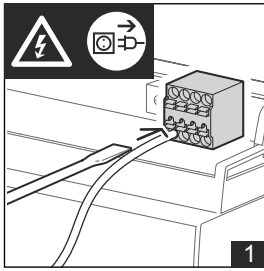
WARNING

Contact with live parts of electrical domestic installation can cause death due to electric shock.
Mounting/removal may only be carried out when power is switched off.



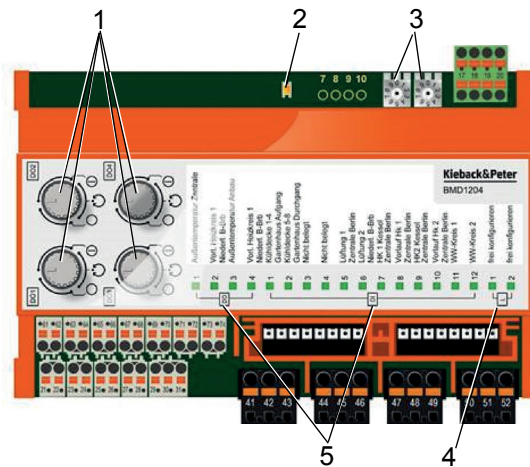


Removal





Function and operation



- (1) Manual/Automatic rotary switch
☺ = auto, ① = on; ○ = off
- (2) Combination LED (green, red) CAN Bus
- (3) Address switch
- (4) Freely programmable LEDs
- (5) LED status of inputs and outputs

Manual/automatic mode

Using the manual/automatic rotary switch (1), you can switch to the corresponding Auto/On/Off mode of the 4 binary outputs, with active parameterized manual mode.

Parameterization

The following functions are defined via parameterization:

- Manual mode permanently deactivated
- Binary inputs activated
- Default value for the outputs in case of bus failure or automation station failure



NOTE

Parameterization is retained in the event of a power failure.

The counter values of the inputs and outputs are not retained after a power failure.

To delete the parameterization, set address 99.

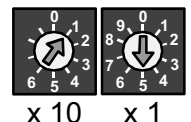
Setting CAN Bus Address

Permitted range for the switch cabinet bus address: 01..63.

Permitted range for fieldbus address: 01..63.

- ▶ Set the first number of the bus address on the address switch(3), the second number on the second rotary address switch (3).

The example shows the address 15.



NOTE

In factory settings, address “00” is set, meaning:

- No bus communication
- Project development is not possible
- Manual mode is active. Switching the 4 binary outputs on or off.
The outputs are switched off if the rotary switch is in the automatic position.



Commissioning



CAUTION

Commissioning by switching on the supply voltage may occur only after the commissioning technician/engineer has finished configuring the DDC and has set the bus address.

- Configuration is described in the DDC controller project planning documentation.
- Before switching on the supply voltage, check the electric installation and the device connections.
- After configuring the device and switching on the supply voltage, check the functions of the module and the connected inputs and outputs.

Functional test

It is possible to check the correct wiring and function of the inputs and outputs.

- ▶ Set the bus address "00".
- The functionality (0/1) and wiring of the 4 outputs can be checked with the manual/automatic rotary switch.
- The correct polarity and wiring of the 12 inputs DI1 to DI12 can be checked with a diode and a 180 Ω resistor (series connection).

Target display:

- Open contact: Red LED
- Resistance diode combination correctly poled: Green LED

Possible wiring errors:

- Open contact: Green LED
- Resistance diode combination connection: Red LED



LED indicators

LED CAN Bus

LED status (combination LED)	Meaning	Cause
off	Module not in operation	No operating voltage or operating voltage too low
Yellow on (green LED and red LED on)	Module in operation, but there is a bus error no CAN communication possible, module not logged on	Bus line short circuit (with respect to ground or each other), Bus lines reversed or interrupted
	Address 00 (manual operation effective, functional test possible)	
Yellow flashing (green LED and red LED flashing simultaneously) Flashing rate 1 sec.	Address error, no bus activity	Outside of address range #01..#63 address assigned multiple times
Green flashes and red LED off	Module OK, bus activity	
Red LED and green LED flash alternately slowly Flashing rate 6 sec.	Update is being transferred from DDC4000e to module	
Red LED permanent light	Address 99 (deleting the configuration, manual control effective)	

LED status of inputs and outputs

Outputs:

- Contact on: LED lights up in green
- Contact off: LED off
- The output LEDs also flash yellow in manual mode.

Inputs:

- Contact closed: LED lights up in green
- Contact open: LED off
- The +12 V DC auxiliary voltage breaks down. Caused by incorrect wiring of the GND:
All input LEDs light up red



Product description
BMD1204