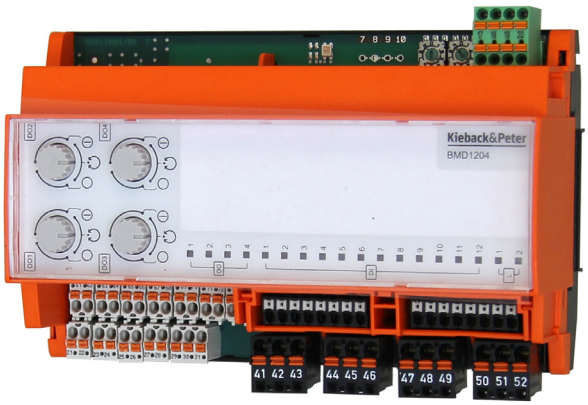
# BMD1204 Input/output module

## 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.

## Content



Kieback&Peter GmbH & Co. KG
Tempelhofer Weg 50, 12347 Berlin/Germany
Telefon: +49 30 60095-0, Telefax: +49 30 60095-164
www.kieback-peter.de, info@kieback-peter.com

## Important Information Regarding Product Safety

### Safety Instructions

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

If the product is not used in accordance with this data sheet, the protection provided will be impaired.

Applicable regulations must be observed when installing and using the device. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (Association for Electrical, Electronic & Information Technologies). If the device is used in other countries, it is the responsibility of the system installer 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 due to technical training, knowledge and experience as well as knowledge of the appropriate regulations.

### Legend

**WARNING**

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

**CAUTION**

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

**CAUTION**

Indicates a hazard of medium risk which can result in material damage or malfunctions if it is not avoided.

**NOTE**

Indicates additional information that can simplify the work with the product for you.

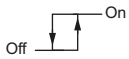
### Notes on Disposal

For disposal, the product is considered waste from electrical and electronic equipment (electronic waste) and must not be disposed of as household waste. Special treatment for specific components may be legally binding or ecologically sensible. The local and currently applicable legislation must be observed.

## Item

| | |
|---|---|
| BMD1204 | Input/output module with 12 binary inputs and 4 binary outputs<br>with manual/automatic rotary switch for the Auto/On/Off binary outputs |

## Technical Data

| | |
|---|---|
| Nominal voltage | DC 12..24 V ± 10%; 3.2 W |
| Inputs and outputs | ■ 12 binary inputs, also as pulse counter inputs up to 80 Hz<br>Switching threshold Off DC ≤ 2.5 V; On DC ≥ 5.0 V.  <br>Supported by NAMUR sensors (proximity initiator)<br>■ 4 binary outputs as potential-free change-over contacts, max. AC 230 V; 6 A (3 A)<br>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.<br>Further rating data of the relay contact when used according to utilization category AC-3:<br>- Switching voltage AC 230 V<br>- Switching capacity: 350 W<br>- Continuous current: Max. 2.5 A<br>- Minimum on/off time 5 s on / 5 s off<br>- Maximum switching frequency 50,000 cycles<br>■ Supporting terminal blocks terminal “81”” to “88 and terminal “91” to “98”<br>max. current load AC 230 V; 6 A (3 A) |
| Indicators and Controls | ■ 16 LED status of inputs and outputs<br>■ 2 freely programmable LEDs<br>■ 1 LED for displaying bus communication<br>See chapter “LED displays”, page 12.<br>■ 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:<br>■ Fieldbus, F-bus: 2000 m; 20 kBaud **or**<br>■ 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 |

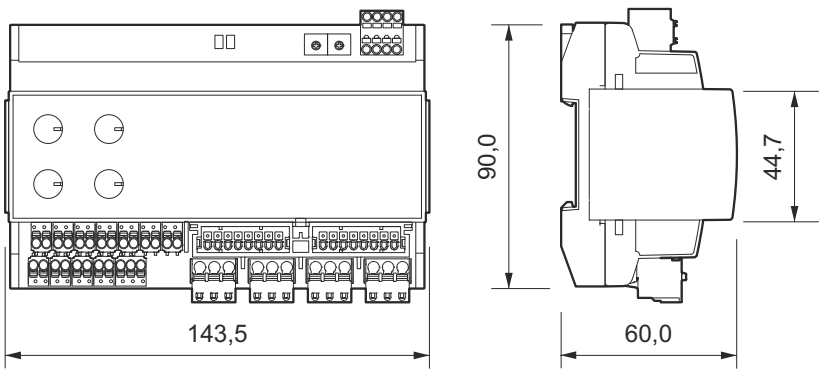
| | |
|---|---|
| Mounting | TH 35x7.5 top hat rail in closed housing<br>This device is intended for installation in a wall-mounted enclosure or switch cabinet with protection class I or II. |
| Weight | 0.282 kg |
| Dimensions | WxHxD 143.5 x 90 x 67 mm |

### 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

| | Input terminals  Terminal 21..32 and 51..59 | Output terminals  Terminal 41..48 | Supporting termi-  nals Terminal 81..88 and 91..98 | Bus terminals  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

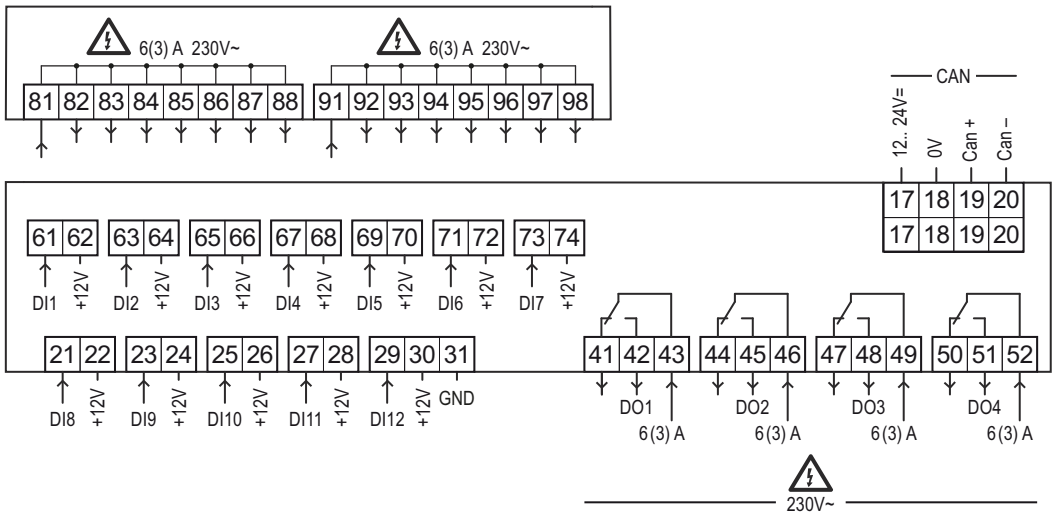
**NOTE**

Until now, the binary inputs of proprietary devices were triggered by a potential-free connection to GND.

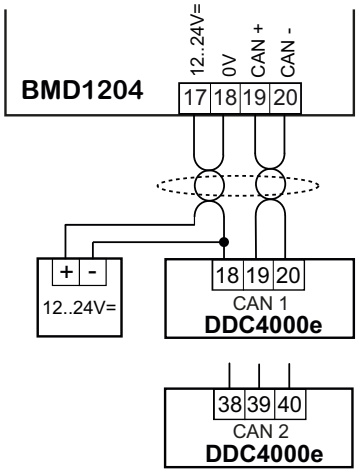
The new device concept that has been implemented here makes an auxiliary voltage of +DC 12 V available at the 2-pole input terminals. Now, the binary inputs are triggered by a connection between the two input terminals (binary message “ON”).

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.

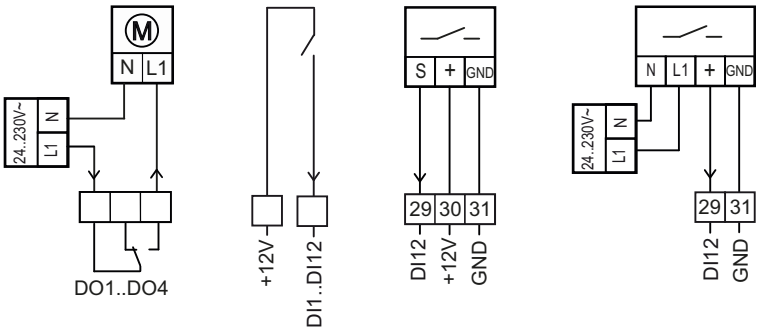
- Two support terminal blocks, terminals “81” to “88” and terminals “91” to “98”




### DDC4000e connection



### Connection for binary inputs and outputs

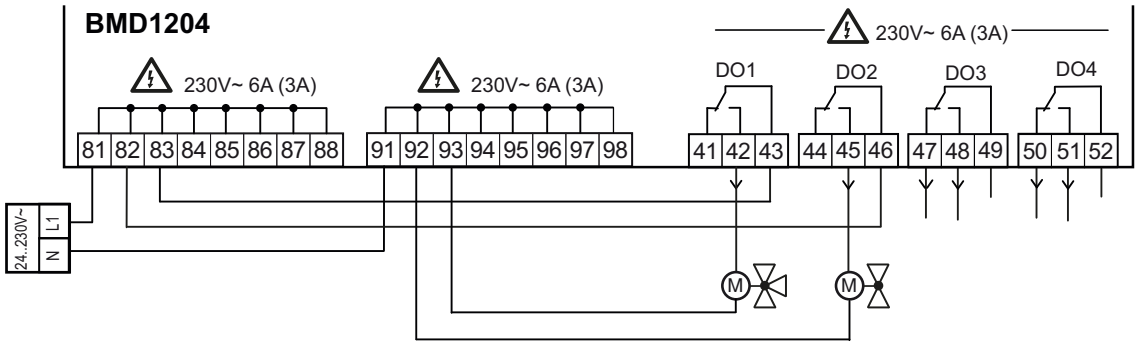



**NOTE**

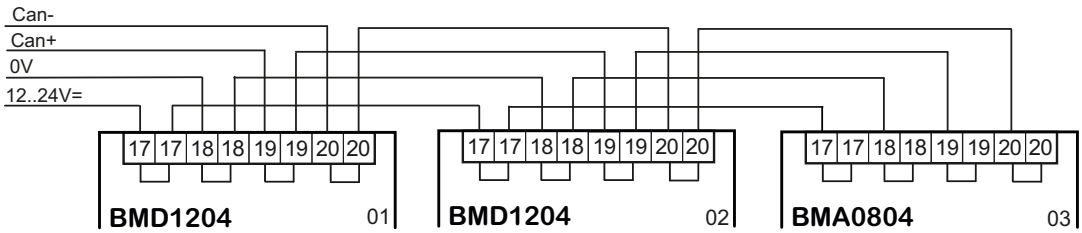
DI12 for applications with common GND of transmitter and module or with +12V power supply of transmitter using the BMD1204 module.

### Connection example

- Example connection of valves with 2-point control and usage 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).

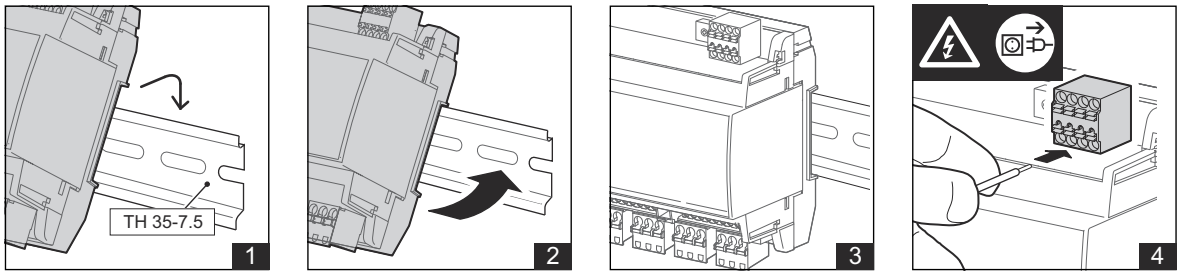
At the end of the fieldbus (furthest point from the DDC controller), install a terminating resistor of about 180 ohms between both data lines (+ and -). The terminating resistor is included with the DDC controller.

The maximum cable length for the Fieldbus is 2000 m.

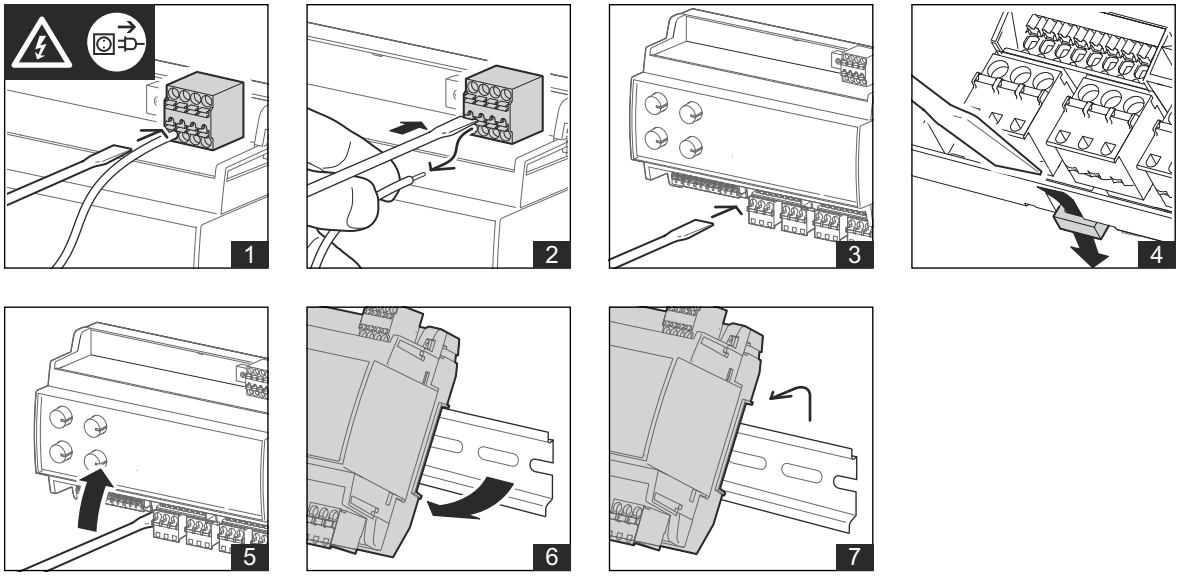
## Mounting

**WARNING**

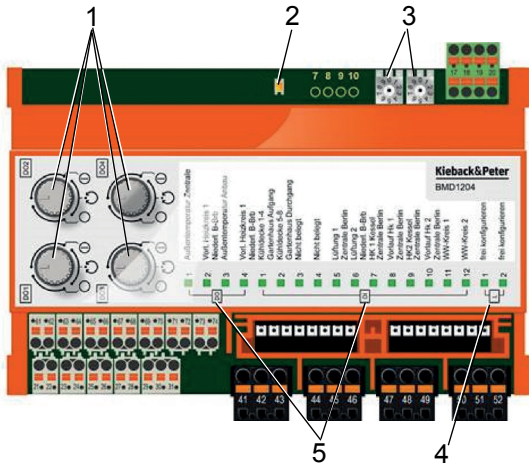
Contact with live parts of electrical domestic installation can cause death due to electric shock.
Mounting/removal may only be carried out when power is switched off.



## Removal



## Function and operation




(1) Manual/Automatic rotary switch
↻ = auto, ⏽ = 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.

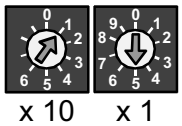
### Setting CAN Bus Address

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 displays

### 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<br>no CAN communication possible, module not logged on | Bus line short circuit (with respect to ground or each other),<br>Bus lines reversed or interrupted |
| | Address 00 (manual operation effective, functional test possible) | |
| Yellow flashing (green LED and red LED flashing simultaneously)<br>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<br>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