

BMDU64 Input/Output Module

Application

The input/output module with 64 binary inputs or binary outputs receives binary signals in the DDC4000 automation system and activates binary control functions.

The output signals can be defined in case communication between the input/output module and the automation station is interrupted.

The function can be individually selected as an input or output for each of the 64 connections by means of DDC configuration.

All 64 binary inputs can be used as pulse counter inputs up to 80 Hz.

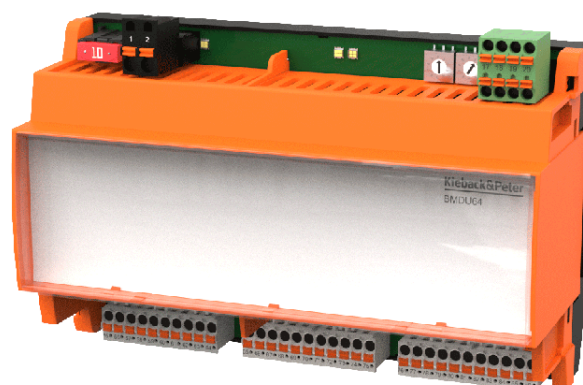
Communication is controlled via LED.

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.

The input/output module can be replaced during operation, and there is no need to switch off or restart the DDC4000 automation system (hot-pluggable).



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Important Information on Product Safety

Safety instructions

This document contains information on installing and commissioning the product “BMDU64”. 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.

Private users should contact their local retailer or their local authority for information regarding environmentally safe recycling of old appliances. The local and currently valid legislation must be observed.

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.

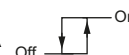


Item

BMDU64 Input/output module with 64 binary inputs or outputs

Technical Data

Nominal voltage	■ DC 12..24 V $\pm$ 10%, 0.6 W (for module and CAN supply) ■ DC 24 V $\pm$ 10%, 160 W for inputs/outputs, of which 10 W is for internal consumption by the inputs and outputs as well as 2 W for +12 V DC auxiliary voltage for active sensors and 148 W for outputs
Fuse	10 A/58 V for inputs/outputs
Inputs and outputs	64 BIs / BOs can be independently configured as: ■ binary input BI - Can also be used as pulse counter inputs up to 80 Hz - Are required for each binary input at DC +12 V; 2.3 mA - Switching threshold off $\leq$ DC 6.0 V; on $\geq$ DC 7.0 V; 2.3 mA - Support of NAMUR sensors (proximity sensors) ■ binary output BO - for each binary output, DC 24 V transistor output, max. 500 mA (12 W) - Total of all outputs max. 148 W
Address switch	Addressing 01..63 through 2 rotary switches
Interfaces	CAN bus as: ■ Fieldbus, F-bus: 2000 m, 20 kBd or ■ Switch cabinet bus, SBM bus: 200 m, 40 kBd (note the special CAN bus settings. You can find more information in the DDC4000 project planning documentation)
Housing	Plastic housing
Overvoltage category	III
Rated impulse voltage	800 V
Level of contamination	2
Method of operation	Type 1
Protection class	III
Degree of protection	IP20 (when installed)
Ambient temperature	0..55 °C
Ambient humidity	20..80 % r.h., non-condensing
Installation position	360° vertical position
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	0.21 kg
Dimensions	WxHxD: 143.5 x 90 x 60 mm

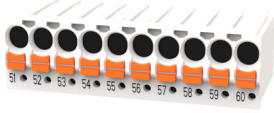
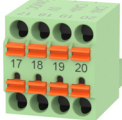




Product Description
BMDU64

Connection clamps

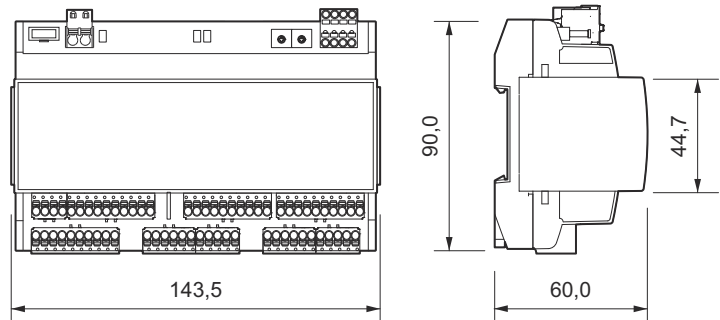
- Spring-loaded terminals
- Twisting two conductors is not permitted, twin wire-end ferrules can be used

	Input/output terminals	IO voltage	Bus terminals
	 Terminals 21..86	 Terminals 1..2	 Terminals 17..20
Single-wire conductor			
Conductor cross-section:	0.5..1.5 mm ²	0.5..2.5 mm ²	0.5..1.0 mm ²
Stripping:	8 mm	10 mm	10 mm
Multiwire conductor			
Conductor cross-section:	0.5..1.5 mm ²	0.5..2.5 mm ²	0.5..1.0 mm ²
Stripping:	8 mm	10 mm	10 mm
Multi-wire conductor with wire end sleeve and plastic collar			
Conductor cross-section:	0.5..1.0 mm ²	0.5..1.5 mm ²	0.5..1.0 mm ²
Wire end sleeve length:	10 mm	10 mm	10 mm
Multi-wire conductor with wire end sleeve without plastic collar			
Conductor cross-section:	0.5..1.0 mm ²	0.5..1.5 mm ²	0.5..1.0 mm ²
Wire end sleeve length:	10 mm	10 mm	10 mm
Required crimping	Square crimping	Square crimping	Square crimping

Accessories (not included in delivery)

ES055KD-VE10 Fuse, F 10 A/58 V for BMDUxx, VE= 10 pcs.

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 input terminals. The binary inputs are now triggered by a connection between the input terminals and the DC +12 V terminals "21" and "22" (binary message "ON"). This prevents an active signal from being generated on the input/output module in secondary earthed installations (PELV) and/or an unwanted connection to ground or reference potential (fault event).



NOTE

Previously, the binary outputs of the GND were switched in our devices. In the new device concept that is now implemented, the DC +24 V is switched at the output terminals. This prevents an active signal from being generated on the input/output module in secondary earthed installations (PELV) and/or an unwanted connection to ground or reference potential (fault event).

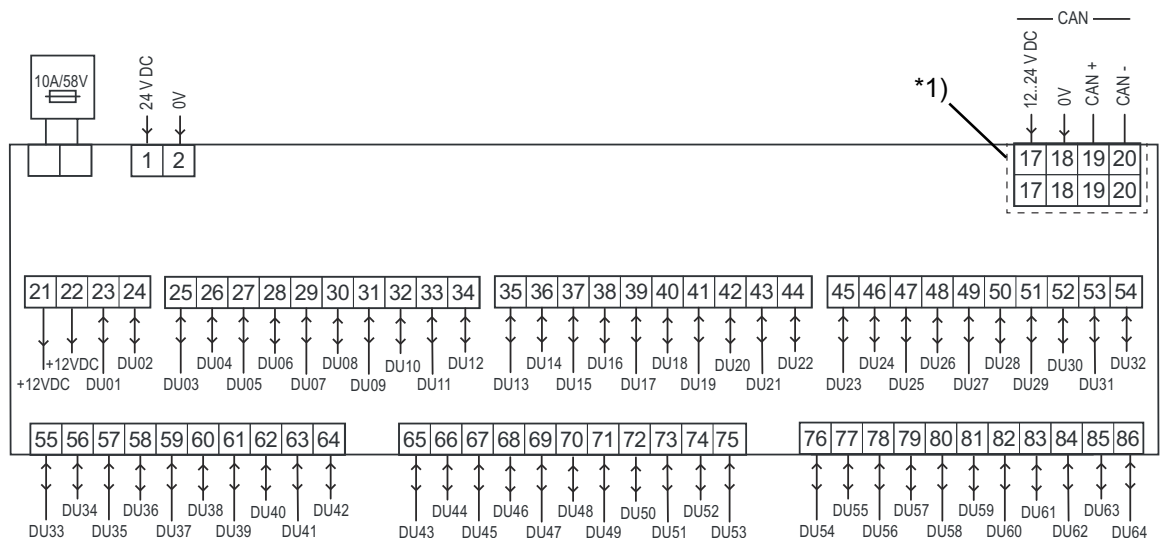


NOTE

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.



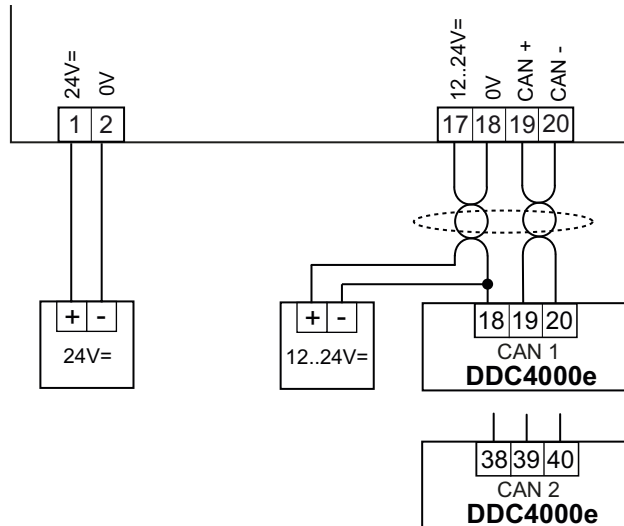
*1) Galvanic isolation



CAUTION

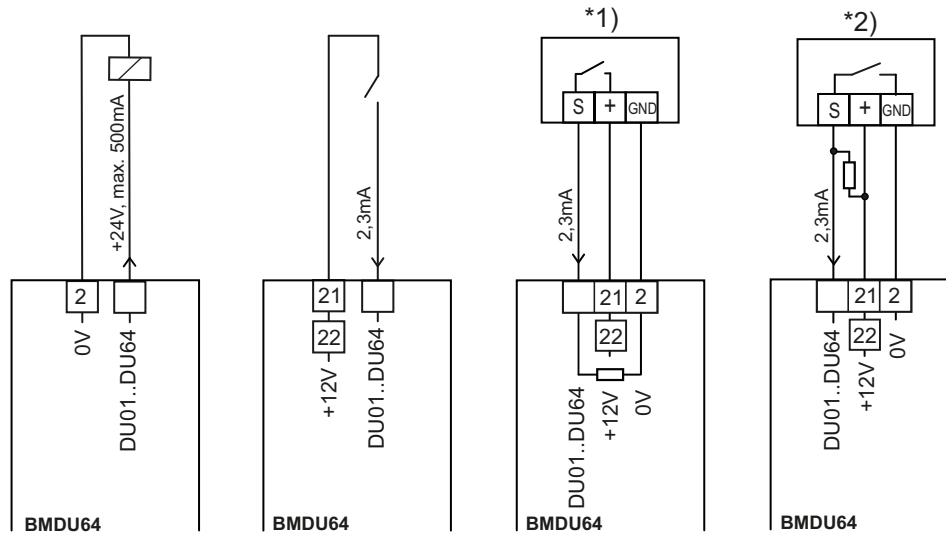
The DC +12 V on terminals “21” and “22” are only to be used for the device’s internal binary inputs and binary inputs that are to be actively supplied (NAMUR sensors), and must not be reused.

Terminal DDC4000e





Connection of binary inputs and outputs



*1) Sensor with PNP output (most frequent application).

The resistance is internal in the input/output module.

*2) Sensor with NPN output/open collector (when the sensor is switched on, the module input resistance is off).

The resistance of 2.2 kΩ must be set externally.



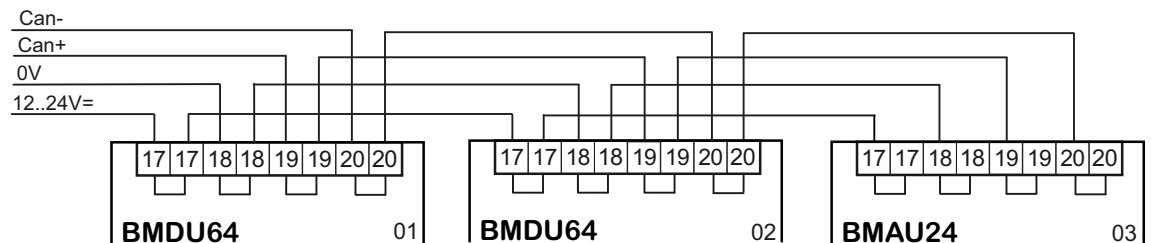
NOTE

Terminal 2 provides the GND for all binary inputs DU01..DU64.

If switching transmitters (such as 3-pole Namur transmitters) are supplied with the DC +12 V voltage provided by the module, it should be noted that the total maximum current of 165 mA must not be exceeded.

2-pole Namur transmitters are connected to DC +12 V and the binary input BI.

Connection of multiple 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.



Migration to existing installations

For migration to existing installations in which the older one-output modules (e.g. BMD4032 or BMD4064) are still installed, the one-output module can be switched to the migration mode via parameterization.

This means switching the reference potential with negative logic.

You can find more information in the DDC4000 project planning documentation.

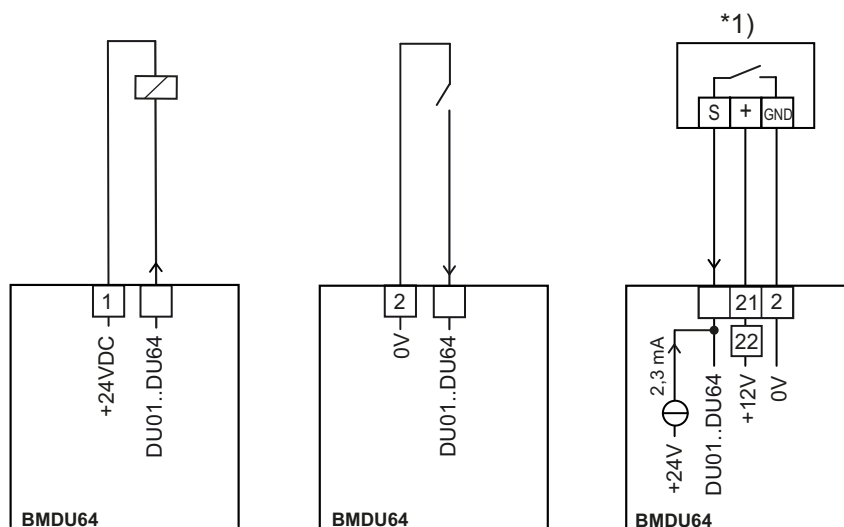
Switching the reference potential (negative logic) means:

- The binary inputs are triggered by a floating connection to GND.

Switching threshold on $\leq$ DC 6.0 V; off $\geq$ DC 7.0 V; 2.3 mA

- In the case of binary outputs, the GND is switched.

For each binary output, DC 24 V transistor output, max. 150 mA (3.6 W) and the total of all outputs max. 148 W.



*1) Only sensor application with NPN output / open collector possible

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.

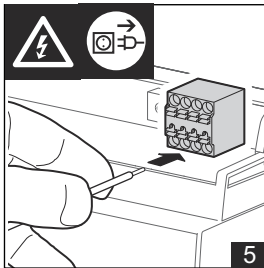
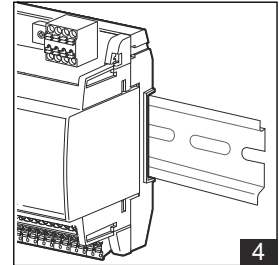
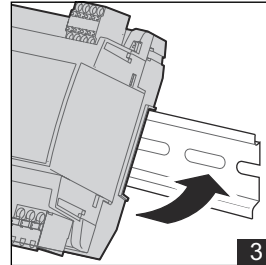
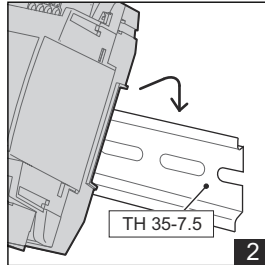
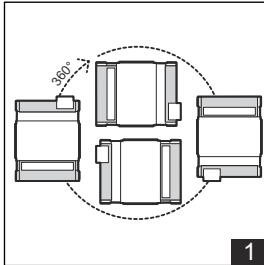


Mounting

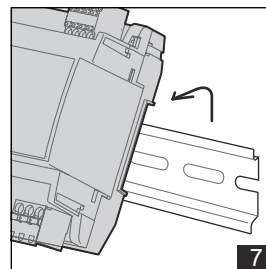
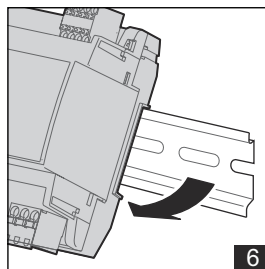
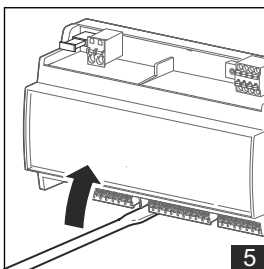
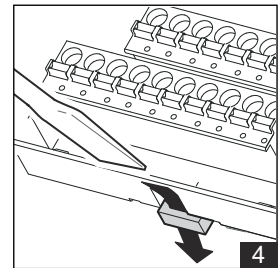
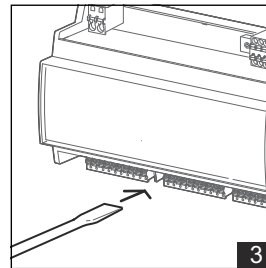
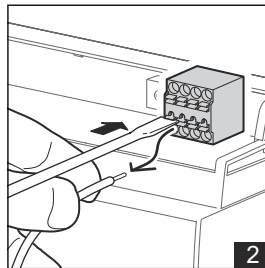
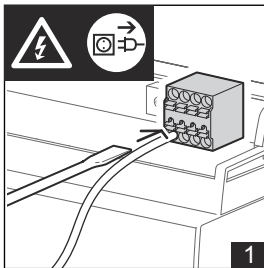


WARNING

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.

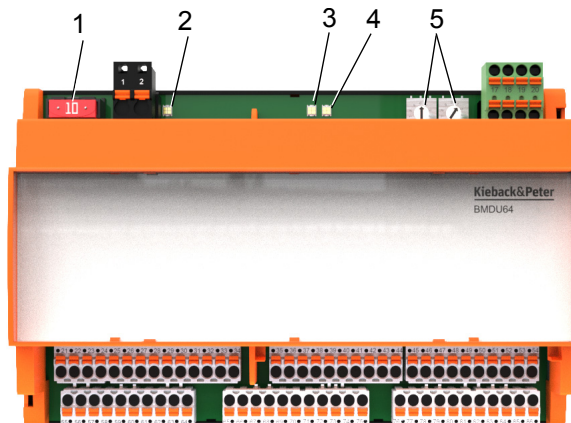


Removal





Setting the CAN bus address



- (1) Fuse 10 A /58 V
- (2) LED IO supply voltage DC 24 V
Terminal 1 and 2
- (3) LED without function
- (4) Combination LED (green, red) for
CAN bus
- (5) Address switches

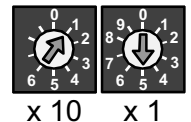
Setting CAN Bus Address

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, the second number on the second rotary address switch.

The example shows the address 15.



CAUTION

Only a maximum of 16 BMDU64 input/output modules can be connected to a CAN bus.



Commissioning



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.

- 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.



NOTE

The parameterization of the fallback values at the outputs and the PIN configuration is maintained in the event of a voltage failure.

Set address 99 to delete the parameterization.



NOTE

In the delivered condition, the address is set to "00," meaning:

- no bus communication
- no parameterization possible

LED Indicators

Combination LED (4) CAN Bus

Status combination LED (4)	Meaning	Cause
Off	Module not in operation	No or insufficient CAN-BUS rated voltage (terminals 17 and 18)
Yellow on (green LED and red LED on)	Module in operation, but there is a bus error; no CAN communication possible, module not registered	Short circuit on the bus lines (against the ground or each other), interrupted Bus lines mixed up or
Yellow flashing (green LED and red LED flashing concurrently) 1 s flashing period	Address error, no bus activity	Outside the address range #01..#63, address assigned multiple times
Green LED flashing and red LED off	Module OK, bus activity	
Red LED and green LED slowly flash in alternation 6 s flashing period	Update is being transferred from DDC4000e to module	
Red LED lights up continuously	Deletion of project planning address 99	

LED (2) IO supply voltage DC 24 V

Status LED (2)	Meaning	Cause
Off	Module not in operation	No CAN-BUS rated voltage (terminals 17 and 18)
Green on	Both voltages OK	
Red on	IO supply voltage missing or fuse faulty	
Yellow on	IO error	e.g. DC +12 V auxiliary voltage overload or output overloaded



Product Description
BMDU64