



Install an additional electrical isolating device upstream of every line of connected TQ-Automation modules so that every TQ-Automation module in the line can be electrically disconnected.

### NOTE

- Always run data and mains cables separately or in separate conduits. Refer to EN 50174-2.
- Protect the UIO100 module against damage by transient over-voltages by installing additional overvoltage protection elements conforming to SPD type 1 (coarse protection) and SPD type 2 (medium protection) upstream of the POW100 mains adapter.
- Make sure that the POW100 mains adapter that powers the UIO100 can be isolated from the supply, e.g. with a type C2 or B6 circuit breaker. This must be identified as the isolating device for the POW100 and must be easily accessible.
- Make sure that the UIO100 module is adequately ventilated. Make sure that the ventilation slots are not covered to prevent the UIO100 module from overheating.
- The UIO100 module requires no maintenance.

### 3 Target group

The activities described in this manual must only be carried out by technicians with the following qualifications:

- Training in the installation and commissioning of electrical devices
- Training in electrical hazards and the local safety requirements
- Knowledge of the relevant standards and directives
- Knowledge and observance of this document and all the safety instructions

### 4 Description

The UIO100 module is an I/O unit for building automation. It has eight UIO channels, six digital inputs (DI) and two inputs for an optional power supply (AUX IN). The UIO channels and inputs (DI, AUX IN) are divided into two galvanically isolated groups (see section 7). The UIO100 module is made up of two parts - the backplane and the electronic module, which is electrically connected to the backplane via contacts. The backplane latches into place on a DIN rail with two snap locks. All the cables from interfaces, actuators and sensors are connected to the backplane with push-in terminals. The backplane has a mechanical housing encoding to prevent any confusion between different modules of the same width. The electronic module is plugged into the backplane. In the event of a fault, the electronic module can be easily replaced without having to detach any wiring. The POW100 mains adapter provides the 24 V supply voltage for the UIO100 module. The supply voltage is supplied to the UIO100 module via the CAB bus.

### 5 Intended usage

- The UIO100 module may only be operated when it is installed on the DIN rail in the distribution board and the protective covers are attached.
- The UIO100 module is approved only for use in dry interior areas.
- Only use the UIO100 module as specified in these instructions provided. Any other usage may result in injury or damage to property.
- For safety reasons, no changes may be made to the UIO100 module, including the software, unless they are expressly approved for the product by TQ-Automation.
- The intended usage also includes compliance with all the notes in these instructions.

### NOTE

Any types of usage other than those specified in section 5 „Intended usage“ are regarded as contrary to the intended usage and will invalidate the warranty.

## 6 Scope of delivery

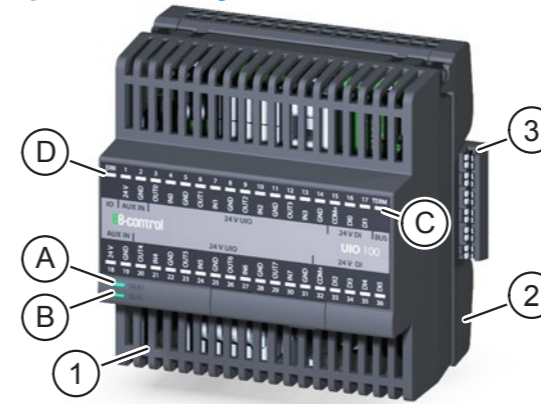


Fig. 1: View of the UIO100 Universal Input/Output module

Item	Designation	Quantity
1	UIO100 Universal Input/Output module	1x
2	Backplane	1x
3	Backplane connector*	1x
-	Installation instructions	1x

\* The backplane connector is used to connect adjacent backplanes of other modules.

## 7 Technical data

Input data	
Supply voltage	24 V DC
Power consumption	Max. 9 W
Universal Input / Output (24 V UIO), group 1	
24 V OUT	OUT0 - OUT3, see group guidelines 1 and 3 in Fig. 2
24 V IN, configured as digital inputs	IN0 - IN3, see group guideline 3 in Fig. 2
24 V IN, config. as analogue inputs	IN0 - IN3
— Voltage measurement	0 to 10 V DC
— Current measurement	0 to 20 mA
— Temperature measurement	-10 °C to 45 °C
— Resistance measurement	600 to 10,000 Ω
Inputs, group 1	
24 V digital inputs	DI0 - DI1
COM+ 24 V (LED position 15)	See group guidelines 2 and 4 in Fig. 2
AUX IN (LED position 1)	24 V DC / 1800 mA
Universal Input / Output (24 V UIO), group 2	
24 V OUT	OUT4 - OUT7, see group guidelines 5 and 7 in Fig. 2
24 V IN, configured as digital inputs	IN4 - IN7, see group guideline 7 in Fig. 2
24 V IN, config. as analogue inputs	IN4 - IN7
— Voltage measurement	0 to 10 V DC
— Current measurement	0 to 20 mA
— Temperature measurement	-10 °C to 45 °C
— Resistance measurement	600 to 10,000 Ω
Inputs, group 2	
24 V digital inputs	DI2 - DI5
COM+ 24 V (LED position 32)	See group guidelines 6 and 8 in Fig. 2
AUX IN (LED position 18)	24 V DC / 1800 mA
Line connections	
Connection cross section	0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup>
Housing protection	
IP code	IP20
Protection class	III
Overvoltage category	I (EN 61010-1:2010)
Ambient conditions	
Ambient temperature	
— Operation	0 °C to 50 °C
— Storage	-25 °C to 60 °C
Relative humidity (non condens.)	50 % to 95 %
Air pressure during operation	790 hPa to 1070 hPa

## UIO100 Universal Input/Output module Installation instructions, edition 05/2019 EN

### 1 Introduction

These installation instructions contain important information that should be followed when installing the UIO100 Universal Input/Output module.

- Read all the instructions carefully before installing and commissioning the UIO100 Universal Input/Output module to avoid possible risks and mistakes.
- Keep the installation instructions in a safe place for future reference.

### 2 Safety instructions

These instructions contain notes that you must follow for your own personal safety and to avoid injury and damage to property. They are highlighted by warning triangles and are shown as follows according to the level of danger.

#### 2.1 Hazard classification



The signal word designates a hazard with a **high** degree of risk which, if it is not avoided, will result in death or severe injury.



The signal word designates a hazard with a **medium** degree of risk which, if it is not avoided, will result in death or severe injury.



The signal word designates a hazard with a **low** degree of risk which, if it is not avoided, could result in minor or moderate injury.

### NOTE

A note as used in these instructions contains important information about the product or about a part of the manual to which particular attention should be paid.

#### 2.2 Notes on installation



- Follow ALL danger and warning instructions and notes on precautionary measures.
- Read section 2 „Safety instructions“ carefully.

#### 2.3 Notes on using the module safely



##### Danger of death by electric shock.

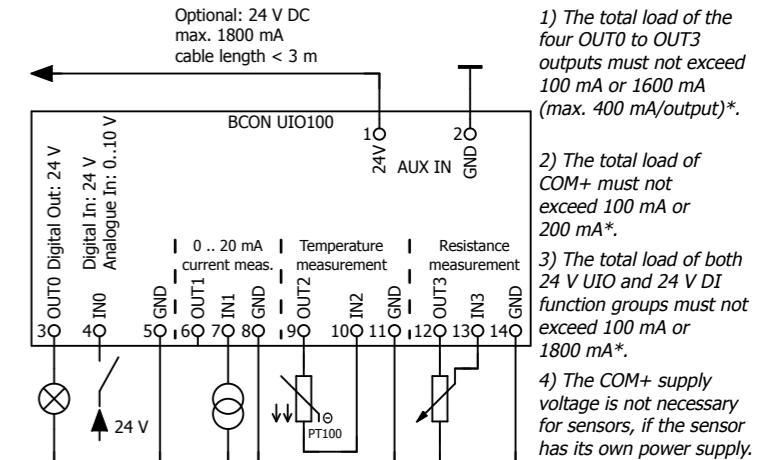
Only safety extra low voltages (SELV) may be connected to the UIO100 module. Components of other TQ-Automation modules on the same DIN rail do carry potentially fatal voltages, however.

- Install the TQ-Automation modules only in approved housings or distribution boards so that the connections for the outer and neutral conductors are located behind a cover or guard to prevent accidental contact. The housing or distribution board must be accessible only with a key or suitable tool in order to limit access to authorised personnel.
- Before starting any installation or maintenance work, switch off the input voltage and secure it to prevent it being switched on again accidentally.
- Install the UIO100 module only in a dry environment.
- Protect the UIO100 module against moisture and wet conditions.

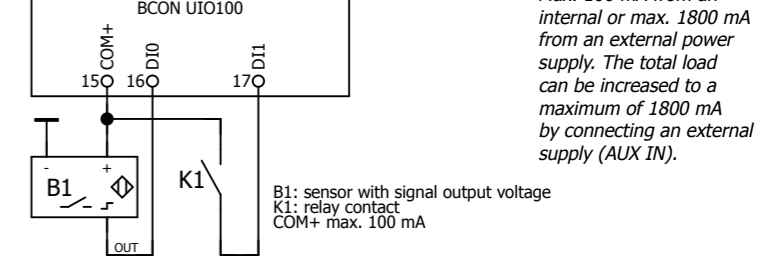
Dimensions/weight	
Dimensions (W x H x D)	90 mm x 95 mm x 67 mm, width equals 5 DIN units
Weight	0.29 kg
Handling	
Max. altitude during operation	2000 m above sea level
DIN rail system	TS 35 (35 mm x 7.5 mm, 1 mm thick)

## 8 Wiring diagrams for the connections

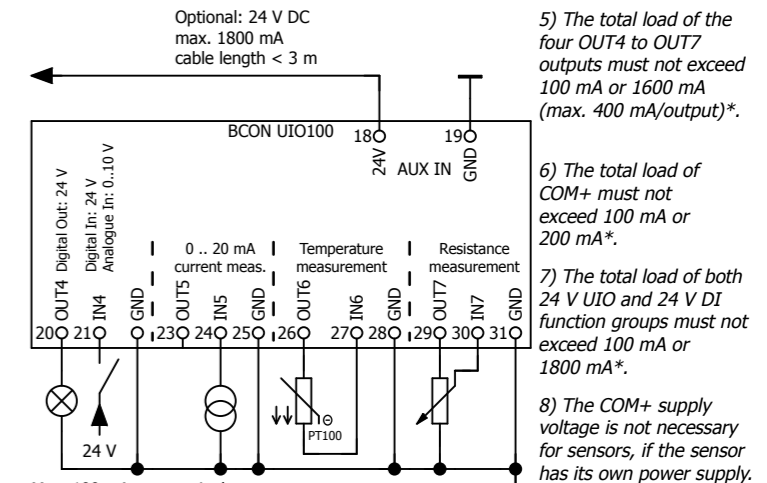
### 24 V UIO (24 V Universal Input/Output)



### 24 V DI (24 V Digital Input)



### 24 V UIO (24 V Universal Input/Output)



### 24 V DI (24 V Digital Input)

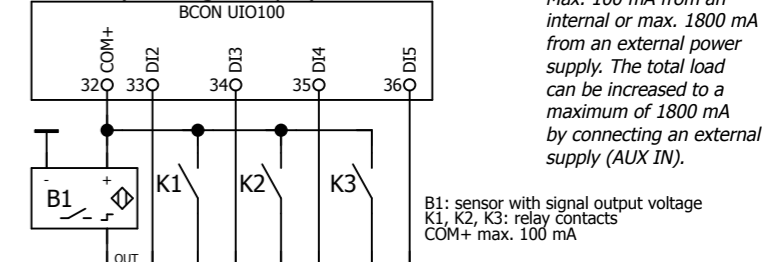


Fig. 2: Wiring diagrams for UIO channels and digital inputs

## 9 Controls

There are three pushbuttons and a USB port beneath the service flap (item 5 in Fig. 3) on the UIO100 module.

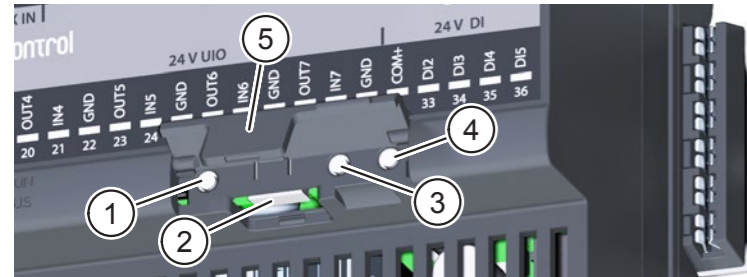


Fig. 3: Controls

Item	Control	Function
1	RESET button	Restarts the UIO100 module
2	USB port (Micro-B)	For software and firmware updates or manually controlling the module
3	BTN1 button	Assigned to a software function
4	BTN2 button	Assigned to a software function

## 10 LED status displays

All the status LEDs are arranged on the front panel of the UIO100 module. There is an overview of the LED status displays in Table 1 and Table 2.

## 11 Installation

### **DANGER**

**Danger of death by electric shock.**

Only safety extra low voltages (SELV) may be connected to the UIO100 module. Components of other TQ-Automation modules on the same DIN rail do carry potentially fatal voltages, however.

- ▶ Disconnect the connection points from the power supply.
- ▶ Secure the fuses to prevent switching on again.
- ▶ Make sure that the conductors to be connected are voltage-free.

### 11.1 Tools and equipment

- Screwdriver, insulated, size 1, max. blade width 3 mm
- Voltmeter

### 11.2 Install the backplane

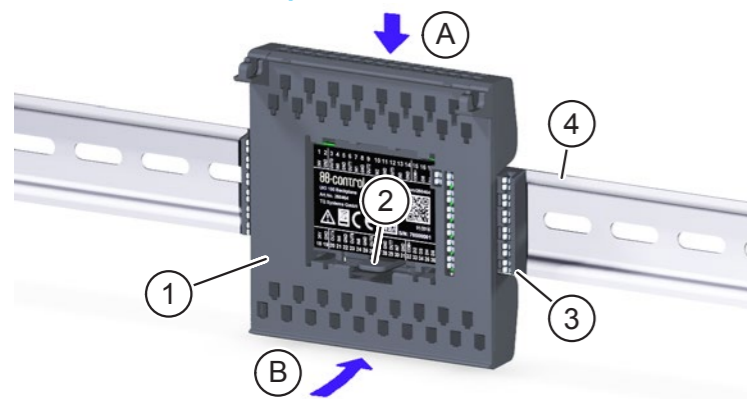


Fig. 4: Place the backplane on the DIN rail

- ▶ Arrange the backplane (item 1 in Fig. 4) so that the tab (item 2 in Fig. 4) is underneath.
- ▶ Holding the backplane at an angle, engage it from above (item A in Fig. 4) in the top edge of the DIN rail (item 4 in Fig. 4).
- ▶ Carefully press the backplane (item 1 in Fig. 4) against the DIN rail (item 4 in Fig. 4) until it snaps into place (item B in Fig. 4).

### NOTE

- There must be no backplane connector (item 3 in Fig. 4) inserted on the last module of a row of DIN rails or on the last module of the entire installation.
- To detach the backplane from the DIN rail, press the tab (item 2 in Fig. 4) down lightly and swivel the backplane up.

## 11.3 Wire the backplane

- ▶ Wire the backplane as described in the installation specifications. The openings for the push-in terminals (item 1 in Fig. 5) are at the top and bottom of the backplane. The label on the backplane shows the terminal assignments.
- ▶ Strip the insulation from the end of the hook-up wire:
  - Rigid wire 0.5 to 1.5 mm<sup>2</sup>, stripped length 10 mm
  - Strand 0.5 to 1.5 mm<sup>2</sup>, ferrule, length 10 mm

### NOTE

- ▶ Note the length of the ferrule (10 mm).

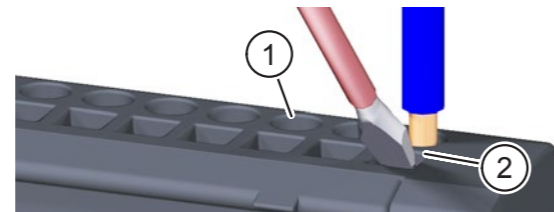


Fig. 5: Wire the backplane

- ▶ Insert the rigid wire or ferrule into the round opening of the push-in terminal (item 1 in Fig. 5) as far as it will go.

### NOTE

For small hook-up wire cross-sections:

- ▶ Insert the screwdriver from the front into the square opening (item 2 in Fig. 5) at a 45° angle.
- ▶ Press the screwdriver lightly against the terminal and insert the hook-up wire into the round opening as far as it will go.
- ▶ Pull on the hook-up wire to make sure that it is seated firmly in the push-in terminal.

### NOTE

To release the hook-up wire from the terminal:

- ▶ Insert the screwdriver from the front into the square opening (item 2 in Fig. 5) at a 45° angle.
- ▶ Press the screwdriver lightly against the terminal and pull the hook-up wire out.

## 11.4 Install the electronic module

- ▶ Remove the protective film from the backplane.
- ▶ Insert the pivot axes (item 4 in Fig. 6) of the electronic module (item 1 in Fig. 6) into the hooks (item 3 in Fig. 6) of the backplane (item 2 in Fig. 6).
- ▶ Tilt the electronic module down and press it carefully against the backplane until it latches into place.



Fig. 6: Install the electronic module

## 11.5 Start up the UIO100 module

### NOTE

- ▶ Carry out an insulation measurement before starting up.
- ▶ Switch on the POW100 mains adapter. The L LED on the POW100 module and the RUN LED on the POW100 and UIO100 modules light up green.
- ▶ Check the LED statuses according to Table 1 and Table 2.

## 11.6 Uninstalling the electronic module

To uninstall the electronic module from the backplane:

- ▶ Insert the screwdriver into the two gaps (item 1 in Fig. 7) on the underside of the electronic module one after the other in order to detach the module from its fixing.

Function	Labelling	LED position	LED colour	Status if LED is off	Status if LED is on	Status if LED is flashing
Module status	RUN	Item A in Fig. 1	red/ green	The module is switched off or the status is not OK if the module is switched on	– red: the module is switched on, but the processor is not responding or the module is in the bootloader state	– red (< 150/150 ms interval): software exception – red alternating with the CAB bus status LED: CAB bootloader active – green (1750/250 m interval): module status OK
CAB bus status	BUS	Item B in Fig. 1	red/ yellow/ green	CAB bus inactive	– red: baud rate synchronisation is active – yellow: CAB bus in Init mode – green: CAB bus is ready-to-operate	– red (500 ms interval): bus in scan mode – red (1 s interval): bus in position detection mode – red alternating with the module status LED: module in the bootloader state – yellow (250 ms interval): bus in PREOP mode – yellow (1 s interval): bus in SAFEOP mode
Bus termination	TERM	Item C in Fig. 1	yellow	Termination is inactive	Termination is active	-
I/O error	ERR	Item D in Fig. 1	red	Module is switched off or is working normally	An I/O error has occurred (e.g. overload)	-

Table 1: LED status displays for module functions

Interface	Labelling	LED pos.	LED colour	Status if LED is off	Status if LED is on	Status if LED is flashing
AUX IN (group 1)	24 V	1	green	External supply not connected, off or faulty	External supply available and OK	-
24 V UIO (group 1)	OUT0 to OUT3	3, 6, 9, 12	red/ green	Output is OFF	– red (all LEDs): overload at an output – green: 24 V output ON	red (750/750 ms): cable break/broken sensor
	IN0 to IN3	4, 7, 10, 13	red/ green	Software-defined, e.g. input = LOW	– red (all LEDs): overload at an input – green: 24 V input = HIGH	red (750/750 ms): cable break/broken sensor
24 V DI (group 1)	DI0 to DI1	16, 17	green	Input level = LOW	Input level = HIGH	-
AUX IN (group 2)	24 V	18	green	External supply not connected, off or faulty	External supply available and OK	-
24 V UIO (group 2)	OUT4 to OUT7	20, 23, 26, 29	red/ green	Output is OFF	– red (all LEDs): overload at an output – green: 24 V output ON	red (750/750 ms): cable break/broken sensor
	IN4 to IN7	21, 24, 27, 30	red/ green	Software-defined, e.g. input = LOW	– red (all LEDs): overload at an input – green: 24 V input = HIGH	red (750/750 ms): cable break/broken sensor
24 V DI (group 2)	DI2 to DI5	33, 34, 35, 36	green	Input level = LOW	Input level = HIGH	-

Table 2: LED status displays for interfaces

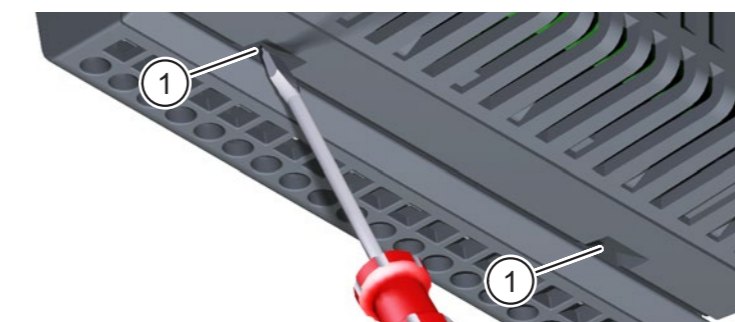


Fig. 7: Uninstalling the electronic module

- ▶ Tilt the electronic module upwards and lift it away from the backplane.

### NOTE

- ▶ Once you have removed the module from the backplane, reattach the protective film to the backplane. This will protect the contacts against soiling by dust on site, for example.

## 12 Environmentally-friendly disposal

- ▶ The UIO100 module must not be disposed of in the residual waste bin.

- ▶ Dispose of the UIO100 module in accordance with the electronic waste disposal regulations that apply on site.

## 13 Fault finding

- The RUN LED does not light up: fault in the electronic module. Contact Customer Service.
- The RUN LED flashes red: a fault has occurred. Contact Customer Service.
- The RUN LED lights up red: the module is in the bootloader state or a software update is in progress.

## 14 Software licence

This product also contains open source software that was developed by third parties. You will find the licence texts and associated notes on our home page [www.tq-automation.com](http://www.tq-automation.com).

## 15 Contact

If you have technical problems with the product, contact TQ-Automation Customer Service. We will need the following information to be able to give you specific help:

- Serial number of the UIO100 module
- Description of the fault

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Germany

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