ANO100 Analogue Output module
Installation instructions, edition 05/2019 EN

1 Introduction

These installation instructions contain important information that should be followed when installing the ANO100 Analogue Output module.

- ► Read all the instructions carefully before installing and commissioning the ANO100 Analogue 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

⚠ DANGER

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.

⚠ WARNING

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.

⚠ CAUTION

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

⚠ WARNING

- ► **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

Danger of death by electric shock.

Only safety extra low voltages (SELV) may be connected to the ANO100 module. Components of other TQ-Automation-Module on the same DIN rail do carry potentially fatal voltages, however.

- ► Install the TQ-Automation-Module 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 ANO100 module only in a dry environment.
- ► Protect the ANO100 module against moisture and wet conditions.

⚠ WARNING

- ► Install an additional electrical isolating device upstream of every line of connected TQ-Automation-Module 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 ANO100 module against damage by transient overvoltages 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 ANO100 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 ANO100 module is adequately ventilated. Make sure that the ventilation slots are not covered to prevent the ANO100 module from overheating.
- ► The ANO100 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 ANO100 module is a unit for outputting analogue signals for building automation. It has eight analogue outputs that are divided into two galvanically isolated groups (see section 7). Each output can output either voltages from 0 to 10 V DC or currents from 0 to 20 mA. The ANO100 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 lines of the interfaces 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 ANO100 module. The supply voltage is supplied to the ANO100 module via the CAB bus.

5 Intended usage

— The ANO100 module may only be operated when it is installed on the DIN rail in the distribution board and the protective covers are attached.
— The ANO100 module is approved only for use in dry interior areas.
— Only use the ANO100 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 ANO100 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

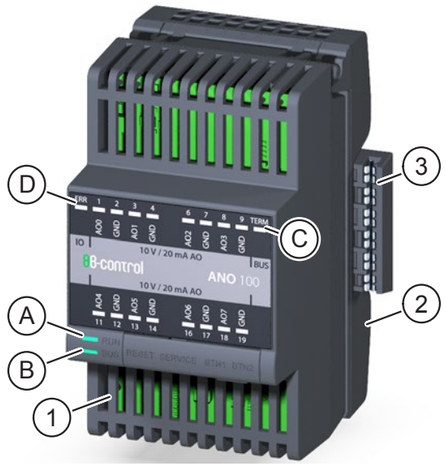

Fig. 1: View of the ANO100 Analogue Output module

Item	Designation	Quantity
1	ANO100 Analogue Output module	1x
2	Backplane	1x
3	Backplane connector*	1x
-	20 kΩ resistor	8x
-	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. 7 W
Analogue output, group 1	
Analogue output configured as:	AO0 - AO3
— Voltage output	0 to 10 V DC
— Current output	0 to 20 mA
Analogue output, group 2	
Analogue output configured as:	AO4 - AO7
— Voltage output	0 to 10 V DC
— Current output	0 to 20 mA
Line connections	
Connection cross section	0.5 mm² to 1.5 mm²
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
Dimensions/weight	
Dimensions (W x H x D)	53 mm x 95 mm x 67 mm, width equals 3 DIN units
Weight	0.125 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

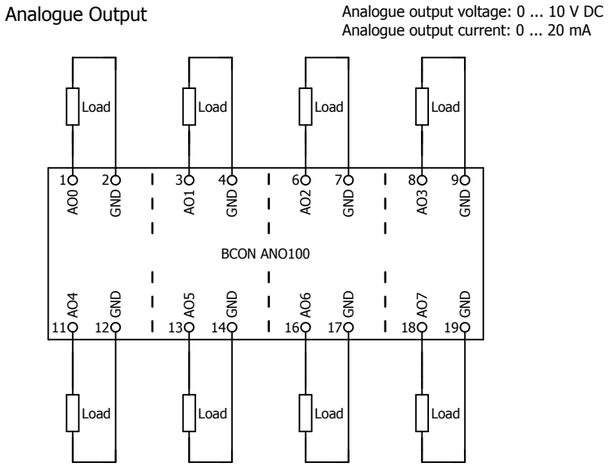

Fig. 2: Wiring diagrams for analogue outputs

9 Controls

There are three pushbuttons and a USB port beneath the service flap (item 5 in Fig. 3) on the ANO100 module.

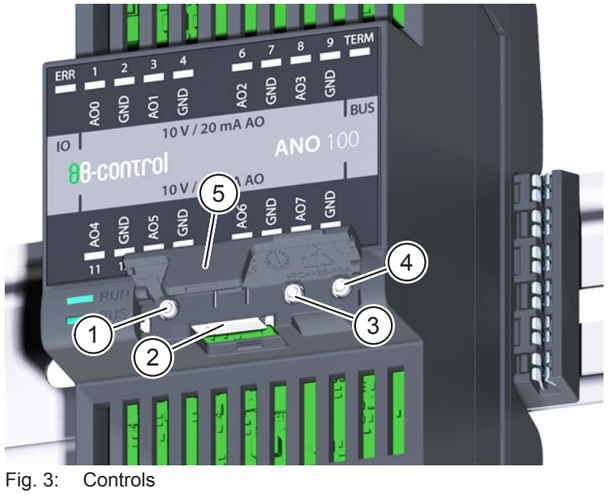

Fig. 3: Controls

Item	Control	Function
1	RESET button	Restarts the ANO100 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 ANO100 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 ANO100 module. Components of other TQ-Automation-Module 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

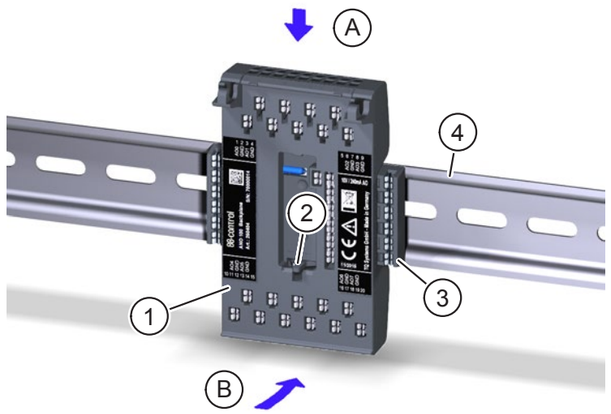

Fig. 4: Place the backplane on the DIN rail

► 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 labels on the backplane show the terminal assignments.
► Strip the insulation from the end of the hook-up wire:
— Rigid wire 0.5 to 1.5 mm², stripped length 10 mm
— Strand 0.5 to 1.5 mm², ferrule, length 10 mm

NOTE

► Note the length of the ferrule (10 mm).

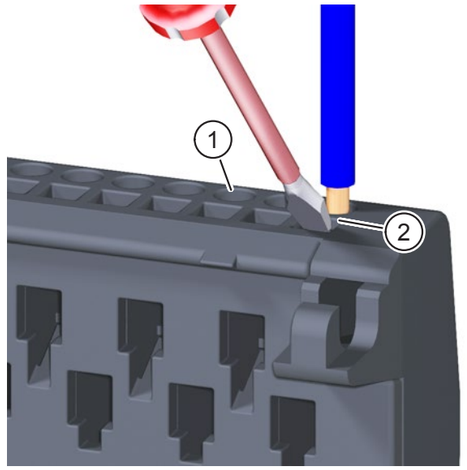

Fig. 5: Wire the backplane

► 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.

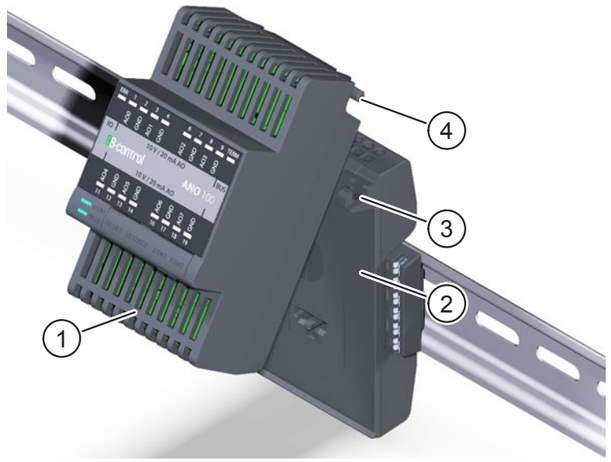

Fig. 6: Install the electronic module

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 boot-loader state – green: the module is ready-to-operate	– red (< 150/150 ms interval): software exception – red alternating with the CAB bus status LED: CAB bootloader active – green (750/250 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 – 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
10 V / 20 mA AO (group 1)	AO0 to AO3	1, 3, 6, 8	red/ green	Output is OFF	– red: output not OK (error) – green: output ON
10 V / 20 mA AO (group 2)	AO4 to AO7	11, 13, 16, 18	red/ green	Output is OFF	– red: output not OK (error) – green: output ON

Table 2: LED status displays for interfaces

11.5 Start up the ANO100 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 ANO100 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.
► Tilt the electronic module upwards and lift it away from the backplane.

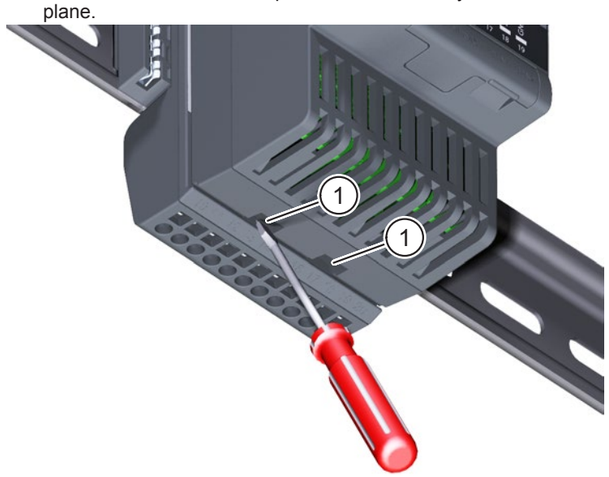

Fig. 7: Uninstalling the electronic module

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 ANO100 module must not be disposed of in the residual waste bin.

► Dispose of the ANO100 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.

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 ANO100 module
— Description of the fault

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