Modbus RTU to Isolated Analog Output Module
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UNI EN ISO 9001:2008

Modbus RTU to 4 Channel Isolated Analog Output

DAT3024-ISO

FEATURES
- **Field-Bus remote data acquisition**
- **Modbus Slave device on RS-485**
- **Modbus RTU/ Modbus ASCII protocol**
- **4 isolated output channels**
- **Outputs configurable as Voltage or Current**
- **Watch-Dog Alarm**
- **Remotely Configurable**
- **1500 Vac 3-ways Galvanic Isolation**
- **High Accuracy**
- **CE mark**
- **DIN rail mounting in compliance with EN-50022**

GENERAL DESCRIPTION

The DAT3024-ISO device generates 4 output analog signals from digital commands.The data are transmitted with MODBUS RTU/MODBUS ASCII protocol on the RS-485 network. To ensure the plant safety, one Watch-Dog timer alarm is provided.
The output channels are configurable independently.
For each channel it is possible to set:
- Type and output value;
- Preset of the value at the power up (Power-up) separated for output voltage and current;
- Preset of safety value (Safe) separated for output voltage and current.

It is possible to generate voltage signals up to 10V and current signals up to 20mA, both active or passive loops.
The device guarantees high accuracy and stable measure versus time and temperature.
The isolation between the parts of circuit removes eventual ground-loop effects, allowing the use of the device even in the heavy environmental conditions. The device is housed in a rough self-extinguishing plastic container which, thanks to its thin profile of 17.5mm only, allows a high density mounting on EN-50022 standard DIN rail.

COMMUNICATION PROTOCOLS

The DAT3024-ISO is designed to work with the MODBUS RTU/MODBUS ASCII protocol: standard protocol in field-bus; allows to directly interface DAT3000 series devices to the larger part of PLCs and SCADA applications available on the market.
For the protocol instructions, refer to the User Guide of the device.

USER INSTRUCTIONS

Before to install the device, please read the “Installation Instruction” section.
If the module configuration is unknown, with device powered off, connect the INIT terminal to the GND terminal (ground), at the next power on the device will be auto-configured in the default settings (refer to the User Guide of the device).
Connect power supply, serial bus and analogue outputs as shown in the “Wiring” section.
The “PWR” LED state depends on the working condition of the device: see the "Light Signalling" section to verify the device working state.
To perform configuration and calibration operations, read the instructions in the User Guide of the device.
To simplify handling or replacing of the device, it is possible to remove the wired terminals even with the device powered.

TECHNICAL SPECIFICATIONS (Typical @ 25 °C and in the nominal conditions)

OUTPUT (4 channels)

Output type	Min	Max
Current mA	0 mA	+20 mA
Voltage Volt	0 V	+10 V

Output Accuracy	
Current	± 10 uA
Voltage	± 5 mV
Thermal drift	
Full scale	± 0.01 % / °C
Load resistance	
Voltage	≥ 5 KΩ
Current	≤ 500 Ω
Auxiliary Voltage (4 channels)	
	≥ 13Vdc @ 20mA
Response time (from 10 % to 90 %)	15 ms
Sample time	50 ms
Data Transmission	
Baud Rate	115.2 Kbps
Max. distance	1.2 Km – 4000 ft

POWER SUPPLY	
Power supply voltage	20 .. 30 Vdc
Reverse polarity protection	60 Vdc max
Current consumption	150 mA max.
ISOLATION	
On all the ways	1500 Vac, 50 Hz, 1 min
ENVIRONMENTAL CONDITIONS	
Operative Temperature	-20°C .. +60°C
Storage Temperature	-40°C.. +85°C
Humidity (not condensed)	0 .. 90 %
Maximum Altitude	2000 m
Installation	Indoor
Category of installation	II
Pollution Degree	2
MECHANICAL SPECIFICATIONS	
Material	Self-extinguish plastic
IP Code	IP20
Wiring	wires with diameter 0.8÷2.1 mm^2 /AWG 14-18
Tightening Torque	0.5 N m
Mounting	in compliance with DIN rail standard EN-50022
Weight	about 150 g.
CERTIFICATIONS	
EMC (for industrial environments)	
Immunity	EN 61000-6-2
Emission	EN 61000-6-4

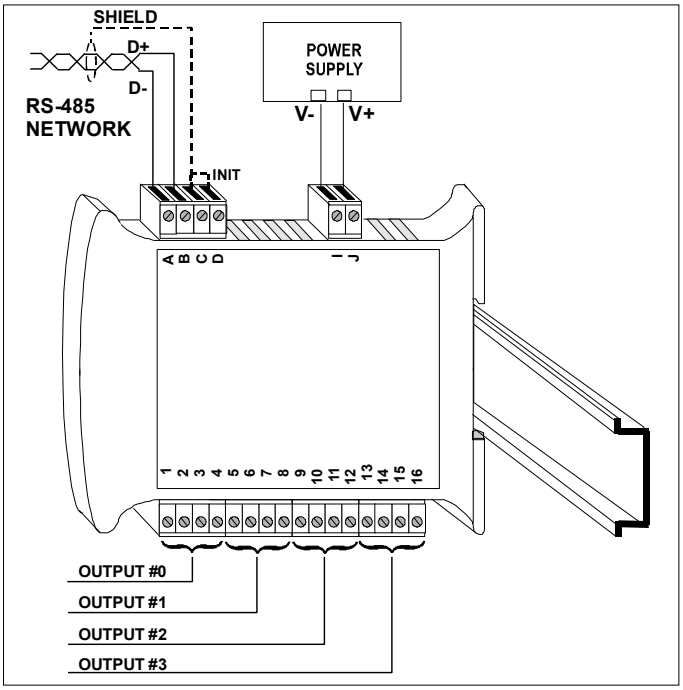
INSTALLATION INSTRUCTIONS

The DAT3024-ISO is suitable for fitting to DIN rails in the vertical position.
For optimum operation and long life follow these instructions:
When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following case:
- If panel temperature exceeds 45°C and at least one of the overload conditions exist.
- If panel temperature exceeds 35°C and at least two of the overload conditions exists.

The overload conditions are the following:
- High supply voltage: >27Vdc
- Use of the auxiliary power supply

Make sure that sufficient air flow is provided for the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel. Install the device in a place without vibrations.
Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters etc...) and to use shielded cable for connecting signals.

CABLING

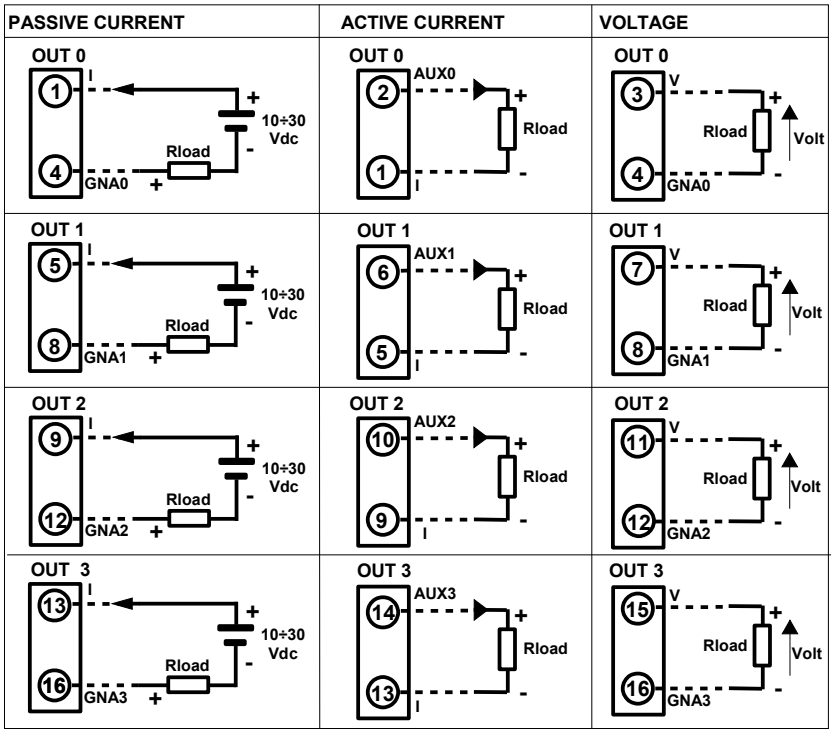


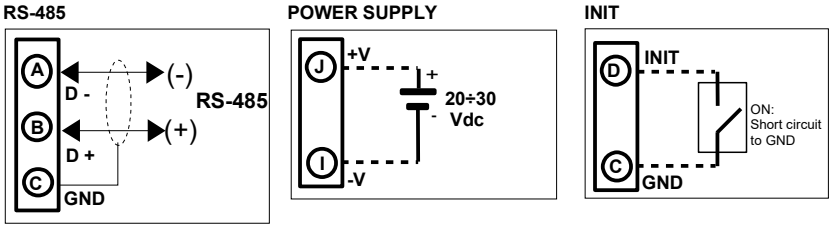
MODBUS REGISTERS MAPPING

Register Position	Description	Access
40002	Firmware [0]	RO
40003	Firmware [1]	RO
40004	Name [0]	R/W
40005	Name [1]	R/W
40006	Baud-Rate	R/W
40007	Node ID	R/W
40008	Delay TX/RX	R/W
40009	Watchdog timer	R/W
40010	System Flags	R/W
40014	Outputs type	R/W
40015	Analog Output (0)	R/W
40016	Analog Output (1)	R/W
40017	Analog Output (2)	R/W
40018	Analog Output (3)	R/W
40023	Power Up Current (0)	R/W
40024	Power Up Current (1)	R/W
40025	Power Up Current (2)	R/W
40026	Power Up Current (3)	R/W
40031	Power Up Voltage (0)	R/W
40032	Power Up Voltage (1)	R/W
40033	Power Up Voltage (2)	R/W
40034	Power Up Voltage (3)	R/W
40039	Safe Current (0)	R/W
40040	Safe Current (1)	R/W
40041	Safe Current (2)	R/W
40042	Safe Current (3)	R/W
40047	Safe Voltage (0)	R/W
40048	Safe Voltage (1)	R/W
40049	Safe Voltage (2)	R/W
40050	Safe Voltage (3)	R/W

WIRING

ANALOGUE OUTPUTS

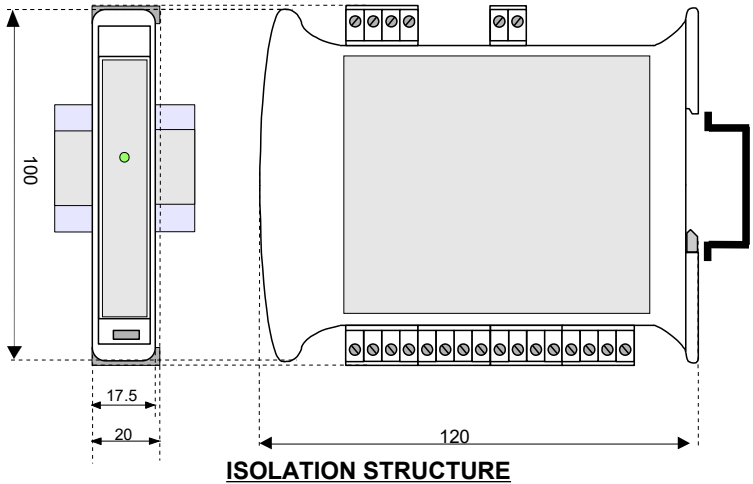




LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered / Wrong RS-485 cabling.
		FAST BLINK	Communication in progress (blink frequency depends to baud-rate)
		1 second BLINK	Watch-Dog Alarm condition

MECHANICAL DIMENSIONS (mm)



ISOLATION STRUCTURE

HOW TO ORDER

The device can be supplied with the configuration specified by the customer.

DAT 3024-ISO / mA — Output type — = Optional