

4 channel RTD input to Modbus RTU DAT10014

DAT 10014

FEATURES

- Modbus Server device on RS-485
- Modbus RTU/ Modbus ASCII protocol
- 4 input channels
- Input configurable for RTD, Resistance and Potentiometer
- Communication parameters configurable by dip-switches
- Watch-Dog Alarm
- Remotely Configurable
- 1500 Vac 3-ways Galvanic Isolation
- LEDs of signalling on front side for power supply and communication
- Connection by removable screw terminals
- High Accuracy
- CE/UKCA mark
- DIN rail mounting in compliance with EN-50022



GENERAL DESCRIPTION

The device DAT10014 converts up to 4 analogue input signals into engineering units in digital format. The data are transmitted with MODBUS RTU / MODBUS ASCII protocol over the RS-485 network.

It is possible to connect on input RTD, Potentiometer or Resistance sensors.

The device guarantees high accuracy and stable measure versus time and temperature.

To ensure the plant safety, a Watch-Dog timer alarm is provided.

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 6 module DIN rough self-extinguishing plastic box for mounting on EN-50022 standard DIN rail.

USER INSTRUCTIONS

Before to install the device, please read the "Installation Instruction" section.

It is possible to configure the device in two modes: by the dip-switches located on the front of the device or via software using the INIT modality.

Connect the terminal INIT to the terminal REF; at the power-on the device will be automatically set in the configuration set-up (refer to the User Guide of the device).

Connect power supply, serial bus and analogue inputs as shown in the "Wiring" section.

The LEDs 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)

INPUT			OUTPUT	GENERAL SPECIFICATIONS	
Input Type	Min	Max	Data Transmission	Power supply voltage	10 .. 30 Vdc
RTD 2 or 3 wires Pt100 Pt1000 Ni100 Ni1000	-200 °C	850 °C	RS-485 asynchronous serial Baud Rate 115.2 Kbps Max. distance 1.2 Km – 4000 ft	Reverse polarity protection	60 Vdc max
	-200 °C	400 °C		Current consumption @ 24 Vdc	
	-60 °C	180 °C			35 mA max.
	-60 °C	150 °C		Max. Current consumption 45 mA	
	RES. 2 or 3 wires			ISOLATION	
Low	0 Ω	500 Ω		Among all the ways 1500 Vac, 50 Hz, 1 min	
High	0 Ω	2000 Ω		ENVIRONMENTAL CONDITIONS	
POT (Nominal R)				Operative temperature -10°C .. +60°C	
	20 Ω	500 Ω		Storage temperature -40°C .. +85°C	
Low	20 Ω	500 Ω		Humidity (not condensing) 0 .. 90 %	
High	20 Ω	2000 Ω		Maximum Altitude 2000 m slm	
Input Accuracy (1) RTD ±0.05 % f.s. Resistance ±0.05 % f.s. Potentiometer ±0.05 % f.s.				Installation Indoor	
				Category of Installation II	
				Pollution Degree 2	
				MECHANICAL SPECIFICATIONS	
				Material Self-extinguish plastic	
Linearity (1) RTD ± 0.1 % f.s.				IP Code IP20	
				Wiring wires with diameter 0.8+2.1 mm ² AWG 14-18	
				Tightening Torque 0.8 N m	
				Mounting in compliance with DIN rail standard EN-50022	
				Weight about 200 g.	
Lead wire resistance influence RTD/res.3 wires(50 Ω max balanced) 0.05 f.s. % / Ω				CERTIFICATIONS	
				EMC (for the Industrial Environments)	
				Immunity EN 61000-6-2	
				Emission EN 61000-6-4	
				UKCA (ref S.I. 2016 N°1091)	
RTD excitation current Typical 0.350 mA				Immunity BS EN 61000-6-2	
				Emission BS EN 61000-6-4	
Thermal drift (1) Full scale ± 0.01 % / °C					
Sample time 0.5 ÷ 1 sec.					
Warm-up time 3 min.					
(1) referred to the input Span (difference between max. and min.)					

INSTALLATION INSTRUCTIONS

The device is suitable for fitting to DIN rails in the vertical position.
For optimum operation and long life follow these instructions:

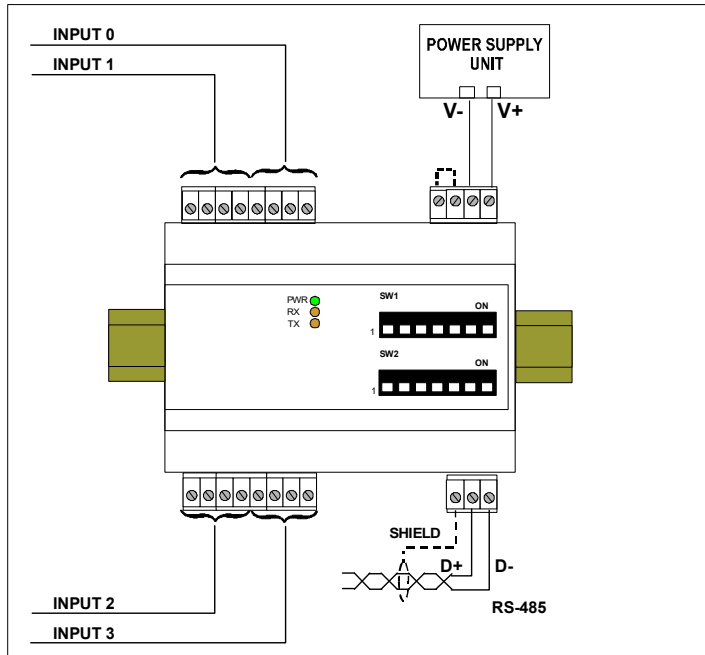
When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following case:
- If panel temperature exceeds 45°C and power supply voltage 10 Vdc.

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.

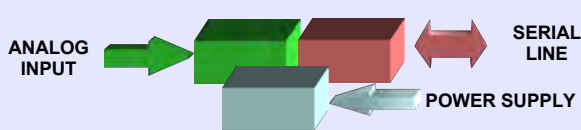
TERMINALS OVERVIEW



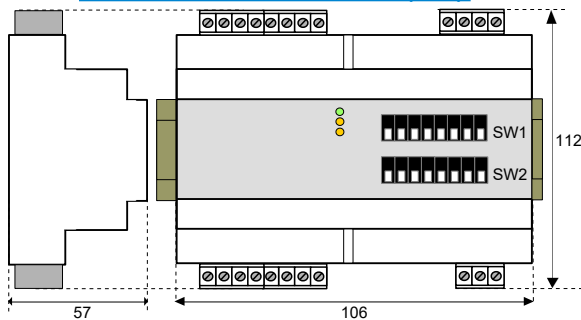
LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINK	~1 sec. - Watch-Dog alarm condition occurred
RX	ORANGE	BLINK	Stream of data over receiving line of RS-485
		OFF	No data over receiving line of RS-485
TX	ORANGE	BLINK	Stream of data over transmission line of RS-485
		OFF	No data over transmission line of RS-485

ISOLATION STRUCTURE



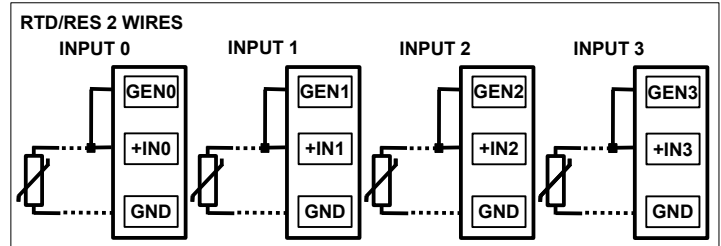
MECHANICAL DIMENSIONS (mm)



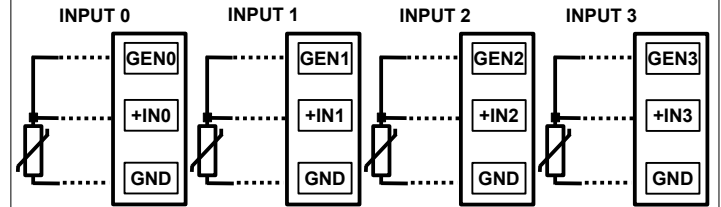
The symbol reported on the product indicates that the product itself must not be considered as a domestic waste.
It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste.
For more information contact the proper office in the user's city, the service for the waste treatment or the supplier from which the product has been purchased.

WIRING

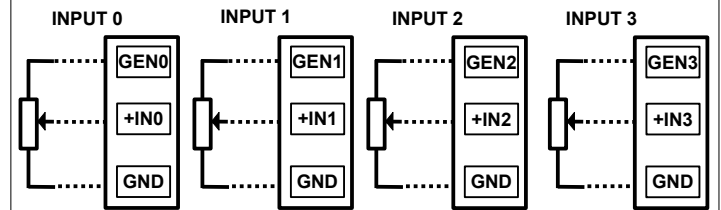
ANALOGUE INPUTS



RTD/RES 3 WIRES

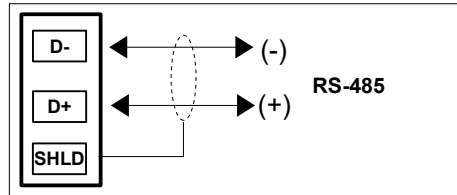


POTENTIOMETER

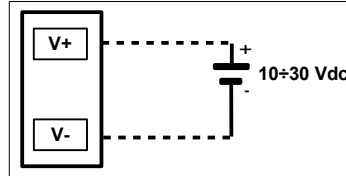


NOTE: the input channels are not isolated between them (terminal GND is common)

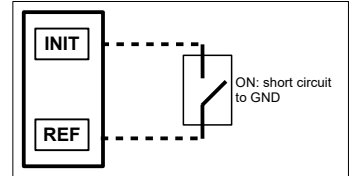
SERIAL LINE RS-485



POWER SUPPLY



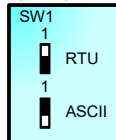
INIT



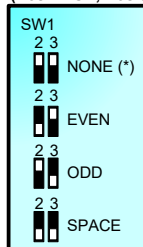
DIP-SWITCHES : TABLES OF CONFIGURATION

Warning: set all the dip-switches in OFF position to access to the device in EEPROM modality (the device will follow all the communication parameters set by software) or INIT. Power-off the device before to change the set of the dip-switches.

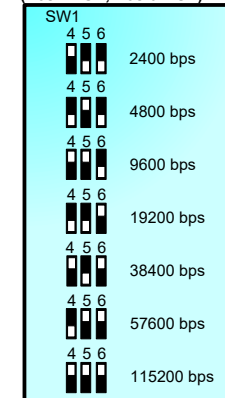
TAB.1 Modality settings
(Pos.1)



TAB.2 Parity settings
(Pos.2 LSB; Pos.3 MSB)



TAB.3 Baud rate settings
(Pos.4 LSB; Pos.6 MSB)



Note (*):

- in Modbus RTU Modality the setting is NONE; number of bit = 8
- in Modbus ASCII Modality the setting is MARK; number of bit = 7

DIP POSITION

ON OFF

HOW TO ORDER

The device can be supplied as requested from the customer.
Refer to the section "Technical Specifications" for the input types available.

DAT 10014 / Pt100 Input type

SW2													
12345678 EEPROM		12345678 Address 38		12345678 Address 76		12345678 Address 114		12345678 Address 152		12345678 Address 190		12345678 Address 228	
12345678 Address 1		12345678 Address 39		12345678 Address 77		12345678 Address 115		12345678 Address 153		12345678 Address 191		12345678 Address 229	
12345678 Address 2		12345678 Address 40		12345678 Address 78		12345678 Address 116		12345678 Address 154		12345678 Address 192		12345678 Address 230	
12345678 Address 3		12345678 Address 41		12345678 Address 79		12345678 Address 117		12345678 Address 155		12345678 Address 193		12345678 Address 231	
12345678 Address 4		12345678 Address 42		12345678 Address 80		12345678 Address 118		12345678 Address 156		12345678 Address 194		12345678 Address 232	
12345678 Address 5		12345678 Address 43		12345678 Address 81		12345678 Address 119		12345678 Address 157		12345678 Address 195		12345678 Address 233	
12345678 Address 6		12345678 Address 44		12345678 Address 82		12345678 Address 120		12345678 Address 158		12345678 Address 196		12345678 Address 234	
12345678 Address 7		12345678 Address 45		12345678 Address 83		12345678 Address 121		12345678 Address 159		12345678 Address 197		12345678 Address 235	
12345678 Address 8		12345678 Address 46		12345678 Address 84		12345678 Address 122		12345678 Address 160		12345678 Address 198		12345678 Address 236	
12345678 Address 9		12345678 Address 47		12345678 Address 85		12345678 Address 123		12345678 Address 161		12345678 Address 199		12345678 Address 237	
12345678 Address 10		12345678 Address 48		12345678 Address 86		12345678 Address 124		12345678 Address 162		12345678 Address 200		12345678 Address 238	
12345678 Address 11		12345678 Address 49		12345678 Address 87		12345678 Address 125		12345678 Address 163		12345678 Address 201		12345678 Address 239	
12345678 Address 12		12345678 Address 50		12345678 Address 88		12345678 Address 126		12345678 Address 164		12345678 Address 202		12345678 Address 240	
12345678 Address 13		12345678 Address 51		12345678 Address 89		12345678 Address 127		12345678 Address 165		12345678 Address 203		12345678 Address 241	
12345678 Address 14		12345678 Address 52		12345678 Address 90		12345678 Address 128		12345678 Address 166		12345678 Address 204		12345678 Address 242	
12345678 Address 15		12345678 Address 53		12345678 Address 91		12345678 Address 129		12345678 Address 167		12345678 Address 205		12345678 Address 243	
12345678 Address 16		12345678 Address 54		12345678 Address 92		12345678 Address 130		12345678 Address 168		12345678 Address 206		12345678 Address 244	
12345678 Address 17		12345678 Address 55		12345678 Address 93		12345678 Address 131		12345678 Address 169		12345678 Address 207		12345678 Address 245	
12345678 Address 18		12345678 Address 56		12345678 Address 94		12345678 Address 132		12345678 Address 170		12345678 Address 208		12345678 Address 246	
12345678 Address 19		12345678 Address 57		12345678 Address									