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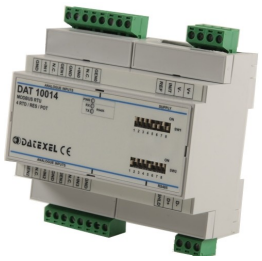
Distributed I/O device in 6 DIN module box
4 input channels for RTD communicating over RS-485

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

Input Type	Min	Max
RTD 2 or 3 wires		
Pt100	-200 °C	850 °C
Pt1000	-200 °C	400 °C
Ni100	-60 °C	180 °C
Ni1000	-60 °C	150 °C
RES. 2 or 3 wires		
Low	0 Ω	500 Ω
High	0 Ω	2000 Ω
POT (Nominal R)		
Low	20 Ω	500 Ω
High	20 Ω	2000 Ω

Input Accuracy (1)	
RTD	±0.05 % f.s.
Resistance	±0.05 % f.s.
Potentiometer	±0.05 % f.s.
Linearity (1)	
RTD	± 0.1 % f.s.
Lead wire resistance influence	
RTD/res.3 wires(50 Ω max balanced)	0.05 f.s. % / Ω
RTD excitation current	
Typical	0.350 mA
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.)

OUTPUT

Data Transmission

RS-485 asynchronous serial

Baud Rate	**115.2 Kbps**
Max. distance	**1.2 Km – 4000 ft**

GENERAL SPECIFICATIONS

Power supply voltage	10 .. 30 Vdc
Reverse polarity protection	60 Vdc max
Current consumption @ 24 Vdc	
	35 mA max.
Max. Current consumption	45 mA

ISOLATION	
Among all the ways	1500 Vac, 50 Hz, 1 min

ENVIRONMENTAL CONDITIONS	
Operative temperature	-10°C .. +60°C
Storage temperature	-40°C .. +85°C
Humidity (not condensing)	0 .. 90 %
Maximum Altitude	2000 m slm
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	0.8 N m
Mounting	in compliance with DIN rail standard EN-50022
Weight	about 200 g.

CERTIFICATIONS	
EMC (for the Industrial Environments)	
Immunity	EN 61000-6-2
Emission	EN 61000-6-4
UKCA (ref S.I. 2016 N°1091)	
Immunity	BS EN 61000-6-2
Emission	BS EN 61000-6-4

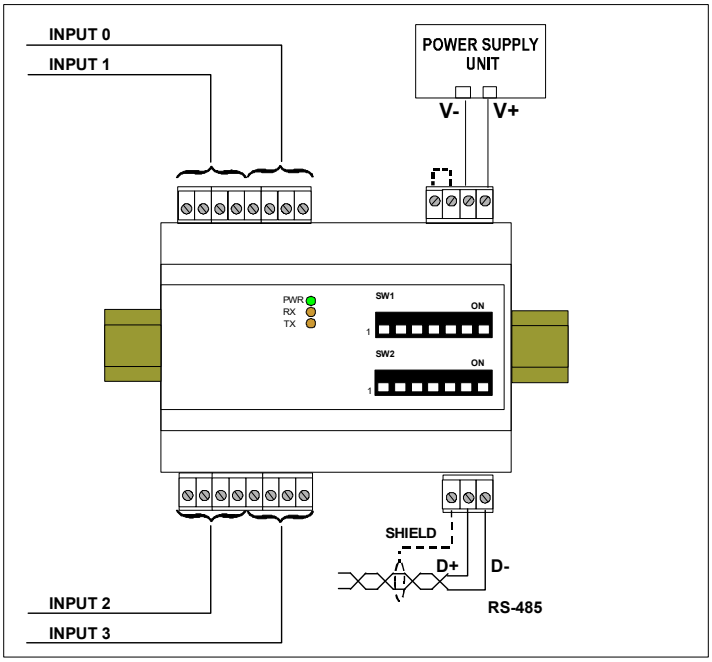
INSTALLATION INSTRUCTIONS

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.

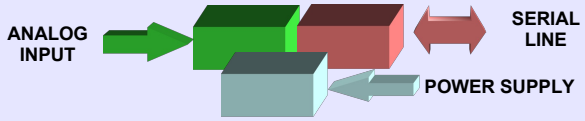
TERMINALS OVERVIEW



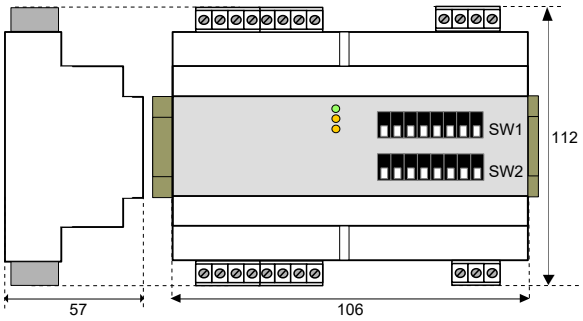
LIGHT SIGNALLING

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)

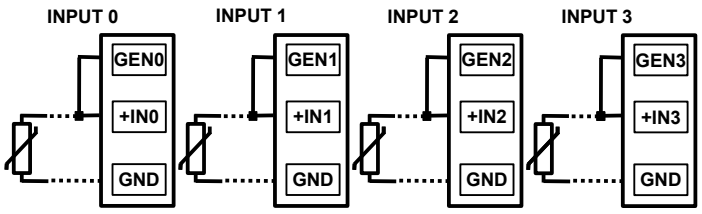


The symbol reported on the product indicates that the product itself must not be considered as a domestic waste.
It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste.
For more information contact the proper office in the user's city , the service for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

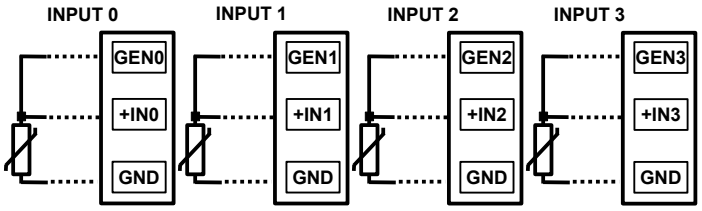
WIRING

ANALOGUE INPUTS

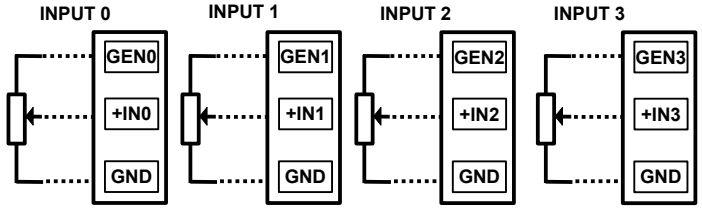
RTD/RES 2 WIRES



RTD/RES 3 WIRES

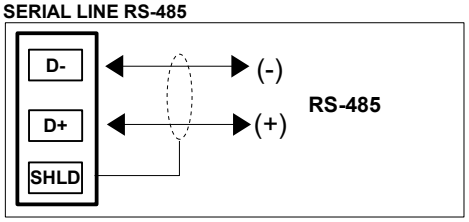


POTENTIOMETER

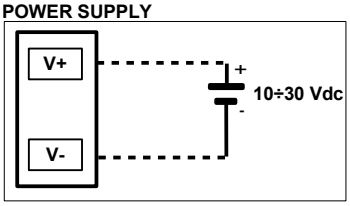


NOTE: the input channels are not isolated between them (terminal GND is common)

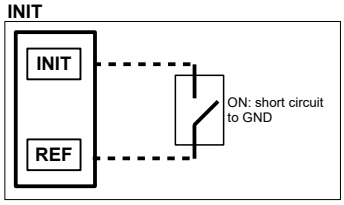
SERIAL LINE RS-485



POWER SUPPLY



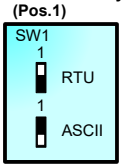
INIT



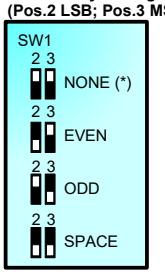
DIP-SWITCHES : TABLES OF CONFIGURATION

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.

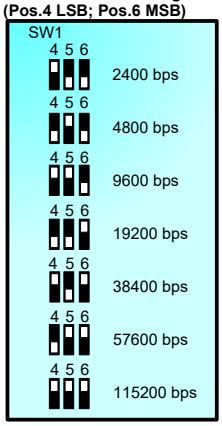
TAB.1 Modality settings (Pos.1)



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

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

TAB.4 Address Selection 1÷247 (Pos.1 LSB; Pos.8 MSB)

SW2