

Modbus Temperature Transmitter

DAT 1485

FEATURES

- Configurable input for RTD, TC, mV, Resistance and Potentiometer
- 1500 Vac 3-ways Galvanic Isolation
- Modbus Slave device over RS-485 with MODBUS RTU / MODBUS ASCII protocol
- Remotely Configurable
- High accuracy
- On-field reconfigurable
- EMC compliant – CE / UKCA mark
- DIN B in-head mounting with option for DIN rail mounting in compliance with EN 50022 (DIN RAIL Option)



GENERAL DESCRIPTION

The isolated converter DAT1485 is able to execute many functions such as measure and linearisation of the temperature characteristic of RTDs sensors, conversion of a linear resistance variation, conversion of an mV signal and conversion of a signal from a potentiometer connected to its input. The DAT1485 is able to measure and linearise the standard thermocouples with internal cold junction compensation. The measured values are converted into engineering units in digital format. The data are transmitted with MODBUS RTU / MODBUS ASCII protocol over the RS-485 network. The device guarantees high accuracy and performance stability both in time and in temperature.

The programming of the DAT1485 is made by a Personal Computer using the software "MODBUS_3000_1000" developed and provided by DATEXEL.

The isolation between the parts of circuit removes the effects of all ground loops eventually existing and allows the use of the converter in heavy environmental conditions found in industrial applications.

It is housed in a self-extinguish plastic enclosure suitable for DIN B in-head mounting.

Moreover, it is possible to mount the DAT1485 on DIN rail by proper mounting kit (**only on request**).

USER INSTRUCTIONS

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

It is possible to configure the device via software using the INIT modality. By setting the dip switch in INIT mode, the device will automatically be set in the set-up configuration when the device is turned on (refer to the User Guide of the device).

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

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

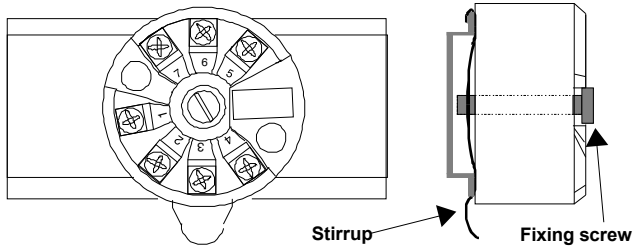
INPUT			OUTPUT	GENERAL SPECIFICATION			
Input Type	Min	Max	Thermal drift (1)		Power supply voltage 18 .. 30 Vdc		
TC (*) CJC int.			Full scale ± 0.01% / °C		Current consumption 16 mA max		
J	-200°C	1200°C	CJC ± 0.01% / °C		Reverse polarity protection 60 Vdc max		
K	-200°C	1300°C			ISOLATION (Referred 50 Hz, 1 min)		
S	0°C	1750°C	Sample time about 200 ms			Input - Pow. Supply 1500 Vac	
R	0°C	1750°C				Input - RS485 1500 Vac	
B	400°C	1800°C	Warm-up time 3 min			Pow. Supply - RS485 1500 Vac	
E	-200°C	1000°C				ENVIRONMENTAL CONDITIONS	
T	-200°C	400°C	Data Transmission		Operative temperature -40°C .. +85°C		
N	-200°C	1300°C	(RS-485 asynchronous serial)		Storage temperature -40°C .. +85°C		
RTD (*) 2,3 wires					Humidity (not condensing) 0 .. 90 %		
Pt100	-200°C	850°C	Baud Rate 115.2 Kbps		Maximum Altitude 2000 m slm		
Pt1000	-200°C	185°C	Max. distance 1.2 Km – 4000 ft		Installation Indoor		
Ni100	-60°C	180°C	Interface RS485 (2 wires)		Category of Installation II		
Ni1000	-60°C	150°C	Protocol Modbus RTU		Pollution Degree 2		
RES. 2,3 wires			Modbus ASCII		MECHANICAL SPECIFICATIONS		
Res 500 Ω	0 Ω	500 Ω				Material PC + ABS V0	
Res 2000 Ω	0 Ω	2000 Ω				Mounting DIN B in-head	
Voltage						Wiring Wire section max 1.5 mm²	
mV	-100 mV	+90 mV				AWG 16	
mV	-100 mV	+200 mV			Weight about 50 g.		
mV	-100 mV	+800 mV			Dimensions ∅ = 43 mm ; H = 24 mm		
Potentiometer					IP Code Enclosure: IP40		
(R nom. <= 50 KΩ)	0 %	100 %			Terminals : IP10		
Input calibration (1)					CERTIFICATIONS		
RTD	> of ±0.1% f.s. or ±0.2°C					EMC (for the Industrial Environments)	
Low res.	> of ±0.1% f.s. or ±0.15 Ω						Immunity EN 61000-6-2
High res.	> of ±0.2% f.s. or ±1 Ω						Emission EN 61000-6-4
mV, TC	> of ±0.1% f.s. or ±10 uV					UKCA (ref S.I. 2016 N°1091)	
Input impedance							Immunity BS EN 61000-6-2
TC, mV	≥ 10 MΩ						Emission BS EN 61000-6-4
Linearity (1)							
TC	± 0.2 % f.s.						
RTD	± 0.1 % f.s.						
Line resistance influence							
TC, mV	≤ 0.8 uV/Ohm						
RTD 3 wires	0.05%/Ω (50 Ω balanced max.)						
RTD excitation current							
Typical	0.400 mA						
CJC comp.	± 1.5°C						
			(1) referred to input Span (difference between max. and min. values)				
			(*) For the temperature sensors it is possible to set the measurement also in °F				

INSTALLATION INSTRUCTIONS

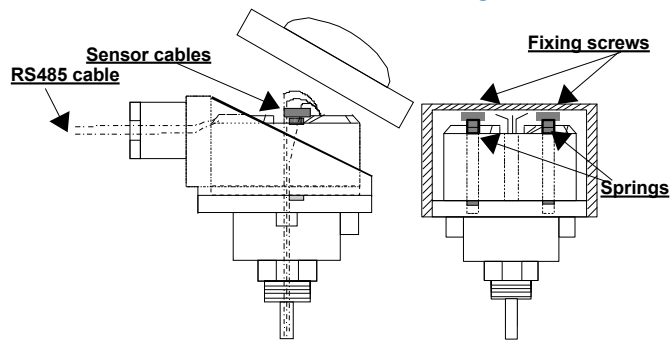
The device DAT1485 is suitable for direct DIN B in-head mounting. The converter must be fixed inside the probe by the proper kit. By apposite stirrup, provided on request, it is possible to mount the device on DIN rail in compliance with EN-50022. It is necessary to install the device in a place without vibrations and avoid to routing conductors near power signal cables.

To avoid passive current loops, the shield of the communication cable (RS485) must only be connected at one point on the network.

DIN rail mounting (DIN RAIL Option)



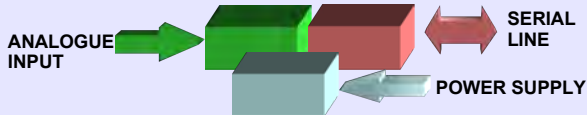
DIN B in-head mounting



REGISTER TABLE

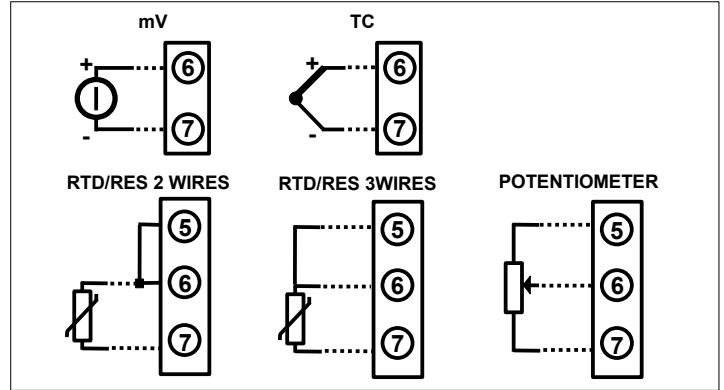
Register (*)	Description	Access
40001	Test	R/W
40002	Firmware [0]	RO
40003	Firmware [1]	RO
40004	Name [0]	R/W
40005	Name [1]	R/W
40006	Communication	R/W
40007	Address	R/W
40008	Delay RX/TX	R/W
40009	WatchDog timer	R/W
40010	System Flags	R/W
40011	Input type	R/W
40012	Degree Type	R/W
40013	Offset CJC	R/W
40014	Measure CJC	RO
40015	Input Value	RO
40023	Sync Input value	RO
40031	Input Offset	R/W

ISOLATION STRUCTURE

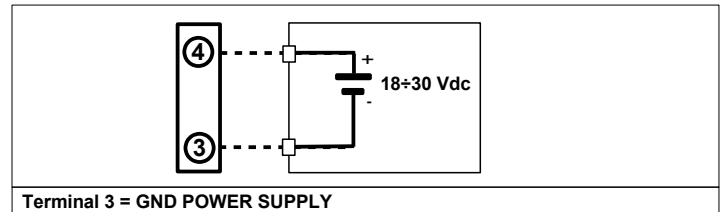


DAT1485 WIRING

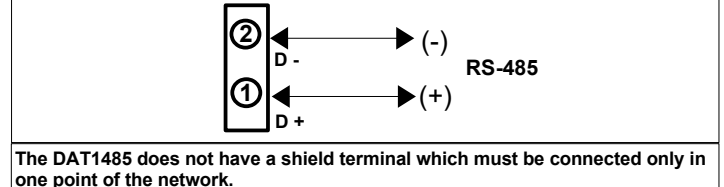
INPUT CONNECTIONS



POWER SUPPLY CONNECTIONS



RS485 CONNECTIONS



Note: in this modality the communication parameters are fixed to Modbus address 1 and Baud-rate 9600 Kbps.

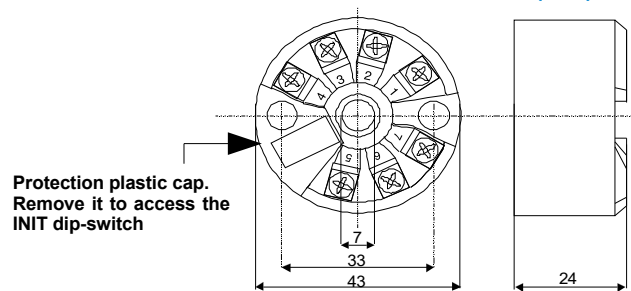
Enable INIT

- Power-off the device.
- Remove the protection plastic cap.
- Move the actuator of the dip-switch towards the central hole of the device.
- Power-on the device.

Disable INIT

- Power-off the device.
- Move the actuator of the dip-switch towards the external of the device.
- Apply the protection plastic cap.
- Power-on the device.

MECHANICAL DIMENSIONS (mm)



Protection plastic cap.
Remove it to access the
INIT dip-switch

HOW TO ORDER

The DAT1485 is provided as requested on the Customer's order.

The mounting kit for DIN rail is provided **only on request** with code DIN RAIL.

ORDER CODE EXAMPLE:

DAT1485 / Tc K

Input type



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.