



FEATURES

- Modbus Slave device on RS-485
- Modbus RTU/ Modbus ASCII protocol
- 8 input channels for voltage up to ± 250 mV and thermocouples sensor type B, E, K, J, N, R, S, T
- 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 mark
- DIN rail mounting in compliance with EN-50022

GENERAL DESCRIPTION

The device DAT10018 converts up to 8 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 8 voltage signals up to ± 250 mV or thermocouples sensor type B, E, K, J, N, R, S, T. By programming, it is possible to execute the scaling of the measure of input up to ± 32768 points obtaining in the dedicated registers the measure of the channel in the desired format (ref. User Guide). 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.

COMMUNICATION PROTOCOLS

The device is designed to work with the MODBUS RTU/MODBUS ASCII protocol: standard protocol in field-bus; allows to directly interface DAT10000 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.

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 Accuracy (1) mV, TC	Input Accuracy (1) > of $\pm 0.05\%$ f.s. or 5 μ V	POWER SUPPLY				
Input type	Min	Max							
Voltage			Linearity (1) mV TC	$\pm 0.1\%$ f.s. $\pm 0.2\%$ f.s.	Power supply voltage	10 .. 30 Vdc			
50 mV	-50 mV	+50 mV			Reverse polarity protection	60 Vdc max			
100 mV	-100 mV	+100 mV			Current consumption (operative)	35 mA max@24Vdc 45 mA max@10Vdc			
250 mV	-250 mV	+250 mV	CJC Compensation	± 1 °C	ISOLATION				
Thermocouple					Between all the ways	1500 Vac, 50 Hz, 1 min			
J	-210 °C	+1200 °C			ENVIRONMENTAL CONDITIONS				
K	-210 °C	+1372 °C	Input impedance mV,TC	≥ 1 M Ω	Operative Temperature	-10°C .. +60°C			
R	-50 °C	+1767 °C			Storage Temperature	-40°C.. +85°C			
S	-50 °C	+1767 °C			Humidity (not condensed)	0 .. 90 %			
B	+400 °C	+1825 °C	Thermal drift (1) Full scale	$\pm 0.005\%$ / °C	Maximum Altitude	2000 m			
E	-210 °C	+1000 °C			Installation	Indoor			
T	-210 °C	+400 °C			Category of installation	II			
N	-210 °C	+1300 °C	Thermal drift CJC Full scale	$\pm 0.02\%$ / °C	Pollution Degree	2			
					Line resistance influence (1) mV, TC	< 0.8 μ V/Ohm	MECHANICAL SPECIFICATIONS		
							Sample time	0.5 \div 1 sec.	Material
			Warm-up time	3 min			IP Code	IP20	
			Data Transmission (RS-485 asynchronous serial)	Baud Rate	115.2 Kbps	Wiring	wires with diameter 0.8 \div 2.1 mm ² /AWG 14-18		
						Max. distance	1.2 Km – 4000 ft	Tightening Torque	0.5 N m
								Mounting	in compliance with DIN rail standard EN-50022
					Weight	about 200 g.			
						CERTIFICATIONS			
						EMC (for industrial environments)			
					Immunity	EN 61000-6-2			
						Emission	EN 61000-6-4		

(1) referred to the input Span (difference between max. and min.)

INSTALLATION INSTRUCTIONS

The DAT10018 is suitable for fitting to DIN rails in the vertical position. For optimum operation and long life follow these instructions:

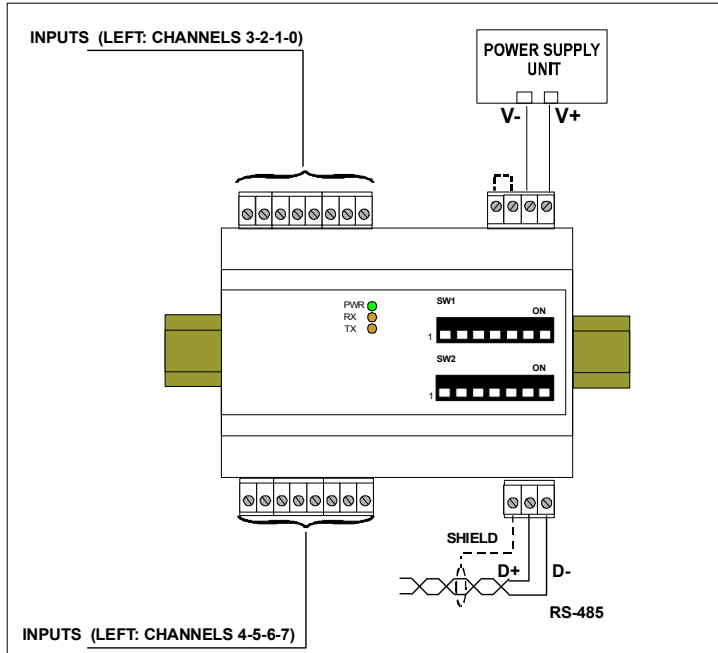
When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following case:

- 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.

WIRING



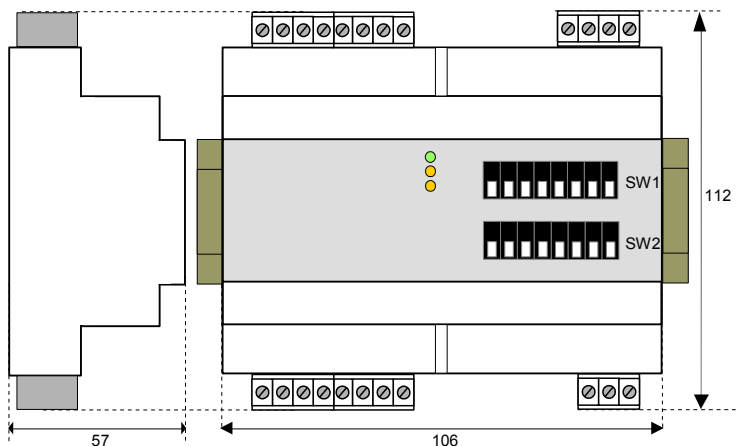
LIGHT SIGNALLING

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

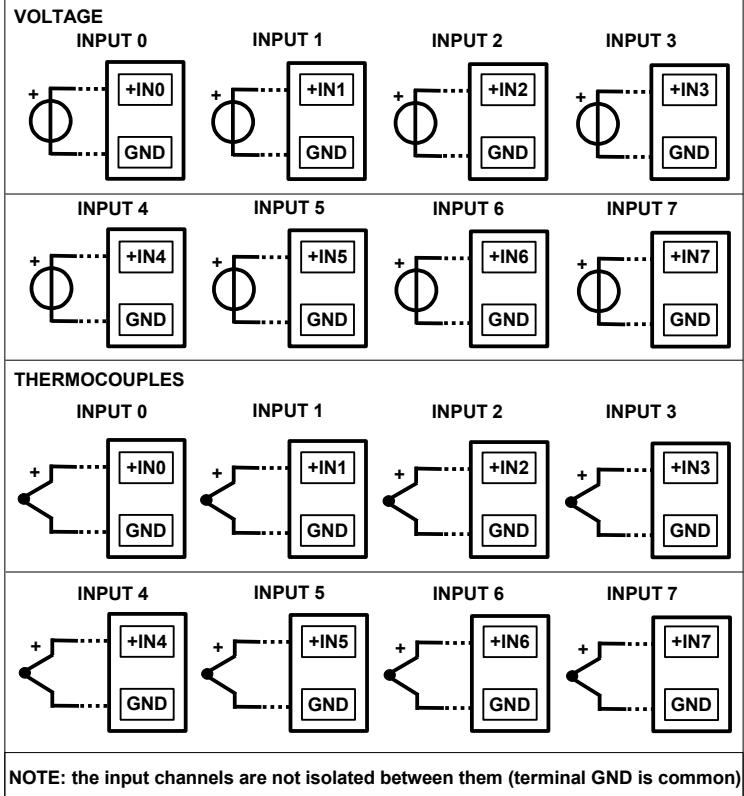


MECHANICAL DIMENSIONS (mm)



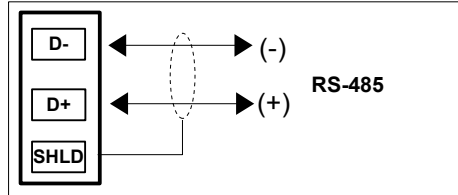
CONNECTIONS

ANALOGUE INPUTS

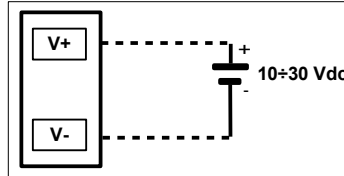


NOTE: the input channels are not isolated between them (terminal GND is common)

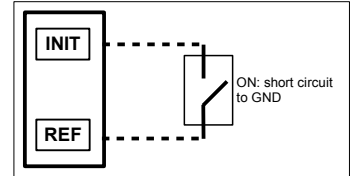
SERIAL LINE RS-485



POWER SUPPLY



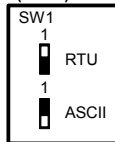
INIT



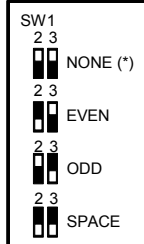
DIP-SWITCHES : TABLES OF CONFIGURATION

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.

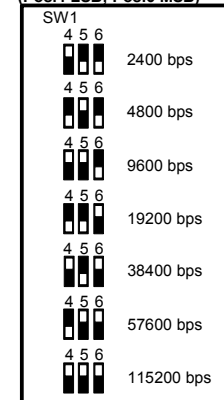
TAB.1 Modality settings (Pos.1)



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 DAT10018 could be supplied as requested from the customer. Refer to the section "Technical Specifications" for the input type available.

DAT 10018 / TCK — Input type

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

SW2	1 2 3 4 5 6 7 8							1 2 3 4 5 6 7 8							1 2 3 4 5 6 7 8							1 2 3 4 5 6 7 8							1 2 3 4 5 6 7 8							1 2 3 4 5 6 7 8													
	EEPROM							Address 38							Address 76							Address 114							Address 152							Address 190							Address 228						
	Address 1							Address 39							Address 77							Address 115							Address 153							Address 191							Address 229						
	Address 2							Address 40							Address 78							Address 116							Address 154							Address 192							Address 230						
	Address 3							Address 41							Address 79							Address 117							Address 155							Address 193							Address 231						
	Address 4							Address 42							Address 80							Address 118							Address 156							Address 194							Address 232						
	Address 5							Address 43							Address 81							Address 119							Address 157							Address 195							Address 233						
	Address 6							Address 44							Address 82							Address 120							Address 158							Address 196							Address 234						
	Address 7							Address 45							Address 83							Address 121							Address 159							Address 197							Address 235						
	Address 8							Address 46							Address 84							Address 122							Address 160							Address 198							Address 236						
	Address 9							Address 47							Address 85							Address 123							Address 161							Address 199							Address 237						
	Address 10							Address 48							Address 86							Address 124							Address 162							Address 200							Address 238						
	Address 11							Address 49							Address 87							Address 125							Address 163							Address 201							Address 239						
	Address 12							Address 50							Address 88							Address 126							Address 164							Address 202							Address 240						
	Address 13							Address 51							Address 89							Address 127							Address 165							Address 203							Address 241						
	Address 14							Address 52							Address 90							Address 128							Address 166							Address 204							Address 242						
	Address 15							Address 53							Address 91							Address 129							Address 167							Address 205							Address 243						
	Address 16							Address 54							Address 92							Address 130							Address 168							Address 206							Address 244						
	Address 17							Address 55							Address 93							Address 131							Address 169							Address 207							Address 245						
	Address 18							Address 56							Address 94							Address 132							Address 170							Address 208							Address 246						
	Address 19							Address 57							Address 95							Address 133							Address 171							Address 209							Address 247						
	Address 20							Address 58							Address 96							Address 134							Address 172							Address 210							Address 248						
	Address 21							Address 59							Address 97							Address 135							Address 173							Address 211							Address 249						
	Address 22							Address 60							Address 98							Address 136							Address 174							Address 212							Address 250						
	Address 23							Address 61							Address 99							Address 137							Address 175							Address 213							Address 251						
	Address 24							Address 62							Address 100							Address 138							Address 176							Address 214							Address 252						
	Address 25							Address 63							Address 101							Address 139							Address 177							Address 215							Address 253						
	Address 26							Address 64							Address 102							Address 140							Address 178							Address 216							Address 254						
	Address 27							Address 65							Address 103							Address 141							Address 179							Address 217							Address 255						
	Address 28							Address 66							Address 104							Address 142							Address 180							Address 218							Address 256						
	Address 29							Address 67							Address 105							Address 143							Address 181							Address 219							Address 257						
	Address 30							Address 68							Address 106							Address 144							Address 182							Address 220							Address 258						
	Address 31							Address 69							Address 107							Address 145							Address 183							Address 221							Address 259						
	Address 32							Address 70							Address 108							Address 146							Address 184							Address 222							Address 260						
	Address 33							Address 71							Address 109							Address 147							Address 185							Address 223							Address 261						
	Address 34							Address 72							Address 110							Address 148							Address 186							Address 224							Address 262						
	Address 35							Address 73							Address 111							Address 149							Address 187							Address 225							Address 263						
	Address 36							Address 74							Address 112							Address 150							Address 188							Address 226							Address 264						
	Address 37							Address 75							Address 113							Address 151							Address 189							Address 227							Address 265						