DATEXEL

UNI EN ISO 9001:2008

16 Digital inputs on Modbus RTU DAT10148
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16 digital inputs to Modbus RTU RS-485

DAT 10148

FEATURES
- **Modbus Slave device on RS-485**
- **Modbus RTU/ Modbus ASCII protocol**
- **16 digital inputs**
- **8 digital 16 bit counters up to 100 Hz**
- **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**
- **LEDs of signalling on front side for digital inputs state**
- **Connection by removable screw terminals**
- **High Accuracy**
- **CE mark**
- **DIN rail mounting in compliance with EN-50022**

GENERAL DESCRIPTION
The device DAT10148 is able to acquire up to 16 digital inputs with connection NPN or PNP. The data are transmitted with MODBUS RTU / MODBUS ASCII protocol over the RS-485 network.
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, digital 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		POWER SUPPLY	
		Power supply voltage	10 .. 30 Vdc
Channels	16	Reverse polarity protection	60 Vdc max
Voltage input (bipolar)		**Current consumption**	
OFF State	0 ÷ 3 V	(operative)	40 mA max@24Vdc
ON State	10 ÷ 30 V		85 mA max@10Vdc
Impedance	4.7 KΩ		
Sample time	5 ms		
		ISOLATION	
Number of counters	8	Between all the ways	1500 Vac,
Counter register size	16 bit		50 Hz, 1 min
Counter frequency	up to 100 Hz		
Minimum pulse width	1 ms	**ENVIRONMENTAL CONDITIONS**	
		Operative Temperature	-10°C .. +60°C
		Storage Temperature	-40°C.. +85°C
		Humidity (not condensed)	0 .. 90 %
Data Transmission (RS-485 asynchronous serial)		Maximum Altitude	2000 m
Baud Rate	115.2 Kbps	Installation	Indoor
Max. distance	1.2 Km – 4000 ft	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 200 g.
		CERTIFICATIONS	
		EMC (for industrial environments)	
		Immunity	EN 61000-6-2
		Emission	EN 61000-6-4

INSTALLATION INSTRUCTIONS

The DAT10148 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
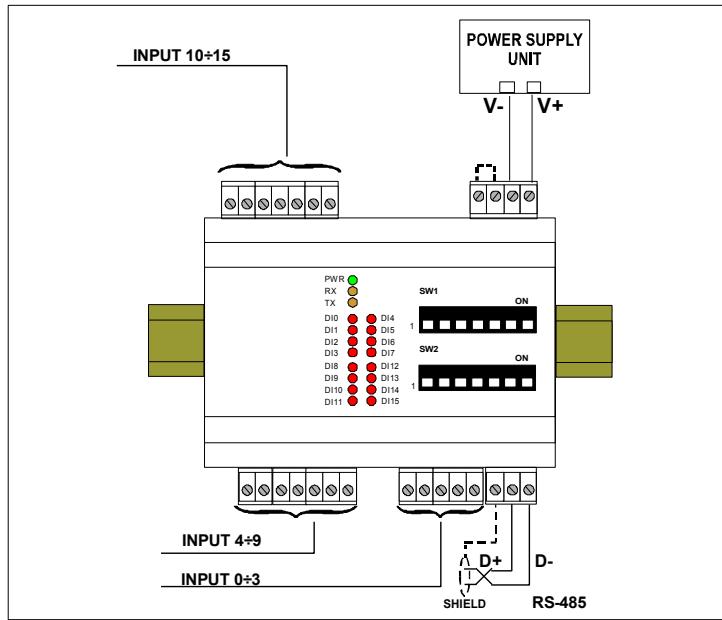
LIGHT SIGNALLING

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
DI*n*	RED	ON	Digital input ON state
		OFF	Digital input OFF state

ISOLATION STRUCTURE
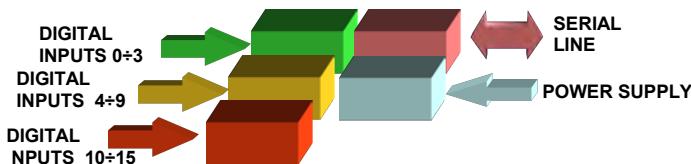

MECHANICAL DIMENSIONS (mm)
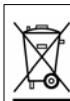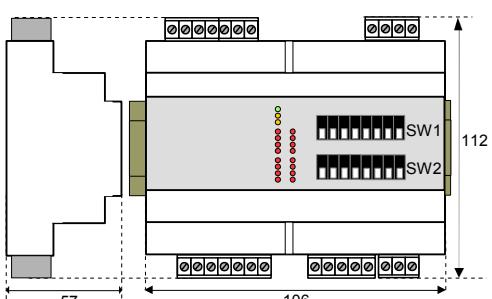
CONNECTIONS

DIGITAL INPUTS
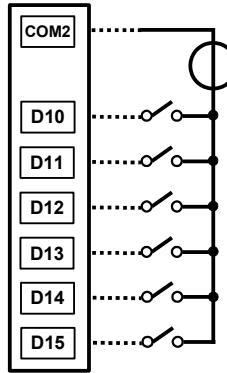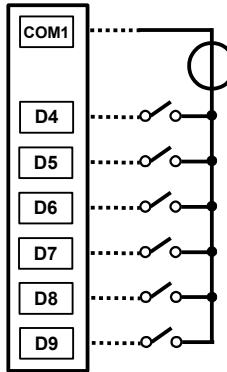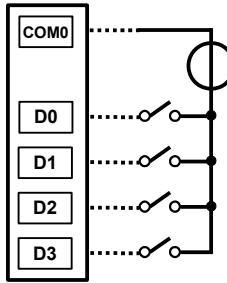
NOTE: the channels DO÷D3, D4÷D9, D10÷D15 are not isolated between them.
NOTE: the groups DO÷D3, D4÷D9, D10÷D15 are isolated between them.
NOTE: the groups D4÷D9, D10÷D15 are isolated between them at 1000 Vac.

SERIAL LINE RS-485

POWER SUPPLY


INIT

ON: short circuit to GND
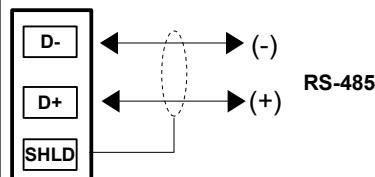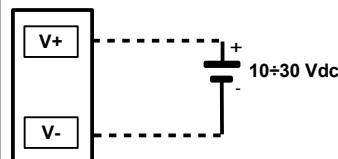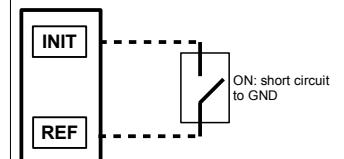
DIP-SWITCHES : TABLES OF CONFIGURATION

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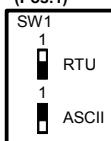
TAB.3 Baud rate settings (Pos.4 LSB; Pos.6 MSB)

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
DAT 10148

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

SW2 — DIP switch address selection chart (1 2 3 4 5 6 7 8) for: EEPROM, Address 1 through Address 247.