



FEATURES

- N.1 serial interface RS-485 Modbus RTU Master**
- N.1 serial interface RS-485/232 Modbus RTU Slave**
- N.1 slot for USB memory stick**
- Interface Ethernet 10Base-T, Modbus TCP Server**
- N.4 Digital Inputs + N.2 SPDT relays**
- Functional Block programming software**
- Remotely programmable**
- Connection by removable screw-terminals**
- LED signalling for Link/Act Ethernet, serial RX-TX, power supply**
- LED signalling for digital inputs and outputs status**
- Galvanic Isolation on all the ways**
- EMC compliance – CE mark**
- Suitable for DIN rail mounting in compliance with EN-50022 standard**

GENERAL DESCRIPTION

The device DAT9000-USB-IO is an Intelligent unit able to control a network of slave Modbus RTU devices connected on serial line RS-485 Master executing the reading and writing of the field values and performing the logical and mathematical functions necessary for the system working, managing up to 8 task of recording memorized on files saved on the USB device.

The device is equipped with four digital inputs two relay output channels.

By means of the Ethernet interface or the RS-485 "SLAVE" or RS-232 ports it is possible to read and write, in real time, the internal registers value. By Ethernet it is possible to get access to the files saved on the USB device when the Data-Logger function is active.

Moreover, by means of the Ethernet interface, or by the RS-485 "SLAVE" or RS-232 ports it is possible to:

- Programming of the Control Logic
- Monitor, request of data, programming in real time the Intelligent Unit
- Direct programming and request of data from the Slave devices connected on the RS-485 Master.

The device DAT9000-USB-IO is configurable by the software DEV9K, an easy and intuitive free IDE developed by DATEXEL and running under Windows.

The device DAT9000-USB-IO realizes a full electrical isolation between the lines, introducing a valid protection against the effects of all ground loops eventually existing in industrial applications.

LED signalling of Ethernet activity and data rx-tx flow on the serial line allows a direct monitoring of the system functionality. The connection is made by removable screw-terminals (supply and RS-485) and RJ45 plug (Ethernet and RS-232).

The DAT 9000-USB-IO is in compliance with the Directive 2004/108/EC on the electromagnetic compatibility.

The device is housed in a rough self-extinguishing plastic enclosure which, thanks to its thin profile of 22.5 mm only, allows a high density mounting on EN-50022 standard DIN rail.

LIST OF SUPPORTED FUNCTION

- Communication:**
 - Read data from "slave" devices (Modbus function 04)
 - Write data to "slave" devices (Modbus function 16)
- Logical:**
 - Boolean(And, Or,)
 - Compare (>, <, =,
 - Arithmetical (Sum, Subtraction, Multiplication, Division
 - Calculation (Scaling, Exponential functions, Square root extraction, Arithmetic mean,
- Process:**
 - Conditional statements (IF)
 - Flow control (Goto, Call,
- Scheduler:**
 - Data-Logger

For the complete list of functions and their operation, refer to the Programming software User Guide.

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

In compliance with Ethernet IEEE 802.3 EIA RS485 and RS232		Digital Inputs		Power supply	18 ÷ 30 Vdc
Network interface Protocol	Ethernet 10Base-T Modbus TCP Server	Channels	4	Current consumption	45 mA typ. @ 24Vdc (standby) 100 mA max
RS485 Interface Baud-rate	up to 38.4 Kbps	Input voltage	(bipolar)	Isolations	
Max. distance (recommended) (1)	1,2 Km @ 38.4 Kbps	OFF state	0 ÷ 3 V	Power supply / Ethernet	1500 Vac, 50 Hz, 1 min.
Number of modules in multipoint	up to 32	ON state	10 ÷ 30 V	Power supply / RS485	1500 Vac, 50 Hz, 1 min.
Internal termination resistance (optional)	120 Ohm	Impedance	4.7 KΩ	Ethernet / RS485	1500 Vac, 50 Hz, 1 min.
Compatible USB devices		Freq	up to 300 Hz	Inputs / RS485	2000 Vac, 50 Hz, 1 min.
Type	Pen drive	Digital Outputs		Inputs / Power supply	2000 Vac, 50 Hz, 1 min..
Memory size	Up to 8 GB	Channels	2	EMC (for industrial environments)	
Format	FAT16 or FAT32	Type	SPDT Relays	Immunity	EN 61000-6-2
		Switching Power (max.)		Emission	EN 61000-6-4
		2 A @ 250 Vac (resistive load) per contact		Temperature & Humidity	
		2 A @ 30 Vdc (resistive load) per contact		Operative temperature	-20 ÷ +60 °C
		Minimum load 5Vdc , 10mA		Storage temperature	-40 ÷ +60 °C
		Max. voltage 250Vac (50 / 60 Hz) , 30Vdc		Relative humidity (not cond.)	0 ÷ 90 %
		Dielectric strength between contacts		Connections	
		1000 Vac, 50 Hz, 1 min.		Ethernet	RJ-45 (on terminals side)
		Dielectric strength between coil and contacts		RS-232D	RJ-45 (on front side)
		4000 Vac, 50 Hz, 1 min.		RS-485 / Supply	Removable screw terminals
				Housing	
				Material	Self-extinguishing plastic
				Mounting	DIN rail EN-50022
				Dimensions in mm.(WxHxT)	100 x 120 x 22.5
				Weight	about 160 gr.

(1) – The maximum distance depends of: number of devices connected, type of cabling, noises, etc...

INSTALLATION INSTRUCTIONS

The Intelligent Unit DAT9000-USB-IO 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 high power supply value(> 27Vdc).

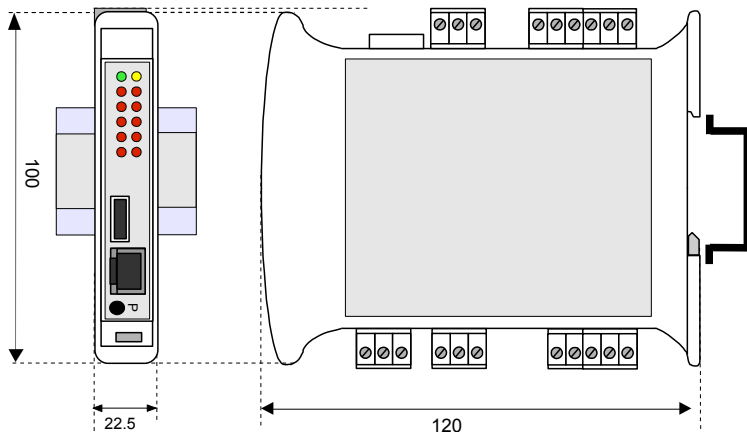
Make sure that sufficient air flow is provided for the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel. 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.

MODBUS REGISTERS MAPPING

Register	Description	Access
%S0	--Reserved--	R/W
%S1	Firmware [0]	R
%S2	Firmware [1]	R
%S3	Name [0]	R/W
%S4	Name [1]	R/W
%S5	Port 1 [BaudRate]	R/W
%S6	Node ID	R/W
%S7	Port 1 [Timeout RX]	R/W
%S8	Digital Inputs	R/W
%S9	Digital Outputs	R/W
%S10	System Flags	R/W
%S11	--Reserved--	-
%S12	--Reserved--	-
%S13	PC	R
%S14	Status [0]	R
%S15	Status [1]	R
%S16	COM Errors	R/W
%S17	Gateway Mask [L-H]	R/W
%S18	Port 0 [Settings]	R/W
%S19	Port 0 [Settings]	R/W
%S20	Timers Enable	R/W
%S21	--Reserved--	-
%R22	--RTC(0)	R/W
%R23	--RTC(1)	R/W
%R24	--RTC(2)	R/W
%R25	--RTC(3)	R/W
%R26	General Purpose Registers	R/W
%R1215	Memory Registers	R/W
%R1216		
%R1279		

MECHANICAL DIMENSIONS (mm)



PUSH-BUTTON "P" FUNCTIONALITY

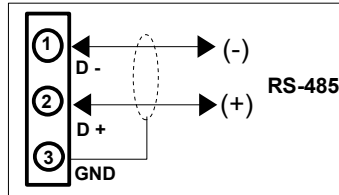
On the front side of the device it is available a push-button that allows to the user in case of necessity to re-load the following factory default settings in the following modalities:

- Push the button for 5 seconds with device powered to load the factory default settings (IP address, node ID).
- Power on the device keeping pushed the button for 5 seconds to load the factory default firmware.

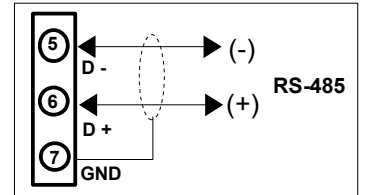
CONNECTIONS

SERIAL PORT CONNECTIONS

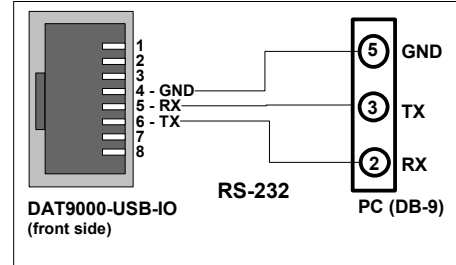
RS-485 Slave (Port 0)



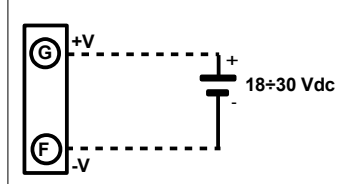
RS-485 Master (Port 1)



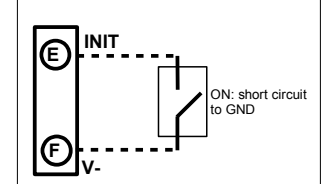
RS-232D Slave (Port 0)



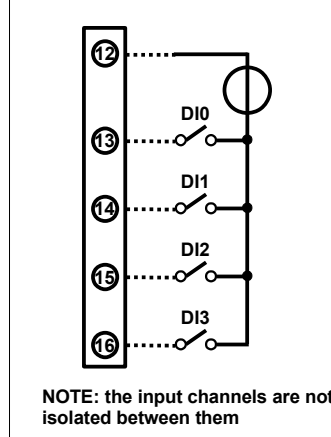
POWER SUPPLY CONNECTIONS



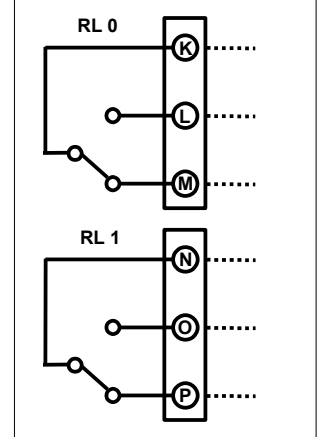
INIT CONNECTIONS



DIGITAL INPUTS



RELAY OUTPUTS



LIGHT SIGNALLING

LED	COLOR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered / Wrong RS-485 connection
STS	YELLOW	BLINK	DEBUG modality
		OFF	RUN modality
RX <i>n</i>	RED	BLINK	PORT <i>n</i> - Data received (the blink frequency depends on Baud-rate)
		OFF	No reception in progress.
TX <i>n</i>	RED	BLINK	PORT <i>n</i> - Data transmitted (the blink frequency depends on Baud-rate)
		OFF	No reception in progress.
I <i>n</i>	RED	ON	State 1 Digital Inputs.
		OFF	State 0 Digital Inputs.
O <i>n</i>	RED	ON	State 1 Digital Outputs.
		OFF	State 0 Digital Outputs.

HOW TO ORDER

" DAT 9000-USB-IO "

■ = Requested
□ = Optional