

## Intelligent Unit with Data-logger and Ethernet interface

## DAT9000DL-2.0

### FEATURES

- N.1 serial interface RS-485 Modbus RTU Client
- N.1 serial interface RS-485/uUSB Modbus RTU Server
- Interface Ethernet 10/100 Base-T, Modbus TCP Client/Server
- N.1 slot for SD card
- Client function both on RS-485 (Modbus RTU) and on Ethernet (Modbus TCP)
- Programming software with "flow chart" structure
- Remotely programmable
- Connection by removable screw-terminals
- Programmable without external sources via uUSB and optional cable CVPROG
- LED signalling for Link/Act Ethernet, serial RX-TX, power supply
- Galvanic Isolation on all the ways
- CE / UKCA mark
- In compliance to EN-50022 DIN rail mounting



### GENERAL DESCRIPTION

The device DAT9000DL is an Intelligent unit able to control a network of server Modbus RTU devices connected over RS-485 Master or Modbus TCP through the Ethernet interface 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 SD card memory.

By means of the Ethernet interface or the RS-485 "SLAVE" or uUSB 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 SD card when the Data-Logger function is active.

The CVPROG cable that must be ordered separately allows to configure / program the device without using an external power supply. Moreover, by means of the Ethernet interface, or by the RS-485 "SLAVE" or uUSB ports it is possible to Program the Control Logic, Monitor, request of data, programming in real time the Intelligent Unit, Direct program and request of data from the Slave devices connected to the RS-485 Master. The device DAT9000 is configurable by the software DEV9K 2.0 and successive versions developed by DATEXEL and running under Windows. The device DAT9000 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). 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.

### SUPPORTED FUNCTION

The DAT9000 series devices support the standard Modbus write and read functions (see Device User Guide), mathematical operations, logic operations and calculation functions (Scaling, Average, root extraction, ...)

*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)

ETHERNET		RS-485		GENERAL SPECIFICATIONS	
<b>In compliance with standard</b> Ethernet IEEE 802.3		<b>In compliance with standard</b> RS485		DC power supply voltage	10 .. 30 Vdc
Ethernet interface	Ethernet 10/100Base-T	<b>Baud-rate</b>	up to 115.2 Kbps	Reverse polarity protection	60 Vdc max
Ethernet connection	RJ-45	<b>Cable Length</b>	1200 m / 4000 ft max	<b>Max. Current consumption</b>	100 mA
Protocol	Modbus TCP	The reachable maximum distance depends on the number of devices connected, on the type of cable used and its immunity against noises.		<b>ISOLATION (test time 1 min)</b>	
TCP Port	502 (Modbus TCP) 80 (HTTP)	<b>Number of modules in multi-point</b>	up to 32	Power supply / Ethernet	1500 Vac, 50 Hz
<b>Number of sockets</b>		<b>Switching time TX/RX</b>	150 us.	Power supply / RS485	1500 Vac, 50 Hz
Modbus TCP	16	<b>Connection</b>	removable screw terminals	Ethernet / RS485	1500 Vac, 50 Hz
HTTP	3			<b>ENVIRONMENTAL CONDITIONS</b>	
<b>Modbus TCP Client function</b>				Operative temperature	-20°C .. +60°C
IP Table Size	max 8 devices (IP)			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
DATA LOGGER		OPTIONAL PROGRAMMING PORT		<b>MECHANICAL SPECIFICATIONS</b>	
<b>N° Logging task</b>	up to 8	<b>Connection</b>	uUSB micro-B (on front)	Material	Self-extinguish plastic
<b>Min. schedule rate</b>	10 seconds	It is requested the use of the dedicated cable CVPROG. It doesn't work with standard USB cables		IP Code	IP20
<b>Compatible devices</b>				Wiring	wires with diameter 0.8+2.1 mm <sup>2</sup> AWG 14-18
Type	microSD (SDHC)			Tightening Torque	0.5 N m
Memory size	Up to 32 GB			Mounting	in compliance with DIN rail standard EN-50022
Format	FAT16 or FAT32			Weight	about 160 g.
Connector	microSD on front			<b>CERTIFICATIONS</b>	
				<b>EMC ( for the Industrial Environments )</b>	
				Immunity	EN 61000-6-2
				Emission	EN 61000-6-4
				<b>UKCA (ref S.I. 2016 N°1091 )</b>	
				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 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.

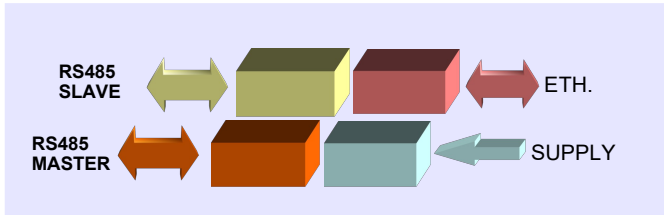
Install the device in a place without vibrations.

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.

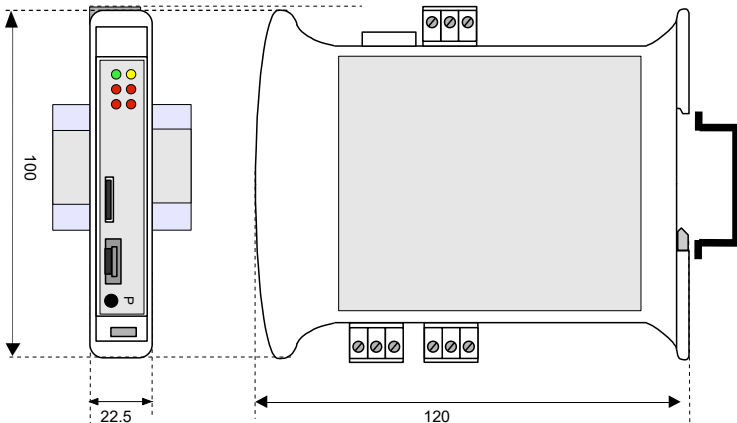
## LIGHT SIGNALLING

LED	COLOR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINK	Watchdog Alarm
STS	YELLOW	BLINK	DEBUG Modality
		OFF	RELEASE Modality
RXn	RED	BLINK	PORT n – Data received ( the blink frequency depends on Baud-rate)
		OFF	No reception in progress
TXn	RED	BLINK	PORT n – Data transmitted ( the blink frequency depends on Baud-rate)
		OFF	No reception in progress

## ISOLATIONS STRUCTURE

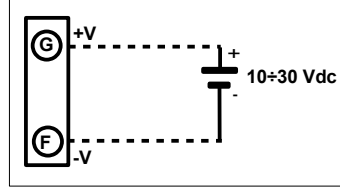


## MECHANICAL DIMENSIONS (mm)

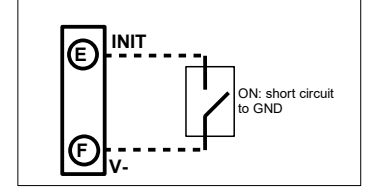


## WIRING

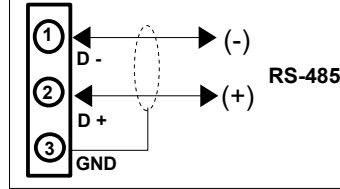
### POWER SUPPLY



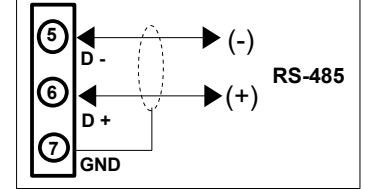
### INIT



### RS-485 Slave (Port 0)



### RS-485 Master (Port 1)



**Note: the device must be powered using a power supply unit classified NEC class 2 or SELV with limited energy**

## PUSH-BUTTON "P" FUNCTIONALITY

This button, located on the front of the device allow to load the following factory defaults in the following two modes:

A) With the device on, press the button until the green LED (PW) goes off; immediately after release it to load the factory default parameters (modbus parameters, default IP, login credentials to the web server).

B) Turn on the device by keeping the button pressed and keep the pressure until the green LED (PW) goes off; immediately after release it to load the factory firmware.

While the default parameters or the factory firmware are loaded, the yellow STS LED remains permanently switched on. At the end of the loading it switches off.

**ATTENTION: do not switch off the device during the loading phase!**

## "CVPROG" INTERFACE CABLE

### Description

The CVPROG cable is an interface consisting of the physical cable, a uUSB port that must be connected to the DATEXEL device in use, a USB port that must be connected to the user PC and a chip to recognize the USB port as VCP (Virtual Com Port).

Due to this the CVPROG interface cable is not a simple uUSB-USB cable.

Through the CVPROG cable it is possible to communicate and program the DATEXEL devices without external power.

This allows a simple use of the device.

**WARNING: the uUSB port and the RS485 slave port (Port 0) cannot be used simultaneously and the communication parameters are common to both ports.**

When connecting the CVPROG cable to the PC, it could be necessary to install the drivers downloaded from the website [www.datexel.it](http://www.datexel.it)

### Verify of the generated COM port

When the CVPROG cable is inserted into the PC, a virtual COM port is automatically generated and it can be displayed in the "Device Management" window → Ports (COM and LPT) of the operating system in use.

## ACCESS TO THE INTEGRATED WEB SERVER "

To access the integrated web server, open a browser on your PC and type the IP address of the device in the address bar of the browser.

- **Factory IP Address:** 192.168.1.100

**WARNING: make sure that the PC is in the same subnet as the device in use (see user guide of the device).**

The factory / default login credentials that are requested on the "Login" page are:

- **Username:** Fact\_user

- **Password:** Fact\_pwd

Once you have logged in for the first time, you can change the credentials in the "Username and Password" section.

## HOW TO ORDER

**" DAT9000DL-2.0 "**

Note: the device is provided with default configuration as:

IP address : 192.168.1.100

Modbus address: 10



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.