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Remote Graphic Display on RS-485 with Modbus RTU protocol

DAT9550

FEATURES

- **Graphic display 132x32 pixels**
- **RS-485/RS-232 Modbus-RTU Slave Interface**
- **RS-485 Modbus-RTU Master Interface**
- **Remotely programmable**
- **Connection by removable screw-terminals (power supply & RS-485) and RJ45 (RS-232)**
- **Compact enclosure dimensions (DIN 48 x 96 mm)**
- **Galvanic Isolation on all the ways**
- **CE / UKCA mark**
- **Suitable for panel mounting in compliance with DIN 43700**

GENERAL DESCRIPTION

The device DAT 9550 is a graphic display designed for panel mounting communicating using Modbus RTU protocol on RS-485 and RS-232 serial Slave ports.
The device is equipped with a RS-485 Master port by which it is possible to poll the Modbus Slave devices potentially connected.
It can be used as Slave peripheral for the visualization of the data coming from the Intelligent Units of the DAT9000 series or from a PC, PLC or panel operator.
By means of the Slave serial ports it is possible to configure, by software Dev9K 2.0, the graphic pages.
The device is equipped with buttons on the front panel by which it is possible to:
- set the communication parameters of the device such as baud-rate and Modbus address;
- set the levels of brightness and contrast of the display;
- set the values of the local variables selected from the user;
- scroll between the graphic pages.

The implementation of the device is easy and immediate: it must be fixed to the panel by screw terminals; for the connection on the rear side are used removable screw terminals to connect the RS-485 serial ports and the power supply; to connect the RS-232 port it is available a RJ45 connector.
It is housed into a robust plastic enclosure of 96 x 48 x 74 mm in compliance with the DIN43700 standard.

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)

DISPLAY

Graphic Area	
Pixels	132 x 32
Metric(mm)	48.1 x 13.2

RS-485

In compliance with standard	**RS485**
Baud-rate	up to 115.2 Kbps
Cable Length	1200 m / 4000 ft max

The reachable maximum distance depends on the number of devices connected, on the type of cable used and its immunity against noises.

Number of modules in multi-point	up to 32
Switching time TX/RX	150 us.
Connection	removable screw terminals

RS-232

In compliance with standard	**RS232**
Baud-rate	up to 115.2 Kbps
Cable Length	30 m / 100 ft max
Connection	RJ45

GENERAL SPECIFICATIONS

DC power supply voltage	10 .. 30 Vdc
Reverse polarity protection	60 Vdc max
Max. Current consumption	80 mA

ISOLATION (test time 1 min)

Power supply / RS485 Slave	1500 Vac, 50 Hz
Power supply / RS485 Master	1500 Vac, 50 Hz
RS485 Slave / RS485 Master	1500 Vac, 50 Hz

ENVIRONMENTAL CONDITIONS

Operative temperature	-20°C .. +60°C
Storage temperature	-30°C .. +80°C
Humidity (not condensing)	0 .. 90 %
Maximum Altitude	2000 m slm
Installation	Indoor
Category of Installation	II
Pollution Degree	2

MECHANICAL SPECIFICATIONS

Material	NORYL 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	on Panel
Dimensions in mm.	(W x H x T) 96 x 48 x 74
Weight	about 160 g.

CERTIFICATIONS

EMC (for the Industrial Environments)

Immunity	EN 61000-6-2
Emission	EN 61000-6-4

UKCA (ref S.I. 2016 N°1091)

Immunity	BS EN 61000-6-2
Emission	BS EN 61000-6-4

INSTALLATION INSTRUCTIONS

The device is suitable for panel mounting to which must be fixed by the proper kit. The device needs a panel cut-out of 92 * 45 mm (W * H) .
It is necessary to install the device in a place without vibrations; avoid to routing conductors near power signal cables .

FUNCTIONAL MENUS DAT9550

At any time it is possible to access to the following menus:
- "Config" menu: wherein it is possible to set the communication parameters of the device such as the Modbus address, Baud-rate and the adjustments of brightness and contrast of the display.
- "Pre-set" menu: wherein it is possible to set the values of the local variables selected from the user.

CONFIGURATION VIA SOFTWARE

The graphic pages must be set by the software Dev9K 2.0 and later.
To program the device :
-Connect the serial cable coming from the PC to the RS-232D or RS-485.
-Power-on the device.
-Execute the software
-Set the parameters and program the device (refer to the software User Guide).

BUTTONS FUNCTION.

In "Visualization of the graphic pages" modality.

- Scroll the graphic pages.
Press the button "**Page Up**" (⮝) to scroll the graphic pages in decreasing order.
Press the button **"Page Down"** (⮟) to scroll the graphic pages in increasing order.
If has been loaded only one graphic page, the buttons don't work.

- Recall the system menus.
Press and hold down the button **"Right"** (➤),than press the button "**Page Up**" (⮝) to access the "Pre-set" menu.
The "Pre-set" menu appears. It is possible to modify the parameters of this menu or to get access to the "Config" menu.

- Modify the parameters in the "Pre-set" menu
Press the button "**Page Up**" (⮝) to scroll upward the list of the parameters.
Press the button **"Page Down"** (⮟) to scroll downward the list of the parameters.
When a parameter has been selected press the button **"F4"** ("Enter") to modify it.
The first character of the parameter will be highlighted.
Use the button "**Page Up**" (⮝) to scroll upward the available character or the button **"Page Down"** (⮟) to scroll them downward .
When a character has been modified press the button **"Left"** (⮜) or **"Right"** (➤) to move to the next character to edit.
Press the button **"F4"** ("Enter") to confirm the changes or press the button **"F3"**("Esc") to discard them.
Press the button **"F3"**("Esc") to return back to the modality of visualization of the graphic pages.

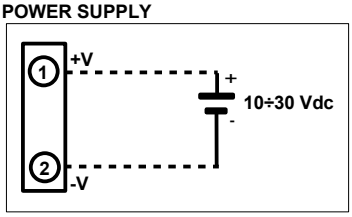
- Move to the "Config." menu
It is possible to get access to this menu only from the "Pre-set" menu.
With "Pre-set" menu active, press the button **"F1"** to enter into the "Config" menu.
This menu shows the actual programming for the communication, physical and status parameters of the device.
The communication parameters shown are the following:
Baud-rate: show which is the programmed baud-rate of the device for the ports.
Address: shows which is the programmed address of the device (available from 1 up to 247).
When the device is in INIT condition the communication parameters are forced as baud rate = 9600 bps and the address = 10.
Note: It is possible to modify the parameters of communication but is important that these parameters match those selected in the Dev9K software, otherwise the communication with the device won't be performed and a "Time out" error will occur.
The physical parameters shown are the following:
Bright: shows which is the brightness of the display. This parameter is programmable from 1 (minimum brightness) up to 15 (maximum brightness).
Contrast: shows which is the contrast of the display. This parameter is programmable from 1 (minimum contrast) up to 15 (maximum contrast) for positive visualization; from 16 (minimum contrast) up to 31 (maximum contrast) for negative visualization.
The status parameters are the following:
Firmware: shows the firmware version.
Status: shows the operating condition of the device: RUN for release condition or STOP when there is not a program running.

- Modify the parameters in the Pre-set menu

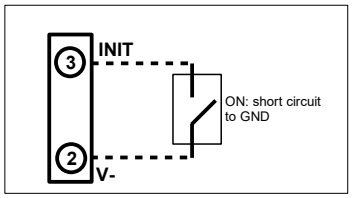
Press the button "**Page Up**" (⮝) to scroll upward the list of the parameters.
Press the button **"Page Down"** (⮟) to scroll downward the list of the parameters.
When a parameter has been selected press the button **"F4"** ("Enter") to modify it. It will be highlighted.
Use the button "**Page Up**" (⮝) to scroll upward the available options or the button **"Page Down"** (⮟) to scroll the option downward .
When an option has been modified press the button **"F4"** ("Enter") to confirm the modifies or press the button **"F3"**("Esc") to discard it.
Press the button **"F3"**("Esc") to return back to the modality of visualization of the graphic pages.

WIRING

POWER SUPPLY

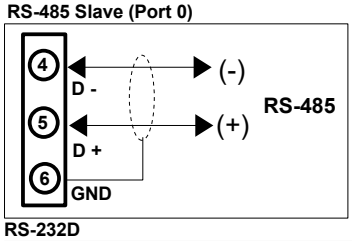


INIT

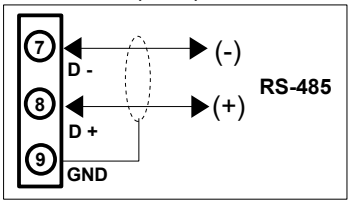


Note: the device must be powered using a power supply unit classified NEC class 2 or SELV with limited energy

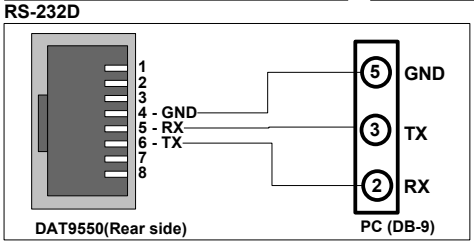
RS-485 Slave (Port 0)



RS-485 Master (Port 1)

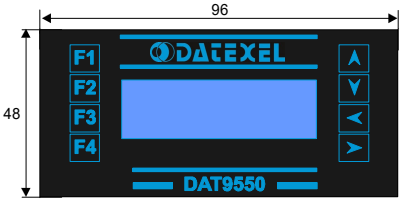


RS-232D



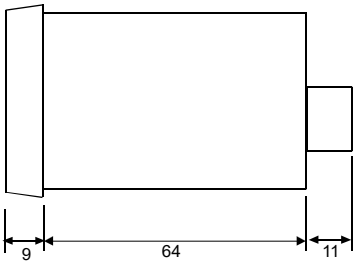
DIMENSIONS (mm) & BUTTONS POSITION

FRONT VIEW

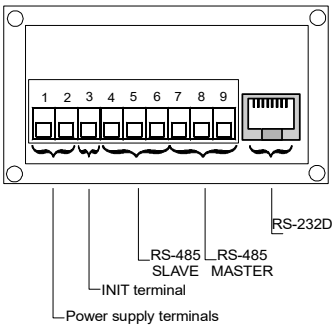


F1,F2,F3,F4 :function buttons
⮝,⮟,⮜,➤: scroll buttons

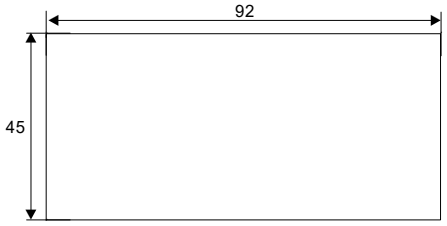
SIDE VIEW



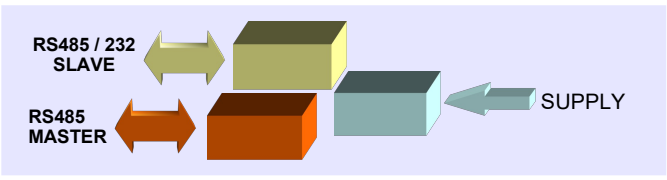
REAR VIEW



PANEL CUT-OUT



ISOLATION STRUCTURE



HOW TO ORDER

" DAT9550 "
Modbus address: 1