

Remote Graphic Display on RS-485 with Modbus RTU protocol **DAT 9550**



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
- EMC compliance – CE mark
- Suitable for panel mounting in compliance with DIN 43700

GENERAL DESCRIPTION

The device DAT 9550 is a graphic display designed for panel mounting and communicating with Modbus RTU protocol on RS-485 and RS-232 serial Slave port. Moreover on the device there is a RS-485 Master port by means of which it is possible to communicate with the eventual Modbus Slave devices 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, 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.

LIST OF SUPPORTED FUNCTION

- Communication: - Read data from "slave" devices (Modbus functions 03 and 04)
 - Write data to "slave" devices (Modbus functions 06 and 16)
- Logical: - Boolean(And, Or,)
 - Compare (>, <, =,)
 - Arithmetical (Sum, Subtraction, Multiplication, Division)
 - Calculation (Scaling, Exponential functions, Square root extraction, Arithmetic average,)
- Process: - Conditional statements (IF)
 - Flow control (Goto, Call,)

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 IEEE 802.3 EIA RS485 and RS232		Power supply	10 ÷ 30 Vdc
		Current consumption	45 mA typ. @ 24Vdc (standby,max. brightness) 80 mA max
RS485 Interface		Isolations	
Baud-rate	up to 38.4 Kbps	Power supply / RS485 Slave	1500 Vac, 50 Hz, 1 min
Max. distance (recommended) (1)	1.2 Km @ 38.4 Kbps	Power supply / RS485 Master	1500 Vac, 50 Hz, 1 min
		RS485 Slave / RS485 Master	1500 Vac, 50 Hz, 1 min
		Connections	
Internal termination resistance (optional)	120 Ohm	RS-232D	RJ-45
Display		RS-485 / Supply	Removable screw terminal blocks
Graphic Area	132x32 pixels 13.2 * 48.1 mm	Environmental Conditions	
		Operative Temperature	-20°C .. +60°C
		Storage Temperature	-30°C.. +80°C
		Humidity (not condensed)	0 .. 90 %
		Maximum Altitude	2000 m
		Installation	Indoor
		Category of installation	II
		Pollution Degree	2
		Mechanical specifications	
		Material	NORYL self-extinguishing plastic
		IP Code	IP20
		Wiring	wires with diameter 0.8+2.1 mm ² /AWG 14-18
		Tightening Torque	0.8 N m
		Mounting	Panel mounting
		Dimensions in mm.(W x H x T)	96 x 48 x 74
		Weight	about 160 g.
		EMC (for industrial environments)	
		Immunity	EN 61000-6-2
		Emission	EN 61000-6-4

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

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 and the 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 version 1.2 and later.

To program the device proceed as follows :

- 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).

BUTTON'S FUNCTIONS.

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 have not effect.

- **Recall the system menus.**

Press and hold down the button **“Right”** (➤), then press the button **“Page Up”** (▲) to access to 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. It will be highlighted the first character of the parameter.

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 modify.

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.

- **Move to the “Config.” menu**

It is possible to get the 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-rateSI: shows which is the programmed baud-rate of the device.

AddressSI: 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 correspond to 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 are not programming loaded.

- *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.

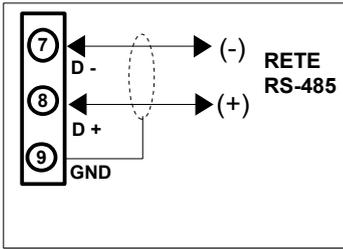
INSTALLATION INSTRUCTIONS

The device DAT9550 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 .

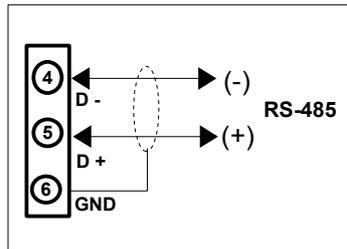
WIRING

SERIAL PORTS

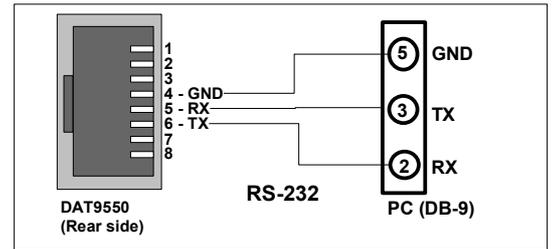
RS-485 MASTER



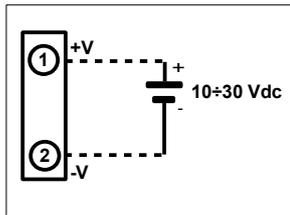
RS-485 SLAVE



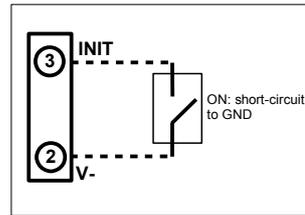
RS-232D



POWER SUPPLY

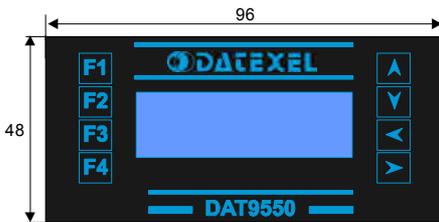


INIT



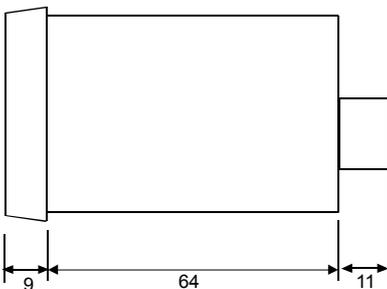
DIMENSIONS (mm) & BUTTONS POSITION

FRONT VIEW

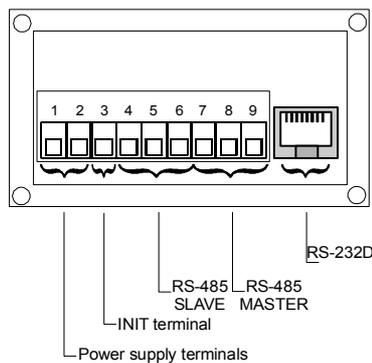


F1,F2,F3,F4 :function buttons
 ▲,▼,◀,▶ : scroll buttons

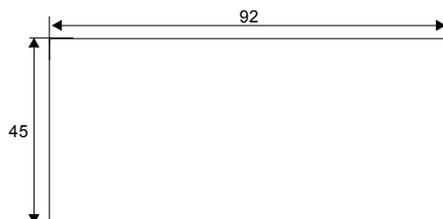
SIDE VIEW



REAR VIEW



PANEL CUT-OUT



MODBUS REGISTERS MAPPING

Register	Description	Access
%R0	--Reserved--	R/W
%R1	Firmware [0]	R
%R2	Firmware [1]	R
%R3	Name [0]	R/W
%R4	Name [1]	R/W
%R5	Port 1 [BaudRate]	R/W
%R6	Node ID	R/W
%R7	Port 1 [Timeout RX]	R/W
%R8	Function Keys	R
%R9	View Page	R/W
%R10	System Flags	R/W
%R11	Display options	R/W
%R12	--Reserved--	-
%R13	PC	R
%R14	Status [0]	R
%R15	Status [1]	R
%R16	COM Errors	R/W
%R17	Gateway Mask [L-H]	R/W
%R18	Port 0 [Settings]	R/W
%R19	Port 0 [Settings]	R/W
%R20	Timers Enable	R/W
%R21	--Reserved--	-
%R22	--Reserved--	-
%R23	--Reserved--	-
%R24	--Reserved--	-
%R25	--Reserved--	-
%R26	General Purpose Registers	R/W
%R959		
%R960	Memory Registers	R/W
%R1023		



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.

HOW TO ORDER

The DAT 9550 is supplied as requested in phase of order.

ORDER CODE: DAT 9550