N322T Line

Registers Table for Serial Communication V1.8x

1. SERIAL COMMUNICATION

1.1 RS485 INTERFACE

- Signals compatible with the RS485 standard.
- 2-wire connection between master and up to 31 slave controllers in bus topology. When using multi-output converters, you can reach up to 247 nodes.
- Maximum connection distance: 1000 meters.
- The RS485 signals are:

D1	D	D+	B	Bidirectional data line.
D0	$\overline{D}$	D-	A	Inverted bidirectional data line.
C				Communication common. Interconnect between all network devices for protection.
GND				

1.2 GENERAL FEATURES

- The serial interface is not isolated from the input circuit.
- The interface is isolated from the power supply circuit, except for the 24 V power supply model.
- Fixed speed: 9600 bps
- Data Bits: 8
- Parity: None
- Stop Bits: 1

1.3 COMMUNICATION PROTOCOL

The device is compatible with the slave MODBUS RTU protocol, available in most supervisory software found in the market.

The available Modbus commands are as follows:

03 - *Read Holding Register*

06 - *Preset Single Register*

Command 03 (*Read Holding Register*) accepts the reading of up to 4 consecutive registers.

2. CONTROLLER SETTINGS

Controllers with a RS485 serial interface feature the **Addr** parameter. In this parameter you can set a **communication address** for each network element. The define address must be between 1 and 247.

Addr	Controller communication address. Each controller must have a unique address.

3. REGISTERS TABLE

Registers are the controller internal parameters. Each parameter in the table corresponds to a 16-bit work with sign represented as 2's complement.

HOLDING REGISTERS	PARAMETER	REGISTER DESCRIPTION
0000	SP1	Read: OUTPUT1 setpoint. Write: OUTPUT1 setpoint. Range: From **SPL** to the value set in **SPH**.
0001	PV	Read: Measured temperature value. Write: Not allowed. Range: The range is equal to the range of the sensor used by the device.
0002	IHM Status1	Read: IHM Status. Write: not allowed. Value format: Bit 0 – OUT1 flag, Bit 1 – OUT2 flag, Bit 10 – Decimal Point, Bit 12 – Signal
0003	Control 1 Status	Read: Measurement and OUTPUT1 status. Write: Not allowed. Value format: Bit 0 – Underflow measurement, Bit 1 – Overflow measurement, Bit 8 – OUTPUT1 status, Bit 13 – Controller in defrost.
0004	Displayed Screen Value	Read: Displayed screen parameter value. Write: Not allowed. Maximum range: -199 to 1999. The range depends on the parameter displayed on the screen.
0005	Version Screen number	Read: Software version that has been implemented in the controller and the current screen number. Write: Not allowed. Screen number format: XXYYh, where: XX – Version, YY – Screen number
0006	Serial number high	Read: First 3 digits of the controller serial number. Write: Not allowed. Screen number format: XXXXh.
0007	Serial number low	Read: Last 3 digits of the controller serial number. Write: Not allowed. Screen number format: XXXXh.
0008	Hysteresis 1	Read: OUTPUT1 hysteresis. Write: OUTPUT1 hysteresis. Range: 0.1 to 50.0.
0009	-	Reserved
0010	-	Reserved
0011	-	Reserved
0012	Offset	Read: Temperature client Offset. Write: Temperature client Offset. Range: -10.0 a 10.0

Table 1 – Registers table

Note: To avoid the decimal point, the read values of SP, PV and Hysteresis are always multiplied by 10.

4. EXCEPTION RESPONSES – ERROR CONDITIONS

There will be a CRC check on the received data block whenever the device receives a command. If there is a CRC error upon reception, there will not be sent any response to the master.

If a command was received without error, the consistency of the command and the requested registers will be checked. If invalid, an exception response, containing the corresponding error code, will be sent. In exception responses, the field corresponding to the response Modbus command is summed up from 80h.

If the command to write a value to a parameter value has a value outside of the allowed range, no value will be written in this parameter. In response, the device will return a 03-error code.

Broadcast reading commands will be ignored by the controller. Thus, there will be no response. You can only write in Broadcast mode.

ERROR CODE	ERROR DESCRIPTION
01	Invalid or non-existent command.
02	Invalid or out-of-range register number.
03	Invalid or out-of-range register quantity.

Table 2 – Error codes in exception responses

5. ELECTRICAL CONNECTIONS

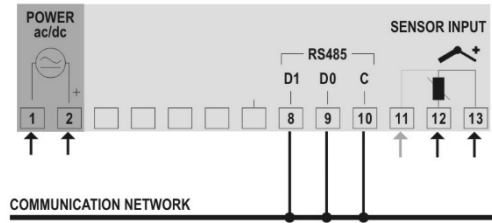Shielded twisted pair cable, 3x 24 AWG and grounded braid on both ends.

Figure 01 – Communication connections