

Line N322-RHT

Communication Protocol V2.0x

1. COMMUNICATION SERIAL

RS485 Interface

- Compatible line signals with RS485 standard.
- 2 wire connection from master to up to 31 slaves indicators in a multidrop bus. It is possible address 247 nodes with multiple outputs converters.
- Maximum communication distance: 1000 meters.
- The RS485 signals are:

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

General Characteristics

- Serial interface not isolated from input circuitry.
- Serial interface isolated from input circuitry, except in 24 V powered model.
- Baud rate: 9600 bps.
- Data Bits: 8
- Parity: None
- Stop Bits: 1

Communication Protocol

The MODBUS RTU slave is implemented, available in more SCADA software's in the market.

The available Modbus commands are:

- 03 - Read Holding Register
- 06 - Preset Single Register

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

1.1 CONFIGURATION ON CONTROLLER

The controllers that have built-in RS485 serial communication interface have the **Addr** parameter at their programming level. In this parameter the user defines a **communication address** for each element of the network. The address you set must be between 1 and 247.

Addr	Device communication address. Each device must have an exclusive address.
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1.2 REGISTERS TABLE

The Modbus registers hold the internal controller parameters. Each parameter is a 16-bit word, with negative values represented as 2's complement.

Holding Registers	Parameter	Description
0000	SP1	Read: OUTPUT1 <i>Setpoint</i> . Write: OUTPUT1 <i>Setpoint</i> . Range: From SPL to the value specified in SPH .
0001	SP2	Read: OUTPUT2 <i>Setpoint</i> . Write: OUTPUT2 <i>Setpoint</i> . Range: From SPL to the value specified in SPH .
0002	Reserved	
0003	PV RH	Read: Humidity value measure. Write: Not allowed. Range: It is equal to the sensor range used by the equipment.
0004	PV Temperature	Read: Temperature value measure. Write: Not allowed. Range: It is equal to the sensor range used by the equipment.
0005	Displayed Value	Read: Parameter value displayed. Write: Not allowed. Max. Span: -199 to 999. The actual span depends on the parameter being displayed.
0006	Offset RH	Read: Humidity offset. Write: Humidity offset. Range: -10.0 to 10.0

0007	Offset Temperature	Read: Temperature offset. Write: Temperature offset. Range: -10.0 to 10.0
0008	Hysteresis 1	Read: OUTPUT1 hysteresis. Write: OUTPUT1 hysteresis. Range: 0.1 to 50.0.
0009	Hysteresis 2	Read: OUTPUT2 hysteresis. Write: OUTPUT2 hysteresis. Range: 0.1 to 50.0.
0010	Reserved	
0011	Control Status1	Read: OUTPUT1 Status. Write: Not allowed. Value format: Bit 0 – measured <i>Underflow</i> Bit 1 – measured <i>Overflow</i> Bit 8 – OUTPUT1 Status Bit 13 – defrost controller
0012	Control Status2	Read: OUTPUT2 Status. Write: Not allowed. Value format: Bit 0 – OUTPUT2 status
0013	Reserved	
0014	Display version	Read: Version of the software implemented in the controller and screen number. Write: Not allowed. Screen number formation: XXYYh, where: XX→Version, and YY→ screen number.
0015	Serial number High	Read: First 3 digits of the controller serial number. Write: Not allowed. Value format: XXXXh.
0016	Serial number Low	Read: Last 3 digits of the controller serial number. Write: Not allowed. Value format: XXXXh.

Table 1 - Modbus registers table

Note: The SP, PV and Hysteresis values are always multiplied by 10 to account for the decimal point.

1.3 EXCEPTION RESPONSES – ERROR CONDITIONS

The MODBUS RTU protocol checks the CRC in the data blocks received. If there is a CRC error at reception, no response will be sent to the master. For commands received without error a consistency of command and requested registers is made. If invalid, an exception response is sent with the corresponding error code. In exception responses, the field corresponding to the Modbus command in the response is summed as 80H.

If a value write command in a parameter has a value outside the allowed range, no value will be written to that parameter, returning error code 03 in response.

Broadcast read commands are ignored by the controller and there is no response. It is only possible to write in broadcast mode.

Error Code	Error Description
01	Invalid Command or non-existent
02	Invalid Register Number or out of range
03	Invalid Register Quantity or out of range

Table 2 – Error code

1.4 ELECTRICAL CONNECTIONS

Use twisted pair, shielded, 3x 24 AWG and grounded wire at both ends.

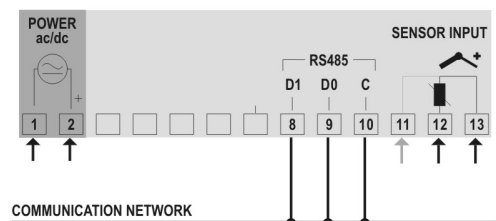


Figure 1 – Connections