

ModRHT: relative humidity, ambient temperature and dew point combined sensor

ModRHT module detects and transmits, over the **CONTATTO** bus, the relative humidity and the ambient temperature measured by a special sensor inside the module itself.

In addition, ModRHT module calculates the dew point. The dew point is the temperature at which, at constant pressure, the humidity contained in the air begins to condense into water. The dew point is always less than or equal to the temperature of the air.

ModRHT module also features 2 digital points that, when activated, report the following conditions:

- the dew point is greater than or equal to a configurable first value (e.g. 14°C); this is useful to activate the dehumidifier
- the dew point is greater than or equal to a configurable second value (e.g. 18°C, safety value); this is useful to switch off the cooler

These two thresholds can be freely fixed and also two separated configurable hysteresis are provided.

ModRHT module is thus particularly suitable for the management of the dehumidification and cooling of rooms. ModRHT module has been expressly developed for the wall mounting.

The module features only one 4-way terminal block for the connection to the **CONTATTO** bus; no more connections are required. Inside the box, a small connector allow the connection to FXPRO for the address assignment.

Address programming

ModRHT module takes 1 input address (4-channel, 16-bit) and, if enabled by the configuration panel in MCP IDE, 1 output address with the same value.

The address has to be assigned by FXPRO programmer connected to the proper connector inside the module. For details about the address assignment, refer to the related documentation.

Installation hints

The correct positioning of the sensor plays a key role for the correct measurement of humidity and temperature, therefore it is recommended to strictly observe the following principles of installation:

- do not install the module on a wall in contact with the outside or in contact with an unheated room (e.g. garage)
- do not install it on a hot wall (such as walls containing heating pipes)
- do not place it near a heat source that could distort the proper temperature reading
- avoid to place it near to household appliances that radiate heat (microwave, refrigerators, televisions, etc..)

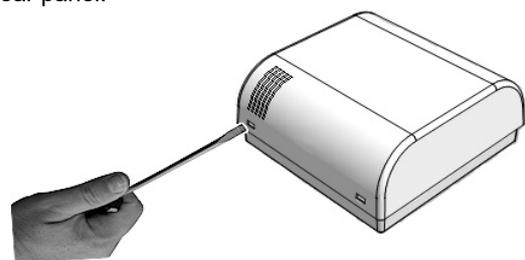


- do not place it in dead corners, behind doors or where the air cannot freely circulate, but also avoid places subject to excessive air currents
- a possible opening for the cables on the back of ModRHT module must be sealed to prevent air currents affecting the measures
- do not install the module in a place where it can be subjected to direct sunlight from the outside
- install it at about 140/150 cm. from the floor

To install ModRHT module follow the steps here below described.

Opening the module

Find the two fissures where the small dull teeth of the rear panel are housed (normally on the bottom side). Insert the tip of a small screwdriver in one of these fissures so that the rear panel releases towards the outside. Then insert the screwdriver in the other fissure so to extract completely the rear panel.



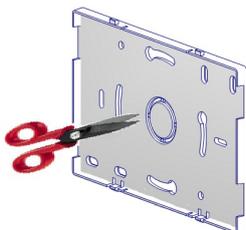
Address assignment

Insert the proper connector of FXPRO programmer in the connector on the rear side of the electronic card; then assign the base address following the normal procedure of all **CONTATTO** modules.



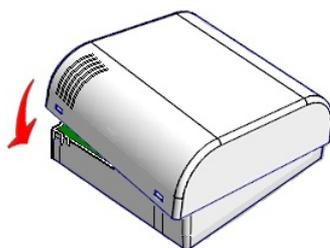
Connection

Open the hole on the rear panel helping yourself with a small pincers or a pair of scissors. Insert the wires of the bus in the hole of the rear panel; fix the rear panel to the wall, placing attention to its orientation (see the UP label on the rear panel itself). Be sure that no voltage is present on the wires. Connect the wires to the terminal blocks of the electronic card according to schematic diagram.



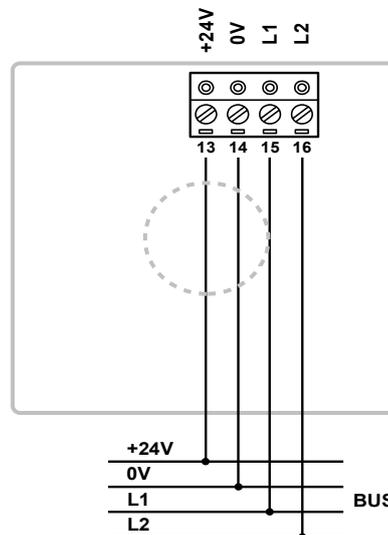
Closing the module

Place the top side of the cover on the rear panel fixed to the wall, so that the two teeth on the top side of the rear panel itself fit in the related fissures and, at the same time, the connector of the electronic card fits into the terminal block. At this point, delicately push the bottom side of the cover towards the rear panel, until the two dull teeth on the rear panel fit in the related fissures of the cover.



Wiring diagram

The following schematic diagram shows the connection required between ModRHT and the **CONTATTO** bus.



Information reported on the bus

Input section

ModRHT module takes 1 input address and, if enabled, 1 output address, 4-channel each one. The available information reported by the bus will be here described.

Point	CH1	CH2	CH3	CH4
1				DP ≥ thresh.1
2				DP ≥ thresh.2
3				-
4				-
5				-
6		Value of the ambient temperature	Value of the dew point	-
7	Value of the relative humidity (%)	in tenth of °K (Kelvin degrees multiplied by 10)	in tenth of °K (Kelvin degrees multiplied by 10)	-
8				-
9				-
10				-
11				-
12				-
13				-
14				-
15				-
16				-

In details:

CH1: measurement of the relative humidity in %; value in the range 0 to 100%

CH2: measurement of the ambient temperature in °K multiplied by 10; called X the value reported by the channel, the value in °C is (X-2730)/10

CH3: calculated value for the dew point in °K multiplied by 10; called Y the value reported by the channel, the value in °C is (Y-2730)/10

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CH4: it reports two digital points that, when activated, signals the presence of the following conditions:

- $DP \geq \text{thresh.1}$: the dew point is greater than or equal to a first threshold value specified by the content of the output section (CH1) or by a value specified in configuration
- $DP \geq \text{thresh.2}$: the dew point is greater than or equal to a second threshold value specified by the content of the output section (CH2) or by a value specified in configuration

Output section

As said before, the output section may be enabled or less by the configuration panel in MCP Ide.

The following table reports the mapped information.

Point	CH1	CH2	CH3	CH4
1				
2				
3				
4				
5				
6	Value of threshold 1 for dew point, in tenth of °K (Kelvin degrees multiplied by 10)	Value of threshold 2 for dew point, in tenth of °K (Kelvin degrees multiplied by 10)		
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

In details:

CH1: threshold 1 to be compared to the current dew point value, in °K multiplied by 10; called X the desired value in °C, the value in °K multiplied by 10 is $(X+273) \times 10$

CH2: threshold 2 to be compared to the the current dew point value, in °K multiplied by 10; called Y the desired value in °C, the value in °K multiplied by 10 is $(Y+273) \times 10$

CH3: not used

CH4: not used

If the output address has not been enabled, the two thresholds can be set by the configuration panel, and this option is recommended if it not needed to change the thresholds; if instead the thresholds have to be often changed, it is better to enable the output address and write to channels 1 and 2; in this way, the thresholds can be easily set by a supervisor, touch screen, etc.

In both cases, the two values will be stored in the non volatile memory of the module, allowing to maintain them even if a power supply failure occurred.

Anyway, the result of the comparison between the dew point and the two thresholds will affect the point 1 and 2 of the input section channel 4.

If the output address has been enabled, the configuration of MCP must include, in addition to the declaration of the

module, the directive **FIELDtoRAM**; for a ModRHT module addressed 1, MCP program must include:

```
MODRHT = ( I1, O1 )
FIELDtoRAM = ( AO1:1..AO1:2 )
```

if instead the output address has not been enabled, the **FIELDtoRAM** directive is not needed.

Using the digital points of ModRHT

As said before, ModRHT module provides, at CH4 of input address, two digital points that will be activated when the following conditions occur:

- the dew point is greater than or equal to a first configurable threshold value
- the dew point is greater than or equal to a second configurable threshold value

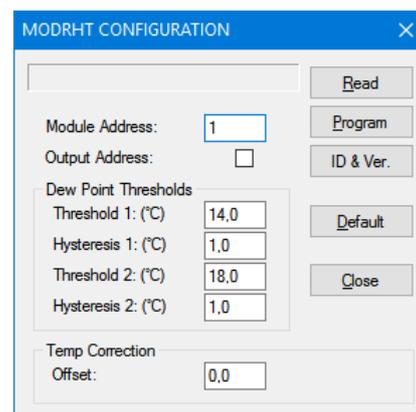
The first point is normally used to activate the dehumidifier when the dew point exceeds a given value (e.g. 14°C)

The point 2 can be instead used to switch off the cooling unit when the dew point exceeds another given value (e.g. 18°C, also said safety value).

The availability of these digital points allows to implement the dehumidifier management without using the MCP XT or MCP 4 controller, or anyway this allows to simplify the programming of the controller itself.

ModRHT configuration panel

The configuration panel, available in MCP Ide, allows to set ModRHT module. The details will be described in the following. From the main menu of MCP Ide select Configuration, Sensors and then MODRHT; the following windows will be shown:



Module Address: it is the base address of ModRHT module to be set or read.

Output Address: when checked, this option enables the output addresses

Read: read the current settings of the selected ModRHT module

Program: send the settings displayed in the window to the memory of the selected ModRHT module

ID & Ver.: ask the current firmware version to the selected ModRHT module

Default: restore the default values in the configuration panel; these one are the following:

- x Output address: disabled
- x Threshold 1: 14.0°C
- x Hysteresis 1: 1.0°C
- x Threshold 2: 18.0°C
- x Hysteresis 2: 1.0°C
- x Temperature offset: 0.0°C

Close: quit the configuration panel

Threshold 1 and **Threshold 2:** these are the threshold values 1 and 2; allowed resolution for these values is 0.1°C

Hysteresis 1 and **Hysteresis 2:** these are the hysteresis values applied to the threshold 1 and 2 respectively; allowed resolution for these values is 0.1°C

Offset: this is a value to be added to the temperature value read by the sensor, in order to compensate possible reading errors due to external factors; this value, called offset, can be both a positive and negative value and its resolution is 0.1°C

Technical characteristics

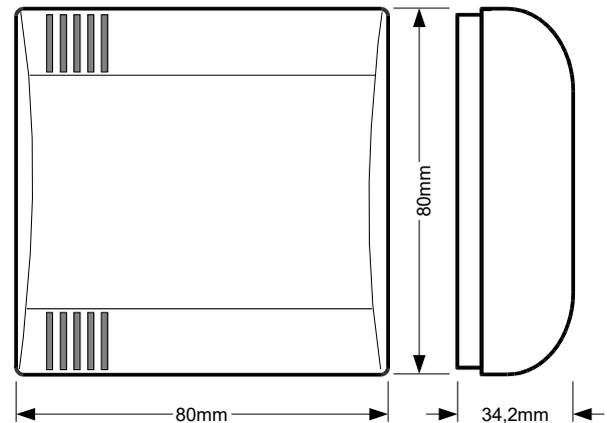
Supply voltage	24V $\pm 25\%$
MAX current consumption	15mA
Humidity measurement	
Range:	0 ÷ 100%
Resolution:	0.1 points %
Accuracy:	± 2 points % in the range 0÷100%
Temperature measurement	
Range:	-5 ÷ +50°C
Resolution:	0.1°C
Accuracy:	± 0.3 °C
Calculated Dew Point resolution	0.1°C
Operating temperature	-5 ÷ +50 °C
Storage temperature	-20 ÷ +70 °C
Protection degree	IP20

Correct disposal of the product (waste electrical & electronic equipment)



(Applicable in the European Union and other European countries with separate collection systems). This marking on the product, accessories or documentation indicates that the product and its electronic accessories should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. Adequate disposal of the decommissioned equipment for recycling, treatment and environmentally compatible disposal contributes in preventing potentially negative effects on the environment and health and promotes the reuse and/or recycling of equipment materials. Abusive product disposal by the user is punishable by law with administrative sanctions.

Outline dimensions



Installation and use restrictions

Standards and regulations

The design and the setting up of electrical systems must be performed according to the relevant standards, guidelines, specifications and regulations of the relevant country. The installation, configuration and programming of the devices must be carried out by trained personnel.

The installation and the wiring of the **CONTATTO** bus line and the related devices must be performed according to the recommendations of the manufacturers (reported on the specific data sheet of the product) and according to the applicable standards.

All the relevant safety regulations, e.g. accident prevention regulations, law on technical work equipment, must also be observed.

Safety instructions

Protect the unit against moisture, dirt and any kind of damage during transport, storage and operation.

Do not operate the unit outside the specified technical data.

Never open the housing. If not otherwise specified, install in closed housing (e.g. distribution cabinet).

Earth the unit at the terminals provided, if existing, for this purpose.

Do not obstruct cooling of the units.

Setting up

The physical address must be assigned with the specific programmer and the setting of parameters (if any) must be performed by the specific configuration softwares; for more details refer to the specific data sheet of the product. For the first installation of the device, generally and unless otherwise specified on the specific data sheet of the product, proceed according to the following guidelines:

- Check that any voltage supplying the plant has been removed
- Assign the address to module (if any)
- Install and wire the device according to the schematic diagrams on the specific data sheet of the product
- Only then switch on the 230Vac supplying the bus power supply and the other related circuits

Applied standards

The devices belonging to **CONTATTO** line comply with the essential requirements of the following directives:

- 2014/30/UE (EMC)
- 2014/35/UE (Low Voltage)
- 2011/65/UE (RoHS)

Note

Technical characteristics and this data sheet are subject to change without notice.