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e-Room® Modbus

EN

Fan-Coil controller with Modbus communication
Ref: RC.674501-000

Instruction Sheet

***e-Room® Modbus* is a fan coil controller which combine room climate control with lighting control functions, switching on/off those systems depending on the occupancy status of the room.**

The device is designed to provide maximum comfort and energy efficiency optimization of the installation, controlling the climate to achieve the desired level by the user.

The device includes different operating configurations depending on the installation type and requirements, as well as a standard Modbus communication bus to communicate with a BMS system.

Features

- Fan Coil controller designed for 2 and 4 pipes systems
- Six possible configurations depending on the installation type
- Two self-configurable dry contact inputs: Keycard contact/ motion detector, window contact
- Two self-configurable analog inputs: Water temperature sensor/ Door contact, ambient temperature external sensor.
- Three relay outputs for fan-coil speeds
- Two relay outputs for valve actuator (2/4 pipes) + room light/ courtesy light
- Modbus RTU communication protocol with RS-485 interface to remote management from BMS.
- Large display blue LED backlighted LCD screen of 64x26mm
- Front panel built in pushbuttons: +Tª / -Tª / Fan-Coil speed / On-Off
- Front panel built in temperature sensor
- Selectable temperature units ºC / ºF
- Eco mode on unoccupied zone (Off / ECO set-point)
- Real setpoint and user setpoint configurable for heat and cool
- Automatic switch-on for extreme temperatures (over temp. or frost risk)
- Configurable fan coil: 3 Speeds / 1 Speed
- Fan coil speed configurable as blocked on zero demand
- Configurable setpoint heat/cool temperature on Stand-by mode
- Configurable heat/cool dead band
- Time to change into stand-by mode when room changes into unoccupied state.

Product description

Introduction

e-Room® Modbus is a room controller for hotel and offices installations which provides a global climate and lighting control of a room or zone depending on its occupancy state, managing the energy consumption to achieve energy efficiency optimization in installations. The device includes multiple configurations to take into account different kind of installations based on the occupancy detection, installation type (2 / 4 pipes) and light control.

The device is designed to operate on water installations with 2 or 4 pipes with fan coil and valve actuators to control water flow rates and manage efficiently zone's temperature.

The occupancy room state can be performed through a keycard contact located in the room (in hotel installations) or throughout a motion sensor and door contact that allows to detected when room changes into occupied or unoccupied state.

The device provides a configuration parameter to switch off the climate or change into economic mode modifying the temperature set point to a pre-set value for energy saving, when room changes into unoccupied state.

An input contact to manage the window status allows to switch the climate off when the window is open, saving energy during that period of time, and switching the climate on again when the window closes.

The device has a complex control algorithm that automatically manages the valve actuators state and fan coil speeds to ensure room temperature to a pre-set value defined by the user.

Depending on the type of installation configured, the device can control zone lights, switching it on automatically when room changes into occupied state and switching it off when room changes into unoccupied state. Additionally, the light control can be configured as a courtesy light for hotels installations. In that case, lights will switch on during a preconfigured time and then will switch off when room changes into occupied or unoccupied state.

The device has an RS-485 communication interface to communicate through the standard Modbus RTU protocol, and throughout which is possible to enter to each configuration parameter, monitoring different device parameters like room's temperature, occupancy state, fan coil speed, etc. and remotely switch it on, change temperature set-point or modify whatever parameter on the device.

The device includes 36 configuration parameters that can be modified to adapt the operating functions of the device to the installation requests. All that parameters are configurable through a simple configuration menu entering using the pushbuttons included on the front panel of the device or remotely throughout communication bus.

Refer to the "**Operating manual**" of the device for additional information about the product functionality

Type of Installation

The device includes different operating modes according to the installation type. Device Inputs and outputs are used to perform room or zone automation depending on the type of installation set

Product description (continued)

up. Depending on the configured operating mode on the device, each input and output have a specific functionality according to normally operating requests of installations.

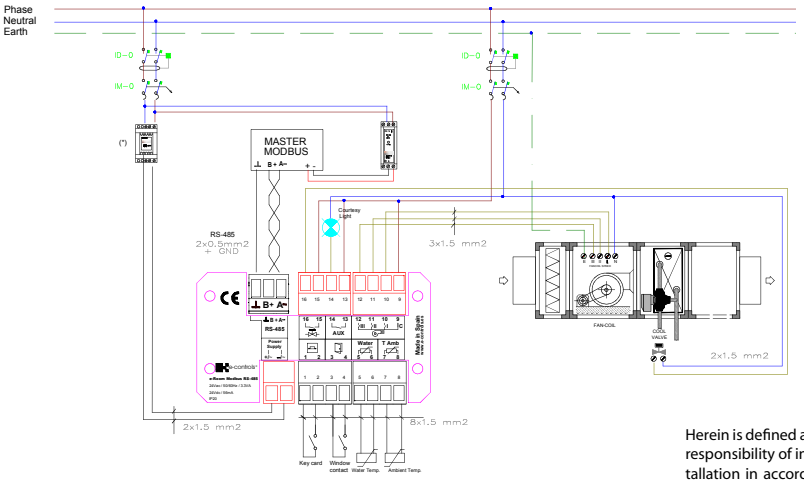
The following table summarizes the functionality of each input and output according to each operating mode configured:

		Inputs and terminals (GREY)			
Type of Installation	**Number of Pipes**	**IN1 (1 - 2)**	**IN2 (3 - 4)**	**IN3 (5 - 6)**	**IN4 (7 - 8)**
Option 1	**2**	Keycard contact	Window contact	Lighting Pushbutton	Tª Ext.
Option 2	**2**	Keycard contact	Window contact	Tª Water	Tª Ext.
Option 3	**4**	Keycard contact	Window contact	Tª Water	Tª Ext.
Option 4	**2**	Motion Sensor	Window contact	Door Contact	Lighting Pushbutton
Option 5	**2**	Motion Sensor	Window contact	Door Contact	Tª Ext.
Option 6	**4**	Motion Sensor	Window contact	Door Contact	Tª Ext.

		Outputs and terminals (RED)				
Type of Installation	**Number of Pipes**	**OUT1 (9 -10)**	**OUT2 (9 -11)**	**OUT3 (9 - 12)**	**OUT4 (13 - 14)**	**OUT5 (15 - 16)**
Option 1	**2**	Fan-Coil Speed I	Fan-Coil Speed II	Fan-Coil Speed III	Lighting	EV HEAT/COOL
Option 2	**2**	Fan-Coil Speed I	Fan-Coil Speed II	Fan-Coil Speed III	Lighting	EV HEAT/COOL
Option 3	**4**	Fan-Coil Speed I	Fan-Coil Speed II	Fan-Coil Speed III	EV HEAT	EV COOL
Option 4	**2**	Fan-Coil Speed I	Fan-Coil Speed II	Fan-Coil Speed III	Lighting	EV HEAT/COOL
Option 5	**2**	Fan-Coil Speed I	Fan-Coil Speed II	Fan-Coil Speed III	Lighting	EV HEAT/COOL
Option 6	**4**	Fan-Coil Speed I	Fan-Coil Speed II	Fan-Coil Speed III	EV HEAT	EV COOL

Wiring diagram

Installation Type:
Option 2



Herein is defined a functional diagram. It shall be the responsibility of installer to protect properly the installation in accordance with applicable regulations of each country.

Device configuration

The device is completely configurable throughout communication bus for remote management.

To configure the device, refer to the "**Configuration sheet"**

BMS remote manage

The device includes a communication interface RS-485 to communicate with the Building Management System through Modbus RTU protocol. The device is a slave product inside the net and has different parameters to configure the bus.

The remote management of the device is performed through input and output registers which are defined on the device.
For a more detailed information about input/output registers refer to **"RC.674501-000 - e-Room Modbus - Registers Modbus V0.1.0 – DMCEN" document.**

Product installation

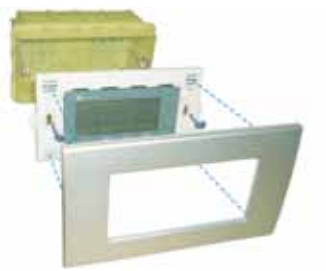
This device should not be installed on shelves, behind curtains, above or near heat sources, or exposed to direct sunlight. For fast and accurate ambient temperature measurement, the controller should be installed such that air may circulate vertically. Installation height should be approximately 1.5 m from the floor.

Caution:

- Prior to installing or removing the device, ensure that there is no mains voltage present in the wiring to be connected or near the unit.
- Do not cut or roll up the wires to be connected to the device.
- Do not work on the wiring with wet hands.
- Do not open or drill through the device.
- Keep the device and the supply wires away from moisture and dust.
- Use a damp cloth to clean the device.

Installation steps:

1º Install the flush mount back box on the wall
2º Connect all wires to the appropriate device terminals ensuring that there isn't voltage on it, following the wiring diagram.
3º Insert and screw the device in the box
4º Fit the frame onto the device
5º Remove the front panel anti-scratch protective foil



Technical features

Supply power
Operating voltage . . . . . 24 Vca ± 20%, 50/60Hz
24Vdc ± 20%
Maximum rate current . . . . . .100 mA

Comunication
Interface RS-485
Terminals . . . . . A-, B+, GND
Protocol . . . . . Modbus RTU
Transmission speed configurable. . . . . 1200...115200 Baud
Modbus Configuration 8E1, 8O1, 8N1, 8N2

Digital Inputs (Keycard, Window, Detector)
Open circuit voltage . . . . . .10,5 Vdc ±0,2 V
Short circuit current . . . . . 7,0 mA
Close circuit input impedance. . . . . <85 Ω
Open circuit Input impedance . . . . . .>420 Ω

Analog Inputs (Water, External sensor)
Type . . . . . Resistive
Characteristics. . . . . NTC interchangeable, 1%
10 KΩ a 25ºC (77ºF)
Temperature measuring range . +5ºC a +45ºC (+41ºF a 113ºF)
Resolution 0,5ºC

Built-in temperature sensor
Temperature measuring range . +5ºC a +45ºC (+41ºF a 113ºF)
Resolution 0,5ºC

Digital Outputs (Fan-Coil, Valve actuator)
Contact type. . . . . Potential free relay
Normally Open
Maximum operating voltage . . . . . 250 Vca
Maximum current . . . . . 5 A, resistive load
3 A, inductive load

LCD Display
Type . . . . . .Backlight liquid crystal
Dimensions visible area 64x26mm
Lighting type . . . . . .Blue LED

LED front panel indicator
Climate switch on . . . . . .Led switch off
Standby . . . . . Green Led switch on
Reset device . . . . . .Red Led switch on

Front panel pushbuttons
+T / -T / Fan-Coil Speed / ON-OFF

Temperature
Operating . . . . . 0ºC a +50ºC (32ºF a 104ºF)
Storage . . . . . -20ºC a +85ºC (-4ºF a +185ºF)

Humidity (non condensing)
Operating . . . . . 10% a 90% RH a 50ºC
Storage . . . . . 95% RH a 50ºC

Installation
Type installation . . . . . Flush mounting
Flush mount back box . . . . . .Bticino 504E
Mount recommended heigh. . . . . 1,5mts from floor

Mechanical features
Dimensions (with frame) . . . . . .142x86x42 mm
Weight . . . . . 250 g
Plug-in connectors . . . . . Si
Cross sectional area conductor . . . . . .0,5 mm2 a 2,5 mm2
Protection index . . . . . .IP20 (EN 60529:1991)
Electrical safety . . . . . Clase III

Conformidad CE
Low Voltage Directive (LVD) 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC

Standards
Product standard . . . . . .EN 60730-1:2011
EN 50491-3:2009
Electrical safety . . . . . EN 60730-1:2011
EN 50491-3:2009
EN 50491-4-1:2012
Electromagnetic compatibility . . . . . .EN 60730-1:2011
EN 50491-5-1:2010
EN 50491-5-2:2010

Product reference

e-Room Modbus. RC.674501-000

Accesories

Temperature sensor
e-Temp, External Tª sensor e-Room Cable, BTicino Light frame pure white AC.000100-000
e-Temp, External Tª sensor e-Room Cable, BTicino Light frame matt aluminium AC.000100-001
e-Temp Surface, External temperature sensor enclosure flush mounting, NTC10K, dimensions 44x76x27mm . . . AC.000102-002

Motion detectors
e-Sensor Noiseless, Motion sensor transistor output, BTicino white colour, 12 -24V DP.801110-000
e-Sensor Noiseless, Motion sensor transistor output, BTicino aluminium colour 12 -24V DP.801110-001

Frames
Pastic frame for e-Room, BTicino white colour LNA4804BI
Metallic frame for e-Room, BTicino aluminium colour. LNA4804TE
Metallic frame for e-Temp and e-Sensor, BTicino White colour LNA4802BI
Metallic frame for e-Temp and e-Sensor, BTicino aluminium colour. LNA4802TE

Window contact
Window plastic contact, flush mounting. REED type 125Vac/0,5A, normally closed , D15 . . . . . CVP-NC

Related documents

Configuration Manual . . . . . DMCEN
User Manual . . . . . DMUEN
Operating Manual . . . . . DMFEN
Wiring Diagram . . . . . DEC

The package of this product is considered as industrial packaging; intended for professional use only.
The manufacturer is not responsible of the incorrect installation or use of the products. Specifications are subject to change without notice