MIDAM
CONTROL SYSTEM

# MIDAM WFC01001

## Wireless fan-coil controller


encrypted AES 128

**Wireless fan coil controller with three-stage fan speed and heating/cooling valves operation. It can work completely in autonomous mode, or thanks to integrated modbus map, to be integrated into a topology of any SCADA systems. The communication is based on the AES128 encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis. WRU01001 room unit is the HMI for WFC01001.**

WIRELESS SOLUTIONS

## Application

- Room control with four-pipe fan coil
- Room control with two-pipe fan coil
- Room control with cooling fan coils and radiators
- Room control with heating convectors and cooling panels
- wMbus protocol data acquisition
- Wired and/or wireless integration into the SCADA systems

## Function

The WFC01001 fan coil controller communicates with the room controller via a 868 MHz unlicensed band. Embedded AES 128-bit, provides the most secure encryption standard for wireless connections. The room and setpoint temperature transmitted from the room controller is calculated in the PI algorythm. The PWM modulation is applied for controlling radiator valves via device output triacs. The controller is designed to work in a non-aggressive environment, but requires no maintenance at all. It can be mounted using attached brackets to any flat surface (fcu body, installation panel) as well as on a standard DIN rail. High precision calibrated real time clock, backed up with internal battery allows to set a week schedule with up to six programs for a particular day. Control modes are Comfort, PreComfort, and Off. The controller has two digital inputs for the presence sensor (card reader, motion sensor) and window contact readouts. Both modes, NO (normally open) or NC (normally closed) can be set for valves. The fan stages are controlled automatically (according to the PID output or control deviation) or manually (if enabled during configuration). The controller features a native modbus map (also for WRU01001) with the direct read and write functionality. The modbus map is available in a separate document. All settings and configuration are also stored in a modbus register, directly in the device. Before using the device for the first time, it is necessary to pair it and it is recommended to perform individual configuration, especially to change the encryption password.

## SCADA system integration

The WFC01001 can be integrated into the SCADA system directly via the Modbus RTU (RS485) bus or via WCOM01, resp. WCOM51 wireless gateways.

## Pairing

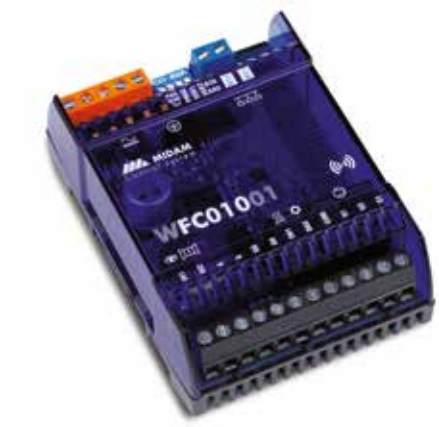
Up to eight KFP or wMBUS wireless devices can be connected to one WFC01001 controller simultaneously. Usually, wireless gateway or configuration dongle is used to set up remote wireless devices. Use look-up function in software tool to display a list of all available devices in range and assign or adjust parameters based on wireless ID code for each single device. There is a comprehensive help section integrated in the software tool to provide support during the wireless device set up procedure.

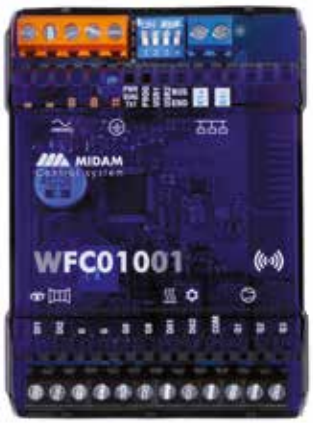
## Midam KFP Password change

Prior to the first use, the encryption password (default "MIKROKLIMA1234AB") must be changed using the WUSB01 configuration dongle and the relevant software tool.

# MIDAM WFC01001

## Wireless fan-coil controller




## Technical data

| | |
|---|---|
| **Power supply** | 24 V AC ± 20% |
| **Consumption** | 3 W |
| **Communication** | 868,950 MHz, 100 kbps, wMBUS T1, KFP (default factory setting)<br>868,300 MHz, 32 kbps, wMBUS S1, KFP<br>868,100 MHz, 100 kbps, KFP<br>869,525 MHz, 100 kbps, wMBUS C, KFP<br>868,300 MHz, 38 kbps, KFP<br><br>RS485, 300 to 115200 bps, galvanic isolation 1 kV |
| **Protocol** | wMBUS (EN 13757-4), KFP (radio dual stack)<br>Modbus RTU, 256 node (RS485) |
| **Network communication** | Direct connection of up to 8 KFP or wMbus devices. |
| **Encryption** | AES 128 PCBC, EN 13757-4 |
| **RF power** | +10 to - 20 dBm, step 5 dB |
| **Antenna** | Integrated |
| **Communication range** | 100 m in free space, 30 m in buildings |
| **Indication** | 3 x LED (PWR, DIAG, TX1) |
| **Inputs** | 2× DI dry contact, 24 V DC, 15 mA |
| **Outputs** | 2 x solid state relay for AC load, zero crossing switching, 24 V AC, max. current 0.4 A<br>3 x relay 230 V AC, 5 A SPST, AC1 EN 60947 |
| **Mechanical and dimensions** | 98 x 70 x 35 mm ( l x w x h )<br>Polycarbonate enclosure (UL94V0)<br>IP20, DIP switch (INIT, USR, bus end)<br>Internal, high precision calibrated RTC with battery backup |
| **Terminals** | M2 screw terminals, recommended wire diameter 0,35 to 1,5 $mm^2$ |
| **Ambient conditions** | -5 to +45 °C, 5 % to 95 % rH (EN 60721-3-3 class 3K5) |
| **RoHS notice** | The device contains a non-rechargeable battery which backups the real-time clock and part of the memory. After the device is not operable, please return it to the manufacturer or dispose of it in compliance with local regulations. |

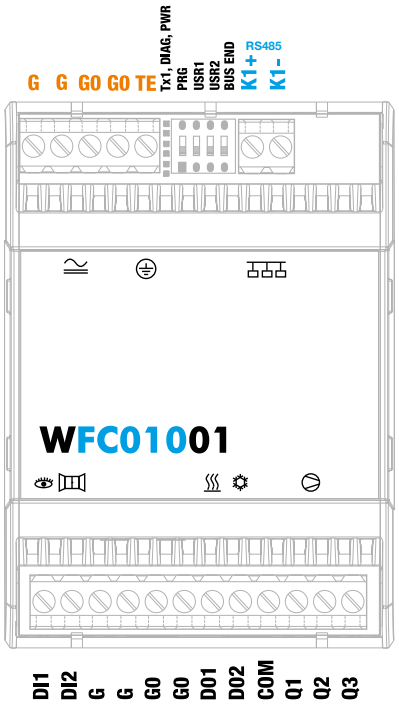
WIRELESS SOLUTIONS

# MIDAM WFC01001

Wireless fan-coil controller

## Terminals and connection

| | |
|---|---|
| G | Power supply |
| G0 | Power - common |
| TE | Technical ground (TE) |
| K1+ | Serial line RS485 + |
| K1- | Serial line RS485 - |
| DI1 | Presence input against G |
| DI2 | Window contact input against G |
| G | Power supply for inputs (connected to G in the upper terminal row) |
| G0 | Power supply for outputs - common point (connected to G0 in the upper terminal row) |
| DO1 | Heating valve output (against G0) |
| DO2 | Cooling valve output (against G0) |
| COM | Common terminal for Q1, Q2 and Q3 |
| Q1 | Fan coil relay stage 1 |
| Q2 | Fan coil relay stage 2 |
| Q3 | Fan coil relay stage 3 |




## LED indication and DIP switches

| | |
|---|---|
| TX1 | Red LED - RS485 transmitting data to the field bus (flashing: transmitting data, OFF: no data traffic) |
| DIAG | Red LED – diagnostic, wireless radio indication |
| PWR | Green LED - power (ON: power is OK, OFF: no power applied, weak or damaged power supply) |
| PRG | Default frequency, power and password is used in ON position. |
| USR 1 | In ON position - unidirectional communication. |
| USR 2 | Not used. |
| BUS END | Bus end RS485, the first and last devices on the bus should have bus end in ON position. |

## Changes in versions

| | |
|---|---|
| 01/2020 | New datasheet version (v20/01). |
| 06/2020 | Communication update with W-RUxxx-0x (v20/06). |
| 08/2020 | Number of wireless devices connected - Network communication (v20/08). |
| 10/2020 | Layout changes (v20/10). |
| 06/2021 | DI, DO, G, G0 terminal connection updated (v21/06). |
| 07/2025 | The wording of the section "Midam KFP Password change" has been modified (v25/07). |

WIRELESS SOLUTIONS