



MIDAM WFC01001

Wireless fan coil controller



Summary

WFC01001 is a 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 DDC/SCADA systems. The communication is based on the encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis. **WRU01001** is the HMI for **WFC01001**.

General information

This document explains the Modbus protocol for **WFC01001** fan coil controller. Modbus is a communication protocol open to all users and supported in common by many manufacturers. The Modbus protocol allows data and setup information to be transferred between a Modbus Master and a Modbus Slave. The HMI room unit **WRU01001** shares certain modbus registers and settings.

50 words can be read at the same time (i.e. 100 bytes).

coil write / read not allowed, functions 3 and 16 supported only

type:

R - register is read only

W - register is write only

RW - register is read/write,

RWE - register is read from EEPROM, write to EEPROM

Modbus map

name	address	type (def.v.)	description	notes/defaults
modbus ID	1	R	identifier of modbus map	0x50C
firmware	2	R	compatible firmware version	1
status LSB	3 LSB	R		
status MSB	3 MSB	RW	module status bit 0 - write to eeprom (WR) bit 1 - write OK (RD) Write to EEPROM if bit 0 is set, then content of RAM is written into EEPROM. Bit 0 is clear and bit 1 is set by device	



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modbus address	4 LSB	RWE	Modbus module address (for even distribution of load, fans and outputs are enabled after address mod 10 secs) !!! the change will be effective after restart only (however the register will be set immediately)	1
baud rate	4 MSB	RWE	communication speed 10dec ... 1 200bps 11dec ... 2 400bps 12dec ... 4 800bps 13dec ... 9 600bps 14dec ... 19 200bps 15dec ... 38 400bps 16dec ... 57 600bps 17dec ... 115 200bps (default) !!! the change will be effective after restart only (however the register will be set immediately)	17dec (115 200 bps)
serial port settings	5 LSB	RWE	serial line parameter settings bit 0-1 ... parity (00 - no parity, 01 - even, 10 - odd) bit 2 ... stop bits (0 - one, 1 - two) !!! the change will be effective after restart only (however the register will be set immediately)	no parity, 1 stop bit
device ID	6	R	device identifier - used by bootloader	1082
hw number	7	R	version of hardware compatibility	1
boot FW num	8	R	bootloader version, 0 if runs the application	
name	9 - 16	RWE	editable user name .. max 16 chars	Thermostat 1
RF address	17,18	R	RF address	0x02000000 - 0x020FFFFF
RF key	19 - 26	RWE	Communication key .. 16 chars	MIKROKLIMA1234AB
RF frequency	27 LSB	RWE	Communication frequency 0..868.95 MHz 1..868.3 MHz (32.768 kBit) 2..868.1 MHz 3..869.525 MHz 4..ENIKA (868.3 MHz, 38.400 kBit)	0 (868,95MHz)
RF power	27 MSB	RWE	RF transmit power of FA010 0..20 dBm 1..15 dBm 2..10 dBm 3..5 dBm 4..0 dBm 5..-5 dBm 6..-10 dBm	2 (+10dBm)
EEPROM writes	28	R	number of EEPROM writing cycles, does not overflow, cannot be reset by INIT nor by any other means	



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uptime	29 - 30	R	uptime in seconds	
vbat	32 LSB	R	battery voltage * 0.1 V	0 .. 25.5V
bat state	32 MSB	R	bit 0..3 - battery state * 10% bit 7 - lowbat	0 .. 100 %
actual temperature	33	R	actual temperature measured by the internal sensor incl. correction (see corr temp) temperature = register value * 0,01 °C	signed short
actual set point heat	34	RWV	actual heating setpoint incl. setpoint correction actual set point = register * 0,01 °C	signed short
actual set point cool	35	RWV	actual cooling setpoint incl. setpoint correction actual set point = register * 0,01 °C	signed short
actual rH	36	R	actual relative humidity = register * 0,01 %	
actual CO2	37	R	actual value of CO2 in ppm	
actual outside temperature	38	RWV	This value is written by PLC and displayed. Value = register * 0,01 °C	
inputs	39	RWV	Bit 0 .. presence bit 1 .. window contact bit 2 .. heating demand (PID output HEAT > 5%) bit 3 .. cooling demand (PID output COOL > 5%) bit 4 .. last state was cooling (for regular indication on LCD) 0..heat, 1..cool	
set temperature correction	40	RWV	setpoint correction set by user; resets at each operation mode change limits are set in the min and max rel. temp correction registers temp = register * 0,01 °C	350 (3,5 °C)
set day/ comfort heating temperature	41	RWE	day/comfort mode heating temperature setpoint set by user temp = register * 0,01 °C	2100 (21 °C)
set night/ pre-comfort heating temp	42	RWE	night/standby mode heating temperature setpoint set by user temp = register * 0,01 °C	1900 (19 °C)
set depression/ economy heating temp	43	RWE	off mode heating temperature setpoint set by user temp = register * 0,01 °C	1200 (12 °C)
set day/ comfort cooling temp	44	RWE	day/comfort mode cooling temperature setpoint set by user temp = register * 0,01 °C	2400 (24 °C)
set night/ pre-comfort cooling temp	45	RWE	night/standby mode cooling temperature setpoint set by user temp = register * 0,01 °C	2600 (26 °C)



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set depression/ economy cooling temp	46	RWE	off mode cooling temperature setpoint set by user temp = register * 0,01 °C	3500 (35 °C)
actual regulation mode	47	R	actual mode used for control, if on manual then the actual control mode is equal to set presence mode, if on auto then the actual control mode is according to time schedule bit 0 ... comfort/day bit 1 ... standby/night bit 2 ... off/depression bit 3 ... auto bit 4 ... party (displayed symbols depend on the configuration register regulator settings, if set to hotel then comfort, standby, off; if set to residential then day, night, depression, auto, party)	
set presence mode	48	RWE	presence status set by user (displayed symbols depend on the configuration register regulator settings, if set to hotel then comfort, standby, off; if set to residential then day, night, depression, auto, party) bit 0 ... comfort (occupied house) or day (sun + occupied house) bit 1 ... standby (empty house) or night (moon + occupied house) bit 2 ... off (off) or depression (empty house) bit 3 ... auto (clock) - only when residential bit 4 ... party (sun + drink + clock, after 2h goes to auto) - only when residential bit 5 to 14 ... reserved bit 15 ... write enable (if set to 1 value will be written into register, if in 0 attempt will be ignored)	1 (comfort/day)
set fan mode	49	RWE	fan status set by user; bit 0 ... Auto (fan + A) bit 1 ... Off (fan + M) bit 2 ... Man 1 (fan + M + Stage 1) bit 3 ... Man 2 (fan + M + Stage 1 and 2) bit 4 ... Man 3 (fan + M + Stage 1, 2 and 3)	1 (auto)
LCD contrast	50 LSB	RWE	contrast of LCD 0..6	3
CO2 measure period	50 MSB	RWE	CO2 measure period in seconds 10 .. 180 sec	30



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regulator settings	51 LSB	RWE	controller configuration bit 0 ... presence mode type (0 - hotel, 1 - residential) bit 1 ... temperature correction display (0 -relative, 1 - absolute) bit 2 ... 1 - stop fan when HEAT, 0 - fan can be on when HEAT) bit 3 ... 1 - stop fan when COOL, 0 - fan can be on when COOL) bits 4-5 ... fan type (00 - 3 stages, 01 - 2 stages, 10 - 1 stage) bit 6 ... valve exercising (1 - enabled) bit 7 ... valve type (0 ... NC, 1 ... NO)	0 (hotel, relative, 3 stage fan)
inputs settings (inputs enable, inputs logic)	51 MSB	RWE	inputs configuration DI1 ... presence DI2 ... window / alarm contact bit 0 ... DI1 enabled for operation mode control bit 1 ... DI2 enabled for operation mode control bit 2 ... DI1 sense (0- NC- normally closed, 1-NO- normally open) bit 3 ... DI2 sense (0- NC - normally closed, 1 - NO-normally open)	(inputs enabled, normally open, i.e. active when contact on, 0x0F)
min rel. temp correction	52	RWE	minimum relative user temperature correction, a positive value is saved and is taken as negative limit $temp = register * 0,01 \text{ } ^\circ\text{C}$	350 (-3,5 °C)
max rel. temp correction	53	RWE	maximum relative user temperature correction $temp = register * 0,01 \text{ } ^\circ\text{C}$	350 (3,5 °C)
min day, night, depression temperature	54	RWE	minimum temperature which user can set as setpoint for day, night, and off modes -199.99 to 199.99 $temp = register * 0,01 \text{ } ^\circ\text{C}$	1000 (10 °C)



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max day, night, depression temperature	55	RWE	maximum temperature which user can set as setpoint for day, night, and off modes -199.99 to 199.99 temp = register * 0,01 °C	4000 (40 °C)
temperature sensor correction	56	RWE	correction: adds to the actual temperature measured by the internal sensor -20.00 to 20.00 temp = register * 0,01 °C	0 (0 °C)
correction rH	57	RWE	correction: adds to the actual humidity measured by the internal sensor rH corr = register * 0,01 %	0 (0 %)
Correction CO2	58	RWE	correction: adds to the actual CO2 measured by the internal sensor CO2 = register * 1 ppm	0 (0 ppm)
step temp	59 LSB	RWE	step for user temperature setpoints setting step = register * 0,01 °C 1 ... 0.01 °C 50 ... 0.5 °C 100 ... 1 °C etc.	50 (0.5 °C)
step minutes	59 MSB	RWE	time step for time schedule setting step = register * 1 min	5 (5 minutes)
show mode	60 LSB	RWE	data that roll on the LCD display (default = 1) If only one of the bits is active there is only one value displayed. Otherwise they change periodically after show time. bit 0 ... temperature bit 1 ... outside temp. bit 2 ... current time bit 3 ... temperature correction bit 4 .. relative humidity bit 5 .. CO2	1 (temperature)
show time	60 MSB	RWE	time to display each value in show mode time = register * 100 ms	30 (3 sec) see show mode
edit return time	61 LSB	RWE	time (in s) of user inactivity to return from edit mode to show mode time = register * 1 s	30 (30 sec)
quick edit mode number	61 MSB	RWE	number of mode which is editable through quick edit menu (short push of the knob) 0 ... push function inactive 1 ... presence mode 2 ... fan mode	2 (fan mode)



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long push time	62 LSB	RWE	time evaluated as long push (go to time schedule menu / leave menu) for editing of the time schedule and presence or fan mode time = register * 100 ms	15 (1,5 sec)
super long push time	62 MSB	RWE	time (in 100 ms) evaluated as superlong push (go to settings menu) for actual time and basic setpoints settings time = register * 100 ms	50 (5 sec)
allowed operation modes	63	RWE	settings that user is able to perform 0 ... disabled 1 ... enabled bit 0 ... temp corr. bit 1 ... heating day temp bit 2 ... heating night temp bit 3 ... heating depression temp bit 4 ... cooling day temp bit 5 ... cooling night temp bit 6 ... cooling depression temp bit 7 ... RTC time bit 8 ... presence mode bit 9 ... fan mode bit 10 ... time programme bit 11 ... LCD contrast	0x0A01 (temp corr, fan mode, contrast)
presence mode edit mask	64	RWE	states in presence mode that user is able to switch between bit 0 ... day (sun + occupied house) bit 1 ... night (moon + occupied house) bit 2 ... depression (empty house) bit 3 ... auto (clock) bit 4 ... party (sun + drink + clock, after 2h goes to auto)	0x001F (all)
fan mode edit mask	65	RWE	fan states that user is able to switch between bit 0 ... Auto (fan + A) bit 1 ... Off (fan + M) bit 2 ... Man 1 (fan + M + Stage1) bit 3 ... Man 2 (fan + M + Stage1 and 2) bit 4 ... Man 3 (fan + M + Stage1, 2 and 3)	0x001F (all)
display symbols	66	RW	displayed symbols bit 0 ... spanner bit 1 ... boiler bit 2 ... alarm bell bit 3 ... heat bit 4 ... coolig	0



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actual tpg change num	67	R	number of change od day programm	
RTC	68 69 70 71	RWV	Real time clock, BCD coding sec,min,hour,wday,mday,mon, year -2000	1:00 1.1.2000
program Monday Event 1 time	72	RWE	time schedule, Monday, time of event No. 1, in mins since 0:00 (midnight)	360 (6:00)
program Monday Event 1 value	73	RWE	time schedule, Monday, event No. 1, value 0 ... day / comfort 1 ... night / standby 2 ... off / depression bit 15 = 1 ... event is disabled	0 (day / comfort)
program Monday Event 2 time	74	RWE		480 (08:00)
program Monday Event 2 value	75	RWE		1 (night / standby)
program Monday Event 3 time	76	RWE		840 (14:00)
program Monday Event 3 value	77	RWE		0 (day / comfort)
program Monday Event 4 time	78	RWE		1320 (22:00)
program Monday Event 4 value	79	RWE		1 (night / standby)
program Monday Event 5 time	80	RWE		1435 (23:55)
program Monday Event 5 value	81	RWE		0x8000 (disabled)
program Monday Event 6 time	82	RWE		1435 (23:55)



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program Monday Event 6 value	83	RWE		0x8000 (disabled)
program Tuesday Event 1 time	84	RWE		360 (6:00)
...
program Sunday Event 6 value	155	RWE		0x8000 (disabled)
external input state	156	R	status of external window switches bit 0 - window 1 .. bit 3 - window 4	
PID output HEAT	157 LSB	R	controller heating output (PID output, or value from manual control), range 0 .. 100%	
PID output COOL	157 MSB	R	controller cooling output (PID output, or value from manual control, incl. change-over C/O mode), range 0 .. 100%	
PID fan speed	158 LSB	R	fan speed state (PID output, or value from manual control) 0 ... off 1 ... Stage 1 2 ... Stage 2 3 ... Stage 3	
Thermometer communication state	158 MSB	R	communication status of the room unit UC 010 (if comm fails for 60 secs, all controller outputs go to off (except for those controlled manually, see register manual control) 0... communication OK 3... MB error	
manual control	159 LSB	RW	manual output control; if a bit is set to 1, the output goes to state defined below (see manual fan speed, manual heat output, manual cool output); if set to 0, PID output values apply bit 0 ... fan bit 1 ... heat output bit 2 ... cool output bit 3 to 4 ... reserved bit 5 ... C/O (1 = on)	



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manual fan speed	159 MSB	RW	manual fan speed setting (only if the corresponding bit in the manual control register is set) 0 ... off 1 ... Stage 1 2 ... Stage 2 3 ... Stage 3	
manual heat output	160 LSB	RW	manual heat output setting (only if the corresponding bit in the manual control register is set) range 0 .. 100%	
manual cool output	160 MSB	RW	manual cool output setting (only if the corresponding bit in the manual control register is set) range 0 .. 100%	
P band / On-Off hysteresis	161	RWE	controller P-band (input deviation for output proportional part of 100 %) or hysteresis if On/Off (hysteresis for heating is under the setpoint, for cooling above the set-point) PI or OnOff setting see Reg. 29, bit 4 x 0.1 K	0x0014 (2K)
I const	162	RWE	controller I - constant; if out of bounds, a new recalculated value is set after restart in seconds; if set to 0, integration part is disabled	0x0E10 (60 min)
regulator settings 2	163 LSB	RWE	controller configuration bit 0 ... fan stages reset to Auto when scheduler changes the presence mode bit 1 ... enable FC Slave function (controller will not communicate with UC010) - change only applies after restart bit 2 ... DI2 as alarm input, switches off all outputs bit 3 .. temp correction reset to 0 when presence mode changes bit 4 ... control mode (0 - PI, 1 - on/off) bit 5 ... reserved bit 6 ... reserved bit 7 ... fancoil type: 0: 2-pipe, 1: 4-pipe.	(fan stage reset enable, slave off, DI2 as window contact, correction reset enable, PI control, 4-pipe, 0x89)
latch enable	164	RW	Latch enable function for individual inputs: By writing 1 into the register the particular bit in the latched value register goes to 0 and is kept until the required value is caught. After reset, the whole register is set to 0.	Resetting of the individual caught bits in the latched Value register: change the particular bit from log. 0 to log.1 (disable and enable the latch function for individual bits)



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latched values	165	R	<p>cached values</p> <p>0 - since latch enable there was no change on the bit</p> <p>1 - since latch enable the bit value has changed its state</p> <p>bit 0 is input 1</p> <p>bit 1 is input 2</p> <p>to reset the bits, disable and enable latch - see latch enable</p>	
change over period	166	RWE	time delay when switching between heating and cooling modes in minutes, 1-255	0x1E (30 min)
Wmbus key	167-174	RW	<p>AES key for reception of wMBUS window sensors</p> <p>(</p> <p>0x5134 0x9043</p> <p>0xE300</p> <p>0x54BB</p> <p>0x5421</p> <p>0x4311</p> <p>0x34CA</p> <p>0x3154</p> <p>)</p>	
Wmbus device 1 addr	175-176	RWE	address of wMBUS window sensor, or address of KFP window sensor	0
Wmbus device 1 vif	177 LSB	RWE	wMBUS vendor identifier	0
Wmbus device 1 offset	177 MSB	RWE	offset where is the bit with window status information	0
Wmbus device 1 manufacturer	178	RWE	wMBUS manufacturer cod	0
Wmbus device 2 addr	179-180	RWE	address of wMBUS window sensor, or address of KFP window sensor	



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Wmbus device 2 vif	181 LSB	RWE	wMBUS vendor identifier
Wmbus device 2 offset	181 MSB	RWE	offset where is the bit with window status information
Wmbus device 2 manufacturer	182	RWE	wMBUS manufacturer cod
Wmbus device 3 addr	183-184	RWE	address of wMBUS window sensor, or address of KFP window sensor
Wmbus device 3 vif	185 LSB	RWE	wMBUS vendor identifier
Wmbus device 3 offset	185 MSB	RWE	offset where is the bit with window status information
Wmbus device 3 manufacturer	186	RWE	wMBUS manufacturer cod
Wmbus device 4 addr	187-188	RWE	address of wMBUS window sensor, or address of KFP window sensor
Wmbus device 4 vif	189 LSB	RWE	wMBUS vendor identifier
Wmbus device 4 offset	189 MSB	RWE	offset where is the bit with window status information



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Wmbus device 4 manufacturer	190	RWE	wMBUS manufacturer codr	
Wmbus 1 pwr	191 LSB	R	For KFP device only bit 0..4 remaining capacity battery UA010 , step 10% 10 .. 100% bit 7 lowbat 1.. lowbat 0.. bat OK	
Wmbus 1 rssi	191 MSB	R	RF level of received signal in dBm	signed char
Wmbus 2 pwr	192 LSB	R	For KFP device only bit 0..4 remaining capacity battery UA010 , step 10% 10 .. 100% bit 7 lowbat 1.. lowbat 0.. bat OK	
Wmbus 2 rssi	192 MSB	R	RF level of received signal in dBm	signed char
Wmbus 3 pwr	193 LSB	R	For KFP device only bit 0..4 remaining capacity battery UA010 , step 10% 10 .. 100% bit 7 lowbat 1.. lowbat 0.. bat OK	
Wmbus 3 rssi	193 MSB	R	RF level of received signal in dBm	signed char
Wmbus 4 pwr	194 LSB	R	For KFP device only bit 0..4 remaining capacity battery UA010 , step 10% 10 .. 100% bit 7 lowbat 1.. lowbat 0.. bat OK	



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Wmbus 4 rssi	194 MSB	R	RF level of received signal in dBm	signed char
WMBUS 1 data	195 - 258	R	Last received packet from wMBUS device 1	128 Bytes
WMBUS 2 data	259 - 322	R	Last received packet from wMBUS device 2	128 Bytes
WMBUS 3 data	323 - 386	R	Last received packet from wMBUS device 3	128 Bytes
WMBUS 4 data	387 - 450	R	Last received packet from wMBUS device 4	128 Bytes

Real time table

addr.	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	function	range
49 LSB		10 x secs			seconds				secs	00-59
49 MSB	0	10 x mins			minutes				mins	00-59
50 LSB	0	10 x hours		10 x hours	hours				hours	00-23
50 MSB	0	0	0	0	0	day			day	01-07
51 LSB	0	0	10 x date		date				date	01-31
51 MSB	0	0	0	10 x month	month				month	01-12
52 LSB	10 x year				year				year	00-99
52 MSB	0	0	0	0	0	0	0	0	not used	00



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