

FCR015 modbus –VAV controller, 2 × DI, 3 × AO (0 ... 10 V), 2 × DO, 2 × RS485

50 words (100 bytes) can be read and write at once

- **Whole range can be addressed**
- **Supported Modbus functions: F01, F03, F15, F16**
- **For values saved in EEPROM, the defaults are in parentheses**
- **Whole memory area is mirrored from address 0x101 (257 decimal) as a read only area (address 1 corresponds with address 257, etc.)**

Name	Address	Type (def)	Description	Note
module ID	1 LSB 1 MSB	R	module identification	Module ID: 0x050A
firmware	2 LSB 2 MSB	R, EEPROM	FW version	FW version (in dec) corresponds with version of this document; for example: FW 13h (19dec) = document V 01900 first three digits: FW version, remaining two digits: document revision
status LSB	3 LSB	R, W RAM	module status lower byte bit 0 – EEPROM write enable bit 1 – SW reset enable bit 4 – EEPROM init	EEPROM init is enabled when the INIT switch was ON at power-up, and switched OFF before bit 4 was set to 1 (indicated by bit 2 in status MSB) SW reset Enables device restart (see register 1002)
status MSB	3 MSB	R, RAM	module status upper byte bit 0 - 0 normal mode - 1 init mode bit 1 - 1 at the next write attempt received data will be written to EEPROM - 0 at the next write attempt received data will be written to RAM only	

			bit 2 – 1 EEPROM initialised bit 3 – not used bit 4 – 0 bit 5 – SW reset enable bit 6 – 0 bit 7 – commission mode (1)	
address	4 LSB	R, W EEPROM (0x01)	module address (for even distribution of load, fans and outputs will enable after time equal to address mod 10)	!!! The changes will become active only after module restart (the register is written immediately, but the new address is effective after restart)
baud rate	4 MSB	R, W EEPROM (9600 bps, 13 dec)	communication, no parity 10dec ... 1 200bps 11dec ... 2 400bps 12dec ... 4 800bps 13dec ... 9 600bps 14dec ... 19 200bps 15dec ... 38 400bps 16dec ... 57 600bps 17dec ... 115 200bps	!!! The changes will become active only after module restart (the register is written immediately, but the new baud rate is effective after restart)
serial port setting	5 LSB	R, W EEPROM (no parity, one stopbit, 0x00)	serial port settings bit 0-1 – parity - 00 – no parity - 01 – even, - 10 – odd bit 2 ... number of stopbits - 0 ... one - 1 ... two	!!! The changes will become active only after module restart
	5 MSB		reserved	
eprom writes	6 LSB 6 MSB	R, EEPROM	number of EEPROM writes	no overflow, EEPROM init not reset this register
relay	7 LSB	R, RAM	state of relay outputs (D01, D02)	bit 0 ... relay 1 bit 1 ... relay 2
inputs	7 MSB	R, RAM	digital inputs status (DI1 ... presence, DI2 ... window contact) and heating/cooling demands; DI1 and DI2 state – logical (active/inactive) or physical state (voltage on/voltage off) - takes into account settings from inputs settings register,	bit 0 ... input DI1 bit 1 ... input DI2 bit 2 ... heating demand (PID output HEAT > 5%) bit 3 ... cooling demand (PID output COOL > 5%)

			if system includes slave modules, they are already included in that register. The master controller inputs must be enabled (see inputs settings) to include slave module inputs.	
Pid output HEAT	8 LSB	R, RAM	controller heating output (PID output)	range 0 ... 100 %
Pid output COOL	8 MSB	R, RAM	controller cooling output (PID output, incl. manual control value, incl. change-over C/O mode)	range 0 ... 100 %
P output VAV	9 LSB	R, RAM	output of P CO2 regulation for VAV box, if in manual control value is 30-70-100 % according to chosen fan speed	range 0 ... 100 %
UC communication state	9 MSB	R, RAM	state of communication with UC010 (timeout = 3 secs)	0 ... comm ok 1 ... timeout 2 ... MB exception 3 ... MB error
Manual control	10 LSB	R, W RAM	manual output control and changeover (C/O, for changeover delay switch see reg. 43MSB), if corresponding bit is set to 1, then output value is set from manual values (see manual fan speed, manual heat output, manual cool output), otherwise controller values are taken; for other DO output settings see reg. 141; C/O -> output of cooling sequence will be used for heating output	bit 0 ... AO3 VAV bit 1 ... AO1 heat output bit 2 ... AO2 cool output bit 3 ... DO1 state (if bit 0 of register 141 = 0) bit 4 ... DO2 state (if bit 1 of register 141 = 0) bit 5 ... C/O (1 - ON)
Manual VAV (AO3)	10 MSB	R, W RAM	manual settings of fan speed AO3 (only if corresponding bit is set in reg. manual control); AO may include also output min/max transformation	range 0 ... 100 %
Manual heat output (AO1)	11 LSB	R, W RAM	manual settings of heating output AO1 (only if corresponding bit is set in reg. manual control); AO	range 0 ... 100 %

			may include also output min/max transformation	
Manual cool output (AO2)	11 MSB	R, W RAM	manual settings of cooling output AO2 (only if corresponding bit is set in reg. manual control); AO may include also output min/max transformation	range 0 ... 100 %
Set temp correction	12 LSB 12 MSB	R, W RAM	actual relative temperature correction, resets at each change of operation mode (limits are set in the min a max rel. temp correction registers)	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Actual temp set point HEAT	13 LSB 13 MSB	R, RAM	actual heating setpoint including setpoint correction	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Actual temp set point COOL	14 LSB 14 MSB	R, RAM	actual cooling setpoint including setpoint correction	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Set day/ comfort heating temp	15 LSB 15 MSB	R, W EEPROM (21 °C, 0x0834)	day/comfort mode heating temperature setpoint	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Set night/ pre-comfort heating temp	16 LSB 16 MSB	R, W EEPROM (19 °C, 0x076C)	night/pre-comfort mode heating temperature setpoint	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex

				-199.99 ... 0B1E1hex
Set depression/ economy heating temp	17 LSB 17 MSB	R, W EEPROM (12 °C, 0x04B0)	depression/economy mode heating temperature setpoint	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Set day/ comfort cooling temp	18 LSB 18 MSB	R, W EEPROM (24 °C, 0x0960)	day/comfort mode cooling temperature setpoints	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Set night/ pre- comfort cooling temp	19 LSB 19 MSB	R, W EEPROM (26 °C, 0x0A28)	night/pre-comfort mode cooling temperature setpoint	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Set depression/ economy cooling temp	20 LSB 20 MSB	R, W EEPROM (35 °C, 0x0DAC)	depression/economy mode heating temperature setpoint	recalculate: set temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Actual temp	21 LSB 21 MSB	R, W RAM	actual measured temperature, incl. temperature correction (see temp sensor corr)	recalculate: actual temperature = (read value +correction)/ 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Actual outside temp	22 LSB 22 MSB	R, W RAM	actual outside temperature	recalculate: actual temperature = (read value +correction)/ 100

				<p>0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex</p>
Set presence mode	23 LSB 23 MSB	R, W EEPROM (comfort/ day, 0x0001)	presence status set by user (displayed symbols depend on the configuration register regulator settings, if set to hotel then comfort, standby, economy; if set to residential than day, night, depression, auto, party)	<p>bit 0 ... comfort (occupied house) or day (sun + occupied house) bit 1 ... depression (empty house) or night (moon + occupied house) bit 2 ... economy (off) or depression (house) bit 3 ... auto (clock) – only when residential bit 4 ... party (sun + drink + clock, after 2 hours goes on auto) bit 5 ... 14 – reserved bit 15 ... write enable (if bit is set in 1, write is executed into register, if 0 is ignored)</p>
Set VAV mode	24 LSB 24 MSB	R, W EEPROM (auto, 0x0001)	air volume status set by user; if on Manual OFF the cooling/heating valves are closed	<p>bit 0 ... auto (fan+A) bit 1 ... off (fan+M) bit 2 ... man 1 (fan+M+stage 1) bit 3 ... man 2 (fan+M+stages 1,2) bit 4 ... man 3 (all except A) bit 5 ... 14 - reserved bit 15 ... write enable (if bit is set in 1, write is executed into register, if 0 is ignored)</p>
Actual regulation mode	25 LSB	R, RAM	actual mode used for regulation, if on manual then the actual regulation mode is equal to set	<p>bit 0 ... comfort/day bit 1 ... depression/night</p>

			presence mode, if on auto then according to time schedule (names of modes depend on the configuration register regulator settings, if set to hotel then comfort, depression, economy; if set to residential then day, night, depression, auto, party)	bit 2 ... economy/depression
FC slaves communication state	25 MSB	R, RAM	state of communication with subordinate FC(R) modules (in master – slave configuration); if there is a communication error with UC module, communication with slave modules is also not working	0 ... OK 1 or more ... order of first FC(R) slave module with communication error
Regulator settings	26 LSB	R, W EEPROM (hotel, relative, protection ON, valves type NC, 0x40)	controller configuration; valve exercising = if valve was not used in last 7 days then will be set in opposite position and back (the change time is 5 minutes)	bit 0 ... presence mode (0 – hotel, 1 – residential) bit 1 ... temperature correction (0–relative, 1–absolute) bit 2 ... reserved bit 3 ... reserved bit 4-5 ... reserved bit 5 ... polarity of the DO2 cooling valve 10 – speed 1) bit 6 ... valve exercising (1 – enabled) bit 7 ... heating valve polarity DO1 (0 – NC, 1 – NO)
Inputs settings (inputs enable, inputs logic)	26 MSB	R, W EEPROM (inputs enabled, active when contact closed, 0x0F)	configuration of inputs DI1 ... presence DI2 ... window/alarm contact	bit 0 ... enable DI1 for controller function bit 1 ... enable DI2 for controller function bit 2 ... DI1 input logic (0– NC– normally closed, 1– NO– normally open)

				bit 3 ... DI2 input logic (0- NC – normally closed, 1- NO-normally open)
P band / on-off hysteresis	27 LSB 27 MSB	R, W EEPROM (2 K, 0x0014)	Heating/cooling controller P-band for PI control, or hysteresis for ON-OFF control	[in 0,1 K]
I const	28 LSB 28 MSB	R, W EEPROM (15 min, 0x0384)	I constant of controller. If out of bounds, a new recalculated value is set after restart	[in seconds] if set to 0 = disabled, P control only
Regulator settings 2	29 LSB	R, W EEPROM (fan speed reset, slave function disabled, DI2 = window contact, correction reset, PI regulation, autocalibration enabled, 4-pipe, 0xC9)	Controller configuration 2 Autocalibration – it is presumed that during measured period (7 days with uninterrupted power supply) CO2 concentration will drop to zero level (outside concentration 400ppm). This will not work with permanently occupied rooms and it is necessary to turn it off.	bit 0 ... fan speed reset into AUTO mode if presence mode changes (TPG change, user, modbus) bit 1 ... enable slave mode (will not actively communicate with UC010 – change will be effective after restart) bit 2 ... DI2 as alarm input (rather than window contact), switches off all outputs when active bit 3 ... temperature correction reset when presence mode changes bit 4 ... control mode (0 – PI, 1 – On-Off) bit 5 ... polarity of the DO2 cooling valve (0 – NC, 1 – NO) bit 6 ... internal CO2 auto-calibration enable (loads only after module power-up) bit 7 ... fancoil type

				(0...2-pipes, 1...4-pipes)
Multi-slave number	29 MSB	R, W EEPROM (multi-slave off, 0x00)	number of slave FC(R)010 modules (connected on the bus as UC010, from modbus address 10), the module with non-zero multi-slave number serves as master (The change will become active only after module restart)	0 ... multi-slave function OFF 1 or more ... number of slave FC(R) modules
Actual primary CO2 ppm	30 LSB 30 MSB	R, RAM	actual value of CO2 sensor, in ppm with correction (see register 40); readout period 16 s	[in ppm]
Latch enable	31 LSB	R, W RAM	Latch enable function for individual inputs: By writing 1 into the register the particular bit in the latched value register is set 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)
	31 MSB		reserved	
Latched values	32 LSB	R RAM	latched values 0 – since latch enable there was no change on the bit 1 – since latch enable the bit value has changed its state	bit 0 is input 1 bit 1 is input 2; to reset the bits, disable and enable latch, see latch enable
	32 MSB		reserved	
Min. rel. temp correction	33 LSB 33 MSB	R, W EEPROM (-5 °C, 0x01F4)	minimum relative temperature correction set by user, a positive value is saved and taken as negative one	recalculate: max correction = (read value/100); 10.00 ... 1000
Max. rel. temp correction	34 LSB 34 MSB	R, W EEPROM (-5 °C, 0x01F4)	maximum relative temperature correction set by user	recalculate: max correction = (read value/100); 10.00 ... 1000
Min day, night, depression temp	35 LSB 35 MSB	R, W EEPROM (10 °C, 0x03E8)	minimum temperature which user can set as setpoint for day, night and off modes 199.99 to 199.99	recalculate: min. temperature= read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex

				-199.99 ... 0B1E1hex
Max day, night, depression temp	36 LSB 36 MSB	R, W EEPROM (40 °C, 0x0FA0)	maximum temperature which user can set as setpoint for day, night and off modes -199.99 to 199.99	recalculate: max. temperature= read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Temp sensor corr	37 LSB 37 MSB	R, W EEPROM (-1,55 °C, 0xFF65)	temperature sensor correction -20.00 to 20.00	recalculate: temperature correction = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
Latch state	38 LSB	R, W EEPROM (catches up log 0, 0x00)	States that will be latched 0 – log. 0 will be latched 1 – log. 1 will be latched	bit 0 is input 1 bit 1 is input 2
	38 MSB		reserve	
Step temp	39 LSB	R, W EEPROM (0,5 °C, 0x32)	step for temperature settings in time schedule and at all temperatures	real step = read number/100 10 ... 0.1 100 ... 1
Step minutes	39 MSB	R, W EEPROM (5 min, 0x05)	time step for time schedule setting	in minutes
CO2 sensor corr	40 LSB 40 MSB	R, W EEPROM (0 ppm, 0x0000)	CO2 sensor correction (altitude elimination, ...), not affected by autocalibration	
Show mode	41 LSB 41 MSB	R, W EEPROM (temp., 0x0001)	data that roll on the LCD display	bit 0 ... temperature bit 1 ... outside temp. bit 2 ... actual time bit 3 ... temp. Correction bit 4 ... humidity
Show time	42 LSB	R, W EEPROM (3 secs, 0x1E)	time (in 100 ms) to display each value in show mode	See show mode
Edit return time	42 MSB	R, W EEPROM (30 secs, 0x1E)	time (in 100 ms) of user inactivity to return from edit mode to show mode	
Quick edit mode number	43 LSB	R, W EEPROM (presence mode, 0x01)	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

Changeover delay switch	43 MSB	R, W EEPROM (30 mins, 0x3C)	time delay between switch of heating/cooling (protection of heat exchanger)	Range [1-255 min]
Long push time	44 LSB	R, W EEPROM (1,5 secs, 0x0F)	time (in 100 ms) evaluated as long push	for editing of the presence or fan mode range [0,1 – 25,5 s]
Super long push time	44 MSB	R, W EEPROM (5 secs, 0x32)	time (in 100 ms) evaluated as superlong push (go to settings menu)	edit of RTC and temperature range [0,1 – 25,5 s]
Allowed operation modes	45 LSB 45 MSB	R, W EEPROM (temp. corr., presence mode, 0x101)	settings that is user allowed to set 0 ... disabled 1 ... enabled	bit 0 ... temp corr. bit 1 ... day temp bit 2 ... night temp bit 3 ... 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 bit 10 ... time programme
Presence mode edit mask	46 LSB 46 MSB	R, W EEPROM (day / night, 0x0003)	states of 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)
Fan mode edit mask	47 LSB 47 MSB	R, W EEPROM (all is editable, 0x001F)	states of fan mode that user is able to set	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 (all except A)

Display symbols	48 LSB 48 MSB	R, W RAM	displayed symbols	bit 0 ... key bit 1 ... boiler bit 2 ... bell (alarm) bit 3-14 ... reserved bit 15 ... write enable (1 = write enabled)
RTC	49 LSB 49 MSB 50 LSB 50 MSB 51 LSB 51 MSB 52 LSB 52 MSB	R, W EEPROM (non init)	Real time clock, BCD coding	See table at the end of this file, to write to those registers, write to EEPROM must be enabled in the status LSB register
	53 LSB 53 MSB		Reserved	
Program Monday num. 1 time	54 LSB 54 MSB	R, W EEPROM (06:00, 0x0168)	time schedule, Monday, time of event No. 1, in mins since 0:00 (midnight)	121 ... 2h 1 min
Program Monday num. 1 value	55 LSB 55 MSB	R, W EEPROM (day/ comfort, 0x0000)	time schedule, Monday, time of event No. 1, value change for heating/cooling	0 ... day/comfort temperatures 1 ... night/depression temperatures 2 ... decrease/economic temperatures Bit 15 = 1 ... event change is disabled
Program Monday num. 2 time	56 LSB 56 MSB	R, W EEPROM (08:00, 0x01E0)	time schedule, Monday, time of event No. 2, in mins since 0:00 (midnight)	For description see address 54 - program Monday num. 1 time
Program Monday num. 2 value	57 LSB 57 MSB	R, W EEPROM (night/ depression, 0x0001)	time schedule, Monday, time of event No. 2, value change for heating/cooling	For description see address 55 - program Monday num. 1 value
Program Monday num. 3 time	58 LSB 58 MSB	R, W EEPROM (14:00, 0x0348)	time schedule, Monday, time of event No. 3, in mins since 0:00 (midnight)	For description see address 54 - program Monday num. 1 time
Program Monday num. 3 value	59 LSB 59 MSB	R, W EEPROM (day/ comfort, 0x0000)	time schedule, Monday, time of event No. 3, value change for heating/cooling	For description see address 55 - program Monday num. 1 value
Program Monday num. 4 time	60 LSB 60 MSB	R, W EEPROM (22:00, 0x0528)	time schedule, Monday, time of event No. 4, in mins since 0:00 (midnight)	For description see address 54 - program Monday num. 1 time

Program Monday num. 4 value	61 LSB 61 MSB	R, W EEPROM (night/depression, 0x0001)	time schedule, Monday, time of event No. 4, value change for heating/cooling	For description see address 55 - program Monday num. 1 value
Program Monday num. 5 time	62 LSB 62 MSB	R, W EEPROM (06:00, 0x0168)	time schedule, Monday, time of event No. 5, in mins since 0:00 (midnight)	For description see address 54 - program Monday num. 1 time
Program Monday num. 5 value	63 LSB 63 MSB	R, W EEPROM (change disabled, 0x8000)	time schedule, Monday, time of event No. 5, value change for heating/cooling	For description see address 55 - program Monday num. 1 value
Program Monday num. 6 time	64 LSB 64 MSB	R, W EEPROM (06:00, 0x0168)	time schedule, Monday, time of event No. 6, in mins since 0:00 (midnight)	For description see address 54 - program Monday num. 1 time
Program Monday num. 6 value	65 LSB 65 MSB	R, W EEPROM (change disabled, 0x8000)	time schedule, Monday, time of event No. 6, value change for heating/cooling	For description see address 55 - program Monday num. 1 value
Program Tuesday num. 1 time	66 LSB 66 MSB	R, W EEPROM (06:00, 0x0168)	time schedule, Tuesday, time of event No. 1, in mins since 0:00 (midnight)	For description see address 54 - program Monday num. 1 time
...
Program Sunday num. 6 value	137 LSB 137 MSB	R, W EEPROM (change disabled, 0x8000)	time schedule, Sunday, time of event No. 56, value change for heating/cooling	For description see address 55 - program Monday num. 1 value
VAV minimum	138 LSB 138 MSB	R, W EEPROM (30 %)	minimal level for VAV box (will be set if controller output is 0 %); only for comfort and depression modes (in economy mode the output is zeroed)	0,1 % [range 0.0 ... 100.0 %]
AQ P band	139 LSB 139 MSB	R, W EEPROM (1000 ppm, 0x03E8)	Air Quality band width (linear distribution between VAV min. and max. 10 V)	[range 1 ... 5000 ppm]
AQ set point	140 LSB 140 MSB	R, W EEPROM (800 ppm, 0x0320)	demanded CO2 value (in space)	[range 0 ... 5000 ppm]
Extended DO settings	141 LSB	R, W EEPROM (0x0000)	bit 0 = 0 ... DO1 will be directly controlled by bit 3 of register 10 LSB bit 0 = 1 ... DO1 will be directly controlled according to conf. in reg. 141, bit 2	bit 0 ... DO1 bit 1 ... DO1 bit 2 ... manual mode of DO1 bit 0 ... manual mode of DO2

			<p>bit 1 = 0 ... will be directly controlled by bit 4 register 10 LSB</p> <p>bit 1 = 1 ... DO2 will be controlled according to conf. in reg. 141 bit 3</p> <p>bit 2 = 0 ... DO1 mirrors AO1 at output (always as PWM sequence)</p> <p>bit 3 = 0 ... DO2 mirrors AO2 at output (always as PWM sequence)</p> <p>bit 2 = 1 ... DO1 has PWM sequence at output, according to value of register 142 LSB</p> <p>bit 3 = 1 ... DO2 PWM sequence at output, according to value of register 142 MSB (if set as slave then this register is set from master module)</p>	
	141 MSB		reserved	
Manual heat digital output	142 LSB	R, W RAM	manual control of output DO1 (only if enabled in reg. 141)	in %, range 0 ... 100 %
Manual cool digital output	142 MSB	R, W RAM	manual control of output DO2 (only if enabled in reg. 141)	in %, range 0 ... 100 %
DO1 output	143 LSB	R, RAM	state of output DO1	in % PWM (20 s period) range 0 ... 100 %
DO2 output	143 MSB	R, RAM	state of output DO2	in % PWM (20 s period) range 0 ... 100 %
	144 LSB 144 MSB	R, RAM	reserved	
Actual rh	145 LSB 145 MSB	R, RAM	Actual measured relative humidity with incl. sensor correction (see rh sensor corr)	signed 16bit register [0,01 %]
	146 LSB 146 MSB	R, RAM	reserved	
rh sensor corr	147 LSB 147 MSB	R, W EEPROM (+3,80 %)	Relative humidity sensor correction	Signed 16bit register [0,01 %]
Backlight config	148 LSB 148 MSB	R, W EEPROM (0x0009)	configuration of LCD and knob backlight function.	bit 0 ... central enable of backlight functions (0 – off)

			<p>If the bit 0 is centrally disabled by 0, all backlight functions are turned off. If the bit 3 is enabled (afterglow function) the first user action (press/turn button) switch on backlight and the second user action (press/turn button) is according defined user function.</p>	<p>bit 1 ... manual LCD backlight (1 – permanently switch on backlight on level LCD backlight intensity high, this function has higher priority than afterglow function, 0 – switch on backlight on level LCD backlight intensity low, afterglow function could change this level)</p> <p>bit 2 ... manual knob backlight (1 – permanently switch on backlight on level knob backlight intensity high, this function has higher priority than afterglow function, 0 – switch on backlight on level knob backlight intensity low, afterglow function could change this level)</p> <p>bit 3 ... enable afterglow (1 – first user activity, press or turn button, set backlight to high intensity (see registers LCD and knob backlight int. h.), after defined time from the last user activity (LCD and knob b. afterglow) set backlight back to low level; 0 – no response on user activity)</p>
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LCD backlight intensity high	149 LSB	R, W EEPROM (100 %)	LCD backlight intensity – higher intensity	[0 ... 100 %]
LCD backlight intensity low	149 MSB	R, W EEPROM (0 %)	LCD backlight intensity – lower intensity	[0 ... 100 %]
knob backlight intensity high	150 LSB	R, W EEPROM (100 %)	knob backlight intensity – higher intensity	[0 ... 100 %]
knob backlight intensity low	150 MSB	R, W EEPROM (0 %)	knob backlight intensity – lower intensity	[0 ... 100 %]
LCD backlight afterglow	151 LSB	R, W EEPROM (3 secs)	time of LCD backlight after last user activity (turn/push knob) or after end of edit (return to scrolling mode), if value is 0 then no response on user activity, if non-zero value then it must be bigger than register long push time	[1 sec]
Knob backlight afterglow	151 MSB	R, W EEPROM (3 secs)	time of knob backlight after last user activity (turn/push knob) or after end of edit (return to scrolling mode), if value is 0 then no response on user activity, if non-zero value then must be bigger than register long push time	[1 sec]
UC FW version	152 LSB 152 MSB	R, RAM	FW version read from UC module	
AO1 configuration	154 LSB	R, W EEPROM (heating sequence, 0x01)	Configuration of AO1 output, in case of multiple bits setting, the larger output is selected; if bit 4 is set to 1 (CO2 sequence), then VAV/min offset (reg. 138) is added to the output; if bit 4 is set to 1 (CO2 sequence) and at the same time presence mode is in third regulation mode (depression), then corresponding output is set to zero (0V). If bit 4 is set to 1 then bit 7 is internally turned on.	bit 0 ... heating sequence output + C/O (0...100%) bit 1 ... cooling sequence output + C/O (0...100%) bit 2 ... heating demand + C/O > 5 % => „DID Volume Setpoint“, otherwise 0 % bit 3 ... cooling demand > 5 % => „DID Volume Setpoint“, otherwise 0 % bit 4 ... CO2 sequence output, 0...100%, subject of manual control even if not set in bit 7

				bit 5, 6 ... reserved bit 7 ... output manual control from knob 0-1-2-3 (30- 70-100, automatic mode not counted), only for fan_mode
AO2 configuration	154 MSB	R, W EEPROM (cooling sequence, 0x02)	configuration of AO2 output	See reg. 154 LSB
AO3 configuration	155 LSB	R, W EEPROM (CO2 + knob, 0x90)	configuration of AO3 output	See reg. 154 LSB
DID Volume Setpoint	155 MSB	R, W EEPROM (100 %)	DID unit setting (Active Chilled Beam)	[0 ... 100 %]
AO1 output	156 LSB	R, RAM	state of AO1 output	[0 ... 100 %]
AO3 output	156 MSB	R, RAM	state of AO2 output	[0 ... 100 %]
AO3 output	157 LSB	R, RAM	state of AO3 output	[0 ... 100 %]
	157 MSB	R, RAM	reserved	
AO1 min	158 LSB	R, W EEPROM (0 V)	minimal output AO1 value, output transformation is last sequence	in 0.1 V [0.0 ... 10.0 V]
AO1 max	158 MSB	R, W EEPROM (10 V, 100)	maximal output AO1 value, output transformation is last sequence	in 0.1 V [0.0 ... 10.0 V]
AO2 min	159 LSB	R, W EEPROM (0 V)	minimal output AO2 value, output transformation is last sequence	in 0.1 V [0.0 ... 10.0 V]
AO2 max	159 MSB	R, W EEPROM (10 V, 100)	maximal output AO2 value, output transformation is last sequence	in 0.1 V [0.0 ... 10.0 V]
AO3 min	160 LSB	R, W EEPROM (0 V)	minimal output AO3 value, output transformation is last sequence	in 0.1 V [0.0 ... 10.0 V]
AO3 max	160 MSB	R, W EEPROM (10 V, 100)	maximal output AO3 value, output transformation is last sequence	in 0.1 V [0.0 ... 10.0 V]
	161 LSB 161 MSB		reserved – internal use	
uptime	1000 LSB 1000 MSB 1001 LSB 1001 MSB	R	uptime [secs]	

SW reset	1002 LSB 1002 MSB	R, W RAM	writing of non-zero value executes module restart (function must be enabled in Status LSB bit 1).	
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Address	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	Function	Range
49 LSB		10xSeconds			Seconds				Seconds	00-59
MSB	0	10xMinutes			Minutes				Minutes	00-59
LSB	0		10xHour	10xHour	Hours				Hours	00-23
MSB	0	0	0	0	0	Day			Day	01-07
LSB	0	0	10xDate		Date				Date	01-31
MSB	0	0		10xMonth	Month				Month	01-12
LSB	10xYear			Year				Year	01-99	
52 MSB	0	0	0	0	0	0	0	0	not used	00

Revision:

24. 06. 2019 ver. 103

20. 05. 2020 ver. 103_2

01. 05. 2021 ver. 104

14. 01. 2022 ver. 104 – stylistic adjustments, change logo

08. 01. 2022 ver. 104 – add 26 LSB bit 7, 29 LSB bit 5