

UC905(/DK/BL) modbus – Room unit for VAV controller FC(R)15 (cannot be used separately) – LCD, knob, humidity, temperature, CO2, 1 × RS485 galvanically separated

**...BL contains backlight LCD and knob
/DK is without knob and LCD**

- **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: UC905: 0x0326 UC905BL: 0x0327 UC905/DK: 0x0336
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	<p>module status upper byte</p> <p>bit 0 - 0 normal mode - 1 init mode</p> <p>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</p> <p>bit 2 - 1 EEPROM initialised</p> <p>bit 3 -</p> <p>bit 4 - 0</p> <p>bit 5 - SW reset enable</p> <p>bit 6 - 0</p> <p>bit 7 - commission mode (1-active)</p>	
address	4 LSB	R,W EEPROM (0x01)	<p>module address (for even distribution of load, fans and outputs will enable after time equal to address mod 10)</p>	<p>!!! The changes will become active only after module restart (the register is written immediately, but the new address is effective after restart)</p>
baud rate (comm speed)	4 MSB	R,W EEPROM (13dec)	<p>10dec ... 1 200bps 11dec ... 2 400bps 12dec ... 4 800bps 13dec ... 9 600bps 14dec ... 19 200bps 15dec ... 38 400bps 16dec ... 57 600bps 17dec ... 115 200bps</p>	<p>!!! The changes will become active only after module restart (the register is written immediately, but the new baud rate is effective after restart)</p>
serial port settings	5 LSB	R, W EEPROM (no parity, one stopbit, 0x00)	<p>serial port settings</p> <p>bits 0,1 - parity 0 none 1 even 2 odd</p> <p>bit 2 - 0 one stopbit 1 two stopbits</p>	<p>!!! The changes will become active only after module restart</p>
reserved	5 MSB		reserved	
reserved	6 LSB 6 MSB		reserved	

reserved	7 LSB	R	reserved	
inputs	7 MSB	R, W RAM	Digital inputs status (DI1 ... presence, DI2 ... window/alarm 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, if system includes slave modules, they are already in that register. The master controller inputs must be enabled (see inputs settings) to include slave module inputs.	bit 0 ... input DI1 bit 1 ... input DI2 bit 2 ... heating demand (PID output HEAT > 5%) bit 3... cooling demand (PID output COOL > 5%)
PID output HEAT	8 LSB	R, RAM	controller heating output (PID output, or value from manual control)	in %, 0...100 % [0 ... 10V]
PID output COOL	8 MSB	R, RAM	controller cooling output (PID output, or value from manual control, incl. change-over C/O mode)	in %, 0...100 % [0 ... 10V]
VAV output	9 LSB	R, RAM	air volume setpoint (output of P CO2 regulation)	in %, 0...100 % [0 ... 10V]
UC internal status	9 MSB	R, W RAM	controller module status – for communication with module FC0x0 (if communication fails for 60 secs, alarm bell is displayed and values can not be set)	bit 0 ... change in progress (entries from FC are ignored, set and reset by UC) bit 1 ... values changed (set by UC, reset by FC) bit 2 ... time schedule change (set by UC, reset by FC) bit 3 ... RTC change (set by UC, reset by FC) bit 4 ... factory mode (set and reset by UC)
Manual control	10 LSB	R, W RAM	manual output control and changeover (C/O)	bit 0 ... 4 ... reserved bit 5 ... C/O (1 – C/O active)
reserved	10 MSB		reserved	
actual rH	11 LSB 11 MSB	R, RAM	actual measured humidity including setpoint correction (see rH sensor corr)	signed 16bit register [in 0,01 %]



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 = 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 = 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 RAM	day/comfort mode heating temperature setpoint	recalculate: set temperature = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
set night/ precomfort heating temp	16 LSB 16 MSB	R, W RAM	night/depression mode heating temperature setpoint	night/depression mode heating temperature setpoint set by user recalculate: set temperature = read value / 100 1 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
set depression/ economy heating temp	17 LSB 17 MSB	R, W RAM	depression/economy mode heating temperature setpoint	recalculate: set temperature = 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 RAM	day/comfort mode cooling temperature setpoints	recalculate: set temperature = read value / 100 0 ... 0



				199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
set night/ precomfort cooling temp	19 LSB 19 MSB	R, W RAM	night/depression mode cooling temperature setpoint	recalculate: set temperature = 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 RAM	depression/economy mode heating temperature setpoint	recalculate: set temperature = read value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
actual temp	21 LSB 21 MSB	R, RAM	actual temperature measured by internal sensor including correction (see temp sensor corr)	recalculate: set temperature = read value / 100 1 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
actual outside temp	22 LSB 22 MSB	R, W RAM	actual outside temperature, optional value to be written over bus – just for display	recalculate: actual temperature = (read value + correction) / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
set presence mode	23 LSB 23 MSB	R, W RAM	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 than day, night, depression, auto, party)	bit 0 ... comfort (occupied house) <i>or</i> day (sun + occupied house) bit 1 ... depression (empty house) <i>or</i> night (moon + occupied house) bit 2 ... economy (off) <i>or</i> depression (house) bit 3 ... auto (clock) – <i>only when residential</i> bit 4 ... party (sun + drink + clock, after 2h goes to auto) bit 5 ... 14 – reserved bit 15 ... write enable (if bit is set in 1, write

				is executed into register, if 0 is ignored)
set VAV mode	24 LSB 24 MSB	R, W RAM	air volume status set by user; if on Manual OFF the cooling/heating valves are closed. The stages set the air volume setpoint: Off ... 0 % St1 ... 30 % St2 ... 60 % St3 ... 100 % Auto ... according to CO2 concentration	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)
actual regulation mode	25 LSB	R, RAM	actual mode used for regulation, if on manual then the actual regulation mode is equal to set presence mode , if on auto then according to time schedule (displayed symbols 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 0 ... comfort/day bit 1 ... depression/night 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 RAM	controller configuration	bit 0 ... presence mode (0 – hotel, 1 – residential) bit 1 ... temperature correction (0–relative,1–absolute) bit 2 ... stop fan when HEATing (0 – disabled) bit 3 ... stop fan when COOLing (0 – disabled)

				bity 4-5 ... fan speed type (00 – speed 3, 01 – speed 2, 10 – speed 1) bit 6 ... valve exercising (1 – enabled) bit 7 ... valve polarity (0 – NC, 1 – NO)
inputs settings (inputs enable, inputs logic)	26 MSB	R, W RAM	inputs configuration DI1 ... presence DI2 ... window contact	bit 0 ... enable DI1 for controller function bit 1 ... enable DI2 for controller function bit 2 ... DI1 input logic (0– NC– normally close, 1–NO– normally open) bit 3 ... DI2 input logic (0– NC – normally close, 1– NO–normally open)
P band/ON-OFF hysteresis	27 LSB 27 MSB	R, W RAM	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 RAM	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 RAM	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) – the change will become active only after module 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 ... reserved bit 6 ... internal CO2 auto-calibration enable (loads only after module power-up) bit 7 ... fancoil type (0 – 2-pipe, 1 – 4-pipe)
multi-slave number	29 MSB	R, W RAM	number of slave FC(R) modules, 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)	[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)
reserved	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
reserved	32 MSB		reserved	
min rel. temp correction	33 LSB 33 MSB	R, W RAM	minimum relative temperature correction set by user, a positive value is saved and taken as negative one	recalculate: min correction = -(read value/100); -10.00 ... 1000
max rel. temp correction	34 LSB 34 MSB	R, W RAM	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 RAM	minimum temperature which user can set as setpoint for day, night and off modes	recalculate: min temperature = read value / 100 0 ... 0



			199.99 to 199.99	199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
max day, night, depression temp	36 MSB 36 MSB	R, W RAM	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 MSB 37 MSB	R, W RAM	temperature sensor correction -20.00 to 20.00	recalculate: temperature correction = real value / 100 0 ... 0 199.99 ... 19999 -0.01 ... 0FFFFhex -199.99 ... 0B1E1hex
latch state	38 LSB	R, W RAM	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
reserved	38 MSB		reserved	
step temp	39 LSB	R, W RAM	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 RAM	time step for time schedule setting	in minutes
CO2 sensor corr	40 LSB 40 MSB	R, W RAM	CO2 sensor correction (altitude elimination, ...), not affected by autocalibration	
show mode	41 LSB 41 MSB	R, W RAM	data that roll on the LCD display	bit 0 ... temperature bit 1 ... outside temp bit 2 ... current time bit 3 ... temp correction bit 4 ... humidity
show time	42 LSB	R, W RAM	time (in 100 ms) to display each value in show mode	see show mode
edit return time	42 MSB	R, W RAM	time (in seconds) of user inactivity to return from edit mode to show mode	
quick edit mode number	43 LSB	R, W RAM	number of mode which is editable through quick edit menu (short push of the knob)	0... function inactive 1... presence mode 2... fan mode



time delay switch	43 MSB	R, W RAM	time delay when changing from heating to cooling and back	Range [1 ... 255 min]
long push time	44 LSB	R, W RAM	time (in 100 ms) evaluated as long push	for editing of the time schedule and presence or fan mode range [0,1 ... 25,5 s]
super long push time	44 MSB	R, W RAM	time (in 100 ms) evaluated as superlong push (go to settings menu)	RTC and temperature edit range [0,1 ... 25,5 s]
allowed operation modes	45 LSB 45 MSB	R, W RAM	settings that user is able to perform 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 10 ... time programme
presence mode edit mask	46 LSB 46 MSB	R, W RAM	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)
fan mode edit mask	47 LSB 47 MSB	R, W RAM	states in 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 = enabled)
RTC	49 LSB 49 MSB 50 LSB 50 MSB 51 LSB 51 MSB 52 LSB 52 MSB	R, W RAM	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
Reserved	53 LSB 53 MSB		reserved	
program Monday num.1 time	54 LSB 54 MSB	R, W RAM	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 RAM	time schedule, Monday, time of event No. 1, value change for heating/cooling	0 ... day/comfort temperature 1 ... night/standby temperatures 2 ... off/depression temperatures Bit 15 = 1 ... event is disabled
program Monday num.2 time	56 LSB 56 MSB	R, W RAM	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 RAM	time schedule, Monday, time of event No. 2, value change	For description see address 55 - program Monday num. 1 value
program Monday num.3 time	58 LSB 58 MSB	R, W RAM	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 RAM	time schedule, Monday, time of event No. 3, value change	For description see address 55 - program Monday num. 1 value
program Monday num.4 time	60 LSB 60 MSB	R, W RAM	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 RAM	time schedule, Monday, time of event No. 4, value change	For description see address 55 - program Monday num. 1 value
program Monday num.5 time	62 LSB 62 MSB	R, W RAM	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 RAM	time schedule, Monday, time of event No. 5, value change	For description see address 55 - program Monday num. 1 value
program Monday num.6 time	64 LSB 64 MSB	R, W RAM	time schedule, Monday, time of event No. 1, 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 RAM	time schedule, Monday, time of event No. 6, value change	For description see address 55 - program Monday num. 1 value
program Tuesday num.1 time	66 LSB 66 MSB	R, W RAM	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 RAM	time program, Sunday, change num. 6, value settings	For description see address 55 - program Monday num. 1 value
VAV minimum	138 LSB 138 MSB	R, W RAM	minimum output signal for VAV box	[0,01 V] range [0 ... 10 V]
AQ P band	139 LSB 139 MSB	R, W RAM	width of Air Quality P-band (linear distribution between VAV min and max 10 V)	Range [1 ... 5000 ppm]
AQ set point	140 LSB 140 MSB	R, W RAM	demanded CO2 value	Range [0 ... 5000 ppm]
reserved	141 LSB 141 MSB	R, RAM	reserved	
rh sensor corr	142 LSB 142 MSB	R, W RAM	relative humidity sensor correction v 0.01 %	signed 16bit register [in 0,01 %]
backlight config	143 LSB 143 MSB	R, W RAM	configuration LCD and knob backlight function. If the bit0 is centrally disabled by 0, all backlight functions are turned off. If the bit3 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.	bit 0 ... central enable of backlight functions (0 – off) 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>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>
LCD backlight intensity high	144 LSB	R, W RAM	LCD backlight intensity – higher intensity	[0 .. 100 %]
LCD backlight intensity low	144 MSB	R, W RAM	LCD backlight intensity – lower intensity	[0 .. 100 %]
knob backlight intensity high	145 LSB	R, W RAM	knob backlight intensity – higher intensity	[0 .. 100 %]
knob backlight intensity low	145 MSB	R, W RAM	knob backlight intensity – lower intensity	[0 .. 100 %]
LCD backlight afterglow	146 LSB	R, W RAM	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 s]
knob backlight afterglow	146 MSB	R, W RAM	time of knob backlight after last user activity (turn/push knob) or after end of edit (return to scrolling mode),	[1 s]



			if value is 0 then no response on user activity, if non-zero value then must be bigger than register long push time	
reserved	147 LSB 147 MSB		reserved	
reserved	148 LSB 148 MSB 149 LSB 149 MSB		reserved – internal use	
uptime	1000 LSB 1000 MSB 1001 LSB 1001 MSB	R	uptime [s]	
SW reset	1002 LSB 1002 MSB		writing of non-zero value executes module restart (function must be enabled in Status LSB bit 1).	
serial number	1003 LSB 1003 MSB 1004 LSB 1004 MSB	R, W EEPROM (0 – factory setting)	module serial number (OTP)	
extended settings	1005 LSB 1005 MSB	R, W RAM	extended settings	bit 0 ... light up all symbols (factory test)

Address	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0	Function	Range
LSB		10xSeconds			Seconds				Seconds	00-59
MSB	0	10xMinutes			Minutes				Minutes	00-59
LSB	0		10xHour	10xHour	Hours				Hours	00-23
MSB										
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	
MSB	0	0	0	0	0	0	0	0	not used	00

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