WCOM51 – WIRELESS GATEWAY / REPEATER

Router/repeater for integration of up to 50 wireless devices. The communication is based on the AES 128 encrypted Midam KFP protocol, which allows to update the device firmware on a wireless basis across the wireless network topology. Native modbus map grants seamless integration into the DDC/SCADA systems. Thanks to the "dual stack radio" technology, it can read values from wMbus based devices simultaneously.

GENERAL INFORMATION

This document explains the Modbus protocol for WCOMxx gateway/repeater. 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.

250 words can be read at the same time (i.e. 500bytes).

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

The supported Modbus functions are:
03 Read Holding Registers – read words
16 Force Multiple Registers – write words
Self registers for gateway available in register 4 LSB.

SPECIFICATIONS

name	address	type	description	default value/note
Modbus ID	1	R	modbus map identifier	0x050D (W-COM-51) 0xF019 (W-COM-99)
FW num	2	R	Firmware version	400
Status	3	RW	Bit 8 set: write content of RAM into EEPROM	0
Modbus_address	4 LSB	RWE	modbus address	1
Baudrate	4 MSB	RWE	baudrate index 10 .. 1200 11 .. 2400 12 .. 4800 13 .. 9600 14 .. 19200 15 .. 38400 16 .. 57600 17 .. 115200	17 (115200 baud)
Serial port settings	5 LSB	RWE	0	
Device_id	6	R	Device identifier .. used by bootloader	1141
HW num	7	R	PCB version	
Bootloader FW num	8	R	Version of bootloader (0 if application runs)	
Name 0	9	RWE	user name, 16 chars	Gateway 1
Name 1	10	RWE		
Name 2	11	RWE		
Name 3	12	RWE		
Name 4	13	RWE		
Name 5	14	RWE		
Name 6	15	RWE		
Name 7	16	RWE		
RF address Lo	17	R		0x00800000 – 0x008FFFFF
RF address Hi	18	R		

OTHER PARAMETERS

name	address	type	description	default value/note
RF key 0	19	WE	16 byte AES key, write only, non-defalt key always readed as zeros, write zeros does nothing, unused bytes set as zero	MIKROKLIMA1234AB
RF key 1	20	WE		
RF key 2	21	WE		
RF key 3	22	WE		
RF key 4	23	WE		
RF key 5	24	WE		
RF key 6	25	WE		
RF key 7	26	WE		
RF frequency	27 LSB	RWE	Communication frequency 0..868.95 MHz 100 kBit 1..868.3 MHz 32.768 kBit 2..868.1 MHz 100 kBit 3..869.525 MHz 100 kBit 4..868.3 MHz 38.400 kBit	0 (868.95 MHz) for wM-bus T1 and C1 reception is necessary 0 set here
RF power	27 MSB	RWE	Transmission power 0 .. 27 dBm 1 .. 20 dBm 2 .. 14 dBm 3 .. 10 dBm 4 .. 0 dBm 5 .. -10 dBm 6 .. -20 dBm	2 (+ 14 dBm) higher power than 14 dBm is possible set on frequency 869.525 MHz only
EEPROM writes	28	R	number of writes into FLASH	
Uptime Lo	29	R	uptime in seconds	
Uptime Hi	30	R		
RF background RSSI	31 LSB	R	signed char background rssi -128 .. +27 dBm	
RF band use	31 MSB	R	unsigned char RF band use x 0,5%	
In Out State	32 MSB	R	bit 0 init, bit 1 usr, bit 7 output	
System mode	34 LSB	RWE	0 .. gateway communicates with up – level system via RS485, or USB only 1 .. gateway is looking for up-level gateway and is transmitting periodical message	0
…	…	…	…	…
GW address Lo	51	RWE	Up level gateway address	0
GW address Hi	52	RWE		0
Device 0 address Lo	53	RWE	this range is used for bidirectional communication only paired device address	0
Device 0 address Hi	54	RWE		0
Device 0 mb map offset	55	RWE	modbus map offset	0
Device 0 mb map length	56	RWE	bits 0..9 map length bits 13,14 connection priority 0 .. direct connection disabled 1 .. low priority 2 .. medium priority 3 .. high priority bit 15 device is cached If the device is not permanently on reception, the cache must be used	0
…	…	…	…	…
Device 77 address Lo	361	RWE	see Device 0	0
Device 77 address Hi	362	RWE		0
Device 77 mb map offset	363	RWE		0
Device 77 mb map length	364	RWE		0
Device Uni 0 address Lo	365	RWE	This range is used for unidirectional communication (data collection) device address addresses MUST be sorted from the highest. If is necessary to store more as 2 registers, is it possible to enter the same address on more positions	0
Device Uni 0 address Hi	366	RWE		0
Device Uni 0 mb register 1	367	RWE	First saved register number	0
Device Uni 0 mb register 2	368	RWE	second saved register number	0
Device Uni 1 address Lo	369	RWE	see Device Uni 0	0
Device Uni 1 address Hi	370	RWE		0
Device Uni 1 mb register 1	371	RWE	First saved register number	0
Device Uni 1 mb register 2	372	RWE	second saved register number	0
Device Uni 199 address Lo	1161	RWE	see Device Uni 0	0

OTHER PARAMETERS

name	address	type	description	default value/note
Device Uni 199 address Hi	1162	RWE		0
Device Uni 199 mb register 1	1163	RWE		0
Device Uni 199 mb register 2	1164	RWE		0
Device 0 timestamp Lo	1165	R	timestamp (unix time) of last communication	
Device 0 timestamp Hi	1166	R		
Device 0 router Lo	1167	R	router address. 0.. device connected to GW	
Device 0 router Hi	1168	R		
Device 0 RF rastr	1169 LSB	R	0 .. device disconnected 1 .. device receives permanently 2 .. device is in 1 sec rastr 3 .. device is in 8 sec rastr 4 .. device is on reception few miliseconds after transmitting only 5 .. device rastr is unknown	
Device 0 RSSI	1169 MSB	R	RF level on gateway input, signed char -128 .. +20 dBm	
Device 0 rx rssi	1170 LSB	R	RF level on device input signed char -128 .. +20 dBm	
…	…	…	…	…
Device 77 timestamp Lo	1627	R	see Device 0	
Device 77 timestamp Hi	1628	R		
Device 77 router Lo	1629	R		
Device 77 router Hi	1630	R		
Device 77 RF rastr / rssi	1631	R		
Device 77 rx rssi	1632 LSB	R		
Control	1633	RW	write 1 in bit 0 switches relay on write 1 in bit 1 switches relay off writing zero has no effect the set bits are cleared by gateway after the action is executed	W-COM-51 only
Dev Uni 0 first register	1635	R	cache of first register of unidirectional device	
Dev Uni 0 second register	1636	R	cache of second register of unidir. device	
…	…	…	…	…
Dev Uni 199 first register	2033	R	see Dev Uni 0	
Dev Uni 199 second register	2034	R		
Device cache begin	2035	RW	14336 registers cache	
…	…	…	…	…
Device cache end	16370	RW		
RF device cache write flags begin	16371	RW	every bit correspond of one register of cache. If bit is set, the correspond register of cache will be written	
RF device cache write flags end	17394	RW		
RF device cache read flags begin	17395	RW	every bit correspond of one register of cache. If bit is set, the correspond register of cache will be read	
RF device cache read flags end	1169 LSB	RW		
wMbus Timestamp Lo	18419	R	32 bit timestamp (unix time) of last communication – lower 16 bits	
wMbus Timestamp Hi	18420	R	32 bit timestamp (unix time) of last communication – upper 16 bits	
wMbus message FIFO 0	18421 LSB	R	wMbus message in raw form (max 124 bytes), reading clears message on the top of FIFO and put there the next message	
…	…	…	…	…
wMbus message FIFO 123	18482 MSB	R		
wMbus message length	18483 LSB	R	wMbus message length. Read periodically, if nonzero, then read message	0
wMbus rssi	18483 MSB	R	signed char rssi -128 .. +27 dBm	
Modbus Message FIFO Addr Lo	18485	R	RF address of device	
Modbus Message FIFO Addr Hi	18486	R		
Modbus Message FIFO register	18487	R	number of first register, that is stored	
Modbus Message FIFO registers	18488	RW	number of stored registers, writing a zero moves to the next item in FIFO	0
Modbus Message FIFO value 0	18489	R	first stored register, value is stored for 10 seconds	
Modbus Message FIFO value 1	18490	R		
Modbus Message FIFO value 2	18491	R		
Modbus Message FIFO value 3	18492	R		
Device Uni 0 timestamp Lo	18493	R	timestamp (unix time) of reception any of the two captured registers	
Device Uni 0 timestamp Hi	18494	R		
Device Uni 0 RSSI	18495 LSB	R	RF level on gateway input, signed char -128 .. +20 dBm	

OTHER PARAMETERS

name	address	type	description	default value/note
unused	18496	R		
Device Uni 1 timestamp Lo	18497	R	see Device Uni 0	
Device Uni 1 timestamp Hi	18498	R		
Device Uni 1 RSSI	18499 LSB	R	see Device Uni 0	
unused	18500	R		
…	…	…	…	…
Device Uni 199 timestamp Lo	19289	R	see Device Uni 0	
Device Uni 199 timestamp Hi	19290	R		
Device Uni 199 RSSI	19291 LSB	R	see Device Uni 0	
unused	19292	R		
Device 0 modbus address	19293 LSB	RWE	virtual MODBUS address for this device	0
Device 1 modbus address	19293 MSB	RWE	virtual MODBUS address for this device	0
Device 2 modbus address	19294 LSB	RWE	virtual MODBUS address for this device	0
…	…	…	…	…
Device 76 modbus address	19331 LSB	RWE	virtual MODBUS address for this device	0
Device 77 modbus address	19331 MSB	RWE	virtual MODBUS address for this device	0
unused	19332	R		
RTC year	19333 LSB	RW	year = register + 2000	
RTC month	19333 MSB	RW	month 1..12	
RTC day	19334 LSB	RW	day 1..31	
RTC hour	19334 MSB	RW	hour 0..23	
RTC minute	19335 LSB	RW	minute 0..59	
RTC second	19335 MSB	RW	second 0..59	
RTC write	19336 LSB	RW	if bit 0 set, then content of modbus map is copied into RTC	
unix time Lo	19337	R	calculated from RTC year .. RTC second	used as RX timestamp
unix time Hi	19338	R		
wMbus key[0]	19339 LSB	RWE	16 byte AES key for wMbus communication	0
wMbus key[1]	19339 MSB	RWE		
…	…	…	…	…
wMbus key[15]	19346 MSB	RWE		