

# Geckollect-wMbus to Modbus gateway user manual and the modbus protocol implementation



# Tartalom

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## 1 modbus protocol overview

This section provides basic information for interfacing the Geckollect-wMbus->Modbus gateway to a Modbus Protocol network. If background information or more details of the implementation is required please contact us.

Geckollect-wMbus->Modbus provides an RS485 communication option for direct connection to SCADA or other communications systems using the Modbus Protocol RTU protocol. The Modbus Protocol establishes the format for the master's query by placing into it the device address, a function code defining the requested action, any data to be sent, and an error checking field. The slave's response message is also constructed using Modbus Protocol. It contains fields confirming the action taken, any data to be returned, and an error-checking field. If an error occurs in receipt of the message, the gateway will make no response. If the gateway is unable to perform the requested action, it will construct an error message and send it as the response.

The electrical interface is 2-wire RS485, via 2 screw terminals. Connection should be made using twisted pair screened cable (Typically 22 gauge Belden 8761 or equivalent). All "A" and "B" connections are daisy chained together. Line topology may or may not require terminating loads depending on the type and length of cable used. Loop (ring) topology does not require any termination load. The impedance of the termination load should match the impedance of the cable and be at both ends of the line. The cable should be terminated at each end with a 120 ohm (0.25 Watt min.) resistor. A total maximum length of 3900 feet (1200 meters) is allowed for the RS485 network. A maximum of 32 electrical nodes can be connected, including the controller. The read-out address can be set to values between 2 and 240 on a meter basis. Broadcast mode (address 0) is not supported.

The format for each byte in RTU mode is:

Coding System: 8-bit per byte

Data Format: 4 bytes (2 registers) per parameter.  
Floating point format ( to IEEE 754)

Most significant register first (Default). The default may be changed if required -See Holding Register "Register Order" parameter.

Error Check Field: 2 byte Cyclical Redundancy Check (CRC) - standard

Framing: 1 start bit 8 data bits, least significant bit sent first  
no parity  
1 stop bit

### Data Coding

All data values coming from sensors are transferred as 32 bit IEEE754 floating point numbers, (input and output) therefore meter value is transferred using two Modbus Protocol registers. All register read requests and data write requests must specify an even number of registers. Attempts to read/write an odd number of registers prompt the gateway to return a Modbus Protocol exception message. However, for compatibility with some SCADA systems, the gateway will respond to any single input or holding register read with an instrument type specific value.

## 2 configuration

You have to configure the Geckollect-wMBus->Modbus gateway to receive data from smart meters. For this open the configuration mode with the button, connect to the device via WiFi, and add your meters on the following interface:

**GECKOLLECT.COM wMBus** CLOSE

Mode T1 CHANGE MODE

**Configured meters** ↻

Bus	Address	Last reception	Key	
02	22000213	approx. 47 s.	Not encrypted.	<span>✕</span>
<span>04</span>	<input type="text"/>	<input type="checkbox"/> Encrypted	<input type="text" value="For automated decryption leave this e"/>	<span>+</span>

Download

Each meter will respond via modbus on the address associated with it in the column Bus. You should fill the Address field shown on the meter, and tick the Encrypted checkbox if needed.

The Key is also an user parameter, you can leave it out for Danfoss meters. We recommend not encrypting your meters.

You can also download your meter list as a CSV via the shown Download link, or take the whole configuration file on the lower menu:

**Advanced setup**

**Configuration** Download current configuration file: DOWNLOAD

Upload new configuration file: Choose File No file chosen UPLOAD

It is recommended that you backup your configuration before and after every change.

You must close the interface after configuring the gateway with the red button in the top right corner.



## 3 input register

Input registers are used to indicate the present values of the measured and calculated electrical quantities. Each parameter is held in two consecutive 16 bit register. The following table details the 3X register address, and the values of the address bytes within the message.

Any parameter with a cross(X) will return the value zero when not present. Each parameter is held in the 3X registers. Modbus Protocol function code 04 is used to access all parameters.

For example, to request:

Value                    Start address = 0001  
                               No. of registers = 0002  
 Hist. value            Start address = 0009  
                               No. of registers = 0002

Each request for data must be restricted to 10 parameters or less. The gateway only registers the first 10 datapoints from any meter. In the following section we present some meter types with their default register addresses and units.

### 3.1 Maddalena ElecTo S]

Register	#	Description	Unit
30001	1	current consumed volume	m <sup>3</sup>
30003	2	installation counter	secs
30009	5	historical consumed volume	m <sup>3</sup>

### 3.2 Bmeters Hydrosonis ULC

Register	#	Description	Unit
30001	1	energy	kWh
30003	2	volume	secs
30005	3	flowrate	m <sup>3</sup> /h
30007	4	power	W
30009	5	forward temperature	degC
30011	6	reverse temperature	degC

### 3.3 AXIOMA E4

Register	#	Description	Unit
30011	6	heating energy	kWh
30013	7	cooling energy	kWh



### 3.4 QUALCOSONIC HEAT 1

Register	#	Description	Unit
30001	1	heating energy	kWh
30003	2	installation time	secs
30005	3	volume	m <sup>3</sup>
30007	4	cooling energy	kWh
30015	8	power	W
30017	9	forward temperature	degC
30019	10	reverse temperature	degC

### 3.5 Danfoss SonoSafe 10

Register	#	Description	Unit
30001	1	heating energy	kWh
30003	2	volume	m <sup>3</sup>
30005	3	installation time	secs
30009	5	power	W
30011	6	forward temperature	degC
30013	7	reverse temperature	degC

### 3.6 Danfoss SonoSelect 10 (only heating)

Register	#	Description	Unit
30001	1	heating energy	kWh
30003	2	volume	m <sup>3</sup>
30007	4	power	W
30009	5	forward temperature	degC
30011	6	reverse temperature	degC

### 3.7 Danfoss SonoSelect 10 (factory cooling)

3.6 and an extra field:

30017	9	cooling energy	kWh
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