Modbus RTU Slave Module

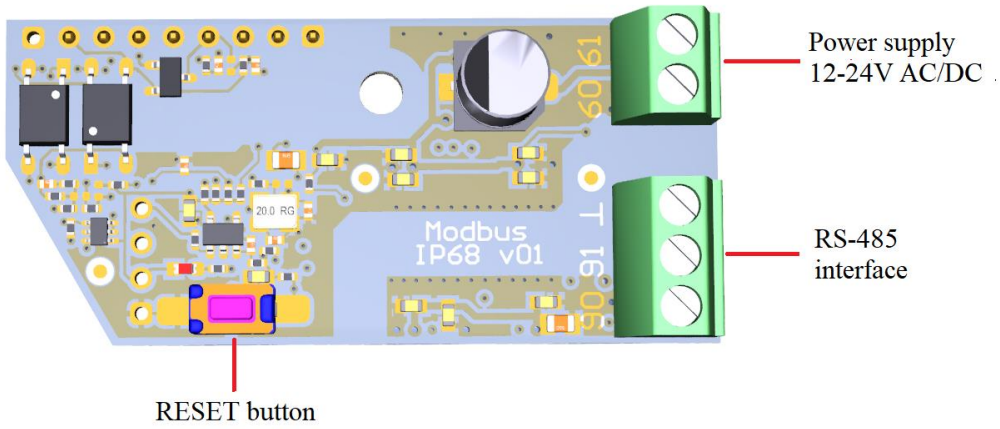
For calculator QalcoMet E1

Description:

MODBUS RTU is a master-slave communication protocol, able to support up to 247 slaves connected in a bus or a star network. The protocol uses a simplex connection on a single line. In this way, the communication messages move on a single line in two opposite directions.

The module has a separate, independent processor for retrieving data from the meter by configuring it at a selected interval. Later, the processed data is transmitted to the reading systems via the RS485 interface.

Connection:



Polarity independent connection for SELV power supply	60 and 61 connectors
Voltage	12-24 V AC/DC
Max power consumption	2 W
Typical current supply	50 mA

Connectors	90 and 91 (GND optional, for serial communication)
Communication protocol	Modbus RTU
Slave address	1 – 247 (default address – **according to meter's M-Bus**)
Baud rate	1200, 2400, 4800, 9600 (**default**), 19200, 38400, 57600, 115200
Data format	8E1 (8 data bits, Even parity, 1 stop bit) – **default** 8O1 (8 data bits, Odd parity, 1 stop bit) 8N2 (8 data bits, None parity, 1 stop bit)
Communication with calculator	2400 baud rate, 8 data bits, Even parity, 1 stop bit (must be set on calculator for wired M-Bus)

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Status LED and SET button functionality:

Status LED is signalizing every Modbus communication event. Status LED is blinking every time during communication request and even to response messages.

The RESET button is used when it is necessary to reset the module parameters after a failed configuration, forgotten address, baud rate, etc. In order to reset module, procedure is this:

- Turn off module from power supply (wait until module discharge)
- Press and hold RESET button. Then, turn on module power supply
- Wait until Status LED starts blinking frequently (after about 12 sec.)

List of Modbus Data Registers:

Designation	Modbus Register	Modbus Register Type	Modbus Address	Data Value Range	Unit	Read only (RO)
Energy 1	30001 or 40001	Input or Holding	0	Int32	-	RO
Energy 1 (Unit factor)	30003 or 40003	Input or Holding	2	Ulnt16	-	RO
Energy 1 (Unit)	30004 or 40004	Input or Holding	3	4 char ASCII	-	RO
Energy 1 (Float)	30006 or 40006	Input or Holding	5	IEEE754	-	RO
Energy 2	30008 or 40008	Input or Holding	7	Int32	-	RO
Energy 2 (Unit factor)	30010 or 40010	Input or Holding	9	Ulnt16	-	RO
Energy 2 (Unit)	30011 or 40011	Input or Holding	10	4 char ASCII	-	RO
Energy 2 (Float)	30013 or 40013	Input or Holding	12	IEEE754	-	RO
Energy 3	30015 or 40015	Input or Holding	14	Int32	-	RO
Energy 3 (Unit factor)	30017 or 40017	Input or Holding	16	Ulnt16	-	RO
Energy 3 (Unit)	30018 or 40018	Input or Holding	17	4 char ASCII	-	RO
Energy 3 (Float)	30020 or 40020	Input or Holding	19	IEEE754	-	RO
Not used	30022 or 40022	Input or Holding	21	Int32	-	RO
Not used	30024 or 40024	Input or Holding	23	Ulnt16	-	RO
Not used	30025 or 40025	Input or Holding	24	4 char ASCII	-	RO
Not used	30027 or 40027	Input or Holding	26	IEEE754	-	RO
Volume 1	30029 or 40029	Input or Holding	28	Int32	-	RO
Volume 1 (Unit factor)	30031 or 40031	Input or Holding	30	Ulnt16	-	RO
Volume 1 (Unit)	30032 or 40032	Input or Holding	31	4 char ASCII	-	RO
Volume 1 (Float)	30034 or 40034	Input or Holding	33	IEEE754	-	RO
Volume 2	30036 or 40036	Input or Holding	35	Int32	-	RO
Volume 2 (Unit factor)	30038 or 40038	Input or Holding	37	Ulnt16	-	RO
Volume 2 (Unit)	30039 or 40039	Input or Holding	38	4 char	-	RO

				ASCII		
Volume 2 (Float)	30041 or 40041	Input or Holding	40	IEEE754	-	RO
Volume 3	30043 or 40043	Input or Holding	42	Int32	-	RO
Volume 3 (Unit factor)	30045 or 40045	Input or Holding	44	Ulnt16	-	RO
Volume 3 (Unit)	30046 or 40046	Input or Holding	45	4 char ASCII	-	RO
Volume 3 (Float)	30048 or 40048	Input or Holding	47	IEEE754	-	RO
Power 1	30050 or 40050	Input or Holding	49	Int32	-	RO
Power 1 (Unit factor)	30052 or 40052	Input or Holding	51	Ulnt16	-	RO
Power 1 (Unit)	30053 or 40053	Input or Holding	52	4 char ASCII	-	RO
Power 1 (Float)	30055 or 40055	Input or Holding	54	IEEE754	kW	RO
Flow 1	30057 or 40057	Input or Holding	56	Int32	-	RO
Flow 1 (Unit factor)	30059 or 40059	Input or Holding	58	Ulnt16	-	RO
Flow 1 (Unit)	30060 or 40060	Input or Holding	59	4 char ASCII	-	RO
Flow 1 (Float)	30062 or 40062	Input or Holding	61	IEEE754	-	RO
Temperature 1 (Fixed)	30064 or 40064	Input or Holding	63	Int32	0.01°C	RO
Temperature 1 (Float)	30066 or 40066	Input or Holding	65	IEEE754	°C	RO
Temperature 2 (Fixed)	30068 or 40068	Input or Holding	67	Int32	0.01°C	RO
Temperature 2 (Float)	30070 or 40070	Input or Holding	69	IEEE754	°C	RO
Not used	30072 or 40072	Input or Holding	71	Int32	-	RO
Not used (Float)	30074 or 40074	Input or Holding	73	IEEE754	-	RO
Heat Meter Serial Number (Fixed)	30076 or 40076	Input or Holding	75	Ulnt32	-	RO
Meter Serial Number (ASCII)	30078 or 40078	Input or Holding	77	8 char ASCII	-	RO
∑ Error	30082 or 40082	Input or Holding	81	Ulnt32	-	RO
Data and time	30084 or 40084	Input or Holding	83	Ulnt32	-	RO
Battery operation time	30086 or 40086	Input or Holding	85	Ulnt32	-	RO
Working time without error 1	30088 or 40088	Input or Holding	87	Ulnt32	-	RO
Working time without error 2	30090 or 40090	Input or Holding	89	Ulnt32	-	RO
Volume 4	30092 or 40092	Input or Holding	91	Int32	-	RO
Volume 4 (Unit factor)	30094 or 40094	Input or Holding	93	Ulnt16	-	RO
Volume 4 (Unit)	30095 or 40095	Input or Holding	94	4 char ASCII	-	RO
Volume 4 (Float)	30097 or 40097	Input or Holding	96	IEEE754	-	RO
Volume 5 Energy	30099 or 40099	Input or Holding	98	Int32	-	RO
Volume 5 (Unit factor)	30101 or 40101	Input or Holding	100	Ulnt16	-	RO
Volume 5 (Unit)	30102 or 40102	Input or Holding	101	4 char ASCII	-	RO
Volume 5 (Float)	30104 or 40104	Input or Holding	103	IEEE754	-	RO
-Volume 2	30106 or 40106	Input or Holding	105	Int32	-	RO
-Volume 2 (Unit factor)	30108 or 40108	Input or Holding	107	Ulnt16	-	RO
-Volume 2 (Unit)	30109 or 40109	Input or Holding	108	4 char	-	RO

				ASCII		
-Volume 2 (Float)	30111 or 40111	Input or Holding	110	IEEE754	-	RO
Power 2	30113 or 40113	Input or Holding	112	Int32	-	RO
Power 2 (Unit factor)	30115 or 40115	Input or Holding	114	Ulnt16	-	RO
Power 2 (Unit)	30116 or 40116	Input or Holding	115	4 char ASCII	-	RO
Power 2 (Float)	30118 or 40118	Input or Holding	117	IEEE754	kW	RO
Power 3	30120 or 40120	Input or Holding	119	Int32	-	RO
Power 3 (Unit factor)	30122 or 40122	Input or Holding	121	Ulnt16	-	RO
Power 3 (Unit)	30123 or 40123	Input or Holding	122	4 char ASCII	-	RO
Power 3 (Float)	30125 or 40125	Input or Holding	124	IEEE754	kW	RO
Flow 2	30127 or 40127	Input or Holding	126	Int32	-	RO
Flow 2 (Unit factor)	30129 or 40129	Input or Holding	128	Ulnt16	-	RO
Flow 2 (Unit)	30130 or 40130	Input or Holding	129	4 char ASCII	-	RO
Flow 2 (Float)	30132 or 40132	Input or Holding	131	IEEE754	-	RO
Flow 3	30134 or 40134	Input or Holding	133	Int32	-	RO
Flow 3 (Unit factor)	30136 or 40136	Input or Holding	135	Ulnt16	-	RO
Flow 3 (Unit)	30137 or 40137	Input or Holding	136	4 char ASCII	-	RO
Flow 3 (Float)	30139 or 40139	Input or Holding	138	IEEE754	-	RO
Flow 4	30141 or 40141	Input or Holding	140	Int32	-	RO
Flow 4 factor)	30143 or 40143	Input or Holding	142	Ulnt16	-	RO
Flow 4 (Unit)	30144 or 40144	Input or Holding	143	4 char ASCII	-	RO
Flow 4 (Float)	30146 or 40146	Input or Holding	145	IEEE754	-	RO
Flow 5	30148 or 40148	Input or Holding	147	Int32	-	RO
Flow 5 (Unit factor)	30150 or 40150	Input or Holding	149	Ulnt16	-	RO
Flow 5 (Unit)	30151 or 40151	Input or Holding	150	4 char ASCII	-	RO
Flow 5 (Float)	30153 or 40153	Input or Holding	152	IEEE754	-	RO
Temperature 3(Fixed)	30155 or 40155	Input or Holding	154	Int32	0.01°C	RO
Temperature 3 (Float)	30157 or 40157	Input or Holding	156	IEEE754	°C	RO
Temperature 4 (Fixed)	30159 or 40159	Input or Holding	158	Int32	0.01°C	RO
Temperature 4 (Float)	30161 or 40161	Input or Holding	160	IEEE754	°C	RO
Temperature 5 (Fixed)	30163 or 40163	Input or Holding	162	Int32	0.01°C	RO
Temperature 5 (Float)	30165 or 40165	Input or Holding	164	IEEE754	°C	RO
Pressure 1	30167 or 40167	Input or Holding	166	Int32	-	RO
Pressure 1 (float)	30169 or 40169	Input or Holding	168	Ulnt16	-	RO
Pressure 2	30171 or 40171	Input or Holding	170	Int32	-	RO
Pressure 2 (float)	30173 or 40173	Input or Holding	172	IEEE754	0.1kPa	RO
Error 1	30175 or 40175	Input or Holding	174	Ulnt32	-	RO
Error 2	30177 or 40177	Input or Holding	176	Ulnt32	-	RO

Read/Write parameters

Designation	Modbus Register	Modbus Register Type	Modbus Address	Data Value Range	Unit	Read/write (R/W)
Modbus Slave ID [1]	41001	Holding	1000	Ulnt16	-	R/W
Update Rate Data from Meter [2]	41002	Holding	1001	Ulnt16	x100 ms	R/W
Baud Rate	41003	Holding	1002	Ulnt32	-	R/W
Data Bits	41005	Holding	1004	Ulnt16	-	R/W
Parity [3]	41006	Holding	1005	Ulnt16	-	R/W
Stop Bits	41007	Holding	1006	Ulnt16	-	R/W

[1] Slave ID can be set up between 1 – 247 addresses. Default address same as meter's M-Bus address.

[2] Data update rate from meter can be set according to request (default 300s). Entered value are multiplied by 100ms.

[3] The parity register is set by the ASCII char value – 'Even' parity (69 dec or 45 hex), 'Odd' parity (79 dec or 4F hex) and 'None' parity (78 dec or 4E hex).