ADM100W Power Meter

Modbus RTU over RS485 Communications

May 2021 | Version 02

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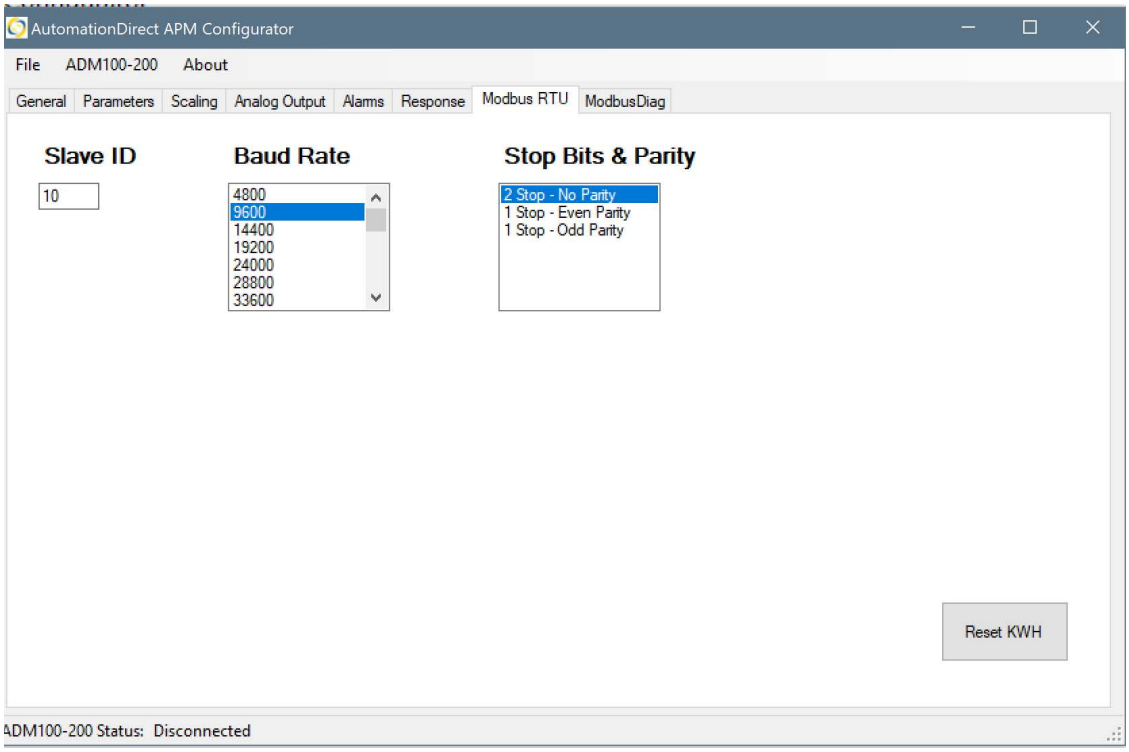
1 About this document

This document describes the use of Modbus RTU over RS485 in the ADM100W Power Meter. Modbus is implemented in the ADM100W to enable the reading of the measured values and the status of the alarms. Configuration of the ADM100W measurements can be performed by using the ADM100-200 Series configurator, which is available from:

https://www.automationdirect.com/support/software-downloads?itemcode=ADM%20Configurator.

2 Configuration.



2.1 Slave ID

Any value between 0 and 255 can be entered.

2.2 Baud Rate

The following baud rates are supported.

Baud Rate					
4800	9600	14400	19200	24000	28800
33600	38400	43200	48000	52800	57600
62400	67200	72000	76800	81600	86400
91200	96000	100800	105600	110400	115200
120000	124800	129600	134400	139200	144000
148800	153600	158400	163200	168000	172800
177600	182400	187200	192000		

2.3 Stop Bits & Parity

The following combinations of Stop bits, and Parity bits are supported.

- 2 Stop bits and No Parity bits
- 1 Stop bit and an Even Parity bit
- 1 Stop Bit and an Odd Parity bit

2.4 Function Codes

Function Codes		
Code	**Function**	**Max registers in one message**
1	Read Coil Registers	32
4	Read Input Registers	88

3 Register Map

3.1 Input Registers (Read only)

Use Function Code 4. The Input registers show the displayed value for each parameter, scaled by the ADM100W configured unit.

e.g. ADM100W is configured to measure V and Kva:

- Parameter No. 1 (L1 to L2 Voltage) returned “415” should be read as a value of 415V
- Parameter No. 5 (L1 Apparent Power) returned “8.7” should be read as a value of 8.7kVA

Param No	Address	Type	Details
0	0	32bit Float	Frequency
1	2	32bit Float	L1 to L2 Voltage
2	4	32bit Float	L1 to N Voltage
3	6	32bit Float	L1 Current
4	8	32bit Float	L1 Active Power
5	10	32bit Float	L1 Apparent Power
6	12	32bit Float	L1 Reactive Power
7	14	32bit Float	L1 Current Phase Angle
8	16	32bit Float	L1 Power Factor
9	18	32bit Float	L1 Voltage THD
10	20	32bit Float	L1 Current THD
11	22	32bit Float	L1 Max Load
12	24	32bit Float	L1 to L2 Voltage Phase Angle
13	26	32bit Float	L2 to L3 Voltage
14	28	32bit Float	L2 to N Voltage
15	30	32bit Float	L2 Current
16	32	32bit Float	L2 Active Power
17	34	32bit Float	L2 Apparent Power
18	36	32bit Float	L2 Reactive Power
19	38	32bit Float	L2 Current Phase Angle
20	40	32bit Float	L2 Power Factor
21	42	32bit Float	L2 Voltage THD
22	44	32bit Float	L2 Current THD
23	46	32bit Float	L2 Max Load
24	48	32bit Float	L1 to L3 Voltage Phase Angle
25	50	32bit Float	L3 to L1 Voltage
26	52	32bit Float	L3 to N Voltage
27	54	32bit Float	L3 Current
28	56	32bit Float	L3 Active Power
29	58	32bit Float	L3 Apparent Power
30	60	32bit Float	L3 Reactive Power
31	62	32bit Float	L3 Current Phase Angle
32	64	32bit Float	L3 Power Factor
33	66	32bit Float	L3 Voltage THD
34	68	32bit Float	L3 Current THD
35	70	32bit Float	L3 Max Load

Param No	Address	Type	Details
36	72	32bit Float	Internal Temperature
37	74	32bit Float	Active Energy
38	76	32bit Float	Apparent Energy
39	78	32bit Float	Reactive Energy
40	80	32bit Float	Total Active Power
41	82	32bit Float	Total Apparent Power
42	84	32bit Float	Total reactive power
43	86	32bit Float	All phase power factor

3.2 Coil Registers (Read only)

Use Function Code 1.
Alarm Status is :
1= Alarm Active
0= Alarm Inactive

Param No	Address	Type	Details
0	0	1bit	Alarm 1 status
1	1	1bit	Alarm 2 status
2	2	1bit	Alarm 3 status
3	3	1bit	Alarm 4 status
4	4	1bit	Alarm 5 status
5	5	1bit	Alarm 6 status
6	6	1bit	Alarm 7 status
7	7	1bit	Alarm 8 status
8	8	1bit	Alarm 9 status
9	9	1bit	Alarm 10 status

3.3 Modbus Sentence protocol.

The registers are implemented as 32 bit floats utilizing two 16 bit words. The most significant word is sent first. Each 16 bit word is sent as two 8 bit bytes, the most significant is sent first.

3.4 Error Codes

Error Codes	
Code	**Error**
1	Unsupported Function
2	Illegal Data Address

4 Example using “Simply Modbus”

In the following example SimplyModbus (https://www.simplymodbus.ca) has been used to communicate with the ADM100W.

Send:	0A 04 00 00 00 49	(Read first 73 registers)
Receive:	0A 04 92 42 48 14 7B 43 2E AD FD …	(Values for first 2 Registers)

Send

Receive