H8238 MODBUS POINT MAP

Integer	Float	R/W	N/V	Description
1	257/258	R/W	N/V	Energy Consumption, kWh, Low-word integer. Both 257/258 and 259/260 have the same floating point value
2	259/260	R/W	N/V	Energy Consumption, kWh, High-word integer. Both 257/258 and 259/260 have the same floating point value
3	261/262	R		Real Power, kW
4	263/264	R		Reactive Power, kVAR
5	265/266	R		Apparent Power, kVA
6	267/268	R		Total Power Factor
7	269/270	R		Voltage, L-L, average of 3 phases
8	271/272	R		Voltage, L-N, average of 3 phases
9	273/274	R		Current, average of 3 phases
10	275/276	R		Frequency: measured from the phase A voltage input. Range is 40 to 70 Hz. If voltage is insufficient for an accurate frequency determination, this register reads as 0xFFFF for integer and 0x7FC00000 for float.
11	277/278	R		Real Power, Phase Z
12	279/280	R		Real Power, Phase B
13	281/282	R		Real Power, Phase C
14	283/284	R		Total Power Factor, Phase A
15	285/286	R		Total Power Factor, Phase B
16	287/288	R		Total Power Factor, Phase C
17	289/290	R		Voltage, Phase A-B
18	291/292	R		Voltage, Phase B-C
19	293/294	R		Voltage, Phase A-C
20	295/296	R		Voltage, Phase A-N
21	297/298	R		Voltage, Phase B-N
22	299/300	R		Voltage, Phase C-N
23	301/302	R		Current, Phase A
24	303/304	R		Current, Phase B
25	305/306	R		Current, Phase C
26	307/308	R		Current, Neutral Only valid in the 6-meter configuration. The CT Scale (register 30) for the meter also defines the CT used in this measurement. For the 8-meter configuration, this parameter always reads as 0xFFFF for integer and 0x7FC00000 for float.
27	309/310	R/W		Average kW
28	311/312	R/W		Minimum kW
29	313/314	R/W		Maximum kW
30		R/W	N/V	CT Scale: sets the size of the external 5-Amp CTs used. Range is 1 to 5999. E.g. for 10A:5A CTs, set register to 10; for 4000A:5A CTs, set register to 4000. For the 6-meter configuration, this parameter includes the Neutral Current CT. Default = 100 (100A:5A).
31		R/W	N/V	Over Voltage Alarm Threshold: occurs if the average L-L voltage (register 7) is greater than this threshold for at least 10 seconds. Units are absolute voltage (using integer multiplier). Range = 0 to 65535; Default = 65535
32		R/W	N/V	Under Voltage Alarm Threshold: occurs if the average L-L voltage (register 7) is less than this threshold at any time. Units are absolute voltage (using integer multiplier). Range = 0 to 65535; Default = 0
33		R/W	N/V	Over Current Alarm Threshold: occurs if the average current (register 9) is greater than this threshold at any time. Units are absolute current (using integer multiplier). Range = 0 to 65535; Default = 65535
34		R/W	N/V	Under Current Alarm Threshold: occurs if the average current (register 9) is less than this threshold at any time. Units are absolute current (using integer multiplier). Range = 0 to 65535; Default = 0
35		R/W	N/V	Over kVA Alarm Threshold: occurs if the total apparent power (register 5) is greater than this threshold at any time. Units are absolute kVA (using integer multiplier). Range = 0 to 65535; Default = 65535

R = Read only; R/W = read from either format, write to integer format only;
-G = Read or write to any meter will report/set this value for all meters; N/V = value is stored in nonvolatile memory

Integer	Float	R/W	N/V	Description
36		R/W	N/V	Under kVA Alarm Threshold: occurs if the total apparent power (register 5) is less than this threshold at any time. Units are absolute kVA (using integer multiplier). Range = 0 to 65535; Default = 0
37		R/W	N/V	Meter Alarm Status (Latching): holds the state of the meter alarm latches. These alarms are latching and must be cleared by the user. To reset any alarm, read the register and then write the register with the desired alarm bit cleared. Writing a 1 to any bit has no effect. bit 0 = over current bit 1 = under current bit 2 = over kVA bit 3 = under kVA bit 4 = over voltage bit 5 = under voltage bit 6 = phase loss A bit 7 = phase loss B bit 8 = phase loss C bits 9-15 = 0
38		R/W	N/V	Phase Loss Threshold (0 to 100%, default = 65535): these exist independently for all 3 phases (A, B, C). This register sets the alarm threshold for all three phases. This setting is the percent deviation of a phase from the average of all 3 phases (register 8). The decision logic is constructed so that normal power-ups do not trigger alarms. A phase loss alarm will occur only if the following conditions are met: 1. The average L-L voltage (register 8) is greater than 25V. 2. The L-N voltage on a phase (register 20, 21, or 22) is less than the percent deviation set by this threshold. 3. This threshold is set between 0 and 100%. Thus, phase loss alarms cannot be generated when all 3 phases are off.
Registers 39-42 expect the data-bytes in ASCII character format (i.e. 0x57 = W). Allowed characters are 21h through 7Dh, excluding 5Ch. The high order byte is the high-order character (i.e. 0x4D54 = MT)				
39		R/W	N/V	Meter Name: First 2 characters (Default = MT)
40		R/W	N/V	Meter Name: Second 2 characters (Default = Rx)
41		R/W-G	N/V	Board Name: First 2 characters (Default = BR)
42		R/W-G	N/V	Board Name: Second 2 characters (Default = D1)
43		R-G	N/V	Firmware Revision - Reset System
44		R-G	N/V	Firmware Revision - Operating System
The Serial Number is the time of manufacture expressed as the number of seconds past midnight 1/1/1970 in an unsigned-long format.				
45		R-G	N/V	Serial number MSW
46		R-G	N/V	Serial number LSW
47		R-G		Error Register: reports internal errors detected by the microcontroller. The ALIVE LED will be steadily lit (not blinking) if any errors are detected. bit 0 = NV Ram error bits 1-15 = reserved for future use
48		R-G	N/V	Device ID: reads as 15027 for 8-meter configuration, 15027 for 6-meter
49		R-G	N/V	Meter Alarm Status (non-latching): holds the instantaneous state of the meter alarms. The bits in this register are only set while the alarm condition exists. These alarms cannot be reset by the user. Only set the Over Voltage Alarm when its time-delay condition is satisfied (see register 31). bit 0 = over current bit 1 = under current bit 2 = over kVA bit 3 = under kVA bit 4 = over voltage bit 5 = under voltage bit 6 = phase loss A bit 7 = phase loss B bit 8 = phase loss C bits 9-15 = 0
Registers 50-67 are Set and Reset Counters for alarms. A set counter increments each time the Non-Latching Alarm transitions from a no-alarm to an alarm state. A reset counter increments each time the Non-Latching Alarm transitions from an alarm to a no-alarm state. These registers cannot be cleared. They will rollover from 65535 to 0 and cintinue counting.				
50		R	N/V	Over Voltage Set Counter

R = Read only; R/W = read from either format, write to integer format only;

-G = Read or write to any meter will report/set this value for all meters; N/V = value is stored in nonvolatile memory

Integer	Float	R/W	N/V	Description
51		R	N/V	Over Voltage Reset Counter
52		R	N/V	Under Voltage Set Counter
53		R	N/V	Under Voltage Reset Counter
54		R	N/V	Phase Loss A Set Counter
55		R	N/V	Phase Loss A Reset Counter
56		R	N/V	Phase Loss B Set Counter
57		R	N/V	Phase Loss B Reset Counter
58		R	N/V	Phase Loss C Set Counter
59		R	N/V	Phase Loss C Reset Counter
60		R	N/V	Over Current Set Counter
61		R	N/V	Over Current Reset Counter
62		R	N/V	Under Current Set Counter
63		R	N/V	Under Current Reset Counter
64		R	N/V	Over kVA Set Counter
65		R	N/V	Over kVA Reset Counter
66		R	N/V	Under kVA Set Counter
67		R	N/V	Under kVA Reset Counter
68		R-G	N/V	Modbus address, as configured by DIP switches (1-247)
69		R-G	N/V	Reserved
70		R-G	N/V	Reserved (always reads as 0)
71		R-G	N/V	Baud rate, as configured by DIP switches (2400, 4800, 9600, 19200)
72		R-G	N/V	Reserved
73		R/W	N/V	Meter Enable Register: allows the user to enable or disable selected meters on the board. A disabled meter will not respond to any Modbus queries. A 1 indicates an enabled meter; a 0 indicates a disabled meter. This register can only be written to meter #1. When read from meters 2 through 8, the high bit (bit 15) will always be set as a flag that the register my not be written to that meter. When in 6-meter mode, bit 6 and bit 7 may not be set and will always read as 0. bit 0 = Meter #1 (always reads as 1, cannot be reset) bit 1 = Meter #2 bit 2 = Meter #3 bit 3 = Meter #4 bit 4 = Meter #5 bit 5 = Meter #6 bit 6 = Meter #7 bit 7 = Meter #8 bits 8-14 = 0 bit 15 = 0 if read from Meter #1; 1 if read from Meters #2-#8
74		R/W	N/V	Critical Alarm Register: allows the user to indicate which of the meter's alarms are critical and non-critical. This product takes no action on the contents of this register. It is provided for monitoring systems' use. A 1 indicates a critical alarm; a 0 indicates a non-critical alarm. bit 0 = over current bit 1 = under current bit 2 = over kVA bit 3 = under kVA bit 4 = over voltage bit 5 = under voltage bit 6 = phase loss A bit 7 = phase loss B bit 8 = phase loss C bits 9-15 = 0

R = Read only; R/W = read from either format, write to integer format only;
-G = Read or write to any meter will report/set this value for all meters; N/V = value is stored in nonvolatile memory

MODBUS DETAILS

Addressing

The MCM contains either 6 or 8 meters with a single Modbus connection. Each meter is independently accessed via Modbus at a separate address. Other devices on the network must not use any of the Modbus addresses in the range used by the MCM.

The ADDRESS DIP switch sets the base address of the board. This setting is in binary increments of 8, beginning at 1:

Address DIP Switch	Base Address	Meter Addresses	
87654321		8-Meter configuration	6-meter configuration
00000000	1	1-8	1-6
00000001	9	9-16	9-14
00000010	17	17-24	17-22
.			
.			
00000010	225	225-232	225-230
00011101	233	233-240	233-238
00011110 or higher	off-line	off-line	off-line

Supported Commands

Read Holding Register (03h)

Preset SIngle Register (06h)

Report Slave ID (11h)

Integer vs. Floating Point

Integer format registers report the data as 16 bit integer values. Float format registers represent the same data stored and report as 32-bit floating point values.

For measured data, the float format registers are recommended, since they do not require the use of a multiplier. The integer format registers can be difficult to use for the measured data, as a multiplier must be used for each one to get the correct value. Many of the multipliers change depending on the CT Scale. See the integer multiplier table below.

All registers above 29 are available only as integers.

Setting a threshold requires writing an integer value to the register. Just as reading an integer register for measured data requires the use of a multiplier, writing an integer register requires the identical divisor. For example, an integer voltage reading of 24000 multiplied by the 0.01 multiplier results in 240.00V. To set a threshold of 240.00V, write 240.00V / 0.01 = 24000.

All floating point variables are read-only. All R/W points must be written to their integer registers.

Resetting kWh

The kWh accumulator may be reset to 0 by writing any value to either of its two integer registers.

Resetting Min/Max/Avg kW

Writing any value to any of the average kW, minimum kW, or maximum kW integer registers resets all three of these values to the current kW value.

Changing the CT Scale

Writing the CT Scale register resets the measured parameters to zero, since most of these values are CT-scale dependent. This is the same effect as powering up the device. Non-volatile parameters, however, are NOT reset if the CT Scale is altered. This preserves the integrity of the NV parameters in case of accidental change of CT Scale. If user changes the CT scale, he must reset the NV parameters individually (kWh register, alarm thresholds, and alarm registers).

INTEGER MULTIPLIER TABLE

MB Point	Parameter	CT Scale			
		1-5 A	6-59 A	60-599 A	600-5999 A
1	kWh, low-word	0.0001	0.001	0.01	0.1
2	kWh, high-word	655.36	65.635	655.36	6553.6
3	kW	0.0001	0.001	0.01	0.1
4	kVAR	0.0001	0.001	0.01	0.1
5	kVA	0.0001	0.001	0.01	0.1
6	PF	0.0001	0.0001	0.0001	0.0001
7	Voltage, L-L	0.01	0.01	0.01	0.01
8	Voltage, L-N	0.01	0.01	0.01	0.01
9	Current	0.0001	0.001	0.01	0.1
10	Frequency	0.01	0.01	0.01	0.01
11	kW, phase A	0.0001	0.001	0.01	0.1
12	kW, phase B	0.0001	0.001	0.01	0.1
13	kW, phase C	0.0001	0.001	0.01	0.1
14	PF, phase A	0.0001	0.0001	0.0001	0.0001
15	PF, phase B	0.0001	0.0001	0.0001	0.0001
16	PF, phase C	0.0001	0.0001	0.0001	0.0001
17	Voltage, phase A-B	0.01	0.01	0.01	0.01
18	Voltage, phase B-C	0.01	0.01	0.01	0.01
19	Voltage, phase A-C	0.01	0.01	0.01	0.01
20	Voltage, phase A-N	0.01	0.01	0.01	0.01
21	Voltage, phase B-N	0.01	0.01	0.01	0.01
22	Voltage, phase C-N	0.01	0.01	0.01	0.01
23	Current, phase A	0.0001	0.001	0.01	0.1
24	Current, phase B	0.0001	0.001	0.01	0.1
25	Current, phase C	0.0001	0.001	0.01	0.1
26	Current, neutral	0.0001	0.001	0.01	0.1
27	Average kW	0.0001	0.001	0.01	0.1
28	Minimum kW	0.0001	0.001	0.01	0.1
29	Maximum kW	0.0001	0.001	0.01	0.1
30	CT Scale	1	1	1	1
31	Over Voltage Threshold	0.01	0.01	0.01	0.01
32	Under Voltage Threshold	0.01	0.01	0.01	0.01
33	Over Current Threshold	0.0001	0.001	0.01	0.1
34	Under Current Threshold	0.0001	0.001	0.01	0.1
35	Over kVA Threshold	0.0001	0.001	0.01	0.1
36	Under kVA Threshold	0.0001	0.001	0.01	0.1