Points list for the PM Input Board.

All Modbus variables are stored in 16-bit integer format.

#	R/W	NV	Description
These registers show the Main voltages and are in tents of a volt (1215 = 121.5 Amps)			
1.	R/W		Main Voltage1, phase AB
2.	R/W		Main Voltage1, phase BC
3.	R/W		Main Voltage1, phase CA
4.	R/W		Main Voltage1, phase AN
5.	R/W		Main Voltage1, phase BN
6.	R/W		Main Voltage1, phase CN
7.	R/W		Main Voltage2, phase AB
8.	R/W		Main Voltage2, phase BC
9.	R/W		Main Voltage2, phase CA
10.	R/W		Main Voltage2, phase AN
11.	R/W		Main Voltage2, phase BN
12.	R/W		Main Voltage2, phase CN
An Over Voltage Alarm occurs if the Any L-N voltage is greater than this threshold register at any time and is given in tenths of a volt (1200 = 120.0 Volts). For Defaults see the Voltage Type register.			
13.	R/W	NV	Over Voltage Alarm Threshold Main
An Under Voltage Alarm occurs if the Any L-N voltage is less than this threshold register at any time and is given in tenths of a volt (1200 = 120.0 Volts) For Defaults see the Voltage Type register.			
14.	R/W	NV	Under Voltage Alarm Threshold Main
Frequency is measured from the phase A voltage input. Range is 40.0-70.0Hz: **This register will read as 0xFFFF if frequencies outside of this range or if sufficient voltage is not present on phase A for an accurate determination.**			
15.	R		Frequency
These registers show Total Harmonic Distortion (THD) calculations and are given in tenth of a percent (01 = 0.1%).			
16.	R		Main Voltage1, phase A THD
17.	R		Main Voltage1, phase B THD
18.	R		Main Voltage1, phase C THD
19.	R		Main Voltage2, phase A THD
20.	R		Main Voltage2, phase B THD
21.	R		Main Voltage2, phase C THD

This register shows what Voltage values that are being read by this board.

Note Maximum Minimum Default Limits for each Voltage Type are:

208	Phase to Phase	High	239	Low	177
	Neutral	High	138	Low	102
380	Phase to Phase	High	437	Low	323
	Phase to Neutral	High	252	Low	186
400	Phase to Phase	High	460	Low	340
	Phase to Neutral	High	265	Low	196
415	Phase to Phase	High	518	Low	383
	Neutral	High	299	Low	221
480	Phase to Phase	High	552	Low	408
	Phase to Neutral	High	319	Low	236
600	Phase to Phase	High	690	Low	510
	Phase to Neutral	High	398	Low	295

If your voltage is between the limits, pick the Higher Limit.

22.	R/W	NV	Voltage Type (208, 380, 400, 415, 480, 600)

This register shows the setting for the Voltage monitoring setup. A set bit indicated active value.

23.	R/W	NV	Voltage Option Setting bit 0: Voltage option side 1 set bit 1: Voltage option side 2 set bit 2: Set for 50 Hz bit 3: Auto Adjust Gain. bits 4 – 15: Not Used Always read as 0

These registers show the phase currents and are given in tenth of amps (100 = 10.0 Amps)
Note: For Neutral and Ground options see Current Options and read the note with these options.

24.	R/W	Current, Phase 1A
25.	R/W	Current, Phase 1B
26.	R/W	Current, Phase 1C
27.	R/W	Current, Side 1 Neutral (option)
28.	R/W	Current, Side 1 Ground (option)
29.	R/W	Current, Phase 2A
30.	R/W	Current, Phase 2B
31.	R/W	Current, Phase 2C
32.	R/W	Current, Side 2 Neutral (option)
33.	R/W	Current, Side 2 Ground (option)
34.	R	Current, Phases 1A & 2A
35.	R	Current, Phases 1B & 2B
36.	R	Current, Phases 1C & 2C

These registers show the minimum phase currents and are in tenth of amps (100 = 10.0 Amps)

37.	R	Minimum Current, Phase 1A
38.	R	Minimum Current, Phase 1B
39.	R	Minimum Current, Phase 1C
40.	R	Minimum Current, Phase 1N
41.	R	Minimum Current, Phase 1G
42.	R	Minimum Current, Phase 2A
43.	R	Minimum Current, Phase 2B

44.	R		Minimum Current, Phase 2C
45.	R		Minimum Current, Phase 2N
46.	R		Minimum Current, Phase 2G
47.	R		Minimum Current, Phases1A & 2A
48.	R		Minimum Current, Phases 1B & 2B
49.	R		Minimum Current, Phases 1C & 2C

These registers show the maximum phase currents and are in tenth of amps (100 = 10.0 Amps)

50.	R		Maximum Current, Phase 1A
51.	R		Maximum Current, Phase 1B
52.	R		Maximum Current, Phase 1C
53.	R		Maximum Current, Phase 1N
54.	R		Maximum Current, Phase 1G
55.	R		Maximum Current, Phase 2A
56.	R		Maximum Current, Phase 2B
57.	R		Maximum Current, Phase 2C
58.	R		Maximum Current, Phase 2N
59.	R		Maximum Current, Phase 2G
60.	R		Maximum Current, Phases 1A & 2A
61.	R		Maximum Current, Phases 1B & 2B
62.	R		Maximum Current, Phases 1C & 2C

Writing this register will reset the current Min and Max registers to the current value.

63.	W		Min/Max Reset

These registers set the capacity of full load allowed for the alarms. Units are in Amps (125 = 125 Amps). The Values that are written must be between 100 and 650. The Default is 250 Amps

64.	R/W	NV	Full Load Side One
65.	R/W	NV	Full Load Side Two

These registers show current demand per phase and are in tenth of amps (262 = 26.2 Amps). Values are the average current over the time given in the Demand Register.

66.	R		Demand phase 1A
67.	R		Demand phase 1B
68.	R		Demand phase 1C
69.	R		Demand phase 2A
70.	R		Demand phase 2B
71.	R		Demand phase 2C

The Demand Register is time that the demand is averaged over in minutes. It must be between 10 to 60 minutes. The Default is 15 minutes.

72.	R/W	NV	Demand time

These registers show Percent load and is given in tenth of a percent (753 = 75.3%). These percents are the Amps per phase divided by the full load of that side.

73.	R		Percent load phase 1A
74.	R		Percent load phase 1B
75.	R		Percent load phase 1C
76.	R		Percent load phase 2A
77.	R		Percent load phase 2B

78.	R		Percent load phase 2C

These registers show crest factor per phase. Values are peak current/rms current with three decimal places (1412 = 1.412).

79.	R		Crest Factor phase 1A
80.	R		Crest Factor phase 1B
81.	R		Crest Factor phase 1C
82.	R		Crest Factor phase 2A
83.	R		Crest Factor phase 2B
84.	R		Crest Factor phase 2C

The following Warning Register sets a bit for every channel, which reads a current above the Warning Threshold for at least the Warning Time-Delay. All warnings are latching and must be reset by the controller. To reset any alarm, read the register and the write the register with the desired alarm bit cleared.

85.	R/W	NV	Warning Register (Latching) bit 0: Phase 1A bit 1: Phase 1B bit 2: Phase 1C bit 3: Phase 2A bit 4: Phase 2B bit 5: Phase 2C bits 6 – 15: Not Used Always read as 0

The following Alarm Register sets a bit for every channel, which reads a current above the Alarm Threshold for at least the Alarm Time-Delay. All alarms are latching and must be reset by the controller. To reset any alarm, read the register and then write the register with the desired alarm bit cleared.

86.	R/W	NV	Alarm Register (Latching) bit 0: Phase 1A bit 1: Phase 1B bit 2: Phase 1C bit 3: Phase 2A bit 4: Phase 2B bit 5: Phase 2C bits 6 – 15: Not Used Always read as 0

The following Warning Threshold register sets the thresholds for the Warning alarms. A Warning alarm is given in percent of the Full load registers **(**75 = 75%). A Warning alarm will occur if the measured current is above the Warning Threshold for at least the Warning Time Delay. Default for the Warning thresholds is 70%. The Values that are written to the Warning Threshold must be between 40 and 100 and always below the corresponding Alarm Threshold.

87.	R/W	NV	Warning Threshold

The following Alarm Threshold registers set the thresholds for the Alarms. A Alarm Threshold register is given in percent of the Full Load registers (85 = 85%). An Alarm will occur if the measured current is above the Alarm Threshold for at least the Alarm Time Delay. Default for the Alarm thresholds is 80%. The Values that are written to the Alarm Threshold must be between 50 and 100 and always above the corresponding Warning Threshold.

88.	R/W	NV	Alarm Threshold

The Warning Time Delay register set the minimum time required for the current to exist above the Warning Threshold before the Warning alarm in set. Units are in seconds. The Values that are written to the Warning Time Delays must be between 0-60. The Default is 0 (zero) which means that there is no delay for the Warning alarm.

89. R/W NV Warning Time Delay

The Alarm Time Delay register set the minimum time required for the current to exist above the alarm Threshold before the Alarm is set. Units are in seconds. The Values that are written to the Alarm Time Delays must be between 0-60. The Default is 10 which means that there is ten seconds before an Alarm is given.

90. R/W NV Alarm Time Delay

This register provides a quick status of alarms for the unit. A bit in this register is set if any bit in the indicated register is set.

91. R NV Global Warning/Alarm Register
bit 0: Warning Register
bit 1: Alarm Register
bit 2: Over Voltage Side 1
bit 3: Under Voltage Side 1
bit 4: Over Voltage Side 2
bit 5: Under Voltage Side 2
bits 4 – 15: Not Used Always read as 0

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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.

92. R/W NV Meter Alarm Status (Latching)
bit 0: Over Voltage Phase A Side 1
bit 1: Over Voltage Phase B Side 1
bit 2: Over Voltage Phase C Side 1
bit 3: Under Voltage Phase A Side 1
bit 4: Under Voltage Phase B Side 1
bit 5: Under Voltage Phase C Side 1
bit 6: Over Voltage Phase A Side 2
bit 7: Over Voltage Phase B Side 2
bit 8: Over Voltage Phase C Side 2
bit 9: Under Voltage Phase A Side 2
bit 10: Under Voltage Phase B Side 2
bit 11: Under Voltage Phase C Side 2
bits 10 – 15: Not Used Always read as 0

This register is the four Digital alarm that can be used by the customer.

93. R Digital alarm status
bit 0: Digital alarm 1
bit 1: Digital alarm 2
bit 2: Digital alarm 3
bit 3: Digital alarm 4
bits 4 – 15: Not Used Always read as 0

This register shows the setting for the Current monitoring setup. A set bit indicated active value.

94.	R/W	NV	Current	Option	Setting
			bit 0	Phase	Side 1
			bit 1	Neutral	CT Side 1
			bit 2	Ground	CT Side 1
			bit 3	Phase	Side 2
			bit 4	Neutral	CT Side 2
			bit 5	Ground	CT Side 2
			bits 6– 15: Not Used Always read as 0		

These registers show the KW and are in hundredth of KW (1000 = 10.00 KW)

95.	R	KW, Phase 1A
96.	R	KW, Phase 1B
97.	R	KW, Phase 1C
98.	R	KW, Phase 2A
99.	R	KW, Phase 2B
100.	R	KW, Phase 2C
101.	R	KW, Phases 1A & 2A
102.	R	KW, Phases 1B & 2B
103.	R	KW, Phases 1C & 2C

KVA Registers 104-112 are in hundredth of KVA (1000 = 10.00 KVA)

104.	R	KVA, Phase 1A
105.	R	KVA, Phase 1B
106.	R	KVA, Phase 1C
107.	R	KVA, Phase 2A
108.	R	KVA, Phase 2B
109.	R	KVA, Phase 2C
110.	R	KVA, Phases 1A & 2A
111.	R	KVA, Phases 1B & 2B
112.	R	KVA, Phases 1C & 2C

KVAR Registers 113-121 are in hundredth of KVAR (1000 = 10.00 KVAR)

113.	R	KVAR, Phase 1A
114.	R	KVAR, Phase 1B
115.	R	KVAR, Phase 1C
116.	R	KVAR, Phase 2A
117.	R	KVAR, Phase 2B
118.	R	KVAR, Phase 2C
119.	R	KVAR, Phases 1A & 2A
120.	R	KVAR, Phases 1B & 2B
121.	R	KVAR, Phases 1C & 2C

Power Factor Registers 122-130 are in hundredth of PF (98 = 0.98 PF)

122.	R	Power Factor, Phase 1A
123.	R	Power Factor, Phase 1B
124.	R	Power Factor, Phase 1C
125.	R	Power Factor, Phase 2A
126.	R	Power Factor, Phase 2B
127.	R	Power Factor, Phase 2C
128.	R	Power Factor, Phase 1A & 2A

129.	R		Power Factor, Phase 1B & 2B
130.	R		Power Factor, Phase 1C & 2C

These registers are circuit Phase Kilowatt Hours per phase. Values are in kilowatts hours (90 = 90kwh) For KWH 32-bit value multiply High-word integer by 2^16 (65536) and add Low-word integer.

131.	R	NV	KWH High-word integer, Phase 1A
132.	R	NV	KWH Low-word integer, Phase 1A
133.	R	NV	KWH High-word integer, Phase 1B
134.	R	NV	KWH Low-word integer, Phase 1B
135.	R	NV	KWH High-word integer, Phase 1C
136.	R	NV	KWH Low-word integer, Phase 1C
137.	R	NV	KWH High-word integer, Phase 2A
138.	R	NV	KWH Low-word integer, Phase 2A
139.	R	NV	KWH High-word integer, Phase 2B
140.	R	NV	KWH Low-word integer, Phase 2B
141.	R	NV	KWH High-word integer, Phase 2C
142.	R	NV	KWH Low-word integer, Phase 2C
143.	R	NV	KWH High-word integer, Phase 1A & 2A
144.	R	NV	KWH Low-word integer, Phase 1A & 2A
145.	R	NV	KWH High-word integer, Phase 1B & 2B
146.	R	NV	KWH Low-word integer, Phase 1B & 2B
147.	R	NV	KWH High-word integer, Phase 1C & 2C
148.	R	NV	KWH Low-word integer, Phase 1C & 2C

Writing this register will reset all KWH registers to zero.

149.	W		KWH Reset
150.	R		Board Voltage

This register shows whether this Modbus address is communicating.

151.	R		Communication Error

These registers show the PM Input Board name as sixteen characters long and are compacted into eight integers or two characters per integer.

152.	R/W	NV	PM Input Board Name bit 0-7 Char 2 bit 8-15 Char 1
153.	R/W	NV	PM Input Board Name bit 0-7 Char 4 bit 8-15 Char 3
154.	R/W	NV	PM Input Board Name bit 0-7 Char 6 bit 8-15 Char 5
155.	R/W	NV	PM Input Board Name bit 0-7 Char 8 bit 8-15 Char 7
156.	R/W	NV	PM Input Board Name bit 0-7 Char 10 bit 8-15 Char 9
157.	R/W	NV	PM Input Board Name bit 0-7 Char 12 bit 8-15 Char 11

158.	R/W	NV	PM Input Board Name bit 0-7 Char 14 bit 8-15 Char 13
159.	R/W	NV	PM Input Board Name bit 0-7 Char 16 bit 8-15 Char 15

Note: The value of any option that is not selected will be given as a -1 (65535)