

## Appendix B: Memory Map and Alarm Register

### Modbus Memory Map

#### Date and Time Registers

The current time of the unit available in the Modbus registers below for the BMS to use Modbus data from these registers is transmitted as shown below in Table 1 (available through function codes 03h and 10h).

**Table 1 (Modbus Registers-Time of Day)**

Register Number	Data Type	Description
1412	int16	Month (1-12)
1413	int16	Day (1-31)
1414	int16	Year (1970-2030)
1415	int16	Hours (0-23)
1416	int16	Minutes (0-59)
1417	int16	Seconds (0-59)
1418	int16	Milliseconds (0-999)

#### System Status Registers

The current status of the unit available in the Modbus registers are below. Modbus data from these registers is transmitted as shown below in Table 2 (available through function codes 03h).

**Table 2 (Modbus Registers-System Status)**

Register Number	Data Type	Description
1002	int16	Summary Alarm
		Bit 0: (Set = Summary Alarm) Bit 2: (Set = Unacknowledged Events)
1003	int16	Outputs at UIB Port
1004	int16	Input on UIB Port
1005	int16	Board Temperature
1006	int16	Transformer 180degree status
1007	int16	Transformer 200degree status

## PDM Monitoring Registers

This Map includes all metering, alarm, and warning registers for the PDM system. All the registers have been defined as type int16.

**Table 3 Modbus Registers (PDM Monitoring)**

	Function Code	Parameter Name	Register Address	Scale	Notes
<b>Monitoring Registers</b>	<b>Holding Registers</b>				
		Output Voltage LL (A-B)	2	1	
		Output Voltage LL (B-C)	3	1	
		Output Voltage LL (C-A)	4	1	
		Output Voltage Phase A	5	10	
		Output Voltage Phase B	6	10	
		Output Voltage Phase C	7	10	
		Output Current Phase A	9	10	
		Output Current Phase B	10	10	
		Output Current Phase C	11	10	
		Ground Current	12	10	
		Neutral Current	13	10	
		Input Voltage LL (A-B)	14	10	
		Input Voltage LL (B-C)	15	10	
		Input Voltage LL (C-A)	16	10	
		Phase Sequence	17	1	ABC/BCA
		Frequency	18	10	
		Total KVA	19	10	
		Phase A KVA	20	10	
		Phase B KVA	21	10	
		Phase C KVA	22	10	
		Load Phase A	23	10	
		Load Phase B	24	10	
		Load Phase C	25	10	
		Total KW	26	10	
		Phase A KW	27	10	
		Phase B KW	28	10	
		Phase C KW	29	10	
		Phase A PF	30	100	
		Phase B PF	31	100	
		Phase C PF	32	100	
		Total kWh	33	1	
		Phase A kWh	34	10	
		Phase B kWh	35	10	

	Function Code	Parameter Name	Register Address	Scale	Notes
		Phase C kWh	36	10	
		Total kVAh	37	10	
		Phase A kVAh	38	10	
		Phase B kVAh	39	10	
		Phase C kVAh	40	10	
		Peak Demand KW	41	1	
		Phase A Voltage THD	42	10	
		Phase B Voltage THD	43	10	
		Phase C Voltage THD	44	10	
		Phase A Crest Factor	45	10	
		Phase B Crest Factor	46	10	
		Phase C Crest Factor	47	10	
		Phase A Current THD	48	10	
		Phase B Current THD	49	10	
		Phase C Current THD	50	10	
		Alarm Register 1	51	1	See Alarm Registers Table
		Alarm Register 2	52	1	
		Alarm Register 3	53	1	
		Alarm Register 4	54	1	
		Phase A Voltage Fundamental Voltage	61	100	
		Phase A Voltage First Harmonic Component	62	100	
		Phase A Voltage Third Harmonic Component	63	100	
		Phase A Voltage Fifth Harmonic Component	64	100	
		Phase A Voltage Seventh Harmonic Component	65	100	
		Phase A Voltage Ninth Harmonic Component	66	100	
		Phase B Voltage Fundamental Voltage	71	100	
		Phase B Voltage First Harmonic Component	72	100	

	Function Code	Parameter Name	Register Address	Scale	Notes
		PhaseB Voltage Third Harmonic Component	73	100	
		Phase B Voltage Fifth Harmonic Component	74	100	
		Phase B Voltage Seventh Harmonic Component	75	100	
		Phase B Voltage Ninth Harmonic Component	76	100	
		Phase C Voltage Fundamental Voltage	81	100	
		Phase C Voltage First Harmonic Component	82	100	
		Phase C Voltage Third Harmonic Component	83	100	
		Phase C Voltage Fifth Harmonic Component	84	100	
		Phase C Voltage Seventh Harmonic Component	85	100	
		Phase C Voltage Ninth Harmonic Component	86	100	
		Phase A Current Fundamental Voltage	91	100	
		Phase A Current First Harmonic Component	92	100	
		Phase A Current Third Harmonic Component	93	100	
		Phase A Current Fifth Harmonic Component	94	100	
		Phase A Current Seventh Harmonic Component	95	100	
		Phase A Current Ninth Harmonic Component	96	100	
		Phase B Current Fundamental Voltage	101	100	
		Phase B Current First Harmonic Component	102	100	
		PhaseB Current Third Harmonic Component	103	100	

	Function Code	Parameter Name	Register Address	Scale	Notes
		Phase B Current Fifth Harmonic Component	104	100	
		Phase B Current Seventh Harmonic Component	105	100	
		Phase B Current Ninth Harmonic Component	106	100	
		Phase C Current Fundamental Voltage	111	100	
		Phase C Current First Harmonic Component	112	100	
		Phase C Current Third Harmonic Component	113	100	
		Phase C Current Fifth Harmonic Component	114	100	
		Phase C Current Seventh Harmonic Component	115	100	
		Phase C Current Ninth Harmonic Component	116	100	
<b>Configuration Registers</b>	<b>Holding Registers/ Preset Single/ Preset Multiple</b>	Uart Baud Rate	205	1	
		Maximum Power Demand Period	206	1	
		Input Voltage Rating	207	1	
		Output Volotage Rating	208	1	
		Current Rating	209	1	
		Frequency Rating	210	1	
		Line CT Type	211	1	See CT Types Table
		Neutral CT Type	212	1	
		Output Over Voltage Alarm Threshold	213	1	
		Output Over Voltage Warning Threshold	214	1	
		Output Under Voltage Alarm Threshold	215	1	
		Output Under Voltage Warning Threshold	216	1	
		Over Current Alarm Threshold	217	1	
		Over Current Warning Threshold	218	1	



	Function Code	Parameter Name	Register Address	Scale	Notes
		Input Over Voltage Alarm Threshold	219	1	
		Input Over Voltage Warning Threshold	220	1	
		Input Under Voltage Alarm Threshold	221	1	
		Input Under Voltage Warning Threshold	222	1	
		Neutral Current Threshold	223	1	
		Ground Current Threshold	224	1	
<b>Reset</b>	Force Single Coil Register	Reset kWh/kVAh/Demand	2	1	0 Clears

## Alarm Registers

Alarm Registers		
<b>Alarm Register 1</b>		
	Bit 0	Phase AB Output Over Voltage Alarm
	Bit 1	Phase AB Output Under Voltage Alarm
	Bit 2	Phase BC Output Over Voltage Alarm
	Bit 3	Phase BC Output Under Voltage Alarm
	Bit 4	Phase CA Output Over Voltage Alarm
	Bit 5	Phase CA Output Under Voltage Alarm
	Bit 6	Phase A Output Over Voltage Alarm
	Bit 7	Phase A Output Under Voltage Alarm
	Bit 8	Phase B Output Over Voltage Alarm
	Bit 9	Phase B Output Under Voltage Alarm
	Bit 10	Phase C Output Over Voltage Alarm
	Bit 11	Phase C Output Under Voltage Alarm
	Bit 12	Rsvd
	Bit 13	Phase A Output Over Current Alarm
	Bit 14	Phase B Output Over Current Alarm
	Bit 15	Phase C Output Over Current Alarm
<b>Alarm Register 2</b>		
	Bit 0	Phase AB Input Over Voltage Alarm
	Bit 1	Phase AB Input Under Voltage Alarm
	Bit 2	Phase BC Input Over Voltage Alarm
	Bit 3	Phase BC Input Under Voltage Alarm
	Bit 4	Phase CA Input Over Voltage Alarm
	Bit 5	Phase CA Input Under Voltage Alarm
	Bit 6	Neutral Over Current Alarm
	Bit 7	Ground Over Current Alarm
	Bit 8	Over Frequency Alarm
	Bit 9	Under Frequency Alarm
	Bit 10	Rsvd
	Bit 11	Phase Loss Alarm

## Alarm Registers

Alarm Register 3		
	Bit 0	Phase AB Output Over Voltage Warning
	Bit 1	Phase AB Output Under Voltage Warning
	Bit 2	Phase BC Output Over Voltage Warning
	Bit 3	Phase BC Output Under Voltage Warning
	Bit 4	Phase CA Output Over Voltage Warning
	Bit 5	Phase CA Output Under Voltage Warning
	Bit 6	Phase A Output Over Voltage Warning
	Bit 7	Phase A Output Under Voltage Warning
	Bit 8	Phase B Output Over Voltage Warning
	Bit 9	Phase B Output Under Voltage Warning
	Bit 10	Phase C Output Over Voltage Warning
	Bit 11	Phase C Output Under Voltage Warning
	Bit 12	Rsvd
	Bit 13	Phase A Output Over Current Warning
	Bit 14	Phase B Output Over Current Warning
	Bit 15	Phase C Output Over Current Warning
Alarm Register 4		
	Bit 0	Phase AB Input Over Voltage Warning
	Bit 1	Phase AB Input Under Voltage Warning
	Bit 2	Phase BC Input Over Voltage Warning
	Bit 3	Phase BC Input Under Voltage Warning
	Bit 4	Phase CA Input Over Voltage Warning
	Bit 5	Phase CA Input Under Voltage Warning





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## **Appendix C: Access**

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