Solectria Modbus Level 8

For models

SGI 500XTM/750XTM

Revision B

DOCR-070522-B

Table of Contents

1 Solectria Modbus Level 8

Introduction:
This manual explains the Modbus protocol in use for Solectria Renewable's inverters and equipment. This does not include the history of Modbus or the details regarding the creation of the protocols. It is expected that the person(s) reading this manual have a clear understanding of Modbus.

Each register/data point contains a raw 16-bit signed or unsigned number. The appropriate multiplier must be applied to each word to obtain the scaled representation. Each word is ordered {MSB, LSB}.

Registers can be read using Modbus function code three (3) and certain registers can be written with Modbus function code six (6). Offsets are as given. The equivalent Modicon register is also provided (Offset+40001).

1.1 Determining the Modbus Level

Various Modbus levels are available on inverters produced by Solectria, depending on inverter model and firmware release. The Modbus level can be determined by performing a Modbus read (function 3) to Offset 38. All inverters implementing this particular Modbus level will return a value of eight (8) for this register.

Modbus Level Supported

Modbus Offset:	38
Modicon Register:	40039
Type:	int16u
Write:	No
Data Value:	8
Description:	Indicates Modbus Level supported by a particular inverter.

1.2 Alarms

Critical Alarms

Modbus Offset: 15
Modicon Register: 40016
Type: int16u
Write: No
Memory Type: -
Data Value (Min/Max): 0/65535
Description: See Alarm Definitions Below -

Critical Alarms			
Bit	**Alarm Description**	**AC Power Produced?**	**Site Visit Recommended?**
15	Reserved	-	-
14	Reserved	-	-
13	Shunt Trip	No	Yes
12	RCM Fault	No	Yes
11	Incorrect Phase	No	Yes
10	Reserved	-	-
9	Open Phase Failure	No	Yes*
8	VAC Sense Circuit Failure	No	Yes
7	Ground Fault Failure	No	Yes
6	MOV Failure	Yes	Yes
5	AC Current Sensor Circuit Failure	No	Yes
4	Contactor Failure	No	Yes
3	Power Stage Desaturation	No	Yes
2	Power Stage Temperature Out of Range	No	Yes
1	Reserved	-	-
0	Reserved	-	-

* Open phase alerts may be due to temporary grid disturbances not related to the Inverter. In case of open phase alerts that do not clear, a site visit is required to investigate.

Informative Alarms 1

Modbus Offset: 16
Modicon Register: 40017
Type: int16u
Write: No
Memory Type: -
Data Value (Min/Max): 0/65535
Description: See Alarm Definitions Below -

Informative Alarms 1

Bit	Alarm Description	AC Power Produced?	Site Visit Recommended?
15	Unintentional Islanding	No	No
14	Waiting for Grid	No	No
13	AC Frequency High	No	No
12	AC Frequency Low	No	No
11	Fan Life Reached	Yes	Yes
10	Reserved	-	-
9	Waiting for Restart	No	No
8	Power Stage Temperature Limit Exceeded	Yes	No
7	Reserved	-	-
6	Reserved	-	-
5	AC Voltage Critical High	No	No
4	AC Voltage High	No	No
3	AC Voltage Low	No	No
2	AC Voltage Critical Low	No	No
1	DC Voltage High	No	No
0	Reserved	-	-

Informative Alarms 2

Modbus Offset: 19
Modicon Register: 40020
Type: int16u
Write: No
Memory Type: -
Data Value (Min/Max): 0/65535
Description: See Alarm Definitions Below -

Informative Alarms 2

Bit	Alarm Description	AC Power Produced?	Site Visit Recommended?
15	Slave Temperature Sensor Error	Yes	Yes
14	Master Temperature Sensor Error	Yes	Yes
13	Soft Shutdown	No	No
12	Reserved	-	-
11	Reserved	-	-
10	Remote Shutdown	No	No
9	RCM Error	Yes	Yes
8	Reserved	-	-
7	Reserved	-	-
6	Reserved	-	-
5	Reserved	-	-
4	DC Contactor Failure	Yes	Yes
3	Reserved	-	-
2	Reserved	-	-
1	Reserved	-	-
0	Reserved	-	-

1.3 Metering

DC Voltage

Modbus Offset:	0
Modicon Register:	40001
Unit:	V
Type:	int16s
Write:	No
Memory Type:	-
Multiplier:	0.1953125
Data Value (Min/Max):	0/5632
Scaled Value (Min/Max):	0/1100
Description:	Measured DC input voltage in Volts. A value of 32768 (8000h) means that the DC contactors are open and no DC Voltage measurement is available.

Apparent AC Power Output

Modbus Offset:	1
Modicon Register:	40002
Unit:	VA
Type:	int16u
Write:	No
Memory Type:	-
Multiplier:	19.53125
Data Value (Min/Max):	0/40960
Scaled Value (Min/Max):	0/800000
Description:	Measured apparent power output in VA

Real AC Power Output

Modbus Offset:	80
Modicon Register:	40081
Unit:	W
Type:	int16u
Write:	No
Memory Type:	-
Multiplier:	19.53125
Data Value (Min/Max):	0/40960
Scaled Value (Min/Max):	0/800000
Description:	Measured real power output in Watts

AC Grid Frequency

Modbus Offset: 2
Modicon Register: 40003
Unit: Hz
Type: int16s
Write: No
Memory Type: -
Multiplier: 0.00610352
Data Value (Min/Max): 0/10322
Scaled Value (Min/Max): 0.0/63.0
Description: Measured grid frequency in Hz

L1-to-L2 AC Voltage

Modbus Offset: 4
Modicon Register: 40005
Unit: V
Type: int16s
Write: No
Memory Type: -
Multiplier: 0.1953125
Data Value (Min/Max): 0/2345
Scaled Value (Min/Max): 0/458
Description: Line-to-line voltage between L1 and L2

L2-to-L3 AC Voltage

Modbus Offset: 5
Modicon Register: 40006
Unit: V
Type: int16s
Write: No
Memory Type: -
Multiplier: 0.1953125
Data Value (Min/Max): 0/2345
Scaled Value (Min/Max): 0/458
Description: Line-to-line voltage between L2 and L3

L1-to-L3 AC Voltage

Modbus Offset: 6
Modicon Register: 40007
Unit: V
Type: int16s
Write: No
Memory Type: -
Multiplier: 0.1953125
Data Value (Min/Max): 0/2345
Scaled Value (Min/Max): 0/458
Description: Line-to-line voltage between L1 and L3

Phase Sequence

Modbus Offset: 7
Modicon Register: 40008
Unit: -
Type: int16s
Write: No
Memory Type: -
Data Value (Min/Max): 0/2
Description: Phase sequence of 3 phase system.
0: Not Locked; 1:CW (ABC); 2:CCW (ACB)

Inverter Output Current Average

Modbus Offset: 93
Modicon Register: 40094
Unit: A
Type: int16s
Write: No
Memory Type: -
Multiplier: 0.0976563
Data Value (Min/Max): 0/15360
Scaled Value (Min/Max): 0/1500
Description: Average output current of all three phases.

1.4 SolZone™

This group contains the measured PV zone currents. SolZone current measurement is an optional feature that may not be present on all units.

Zone 1-8 DC Current

Modbus Offset:	20-27
Modicon Register:	40021-40028
Unit:	A
Type:	int16s
Write:	No
Memory Type:	-
Multiplier:	0.1
Data Value (Min/Max):	0/3000
Scaled Value (Min/Max):	0/300
Description:	Measured PV zone currents in Amps. A value of 32768 (8000h) means that SolZone sensor is disconnected

Zone 9-16 DC Current

Modbus Offset:	142-149
Modicon Register:	40143-40150
Unit:	A
Type:	int16s
Write:	No
Memory Type:	-
Multiplier:	0.1
Data Value (Min/Max):	0/3000
Scaled Value (Min/Max):	0/300
Description:	Measured PV zone currents in Amps. A value of 32768 (8000h) means that SolZone sensor is disconnected

Total Current All Zones

Modbus Offset:	28
Modicon Register:	40029
Unit:	A
Type:	int16u
Write:	No
Memory Type:	-
Multiplier:	0.1
Data Value (Min/Max):	0/48000
Scaled Value (Min/Max):	0/4800
Description:	Sum of PV zone currents. A value of 32768 (8000h) means that none of the SolZone sensors are connected

1.5 Energy

AC Energy MSW

Modbus Offset: 8
Modicon Register: 40009
Unit: kWh
Type: int16u
Write: No
Memory Type: -
Multiplier: 0.1
Data Value (Min/Max): 0/65535
Scaled Value (Min/Max): 0/6553
Description: Total AC energy generated over inverter's lifetime Most Significant Word (MSW).
Cumulative Energy AC Energy=((MSW*65536) + LSW) * 0.1
Note: This formula assume raw data and not scaled data.

AC Energy LSW

Modbus Offset: 9
Modicon Register: 40010
Unit: kWh
Type: int16u
Write: No
Memory Type: -
Multiplier: 0.1
Data Value (Min/Max): 0/65535
Scaled Value (Min/Max): 0/6553
Description: Total AC energy generated over inverter's lifetime Least Significant Word (LSW).
Cumulative Energy AC Energy=((MSW*65536) + LSW) * 0.1
Note: This formula assume raw data and not scaled data.

1.6 Historical Statistics

On-Grid Hours

Modbus Offset:	11
Modicon Register:	40012
Unit:	Hour
Type:	int16u
Write:	No
Memory Type:	-
Multiplier:	1.0
Data Value (Min/Max):	0/65535
Scaled Value (Min/Max):	0/65535
Description:	Total hours the inverter has been connected to the grid over its lifetime.

Fan On-Time Hours

Modbus Offset:	12
Modicon Register:	40013
Unit:	Hour
Type:	int16u
Write:	No
Memory Type:	-
Multiplier:	1.0
Data Value (Min/Max):	0/65535
Scaled Value (Min/Max):	0/65535
Description:	Total hours the fan has been in operation.

1.7 AC Protection Settings

The AC Protection Setting contains the trip levels and time delay parameters for the AC protection functions.

All voltage settings are line-to-line voltage values.

WARNING: The line voltage and frequency protection functions are preset to conform to UL 1741 and IEEE 1547 standards. The inverter is capable of operating outside these limits, but changing the settings could invalidate the Nationally Recognized Testing Laboratory (NRTL) listing.

AC Over Voltage Setting

Modbus Offset:	40
Modicon Register:	40041
Unit:	V
Type:	int16s
Write:	Yes
Memory Type:	Parameter. Setting remembered next day.
Multiplier:	0.1953125
Value (min/max):	100% to 120% of the nominal voltage.
Default:	110% of the nominal voltage.
Description:	Voltage level that the line voltage feedback has to be above, for the time specified by 'AC Over Voltage Clearing time' (Offset 48) parameter for an 'AC Voltage High' fault (Offset 16, Bit 4) to occur.

AC Critical Over Voltage Setting

Modbus Offset:	41
Modicon Register:	40042
Unit:	V
Type:	int16s
Write:	No
Memory Type:	Parameter. Setting remembered next day.
Multiplier:	0.1953125
Value (min/max):	100% to 120% of the nominal voltage.
Default:	120% of the nominal voltage.
Description:	Voltage level that the line voltage feedback has to be above, for duration of 160ms for an 'AC Voltage Critical High' fault (Offset 16, Bit 5) to occur.

AC Reconnect Over Voltage Setting

Modbus Offset:	42
Modicon Register:	40043
Unit:	V
Type:	int16s
Write:	No
Memory Type:	Parameter. Setting remembered next day.
Multiplier:	0.1953125
Description:	Voltage level that the line voltage feedback has to be below, for the inverter to clear the 'AC Voltage High' fault (Offset 16, Bit 4) and reconnect to the grid.

AC Under Voltage Setting

Modbus Offset: 43
Modicon Register: 40044
Unit: V
Type: int16s
Write: No
Memory Type: Parameter. Setting remembered next day.
Multiplier: 0.1953125
Value (min/max): 50% to 100% of the nominal voltage.
Default: 88% of the nominal voltage
Description: Voltage level that the line voltage feedback has to be below, for the time specified by 'AC Under Voltage Clearing Time' (Offset 49) for an 'AC Voltage Low' fault (Offset 16, Bit 3) to occur.

AC Critical Under Voltage Setting

Modbus Offset: 44
Modicon Register: 40045
Unit: V
Type: int16s
Write: No
Memory Type: Parameter. Setting remembered next day.
Multiplier: 0.1953125
Value (min/max): 50% to 100% of the nominal voltage.
Default: 50% of the nominal voltage.
Description: Voltage level that the line voltage feedback has to be below, for 160ms duration for an 'AC Voltage Critical Low' fault (Offset 16, Bit 2) to occur.

AC Over Frequency Setting

Modbus Offset: 45
Modicon Register: 40046
Unit: Hz
Type: int16s
Write: No
Memory Type: -
Multiplier: 0.00610352
Data Value: 9912
Scaled Value: 60.5
Default: 60.5 Hz
Description: Line frequency has to be above this value, for duration of 160ms for an 'AC Frequency High' (Offset 16, Bit 13) fault to occur.

AC Under Frequency Setting

Modbus Offset: 46
Modicon Register: 40047
Unit: Hz
Type: int16s
Write: No
Memory Type: Parameter. Setting remembered next day.
Multiplier: 0.00610352
Data Value (Min/Max): 9339/9798
Scaled Value (Min/Max): 57/59.8
Default: 59.3 Hz
Description: Line frequency has to be below this value, for the time specified by 'AC Under Frequency Clearing Time' (Offset 50) parameter for an 'AC Frequency Low' (Offset 16, Bit 12) fault to occur.

AC Critical Under Frequency Setting

Modbus Offset: 47
Modicon Register: 40048
Unit: Hz
Type: int16s
Write: No
Memory Type: -
Multiplier: 0.00610352
Data Value (Min/Max): 9339
Scaled Value (Min/Max): 57
Default 57.0 Hz
Description: Line frequency has to be below this value, for duration of 160ms for an 'AC Frequency Low' (Offset 16, Bit 12) fault to occur.

AC Over Voltage Clearing Time

Modbus Offset: 48
Modicon Register: 40049
Unit: Sec
Type: int16s
Write: No
Memory Type: Parameter. Setting remembered next day.
Multiplier: 0.01
Data Value (Min/Max): 16/3000
Scaled Value (Min/Max): 0.16/30
Default: 1 second (scaled value =1, data value = 100)
Description: Duration that the line voltage feedback has to be above the level specified by the 'AC Over Voltage Setting' (Offset 40) for an 'AC Voltage High' fault (Offset 16, Bit 4) to occur.

AC Under Voltage Clearing Time

Modbus Offset: 49
Modicon Register: 40050
Unit: Sec
Type: int16s
Write: No
Memory Type: Parameter. Setting remembered next day.
Multiplier: 0.01
Data Value (Min/Max): 16/3000
Scaled Value (Min/Max): 0.16/30
Default: 2 seconds (scaled value = 2, data value = 200)
Description: Duration that the line voltage feedback has to be below the level specified by the 'AC Under Voltage Setting' (Offset 43) for an 'AC Voltage Low' (Offset 16, Bit 3) fault to occur.

AC Under Frequency Clearing Time

Modbus Offset: 50
Modicon Register: 40051
Unit: Sec
Type: int16s
Write: No
Memory Type: Parameter. Setting remembered next day.
Multiplier: 0.01
Data Value (Min/Max): 16/30000
Scaled Value (Min/Max): 0.16/300
Default: 0.16 second (scaled value =0.16, data value = 16)
Description: Duration that the line frequency feedback has to be below the level specified by 'AC Under Frequency Setting' (Offset 46) for an 'AC Frequency Low' (Offset 16, Bit 12) fault to occur.

UL Fault Reconnect Wait Time Setting

Modbus Offset:	51
Modicon Register:	40052
Unit:	Sec
Type:	int16u
Write:	No
Memory Type:	Parameter. Setting remembered next day.
Multiplier:	0.01
Data Value (Min/Max):	100/30000
Scaled Value (Min/Max):	1/300
Default:	300 seconds (scaled value =300, data value = 30000)
Description:	Duration the inverter remains disconnected from the grid after a protection fault is cleared.

UL Wait Time Remaining

Modbus Offset:	83
Modicon Register:	40084
Unit:	sec
Type:	int16s
Write:	No
Memory Type:	-
Multiplier:	-
Description:	Countdown for the inverter to reconnect to the grid after a protection fault is cleared. Countdown starts from 'UL Fault Reconnect Wait Time Setting' (Offset 51).

1.8 Power Control

Disable Power Remotely By Message

Modbus Offset: 112
Modicon Register: 40113
Unit: -
Type: int16s
Write: Yes
Memory Type: Variable.
Multiplier: -
Data Value (Min/Max): 0/1
Description: Temporary AC Power Disable.
When this register is set to 1, AC power output is disabled. A register value of '0' enables power output. This register resets to value '0' when the inverter is started.
The effects are immediate,
See the Installation and Operation manual for ramp times and other operational details.

Temporary AC Output Current Limit

Modbus Offset: 61
Modicon Register: 40062
Unit: %
Type: int16s
Write: Yes
Memory Type: Variable.
Multiplier: 0.006103515625
Data Value (Min/Max): 0/100
Description: This register temporarily controls the inverter AC output current from 0 - 100% of its rating.
The effects are immediate
See the Installation and Operation manual for other operational details

Permanent AC Output Limit Percentage

Modbus Offset: 158
Modicon Register: 40159
Unit: %
Type: int16u
Write: No
Memory Type:
Multiplier: 0.006103515625
Data Value (Min/Max): 0/100
Description: This register shows the permanent limiting value the inverter is set to.
The range is from 0% - 100% of its rating.
The inverter AC power must be recycled for this limit to take effect, or wait until the next day.

Permanent AC Output Limit Mode

Modbus Offset:	58
Modicon Register:	40059
Unit:	-
Type:	int16u
Write:	No
Memory Type:	Parameter. Setting remembered next day.
Multiplier:	-
Data Value (Min/Max):	0/1
Description:	This register determines whether the Permanent AC Output Limit Percentage (Offset 158) is Current limiting or Power Limiting. 0 = Limit Current. 1= Limit Power. Default 0 The inverter AC power must be recycled for this limit to take effect, or wait until the next day.

1.9 Temperature Feedback

Internal Temperature 1

Modbus Offset:	84
Modicon Register:	40085
Unit:	°C
Type:	int16s
Write:	No
Memory Type:	-
Multiplier:	0.0976563
Data Value (Min/Max):	-410/1536
Scaled Value (Min/Max):	-40/150
Description:	Power Stage 1 internal temperature.

Internal Temperature 2

Modbus Offset:	87
Modicon Register:	40088
Unit:	°C
Type:	int16s
Write:	No
Memory Type:	-
Multiplier:	0.0976563
Data Value (Min/Max):	-410/1536
Scaled Value (Min/Max):	-40/150
Description:	Power Stage 2 internal temperature

Internal Temperature 3

Modbus Offset:	90
Modicon Register:	40091
Unit:	°C
Type:	int16s
Write:	No
Memory Type:	-
Multiplier:	0.0976563
Data Value (Min/Max):	-410/1536
Scaled Value (Min/Max):	-40/150
Description:	Power Stage 3 internal temperature Applies only to a 750 kW model.

1.10 Communications Settings

Network ID

Modbus Offset:	14
Modicon Register:	40015
Unit:	-
Type:	int16u
Write:	Yes
Memory Type:	Parameter. Setting remembered next day.
Multiplier:	-
Data Value (Min/Max):	1/247
Description:	Modbus ID of the Inverter. Note that the change takes immediate effect. The next communication with the inverter has to use the new ID. While the Inverter supports Modbus ID range from 1 to 247, it supports only up to 16 slave devices on the Modbus, including the Modbus Master.

1.11 Nameplate Information

Inverter Manufacturer Year and Month

Modbus Offset:	31
Modicon Register:	40032
Unit:	-
Type:	int16u
Write:	No
Memory Type:	-
Multiplier:	-
Description:	Inverter Serial Number appears as YYMMDD-##; this register is for YYMM in hex format

Inverter Manufacturer Day and Serial Number

Modbus Offset:	32
Modicon Register:	40033
Unit:	-
Type:	int16u
Write:	No
Memory Type:	-
Multiplier:	-
Description:	Inverter Serial Number appears as YYMMDD-##; this register is for DD## in hex format

Inverter Power Level

Modbus Offset: 73
Modicon Register: 40074
Unit: kW
Type: int16u
Write: No
Memory Type: -
Multiplier: -
Description: Inverter Nameplate Power capability.

Inverter AC Voltage Level

Modbus Offset: 75
Modicon Register: 40076
Unit: V
Type: int16u
Write: No
Memory Type: -
Multiplier: -
Description: Inverter Nameplate AC Voltage capability.

2 Modbus Register Table

Register	Offset	Description	Group	Unit	Multiplier	Type	Write
40001	0	DC Voltage	Metering	V	0.1953125	int16s	No
40002	1	Apparent AC Power Output	Metering	VA	19.53125	int16u	No
40003	2	AC Grid Frequency	Metering	Hz	0.00610352	int16s	No
40005	4	L1-to-L2 AC Voltage	Metering	V	0.1953125	int16s	No
40006	5	L2-to-L3 AC Voltage	Metering	V	0.1953125	int16s	No
40007	6	L1-to-L3 AC Voltage	Metering	V	0.1953125	int16s	No
40008	7	Phase Sequence	Metering	-	-	int16s	No
40009	8	AC Energy MSW	Energy	kWh	0.1	int16u	No
40010	9	AC Energy LSW	Energy	kWh	0.1	int16u	No
40012	11	On-Grid Hours	Historical Stat	Hour	1	int16u	No
40013	12	Fan On-Time Hours	Historical Stat	Hour	1	int16u	No
40015	14	Network ID	Communications	-	-	int16u	Yes
40016	15	Critical Alarms	Alarms	-	-	int16u	No
40017	16	Informative Alarms 1	Alarms	-	-	int16u	No
40020	19	Informative Alarms 2	Alarms	-	-	int16u	No
40021	20	Zone 1 DC Current	SolZone	A	0.1	int16s	No
40022	21	Zone 2 DC Current	SolZone	A	0.1	int16s	No
40023	22	Zone 3 DC Current	SolZone	A	0.1	int16s	No
40024	23	Zone 4 DC Current	SolZone	A	0.1	int16s	No
40025	24	Zone 5 DC Current	SolZone	A	0.1	int16s	No
40026	25	Zone 6 DC Current	SolZone	A	0.1	int16s	No
40027	26	Zone 7 DC Current	SolZone	A	0.1	int16s	No
40028	27	Zone 8 DC Current	SolZone	A	0.1	int16s	No
40029	28	Total DC Current all Zones	SolZone	A	0.1	int16u	No
40032	31	Inverter Manufacturer Year and Month	Nameplate Info	-	-	int16u	No
40033	32	Inverter Manufacturer Day and Serial Number	Nameplate Info	-	-	int16u	No
40039	38	Modbus Level Supported	Modbus Level	-	-	Int16u	No
40041	40	AC Over Voltage Setting	AC Protection	V	0.1953125	int16s	No
40042	41	AC Critical Over Voltage Setting	AC Protection	V	0.1953125	int16s	No
40043	42	AC Reconnect Over Voltage Setting	AC Protection	V	0.1953125	int16s	No
40044	43	AC Under Voltage Setting	AC Protection	V	0.1953125	int16s	No
40045	44	AC Critical Under Voltage Setting	AC Protection	V	0.1953125	int16s	No
40046	45	AC Over Frequency Setting	AC Protection	Hz	0.00610352	int16s	No
40047	46	AC Under Frequency Setting	AC Protection	Hz	0.00610352	int16s	No
40048	47	AC Critical Under Frequency Setting	AC Protection	Hz	0.00610352	int16s	No
40049	48	AC Over Voltage Clearing Time	AC Protection	sec	0.01	int16s	No
40050	49	AC Under Voltage Clearing Time	AC Protection	sec	0.01	int16s	No
40051	50	AC Under Frequency Clearing Time	AC Protection	sec	0.01	int16s	No
40052	51	UL Fault Reconnect Wait Time Setting	AC Protection	sec	0.01	int16u	No
40059	58	Permanent AC Output Limit Mode	Power Control	-	-	int16u	No
40062	61	Temporary AC Output Current Limit	Power Control	%	0.006103515625	Int16s	Yes

Register	Offset	Description	Group	Unit	Multiplier	Type	Write
40074	73	Inverter Power Level	Nameplate Info	kW	-	Int16u	No
40076	75	Inverter AC Voltage Level	Nameplate Info	V	-	Int16u	No
40081	80	Real AC Power Output	Metering	W	19.53125	int16u	No
40084	83	UL Wait Time Remaining	AC Protection	sec	0.01	Int16s	No
40085	84	Internal Temperature 1	Temperature	°C	0.0976563	int16s	No
40088	87	Internal Temperature 2	Temperature	°C	0.0976563	int16s	No
40091	90	Internal Temperature 3	Temperature	°C	0.0976563	int16s	No
40094	93	Inverter Output Current Average	Metering	A	0.0976563	int16s	No
40113	112	Disable Power Remotely By Message	Power Control	-	-	int16s	Yes
40143	142	Zone 9 DC Current	SolZone	A	0.1	int16s	No
40144	143	Zone 10 DC Current	SolZone	A	0.1	int16s	No
40145	144	Zone 11 DC Current	SolZone	A	0.1	int16s	No
40146	145	Zone 12 DC Current	SolZone	A	0.1	int16s	No
40147	146	Zone 13 DC Current	SolZone	A	0.1	int16s	No
40148	147	Zone 14 DC Current	SolZone	A	0.1	int16s	No
40149	148	Zone 15 DC Current	SolZone	A	0.1	int16s	No
40150	149	Zone 16 DC Current	SolZone	A	0.1	int16s	No
40159	158	Permanent AC Output Limit Percentage	Power Control	%	0.006103515625	int16u	No

3 Rev B Technical Document Changes:

Page	Register Offset	Comment
11	8	Added a clarification about how to use the total energy formula
11	9	Added a clarification about how to use the total energy formula
13	41	Changed AC Critical Over Voltage Setting; Write from Yes to No
14	43	Changed AC Under Voltage Setting; Write from Yes to No
14	44	Changed AC Critical Under Voltage Setting; Write from Yes to No
15	46	Changed AC Under Frequency Setting; Write from Yes to No
16	48	Changed AC Over Voltage Clearing Time; Write from Yes to No
16	49	Changed AC Under Voltage Clearing Time; Write from Yes to No
16	50	Changed AC Under Frequency Clearing Time; Write from Yes to No
17	51	Changed UL Fault Reconnect Wait Time Setting; Write from Yes to No
19	58	Changed Permanent AC Output Limit Mode: Write from Yes to No
21	14	Changed the Modbus ID range from 16 to 247
21	14	Added a note about how many devices are supported on the Modbus
23	1	Corrected data type from int16s to int16u
23	28	Corrected data type from int16s to int16u
23	58	Corrected Write from Yes to No
24	80	Corrected data type from int16s to int16u
24	158	Register offset 158 Permanent AC Output Limit Percentage was missing from the summary table.