OffGrid Modbus RS485&RS232 RTU Protocol

V0.26

2024-07-15

No.	Version	Date	Notice	Signature
1	V0.01	2016-12-27	The first version	Zhenyuan.li
2	V0.02	2017-1-12	1、modify input reg 0, system status; 2、add input reg 44 for send DTC to server to identify machine type;	Zhenyuan.li
3	V0.03	2017-2-6	1、modify Holding reg 29, Model Low;	Zhenyuan.li
4	V0.04	2017-2-16	1、add Holding reg 39, battery type; 2、modify Holding reg 0, On/Off; 3、modify Input reg 46, Production Line Mode;	Zhenyuan.li
5	V0.05	2017-3-10	1、modify Input reg 17、28、29, Battery Voltage;	Zhenyuan.li
6	V0.06	2017-3-15	1、modify Holding reg 29, Model L;	Zhenyuan.li
7	V0.07	2017-5-25	1、modify Hold reg 29; 2、modify Input reg 36~39; 3、add Input reg 68~82;	Zhenyuan.li
8	V0.08	2017-5-26	1、add Input reg 90~131 for BMS infomation;	Zhenyuan.li
9	V0.09	2017-7-4	1、add Input reg 135~179 for SolarCharger infomation;	Zhenyuan.li
10	V0.10	2017-7-12	1、add Input reg 83~86 for Machine Rate Power ;	Zhenyuan.li
11	V0.11	2017-8-09	1、Change Machine Rate Power from Input Reg 83~86 to Holding Reg 76~79; 2、Adjust BMS info, and add BMS2 info; 3、Add Solar Charger Info at Input Reg 180~224;	Zhenyuan.li
12	V0.13	2020-06-16		Jianjian.Yu
13	V0.14	2020-10-16	Modify 37,82,95 holding register's description	Jianjian.Yu

14	V0.15	2020-04-20	Add 41 and 42 new function of holding register; Modify 43 of input register;	Xiao.jin
15	V0.16	2021-07-20	Add 102~107 registers for remote debug	Jianjian.yu
16	V0.17	2022-06-22	Modify 45~47 registers for Export to Grid Energy	JianJian.yu
17	V0.18	2023-05-23	Add Input reg 200~289 for BMS Info	Fujin.Lu
18	V0.19	2023-07-05	Add 115~117 for gridtie of command 03; Add 92~97 for Generator energy for command 04;	Jah
19	V0.20	2023-07-05	Add 97 for Generator voltage for command 04;	Jinajian.yu
20	V0.21	2023-08-28	1、 Add 118-136 for Battery Feed parameter for command 03 ; 2、 Add 83 and 137 for Generator Parameter Setting for command 03; 3、Add 98~101 for Battery charge energy for command 04; 4、Modify 00 for System Status for command 04;	Jah
21	V0.22	2024-01-08	1、 Modify Holding Reg 03~06, 119, 125~136; 2、 Add 108-109 registers for command 04; 3、 Add 51-56 for remote diagnosis for command 03	Zhangqu
22	V0.23	2024-03-15	Add 300-423 registers for command 03;	Zhangqu
23	V0.24	2024-05-30	1、 Add 138-166 registers for command 03; Add 109-111 registers for command 04;	Zhangqu
24	V0.25	2024-06-13	Add 107 registers for command 04;	Fujin.Lu
25	V0.26	2024-07-15	1、Add 167,168,169,426 registers for command 03; 2 、 Add 102-106 registers for command 04;	Zhangqu

1 Data format

Address	Function	Data	CRC check
8 bits	8 bits	N×8bits	16bits

Valid slave device addresses are in the range of 0 – 247 decimal.

The individual slave devices are assigned addresses in the range of 1 – 247.

0 is the broadcast address

253 only for debug

It is 16bits (two bytes) unsigned integer for each holding and input register;

2 Command Format

Function 3 Read holding register

QUERY

Field Name	Example (Hex)
Slave Address	01
Function	03
Starting Address Hi	00
Starting Address Lo	6B
No. of Points Hi	00
No. of Points Lo	03
Error Check (LRC or CRC)	—

RESPONSE

Field Name	Example (Hex)
Slave Address	01
Function	03
Byte Count	06
Data Hi (Register 40108)	02
Data Lo (Register 40108)	2B
Data Hi (Register 40109)	00
Data Lo (Register 40109)	00
Data Hi (Register 40110)	00
Data Lo (Register 40110)	64
Error Check (LRC or CRC)	—

Response Error:

11 0x80|0x03 Errornum CRC (Errornum as a byte)

Function 4 Read input register

QUERY

Field Name	Example (Hex)
Slave Address	01
Function	04
Starting Address Hi	00
Starting Address Lo	08
No. of Points Hi	00
No. of Points Lo	01
Error Check (LRC or CRC)	—

RESPONSE

Field Name	Example (Hex)
Slave Address	01
Function	04
Byte Count	02
Data Hi (Register 30009)	00
Data Lo (Register 30009)	0A
Error Check (LRC or CRC)	—

Response Error:

11 0x80|0x04 Errornum CRC (Errornum as a byte)

Function 6 Preset single register

QUERY

Field Name	Example (Hex)
Slave Address	01
Function	06
Register Address Hi	00
Register Address Lo	01
Preset Data Hi	00
Preset Data Lo	03
Error Check (LRC or CRC)	—

RESPONSE

Field Name	Example (Hex)
Slave Address	01
Function	06
Register Address Hi	00
Register Address Lo	01
Preset Data Hi	00
Preset Data Lo	03
Error Check (LRC or CRC)	—

Response Error:

11 0x80|0x06 Errornum CRC (Errornum as a byte)

Function 16 Preset multiple register

QUERY

Field Name	Example (Hex)
Slave Address	01
Function	10
Starting Address Hi	00
Starting Address Lo	01
No. of Registers Hi	00
No. of Registers Lo	02
Byte Count	04
Data Hi	00
Data Lo	0A
Data Hi	01
Data Lo	02
Error Check (LRC or CRC)	—

RESPONSE

Field Name	Example (Hex)
Slave Address	01
Function	10
Starting Address Hi	00
Starting Address Lo	01
No. of Registers Hi	00
No. of Registers Lo	02
Error Check (LRC or CRC)	—

Response Error:

11 0x80|0x10 Errornum CRC (Errornum as a byte)

3 Device Message Transmission Mode / Framing

RTU Mode
When controllers are setup to communicate on a Modbus network using RTU (Remote Terminal Unit) mode, each 8–bit byte in a message contains two 4–bit hexadecimal characters. Each message must be transmitted in a continuous stream.

The format for each byte in RTU mode is:

Coding System: 8–bit binary, hexadecimal 0–9, A–F
Two hexadecimal characters contained in each
8–bit field of the message

Bits per Byte:

1 start bit
8 data bits, least significant bit sent first
None parity
1 stop bit
Error Check Field: Cyclical Redundancy Check (CRC)

The baud rate of the transmission is:

Baud Rate: 9600 bps

Minimum CMD period (RS485 Time out): 850ms.

Wait for minimum 850ms to send a new CMD after last CMD. Suggestion is 1s;

Maximum Data Length Define:

Maximum read data length is 45 words in read command;
Maximum update data length is 45 words in preset command;
Read or update registers NO. should in the range of times of 45,
eg: 1~45 or 96~123 are OK, but 40~60 is not OK;

4 Register map

It is 16bits (two bytes) unsigned integer for each holding and input register;

4.1 Holding Reg

Reg NO.	Variable Name	Description	Customer Write	Value		Unit	Initial value	Note
00	On/Off	The Standby On/Off state and the AC output DisEN/EN state; The low byte is the Standby on/off(1/0), the high byte is the AC output disable/enable (1/0).		0x0000: Output enable; 0x0100: Output disable;			0	
01	OutputConfig	AC output set	W	0: BAT First; 1: PV First; 2: UTI First; 3: PV&UTI First			0	
02	ChargeConfig	Charge source set	W	0: PV first; 1: PV&UTI; 2: PV Only;			0	
03	UtiOutStart	Uti Output Start Time	W	bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
04	UtiOutEnd	Uti Output End Time	W	bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
05	UtiChargeStart	Uti Charge Start Time	W	bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
06	UtiChargeEnd	Uti Charge End Time	W	bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
07	PVModel	PV Input Mode	W	0:Independent; 1: Parallel;			0	
08	ACInModel	AC Input Mode	W	0: APL,90-280VAC; 1: UPS,170-280VAC; 2: GEN			0	
09	Fw version H	Firmware version (high)				ASCII		

10	Fw version M	Firmware version (middle)					
11	Fw version L	Firmware version (low)					
12	Fw version2 H	Control Firmware version (high)			ASCII		
13	Fw version2 M	Control Firmware version (middle)					
14	Fw version2 L	Control Firmware version (low)					
15	LCD language	LCD language	W	0-1		1	English
16	GridV_Adj						
17	InvV_Adj						
18	OutputVoltType	Output Volt Type	W	0: 208VAC; 1: 230VAC 2: 240VAC 3:220VAC 4:100VAC 5:110VAC 6:120VAC		1	
19	OutputFreqType	Output Freq Type	W	0: 50Hz; 1: 60Hz		0	
20	OverLoadRestart	Over Load Restart	W	0:Yes; 1:No; 2: Swith to UTI;		0	Yes(over Load 1mins to restart, after over Load three times to stop output)
21	OverTempRestart	Over Temperature Restart	W	0:Yes; 1:No;		0	Yes(over Temperature to restart , after over Temperature three times to stop output)
22	BuzzerEN	Buzzer on/off enable	W	1:Enable; 0:Disable;		1	
23	Serial NO. 5	Serial number 5	W		ASCII		
24	Serial No. 4	Serial number 4	W				
25	Serial No. 3	Serial number 3	W				
26	Serial No. 2	Serial number 2	W				
27	Serial No. 1	Serial number 1	W				
28	Moudle H	Inverter Moudle (high)	W	0: model can be modify			**Can be set at standy state**

				1: model can't modify			**Only**
29	Moudle L	Inverter Moudle (low)	W	eg: 50 for 5.0KW model	0.1K		**Can be set at standy state Only**
30	Com Address	Communicate address	W	1~254， but 253 only for debug		1	
31	FlashStart	Update firmware	W	0x0001: own 0X0100: control broad			
32	Reset User Info	Reset User Information	W	0x0001			
33	Reset to factory	Reset to factory	W	0x0001			
34	MaxChargeCurr	Max Charge Current	W	0~400	1A	70	
35	BulkChargeVolt	Bulk Charge Volt	W	500~640-	0.1V	564	
36	FloatChargeVolt	Float Charge Volt	W	500~560	0.1V	540	
37	BatLowToUtiVolt	Bat Low Volt Switch To Uti	W	200~640 (non Lithium) or 5~100 (Lithium)	0.1V Or 0.1%	460 Or 50%	
38	ACChargeCurr	AC Charge Current	W	0~400	1A	30	
39	Battery Type	Battery Type	W	0: AGM 1: FLD 2: USE 3: Lithium; 4: USE2		1	**Can be set at standy state Only**
40	Aging Mode	Aging Mode	W	0: Normal Mode; 1: Aging Mode;		0	**Can be set at standy state Only**
41	Function Mask		W	bit0=Etl check enable			0:Disable; 1:Enable;
				bit1=Pv ISO Check enable			0:Disable; 1:Enable;
				bit2~bit15: reserved			
42	Safety Type		W	1: standard 2. ETL 3. AS4777 4. CQC 5. VDE4105			
43	DTC	Device Type Code		&*6			
44							
45	Sys Year	System time-year	W	Year offset is 2000			
46	Sys Month	System time- Month	W				
47	Sys Day	System time- Day	W				

48	Sys Hour	System time- Hour	W				
49	Sys Min	System time- Min	W				
50	Sys Sec	System time- Second	W				
51	Chip Select			01 for Master 02 for Slave 03 for Arm			
52	Var1 Value						
53	Var2 Value						
54	Var1 address						
55	Var2 address						
56	Var1 Setting						
57	DebugModeEn	Debug mode enable		0:disable; 1:Enable;			
58							
59	Manufacturer Info 8	Manufacturer information (high)			ASCII		
60	Manufacturer Info 7	Manufacturer information (middle)					
61	Manufacturer Info 6	Manufacturer information (low)					
62	Manufacturer Info 5	Manufacturer information (high)					
63	Manufacturer Info 4	Manufacturer information (middle)					
64	Manufacturer Info3	Manufacturer information (low)					
65	Manufacturer Info 2	Manufacturer information (low)					
66	Manufacturer Info 1	Manufacturer information (high)			ASCII		
67	FW Build No. 4	Control FW Build No. 2					
68	FW Build No. 3	Control FW Build No. 1					
69	FW Build No. 2	COM FW Build No. 2					
70	FW Build No. 1	COM FW Build No. 1					
71							

72	Sys Weekly	Sys Weekly	W	0-6			
73	ModbusVersion	Modbus Version		Eg：207 is V2.07	Int(16bits)		
74							For par avg power
75	SCC_ComMode	SCC Communication Mode					For BMS board, SCC cntrl
76	Rate Watt H	Rate active power(high)			0.1W		
77	Rate Watt L	Rate active power(low)			0.1W		
78	Rate VA H	Rata apparent power (high)			0.1VA		
79	Rate VA L	Rate apparent power (low)			0.1VA		
80	ComboardVer	Communicaiton board Version					For bms boad
81	uwBatPieceNum						
82	wBatLowCutOff	Bat voltage low cutoff		200~640 (non Lithium) or 5~100 (Lithium)	0.1V Or 0.1%	460 Or 50．0 %	
83	MaxGenChgCurr	maximum generator charge current		0~400	1A		
84	NomGridVolt						
85	NomGridFreq						
86	NomBatVolt						
87	NomPvCurr						
88	NomAcChgCurr						
89	NomOpVolt						
90	NomOpFreq						
91	NomOpPow						
92							
93							
94							
95	uwAC2BatVolt	AC switch to Battery		200~640 (non Lithium) or 5~100 (Lithium)	0.1V Or 0.1%	460 Or 50%	
96	BypEnable						
97	PowSavingEn						
98	SpowBalEn						
99	ClrEnergyToday						

100	clrEnergyAll						
101	BurnInTestEn						
102	ManualStartEn						
103	SciLossChkEn						
104	BlightEn						
105	ParaMaxChgCurr	Parallel System Maximum charge current					
106	LiProtocolType	Protocol type for battery			1~99	1	
107	AudioAlarmEn						
108	uwEqEn						
109	uwEqChgVolt						
110	uwEqTime						
111	uwEqTimeOut						
112	uwEqInterval						
113	uwMaxDisChgCurr						
114	uwFaultResartEn	Fault restart enable		0:disable; 1:Enable;			
115	uwFeedEn	grid feed enable		0:disable; 1:Enable;			
116	uwLoadFirst	Load first or Charge first		0:charge first; 1:load first; 2:Feed first;			
117	uwFeedRange	feed range		0:Asia; 1:Europe; 2:South american; 3:South africa			
118	uwBatFeedEn	battery feed enable		0:disable; 1:Enable;			
119	uwFeedPow	feed power limit		0-120	0.1kW		
120	uwBatFeedCurr	battery feed current		0-400	1A		
121	uwBatFeedVLoss	battery feed voltage loss point		420-540	0.1V		
122	uwBatFeedVBack	battery feed voltage back point		440-560	0.1V		
123	uwBatFeedSocLoss	battery feed Soc loss point		5-90	1%		
124	uwBatFeedSocBack	battery feed Soc back point		15-100	1%		
125	uwBatFeedTimeStart1	battery feed time1 start		bit0~bit7 / 0-23	Hour	0	
				Bit8~bit15 / 0-59	Minute	0	
126	uwBatFeedTimeE	battery feed time1		bit0~bit7 / 0-23	Hour	0	

	nd1	end		Bit8~bit15	0-59	Minute	0	
127	uwBatFeedTimeStart2	battery feed time2 start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
128	uwBatFeedTimeEnd2	battery feed time2 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
129	uwBatFeedTimeStart3	battery feed time3 start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
130	uwBatFeedTimeEnd3	battery feed time3 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
131	uwGridChgTimeStart1	grid charge time1 start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
132	uwGridChgTimeEnd1	grid charge time1 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
133	uwGridChgTimeStart2	grid charge time2 start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
134	uwGridChgTimeEnd2	grid charge time2 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
135	uwGridChgTimeStart3	grid charge time3 start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
136	uwGridChgTimeEnd3	grid charge time3 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
137	MaxGenRunTime	Maximum Generator Running Time		0-23		1H		
138	LiBatChgIntervalEn	Li Bat Charge interval Enable		0:disable; 1:Enable;			0	
139	LiBatChgInterval	Li Bat Charge interval		1~90			30	
140	NgRlyEn	Ng Relay enable		0:disable; 1:Enable;			1	
141	GridAlwaysOnEn	Gird mode allows the second output to be always on		0:disable; 1:Enable;			0	
142	Op2TimeStart1	Second output time1 Start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
143	Op2TimeEnd1	Second output time1 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
144	Op2TimeStart2	Second output time2 Start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
145	Op2TimeEnd2	Second output time2 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
146	Op2TimeStart3	Second output time3 Start		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	

147	Op2TimeEnd3	Second output time3 end		bit0~bit7	0-23	Hour	0	
				Bit8~bit15	0-59	Minute	0	
148	Op2VoltLoss	Second output volt loss point		400~580		0.1V	480	
149	Op2SocLoss	Second output soc loss point		10~100		1%	60	
150	Op2VoltBack	Second output volt back point		440~600		0.1V	480	
151	Op2SocBack	Second output soc back point		10~100		1%	90	
152	PvLowLimWatt	Pv low limit watt for the second output start		0-120		0.1kW	5	
153	MenuBackEn	Menu back main interface enable		0:disable; 1:Enable;			0	
154	BmsErrWorkEn	Bms comm errer work enable		0:disable; 1:Enable;			1	
155	ExternalCtEn	External Ct enable		0:disable; 1:Enable;			0	
156	ExtCtSampleRate	External Ct sample rate		1000-9999			2000	
157	ShavingPow	Grid peak-shaving power		0-240		0.1kW	240	
158	ExpLimPow	export limit power		0-120		0.1kW	120	
159	TypicalSet	Typical setup		0:User defined; 1:On Grid; 2:Zero Export Limit; 3:Off Grid;				
160	EtlEn	Etl check enable		0:disable; 1:Enable;			1	
161	PvIsoEn	Pv Iso check enable		0:disable; 1:Enable;			0	
162	GfciFastProtEn	Gfci fast protect enabel		0:disable; 1:Enable;			0	
163	FeedVoltHighLoss	Feed grid high volt loss		240~280Vac		1V	253	
164	FeedVoltLowLoss	Feed grid low volt loss		170~200Vac		1V	195	
165	FeedFreqHighLoss	Feed grid high freq loss		50 Hz system: 510~550 Hz 60 Hz system: 610~650 Hz		0.1Hz	515	
166	FeedFreqLowLoss	Feed grid low freq loss		50 Hz system: 450~490 Hz		0.1Hz	470	

				60 Hz system: 550~590 Hz			
167	PvDcSourceEn	Pv dc source enable		0:disable; 1:Enable;		1	
168	ShavingEn	Shaving enble		0:disable; 1:Enable;		0	
169	DryContactEn	Dry contact enble		0:Auto; 1:Enable; 2:disable;		0	
…							
209	uwNewSerNum15	New Serial Num15					
210	uwNewSerNum14	New Serial Num14					
211	uwNewSerNum13	New Serial Num13					
212	uwNewSerNum12	New Serial Num12					
213	uwNewSerNum11	New Serial Num11					
214	uwNewSerNum10	New Serial Num10					
215	uwNewSerNum9	New Serial Num9					
216	uwNewSerNum8	New Serial Num8					
217	uwNewSerNum7	New Serial Num7					
218	uwNewSerNum6	New Serial Num6					
219	uwNewSerNum5	New Serial Num5					
220	uwNewSerNum4	New Serial Num4					
221	uwNewSerNum3	New Serial Num3					
222	uwNewSerNum2	New Serial Num2					
223	uwNewSerNum1	New Serial Num1					
…							
…							
300	uwHVDecLoadStart	Grid high volt load reduction start value		0~2800	0.1V	0	
301	uwHVDecLoadEnd	Grid high volt load reduction end value		0~2800	0.1V	0	
302	uwHFreqDecLoadStart	Grid high Freq load reduction start value		0~65000	0.01Hz	50500	
303	uwHFreqDecLoadEnd	Grid high Freq load reduction end value		0~65000	0.01Hz	0	
304	uwLFreqDecLoadStart	Grid low Freq load reduction start value		56000~60000	0.001Hz	0	
305	uwLFreqDecLoadEnd	Grid low Freq load reduction end value		56000~60000	0.001Hz	0	
306	uwFreqSlope1	Underfrequency loading slope		20~70	0.001	0	
307	uwFreqSlope2	Over frequency		20~70	0.001	0	

		loading slope					
308	wHVDecWatt1	Grid high volt load reduction Watt 1		0~100	1%	0	
309	wHVDecWatt2	Grid high volt load reduction Watt 2		-100~100	1%	0	
310	uwPfModelSet	Set PF function mode		0: Reactive power generation is prohibited 1: Constant (Fixed PF mode) 2: Watt/Var (Active and reactive modes) 3: Constant Var (Fixed reactive power percentage) 4: Volt/Var (volt reactive power mode)			
311	wPfSet	Power factor set		-1000~1000 (cannot be 0)	0.001		
312	wGridVoltLowStart	Grid volt low at startup		0~3000	0.1	2130	
313	wGridVoltHighStart	Grid volt high at startup		0~3000	0.1	2640	
314	wGridFreqLowStart	Grid freq low at startup		0~6600	0.01	5930	
315	wGridFreqHighStart	Grid freq high at startup		0~6600	0.01	6050	
316	uwVoltLLPercent1	Volt Low Loss Percent1		1-130	1%	85	
317	uwVoltLLPercent2	Volt Low Loss Percent2		1-130	1%	50	
318	uwVoltLLPercent3	Volt Low Loss Percent3		1-130	1%	50	
319							
320	uwVoltHLPercent1	Volt High Loss Percent1		1-130	1%	110	
321	uwVoltHLPercent2	Volt High Loss Percent2		1-130	1%	115	
322	uwVoltHLPercent3	Volt High Loss Percent3		1-130	1%	120	
323							
324	uwFreqLL1	Freq Low Loss1		4500~6600	0.01Hz	4900	
325	uwFreqLL2	Freq Low Loss2		4500~6600	0.01Hz	4800	
326	uwFreqLL3	Freq Low Loss3		4500~6600	0.01Hz	4750	
327	uwFreqLL4	Freq Low Loss4		4500~6600	0.01Hz	4700	

328	uwFreqHL1	Freq High Loss1		4500~6600	0.01Hz	5100	
329	uwFreqHL2	Freq High Loss2		4500~6600	0.01Hz	5150	
330	uwFreqHL3	Freq High Loss3		4500~6600	0.01Hz	5150	
331							
332	uwVoltLLTime1	Volt Low Loss Time1		0~6000	0.1s	100	
333	uwVoltLLTime2	Volt Low Loss Time2		0~6000	0.1s	2	
334	uwVoltLLTime3	Volt Low Loss Time3		0~6000	0.1s	2	
335							
336	uwVoltHLTime1	Volt High Loss Time1		0~6000	0.1s	400	
337	uwVoltHLTime2	Volt High Loss Time2		0~6000	0.1s	20	
338	uwVoltHLTime3	Volt High Loss Time3		0~6000	0.1s	2	
339	uwVoltRecvTime	Volt Reconnect Time		0~6000	0.1s	50	
340	uwFreqLLTime1	Freq Low Loss Time1		0~6000	0.1s	600	
341	uwFreqLLTime2	Freq Low Loss Time2		0~6000	0.1s	100	
342	uwFreqLLTime3	Freq Low Loss Time3		0~6000	0.1s	60	
343	uwFreqLLTime4	Freq Low Loss Time4		0~6000	0.1s	20	
344	uwFreqHLTime1	Freq High Loss Time1		0~6000	0.1s	620	
345	uwFreqHLTime2	Freq High Loss Time2		0~6000	0.1s	44	
346	uwFreqHLTime3	Freq High Loss Time3		0~6000	0.1s	44	
347	uwFreqRecvTime	High Freq or low Freq Loss Reconnect Time		0~6000	0.1s	50	
348	uwLVRT1	Low volt ride through stage 1		0-3000	0.1V	2112	
349	uwLVRT2	Low volt ride through stage 2		0-3000	0.1V	1680	
350	uwLVRT3	Low volt ride through stage 3		0-3000	0.1V	1200	
351							
352	uwHVRT1	High volt ride through stage 1		0-3000	0.1V	2640	
353	uwHVRT2	High volt ride through stage 2		0-3000	0.1V	2880	
354	uwHVRT3	High volt ride through stage3		0-3000	0.1V	2880	
355							
356	uwLVRTTime1	Low volt ride through stage 1 Time		0~60000	0.01s	2424	
357	uwLVRTTime2	Low volt ride		0~60000	0.01s	1224	

		through stage 1 Time					
358	uwLVRTTime3	Low volt ride through stage 1 Time		0~60000	0.01s	1234	
359	uwHLVRTRecvTime	High and Low volt ride through Reconnect Time		0~6000	0.1s	50	
360	uwHVRTTime1	High volt ride through stage 1 Time		0~60000	0.01s	1464	
361	uwHVRTTime2	High volt ride through stage 2 Time		0~60000	0.01s	6	
362	uwHVRTTime3	High volt ride through stage 3 Time		0~60000	0.01s	6	
363							
364	uwLFRT1	Low Freq ride through stage 1		4500~6600	0.01Hz	5880	
365	uwLFRT2	Low Freq ride through stage 2		4500~6600	0.01Hz	5700	
366	uwLFRT3	Low Freq ride through stage 3		4500~6600	0.01Hz	5700	
367							
368	uwHFRT1	High Freq ride through stage 1		4500~6600	0.01Hz	6120	
369	uwHFRT2	High Freq ride through stage2		4500~6600	0.01Hz	6200	
370	uwHFRT3	High Freq ride through stage3		4500~6600	0.01Hz	6200	
371							
372	uwLFRTTime1	Low Freq ride through stage 1 Time		0~60000	0.01s	30000	
373	uwLFRTTime2	Low Freq ride through stage 2 Time		0~60000	0.01s	6	
374	uwLFRTTime3	Low Freq ride through stage 3 Time		0~60000	0.01s	6	
375							
376	uwHFRTTime1	High Freq ride through stage 1		0~60000	0.01s	30000	

		Time					
377	uwHFRTTime2	High Freq ride through stage 2 Time		0~60000	0.01s	6	
378	uwHFRTTime3	High Freq ride through stage 3 Time		0~60000	0.01s	6	
379							
380	wLoadP_Out1	Active power P1 percent		0~100	1 %	20	
381	wLoadP_Out2	Active power P2 percent		20~100	1%	50	
382	wLoadP_Out3	Active power P3 percent		0~20	1%	100	
383							
384	wLoadQ_Out1	Reactive power Q1 percen		-60~60	1%	0	
385	wLoadQ_Out2	Reactive power Q2 percen		-60~60	1%	0	
386	wLoadQ_Out3	Reactive power Q3 percen		-60~60	1%	44	
387							
388	uwLoadP_Absorp 1	Active power PP1 percent		0~100	1%	20	
389	uwLoadP_Absorp 2	Active power PP2 percent		0~100	1%	50	
390	uwLoadP_Absorp 3	Active power PP3 percent		0~100	1%	100	
391							
392	wLoadQ_Absorp1	Reactive power QP1 percen		-60~60	1%	0	
393	wLoadQ_Absorp2	Reactive power QP2 percen		-60~60	1%	0	
394	wLoadQ_Absorp3	Reactive power QP3 percen		-60~60	1%	-44	
395							
396	uwReactV1	Volt reactive mode V1		0~3000	0.1	2208	
397	uwReactV2	Volt reactive mode V2		0~3000	0.1	2352	
398	uwReactV3	Volt reactive mode V3		0~3000	0.1	2448	
399	uwReactV4	Volt reactive mode		0~3000	0.1	2592	

		V4					
400	wReactQ1_Percent	volt reactive Q1 corresponding to Reactive power percen (Capacitive Qmax)		-60~60	1%	44	
401	wReactQ2_Percent	volt reactive Q2 corresponding to Reactive power percen		-60~60	1%	0	
402	wReactQ3_Percent	volt reactive Q3 corresponding to Reactive power percen		-60~60	1%	0	
403	wReactQ4_Percent	volt reactive Q4 corresponding to Reactive power percen (inductive Qmax)		-60~60	1%	-44	
404	uwPowSlopeTime	Power Slop Time		1~1000	1s	300	
405	wModVoltVarOLRSet	Volt reactive power open loop response time		10~900	0.1s	50	
406	uwVrefModelFilterTime	Vref Model Filter Time		3000-50000	0.1s	300	
407	wModVoltWattOLRSet	Volt active power open loop response time		5~600	0.1s	100	
408	wModFreqDroopOLRSet	Freq active power open loop response time		2~100	0.1s	100	
409	uwStartDelayTime	System countdown time		0~600	1s	60	
410	wReconnectTime	Power-on reconnection time		0~600	1s	60	
411	wDciDetect	DCI DC component detection		0~600	0.01%	50	
412	wIslandProtectTime	Island Protect Time		0~600	0.1s	20	
413							
414							
415	HlvrtEn	High and low crossover enable		0:disable; 1:Enable;		0	
416	HvDecLoadEn	High volt load		0:disable;		0	

		reduction enable		1:Enable;			
417	FreqDecLoadEn	Over frequency load reduction enable		0:disable; 1:Enable;		1	
418	AntiIslandEn	Island detection enabled		0:disable; 1:Enable;		1	
420	AutoVRefEn	Reactive power auto Ref enable		0:disable; 1:Enable;		0	
421	MeterOrCtSw	Meter CT selection		0:wired CT 1: wireless 2:meter			
422	DCIAdjEN	DCI regulation		0:disable; 1:Enable;		1	
423	IslandPWMEN	Island PWM enable		0:disable; 1:Enable;		1	
424	SpectypevalueEn	Safety value protection enable		0:disable; 1:Enable;		0	
425	VrefModelEn	Vref mode enabled		0: Vref mode of QV curve is not activated 1: Vref mode of QV curve activated			
426	RoCoFEn	RoCoF enable		0:disable; 1:Enable;		1	RoCoF > 1.5Hz/s protection

4.2 Input Reg

(Some of input Registers can be wrote by Manufacturer, write address offset is 0x1000, start at 0x1000. Can not be wrote by customer.)

Reg NO.	Variable Name	Description	Value	Unit	Note
00	System Status	System run state	0：Standby 1:PV&Grid Supporting Loads 2：Battery Discharging 3：Fault 4：Flash 5：PV Charging 6：Grid Charging 7：PV&Grid Charging 8:PV&Grid Charging+Grid Bypass		

			9： PV Charging+Grid Bypass 10 Grid Charging+Grid Bypass 11：Grid Bypass 12:PV Charging+Loads Supporting 13：PV Discharging 14 ： PV&Battery Discharging 15：Gen Charging 16 ： Gen Charging+Gen Bypass 17：PV&Gen Charging 18 ： PV&Gen Charging+Gen Bypass 19：PV Charging+Gen Bypas 20：Gen Bypass 21：PV Export to Grid 22 ： PV Export to Grid+Loads Supporting 23 ： PV Charging+Export to Grid 24 ： PV Charging+Export to Grid+Loads Supporting 25：Battery Export to Grid 26: Battery Export to Grid+ Loads Supporting 27 ： Battery&PV Export to Grid 28 ： Battery&PV Export to Grid+Loads Supporting		
01	Vpv1	PV1 voltage		0.1V	

02	Vpv2	PV2 voltage		0.1V	
03	Ppv1 H	PV1 charge power (high)		0.1W	
04	Ppv1 L	PV1 charge power (low)		0.1W	
05	Ppv2 H	PV2 charge power (high)		0.1W	
06	Ppv2 L	PV2 charge power (low)		0.1W	
07	Buck1Curr/Pv1Curr	Buck1 current or Pv1 current		0.1A	
08	Buck2Curr/Pv2Curr	Buck2 current or Pv2 current		0.1A	
09	OP_Watt H	Output active power (high)		0.1W	
10	OP_Watt L	Output active power (low)		0.1W	
11	OP_VA H	Output apparent power (high)		0.1VA	
12	OP_VA L	Output apparent power (low)		0.1	

				VA	
13	ACChr_Watt H	AC charge watt (high)		0.1W	
14	ACChr_Watt L	AC charge watt (low)		0.1W	
15	ACChr_VA H	AC charge apparent power (high)		0.1VA	
16	ACChr_VA L	AC charge apparent power (low)		0.1VA	
17	Bat Volt	Battery volt (M3)		0.01V	
18	BatterySOC	Battery SOC	0~100	1%	
19	Bus Volt	INV Bus Total Voltage		0.1V	
20	Grid Volt	AC input Volt		0.1V	
21	Line Freq	AC input frequency		0.01Hz	
22	OutputVolt	AC output Volt		0.1	

				V	
23	OutputFreq	AC output frequency		0.01Hz	
24	Ouput DCV	Ouput DC Volt		0.1V	
25	InvTemp	Inv Temperature	-30~200.0	0.1C	
26	DcDc Temp	DC-DC Temperature	-30~200.0	0.1C	
27	LoadPercent	Load Percent	0~1000	0.1%	
28	Bat_s_Volt	Battery-port volt (DSP)		0.01V	
29	Bat_Volt_DSP	Battery-bus volt (DSP)		0.01V	
30	Time total H	Work time total (high)		0.5S	
31	Time total L	Work time total (low)		0.5S	
32	Buck1_NTC	Buck1 Temperature	-30~200.0	0.	

				1 C	
33	Buck2_NTC	Buck2 Temperature	-30~200.0	0 . 1 C	
34	OP_Curr	Output Current		0 . 1 A	
35	Inv_Curr	Inv Current		0 . 1 A	
36	AC_InWatt H	AC input watt (high)	**(signed int 32)** > 0 : get energy from grid < 0: export energy to Grid	0 . 1 W	
37	AC_InWatt L	AC input watt (low)		0 . 1 W	
38	AC_InVA H	AC input apparent power (high)		0 . 1 V A	
39	AC_InVA L	AC input apparent power (low)		0 . 1 V A	
40	Fault bit	fault bit	&*1		
41	Warning bit	Warning bit	&*1		
42	Warning bit high				
43	warning value	warning value			
44	DTC	Device Type Code	&*6		
45	Export to Grid Today	Today's energy feed to grid		0 . 1 K W H	
46	Export to Grid Total H	Total energy feed to grid H		0	

				.1KWH	
47	Export to Grid Total L	Total energy feed to grid L		0.1KWH	
48	Epv1_today H	PV Energy today			
49	Epv1_today L	PV Energy today		0.1kWh	
50	Epv1_total H	PV Energy total			
51	Epv1_total L	PV Energy total		0.1kWh	
52	Epv2_today H	PV Energy today			
53	Epv2_today L	PV Energy today		0.1kWh	
54	Epv2_total H	PV Energy total			
55	Epv2_total L	PV Energy total		0.1kWh	
56	Eac_chrToday H	AC charge Energy today			
57	Eac_chrToday L	AC charge Energy today		0.1	

				kWh	
58	Eac_chrTotal H	AC charge Energy total			
59	Eac_chrTotal L	AC charge Energy total		0.1kWh	
60	Ebat_dischrToday H	Bat discharge Energy today			
61	Ebat_dischrToday L	Bat discharge Energy today		0.1kWh	
62	Ebat_dischrTotal H	Bat discharge Energy total			
63	Ebat_dischrTotal L	Bat discharge Energy total		0.1kWh	
64	Eac_dischrToday H	AC discharge Energy today			
65	Eac_dischrToday L	AC discharge Energy today		0.1kWh	
66	Eac_dischrTotal H	AC discharge Energy total			
67	Eac_dischrTotal L	AC discharge Energy total		0.1kWh	
68	ACChrCurr	AC Charge Battery Current		0.1A	
69	AC_DisChrWatt H	AC discharge watt (high)		0.	

				1 W	
70	AC_DisChrWatt L	AC discharge watt (low)		0.1 W	
71	AC_DisChrVA H	AC discharge apparent power (high)		0.1 VA	
72	AC_DisChrVA L	AC discharge apparent power (low)		0.1 VA	
73	Bat_DisChrWatt H	Bat discharge watt (high)		0.1 W	
74	Bat_DisChrWatt L	Bat discharge watt (low)		0.1 W	
75	Bat_DisChrVA H	Bat discharge apparent power (high)		0.1 VA	
76	Bat_DisChrVA L	Bat discharge apparent power (low)		0.1 VA	
77	Bat_Watt H	Bat watt (high)	**(signed int 32)** Positive:Battery Discharge Power; Negative: Battery Charge Power;	0.1 W	
78	Bat_Watt L	Bat watt (low)		0.1 W	
79	uwSlaveExistCnt	The number for slaves			

80					
81	MpptFanSpeed	Fan speed of MPPT Charger	0~100	1 %	
82	InvFanSpeed	Fan speed of Inverter	0~100	1 %	
83	TotalChgCur	Total Charge current		0.1A	
84	TotalDisChgCur	Total DisCharge current		0.1A	
85	Eop_dischrToday_H	Op discharge Enerday today			
86	Eop_dischrToday_L				
87	Eop_dischrTotal_H	Op discharge Enerday total			
88	Eop_dischrTotal_L				
90	ParaChgCurr	Para system charge current		0.1A	
91	ParStatus	Parallel status	0: New module; 1: Master module; 2: Slave module(single parallel); 3: Slave1(three phase parallel_R); 4: Slave2(three phase parallel_S); 5: Slave3(three phase parallel_T); 6: Slave4(two phase parallel_R); 7: Slave5(two phase parallel/120°_S); 8: Slave6(two phase parallel/180°_S);		
92	EGen_dischrToday_H	Generator Enerday today		0.1kWh	
93	EGen_dischrToday_L				

94	EGen_dischrTotal_H	Generator Enerday total		0.1kWh	
95	EGen_dischrTotal_L				
96	EGen_dischrPower	Generator Power		1W	
97	EGen_voltage	Generator voltage		0.1V	
98	EBatChgToday_H	battery charge energy today		0.1kWh	
99	EBatChgToday_L				
100	EBatChgTotal_H	battery charge energy total		0.1kWh	
101	EBatChgTotal_L				
102	CT_InWatt H	Ct input watt (high)		0.1W	
103	CT_InWatt L	Ct input watt (low)		0.1W	
104	CtLoadWatt H	Ct load active power (high)		0.1W	
105	CtLoadWatt L	Ct load active power (low)		0.1W	
106	CtLoadPer	Ct load percentage	0~1000	0.1%	

107	TxTemp	Transformer temperature	-30~200.0	0.1C°	
108	LLCTemp	LLC Temperature	-30~200.0	0.1C°	
109	LLCBusVolt	LLC Bus Total Voltage		0.1V	
110	LLCBatVolt	LLC Battery volt		0.01V	
111	EnvTemp	Environment Temp	-30~200.0	0.1C°	

Reg NO	Variable Name	Description	Value	Unit	Note
200	BMS_Status	状态	&*9		
201	BMS_Error_old	错误（旧）	&*10		
202	BMS_WarnInfo_old	告警信息（旧)	&*11		
203	BMS_SOC	电量百分比	1%～100%	1%	
204	BMS_BatteryVolt	平均电压		0.01V	
205	BMS_BatteryCurr	平均电流	&*12	0.1A	(signed int 16)
206	BMS_BatteryTemp	平均温度		0.1℃	(signed int 16)
207	BMS_MaxCurrChg	最大充电电流		0.1A	
208	BMS_CVolt	浮充电压	&*13	0.01V	

209	BMS_BMSInfo	BMS 板信息	&*14		
210	BMS_PackInfo	电池模组信息	&*15		
211	BMS_UsingCap	使用容量			
212	BMS_Cell_Volt1	单体电芯数据，用于识别同一个 BMS 下的不同电池组的信息		0.001V	
213	BMS_Cell_Volt2			0.001V	
214	BMS_Cell_Volt3			0.001V	
215	BMS_Cell_Volt4			0.001V	
216	BMS_Cell_Volt5			0.001V	
217	BMS_Cell_Volt6			0.001V	
218	BMS_Cell_Volt7			0.001V	
219	BMS_Cell_Volt8			0.001V	
220	BMS_Cell_Volt9			0.001V	
221	BMS_Cell_Volt10			0.001V	
222	BMS_Cell_Volt11			0.001V	
223	BMS_Cell_Volt12			0.001V	
224	BMS_Cell_Volt13			0.001V	
225	BMS_Cell_Volt14			0.001V	
226	BMS_Cell_Volt15			0.001V	
227	BMS_Cell_Volt16			0.001V	
228	ModuleID	单台 ID	1～12		
229	ModuleTotalVolt	单台总电压		0.01V	(signed int 16)
230	ModuleTotalCurrent	单台总电流		0.1A	(signed int 16)
231	ModuleSoc	单台 soc	1%～100%	1%	
232	ModuleStatus	单台状态	&*16		
233	BatProtect1_2	电池保护 1_2	&*17		
234	BatWarnInfo1_2	电池告警 1_2	&*18		
235	PackNumber	电池并联数	1~254		
236	BatDePowerReason	电池降功率原因	&*19		
237	SOH	电池健康状态			Bit 0~ Bit6 SOH Bit7:电池寿命告警标志
238	GaugeRM	当前容量		10mAh	
239	GaugeFCC	正常满电容量		10mAh	
240	DeltaV			1mV	
241	CycleCount				
242	RequestOrBatteryType		&*20		
243	MaximumCellVoltage	单体最高电压		1mV	
244	MinimumCellVoltage	单体最低电压		1mV	

245	MaxMinCellVoltageNumber	单体最高和最低电压编号			Bit 0~ Bit7： Minimum cell voltage number Bit 8~ Bit15： Maximum cell voltage number
246	ProtectPackID	故障电池地址			
247	ManufacturerName				
248	HardwareVersion		range：1~9		
249	SoftwareVersion01				
250	ParallelHightSoftwarVer	并机最高软件版本			
251	MaxCellTemp	单体最高温度		0.1℃	(signed int 16)
252	MinCellTemp	单体最低温度		0.1℃	(signed int 16)
253	MaxMinCellTempSerialNum	最高和最低温度单体编号			Bit 0~ Bit7： MinCellTempNum Bit 8~ Bit15： MaxCellTempNum
254	MaxMinSOC	最高和最低 SOC	0~100		Bit 0~ Bit7： MinSOC Bit 8~ Bit15： MaxSOC
255	TotalCellNumber		1~254		
256	BatProtect3_4	电池保护 3_4	&*21		
257	BatProtect5	电池保护 5	&*22		
258	BatWarnInfo3	电池告警 3	&*23		
259	UpdateStatus	升级状态			Bit 0~1: 0 : normal 正常运行 1: programming 升级中 2：升级成功
260	SoftwareVersion23				ASCII 表示
261	SoftwareVersion45				ASCII 表示
262	BatSerialNumber_ID	电池序号			
263	BatSerialNumber0_1	SN 码			ASCII 表示
264	BatSerialNumber2_3	SN 码			ASCII 表示
265	BatSerialNumber4_5	SN 码			ASCII 表示
266	BatSerialNumber6_7	SN 码			ASCII 表示
267	BatSerialNumber8_9	SN 码			ASCII 表示
268	BatSerialNumber10_11	SN 码			ASCII 表示
269	BatSerialNumber12_13	SN 码			ASCII 表示
270	BatSerialNumber14_15	SN 码			ASCII 表示
271	BatSerialNumber16_17	SN 码			ASCII 表示
272	BatSerialNumber18_19	SN 码			ASCII 表示
273	ModuleID2		1～12		
274	Module2MaxVol	最高单体电压		0.01V	

275	Module2MimVol	最低单体电压		0.01V	
276	Module2MaxTemp	最高温度		1℃	偏移+40
277	Module2MimTemp	最低温度		1℃	偏移+40
278	DoStatus	输出干节点			
279	DsgBatNumber	放电电量统计电池序号		1KWH	
280	DsgEnergyKWH_H	放电电量高 16 位		1KWH	
281	DsgEnergyKWH_L	放电电量低 16 位		1KWH	
282	ChgBatNumber	充电电量统计电池序号			
283	ChgEnergyKWH_H	充电电量高 16 位		1KWH	
284	ChgEnergyKWH_L	充电电量低 16 位		1KWH	
285	reserve285				
286	reserve286				
287	reserve287				
288	reserve288				
289	reserve289				
290	reserve290				

&*0: run state

value	status description	状态描述
0	Standby	待机模式
1	PV&Grid Supporting Loads	光伏与市电联合带载
2	Battery Discharging	电池放电
3	Fault	故障
4	Flash	烧录模式（监控上不显示）
5	PV Charging	光伏充电
6	Grid Charging	市电充电
7	PV&Grid Charging	光伏与市电联合充电
8	PV&Grid Charging+Grid Bypass	联合充电且旁路带载
9	PV Charging+Grid Bypass	光伏充电且旁路带载
10	Grid Charging+Grid Bypass	市电充电且旁路带载

11	Grid Bypass	旁路带载
12	PV Charging+Loads Supporting	光伏充电且逆变带载
13	Export to Grid	并网发电

&*1: Off Grid Inverter fault code Bit(See &*8):

Fault type value	Means(The message showed on the inverter when the inverter has fault)
1	Fan lock 风扇故障
2	Over Temperature 过温
3	Bat Voltage High 电池电压过高
4	Battery low 电池欠压
5	Output short 输出短路
6	Output voltage high 输出电压过高
7	Over Load 过载
8	Bus voltage high 直流母线电压过高
9	Bus start fail 直流母线软起失败
11	Main relay fail 主机继电器损坏
51	over current 过流
52	Bus voltage low 直流母线电压过低
53	inverter softstart fail 逆变软起失败
56	IGBT Over Current IGBT 过流
58	output voltage low 输出电压过低
60	negtive power 负功过大
61	PV voltage high PV 电压过高
62	SCI com error 内部通讯故障
80	can fault Can 通讯失败
81	host loss 主机丢失

&*6: DTC(Device type code)

Code No.	Device type	Note
03xxx	PV Storage	Front 1 tracker PV Storage

&*8: Off Grid Inverter warning code

Warning code		
Warning bit(41)		
0x0001	Fan lock warning (01)	风扇被锁
0x0002	Over charge (03)	电池过充
0x0004	Battery voltage low (04)	电池电压过低
0x0008	Over load (07)	过载
0x0010	Op power derating (10)	输出功率降额
0x0020	Solar stop due to bat low (12)	电池过低太阳能停止充电
0x0040	Solar stop due to Pv high (13)	太阳能电压过高太阳能停止充电
0x0080	solar stop due to over load (14)	过载太阳能停止充电
0x0100	Grid different(15)	并机市电输入不一致
0x0200	Grid phase error(16)	并机输入相序错误
0x0400	Op phase loss(17)	并机输出缺相
0x0800	Over temprature(02)	过温
0x1000	Buck current over(18)	Buck 电流过大
0x2000	Battery disconnected(19)	电池未接
0x4000	BMS com error(20)	BMS 通讯失败
0x8000	Pv power insufficient(21)	Pv 功率不足
Warning bit high(42)		
0x0001	No bat parallel disable(22)	无电池不并机
0x0002	Parallel version different(23)	并机版本不兼容
0x0004		
0x0008	Capacity different(25)	并机机器容量不一致
0x0010	Host Loss(81)	主机丢失
0x0020	BmsCellOverVolt(34)	BMS 单体过压
0x0040	BmsTotalOverVolt(36)	BMS 整体过压
0x0080	BmsDischgOverCurr(38)	BMS 放电过流
0x0100	BmsChgOverCurr(39)	BMS 充电过流
0x0200	BmsOverTemp(43)	BMS 过温
0x0400	Battery voltage consistent(63)	

&*9: BMS_Status code

Bit Index	Content	Comment
0	status	00 : soft_starting
		01 : stand by
		10 : charging
1		11 : discharging
2	Error bit flag	1 : “Error” byte valid

		0 : “Error” byte
		Invalid
3	Cell balance PF status	0 : unbalance PF
		1 : balance
4	Sleep status	0 : disable
		1 : enable
5	Output Discharge status	0 : disable
		1 : enable
6	Output Charge status	0 : disable
		1 : enable
7	Battery terminal status	0 : terminal
		connected
		1 : terminal open
8	Master box Operation Mode	00:单机
		01:并联
9		10:并联准备
10	SP Status	00:none
		01 : stand by
		10 : charging
11		11 : discharging
12	Request force charge 强充标记	0 : disable
		1 : enable

&*10: BMS_Error_old code

Content (binary)	Description	Recovery Mechanism
Bit 0	OCD(Over Current Discharge) protection	(Unloading(1)) &&(charging || DG_ON command)
Bit 1	SCD(Short Circuit Discharge) protection	(Unloading(1))&&(charging || DG_ON command)
Bit 2	OV (Over Voltage)protection	(Stop charging) &&(discharging)
Bit 3	UV (Under Voltage)protection	(Unloading(1)) && (charging)
Bit 4	OTD(Over Temperature Discharge) protection	(Unloading(1)) && (temperature turn down to 60℃)

Bit 5	OTC (Over Temperature Charge)protection	(Stop charging) || (temperature turn down to 50℃)
Bit 6	UTD (Under Temperature Discharge)protection	(Unloading(1)) && (temperature raise to -10℃)
Bit 7	UTC (Under Temperature Charge)protection	(Stop charging) || (temperature raise to 0℃)
Bit 8	Soft start fail	0 : disable
		1 : enable
Bit 9	Permanent Fault	0 : disable
		1 : enable
Bit 10	Delta V Fail	0 : disable
		1 : enable
Bit 11	OCC(Over Current Charge) protection	(Unloading(1)) && (Discharging || DG_ON command)
Bit 12	OT(MOS Over Temperature) protection	MOS temperature turn down to x℃ (x 为 MOS 最高温)
Bit 13	OT(Environment Over Temperature) protection	Environment temperature turn down to x℃(x 为环境最高温)
Bit 14	UT(Environment Under Temperature) protection	Environment temperature raise to x℃(x 为环境最低温)

&*11: BMS_WarnInfo_old code

Content (binary)	State	Description	Recovery Mechanism
Bit 0	0	正常	放电或电压低于单体过压告警值恢复（磷酸铁锂/三元电池）
	1	单体过压告警	

Bit 1	0	正常	充电或电压高于单体欠压告警值恢复（磷酸铁锂/三元电池）
	1	单体欠压告警	
Bit 2	0	正常	放电或电压低于总压过压告警值恢复（磷酸铁锂/三元电池）
	1	总压过压告警	
Bit 3	0	正常	充电或电压高于总压欠压告警值恢复（磷酸铁锂/三元电池）
	1	总压欠压告警	
Bit 4	0	正常	电流高于放电过流告警值
	1	放电过流告警	
Bit 5	0	正常	电流高于充电过流告警值
	1	充电过流告警	
Bit 6	0	正常	温度高于放电高温告警值（℃）
	1	放电高温告警	
Bit 7	0	正常	温度低于放电低温告警值
	1	放电低温告警	（℃）
Bit 8	0	正常	温度高于充电高温告警值
	1	充电高温告警	（℃）
Bit 9	0	正常	温度低于充电低温告警值
	1	充电低温告警	（℃）
Bit 10	0	正常	温度高于 MOS 高温告警值
	1	MOS 高温告警	（℃）
Bit 11	0	正常	温度高于环境高温告警值
	1	环境高温告警	（℃）
Bit 12	0	正常	温度低于环境低温告警值

	1	环境低温告警	（℃）
Bit 13	0	正常	总压高于系统关机/锁住电压告警值（V）
	1	系统低压关机前告警	
Bit 14- Bit 15	电池类型		00: 磷酸铁锂电池
			01: 三元电池
			10: 钛酸锂电池
			11: 保留

&*12: BMS_BatteryCurr code

Content	Description	Comment
电流	0x0000~0x7FFF	表示电流为正值
	0x8000~0xFFFF	表示电流为负值

&*13: BMS_CVolt code

Battery Type	CV Voltage（V）
磷酸铁锂电池	57.6V
三元锂电池	xx
钛酸锂电池	xx
根据不同的电池类型，PACK 厂商给出实际的 CV 电压值。	

&*14: BMS_BMSInfo code

Bit Index	Content	Comment
0	BMS company	00000000 : xx
1		00000001 : xx
2		00000010 : xx
3		00000011 xx
4		00000100 xx
5		
6		
7		

8	BMS Ver.	00000001: first generation
9		00000002: second generation
10		…..
11		
12		
13		
14		
15		

&*15: BMS_PackInfo code

Bit Index	Content	Comment
0	PACK company	000000000 : xx
1		000000001 : EVE
2		000000010 : xx
3		000000011 xx
4		100
5		
6		
7		
8	PACK Ver	000000001: first generation
9		000000002: second generation
10		
11		
12		
13		
14		
15		

&*16: ModuleStatus code

Bit index	Content	Comment

0	status	00:soft starting 01:stand by 10:charging 11:discharging
1		
2	Error bit flag	1:"Error"byte valid 0:"Error"byte Invalid
3	Cell balance status	0:unbalance 1:balance
4	Sleep status	0:disable 1:enable
5	Output Discharge status	0:disable 1:enable
6	Output Charge status	0:disable 1:enable
7	Battery terminal status	0:terminal connected 1:terminal open
8	Master box Operation Mode	00:stand-alone 01：Parallel 10：Parallel preparation
9		
10	PreOutputDsgStatus	0:disable 1:enable
11	PreOutputChgStatus	0:disable 1:enable
Other	Reserved	

&*17: BatProtect1_2 code

Bit Index	Content	Comment
0	Soft start fail	软件开启失败
1	module under voltage	总压欠压
2	module over voltage	总压过压
3	Cell under voltage	单体欠压
4	Cell over voltage	单体过压
5	SCD(Short Circuit Discharge) protection	短路
6	Charge over current	充电过流
7	DisCharge over current1	放电过流 1
8	Parallel Ver Diff	并机版本不一致
9	Parallel fail	并机失败
10	Delta V Fail	内外压差大
11	MOS Ctrl faile	MOS 管控制失效

12	UTC (Under Temperature Charge)protection	充电温度过低
13	UTD (Under Temperature Discharge)protection	放电温度过低
14	OTC (Over Temperature Charge)protection	充电温度过高
15	OTD(Over Temperature Discharge) protection	放电温度过高

&*18: BatWarnInfo1_2 code

Bit Index	Content	Comment
0	Soc Low	Soc 过低
1	module under voltage	总压欠压
2	module over voltage	总压过压
3	Cell under voltage	单体欠压
4	Cell over voltage	单体过压
5	Power off before	关机之前告警
6	Charge over current	充电过流
7	DisCharge over current	放电过流 1
8	Internal communication fail	内部通信失败
9	Ext comm fail	外部 can 通信失败
10	Delta V Fail	内外压差大
11	ExtRs485commfail	RS485 通信失败
12	UTC (Under Temperature Charge) warning	充电温度过低
13	UTD (Under Temperature Discharge) warning	放电温度过低
14	OTC (Over Temperature Charge) warning	充电温度过高
15	OTD(Over Temperature Discharge) warning	放电温度过高

&*19: BatDePowerReason code

Bit Index	Content	Comment
bit0	UcellHlimiFlg	单体过高限流
bit1	UcellLlimiFlg	单体过低限流
bit2	TcellHlimiFlg	温度过高限流
bit3	TcellLlimiFlg	温度过低限流
bit4	UmainHlimiFlg	总压过高限流
bit5	UmainLlimiFlg	总压过低限流
bit6	UcellDiffLimiFlg	单体压差限流
bit7	TDiffLimiFlg	温差限流
bit8	HwFltLimiFlg	硬件故障限流
bit9	ChFullLimiFlg	满充限流
bit10	TmosHLimiFlg	MOS 温度过高限流
bit11	TenvHLimiFlg	环境温度过高限流
bit12	PchFltLimiFlg	预充故障限流

bit13	ComFltLimiFlg	通讯故障限流
bit14	CBusFltLimiFlg	母线故障限流
bit15	Res	预留

&*20: RequestOrBatteryType code

Bit Index	Comment
Bit 1	00: 磷酸铁锂电池 01: 三元电池 10: 钛酸锂电池 11: 保留
Bit 0	
Bit 3	
Bit 2	
Bit 4	Request force charge II* 强充标记 2
Bit 5	Request force charge I* 强充标记 1
Bit 6	Discharge enable
Bit 7	Charge enable

&*21: BatProtect3_4 code

Bit Index	Content	Comment
0	Over Power Charging	充电过功率
1	Over Power Discharging	放电过功率
2	Parallel Same Addr	并机重号故障
3	PreChg Fail	预充失败
4	PreChg OC	预充短路
5	AFE_COM	Communication error between AFE and MCU
6	FLT_CELL_LOST	单体异常故障（单体失效）
7	FLT_CELL_TEMP_LOST	单体温度异常故障（单体失效）
8	FLT_SP_UMAIN	总压采样故障
9	FLT_TEMP_SC	温度短路
10	FLT_SP_ULOAD	负载侧总压采样故障
11	FLT_EEP_PARAM	载入标定参数故障
12	FLT_OVP	硬件过压（AFE OV）
13	FLT_UVP	硬件欠压（AFE UV）
14	FLT_OCP	硬件过流（硬件保护反馈）
15	FLT_DIS_OCP	硬件放电过流故障

&*22: BatProtect5 code

Bit Index	Content	Comment
0	FLT_PRLL_UDIFF_OVER	从主机电池压差较大
1	FLT_CH_ILIMIT_NORSP	充电限流失败故障

2	FLT_DI_ILIMIT_NORSP	放电限流失败故障
3	FLT_BUS_OPEN	主回路开路故障
4	DsgChg Over Curr2	放电过流 2
5	MosTempHigh	MOS 管温度过高
6	CellDeltaV	单体压差大
7	CellDeltT	单体温差大

&*23: BatWarnInfo3 code

Bit Index	Content	Comment
0	OLC	充电过功率
1	OLD	放电过功率
2	FLT_PRLL_I_INCH_H2	系统内部充电环流过流警告
3	FLT_PRLL_I_INDIS_H2	系统内部放电环流过流警告
4	MosTempHigh	mos 管温度过高告警
5	CellDeltaV	单体压差大
6	DeltaT	单体温差大
7	FC	充满

5 Set address

You can set any address accept 253 (reserve for debug)

6 Notice

1) It can drive mostly 32 pv inverters for one rs485 comport.
2) There are only read input and hold registers commands even the newest version.
3) App user could only care the input register.
4) App user could not care the holding registers.