Version V1.39

Date 2024.04.16

GROWATT INVERTER MODBUS RTU PROTOCOL_Ⅱ

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Version Record

Index	Version	Change content	Author	Date
1	V1.00	First Republic	Weiwei.shi	2020.4.28
2	V1.25	Add backup box data register:input3281-3316.	Liang.liu	2022.05.13
3	V1.26	Modify the range of backup box error code(input3284) and warning code(input3285) value.	Liang.liu	2022.07.14
4	V1.27	1.Add PTO enable register (holding3072); 2.Add Battery charge from generator function enable register (holding3073); 3.Add force generator on enable register (holding3074).	Liang.liu	2022.11.03
5	V1.28	1.Add backup box enable register holding3082(for XH model); 2.Add Australian region parameter register holding3083(for XH model); 3.Add the grid parameter of the three-phase backup box register input3317-3319(for XH model); 4.Add backup box data display flag register holding3250 and input3321(for GW server); 5.Add the software version and serial number of backup box register holding3251-3268(for GW server); 6.Add backup box the communication status register input3320(for GW server); 7.Add derating modes in register input3086; 8.Add inverter hardware version register holding3046(for US model);	Liang.liu	2022.12.02
6	V1.29	1. Modify the definition of GridFirstStopSOC(holding3037). 2.Add On-Grid Stop Discharging SOC register holding3067. 3.Add BDC new serial number and reserve registers holding7960-8559 (Support up to 10 parallel BDC). 4.Add inverter SN number flag register input3277(For US model). 5.Add battery SN number flag register input3278(For US model). 6.Add backup box SN number flag register input3279(For US model). 7. Add generator rated power parameter register holding3077 (For US model).	Zhengjie.Liu	2023.02.09
7	V1.30	1.Add On-Grid Stop Discharging SOC register holding3082.	Zhengjie.Liu	2023.03.02
8	V1.31	1. Modify the definition and Variable Name of GeneratorOnCmd register (holding3074).	Zhengjie.Liu	2023.03.24
9	V1.32	1. Add APX battery register holding 5400-7959 and input	Zhengjie.Liu	2023.05.30

		5080-7639. 2.Add AFCI software version register holding3269-3271. 3.Add Buzzer enable register holding645 4.Add Clear EMS time setting register holding3124. 5.Add Inverter total power-on time register input3116-3117.		
10	V1.33	1. Add Acrel meter connect flag register input3322. 2. Add backup box installation flag register input3323. 3.Add battery module new serial number register holding8560-9519. 4.Add BDC information register holding3112, holding3115-3121,	Zhengjie.Liu	2023.06.14
11	V1.34	1.Add battery type register hold700.	Kangju Lu	2023.9.27
12	V1.35	Delete MIX model description and merge it into SPH model.	Meilin.Luo	2023.10.17
13	V1.36	1.Add state 0x09 in Input register1000, 2.Add unit in Input register1149-1150.	Ziqi.Kang	2023.11.23
14	V1.37	1.Add appendix table 1: Inverter derating mode (Input3086) and table 2: Battery derating mode (Input3165),update the inverter and battery derating mode.	Liang.liu	2024.01.29
15	V1.38	1. Add hold355 as the DSP software debugging version number. 2. Add hold359 as the M3 software debugging version number. 3. Add hold3272-3274 busbar protection function parameters. 4. Add hold659 battery serial number setting lock. 5. Add input3324 off-grid box unbalanced current. 6. Add input3342 off-grid box inv relay status. 7. Add input3343 generator relay status. 8. Add hold3282 enter bypass mode enable register. 9. Add meter data registers (read through 0x20 function code). 10. Add holding192 bit1 as the inverter support 1024 bytes update flag.	Zhengjie.Liu	2024.04.08
16	V1.39	1. Add scope WIT TL3. 2. Add hold875-999 as business storge power used by WIT TL3. 3. Add hold871 as Grid phase Sequence. 4. Add hold874 as Parallel enable. 5.Add input8000—9000 for business Storage Power	Shuangshuang.Yang	2024.04.16

Catalog

1 Introduction

1.1 Purpose

Register range for various types of inverter.

1.2 Scope

TL-X/TL-XH/TL-XH US（MIN Type）:03 register range:0~124、3000~3124、3125~3249(TL-XHUS)、3250~3374;04 register range:3000~3124、3125~3249、3250~3374.

TL3-X(MAX、MID、MAC Type):03 register range:0~124、125~249;04 register range:0~124、125~249.

MAX 1500V、MAX-X LV: 03 register range:0~124、125~249;04 register range:0~124、125~249、875~999.

MOD TL3-XH: 03 register range:0~124,3000~3124、3250~3374; 04 register range:3000~3124、3125~3249、3250~3374.

Storage(MIX Type):03 register range:0~124、1000~1124;04 register range:0~124、1000~1124

Storage(SPA Type):03 register range:0~124、1000~1124;04 register range:1000~1124、2000~2124、1125~1249.

Storage(SPH Type):03 register range:0~124、1000~1124;04 register range:0~124、1000~1124、1125~1249.

WIT TL3: 03 register range:0~124、125~249、875~999;04 register range:0~124、125~249、8000~8124.

2 Protocol register

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

2.1 Hold register

Register NO.	Variable Name	Description	Write /Read	Range	Unit	Initial value	Note
First group							
00.	OnOff	Remote On/Off . On（1）;Off（0）Inverter On（3）;Off（2）BDC	W	0~3		1	The inverter can be switched on and off, and the BDC can be switched on and off for the batt ready function.
01.	Safty Function Enable	Bit0: SPI enable Bit1: AutoTestStart Bit2: LVFRT enable Bit3:FreqDerating Enable Bit4: Softstart enable Bit5: DRMS enable Bit6:PowerVoltFunc Enable Bit7: HVFRT enable Bit8:ROCOF enable Bit9: Recover FreqDeratingMode Enable Bit10:Split phase Bit11: AC Couple enable Bit12~15:Reserve	W				0 : disable,1: enable SPI: system protection interface Bit0~3:for CEI0-21 Bit4~6:for SAA
02.	PF CMD memory state	Set holding register 3,4,5,99 CMD will be set or not(1/0), if not, these settings are the initial value.	W	0~1		0	Meaning is these settings will be acting or not when next power on

03.	Active Power Rate	Inverter Max output active power percent	W	0-100 or255	%	255	255: power is not be limited
04.	Reactive Power Rate	Inverter max output reactive power percent	W	-100-100 or 255	%	255	255: power is not be limited
05.	Power factor	Inverter output power factor's 10000 times	W	0-20000		0	0-10000 is underexcited, other is overexcited
06.	Pmax H	Normal power (high)			0.1VA		
07.	Pmax L	Normal power (low)			0.1VA		
08.	Vnormal	Normal work PV voltage			0.1V		
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	0-5			0: Italian; 1: English; 2: German; 3: Spanish; 4: French; 5: Chinese; 6:Polish 7:Portugues 8:Hungary
16.	Country Selected	Country Selected or not	W	0~1			0: need to select; 1: have selected
17.	Vpv start	Input start voltage	W		0.1V		
18.	Time start	Start time	W		1s		

19.	RestartDelayTime	Restart Delay Time after fault back;	W		1s		
20.	Power Start Slope	Power start slope	W	1-1000	0.1%		
21.	Power Restart Slope	Power restart slope	W	1-1000	0.1%		
22.	Select Baud rate	Select communication baud rate	W	0-1		0	0: 9600bps 1:38400bps
23.	Serial NO	Serial number 1-2			ASCII		
24.	Serial NO	Serial number 3-4					
25.	Serial NO	Serial number 5-6					
26.	Serial NO	Serial number 7-8					
27.	Serial NO	Serial number 9-10					
28.	Module H	Inverter Module (high)		&*5			
29.	Module L	Inverter Module (low)		&*5			
30.	Com Address	Communicate address	W	1-254		1	
31.	FlashStart	Update firmware	W	1			
32.	Reset User Info	Reset User Information	W	0x0001			
33.	Reset to factory	Reset to factory	W	0x0001			
34.	Manufacturer Info 8	Manufacturer information (high)			ASCII		
35.	Manufacturer Info 7	Manufacturer information (middle)					
36.	Manufacturer Info 6	Manufacturer information (low)					
37.	Manufac.turer Info 5	Manufacturer information (high)					
38.	Manufacturer Info 4	Manufacturer information (middle)					
39.	Manufacturer Info3	Manufacturer information (low)					

40.	Manufacturer Info 2	Manufacturer information (low)					
41.	Manufacturer Info 1	Manufacturer information (high)					
42.	bfailsafeEn;	G100 fail safe	W	0~1			Enable:1,Disable:0 English G100 fail safe set
43.	DTC	Device Type Code		&*6			
44.	TP	Input tracker num and output phase num					Eg:0x0203 is two MPPT and 3ph output
45.	Sys Year	System time-year	W				Local time, Year offset is 0
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.	Sys Weekly	System Weekly	W	0~6			
52.	Vac low	Grid voltage low limit protect	W		0.1V		
53.	Vac high	Grid voltage high limit protect	W		0.1V		
54.	Fac low	Grid frequency low limit protect	W		0.01Hz		
55.	Fac high	Grid high frequencylimit protect	W		0.01Hz		
56.	Vac low 2	Grid voltage low limit protect 2	W		0.1V		
57.	Vac high 2	Grid voltage high limit protect 2	W		0.1V		
58.	Fac low 2	Grid frequency low limit protect 2	W		0.01Hz		
59.	Fac high 2	Grid high frequency limit protect 2	W		0.01Hz		
60.	Vac low 3	Grid voltage low limit protect 3	W		0.1V		

61.	Vac high 3	Grid voltage high limit protect 3	W		0.1V		
62.	Fac low 3	Grid frequency low limit protect 3	W		0.01Hz		
63.	Fac high 3	Grid frequency high limit protect 3	W		0.01Hz		
64.	Vac low C	Grid low voltage limit connect to Grid	W		0.1V		
65.	Vac high C	Grid high voltage limit connect to Grid	W		0.1V		
66.	Fac low C	Grid low frequency limit connect to Grid	W		0.01Hz		
67.	Fac high C	Grid high frequency limit connect to Grid	W		0.01Hz		
68.	Vac low1 time	Grid voltage low limit protect time 1	W		Cycle		
69.	Vac high1 time	Grid voltage high limit protect time 1	W		Cycle		
70.	Vac low2 time	Grid voltage low limit protect time 2	W		Cycle		
71.	Vac high2 time	Grid voltage high limit protect time 2	W		Cycle		
72.	Fac low1 time	Grid frequency low limit protect time 1	W		Cycle		
73.	Fac high1 time	Grid frequency high limit protect time 1	W		Cycle		
74.	Fac low2 .time	Grid frequency low limit protect time 2	W		Cycle		

75.	Fac high2 time	Grid frequency high limit protect time 2	W		Cycle		
76.	Vac low3 time	Grid voltage low limit protect time 3	W		Cycle		
77.	Vac high3 time	Grid voltage high limit protect time 3	W		Cycle		
78.	Fac low3 time	Grid frequency low limit protect time 3	W		Cycle		
79.	Fac high3 time	Grid frequency high limit protect time 3	W		Cycle		
80.	U10min	Volt protection for 10 min	W		0.1V	1.1Vn	
81.	PV Voltage High Fault	PV Voltage High Fault	W		0.1V		
82.	FW Build No. 5	Model letter version number (TJ)			ASCII		
83.	FW Build No. 4	Model letter version number (AA)			ASCII		
84.	FW Build No. 3	DSP1 FW Build No.			ASCII		
85.	FW Build No. 2	DSP2/M0 FW Build No.			ASCII		
86.	FW Build No. 1	CPLD/AFCI FW Build No.			ASCII		
87.	FW Build No. 0	M3 FW Build No.			ASCII		
88.	Modbus Version	Modbus Version			Int(16bits)		Eg:207 is V2.07

89.	PFModel	Set PF function Model	W				0: PF=1 1: PF by set 2: default PF line 3: User PF line 4: UnderExcited (Inda) Reactive Power 5: OverExcited(Capa) Reactive Power 6:Q(v)model 7:Direct Control mode 8. Static capacitive QV mode 9. Static inductive QV mode
90.	GPRS IP Flag	Bit0-3:read: 1:Set GPRS IP Successed Write:2:Read GPRS IP Successed Bit4-7:GPRS status	W				Bit0-3:about GPRS IP SET Bit4-7:about GRPRS Status
91.	FreqDerateStart	Frequency derating start point	W		0.01Hz		
92.	FLrate	Frequency – load limit rate	W	0-100	10 times		
93.	V1S	CEI021 V1S Q(v)	W	V1S<V2S	0.1V		
94.	V2S	CEI021 V2S Q(v)	W		0.1V		
95.	V1L	CEI021 V1L Q(v)	W	V1L<V1S	0.1V		
96.	V2L	CEI021 V2L Q(v)	W	V2L<V1L	0.1V		
97.	Qlockinpower	Q(v) lock in active power of CEI021	W	0-100	%		
98.	QlockOutpower	Q(v) lock Out active power of CEI021	W	0-100	%		
99.	LIGridV	Lock in gird volt of CEI021 PF line	W	nVn	0.1V		
100.	LOGridV	Lock out gird volt of CEI021 PF line	W	nVn	0.1V		
101.	PFAdj1	PF adjust value 1		4096 is 1			
102.	PFAdj2	PF adjust value 2		4096 is 1			
103.	PFAdj3	PF adjust value 3		4096 is 1			
104.	PFAdj4	PF adjust value 4		4096 is 1			

105.	PFAdj5	PF adjust value 5		4096 is 1			
106.	PFAdj6	PF adjust value 6		4096 is 1			
107.	QVRPDelayTimeEE	QV Reactive Power delaytime	W	0-30	1S	3S	
108.	OverFDeratDelayTimeEE	Overfrequency de ratingdelaytime	W	0-20	50ms	0	
109.	QpercentMax	Qmax for Q(V) curve	W	0-1000	0.1%		
110.	PFLineP1_LP	PF limit line point 1 load percent	W	0-255	%		255 means no this point
111.	PFLineP1_PF	PF limit line point 1 power factor	W	0-20000			
112.	PFLineP2_LP	PF limit line point 2 load percent	W	0-255	%		255 means no this point
113.	PFLineP2_PF	PF limit line point 2power factor	W	0-20000			
114.	PFLineP3_LP	PF limit line point 3 load percent	W	0-255	%		255 means no this point
115.	PFLineP3_PF	PF limit line point 3 power factor	W	0-20000			
116.	PFLineP4_LP	PF limit line point 4 load percent	W	0-255	%		255 means no this point
117.	PFLineP4_PF	PF limit line point 4 power factor	W	0-20000			
118.	Module 4	Inverter Module (4)		&*11			SxxBxx
119.	Module 3	Inverter Module (3)		&*11			DxxTxx
120.	Module 2	Inverter Module (2)		&*11			PxxUxx
121.	Module 1	Inverter Module (1)		&*11			Mxxxx Power
122.	ExportLimit_En/dis	ExportLimit_En/dis	R/W	1/0			ExportLimit enable, 0: Disable exportLimit; 1: Enable 485 exportLimit; 2: Enable 232 exportLimit; 3: Enable CT exportLimit;
123.	ExportLimitPowerRate	ExportLimitPowerRate	R/W	-1000~+1000	0.1%		ExportLimit PowerRate

124.	TrakerModel	Traker Model	W	0~2			0:Independent 1:DC Source 2:Parallel
Second group							
125	INV Type-1	Inverter type-1	R		ASCII		Reserved
126	INV Type-2	Inverter type-2	R		ASCII		
127	INV Type-3	Inverter type-3	R		ASCII		
128.	INV Type-4	Inverter type-4	R		ASCII		
129.	INV Type-5	Inverter type-5	R		ASCII		
130.	INV Type-6	Inverter type-6	R		ASCII		
131.	INV Type-7	Inverter type-7	R		ASCII		
132.	INV Type-8	Inverter type-8	R		ASCII		
133.	BLVersion1	Boot loader version1	R				Reserved
134.	BLVersion2	Boot loader version2	R				Reserved
135.	BLVersion3	Boot loader version3	R				Reserved
136.	BLVersion4	Boot loader version4	R				Reserved
137.	Reactive PValueH	Reactive PowerH	R/W		0.1var		
138.	Reactive PValueL	Reactive PowerL	R/W		0.1var		
139.	ReactiveOutputPriorityEnable	Reactive Output Priority Enable	R/W		0/1		0:disable 1:enable
140.	Reactive PValue(Ratio)	Reactive Power Ratio	R/W		0.1		
…….							Reserved
141.	SvgFunctionEnable	Svg enable on night	R/W		0/1		0:disable 1:enable
142.	uwUnderFUploadPoint	UnderF Upload Point	R/W		0.01Hz		
143.	uwOFDerateRecoverPoint	OFDerate RecoverPoint	R/W		0.01Hz		

144.	uwOFDerateRecoverDelayTime	OFDerate RecoverDelayTime	R/W	0-30000	50ms		
145.	ZeroCurrentEnable	ZeroCurrent Enable	R/W	0-1			
146.	uwZeroCurrentStaticlowVolt	ZeroCurrent StaticlowVolt	R/W	460-2300	0.1V	115V	
147.	uwZeroCurrentStaticHighVolt	ZeroCurrent StaticHighVolt	R/W	2300-2760	0.1V	276V	
148.	uwHVoltDerateHighPoint	HVoltDerate HighPoint	R/W	0-10000	0.1V		
149.	uwHVoltDerateLowPoint	HVoltDerate LowPoint	R/W	0-10000	0.1V		
150.	uwQVPowerStableTime	QVPower Stable Time	R/W	0-600	0.1S		
151.	uwUnderFUploadStopPoint	UnderF Upload StopPoint	R/W		0.01HZ		
152.	fUnderFreqPoint	Underfrequency load start point	R/W	4600-5000	0.01Hz	49.80	CEI
153.	fUnderFreqEndPoint	Underfrequency down load end point	R/W	4600-5000	0.01Hz	49.10	CEI
154.	fOverFreqPoint	Over frequency loading start point	R/W	5000-5200	0.01Hz	50.20	CEI
155.	fOverFreqEndPoint	Over frequency loading end point	R/W	5000-5200	0.01Hz	51.50	CEI
156.	fUnderVoltPoint	Undervoltage load shedding start point	R/W	1600-3000	0.1V	220.0	CEI
157.	fUnderVoltEndPoint	Undervoltage derating end point	R/W	1600-3000	0.1V	207.0	CEI
158.	fOverVoltPoint	Overvoltage loading start point	R/W	1600-3000	0.1V	230.0	CEI
159.	fOverVoltEndPoint	Overvoltage loading end point	R/W	1600-3000	0.1V	245.0	CEI

160.	uwNominalGridVolt	NominalGridVoltSelect	R/W	0~3			UL
161.	uwGridWattDelay	GridWattDelayTime	R/W	0~3000	20ms		UL
162.	uwReconnectStartSlope	ReconnectStartSlope	R/W	1~1000	0.1		UL
163.	uwLFRTEE	LFRT1 Freq	R/W	5500~6500	0.01Hz		UL
164.	uwLFRTTimeEE	LFRT1 Time	R/W		20ms		UL
165.	uwLFRT2EE	LFRT2 Freq	R/W	5500~6500	0.01Hz		UL
166.	uwLFRTTime2EE	LFRT2 Time	R/W		20ms		UL
167.	uwHFRTEE	HFRT1 Freq	R/W	5500~6500	0.01Hz		UL
168.	uwHFRTTimeEE	HFRT1 Time	R/W		20ms		UL
169.	uwHFRT2EE	HFRT2 Freq	R/W	5500~6500	0.01Hz		UL
170.	uwHFRTTime2EE	HFRT2 Time	R/W		20ms		UL
171.	uwHVRTEE	HVRT1 Volt	R/W		0.001Un		UL
172.	uwHVRTTimeEE	HVRT1 Time	R/W		20ms		UL
173.	uwHVRT2EE	HVRT2 Volt	R/W		0.001Un		UL
174.	uwHVRTTime2EE	HVRT2 Time	R/W		0.001Un		UL
175.	uwUnderFUploadDelayTime	UnderFUploadDelayTime	R/W	0-40	50ms	0s	50549
176.	uwUnderFUploadRateEE	UnderFUploadRate	R/W				50549
177.	uwGridRestart_H_Freq	GridRestartHighFreq	R/W	5000~5500	0.01Hz		50549

178.	OverFDeratResponseTime	OverFDeratResponseTime	W/R	0-500			
179.	UnderFUploadResponseTime	UnderFUploadResponseTime	W/R	0-500			
Intelligent control reads relevant data, used to identify the logo 180-200							
180.	MeterLink	Whether to elect the meter	R/W				0: Missed, 1: Received
181.	OPT Number	Number of connection optimizers	R/W	0-64			The total number of optimizers connected to the inverter
182.	OPT ConfigOK Flag	Optimizer configuration completion flag	R/W				0x00:Not configured success 0x01:Configuration is completed
183.	PvStrScan	String Num	R/W	0、8、16、32			0:Not support Other:PvString Num
184.	BDCLinkNum	BDC parallel Num	R/W			0	The number of BDCs connected to the current machine
185.	PackNum	Number of battery modules	R				Total number of battery modules currently associated with all BDCs
186.	Reserved						
187.	VPPFunctionEnableStatus	VPP function enable status	R				0:Disable 1:Enable
188.	DataLog Connect ServerStatus	dataLog Connect Server status					0:connection succeeded 1:Connection failed
……							Reserved

192	INVAndCollectorInteraction Function	INV and collectorInteraction function	R				Bit0: 0:collector not upload software version. 1:collector upload software version Bit1: 0:inv not support 1024 bytes update 1:inv support 1024 bytes update
……							Reserved
200.	Reserved						Reserved
201.	PID Working Model	PID Operating mode	W				0: automatic 1: continuous 2: All night
202.	PID On/Off Ctrl	PID Break control	W				0:On 1:Off
203.	PID Volt Option	PID Output voltage option	W	300~1000	V		
……							Reserved
209.	New Serial NO	Serial number 1-2			ASCII		
210.	New Serial NO	Serial number 3-4			ASCII		
211.	New Serial NO	Serial number 5-6			ASCII		
212.	New Serial NO	Serial number 7-8			ASCII		
213.	New Serial NO	Serial number 9-10			ASCII		
214.	New Serial NO	Serial number 11-12			ASCII		

215.	New Serial NO	Serial number 13-14			ASCII		
216.	New Serial NO	Serial number 15-16			ASCII		
217.	New Serial NO	Serial number 17-18			ASCII		
218.	New Serial NO	Serial number 19-20			ASCII		
219.	New Serial NO	Serial number 21-22			ASCII		
220.	New Serial NO	Serial number 23-24			ASCII		
221.	New Serial NO	Serial number 25-26			ASCII		
222.	New Serial NO	Serial number 27-28			ASCII		
223.	New Serial NO	Serial number 29-30			ASCII		
……							Reserved
229	EnergyAdjust	Power generation incremental calibration coefficient	W/R	1-1000	0.1%		(Percent ratio)
230~249 for growatt debug setting							
230.	IslandDisable	Island Disable or not.	W	0~1		0	1:disable 0:Enable
231.	FanCheck	Start Fan Check	W	1			
232.	EnableNLine	Enable N Line of grid	W	1		0	

233.	CheckHardware	Check Hardware					Bit0: GFCI Break; Bit1:SPS Damage Bit8:Eeprom read warning Bit9:EE write warning ……
234.	CheckHardware2						reserved
235.	NToGNDDetect	Dis/enable N to GND detect function	W	0-1		1	1:enable 0:disable
236.	NonStdVacEnable	Enable/Disable Nonstandard Grid voltage range	W	0-2		0	0:Disable; 1:Enable Voltgrade1 2:Enable Voltgrade2
237.	EnableSpecSet	Disablse/enable appointed spec setting	W		Binary	0x0000	Bit 0: Hungary 1:enable 0:disable
238.	Fast MPPT enable	About Fast mppt		0~2		0	Reserved
239.							Reserved
240.	Check Step		W				
241.	INV-Lng	Inverter Longitude	W				Longitude
242.	INV-Lat	Inverter Latitude	W				Latitude
……							Reserved
304.	uwAntiBackflowFailPowerLimitEE	Anti-backflow failure power percentage	R/W	0-1000	0.1%		Anti-backflow failure default setting power percentage
305.	Qloadspeed	Reactive loading speed	R/W	0-100	1%		Reactive power adjustment speed setting item, n%Pn/s, 0 means that the loading speed is not enabled, that is, it is directly loaded to the set value
306.	ParallelAntiBackflowEn	ParallelAnti-Backflow Enable	R/W	0-1			Parallel anti-Backflow open enable bit 1: enable 0:disable
307.	AntiBackflowFailureResponseTime	AntiBackflowFailure ResponseTime	R/W	1-5000	1s		AntiBackflow Failure Response Time

308.	ParallelAntiBackflowPowerLimitEE	Parallel Anti-Backflow Power	R/W	0-1000	0.1%		Parallel AntiBackflow Power limit value setting
309.	bISOCheckCmd	ISO detection command	R/W	0-1	1		ISO detection command
310.	bGPRSStatus	GPRS Status 1: module not working 2: no sim card 3: No internet 4. TCP not connecting to server 5. TCP connection succeeded	R/W	0-255	1		
311.	Qmax_Inductive	The inductive Qmax of the Q(V) curve	R/W	0-1000	0.1%		
312.	Qmax_Capactive	The Capactive Qmax of the Q(V) curve	R/W	0-1000	0.1%		
313.	ReactivePowerAdjustFailureResponseTime	Reactive Power Adjust Failure Response Time	R/W	0-5000	S		
314.	SuperAntiBackflowEnable	Super Anti-Backflow Enable	R/W				0:disable,1:enable
315.	ReactivePowerStableTime	Reactive Power Stable Time	R/W	0-200	S		
316.	QpStableTime	QpStableTime	R/W	0-200	S		
317.	PuDerateTime	PuDerateTime	R/W	0-200	S		
318.	QVModelQ2Point	QV mode Q2 set point reactive power percentage	R/W	0-2000	0.1%		Capacitive 30% （The corresponding setting is 700);

319.	QVModel Q3Point	QV mode Q3 set point reactive power percentage	R/W	0-2000	0.1%		Inductive 30% (The corresponding setting is 1300); used for IEE1547
320.	VrefModel Enable	VrefModelEnable 0:Vref mode for QV curve is not active 1:Vref mode for QV curve is active	R/W	0/1			When the Vref mode is not activated, the V1~V4 and Q1~Q4 upper computer of the QV curve can be adjusted; When Vref mode is activated, V1~V4 of the QV curve are determined with Vref and cannot be changed, and Q1~Q4 can be modified by the host computer. Used for IEE1547
321.	uwVrefModelFilterTime	VrefModelFilterTime	R/W	0-5000	S		Activate Vref mode, the output filter value is equal to Vref with in the set time .Used for IEE1547
322.	uwUserQPModeP1Krate	Active power P1 set point percentage for QP mode	R/W	0-1000	0.1%		used for IEE1547
323.	uwUserQPModeP2Krate	Active power P2 set point percentage for QP mode	R/W	0-1000	0.1%		used for IEE1547
324.	uwUserQPModeP3Krate	Active power P3 set point percentage for QP mode	R/W	0-1000	0.1%		used for IEE1547
325.	uwUserQPModeQ1Krate	Reactive power Q1 set point percentage for QP mode	R/W	-1000-1000	0.1%		-1000~1000:Inductive（100%）~ Capacitive（100%）
326.	uwUserQPModeQ2Krate	Reactive power Q2 set point percentage for QP mode	R/W	-1000-1000	0.1%		-1000~1000:Inductive（100%）~ Capacitive（100%）

327.	uwUserQPModeQ3Krate	Reactive power Q3 set point percentage for QP mode	R/W	-1000-1000	0.1%		-1000~1000:Inductive（100%）~ Capacitive（100%）
328.	uwAcVoltHighDeratPowerLimit	AcVoltHighDeratPowerLimit	R/W	0-1000	0.1%		
329.	BackflowSingleCtrl	BackflowSingleCtrl	R/W	0: disable 1: enable			
330.	bAntiBackflowProtectMode	AntiBackflowProtectMode	R/W	0-3			Used for Australian
331.	uwUnderFUploadZeroPowerPoint	UnderfreqUploadZeroPowerPoint	W		0.01Hz		
332.	FreqDerateZeroPowerPoint	FreqDerateZeroPowerPoint	W		0.01Hz		
333.	bFreqDeratingStopModeEnable	FreqDeratingStopModeEnable	R/W	0-1			
334.	bFreqIncreasingEnable	FreqIncreasingEnable	R/W	0-1			
335.	FreqIncreasingRecoverTime	FreqIncreasingRecoverTime	R/W		50ms		
336.	FreqIncreasingEndLowPoint	FreqIncreasingEndLowPoint	R/W		0.01Hz		
337.	bFreqIncreasingStopModeEnable	FreqIncreasingStopModeEnable	R/W	0-1			
338.	UserQpChrP1Krate	User QP function, charge P1 set point percentage	R/W	0-1000	0.1%		

339.	UserQpChrP2Krate	User QP function, charge P2 set point percentage	R/W	0-1000	0.1%		
340.	UserQpChrP3Krate	User QP function, charge P3 set point percentage	R/W	0-1000	0.1%		
341	UserQpChrQ1Krate	User QP function, charge Q1 set point percentage	R/W	-1000-1000	0.1%		-1000~1000:Inductive（100%）~ Capacitive（100%）
342.	UserQpChrQ2Krate	User QP function, charge Q2 set point percentage	R/W	-1000-1000	0.1%		-1000~1000:Inductive（100%）~ Capacitive（100%）
343.	UserQpChrQ3Krate	User QP function, charge Q3 set point percentage	R/W	-1000-1000	0.1%		-1000~1000:Inductive（100%）~ Capacitive（100%）
344.	FreqDeratingRecoverLowPoint	FreqDeratingRecoverLowPoint	R/W		0.01HZ		
345.	FreqIncreasingRecoverHighPoint	FreqIncreasingRecoverHighPoint	R/W		0.01HZ		
.....							Reserve
355	DSPDebugFwVer	DSP debug software version	R	0-255			
.....							Reserve
359	M3DebugFwVer	M3 debug software version	R	0-255			
.....							Reserve
532.	TurnOffUnloadSpeed	Turn Off Unload Speed	W/R	0-1000		0.1%	0 means not enabled, that is, the function is not enabled; 1-1000 means n%Pn/min
533.	LimitDevice	Anti-backflow equipment selection	W/R	0-3			1:Meter 3:CT Other:meaningless (Use for TL_XH)
534.	PowerSetOnDCSourceMode	Power settings in dc source mode	W/R	0-90000			The unit is W (Use for TL_XH)

535.	OUFreqGrade1En	Over-under-frequency Grade1Enable, currently only used by CEI0-21	W/R	0-1			0:disable 1:enable
536.	Country Set	Country settings under the same safety regulations	W/R	0-200			For mobile APP use only
538.	InterlockEnable	Three-machine communication Interlock function mode	W/R	0-2			0:disable 1: Slave Enable 2. host enable
539.	OvTemperDeratePoint	Over temperature derate point	W/R				
540.	SafetySetPassword	Switch between different safety regulations to set the password	W/R				
541.	AFCI Onoff	AFCI Onoff	W/R	0xA0/0xA5			0xA0:AFCI off 0xA5:AFCI on
542.	AfciSelfCheck	Afci Self Check	W/R				0:No self check 1: self check
543	AfciReset	Afci Reset	W/R				0:Not Reset 1: Reset
544.	AFCIValue1	AFCIThresholdValue (low)	W/R	0-65000			
545.	AFCIValue2	AFCIThresholdValue (middle)	W/R	0-65000			
546.	AFCIValue3	AFCIThresholdValue (High)	W/R	0-65000			
547.	OverThresholdValueMaxCnt	OverThresholdValueMaxCnt	W/R	0-255			
548.	AFCIScanTypeEnable	AFCI curve scan type	W/R	1~4			1:A road strength 2:A road FFT value 3:B road strength 4:B road FFT value

549.	PowerVoltStopModeEn	PowerVoltStopModeEn	W/R	0、1			0:disable 1:enable The power is restored when the voltage is less than the recovery point
550.	VoltWattRecoverTime	Voltage active power recovery time	W/R	0-15000	20ms		
551.	HVoltDerateStopPower	Voltage active cut-off power	W/R	-5000-11400			
552.	QVTimeExponent	QV Time Exponent	WR	1-255			Q varies exponentially with time
553.	Volt-Watt Watt1	Voltage active V1 point, corresponding active power	WR	0-11400			
554.	Volt-Watt Watt2	Voltage active V2 point, corresponding active power	WR	0-11400			
……							Reserve
600.	Volt-Var Var1	Voltage reactive V1 point, Corresponding reactive power percentage(Capacitive Qmax)	WR	0-1000			0%~100.0%,US latest safety regulations
601.	Volt-Var Var2	Voltage reactive V2 point,Corresponding reactive power percentage	WR	0-1000			0%~100.0%,US latest safety regulations
602.	Volt-Var Var3	Voltage reactive V3 point,Corresponding reactive power percentage	WR	0-1000			0%~100.0%,US latest safety regulations

603.	Volt-Var Var4	Voltage reactive V4 point,Corresponding reactive power per-centage(Inductive Qmax)	WR	0-1000			0%~100.0%,US latest safety regulations
604.	Reserve						Reserve
605.	OPModEnergize	Allowed inverter output power	R/W	0/1			0: output power not allowed 1: allowable output power For US models
608.	OneKeySetBDCMode	One key to set battery mode function	R/W				0: self-use 1: battery priority 2: Grid priority 255:Disable Currently used for US models
609.	PowerOutputEnable	Zero Power Output Enable					0:Zero Power Output 1:Unlimited output power (default is 1)
610.	DealDebugParaFlag	Flag bit for clearing debug variables					Currently only bit0 and bit1 are used bit0 is used to manually clear the Debug data uploaded to the server bit1 is used to manually clear the fault codes that need to be powered off to clear
……							Reserve
645.	BuzzerOnOff	Buzzer enable/disable	R/W	0/1			0:Disable buzzer 1:Enable buzzer(default)
……							Reserve
659	BatSNSettingLock	Bat serial number setting lock	R/W	0/1		0	0:locked 1:unlocked（return 0 after setting bat serial number）
660.	ReloadCmd	M3 remote command					0xA0: Initialize safety defaults 0xAA: Reboot M3 remotely
……							Reserve
700.	bBMSType	Indicates the type of battery connected to the inverter					0: ARO battery 1: LG version 3 battery 2: APX HV battery 3: LG version 4 battery

871	GridPhase Sequence		R/W	0-1			0:Positive order 1:Reverse order
874	ParallelEnable		R/W	0-1			0:disable 1:enable
875---------999 for business Storage Power							
875	FW Build No. 5	ATS Model letter version number（MB）			ASCII		ATS version number
876	FW Build No. 4	ATS Model letter versionnumber（AA）			ASCII		ATS version number
877	FW Build No. 3	ATS-DSP1 FW Build No			ASCII		
878	FW Build No. 2	ATS-DSP2/M3 FW Build No			ASCII		
879	ProductSet Enable		R/W	0-1			0:disable 1:enable
897	ReConnTimGridRestore	Wait time for the grid to be restored and reconnected	R/W	0-65536	1s	300s	
900	STSEnable		R/W	0-1			0:disable 1:enable
901	OilEnable		R/W	0-1			0:disable 1:enable
902	OnOffChangeMode	Toggle modes	R/W	0-2			0:-H 1:-EP 2:-UP
903	PcsType		R/W	0-1			0:Optical storage all-in-one machine 1:Energy storage machine
904	uwBattType		R/W	0-1			0:Directly attach 1:DC-DC
905	uwACChargePowerRate	AC allow charge Power Rate	R/W	0-100			
906	uwBattMaxChargeVol	Battery Max charge voltage	R/W		X10		
907	uwBattEODVol	Battery End of Discharge voltage	R/W		X10		

908	uwConnectPhaseMode	On Grid wireMode	R/W				0:3p3w 1:3p4w
909	uwDisConnectPhaseMode	Off Grid wireMode	R/W				0:3p3w 1:3p4w
910	uwBatMaxChargeCurrent	Battery Max chargeCurrent	R/W		X10		
911	uwBatMaxDisChargeCurrent	Battery Max Discharge Current	R/W		X10		
912	uwOnOffChangeManualMode	OnOffGrid Change Mode	R/W				0:auto 1:manual
913	uwOnOffGridSet	OnOffGrid Set	R/W				0:on grid 1:off grid （use for manual mode）
914	uwOffGridSoftStartEnable	OffGrid volt Soft Start Enable	R/W				0:disable, 1:enable
915	uwOffgridSoftStartTime	Off grid volt soft start time	R/W	2~20	X10		Unit （s）
917	uwBatCap	Bat cap	R/W				
918	uwPowerDispatchEnable	Vpp enable	R/W				0:disable, 1:enable
919	uwPowerDispatchActivePowerSet	Power Dispatch Active Power Set	R/W		X10		
936	uwOffGridVol	Off grid volt	R/W		X10		0:220v 1:230v 2:240v 3:277v 4:127v
937	uwOffGridFreq	Off grid frequency	R/W		X10		0:50HZ;1:60HZ

938	uwLoadPvInverter	PCS Load Port has Invert or not	R/W				0:No 1:Yes
939	uwDgStartSoc	The soc point Start oil engine on Off grid	R/W				
940	uwDgStopSoc	The soc point close oil engine on Off grid	R/W				
941	uwLoadPvInvStartFreq	The invert On load port Over frequency derating point	R/W		0.01Hz		
942	uwLoadPvInvFreqDerateRate	The invert On load port Over frequency derating slope	R/W				
943	uwLoadPvInvFreqDerateMinPower	the invert On load port Over frequency derating Min power	R/W		0.1kw		
944	uwDemandMangeDisChargePowerLimit	Demand management AC port discharge limit power	R/W		1kw		
945	uwDemandMangeChargePowerLimit	Demand management AC port charge limit power	R/W		1kw		
946	uwDemandMangeEnable	Demand management enable	R/W				0:disable 1:enable
947	uwPowerUnblanceCtrlEnable	AC Power unbalance ctrl enable	R/W				0:disable 1:enable
948	PcsParallelNum	Pcs parallel num	R/W				
949	uwACChargeEnable	AC charge enable	R/W				0:disable 1:enable
950	uwOffGridEnable	Off grid enable	R/W				0:disable 1:enable

951	uwBatChargeStopSoc	Battery charge stop SOC	R/W		0~100		
952	uwBatDisChargeStopSoc	Battery discharge stop SOC	R/W		0~100		
953	uwSinglePhaseAntiBackflowEnable	Single phase AntiBackflow	R/W				0:disable 1:enable
954	Time 1 Enable		R/W				bit13~14, 0:load first; 1:battery first; 2:grid first; bit15, 0:disable; 1:enable;
955	Time 1 start time	Start Time	R/W				bit0~7: minutes; bit8~12:hours;
956	Time 1 end time	End Time	R/W				bit0~7: minutes; bit8~12: hours;
957	Time 2 Enable		R/W				bit13~14, 0: load first; 1: battery first; 2: grid first; bit15, 0:disable; 1:enable;
958	Time 2 start time	Start Time	R/W				bit0~7: minutes; bit8~12: hours;
959	Time 2 end time	End Time	R/W				bit0~7: minutes; bit8~12: hours;
960	Time 3 Enable		R/W				bit13~14, 0: load first; 1: battery first; 2: grid first; bit15, 0:disable; 1:enable;
961	Time 3 start time	Start Time	R/W				bit0~7: minutes; bit8~12: hours;
962	Time 3 end time	End Time	R/W				bit0~7: minute; bit8~12: hour;

963	Time 4 Enable		R/W				bit13~14, 0: load first; 1: battery first; 2: grid first; bit15, 0:disable; 1:enable;
964	Time 4 start time	Start Time	R/W				bit0~7: minutes; bit8~12: hours;
965	Time 4 end time	End Time	R/W				bit0~7: minute; bit8~12: hour;
966	Time 5 Enable		R/W				bit13~14, 0: load first; 1: battery first; 2: grid first; bit15, 0:disable; 1:enable;
967	Time 5 start time	Start Time	R/W				bit0~7: minutes; bit8~12: hours;
968	Time 5 end time	End Time	R/W				bit0~7: minutes; bit8~12: hours;
969	Time 6 Enable		R/W				bit13~14, 0: load first; 1: battery first; 2: grid first; bit15, 0:disable; 1:enable;
970	Time 6 start time	Start Time	R/W				bit0~7: minutes; bit8~12: hours;
971	Time 6 end time	End Time	R/W				bit0~7: minutes; bit8~12: hours;
972	BMS Enable		R/W				0:disable 1:enable
973	parallel Enable	uwParallelEnable	R/W				0:disable 1:enable
974	BatCharge PowerLimit	Battle Charge Power Limit	R/W		X10		Unit （kw）
975	BatDisChargePowerLimit	Battle DisCharge Power Limit	R/W		X10		Unit （kw）

976	ATS SpecPower	ATS SpecPower	R/W		0.01		Unit w
987	ESPConstNCEnable	Emergency stop and normal closure are enabled, which distinguishes between the American version and the European version	R/W	0-1			0:Valid low 1:Valid high
988	MachineType		R/W	0-1			0:WIT 1:WIS
989	ForcePowerSlowChange	Power is forcibly slowly enabled	R/W	0-1			0:DISABLE 1:ENABLE
990	ForceChrDischrPower[TIME1]	Time period 1 power setting, only WIS models are allowed to set	R/W	0-100			
991	ForceChrDischrPower[TIME2]	Time period 2 power setting, only WIS models are allowed to set	R/W	0-100			
992	ForceChrDischrPower[TIME3]	Time period 3 power setting, only WIS models are allowed to set	R/W	0-100			
993	ForceChrDischrPower[TIME4]	Time period 4 power setting, only WIS models are allowed to set	R/W	0-100			
994	ForceChrDischrPower[TIME5]	Time period 5 power setting, only WIS models are allowed to set	R/W	0-100			
995	ForceChrDischrPower[TIME6]	Time period 6 power setting, only WIS models are allowed to set	R/W	0-100			
996	BakSoc		R/W	0-100		50	

997	BakSocEnable	The standby SOC is enabled under the demand management function	R/W	0-1			0:DISABLE 1:ENABLE
998	OffGridDisChgStopSoc		R/W	0-100		10	

Six group for Storage Power

Register NO.	Variable Name	Description	Write /read	Range	Unit	Initial value	Note
1000.	Float charge current limit	When charge current battery need is lower than this value, enter into float charge	W		0.1A	600	CC current
1001.	PF CMD memory state	Set the following 19-22 CMD will be memory ornot(1/0), if not, these settings are the initial value.	W	0~1		0	Means these settings will be acting or not when next power on(02 repeat)
1002.	VbatStartForDischarge	LV Vbat	R/W		0.1V		Lead-acid battery LV voltage
1003.	VbatlowWarnClr	Load Percent(only lead-Acid): 45.5V:<20%, 48.0V:20%~50% 49.0V:>50	W		0.1V		Clear battery low voltage error voltage point
1004.	Vbatstopfordischarge	Should stop dischar-ge when lower than this voltage (only lead-Acid): 46.0V:<20% 44.8V:20%~50% 44.2V:>50%	W		0.01V		

1005.	Vbat stop for charge	Should stop charge when higher than this voltage	W		0.01V	5800	
1006.	Vbatstartfordischarge	Should not discharge when lower than this voltage	W		0.01V	4800	
1007.	Vbat constant charge	Can charge when lower than this voltage	W		0.01V	5800	CV voltage（acid）
1008.	EESysInfo.SysSetEn	Bit0:Resved; Bit1:Resved; Bit2:Resved; Bit3:Resved; Bit4:Resved; Bit5:bDischargeEn; Bit6:ForceDischrEn; Bit7:ChargeEn; Bit8:bForceChrEn; Bit9:bBackUpEn; Bit10:bInvLimitLoadE; Bit11:bSpLimitLoadEn; Bit12:bACChargeEn; Bit13:bPVLoadLimitEn; Bit14,15:UnUsed;	W				System Enable
1009.	Battemp lower limitd	Battery temperature lower limit for discharge	W	0-200, 1000-1400	0.1℃	1170	0-200:0-20℃, 1000-1400:-40-0℃
1010.	Battemp upper limitd	Battery temperature upper limit for discharge	W	200-1000	0.1℃	420	
1011.	Battemp lower limitc	Battery temperature lower limit for charge	W	0-200:0-20℃ 1000-1400:-40-0℃	0.1℃	30	Lower temperature limit

1012.	Battemp upper limit c	Battery temperature upper limit for charge	W	200-1000	0.1℃	370	Upper temperature limit
1013.	uwUnderFreDischargeDelyTime	Under Fre Delay Time		0-20s	50ms		Under Fre Delay Time
1014.	BatMdlSerialNum	Battery serial number	W	00:00			SPH4-11K used
1015.	BatMdlParallNum	Battery parallel section	W	00:00			SPH4-11K used
1016.	DRMS_EN						0:disable 1:enable
1017.	Bat First Start Time 4	High eight:hours Low eight: minutes		0-23 0-59			
1018.	Bat First Stop Time 4	High eight:hours Low eight: minutes		0-23 0-59			
1019.	BatFirst on/off Switch 4	Enable:1 Disable:0		0 or 1			Battery priority enable 1
1020.	Bat First Start Time 5	High eight:hours Low eight: minutes		0-23 0-59			
1021.	Bat First Stop Time 5	High eight:hours Low eight: minutes		0-23 0-59			
1022.	BatFirst on/off Switch 5	Enable:1 Disable:0		0 or 1			Battery priority enable 1
1023.	Bat First Start Time 6	High eight:hours Low eight: minutes		0-23 0-59			
1024.	Bat First Stop Time 6	High eight:hours Low eight: minutes		0-23 0-59			
1025.	BatFirst on/off Switch 6	Enable:1 Disable:0		0 or 1			Battery priority enable 1

1026.	Grid First Start Time 4	High eight:hours Low eight: minutes		0-23 0-59			
1027.	Grid First Stop Time 4	High eight:hours Low eight: minutes		0-23 0-59			
1028.	Grid First Stop Switch 4	Enable:1 Disable:0		0 or 1			Grid priority enable
1029.	Grid First Start Time 5	High eight:hours Low eight: minutes		0-23 0-59			
1030.	Grid First Stop Time 5	High eight:hours Low eight: minutes		0-23 0-59			
1031.	Grid First Stop Switch 5	Enable:1 Disable:0		0 or 1			Grid priority enable
1032.	Grid First Start Time 6	High eight:hours Low eight: minutes		0-23 0-59			
1033.	Grid First Stop Time 6	High eight:hours Low eight: minutes		0-23 0-59			
1034.	Grid First Stop Switch 6	Enable:1 Disable:0		0 or 1			Grid priority enable
1035.	Bat First Start Time 4	High eight:hours Low eight: minutes		0-23 0-59			
1036.							Reserve
1037.	bCTMode	Use the CTMode to Choose RFCT \ Cable CT\METER	W	0-2		0	2:METER 1:WirelessCT 0:WiredCT
1038.	CTAdjust	CTAdjust enable	W	0/1		0	0:disable,1:enable
……							Reserve

1044.	Priority	ForceChrEn/ForceDischrEn Load first/bat first /grid first	R	0-2			bForceChrEn/disbForceDischrEn/dis 0.Load(default)/1.Battery/ 2.Grid	
1045.	Reserve							
1046.	Reserve						Reserve	
1047.	AgingTestStep Cmd	Command for aging test		0-2			Cmd for aging test 0: default,1: charge,2: discharge	
1048.	BatteryType	Battery type choose of buck-boost input		0-2		0	Battery type 0:Lithium,1:Lead-acid,2:other	
1049.	Reserve						Reserve	
1060.	BuckUpsFunEn	Ups function enable or disable		0/1			0:disable,1:enable	
1061.	BuckUPSVoltSet	UPS output voltage		0-2		230V	0:230,1:208,2:240	
1062.	UPSFreqSet	UPS output frequency		0/1		50Hz	0:50Hz,1:60Hz	
.....							Reserve	
Priority set								
1070.	GridFirstDischargePowerRate	Discharge Power Rate when Grid First	W	0-100	1%		Discharge Power Rate when Grid First	
1071.	GridFirstStopSOC	Stop Discharge SOC when Grid First	W	0-100	1%		Stop Discharge soc when Grid First	
.....							Reserve	
1080.	Grid First Start Time 1	High eight bit:hour Low eight bit:minute		0-23 0-59				
1081.	Grid First Stop Time 1	High eight bit:hour Low eight bit:minute		0-23 0-59				

1082.	Grid First Stop Switch 1	Enable :1 Disable:0		0 or 1			Grid First enable
1083.	Grid First Start Time 2	High eight bit:hour Low eight bit:minute		0-23 0-59			
1084.	Grid First Stop Time 2	High eight bit:hour Low eight bit:minute		0-23 0-59			
1085.	Grid First Stop Switch 2	ForceDischarge.bSwitch&LCD_SET_FORCE_TRUE_2)==LCD_SET_FORCE_TRUE_2		0 or 1		Grid First enable	ForceDischarge; LCD_SET_FORCE_TRUE_2
1086.	Grid First Start Time 3	High eight bit:hour Low eight bit:minute		0-23 0-59			
1087.	Grid First Stop Time 3	High eight bit:hour Low eight bit:minute		0-23 0-59			
1088.	Grid First Stop Switch 3	Enable :1 Disable:0		0 or 1			Grid First enable
1089.							reserve
1090.	BatFirstPowerRate	Charge Power Rate when Bat First	W	0-100	1%		Charge Power Rate when Bat First
1091.	wBatFirst stop SOC	Stop Charge soc when Bat First	W	0-100	1%		Stop Charge soc when Bat First
1092.	AC charge Switch	When Bat First Enable:1 Disable:0		Enable:1 Disable:0			AC Charge Enable
……							Reserve
1100.	Bat First Start Time 1	High eight bit:hour Low eight bit:minute		0-23 0-59			
1101.	Bat First Stop Time 1	High eight bit:hour Low eight bit:minute		0-23 0-59			
1102.	BatFirst on/off Switch 1	Enable :1 Disable:0		0 or 1			Bat First Enable1

1103.	Bat First Start Time 2	High eight bit:hour Low eight bit:minute		0-23 0-59			
1104.	Bat First Stop Time 2	High eight bit:hour Low eight bit:minute		0-23 0-59			
1105.	BatFirston /off Switch 2	Enable :1 Disable:0		0 or 1			Bat First Enable2
1106.	Bat First Start Time 3	High eight bit:hour Low eight bit:minute		0-23 0-59			
1107.	Bat First Stop Time 3	High eight bit:hour Low eight bit:minute		0-23 0-59			
1108.	BatFirston /off Switch 3	Enable :1 Disable:0		0 or 1			Bat First Enable3
1109.							Reserve
1110.	Load First Start Time 1	High eight bit:hour Low eight bit:minute		0-23 0-59			SPA/ reserve
1111.	Load First Stop Time 1	High eight bit:hour Low eight bit:minute		0-23 0-59			SPA/ reserve
1112.	Load First Switch 1	Enable :1 Disable:0		0 or 1			SPA/ reserve Load First Enable
1113.	Load First Start Time2	High eight bit:hour Low eight bit:minute		0-23 0-59			SPA/ reserve
1114.	Load First Stop Time 2	High eight bit:hour Low eight bit:minute		0-23 0-59			SPA/ reserve
1115.	Load First Switch 2	Enable :1 Disable:0		0 or 1			SPA/ reserve Load First Enable
1116.	Load First Start Time 3	High eight bit:hour Low eight bit:minute		0-23 0-59			SPA/ reserve
1117.	Load First Stop Time 3	High eight bit:hour Low eight bit:minute		0-23 0-59			SPA/ reserve

1118.	Load First Switch 3	Enable :1 Disable:0		0 or 1			SPA/ reserve Load First Enable
1119.	NewEPowerCalcFlag						0:The old formula 1:The new formula
1120.	BackUpEn	BackUp Enable					SPH6K US
1121.	SGIPEn	SGIP Enable					SPH6K US
……							Reserve
1125.	BatSerialNO. 8	Product serial number of the first PACK of energy storage batteries			ASCII		
1126.	BatSerialNO. 7				ASCII		
1127.	BatSerialNO. 6				ASCII		
1128.	BatSerialNO. 5				ASCII		
1129.	BatSerialNO. 4				ASCII		
1130.	BatSerialNO. 3				ASCII		
1131.	BatSerialNO. 2				ASCII		
1132.	BatSerialNO. 1				ASCII		
1132~1204	Bat Serial NO.8~ Bat Serial NO. 1	The serial number of the second to tenth packs of the energy storage battery consists of nine packs, and the format of the serial number of each PACK is 1125 to 1132			ASCII		
……	Reserve						
1244	Com version NameH	Name of the battery main control firmware version			ASCII		
1245	Com version NameL	Name of the battery main control firmware version			ASCII		

1246	Com version No	Version of the battery main control firmware			digital		
1247	Com version NameH	Name of battery monitoring firmware version			ASCII		
1248	Com version NameL	Name of battery monitoring firmware version			ASCII		
1249	Com version No	Battery monitoring firmware version			digital		
Use for TL-X and TL-XH							
3000	ExportLimitFailedPowerRate	The power rate when exportLimit failed	R/W		0.1%		The power rate when export Limit failed
3001	New Serial NO	Serial number 1-2	R/W		ASCII		The new model uses the following registers to record the serial number; The representation is the same as the original: one register holds two characters and the new serial number is 30 characters.
3002	New Serial NO	Serial number 3-4	R/W		ASCII		
3003	New Serial NO	Serial number 5-6	R/W		ASCII		
3004	New Serial NO	Serial number 7-8	R/W		ASCII		
3005	New Serial NO	Serial number 9-10	R/W		ASCII		
3006	New Serial NO	Serial number 11-12	R/W		ASCII		
3007	New Serial NO	Serial number 13-14	R/W		ASCII		
3008	New Serial NO	Serial number 15-16	R/W		ASCII		
3009	New Serial NO	Serial number 17-18	R/W		ASCII		

3010	New Serial NO	Serial number 19-20	R/W		ASCII		
3011	New Serial NO	Serial number 21-22	R/W		ASCII		
3012	New Serial NO	Serial number 23-24	R/W		ASCII		
3013	New Serial NO	Serial number 25-26	R/W		ASCII		
3014	New Serial NO	Serial number 27-28	R/W		ASCII		
3015	New Serial NO	Serial number 29-30	R/W		ASCII		
3016	DryContactFuncEn	Dry Contact function enable	R/W	0/1			0:Disable, 1: Enable
3017	DryContactOnRate	The power rate of dry contact turn on	R/W	0~1000	0.1%		
3018	WorkMode	WorkMode----0:default,1: System Retrofit 2: Multi-Parallel	R/W	0、1、2			MIN2.5~6KTL-XH/XA Double CT special
3019	DryContactOffRate	Dry Contact Off Rate, Dry contact closure power	R/W	0~100	0.1%		Dry contact closure power percentage
3020	BoxCtrlInvOrder	Box Ctrl Inv Order	R/W				control instruction
3021	ExterCommOffGridEn	External communication setting manual off-network enable	R/W				0x00: Disable;（default） 0x01: Enable;
3022	uwBdcStopWorkOfBusVolt	BdcStopWorkOfBusVolt	R				
3023	bGridType	GridType---0:SinglePhase 1:ThreePhase 2:SplitPhase	R/W	0、1、2			MIN2.5~6KTL-XH/XA Double CT special

3024	Float charge current limit	When charge current battery need is lower than this value, enter into float charge	R/W		0.1A	600	CC current
3025	VbatWarning	"Battery-low" warning setup voltage	R/W		0.1V	4800	Lead acid battery LV voltage
3026	VbatlowWarnClr	"Battery-low" warning clear voltage Clear battery low voltage error voltage point Load Percent (only lead-Acid): 45.5V(Load < 20%); 48.0V(20%<=Load <=50%); 49.0V(Load > 50%);	R/W		0.1V		
3027	Vbatstopfordischarge	Battery cut off voltage Should stop discharge when lower than this voltage(only lead-Acid): 46.0V(Load < 20%); 44.8V(20%<=Load <=50%); 44.2V(Load > 50%);	R/W		0.1V		
3028	Vbat stop for charge	Battery over charge volt, Should stop charge when higher than this voltage	R/W		0.01V	5800	
3029	Vbat start for discharge	Battery start discharge volt, Should not discharge when lower than this voltage	R/W		0.01V	4800	
3030	Vbat constant charge	Battery constant charge voltage,CV voltage（acid）can charge when lower than this voltage	R/W		0.01V	5800	
3031	Battemp lower limitd	Battery temperature lower limit for discharge	R/W	0-200,1000-1400	0.1℃	1170	0-200:0-20℃ 1000-1400:-40-0℃
3032	Bat temp upper limitd	Battery temperature upper limit for discharge	R/W		0.1℃	420	
3033	Bat temp lower limitc	Battery temperature lower limit for charge	R/W	0-200,1000-1400	0.1℃	30	0-200:0-20℃ 1000-1400:-40-0℃

3034	Bat temp upper limit c	Battery temperature upper limit for charge	R/W		0.1℃	370	Battery temperature upper limit
3035	uwUnderFreDischargeDelyTime	Under Fre Delay Time	R/W		50ms		Under Fre Delay Time
3036	GridFirstDischargePowerRate	Discharge Power Rate when Grid First	R/W	1-255			
3037	GridFirstStopSOC	Stop Discharge soc when Grid First	R/W	1-100			For US model,Valid in off-grid mode,modified in firmware version ZACA-08/UEAA-09
3038	Time 1(xh)	Period 1: [Start Time ~ End Time], [Charge/Discharge], [Disable/Enable] 3038 enable, charge and discharge, start time, end time 3039	R/W				Bit0~7: minutes; Bit8~12: hour; Bit13~14, 0: load priority; 1: battery priority; 2: Grid priority; Bit15, 0: prohibited; 1: enabled;
3039			R/W				Bit0~7: minutes; Bit8~12: hour; Bit13~15: reserved
3040	Time 2(xh)	Time period 2: [start time ~ end time], [charge / discharge], [disable / enable] 3040 enable, charge and discharge, start time, 3041 end time	R/W				Bit0~7: minutes; Bit8~12: hour; Bit13~14, 0: load priority; 1: battery priority; 2: Grid priority; Bit15, 0: prohibited; 1: enabled;

3041			R/W				Bit0~7: minutes; Bit8~12: hour; Bit13~15: reserved
3042	Time 3(xh)	With Time1	R/W				With Time1
3043			R/W				With Time1
3044	Time 4(xh)	With Time1	R/W				With Time1
3045			R/W				With Time1
3046	INVHWVersion	US inverter hardware version	R		ASCII		V1: 5K off Grid V2: 10K off Grid with dual AC output V3: 10K off Grid, output with a single AC port
3047	BatFirstPowerRate	Charge Power Rate when Bat First		1-100			
3048	wBatFirst stop SOC	Stop Charge soc when Bat First		1-100			
3049	AcChargeEnable	AcChargeEnable					Enable :1 Disable:0
3050	Time 5(xh)	With Time1	R/W				With Time1
3051			R/W				With Time1
3052	Time 6(xh)	With Time1	R/W				With Time1
3053			R/W				With Time1
3054	Time 7(xh)	With Time1	R/W				With Time1
3055			R/W				With Time1
3056	Time 8(xh)	With Time1	R/W				With Time1
3057			R/W				With Time1

3058	Time 9(xh)	With Time1	R/W				With Time1
3059			R/W				With Time1
·····	Reserve						
3067	OnGridGridFirstStopSOC	Stop Discharge soc when Grid First and on-grid	R/W	1-100			For US model, Valid in off-grid mode,added in firmware version ZACA-08/UEAA-09
·····	Reserve						
3070	BatteryType	Battery type choose of buck-boost input	R/W				Battery type 0:Lithium 1:Lead-acid 2:other
3071	BatMdlSeria/ParalNum	BatMdlSeria/ParalNum The upper 8 bits indicate the number of series segments; The lower 8 bits indicate the number of parallel sections;	R/W				SPH4-11K used
3072	bTurnoffAcEnable	Enable Pre-PTO function	R/W	0/1			1:Enable 0:Disable
3073	GeneratorChargeEnable	Enable battery charge from generator function	R/W	0/1			1:Enable 0:Disable
3074	GeneratorOnCmd	Force the generator on,off or not forced [1.27 add] [1.31 Modify]	R/W	0~2			0:Not forced 1:Force generator on 2:Disable Generator
...	Reserved						
3077	uwGeneratorSpecPower	generator rated power	R/W		1W		For US model,added in firmware version ZAca-31/UEaa-28
3078	Reserved						
3079	UpsFunEn	Ups function enable or disable	R/W			0	0:disable 1:enable

3080	UPSVoltSet	UPS output voltage	R/W			0	0:230V 1:208V 2:240V
3081	UPSFreqSet	UPS output frequency	R/W			0	0:50Hz 1:60Hz
3082	~~bLoadFirstStopSocSet~~	~~StopSoc When LoadFirst~~	~~R/W~~	~~13-100~~			~~Ratio~~ Deleted in firmware version ZACA-04/UEAA-04
3082	BackUpBoxEnable	BackUp Box Enable	R/W	0/1			0:disable; 1:enable (for XH model,not used in US model,)
	On-Grid Discharge Stop SOC	Stop Discharge soc when on-grid mode	R/W	1-100			For US model, Valid in on-grid mode,same usage as holding 3067, added in firmware version ZACA-09
3083	AustraliaRegion	Australian region	R/W	0~3			0:Region A; 1:Region B; 2:Region C; 3:Region NZ;
3084	Reserved						
3085	Com Address	Communication addr	R/W			1	1 :Communication addr=1 1 ~ 254 : Communication addr=1~254
3086	BaudRate	Communication BaudRate	R/W			0	0: 9600 bps 1: 38400 bps
3087	Serial NO. 1	Serial Number 1-2	R/W		ASCII		For battery
3088	Serial NO. 2	Serial Number 3-4	R/W		ASCII		
3089	Serial NO. 3	Serial Number 5-6	R/W		ASCII		
3090	Serial NO. 4	Serial Number 7-8	R/W		ASCII		
3091	Serial No. 5	Serial Number 9-10	R/W		ASCII		

3092	Serial No.6	Serial Number 11-12	R/W		ASCII		
3093	Serial No. 7	Serial Number 13-14	R/W		ASCII		
3094	Serial No. 8	Serial Number 15-16	R/W		ASCII		
3095	BdcResetCmd	BDC Reset command	R/W				0:Invalid data 1:Reset setting parameters 2:Reset correction parameter 3:Clear historical power
3096 3097	ARKM3 Code	BDCMonitoring software code	R		ASCII		ZEBA
3098	DTC	DTC	R				
3099 3100	FW Code	DSP software code	R		ASCII		
3101	Processor1 FW Vision	DSP Software Version	R		ASCII		
3102	BusVoltRef	Minimum BUS voltage for charging and discharging batteries	R				
3103	ARKM3Ver	BDC monitoring software version	R				
3104	BMS_MCU Version	BMS hardware version information	R	1			
3105	BMS_FW	BMS software version information	R	1			
3106	BMS_Info	BMS ManufacturerName	R	1			
3107	BMSCommType	BMS Communication interface type:	R	1			0: RS485; 1: CAN;
3108	Module 4	BDCmodel (4)	R/W	&*11			SxxBxx
3109	Module 3	BDCmodel (3)	R/W	&*11			DxxTxx
3110	Module 2	BDCmodel (2)	R/W	&*11			PxxUxx

3111	Module 1	BDCmodel (1)	R/W	&*11			Mxxxx
3112	BDCParalleINomber	Number of BDC parallel	R				[1,5] No parallel, the value is fixed to 1
3113	unProtocolVer	BDC Protocol Version Bit8-bit15:The major version number ranges from 0-256. In principle, it cannot be changed Bit0-bit7:Minor version number [0-256].	R		1		If the protocol is changed, you need to update this version No.
3114	uwCertificationVer	BDC CertificationVer	R		1		
3115	BDCHardwareVersion	BDC hardware version number	R				
3116	BCUSoftwareVer	BCU software code	R		ASCII		
3117							
3118	HistoricalFaultNum	Historical fault number	R		1		
3119	RatedCellCapacity	Cell rated capacity	R	0-60000	1AH		
3120	BDCNumAndBatNum	BDC number and number of battery modules in parallel Bit15 to bit13: indicates the number of the BDC in the range [1-4]. Bit12 to bit10: reserved Bit7~bit0: Parallel number of battery modules range[1,25]	R				No parallel connection, fixed at 1 (for APX only)
3121	RatedBatCapacity	Battery rated capacity	R	0-65535			(for APX only)
……	Reserved						

3124	ClearTime Settings	Clear EMS time settings .Clear holding3125-3238 and holding608	W				1:Clear EMS time settings
US Machine type Time Set							
3125	Time Month1	Use with Time1-9（us）,Add month time	R/W				bit0~3:month_L; bit4~7: month_H bit8, 0:disable 1:enable Bit9~15:reserve
3126	Time Month2	Use with Time10-18（us）,Add month time	R/W				With Time Month1
3127	Time Month3	Use with Time19-27（us）,Add month time	R/W				With Time Month1
3128	Time Month4	Use with Time28-36（us）,Add month time	R/W				With Time Month1
3129	Time 1（us）	time1:[starttime~endtime]	R/W	[Charge/discharge/counter current], [disable/enable]			bit0~6:min; bit7~11:hour; bit12~14, 0:loadfirst; 1:batfirst; 2:gridfirst; 3: anti-reflux bit15, 0:disable; 1:enable;
3130			R/W				bit0~6:min; bit7~11:hour; bit12-13, 0:Weekday 1:Weekend 2:WeeK bit14~15:reserve
3131-3132	Time 2（us）	Same as above	R/W				Same as Time 1（us）
3133-3134	Time 3（us）	Same as above	R/W				Same as Time 1（us）
3135-3136	Time 4（us）	Same as above	R/W				Same as Time 1（us）
3137-3138	Time 5（us）	Same as above	R/W				Same as Time 1（us）

3139-3140	Time 6（us）	Same as above	R/W				Same as Time 1（us）
3141-3142	Time 7（us）	Same as above	R/W				Same as Time 1（us）
3143-3144	Time 8（us）	Same as above	R/W				Same as Time 1（us）
3145-3146	Time9（us）	Same as above	R/W				Same as Time 1（us）
3147-3148	Time 10（us）	Same as above	R/W				Same as Time 1（us）
3149-3150	Time 11（us）	Same as above	R/W				Same as Time 1（us）
3151-3152	Time 12（us）	Same as above	R/W				Same as Time 1（us）
3153-3154	Time 13（us）	Same as above	R/W				Same as Time 1（us）
3155-3156	Time 14（us）	Same as above	R/W				Same as Time 1（us）
3157-3158	Time15（us）	Same as above	R/W				Same as Time 1（us）
3159-3160	Time 16（us）	Same as above	R/W				Same as Time 1（us）
3161-3162	Time 17（us）	Same as above	R/W				Same as Time 1（us）
3163-3164	Time 18（us）	Same as above	R/W				Same as Time 1（us）
3165-3166	Time 19（us）	Same as above	R/W				Same as Time 1（us）
3167-3168	Time 20（us）	Same as above	R/W				Same as Time 1（us）
3169-3170	Time 21（us）	Same as above	R/W				Same as Time 1（us）
3171-3172	Time 22（us）	Same as above	R/W				Same as Time 1（us）
3173-3174	Time 23（us）	Same as above	R/W				Same as Time 1（us）
3175-3176	Time 24（us）	Same as above	R/W				Same as Time 1（us）
3177-3178	Time 25（us）	Same as above	R/W				Same as Time 1（us）

3179-3180	Time 26 （us）	Same as above	R/W				Same as Time 1 （us）
3181-3182	Time 27 （us）	Same as above	R/W				Same as Time 1 （us）
3183-3184	Time 28 （us）	Same as above	R/W				Same as Time 1 （us）
3185-3186	Time 29 （us）	Same as above	R/W				Same as Time 1 （us）
3187-3188	Time 30 （us）	Same as above	R/W				Same as Time 1 （us）
3189-3190	Time 31 （us）	Same as above	R/W				Same as Time 1 （us）
3191-3192	Time 32 （us）	Same as above	R/W				Same as Time 1 （us）
3193-3194	Time 33 （us）	Same as above	R/W				Same as Time 1 （us）
3195-3196	Time 34 （us）	Same as above	R/W				Same as Time 1 （us）
3197-3198	Time 35 （us）	Same as above	R/W				Same as Time 1 （us）
3199-3200	Time 36 （us）	Same as above	R/W				Same as Time 1 （us）
3201	SpecialDay 1	SpecialDay1（month,Day）	R/W				bit0~7:day; bit8~14:month bit15: 0:disable 1:enable
3202	SpecialDay 1_Time1	Start time	R/W				bit0~6:min; bit7~11:hour; bit12~14, 0:loadfirst; 1:batfirst; 2:gridfirst; 3: anti-reflux bit15, 0: disable; 1: enable;
3203		endtime	R/W				bit0~6:min; bit7~11:hour; bit12~15:reserve

3204-3205	SpecialDay1_Time2	Same as above	R/W				Same as SpecialDay1_Time1
3206-3207	SpecialDay1_Time3	Same as above	R/W				Same as SpecialDay1_Time1
3208-3209	SpecialDay1_Time4	Same as above	R/W				Same as SpecialDay1_Time1
3210-3211	SpecialDay1_Time5	Same as above	R/W				Same as SpecialDay1_Time1
3212-3213	SpecialDay1_Time6	Same as above	R/W				Same as SpecialDay1_Time1
3214-3215	SpecialDay1_Time7	Same as above	R/W				Same as SpecialDay1_Time1
3216-3217	SpecialDay1_Time8	Same as above	R/W				Same as SpecialDay1_Time1
3218~3219	SpecialDay1_Time9	Same as above	R/W				Same as SpecialDay1_Time1
3220	SpecialDay2	SpecialDay2（month,Day）	R/W				bit0~7:day; bit8~14:month bit15, 0:disable 1:enable
3221	SpecialDay2_Time1	Start time	R/W				bit0~6: min; bit7~11: hour; bit12~14, 0: loadfirst; 1: batfirst; 2: gridfirst; 3: anti-reflux bit15, 0: disable; 1: enable;

3222		endtime	R/W				bit0~6: min; bit7~11: hour; bit12~15:reserve
3223~3224	SpecialDay2_Time2	Same as above	R/W				Same as Special Day2_Time1
3225~3226	SpecialDay2_Time3	Same as above	R/W				Same as Special Day2_Time1
3227~3228	SpecialDay2_Time4	Same as above	R/W				Same as Special Day2_Time1
3229~3230	SpecialDay2_Time5	Same as above	R/W				Same as Special Day2_Time1
3231~3232	SpecialDay2_Time6	Same as above	R/W				Same as Special Day2_Time1
3233~3234	SpecialDay2_Time7	Same as above	R/W				Same as Special Day2_Time1
3235~3236	SpecialDay2_Time8	Same as above	R/W				Same as SpecialDay2_Time1
3237~3238	SpecialDay2_Time9	Same as above	R/W				Same as Special Day2_Time1
3239~3249	Reserve	Reserve	R/W				
3250	bBoxDataUploadFlag	Backup box Data Upload Flag	R				0: No 1: Yes
3251	uwFirmwareCode_H	Backup box firmware code	R		ASCII		
3252	uwFirmwareCode_L		R		ASCII		
3253	ubFirmwareVersion	Backup box firmware version	R		/		
3254	uwSerialNum0	Backup box serial number 0	R		ASCII		

3255	uwSerialNum1	Backup box serial number 1	R		ASCII		
3256	uwSerialNum2	Backup box serial number 2	R		ASCII		
3257	uwSerialNum3	Backup box serial number 3	R		ASCII		
3258	uwSerialNum4	Backup box serial number 4	R		ASCII		
3259	uwSerialNum5	Backup box serial number 5	R		ASCII		
3260	uwSerialNum6	Backup box serial number 6	R		ASCII		
3261	uwSerialNum7	Backup box serial number 7	R		ASCII		
3262	uwSerialNum8	Backup box serial number 8	R		ASCII		
3263	uwSerialNum9	Backup box serial number 9	R		ASCII		
3264	uwSerialNum10	Backup box serial number 10	R		ASCII		
3265	uwSerialNum11	Backup box serial number 11	R		ASCII		
3266	uwSerialNum12	Backup box serial number 12	R		ASCII		
3267	uwSerialNum13	Backup box serial number 13	R		ASCII		
3268	uwSerialNum14	Backup box serial number 14	R		ASCII		
3269	uwAFCIFirmwareCode_H	AFCI software code	R		ASCII		
3270	uwAFCIFirmwareCode_L	AFCI software code	R		ASCII		
3271	uwAFCIFirmwareVer	AFCI software version	R				
3272	BusbarProtectEn	Busbar protect enable	R/W	0/1		0	0:Disable 1:Enable
3273	BusbarProtectCurrent	Busbar protect current	R/W	0-500A	1A	0	

3274	BusbarProtectFailCurrent	Busbar protect current when meter connect error	R/W	0-500A	1A	0	
3275~3281	Reserve	Reserve					
3282	BypassModeEnterEn	Bypass mode enter enable	R/W	0/1		0	0:Disable 1:Enable
BDC information (support up to 10 parallel BDC)							
5000-5039		1			Reference 3085 to 3124 for a total of 40 registers Description		
5040-5079		2					
5000+(N-1)*40---5039+(N-1)*40		N					
Battery module information (support up to 64 parallel BDC)（Special for APX）							
5400	Serial NO. 1	Serial Number 1-2	R		ASCII		For battery module
5401	Serial NO. 2	Serial Number 3-4	R		ASCII		
5402	Serial NO. 3	Serial Number 5-6	R		ASCII		
5403	Serial NO. 4	Serial Number 7-8	R		ASCII		
5404	Serial No. 5	Serial Number 9-10	R		ASCII		
5405	Serial No.6	Serial Number 11-12	R		ASCII		
5406	Serial No. 7	Serial Number 13-14	R		ASCII		
5407	Serial No. 8	Serial Number 15-16	R		ASCII		
5408	BatDSPCode	DSP software code	R		ASCII		WAAA
5409							
5410	BatDSPVersion	DSP version number	R				
5411	BatMCUCode	Monitoring software code	R		ASCII		QABA
5412							
5413	BatMCUVersion	Monitoring version number	R				

5414	BatManufacturerInfor	Manufacturer information	R			Bit15~bit12: Cell model Bit11~bit8: Battery manufacturers Bit7~bit4: Pack Foundry Bit3~bit0: hardware version number	Bit15~bit12: 0: Invalid value 1: Li-iron_50AH 2:Ternary_50AH Bit11~bit8: 0: Invalid value 1: Rept 2:EVE 3:BYD 4:ATL 5:CATL Bit7~bit4: 0:Growatt 1: Desay Bit3~bit0: 0-15
5415	BatNumber	Number of the battery module	R				Bit15~bit13: Indicates the number of the BDC group where the battery is located, range [1-4] Bit12~bit8: indicates the serial number of the battery module in the BDC group, range [1-21] Bit7~bit0: Reserved
5416	SOX firmware version		R				
5417	PowerCmd	Power on and off command	R				0: standby 1: operation 2: invalid 3: shutdown

5418	MaxPowerPecnent	Maximum charge and discharge power percentage	R		1%		Bit15~bit8: Percentage of maximum discharge power, range [0-128] Bit7~bit0: Percentage of maximum secondary power, range [0-100]
5419	SOCLimit	Charge and discharge SOC limit	R		1%		Bit15~bit8: discharge SOC limit, range [10-100] Bit7~bit0: charging SOC limit, range [0-100]
……	Reserved						
5440-5479		Battery module 2			Reference 5400 to 5439 for a total of 40 registers description		
5480-5519		Battery module 3			Reference 5400 to 5439 for a total of 40 registers description		
5400+(N-1)*40----5439+(N-1)*40		Battery module N(supports up to 64 battery modules)					
BDC information (support up to 10 parallel BDC)							
7960	uwSerialNum0	BDC1 new serial number 0	R	ASCII			
7961	uwSerialNum1	BDC1 new serial number 1	R	ASCII			
7962	uwSerialNum2	BDC1 new serial number 2	R	ASCII			
7963	uwSerialNum3	BDC1 new serial number 3	R	ASCII			
7964	uwSerialNum4	BDC1 new serial number 4	R	ASCII			
7965	uwSerialNum5	BDC1 new serial number 5	R	ASCII			
7966	uwSerialNum6	BDC1 new serial number 6	R	ASCII			

7967	uwSerialNum7	BDC1 new serial number 7	R	ASCII			
7968	uwSerialNum8	BDC1 new serial number	R	ASCII			
7969	uwSerialNum9	BDC1 new serial number 9	R	ASCII			
7970	uwSerialNum10	BDC1 new serial number 10	R	ASCII			
7971	uwSerialNum11	BDC1 new serial number 11	R	ASCII			
7972	uwSerialNum12	BDC1 new serial number 12	R	ASCII			
7973	uwSerialNum13	BDC1 new serial number 13	R	ASCII			
7974	uwSerialNum14	BDC1 new serial number 14	R	ASCII			
……		reserve					
BDC information (support up to 10 parallel BDC)							
8020~8079		2			Reference 7960 to 8019 for a total of 60 registers Description		
8080~8139		3					
7960+(N-1)*60~8019+(N-1)*60		N					
Battery module information (support up to 64 parallel BDC)（Special for APX）							
8560	uwSerialNum0	Battery module 1 new serial number 0	R	ASCII			
8561	uwSerialNum1	Battery module 1 new serial number 1	R	ASCII			
8562	uwSerialNum2	Battery module 1 new serial number 2	R	ASCII			
8563	uwSerialNum3	Battery module 1 new serial number 3	R	ASCII			
8564	uwSerialNum4	Battery module 1 new serial number 4	R	ASCII			
8565	uwSerialNum5	Battery module 1 new serial number 5	R	ASCII			
8566	uwSerialNum6	Battery module 1 new serial number 6	R	ASCII			

8567	uwSerialNum7	Battery module 1 new serial number 7	R	ASCII			
8568	uwSerialNum8	Battery module 1 new serial number 8	R	ASCII			
8569	uwSerialNum9	Battery module 1 new serial number 9	R	ASCII			
8570	uwSerialNum10	Battery module 1 new serial number 10	R	ASCII			
8571	uwSerialNum11	Battery module 1 new serial number 11	R	ASCII			
8572	uwSerialNum12	Battery module 1 new serial number 12	R	ASCII			
8573	uwSerialNum13	Battery module 1 new serial number 13	R	ASCII			
8574	uwSerialNum14	Battery module 1 new serial number 14	R	ASCII			
Battery module information (support up to 64 parallel BDC)（Special for APX）							
8575-8589		Battery module 2 new serial number			Reference 8560 to 8574 for a total of 15 registers Description Each BDC is allowed to connect up to 6 battery modules. So BDC1's battery module SN is from 8560-8650(8560+15*6) BDC2's battery module SN is from 8650-8740(8650+15*6)		
8560+(N-1)*15---8574 +(N-1)*15		Battery module N new serial number			Same as above		

2.2 Input register

NO.	Variable Name	Description	Range	Unit	Note
First group					
0.	Inverter Status	Inverter run state	0:waiting , 1:normal , 3:fault		
1.	Ppv H	Input power (high)		0.1W	
2.	Ppv L	Input power (low)		0.1W	

3.	Vpv1	PV1 voltage		0.1V	
4.	PV1Curr	PV1 input current		0.1A	
5.	Ppv1 H	PV1 input power(high)		0.1W	
6.	Ppv1 L	PV1 input power(low)		0.1W	
7.	Vpv2	PV2 voltage		0.1V	
8.	PV2Curr	PV2 input current		0.1A	
9.	Ppv2 H	PV2 input power (high)		0.1W	
10.	Ppv2 L	PV2 input power (low)		0.1W	
11.	Vpv3	PV3 voltage		0.1V	
12.	PV3Curr	PV3 input current		0.1A	
13.	Ppv3 H	PV3 input power (high)		0.1W	
14.	Ppv3 L	PV3 input power (low)		0.1W	
15.	Vpv4	PV4 voltage		0.1V	
16.	PV4Curr	PV4 input current		0.1A	
17.	Ppv4 H	PV4 input power (high)		0.1W	
18.	Ppv4 L	PV4 input power (low)		0.1W	
19.	Vpv5	PV5 voltage		0.1V	
20.	PV5Curr	PV5 input current		0.1A	
21.	Ppv5H	PV5 input power(high)		0.1W	
22.	Ppv5 L	PV5 input power(low)		0.1W	
23.	Vpv6	PV6 voltage		0.1V	
24.	PV6Curr	PV6 input current		0.1A	
25.	Ppv6 H	PV6 input power (high)		0.1W	
26.	Ppv6 L	PV6 input power (low)		0.1W	
27.	Vpv7	PV7 voltage		0.1V	
28.	PV7Curr	PV7 input current		0.1A	
29.	Ppv7 H	PV7 input power (high)		0.1W	
30.	Ppv7 L	PV7 input power (low)		0.1W	
31.	Vpv8	PV8 voltage		0.1V	
32.	PV8Curr	PV8 input current		0.1A	
33.	Ppv8 H	PV8 input power (high)		0.1W	
34.	Ppv8 L	PV8 input power (low)		0.1W	
35.	Pac H	Output power (high)		0.1W	
36.	Pac L	Output power (low)		0.1W	
37.	Fac	Grid frequency		0.01Hz	
38.	Vac1	Three/single phase grid voltage		0.1V	
39.	Iac1	Three/single phase grid output current		0.1A	
40.	Pac1 H	Three/single phase grid output watt VA (high)		0.1VA	

41.	Pac1 L	Three/single phase grid output watt VA(low)		0.1VA	
42.	Vac2	Three phase grid voltage		0.1V	
43.	Iac2	Three phase grid output current		0.1A	
44.	Pac2 H	Three phase grid output power (high)		0.1VA	
45.	Pac2 L	Three phase grid output power (low)		0.1VA	
46.	Vac3	Three phase grid voltage		0.1V	
47.	Iac3	Three phase grid output current		0.1A	
48.	Pac3 H	Three phase grid output power (high)		0.1VA	
49.	Pac3 L	Three phase grid output power (low)		0.1VA	
50.	Vac_RS	Three phase grid voltage		0.1V	Line voltage
51.	Vac_ST	Three phase grid voltage		0.1V	Line voltage
52.	Vac_TR	Three phase grid voltage		0.1V	Line voltage
53.	Eactoday H	Today generate energy (high)		0.1kWH	
54.	Eac today L	Today generate energy (low)		0.1kWH	
55.	Eac total H	Total generate energy (high)		0.1kWH	
56.	Eac total L	Total generate energy (low)		0.1kWH	
57.	Time total H	Work time total (high)		0.5s	
58.	Time total L	Work time total (low)		0.5s	
59.	Epv1_today H	PV1Energy today(high)		0.1kWh	
60.	Epv1_today L	PV1Energy today (low)		0.1kWh	
61.	Epv1_total H	PV1Energy total(high)		0.1kWh	
62.	Epv1_total L	PV1Energy total (low)		0.1kWh	
63.	Epv2_today H	PV2Energy today(high)		0.1kWh	
64.	Epv2_today L	PV2Energy today (low)		0.1kWh	
65.	Epv2_total H	PV2Energy total(high)		0.1kWh	
66.	Epv2_total L	PV2Energy total (low)		0.1kWh	
67.	Epv3_today H	PV3 Energy today(high)		0.1kWh	
68.	Epv3_today L	PV3 Energy today (low)		0.1kWh	
69.	Epv3_total H	PV3 Energy total(high)		0.1kWh	
70.	Epv3_total L	PV3 Energy total (low)		0.1kWh	
71.	Epv4_today H	PV4Energy today(high)		0.1kWh	
72.	Epv4_today L	PV4Energy today (low)		0.1kWh	
73.	Epv4_total H	PV4Energy total(high)		0.1kWh	
74.	Epv4_total L	PV4Energy total (low)		0.1kWh	
75.	Epv5_today H	PV5Energy today(high)		0.1kWh	

76.	Epv5_today L	PV5Energy today (low)		0.1kWh	
77.	Epv5_total H	PV5Energy total(high)		0.1kWh	
78.	Epv5_total L	PV5Energy total (low)		0.1kWh	
79.	Epv6_today H	PV6Energy today(high)		0.1kWh	
80.	Epv6_today L	PV6Energy today (low)		0.1kWh	
81.	Epv6_total H	PV6Energy total(high)		0.1kWh	
82.	Epv6_total L	PV6Energy total (low)		0.1kWh	
83.	Epv7_today H	PV7Energy today(high)		0.1kWh	
84.	Epv7_today L	PV7Energy today (low)		0.1kWh	
85.	Epv7_total H	PV7 Energy total(high)		0.1kWh	
86.	Epv7_total L	PV7Energy total (low)		0.1kWh	
87.	Epv8_today H	PV8Energy today(high)		0.1kWh	
88.	Epv8_today L	PV8Energy today (low)		0.1kWh	
89.	Epv8_total H	PV8Energy total(high)		0.1kWh	
90.	Epv8_total L	PV8Energy total (low)		0.1kWh	
91.	Epv_total H	PV Energy total(high)		0.1kWh	
92.	Epv_total L	PV Energy total (low)		0.1kWh	
93.	Temp1	Inverter temperature		0.1C	
94.	Temp2	The inside IPM in inverter Temper-ature		0.1C	
95.	Temp3	Boost temperature		0.1C	
96.	Temp4				reserved
97.	uwBatVolt_DSP	BatVolt_DSP		0.1V	BatVolt(DSP)
98.	P Bus Voltage	P Bus inside Voltage		0.1V	
99.	N Bus Voltage	N Bus inside Voltage		0.1V	
100.	IPF	Inverter output PF now	0-20000		
101.	RealOPPercent	Real Output power Percent		1%	
102.	OPFullwatt H	Output Maxpower Limited high			
103.	OPFullwatt L	Output Maxpower Limited low		0.1W	
104.	DeratingMode	DeratingMode			0:no derate 1:PV 2:* 3:Vac 4:Fac 5:Tboost 6:Tinv 7:Control 8:* 9:*OverBack ByTime

105.	Fault Maincode	Inverter fault maincode			
106.	Reserve				
107.	Fault Subcode	Inverter fault subcode			
108.	RemoteCtrlEn	Remote Control Enable	0.Load First 1.BatFirst 2.Grid		StoragePower (SPA)
109.	RemoteCtrlPower	Remote Control Power			StoragePower (SPA)
110.	Warning bit H	Warning bit H			
111.	Warn Subcode	Inverter warn subcode			
112.	Warn Maincode	Inverter warn maincode			
	EACharge_Today_H	ACCharge energy today		0.1kwh	Storage Power
113.	real Power Percent	real Power Percent	0-100	%	MAX
	EACharge_Today_L	ACCharge energy today		0.1kwh	Storage Power
114.	inv start delay time	inv start delay time			MAX
	EACharge_Total_H	ACCharge energy total		0.1kwh	Storage Power
115.	bINVAllFaultCode	bINVAllFaultCode			MAX
	EACharge_Total_L	ACCharge energy total		0.1kwh	Storage Power
116.	AC charge Power_H	Grid power to local load		0.1kwh	Storage Power
117.	AC charge Power_L	Grid power to local load		0.1kwh	Storage Power
118.	Priority	0:Load First 1:Battery First 2:Grid First			Storage Power
119.	Battery Type	0:Lead-acid 1:Lithium battery			Storage Power
120.	AutoProofreadCMD	Aging mode Auto-calibration command			Storage Power
…	reserved				reserved
124.	reserved				reserved
Second group					

125.	PID PV1+ Voltage	PID PV1PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
126.	PID PV1+ Current	PID PV1PE Curr	-10~10mA	0.1mA	
127.	PID PV2+ Voltage	PID PV2PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
128.	PID PV2+ Current	PID PV2PE Curr	-10~10mA	0.1mA	
129.	PID PV3+ Voltage	PID PV3PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
130.	PID PV3+ Current	PID PV3PE Curr	-10~10mA	0.1mA	
131.	PID PV4+ Voltage	PID PV4PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
132.	PID PV4+ Current	PID PV4PE Curr	-10~10mA	0.1mA	
133.	PID PV5+ Voltage	PID PV5PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
134.	PID PV5+ Current	PID PV5PE Curr	-10~10mA	0.1mA	
135.	PID PV6+ Voltage	PID PV6PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
136.	PID PV6+ Current	PID PV6PE Curr	-10~10mA	0.1mA	
137.	PID PV7+ Voltage	PID PV7PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
138.	PID PV7+ Current	PID PV7PE Curr	-10~10mA	0.1mA	
139.	PID PV8+ Voltage	PID PV8PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
140.	PID PV8+ Current	PID PV8PE Curr	-10~10mA	0.1mA	
141.	PID Status	Bit0~7:PID Working Status 1:Wait Status 2:Normal Status 3:Fault Status Bit8~15:Reversed	0~3		
142.	V _String1	PV String1 voltage		0.1V	
143.	Curr _String1	PV String1 current	-15~15A	0.1A	
144.	V _String2	PV String2 voltage		0.1V	
145.	Curr _String2	PV String2 current	-15~15A	0.1A	

146.	V _String3	PV String3 voltage		0.1V	
147.	Curr _String3	PV String3 current	-15~15A	0.1A	
148.	V _String4	PV String4 voltage		0.1V	
149.	Curr _String4	PV String4 current	-15~15A	0.1A	
150.	V _String5	PV String5 voltage		0.1V	
151.	Curr _String5	PV String5 current	-15~15A	0.1A	
152.	V _String6	PV String6 voltage		0.1V	
153.	Curr _String6	PV String6 current	-15~15A	0.1A	
154.	V _String7	PV String7 voltage		0.1V	
155.	Curr _String7	PV String7 current	-15~15A	0.1A	
156.	V _String8	PV String8 voltage		0.1V	
157.	Curr _String8	PV String8 current	-15A~15A	0.1A	
158.	V _String9	PV String9 voltage		0.1V	
159.	Curr _String9	PV String9 current	-15A~15A	0.1A	
160.	V _String10	PV String10 voltage		0.1V	
161.	Curr _String10	PV String10 current	-15~15A	0.1A	
162.	V _String11	PV String11 voltage		0.1V	
163.	Curr _String11	PV String11 current	-15~15A	0.1A	
164.	V _String12	PV String12 voltage		0.1V	
165.	Curr _String12	PV String12 current	-15~15A	0.1A	
166.	V _String13	PV String13 voltage		0.1V	
167.	Curr _String13	PV String13 current	-15A~15A	0.1A	
168.	V _String14	PV String14 voltage		0.1V	
169.	Curr _String14	PV String14 current	-15~15A	0.1A	
170.	V _String15	PV String15 voltage		0.1V	
171.	Curr _String15	PV String15 current	-15~15A	0.1A	
172.	V _String16	PV String16 voltage		0.1V	
173.	Curr _String16	PV String16 current	-15~15A	0.1A	
174.	StrUnmatch	Bit0~15: String1~16 unmatch			suggestive
175.	StrCurrentUnblance	Bit0~15: String1~16 current unblance			suggestive
176.	StrDisconnect	Bit0~15: String1~16 disconnect			suggestive
177.	PIDFaultCode	Bit0:Output over voltage Bit1: ISO fault Bit2: BUS voltage abnormal Bit3~15:reserved			

178.	String Prompt	String Prompt Bit0:String Unmatch Bit1:StrDisconnect Bit2:StrCurrentUnblance Bit3~15:reserved			
179.	PVWarningValue	PV Warning Value			
180.	DSP075 Warning Value	DSP075 Warning Value			
181.	DSP075 Fault Value	DSP075 Fault Value			
182.	DSP067 Debug Data1	DSP067 Debug Data1			
183.	DSP067 Debug Data2	DSP067 Debug Data2			
184.	DSP067 Debug Data3	DSP067 Debug Data3			
185.	DSP067 Debug Data4	DSP067 Debug Data4			
186.	DSP067 Debug Data5	DSP067 Debug Data5			
187.	DSP067 Debug Data6	DSP067 Debug Data6			
188.	DSP067 Debug Data7	DSP067 Debug Data7			
189.	DSP067 Debug Data8	DSP067 Debug Data8			
190.	DSP075 Debug Data1	DSP075 Debug Data1			
191.	DSP075 Debug Data2	DSP075 Debug Data2			
192.	DSP075 Debug Data3	DSP075 Debug Data3			
193.	DSP075 Debug Data4	DSP075 Debug Data4			
194.	DSP075 Debug Data55	DSP075 Debug Data5			
195.	DSP075 Debug Data6	DSP075 Debug Data6			
196.	DSP075 Debug Data7	DSP075 Debug Data7			

197.	DSP075 Debug Data8	DSP075 Debug Data8			
198.	bUSBAgingTest OkFlag	USBAgingTestOkFlag	0-1		
199.	bFlashEraseAgingOkFlag	FlashEraseAgingOkFlag	0-1		
200.	PVISO	PVISOValue		KΩ	
201.	R_DCI	R DCI Curr		0.1mA	
202.	S_DCI	S DCI Curr		0.1mA	
203.	T_DCI	T DCI Curr		0.1mA	
204.	PID_Bus	PIDBusVolt		0.1V	
205.	GFCI	GFCI Curr		mA	
206.	SVG/APF Status+SVGAPF EqualRatio	SVG/APF Status+SVGAPFEqualRatio	0:None 1:SVG run 2:APF run 3:SVG/APF Run		high 8bit: SVG/APF Equal Ratio low 8 bit: SVG/APF Status
207.	CT_I _R	R phase load side current for SVG		0.1A	
208.	CT_I _S	S phase load side current for SVG		0.1A	
209.	CT_I _T	T phase load side current for SVG		0.1A	
210.	CT_Q _R H	R phase load side output reactive power for SVG(High)		0.1Var	
211.	CT_Q _R L	R phase load side output reactive power for SVG(low)		0.1Var	
212.	CT_Q _S H	S phase load side output reactive power for SVG(High)		0.1Var	
213.	CT_Q _S L	S phase load side output reactive power for SVG(low)		0.1Var	
214.	CT_Q _T H	T phase load side output reactive power for SVG(High)		0.1Var	
215.	CT_Q _T L	T phase load side output reactive power for SVG(low)		0.1Var	
216.	CT HAR_I_R	R phase load side harmonic		0.1A	
217.	CT HAR_I_S	S phase load side harmonic		0.1A	
218.	CT HAR_I_T	T phase load side harmonic		0.1A	
219.	COMP_Q _R H	R phase compensate reactive power for SVG(High)		0.1Var	
220.	COMP_Q _R L	R phase compensate reactive power for SVG(low)		0.1Var	

221.	COMP_Q _S H	S phase compensate reactive power for SVG(High)		0.1Var	
222.	COMP_Q _S L	S phase compensate reactive power for SVG(low)		0.1Var	
223.	COMP_Q _T H	T phase compensate reactive power for SVG(High)		0.1Var	
224.	COMP_Q _T L	T phase compensate reactive power for SVG(low)		0.1Var	
225.	COMP HAR_I_R	R phase compensate harmonic for SVG		0.1A	
226.	COMP HAR_I_S	S phase compensate harmonic for SVG		0.1A	
227.	COMP HAR_I_T	T phase compensate harmonic for SVG		0.1A	
228.	bRS232AgingTestOkFlag	RS232AgingTestOkFlag	0-1		
229.	bFanFaultBit	Bit0: Fan 1 fault bit Bit1: Fan 2 fault bit Bit2: Fan 3 fault bit Bit3: Fan 4 fault bit Bit4-7: Reserved			
230.	Sac H	Output apparent power H		0.1W	
231.	Sac L	Output apparent power L		0.1W	
232.	ReActPowerH	Real Output Reactive Power H	Int32	0.1W	
233.	ReActPowerL	Real Output Reactive Power L			
234.	ReActPowerMaxH	Nominal Output Reactive Power H		0.1var	
235.	ReActPowerMaxL	Nominal Output Reactive Power L			
236.	ReActPower_TotalH	Reactive power generation		0.1kwh	
237.	ReActPower_TotalL	Reactive power generation			
238.	bAfciStatus	0:Waiting 1:Self-check state 2:Detect pull arc state 3:Fault 4:Update			
239.	uwPresentFFTValue [CHANNEL_A]	PresentFFTValue [CHANNEL_A]			

240.	uwPresentFFTValue [CHANNEL_B]	PresentFFTValue [CHANNEL_B]			
241.	DSP067 Debug Data1	DSP067 Debug Data1			
242.	DSP067 Debug Data2	DSP067 Debug Data2			
243.	DSP067 Debug Data3	DSP067 Debug Data3			
244.	DSP067 Debug Data4	DSP067 Debug Data4			
245.	DSP067 Debug Data5	DSP067 Debug Data5			
246.	DSP067 Debug Data6	DSP067 Debug Data6			
247.	DSP067 Debug Data7	DSP067 Debug Data7			
248.	DSP067 Debug Data8	DSP067 Debug Data8			
249.					reserved
The eighth group for PV9-PV16 information					
875.	Vpv9	PV9 voltage		0.1V	
876.	PV9Curr	PV9 Input current		0.1A	
877.	Ppv9 H	PV9 input power (High)		0.1W	
878.	Ppv9 L	PV9 input power (Low)		0.1W	
879.	Vpv10	PV10 voltage		0.1V	
880.	PV10Curr	PV10 Input current		0.1A	
881.	Ppv10 H	PV10 input power (High)		0.1W	
882.	Ppv10 L	PV10 input power (Low)		0.1W	
883.	Vpv11	PV11 voltage		0.1V	
884.	PV11Curr	PV11 Input current		0.1A	
885.	Ppv11 H	PV11 input power (High)		0.1W	
886.	Ppv11 L	PV11 input power (Low)		0.1W	
887.	Vpv12	PV12 voltage		0.1V	
888.	PV12Curr	PV12 Input current		0.1A	
889.	Ppv12 H	PV12 input power (High)		0.1W	
890.	Ppv12 L	PV12 input power (Low)		0.1W	
891.	Vpv13	PV13 voltage		0.1V	
892.	PV13Curr	PV13 Input current		0.1A	
893.	Ppv13H	PV13 input power (High)		0.1W	
894.	Ppv13 L	PV13 input power (Low)		0.1W	

895.	Vpv14	PV14 voltage		0.1V	
896.	PV14Curr	PV14 Input current		0.1A	
897.	Ppv14 H	PV14 input power (High)		0.1W	
898.	Ppv14 L	PV14 input power (Low)		0.1W	
899.	Vpv15	PV15 voltage		0.1V	
900.	PV15Curr	PV15 Input current		0.1A	
901.	Ppv15 H	PV15 input power (High)		0.1W	
902.	Ppv15 L	PV15 input power (Low)		0.1W	
903.	Vpv16	PV16 voltage		0.1V	
904.	PV16Curr	PV16 Input current		0.1A	
905.	Ppv16 H	PV16 input power (High)		0.1W	
906.	Ppv16 L	PV16 input power (Low)		0.1W	
907.	Epv9_today H	PV9 energy today (High)		0.1kWh	
908.	Epv9_today L	PV9 energy today (Low)		0.1kWh	
909.	Epv9_total H	PV9 energy total (High)		0.1kWh	
910.	Epv9_total L	PV9 energy total (Low)		0.1kWh	
911.	Epv10_today H	PV10 energy today (High)		0.1kWh	
912.	Epv10_today L	PV10 energy today (Low)		0.1kWh	
913.	Epv10_total H	PV10 energy total (High)		0.1kWh	
914.	Epv10_total L	PV10 energy total (Low)		0.1kWh	
915.	Epv11_today H	PV11 energy today (High)		0.1kWh	
916.	Epv11_today L	PV11 energy today (Low)		0.1kWh	
917.	Epv11_total H	PV11 energy total (High)		0.1kWh	
918.	Epv11_total L	PV11 energy total (Low)		0.1kWh	
919.	Epv12_today H	PV12 energy today (High)		0.1kWh	
920.	Epv12_today L	PV12 energy today (Low)		0.1kWh	
921.	Epv12_total H	PV12 energy total (High)		0.1kWh	
922.	Epv12_total L	PV12 energy total (Low)		0.1kWh	
923.	Epv13_today H	PV13 energy today (High)		0.1kWh	
924.	Epv13_today L	PV13 energy today (Low)		0.1kWh	
925.	Epv13_total H	PV13 energy total (High)		0.1kWh	
926.	Epv13_total L	PV13 energy total (Low)		0.1kWh	
927.	Epv14_today H	PV14 energy today (High)		0.1kWh	
928.	Epv14_today L	PV14 energy today (Low)		0.1kWh	
929.	Epv14_total H	PV14 energy total (High)		0.1kWh	
930.	Epv14_total L	PV14 energy total (Low)		0.1kWh	
931.	Epv15_today H	PV15 energy today (High)		0.1kWh	
932.	Epv15_today L	PV15 energy today (Low)		0.1kWh	
933.	Epv15_total H	PV15 energy total (High)		0.1kWh	
934.	Epv15_total L	PV15 energy total (Low)		0.1kWh	

935.	Epv16_today H	PV16 energy today (High)		0.1kWh	
936.	Epv16_today L	PV16 energy today (Low)		0.1kWh	
937.	Epv16_total H	PV16 energy total (High)		0.1kWh	
938.	Epv16_total L	PV16 energy total (Low)		0.1kWh	
939.	PID PV9+ Voltage	PID PV9PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
940.	PID PV9+ Current	PID PV9PE Current	-10~10mA	0.1mA	
941.	PID PV10+ Voltage	PID PV10PE/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
942.	PID PV10+ Current	PID PV10PE Current	-10~10mA	0.1mA	
943.	PID PV11+ Voltage	PID PV11PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
944.	PID PV11+ Current	PID PV11PE Current	-10~10mA	0.1mA	
945.	PID PV12+ Voltage	PID PV12PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
946.	PID PV12+ Current	PID PV12PE Current	-10~10mA	0.1mA	
947.	PID PV13+ Voltage	PID PV13PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
948.	PID PV13+ Current	PID PV13PE Current	-10~10mA	0.1mA	
949.	PID PV14+ Voltage	PID PV14PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
950.	PID PV14+ Current	PID PV14PE Current	-10~10mA	0.1mA	
951.	PID PV15+ Voltage	PID PV15PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
952.	PID PV15+ Current	PID PV15PE Current	-10~10mA	0.1mA	
953.	PID PV16+ Voltage	PID PV16PE Volt/ Flyspan voltage (MAX HV)	0~1000V	0.1V	
954.	PID PV16+ Current	PID PV16PE Current	-10~10mA	0.1mA	
955.	V _String17	PV String 17 voltage		0.1V	
956.	Curr _String17	PV String 17 Current	-15~15A	0.1A	
957.	V _String18	PV String 18 voltage		0.1V	
958.	Curr _String18	PV String 18 Current	-15~15A	0.1A	
959.	V _String19	PV String 19 voltage		0.1V	

960.	Curr _String19	PV String 19 Current	-15~15A	0.1A	
961.	V _String20	PV String 20 voltage		0.1V	
962.	Curr _String20	PV String 20 Current	-15~15A	0.1A	
963.	V _String21	PV String 21 voltage		0.1V	
964.	Curr _String21	PV String 21 Current	-15~15A	0.1A	
965.	V _String22	PV String22 voltage		0.1V	
966.	Curr _String22	PV String 22 Current	-15~15A	0.1A	
967.	V _String23	PV String 23 voltage		0.1V	
968.	Curr _String23	PV String 23 Current	-15~15A	0.1A	
969.	V _String24	PV String 24 voltage		0.1V	
970.	Curr _String24	PV String 24 Current	-15A~15A	0.1A	
971.	V _String25	PV String 25 voltage		0.1V	
972.	Curr _String25	PV String 25 Current	-15A~15A	0.1A	
973.	V _String26	PV String 26 voltage		0.1V	
974.	Curr _String26	PV String 26 Current	-15~15A	0.1A	
975.	V _String27	PV String 27 voltage		0.1V	
976.	Curr _String27	PV String 27 Current	-15~15A	0.1A	
977.	V _String28	PV String 28 voltage		0.1V	
978.	Curr _String28	PV String 28 Current	-15~15A	0.1A	
979.	V _String29	PV String 29 voltage		0.1V	
980.	Curr _String29	PV String 29 Current	-15A~15A	0.1A	
981.	V _String30	PV String 30 voltage		0.1V	
982.	Curr _String30	PV String 30 Current	-15~15A	0.1A	
983.	V _String31	PV String 31 voltage		0.1V	
984.	Curr _String31	PV String 31 Current	-15~15A	0.1A	
985.	V _String32	PV String 32 voltage		0.1V	
986.	Curr _String32	PV String 32 Current	-15~15A	0.1A	
987.	StrUnmatch2	Bit0~15: String 17~32 unmatch			
988.	StrCurrentUnbl ance2	Bit0~15:String 17~32 current unblance			
989.	StrDisconnect2	Bit0~15: String 17~32 disconnect			
990.	PV Warning Value	PV Warning Value (PV9-PV16) Contains PV9~16 abnormal,Boost9~16 Drive anomalies			
991.	StrWaringvalue 1	string1~string16 abnormal			

992.	StrWaringvalue 2	string17~string32 abnormal			
…					Reserve
999.	SystemCmd	M3 to DSP system command			system command
Ninth group for Storage power					
1000.	uwSysWorkMode	System work mode 0x00:waiting module 0x01: Self-test mode, optional 0x02 : Reserved 0x03:SysFault module 0x04: Flash module 0x05:PVBATOnlinemodule, 0x06:BatOnline module, 0x07:PVOfflineMode module, 0x08:BatOfflineMode module,			The working mode displayed by the monitoring to the customer is: 0x00: waiting module 0x01: Self-test mode, 0x03:fault module 0x04:flash module 0x05|0x06|0x07|0x08|0x09:normal module
1001.	Systemfault word0	System fault word0			Please refer to the fault descri-ption of Hybrid
1002.	Systemfault word1	System fault word1			
1003.	Systemfault word2	System fault word2			
1004.	Systemfault word3	System fault word3			
1005.	Systemfault word4	System fault word4			
1006.	Systemfault word5	System fault word5			

1007.	Systemfault word6	System fault word6			
1008.	Systemfault word7	System fault word7			
1009.	Pdischarge1 H	Discharge power(high)		0.1W	
1010.	Pdischarge1 L	Discharge power (low)		0.1W	
1011.	Pcharge1 H	Charge power(high)		0.1W	
1012.	Pcharge1 L	Charge power (low)		0.1W	
1013.	Vbat	Battery voltage		0.1V	
1014.	SOC	State of charge Capacity	0-100	1%	lith/leadacid
1015.	Pactouser R H	AC power to user H		0.1w	
1016.	Pactouser R L	AC power to user L		0.1w	
1017.	Pactouser S H	Pactouser S H		0.1w	
1018.	Pactouser S L	Pactouser S L		0.1w	
1019.	Pactouser T H	Pactouser T H		0.1w	
1020.	Pactouser T L	Pactouser T H		0.1w	
1021.	PactouserTotal H	AC power to user total H		0.1w	
1022.	PactouserTotal L	AC power to user total L		0.1w	
1023.	Pac to grid R H	AC power to grid H		0.1w	Ac output
1024.	Pac to grid R L	AC power to grid L		0.1w	
1025.	Pactogrid S H			0.1w	
1026.	Pactogrid S L			0.1w	
1027.	Pactogrid T H			0.1w	
1028.	Pactogrid T L			0.1w	
1029.	Pactogrid total H	AC power to grid total H		0.1w	
1030.	Pactogrid total L	AC power to grid total L		0.1w	
1031.	PLocalLoad R H	INV power to local load H		0.1w	
1032.	PLocalLoad R L	INV power to local load L		0.1w	

1033.	PLocalLoad SH			0.1w	
1034.	PLocalLoad SL			0.1w	
1035.	PLocalLoadTH			0.1w	
1036.	PLocalLoadT L			0.1w	
1037.	PLocalLoad total H	INV power to local load total H		0.1w	
1038.	PLocalLoad total L	INV power to local load total L		0.1w	
1039.	IPM Temperature	REC Temperature		0.1℃	No use
1040.	Battery Temperature	Battery Temperature		0.1℃	Lead acid/lithium battery temp
1041.	SP DSP Status	SP state			CHG/DisCHG
1042.	SP Bus Volt	SP BUS2 Volt		0.1V	
1043.					
Power generation data					
1044.	Etouser_today H	Energy to user today high		0.1kwh	
1045.	Etouser_today L	Energy to user today low		0.1kwh	
1046.	Etouser_total H	Energy to user total high		0.1kwh	
1047.	Etouser_ total L	Energy to user total high		0.1kwh	
1048.	Etogrid_today H	Energy to grid today high		0.1kwh	
1049.	Etogrid _today L	Energy to grid today low		0.1kwh	
1050.	Etogrid _total H	Energy to grid total high		0.1kwh	
1051.	Etogrid _ total L	Energy to grid total high		0.1kwh	
1052.	Edischarge1_today H	Discharge energy1 today		0.1kwh	
1053.	Edischarge1_today L	Discharge energy1 today		0.1kwh	
1054.	Edischarge1_total H	Total discharge energy1 (high)		0.1kwh	

1055.	Edischarge1_total L	Total discharge energy1 (low)		0.1kwh	
1056.	Echarge1_today H	Charge1 energy today		0.1kwh	
1057.	Echarge1_today L	Charge1 energy today		0.1kwh	
1058.	Echarge1_total H	Charge1 energy total		0.1kwh	
1059.	Echarge1_total L	Charge1 energy total		0.1kwh	
1060.	ELocalLoad_Today H	Local load energy today		0.1kwh	
1061.	ELocalLoad_Today L	Local load energy today		0.1kwh	
1062.	ELocalLoad_Total H	Local load energy total		0.1kwh	
1063.	ELocalLoad_Total L	Local load energy total		0.1kwh	
1064.	dwExportLimit ApparentPower	Export Limit Apparent Power H		0.1kwh	
1065.	dwExportLimit ApparentPower	Export Limit Apparent Power L		0.1kwh	
1066.	reserved				reserved
Ups information (offline)					
1067.	EPS Fac	UPSfrequency	5000/6000	0.01Hz	
1068.	EPS Vac1	UPS phase R output voltage	2300	0.1V	
1069.	EPS Iac1	UPS phase R output current		0.1A	
1070.	EPS Pac1 H	UPS phase R output power (H)		0.1VA	
1071.	EPS Pac1 L	UPS phase R output power (L)		0.1VA	
1072.	EPS Vac2	UPS phase S output voltage		0.1V	
1073.	EPS Iac2	UPS phase S output current		0.1A	Not used
1074.	EPS Pac2 H	UPS phase S output power (H)		0.1VA	
1075.	EPS Pac2 L	UPS phase S output power (L)		0.1VA	

1076.	EPS Vac3	UPS phase T output voltage		0.1V	
1077.	EPS Iac3	UPS phase T output current		0.1A	Not used
1078.	EPS Pac3 H	UPS phase T output power (H)		0.1VA	
1079.	EPS Pac3 L	UPS phase T output power (L)		0.1VA	
1080.	loadpercent	Load percent of UPS ouput	0-100	1%	
1081.	PF	Power factor	0-2	0.1	Primary Value+1
BMS Infomation					
1082.	BMS_StatusOld	StatusOld from BMS	Detail information, refer to document : GrowattxxSxxP ESS Protocol;		
1083.	BMS_Status	Status from BMS			W/R
1084.	BMS_Error Old	Error info Old from BMS			
1085.	BMS_Error	Errorinfomation from BMS			
1086.	BMS_SOC	SOC from BMS			R SPH6K
1087.	BMS_BatteryVolt	Battery voltage from BMS			R SPH6K
1088.	BMS_BatteryCurr	Battery current from BMS			
1089.	BMS_BatteryTemp	Battery temperature from BMS			
1090.	BMS_MaxCurr	Max charge/discharge current from BMS (pylon)			
1091.	BMS_GaugeRM	Gauge RM from BMS			
1092.	BMS_GaugeFCC	Gauge FCC from BMS			
1093.	BMS_FW				
1094.	BMS_DeltaVolt	Delta V from BMS			
1095.	BMS_CycleCnt	Cycle Count from BMS			
1096.	BMS_SOH	SOH from BMS			
1097.	BMS_Constant Volt	CV voltage from BMS			
1098.	BMS_WarnInfo Old	Warning info old from BMS			
1099.	BMS_WarnInfo	Warning info from BMS			
1100.	BMS_GaugeICCurr	Gauge IC current from BMS			

1101.	BMS_MCUVersion	MCU Software version from BMS			
1102.	BMS_GaugeVersion	Gauge Version from BMS			
1103.	BMS_wGaugeFRVersion_ L	Gauge FR Version L16 from BMS			
1104.	BMS_wGaugeFRVersion_H	Gauge FR Version H16 from BMS			
1105.	BMS_BMSInfo	BMSInformation from BMS			
1106.	BMS_PackInfo	Pack Information from BMS			
1107.	BMS_UsingCap	Using Cap from BMS			
1108.	uwMaxCellVolt	Maximum single battery voltage		0.001V	
1109.	uwMinCellVolt	Lowest single battery voltage		0.001V	
1110.	bModuleNum	Battery parallel number		1	
1111.	bBatNum	Number of batteries		1	
1112.	uwMaxVoltCellNo	Max Voltage Cell No		1	
1113.	uwMinVoltCellNo	Min Voltage Cell No		1	
1114.	uwMaxTemprCell_10T	Max Tempr Cell_10T		0.1℃	
1115.	uwMinTemprCell_10T	Min Tempr Cell_10T		0.1℃	
1116.	uwMaxTemprCellNo	Max Volt Tempr Cell No		1	
1117.	uwMinTemprCellNo	Min Volt Tempr Cell No		1	
1118.	Protect pack ID	Faulty Battery Address		1	
1119.	MaxSOC	Parallel maximum SOC		1%	
1120.	MinSOC	Parallel minimum SOC		1%	
1121.	BMS_Error2	Battery Protection 2		-	CAN ID:0x323 Byte4~5
1122.	BMS_Error3	Battery Protection3		-	CAN ID:0x323 Byte6

1123.	BMS_WarnInfo 2	Battery Warn2		-	CAN ID:0x323 Byte7
1124.	AC Charge Energy Today H	AC Charge Energy today		kwh	Energy today
Ninth group reserved for storage power					
1125.	ACCharge Energy TodayL	AC Charge Energy today		kwh	
1126.	AC Charge Energy Total H				Energy total
1127.	ACCharge Energy Total L				
1128.	AC Charge Power H	AC Charge Power		W	
1129.	AC Charge Power L	AC Charge Power		w	
1130.	70% INV Power adjust	uwGridPower_70_AdjEE_SP		W	
1131.	ExtraACPower to grid_H	Extra inverte AC Power to grid High, For SPA connect inverter			SPA used
1132.	ExtraACPower to grid_L	Extrainverte AC Power to grid Low			SPA used
1133.	Eextra_today H	Extra inverter PowerTOUser_Extra today (high)	R	0.1kWh	SPA used
1134.	Eextra_today L	Extra inverter PowerTOUser_Extra today (low)	R	0.1kWh	SPA used
1135.	Eextra_total H	Extra inverter PowerTOUser_Extra total(high)		0.1kWh	SPA used
1136.	Eextra_total L	Extra inverter PowerTOUser_Extra total(low)		0.1kWh	SPA used
1137.	Esystem_today H	System electric energy today H		0.1kWh	SPA used System electric energy today H

1138.	Esystem_ today L	System electric energy today L		0.1kWh	SPA used System electric energy today L
1139.	Esystem_total H	System electric energy total H		0.1kWh	SPA used System electric energy total H
1140.	Esystem_ total L	System electric energy total L		0.1kWh	SPA used System electric energy total L
1141.	Eself_today H	self electric energy today H		0.1kWh	self electric energy today H
1142.	Eself_ today L	self electric energy today L		0.1kWh	self electric energy today L
1143.	Eself_total H	self electric energy total H		0.1kWh	self electric energy total H
1144.	Eself_ total L	self electric energy total L		0.1kWh	self electric energy total L
1145.	PSystem H	System power H		0.1w	System power H
1146.	PSystem L	System power L		0.1w	System power L
1147.	PSelf H	self power H		0.1w	self power H
1148.	PSelf L	self power L		0.1w	self power L
1149.	EPVAll_Today H	PV electric energy today H		0.1kWh	
1150.	EPVAll_Today L	PV electric energy today L		0.1kWh	
1151.	AcDischarge PackSn	Discharge power pack serial number	R		

1152.	Acdischarge power_H	Cumulative discharge power high 16-bit byte	R	0.1kwh	
1153.	Acdischarge power_L	Cumulative discharge power low 16-bit byte	R	0.1kwh	
1154.	AcCharge PackSn	charge power pack serial number	R		
1155.	AcCharge power_H	Cumulative charge power high 16-bit byte	R	0.1kwh	
1156.	AcCharge power_L	Cumulative charge power low 16-bit byte	R	0.1kwh	
1157.	First Batt Fault Sn	First Battery Fault Sn	R		
1158.	Second Batt Fault Sn	Second Batt Fault Sn	R		
1159.	Third Batt Fault Sn	Third Batt Fault Sn	R		
1160.	Fourth Batt Fault Sn	Fourth Batt Fault Sn	R		
1161.	Battery history fault code 1	Battery history fault code 1	R		
1162.	Battery history fault code 2	Battery history fault code 2	R		
1163.	Battery history fault code 3	Battery history fault code 3	R		
1164.	Battery history fault code 4	Battery history fault code 4	R		
1165.	Battery history fault code 5	Battery history fault code 5	R		
1166.	Battery history fault code 6	Battery history fault code 6	R		
1167.	Battery history fault code 7	Battery history fault code 7	R		
1168.	Battery history fault code 8	Battery history fault code 8	R		

1169.	Number of battery codes	Number of battery codes PACK number + BIC forward and reverse codes	R		
1170.	reversed				reversed
……	reversed				reversed
1199.	NewEPowerCalcFlag	Intelligent reading is used to identify software compatibility features			0:Old energy calculation; 1:new energy calculation
1200.	MaxCellVolt	Maximum cell voltage	R	0.001V	
1201.	MinCellVolt	Minimum cell voltage	R	0.001V	
1202.	ModuleNum	Number of Battery modules	R		
1203.	TotalCellNum	Total number of cells	R		
1204.	MaxVoltCellNo	MaxVoltCellNo	R		
1205.	MinVoltCellNo	MinVoltCellNo	R		
1206.	MaxTemprCell_10T	MaxTemprCell_10T	R	0.1℃	
1207.	MinTemprCell_10T	MinTemprCell_10T	R	0.1℃	
1208.	MaxTemprCellNo	MaxTemprCellNo	R		
1209.	MinTemprCellNo	MinTemprCellNo	R		
1210.	ProtectPackID	Fault Pack ID	R		
1211.	MaxSOC	Parallel maximum SOC	R	1%	
1212.	MinSOC	Parallel minimum SOC	R	1%	
1213.	BatProtect1Add	BatProtect1Add	R		
1214.	BatProtect2Add	BatProtect2Add	R		
1215.	BatWarn1Add	BatWarn1Add	R		
1216.	BMS_HighestSoftVersion	BMS_HighestSoftVersion	R		

1217.	BMS_Hardware Version	BMS_HardwareVersion	R		
1218.	BMS_RequestType	BMS_RequestType	R		
……	reversed				reversed
1248.	bKeyAgingTestOkFlag	Success sign of key detection before aging			1:Finished test 0:test not completed
1249.					reversed
thirteen group for Storage power's SPA					
2000.	Inverter Status	Inverter run state			SPA: 0:waiting 1:normal 3:fault
……	reversed				
2035.	Pac H	Output power (high)		0.1W	SPA
2036.	Pac L	Output power (low)		0.1W	SPA
2037.	Fac	Grid frequency		0.01Hz	SPA
2038.	Vac1	Three/single phase grid voltage		0.1V	SPA
2039.	Iac1	Three/single phase grid output current		0.1A	SPA
2040.	Pac1 H	Three/single phase grid output watt VA (high)		0.1VA	SPA
2041.	Pac1 L	Three/single phase grid output watt VA(low)		0.1VA	SPA
……	reversed				
2053.	Eac today H	Today generate energy (high)		0.1kWh	SPA
2054.	Eac today L	Today generate energy (low)		0.1kWh	SPA
2055.	Eac total H	Total generate energy (high)		0.1kWh	SPA
2056.	Eac total L	Total generate energy (low)		0.1kWh	SPA
2057.	Time total H	Work time total (high)		0.5s	SPA

2058.	Time total L	Work time total (low)		0.5s	SPA
…	reversed				
2093.	Temp1	Inverter temperature		0.1C	SPA
2094.	Temp2	The inside IPM in inverter Temperature		0.1C	SPA
2095.	Temp3	Boost temperature		0.1C	SPA
2096.	Temp4				reserved
2097.	uwBatVolt_DSP	BatVolt_DSP		0.1V	BatVolt(DSP)
2098.	P Bus Voltage	P Bus inside Voltage		0.1V	SPA
2099.	N Bus Voltage	N Bus inside Voltage		0.1V	SPA
2100.	RemoteCtrlEn		0.Load First 1.BatFirst 2.Grid		Remote setup enable
2101.	RemoteCtrlPower				Remotely set power
2102.	Extra AC Power to grid_H	Extra inverte AC Power to grid High	For SPA connect inverter		SPA used
2103.	Extra AC Power to grid_L	Extrainverte AC Power to grid Low			SPA used
2104.	Eextra_today H	Extra inverter PowerTOUser_Extra today (high)	R	0.1kWh	SPA used
2105.	Eextra_today L	Extra inverter PowerTOUser_Extra today (low)	R	0.1kWh	SPA used
2106.	Eextra_total H	Extra inverter PowerTOUser_Extra total(high)		0.1kWh	SPA used
2107.	Eextra_total L	Extra inverter PowerTOUser_Extra total(low)		0.1kWh	SPA used

2108.	Esystem_today H	System electric energy today H		0.1kWh	SPA used System electric energy today H
2109.	Esystem_ today L	System electric energy today L		0.1kWh	SPA used System electric energy today L
2110.	Esystem_total H	System electric energy total H		0.1kWh	SPA used System electric energy total H
2111.	Esystem_ total L	System electric energy total L		0.1kWh	SPA used System electric energy total L
2112.	EACharge_Today_H	ACCharge energy today		0.1kwh	Storage Power
2113.	EACharge_Today_L	ACCharge energy today		0.1kwh	Storage Power
2114.	EACharge_Total_H	ACCharge energy total		0.1kwh	Storage Power
2115.	EACharge_Total_L	ACCharge energy total		0.1kwh	Storage Power
2116.	AC charge Power_H	Grid power to local load		0.1kwh	Storage Power
2117.	AC charge Power_L	Grid power to local load		0.1kwh	Storage Power
2118.	Priority	0:Load First 1:Battery First 2:Grid First			Storage Power
2119.	Battery Type	0:Lead-acid 1:Lithium battery			Storage Power
2120.	AutoProofreadCMD	Aging mode			Storage Power
……	reserved				reserved

2124.	reserved				reserved
Use for TL-X and TL-XH					
3000.	Inverter Status	Inverter run state High 8 bits mode (specific mode) 0: Waiting module 1: Self-test mode, optional 2: Reserved 3:SysFault module 4: Flash module 5:PVBATOnline module: 6:BatOnline module 7:PVOfflineMode 8:BatOfflineMode The lower 8 bits indicate the machine status (web page display): 0:StandbyStatus; 1:OngridStatus; 2:OffgridStatus; 3:FaultStatus 4:FlashStatus;			
3001.	Ppv H	PV total power		0.1W	
3002.	Ppv L				
3003.	Vpv1	PV1 voltage		0.1V	
3004.	Ipv1	PV1 input current		0.1A	
3005.	Ppv1 H	PV1 power		0.1W	
3006.	Ppv1 L				
3007.	Vpv2	PV2 voltage		0.1V	
3008.	Ipv2	PV2 input current		0.1A	
3009.	Ppv2 H	PV2 power		0.1W	
3010.	Ppv2 L				
3011.	Vpv3	PV3 voltage		0.1V	
3012.	Ipv3	PV3 input current		0.1A	
3013.	Ppv3 H	PV3 power		0.1W	
3014.	Ppv3 L				
3015.	Vpv4	PV4 voltage			

3016.	Ipv4	PV4 input current			
3017.	Ppv4H	PV4 power			
3018.	Ppv4L				
3019.	Psys H	System output power		0.1W	
3020.	Psys L				
3021.	Qac H	reactive power		0.1Var	
3022.	Qac L				
3023.	Pac H	Output power		0.1W	Output power
3024.	Pac L				
3025.	Fac	Grid frequency		0.01Hz	Grid frequency
3026.	Vac1	Three/single phase grid voltage		0.1V	Three/single phase grid voltage
3027.	Iac1	Three/single phase grid output current		0.1A	Three/single phase grid output current
3028.	Pac1 H	Three/single phase grid output watt VA		0.1VA	Three/single phase grid output watt VA
3029.	Pac1 L				
3030.	Vac2	Three phase grid voltage		0.1V	Three phase grid voltage
3031.	Iac2	Three phase grid output current		0.1A	Three phase grid output current
3032.	Pac2 H	Three phase grid output power		0.1VA	Three phase grid output power
3033.	Pac2 L				
3034.	Vac3	Three phase grid voltage		0.1V	Three phase grid voltage
3035.	Iac3	Three phase grid output current		0.1A	Three phase grid output current
3036.	Pac3 H	Three phase grid output power		0.1VA	Three phase grid output power
3037.	Pac3 L				
3038.	Vac_RS	Three phase grid voltage		0.1V	

3039.	Vac_ST	Three phase grid voltage		0.1V	
3040.	Vac_TR	Three phase grid voltage		0.1V	
3041.	Ptouser total H	Total forward power		0.1W	Total forward power
3042.	Ptouser total L				
3043.	Ptogrid total H	Total reverse power		0.1W	Total reverse power
3044.	Ptogrid total L				
3045.	Ptoload total H	Total load power		0.1W	Total load power
3046.	Ptoload total L				
3047.	Time total H	Work time total		0.5s	
3048.	Time total L				
3049.	Eac today H	Today generate energy		0.1kWh	Today generate energy
3050.	Eac today L				
3051.	Eac total H	Total generate energy		0.1kWh	Total generate energy
3052.	Eac total L				
3053.	Epv_total H	PV energy total		0.1kWh	PV energy total
3054.	Epv_total L				
3055.	Epv1_today H	PV1 energy today		0.1kWh	
3056.	Epv1_today L				
3057.	Epv1_total H	PV1 energy total		0.1kWh	
3058.	Epv1_total L				
3059.	Epv2_today H	PV2 energy today		0.1kWh	
3060.	Epv2_today L				
3061.	Epv2_total H	PV2 energy total		0.1kWh	
3062.	Epv2_total L				
3063.	Epv3_today H	PV3 energy today		0.1kWh	
3064.	Epv3_today L				
3065.	Epv3_total H	PV3 energy total		0.1kWh	
3066.	Epv3_total L				
3067.	Etouser_today H	Today energy to user		0.1kWh	Today energy to user
3068.	Etouser_today L				

3069.	Etouser_total H	Total energy to user		0.1kWh	Total energy to user
3070.	Etouser_total L				
3071.	Etogrid_today H	Today energy to grid		0.1kWh	Today energy to grid
3072.	Etogrid_today L				
3073.	Etogrid_total H	Total energy to grid		0.1kWh	Total energy to grid
3074.	Etogrid_total L				
3075.	Eload_today H	Today energy of user load		0.1kWh	Today energy of user load
3076.	Eload_today L				
3077.	Eload_total H	Total energy of user load		0.1kWh	Total energy of user load
3078.	Eload_total L				
3079.	Epv4_today H	PV4 energy today		0.1kWh	
3080.	Epv4_today L				
3081.	Epv4_total H	PV4 energy total		0.1kWh	
3082.	Epv4_total L				
3083.	Epv_today H	PV energy today		0.1kWh	
3084.	Epv_today L				
3085.	Reserved				
3086.	DeratingMode	Inverter derating mode	R		Appendix table 1
3087.	ISO	PV ISO value		1KΩ	
3088.	DCI_R	R DCI Curr		0.1mA	
3089.	DCI_S	S DCI Curr		0.1mA	
3090.	DCI_T	T DCI Curr		0.1mA	
3091.	GFCI	GFCI Curr		1mA	
3092.	Bus Voltage	total bus voltage		0.1V	
3093.	Temp1	Inverter temperature		0.1℃	
3094.	Temp2	The inside IPM in inverter temperature		0.1℃	
3095.	Temp3	Boost temperature		0.1℃	
3096.	Temp4	Reserved		0.1℃	
3097.	Temp5	Commmunication broad temperature		0.1℃	
3098.	P Bus Voltage	P Bus inside Voltage		0.1V	
3099.	N Bus Voltage	N Bus inside Voltage		0.1V	

3100.	IPF	Inverter output PF now			0-20000
3101.	RealOPPercent	Real Output power Percent		1%	1~100
3102.	OPFullwatt H	Output Maxpower Limited		0.1W	Output Maxpower Limited
3103.	OPFullwatt L				
3104.	StandbyFlag	Inverter standby flag		bitfield	bit0:turn off Order bit1:PV Low bit2:AC Volt/Freq out of scope bit3~bit7:Reserved
3105.	Fault Maincode	Inverter fault maincode			
3106.	Warn Maincode	Inverter Warning maincode			
3107.	Fault Subcode	Inverter fault subcode		bitfield	
3108.	Warn Subcode	Inverter Warning subcode		bitfield	
3109.				bitfield	
3110.				bitfield	
3111.	uwPresentFFTValue [CHANNEL_A]	PresentFFTValue [CHANNEL_A]		bitfield	
3112.	bAfciStatus	AFCI Status			0:waiting state 1:self-check 2:Detection of arcing state 3:fault state 4:update state
3113.	uwStrength[CHANNEL_A]	AFCI Strength[CHANNEL_A]			

3114.	uwSelfCheckValue[CHANNEL_A]	AFCI SelfCheck[CHANNEL_A]			
3115.	inv start delay time	inv start delay time		1S	inv start delay time
3116.	Time total H			0.5S	
3117.	Time total L				
3118.	BDC_OnOffState	BDC connect state			0:No BDC Connect 1:BDC1 Connect 2:BDC2 Connect 3:BDC1+BDC 2 Connect
3119.	DryContactState	Current status of DryContact			Current status of DryContact 0: turn off; 1: turn on;
3120.	Reserved				
3121.	Pself H	self-use power		0.1W	
3122.	Pself L				
3123.	Esys_today H	System energy today		0.1kwh	
3124.	Esys_today L				
3125.	Edischr_today H	Today discharge energy		0.1kWh	Today discharge energy
3126.	Edischr_today L				
3127.	Edischr_total H	Total discharge energy		0.1kWh	Total discharge energy
3128.	Edischr_total L				
3129.	Echr_today H	Charge energy today		0.1kWh	Charge energy today
3130.	Echr_today L				
3131.	Echr_total H	Charge energy total		0.1kWh	Charge energy total
3132.	Echr_total L				
3133.	Eacchr_today H	Today energy of AC charge		0.1kWh	Today energy of AC charge
3134.	Eacchr_today L				
3135.	Eacchr_total H	Total energy of AC charge		0.1kWh	Total energy of AC charge
3136.	Eacchr_total L				

3137.	Esys_total H	Total energy of system output		0.1kWh	
3138.	Esys_total L				
3139.	Eself_today H	Today energy of Self output		0.1kWh	
3140.	Eself_today L				
3141.	Eself_total H	Total energy of Self output		0.1kWh	
3142.	Eself_ total L				
3143.	Reserved				
3144.	Priority	Word Mode			0:LoadFirst 1:BatteryFirst 2:GridFirst
3145.	EPS Fac	UPS frequency		0.01Hz	
3146.	EPS Vac1	UPS phase R output voltage		0.1V	
3147.	EPS Iac1	UPS phase R output current		0.1A	
3148.	EPS Pac1 H	UPS phase R output power		0.1VA	
3149.	EPS Pac1 L				
3150.	EPS Vac2	UPS phase S output voltage		0.1V	
3151.	EPS Iac2	UPS phase S output current		0.1A	
3152.	EPS Pac2 H	UPS phase S output power		0.1VA	
3153.	EPS Pac2 L				
3154.	EPS Vac3	UPS phase T output voltage		0.1V	
3155.	EPS Iac3	UPS phase T output current		0.1A	
3156.	EPS Pac3 H	UPS phase T output power		0.1VA	
3157.	EPS Pac3 L				
3158.	EPS Pac H	UPS output power		0.1VA	
3159.	EPS Pac L				
3160.	Loadpercent	Load percent of UPS ouput		0.10%	
3161.	PF	Power factor		0.1	
3162.	DCV	DC voltage		1mV	
3163.	Reserved				
3164.	NewBdcFlag	Whether to parse BDC data separately			0:Don't need 1:need

3165.	BDCDeratingMode	Battery derating mode	R		Appendix table 2
3166.	SysState_Mode	System work State and mode The upper 8 bits indicate the mode; 0:No charge and discharge; 1:charge; 2:Discharge; The lower 8 bits represent the status; 0: StandbyStatus; 1: NormalStatus; 2: FaultStatus 3:FlashStatus;			BDC1
3167.	FaultCode	Storge device fault code			
3168.	WarnCode	Storge device warning code			
3169.	Vbat	Battery voltage		0.01V	
3170.	Ibat	Battery current		0.1A	
3171.	SOC	State of charge Capacity		1%	
3172.	Vbus1	Total BUS voltage		0.1V	
3173.	Vbus2	On the BUS voltage		0.1V	
3174.	Ibb	BUCK-BOOST Current		0.1A	
3175.	Illc	LLC Current		0.1A	
3176.	TempA	Temperture A		0.1℃	
3177.	TempB	Temperture B		0.1℃	
3178.	Pdischr H	Discharge power		0.1W	
3179.	Pdischr L				
3180.	Pchr H	Charge power		0.1W	
3181.	Pchr L				
3182.	Edischr_total H	Discharge total energy of storge device		0.1kWh	
3183.	Edischr_total L				
3184.	Echr_total H	Charge total energy of storge device		0.1kWh	

3185.	Echr_total L				
3186.	Reserved				
3187.	BDC1_Flag	BDC mark (charge and discharge, fault alarm code) Bit0: ChargeEn; BDC allows charging Bit1: DischargeEn; BDC allows discharge Bit2~7: Resvd; reserved Bit8~11: WarnSubCode; BDC sub-warning code Bit12~15: FaultSubCode; BDC sub-error code			
3188.	Vbus2	Lower BUS voltage		0.1V	
3189.	BmsMaxVoltCellNo	BmsMaxVoltCellNo			
3190.	BmsMinVoltCellNo	BmsMinVoltCellNo			
3191.	BmsBatteryAvgTemp	BmsBatteryAvgTemp			
3192.	BmsMaxCellTemp	BmsMaxCellTemp		0.1° C	
3193.	BmsBatteryAvgTemp	BmsBatteryAvgTemp		0.1° C	
3194.	BmsMaxCellTemp	BmsMaxCellTemp			
3195.	BmsBatteryAvgTemp	BmsBatteryAvgTemp			
3196.	BmsMaxSOC	BmsMaxSOC		1%	
3197.	BmsMinSOC	BmsMinSOC		1%	
3198.	ParallelBatteryNum	ParallelBatteryNum			
3199.	BmsDerateReason	BmsDerateReason			
3200.	BmsGaugeFCC（Ah）	BmsGaugeFCC（Ah）			
3201.	BmsGaugeRM（Ah）	BmsGaugeRM（Ah）			
3202.	BmsError	BMS Protect1			

3203.	BmsWarn	BMSWarn1			
3204.	BmsFault	BMS Fault1			
3205.	BmsFault2	BMS Fault2			
3206.	Reserved				
3207.	Reserved				
3208.	Reserved				
3209.	Reserved				
3210.	BatIsoStatus	Battery ISO detection status			0:Not detected 1:Detection completed
3211.	BattNeedChargeRequestFlag	battery work request			bit0:1:Prohibit charging,0:Allow the charging bit1:1:Enable strong charge,0:disable strong charge bit2:1:Enable strong charge2 0:disable strong charge 2 bit8:1: Discharge is prohibited, 0:allow discharge bit9:1:Turn on power reduction 0:turn off power reduction

3212.	BMS_Status	battery working status	R		0: dormancy 1:Charge 2:Discharge 3:free 4:standby 5:Soft start 6:fault 7:update
3213.	BmsError2	BMS Protect2	R	1	
3214.	BmsWarn2	BMS Warn2	R	1	
3215.	BMS_SOC	BMS SOC	R	1%	
3216.	BMS_BatteryVolt	BMS BatteryVolt	R	0.01V	
3217.	BMS_BatteryCurr	BMS BatteryCurr	R	0.01A	
3218.	BMS_BatteryTemp	battery cell maximum temperature	R	0.1℃	
3219.	BMS_MaxCurr	Maximum charging current	R	0.01A	
3220.	BMS_MaxDischrCurr	Maximum discharge current	R	0.01A	
3221.	BMS_CycleCnt	BMSCycleCnt	R	1	
3222.	BMS_SOH	BMS SOH	R	1	
3223.	BMS_ChargeVoltLimit	Battery charging voltage limit value	R	0.01V	
3224.	BMS_DischargeVoltLimit	Battery discharge voltage limit value			
3225.	Bms Warn3	BMS Warn 3	R	1	
3226.	Bms Error3	BMS Protect3	R	1	
3227.	Reserved				
3228.	Reserved				
3229.	Reserved				
3230.	BMSSingleVoltMax	BMS Battery SingleVoltMax	R	0.001V	
3231.	BMSSingleVoltMin	BMS Battery SingleVoltMin	R	0.001V	

3232.	BatLoadVolt	Battery LoadVolt	R	0.01V	[0,650.00]
3233.					
3234.	Debug data1	Debug data1	R		
3235.	Debug data2	Debug data2	R		
3236.	Debug data3	Debug data3	R		
3237.	Debug data4	Debug data4	R		
3238.	Debug data5	Debug data5	R		
3239.	Debug data6	Debug data6	R		
3240.	Debug data7	Debug data7	R		
3241.	Debug data8	Debug data8	R		
3242.	Debug data9	Debug data9	R		
3243.	Debug data10	Debug data10	R		
3244.	Debug data10	Debug data10	R		
3245.	Debug data12	Debug data12	R		
3246.	Debug data13	Debug data13	R		
3247.	Debug data14	Debug data14	R		
3248.	Debug data15	Debug data15	R		
3249.	Debug data16	Debug data16	R		
3250.	Pex1H	PV inverter 1 output power H	R	0.1W	
3251.	Pex1L	PV inverter 1 output power L	R	0.1W	
3252.	Pex2H	PV inverter 2 output power H	R	0.1W	
3253.	Pex2L	PV inverter 2 output power L	R	0.1W	
3254.	Eex1TodayH	PV inverter 1 energy Today H	R	0.1kWh	
3255.	Eex1TodayL	PV inverter 1 energy Today L	R	0.1kWh	
3256.	Eex2TodayH	PV inverter 2 energy Today H	R	0.1kWh	

3257.	Eex2TodayL	PV inverter 2 energy Today L	R	0.1kWh	
3258.	Eex1TotalH	PV inverter 1 energy Total H	R	0.1kWh	
3259.	Eex1TotalL	PV inverter 1 energy Total L	R	0.1kWh	
3260.	Eex2TotalH	PV inverter 2 energy Total H	R	0.1kWh	
3261.	Eex2TotalL	PV inverter 2 energy Total L	R	0.1kWh	
3262.	uwBatNo	battery pack number	R		BDC reports update every 15 minutes
3263.	BatSerialNum1	Battery pack serial numberSN[0]SN[1]	R		BDC reports update every 15 minutes
3264.	BatSerialNum2	Battery pack serial numberSN[2]SN[3]	R		
3265.	BatSerialNum3	Battery pack serial numberSN[4]SN[5]	R		
3266.	BatSerialNum4	Battery pack serial numberSN[6]SN[7]	R		
3267.	BatSerialNum5	Battery pack serial numberSN[8]SN[9]	R		
3268.	BatSerialNum6	Battery pack serial numberSN[10]SN[11]	R		
3269.	BatSerialNum7	Battery pack serial numberSN[12]SN[13]	R		
3270.	BatSerialNum8	Battery pack serial numberSN[14]SN[15]	R		
……	Reserve	Reserve			
3277.	bInvSnNumberFlag	inverter SN number flag	R		0:other 1:10 bit SN 2:16 bit SN 3:21 bit SN

3278.	bBatterySnNumberFlag	battery SN number flag	R		Bit0-7: BDC1: 0:other 1:10 bit SN 2:16 bit SN 3:21 bit SN Bit8-15: BDC2: 0:other 1:10 bit SN 2:16 bit SN 3:21 bit SN
3279.	bBoxSnNumberFlag	inverter SN number flag	R		0:other 1:10 bit SN 2:16 bit SN 3:21 bit SN
3280.	bClrTodayDataFlag	Clear day data flag	R		Data of the current day that the server determines whether to clear. 0:not cleared. 1: Clear.
3281.	ubBypassStatus	Backup box bypass switch status	R		Value: 0:Off 1:On (Reserved)
3282.	ubWorkMode	Backup box work mode	R		Value: 0:Offgrid ; 1:Ongrid; 2:Generator
3283.	ubFanStatus	Backup box fan status	R		Value: 0:Off 1:On
3284.	uwErrorCode	Backup box error code	R		Value:700-800
3285.	uwWarnCode	Backup box warning code	R		Value:700-800

3286.	bNtcTemp	Backup box temprature	R	1℃	Value:-40-100 Type:Int8
3287.	uwGridVolt	Backup box grid voltage	R	0.1V	Type:Uint16
3288.	uwGridCurr	Backup box grid current	R	0.1A	Type:Uint16
3289.	dGridWatt_H	Backup box grid power	R	0.1W	Type:Int32
3290.	dGridWatt_L				
3291.	uwGridFreq	Backup box grid frequency	R	0.01Hz	Type:Uint16
3292.	uwGenVolt	Backup box generator voltage	R	0.1V	Type:Uint16
3293.	uwGenCurr	Backup box generator current	R	0.1A	Type:Uint16
3294.	DGenWatt_H	Backup box generator power	R	0.1W	Type:Int32
3295.	DGenWatt_L				
3296.	uwGenFreq	Backup box generator frequency	R	0.01Hz	Type:Uint16
3297.	dLoadWatt_H	Backup box load power	R	0.1W	Type:Uint32
3298.	dLoadWatt_L				
3299.	uwFirmwareCode_H	Backup box firmware code	R		Value: 4 characters Type: ASCII
3300.	uwFirmwareCode_L				
3301.	ubFirmwareVersion	Backup box firmware version	R		Type:Uint8
3302.	uwSerialNum0	Backup box serial number	R		Value: 30 characters Type:ASCII
3303.	uwSerialNum1				
3304.	uwSerialNum2				
3305.	uwSerialNum3				
3306.	uwSerialNum4				
3307.	uwSerialNum5				
3308.	uwSerialNum6				

3309.	uwSerialNum7				
3310.	uwSerialNum8				
3311.	uwSerialNum9				
3312.	uwSerialNum10				
3313.	uwSerialNum11				
3314.	uwSerialNum12				
3315.	uwSerialNum13				
3316.	uwSerialNum14				
3317.	uwGridVoltS	Backup box S phase grid voltage(for XH model)	R	0.1V	
3318.	uwGridVoltT	Backup box T phase grid voltage(for XH model)	R	0.1V	
3319.	uwGridFreqS	Backup box S phase grid frequency(for XH model)	R	0.01Hz	
3320.	bBoxConnectFlag	Backup box communication status (for for GW server)	R		0: Abnormal 1:Normal
3321.	bBoxDataUploadFlag	Backup box Upload flag(for GW server)	R		0:No 1:Yes
3322.	MeterConnectFlag	Ankeri meter connection status	R		0: Invalid 1: Normal
3323.	SYNInstalledFlag	The backup box installation flag determines whether backup box is installed based on the communication between M3 and backup box	R		0: backup box is not installed 1: backup box is installed
3324.	BoxUnbalanceCurrent	Backup box unbalance current	R	0.1A	
……	Reserve	Reserve			

3342	InvRelayStatus	Backup box inv relay status	R		0:software not support reading or box communication abnormal 1:open 2:close
3343	GenvRelayStatus	Generator relay status	R		0:software not support reading or box communication abnormal 1:open 2:close
……	Reserve	Reserve			
3410	ErrorBit1	Error bit1			
3411	ErrorBit2	Error bit2			
3412	ErrorBit3	Error bit3			
3413	ErrorBit4	Error bit4			
3414	WarningBit1	Warning bit1			
3415	WarningBit2	Warning bit2			
3416	WarningBit3	Warning bit3			
3417	WarningBit4	Warning bit4			
BDC and BMS information (support up to 10 PARALLEL BDCS)					
4000 ~4107.	1	The first 8 registers are the 16-bit serial number of BDC, then 69 registers have the same data area as 3165-3233, the remaining 31 registers are reserved, a total of 108 registers (including 8 registers occupied by serial number).			
4108 ~4215.	2	The first 8 registers are the 16-bit serial number of BDC, then 69 registers have the same data area as 3165-3233, the remaining 31 registers are reserved, a total of 108 registers (including 8 registers occupied by serial number).			

……		The first 8 registers are the 16-bit serial number of BDC, then 69 registers have the same data area as 3165-3233, the remaining 31 registers are reserved, a total of 108 registers (including 8 registers occupied by serial number).			
4864 ~4971.	9	The first 8 registers are the 16-bit serial number of BDC, then 69 registers have the same data area as 3165-3233, the remaining 31 registers are reserved, a total of 108 registers (including 8 registers occupied by serial number).			
4972 ~5079.	10	The first 8 registers are the 16-bit serial number of BDC, then 69 registers have the same data area as 3165-3233, the remaining 31 registers are reserved, a total of 108 registers (including 8 registers occupied by serial number).			
Battery module information (support up to 64 parallel BDC)（Special for APX）					
5080.	BatSysState	System working state	R		0:initialize; 1:standby; 2:charge; 3:discharge; 4:shutdown; 5:fault; 6:update;
5081.	BatSOC		R	1%	Bit 15-8: Mapping SOC[0,100] Bit7-0: SOC[0,100]
5082.	BatSOH		R	1%	bit7: 0:Represent available 1:Represent need to scrap Bit6-bit0: SOH value[0,100]
5083.	BatVolt	Total internal voltage of battery system	R	0.1V	[0,1500.0V]
5084.	BatCurrent	Battery system current	R	0.1A	[-1000.0,1000.0A]
5085.	BatPower	Charge and discharge power	R	1W	[-32000,32000W]

5086. 5087.	BatTotalDischargeElectric	Cumulative discharge energy	R	0.1kWh	[0,2000000.0 kwH]
5088.	BatMaxCellVolt	Maximum cell voltage	R	0.001V	[0,6.000V]
5089.	BatMinCellVolt	Minimum cell voltage	R	0.001V	[0,6.000V]
5090.	BatMaxTemp	Maximum battery temperature	R	0.1℃	[-40.0,125.0℃]
5091.	BatMinTemp	Minimum battery temperature	R	0.1℃	[-40.0,125.0℃]
5092.	BatMaxLimitChargeCurrent	Maximum allowable charging current	R	0.1A	[0,1000.0A]
5093.	BatMaxLimitDischargeCurrent	Maximum allowable discharge current	R	0.1A	[0,1000.0A]

5094.	BatBalanceState	Battery balance state Bit15-bit8: 0: Balancing is not detected. 1: The bottom end detects the need for balancing and updates the balancing time; 2: The top detects the need for balancing and updates the balancing time; 3: The charging terminal detects the need for balancing, and updates the balancing time; 4: Even channels are balanced when parity balance is limited; 5: Limit the parity balance in the case of odd channels to perform balancing; 6: The balance is not completed, but the balance is closed; 7: Parity channels are balanced without limiting parity balance; 8: The balance is complete	R		Balance time Bit7-bit0: Unit h; Data type uint8. Balancing time longer than 255 is shown as 255 hours
5095.	BatCellCapacity	Effective cell capacity	R	0.1Ah	[0,5000.0Ah]

5096.	BatRealSOC	Real SOC/ Number of the battery module	R	1%	Bit15~bit13: Indicates the number of the BDC group to which it belongs. Range[1-4] Bit12~bit8: Indicates the number of the battery module in the BDC group. Range[1-21] Bit7~bit0: Real SOC. Range [0,100]
5097.	BatFaultCode		R		
5098.	BatWarningCode		R		

5099.	BatSubCode	Charge and discharge flag / Fault subcode / Warning subcode	R		Charge and discharge flag Bit0:Enable charging Bit1:Discharge enabled Bit2-7:reserved Fault subcode / Warning subcode Bit8-11:Warning subcode bit12-15:Fault subcode
5100. 5101.	BatTotalChargeElectric	Cumulative charge energy	R	0.1kwh	[0~429496729.5kwh]
5102. 5103.	BatTotalDischarge Capacity	Cumulative discharge capacity	R	0.01Ah	[0~429496729.5Ah]
5104. 5105.	BatTotalCharge Capacity	Cumulative charge capacity	R	0.01Ah	[0~429496729.5Ah]
5106.	BatMinCellCapacity	Minimum cell capacity	R	0.1Ah	[0,6553.5Ah]
5107.	BatAHIntegralValue	AH integral value of the battery	R	0.1Ah	[0,6553.5Ah]
5108.	BatCyclesNumber	Number of charge and discharge cycles	R	0.1	[0,6553.5Cyc]
5109.	BatInternalState		R		Bit15-8:Internal short-circuit condition Bit7-0:Battery SOX correction status

5110.	BDCDerating Mode		R	[0,32]	No distinguish Charge/ Discharge 0: No derating 1: Fault

					17: Maximum battery discharge current 18: Battery discharge is enabled 19: The BUS voltage is too high 20: Discharge NTC high temperature 21: Discharge system alarm is generated 22: Discharge upper computer Settings 23-32: Reserved
5111-5119.	Reserved				
5120-5159.	Battery module 2			Reference 5080 to 5119 for a total of 40 registers description	
5160-5199.	Battery module 3			Reference 5080 to 5119 for a total of 40 registers description	
5080+(N-1)*40----5119+(N-1)*40	Battery module N(supports up to 64 battery modules)				
8000—9000 for business Storage Power					

8000	Vpv9	PV9 voltage		0.1V			
8001	PV9Curr	PV9 input current		0.1A			
8002	Ppv9 H	PV9 input power(high)		0.1W			
8003	Ppv9 L	PV9 input power(low)		0.1W			
8004	Vpv10	PV10 voltage		0.1V			
8005	PV10Curr	PV10 input current		0.1A			
8006	Ppv10 H	PV10 input power(high)		0.1W			
8007	Ppv10 L	PV10 input power(low)		0.1W			
8008	Epv9_today H	PV9Energy today(high)		0.1kWh			
8009	Epv9_today L	PV9Energy today (low)		0.1kWh			
8010	Epv9_total H	PV9Energy total(high)		0.1kWh			
8011	Epv9_total L	PV9Energy total (low)		0.1kWh			
8012	Epv10_today H	PV10Energy today(high)		0.1kWh			
8013	Epv10_today L	PV10Energy today (low)		0.1kWh			
8014	Epv10_total H	PV10Energy total(high)		0.1kWh			
8015	Epv10_total L	PV10Energy total (low)		0.1kWh			
8016	V _String17	PV String17voltage		0.1V			
8017	Curr _String17	PV String17 current	-15~15A	0.1A			
8015	V _String18	PV String18voltage		0.1V			
8016	Curr _String18	PV String18current	-15~15A	0.1A			
8017	V _String19	PV String19voltage		0.1V			
8018	Curr _String19	PV String19current	-15~15A	0.1A			
8019	V _String20	PV String20voltage		0.1V			
8020	Curr _String20	PV String20current	-15~15A	0.1A			
8021	PID PV9+ Voltage	PID PV9PE voltage	0~1000V	0.1V			
8022	PID PV9+ Current	PID PV9PE current	-10~10mA	0.1mA			
8023	PID PV10+ Voltage	PID PV10PE voltage	0~1000V	0.1V			

8024	PID PV10+ Current	PID PV10PE current	-10~10mA	0.1mA			
8028	StrUnmatch2	Bit0~15: String 17~32 unmatch					
8029	StrCurrentUnblance2	Bit0~15: String17~32 current unblance					
8030	StrDisconnect2	Bit0~15: String17~32 disconnect					
8031	PV Warning Value	PV Warning Value (PV9-PV16) Contains PV9~16 abnormal , Boost9~16 Drive anomalies					
8032	StrWaringvalue1	string1~string16 abnormal					
8033	StrWaringvalue2	string17~string32 abnormal					
8034	BAT_Volt	Battery voltage		0.1V			
8035	BAT_Curr	Battery current		0.1A			
8036	STS_R_Volt_Rms	STSphase R grid voltage		0.1V			
8037	STS_S_Volt_Rms	STSphase S grid voltage		0.1V			
8038	STS_T_Volt_Rms	STSphase T grid voltage		0.1V			
8039	STS_RS_Volt_Rms	STS Line RS voltage		0.1V			
8040	STS_ST_Volt_Rms	STS Line ST voltage		0.1V			
8041	STS_TR_Volt_Rms	STS Line TR voltage		0.1V			
8042	STS_R _LOAD_CURR_Rms	STS phaseR Load Current		0.1A			
8043	STS_S _LOAD_CURR_Rms	STS phaseS Load Current		0.1A			
8044	STS_T _LOAD_CURR_Rms	STSphase T Load Current		0.1A			
8045	Pself H	self-use power		0.1W			
8046	Pself L						

8047	Esys_today H	System energy today		0.1kwh			
8048	Esys_today L						
8049	Edischr_today H	Today discharge energy		0.1kWh			
8050	Edischr_today L						
8051	Edischr_total H	Total discharge energy		0.1kWh			
8052	Edischr_total L						
8053	Echr_today H	Charge energy today		0.1kWh			
8054	Echr_today L						
8055	Echr_total H	Charge energy total		0.1kWh			
8056	Echr_total L						
8057	Eacchr_today H	Today energy of AC charge		0.1kWh			
8058	Eacchr_today L						
8059	Eacchr_total H	Total energy of AC charge		0.1kWh			
8060	Eacchr_total L						
8061	Esys_total H	Total energy of system output		0.1kWh			
8062	Esys_total L						
8063	Eself_today H	Today energy of Self output		0.1kWh			
8064	Eself_today L						
8065	Eself_total H	Total energy of Self output		0.1kwh			
8066	Eself_ total L						
8067	Etouser_today H	Today energy to user		0.1kWh			
8068	Etouser_today L						
8069	Etouser_total H	Total energy to user		0.1kWh			
8070	Etouser_total L						
8071	Etogrid_today H	Today energy to grid		0.1kWh			
8072	Etogrid_today L						
8073	Etogrid_total H	Total energy to grid		0.1kWh			

8074	Etogrid_total L						
8075	Eload_today H	Today energy of user load		0.1kWh			
8076	Eload_today L						
8077	Eload_total H	Total energy of user load		0.1kWh			
8078	Eload_total L						
8079	Ptoload total H	Total load power		0.1W			
8080	Ptoload total L						
8081	Ptouser total H	Total forward power		0.1W			
8082	Ptouser total L						
8083	Ptogrid total H	Total reverse power		0.1W			
8084	Ptogrid total L						
8085	Psys H	System output power		0.1W			
8086	Psys L						
8087	usingtime_buscap_H	Bus capacitor use time		1H			
8088	usingtime_buscap_L						
8089	running_Time_H	Run time		1H			
8090	running_Time_L						
8091	BatPower_H	Battery power		0.1W			
8092	BatPower_L						
8093	SOC	Battery SOC		%			
8094	SOH	Battery SOH		%			
8095	BMS_BATVol	BMS Batteryvoltage		0.1V			
8096	INV_R_Volt_Rms	INV Phase R voltage		0.1V			
8097	INV_S_Volt_Rms	INV Phase S voltage		0.1V			
8098	INV_T_Volt_Rms	INV Phase T voltage		0.1V			
8099	AC_CT_R_RMS	AC Phase R Current		0.1A			
8100	AC_CT_S_RMS	AC Phase S Current		0.1A			

8101	AC_CT_T_RMS	AC Phase T Current		0.1A			
8102	ExtraAC Power to grid_H	Extra invert power H		0.1kW			
8103	ExtraAC Power to grid_L	Extra invert power L		0.1kWh			
8104	Eextra_today H	Today energy of Extra invert(H)		0.1kWh			
8105	Eextra_today L	Today energy of Extra invert (L)		0.1kWh			
8106	Eextra_total H	Total energy of Extra invert (H)		0.1kWh			
8107	Eextra_total L	Total energy of Extra invert (L)		0.1kWh			
8108	ATS SCR temperature			0.1C			
8109	ATS Relays temperature			0.1C			
8110	ATS interior temperature			0.1C			

2.3 Meter register（Function code 0x20）

NO.	Variable Name	Description	Range	Unit	Note
1	Reserved				
2	Reserved				
3	Reserved				
4	Reserved				
5	Reserved				
6	Reserved				
7	Reserved				
8	L1 Current	L1 phase current		0.1A	
9					
10	L2 Current	L2 phase current		0.1A	
11					
12	Reserved				
13	Reserved				
14	L1ActivePow	L1 phase active power		0.1W	

15	er				
16	L2ActivePow	L2 phase active power		0.1W	
17	er				
18-37	Reserved				
38	TotalActiveP	Total active power		0.1W	
39	ower				

3 Set address

Refer to the Inverter user manual. Always is :

Knock the pv inverter to let the lcd display to the "COM Addr: xxx", then double knock, if displays "Move", you should another double knock, until it displays a address number, then you can give a single knock to change the address, this address will be remembered when the lcd backlight off.

4 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.

5) Except the CEI0-21 and VDE-AR-N 4105 power management registers, you should refer the manufactory’ s suggestion when writing the other registers.

5 Attachment

5.1 Data format

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

The valid slave address range is 0 - 254 decimal.
The address range assigned to each slave device is 1-254.
0 is a broadcast address.
Each hold and input register is a 16 bit (two bytes) unsigned integer.

5.2 Command format

(1) Function code 0x03 read hold register
Send Message:

Field Name	Example(HEX)
Slave Address	11
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 Message:

Field Name	Example(HEX)
Slave Address	11
Function	03
Byte Count	06
Data Hi	02
Data Lo	2B
Data Hi	00
Data Lo	00
Data Hi	00
Data Lo	64
Error Check(LRC or CRC)	-

Response error:11 0x80 | 0x03 Errornum ber CRC (Errornum is a byte)

(2) Function code 0x04 read input register
Send Message:

Field Name	Example(HEX)
Slave Address	11
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 Message:

Field Name	Example(HEX)
Slave Address	11
Function	04
Byte Count	02
Data Hi	00
Data Lo	0A
Error Check(LRC or CRC)	-

Response error:11 0x80 | 0x04 Errornum CRC (Errornum is a byte)

(3) Function code 0x06 preset single register

Send Message:

Field Name	Example(HEX)
Slave Address	11
Function	06
Register Address Hi	00
Register Address Lo	01
Preset Data Hi	00
Preset Data Lo	03
Error Check(LRC or CRC)	-

Response Message:

Field Name	Example(HEX)
Slave Address	11
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 is a byte)

(4) Function code 0x10: preset multiple registers
Send Message:

Field Name	Example(HEX)
Slave Address	11
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 Message:

Field Name	Example(HEX)
Slave Address	11
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 is a byte)

(5) Function code 0x20 read hold register

Send Message:

Field Name	Example(HEX)
Slave Address	11
Function	20
Starting Address Hi	00
Starting Address Lo	6B
No. of Points Hi	00

No. of Points Lo	03
Error Check(LRC or CRC)	-

Response Message:

Field Name	Example(HEX)
Slave Address	11
Function	20
Byte Count	06
Data Hi	02
Data Lo	2B
Data Hi	00
Data Lo	00
Data Hi	00
Data Lo	64
Error Check(LRC or CRC)	-

Response error:11 0x80 | 0x20 Errornum ber CRC (Errornum is a byte)

Error codes:

Description	Code	Meaning
Illegal function	0x01	1 write undefined function code 2 write reading only registers 3 read writing only registers
Illegal data address	0x02	1 write undefined address 2 read undefined address 3 read data crossing multi-groups

Illegal data	0x03	1 write data over prescribed scope
Checkout fault	0x08	1 CRC checkout error

5.3 Device Message Transmission Mode / Framing

5.3.1 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:Default Baud Rate: 9600 bps,which can be set through hold register 22.

Minimum CMD period (RS485 Time out): 850ms.Wait for minimum 850ms to send a new CMD after last CMD. Suggestion is 1s.

5.3.2 Maximum Data Length Definition

Maximum read data length is 125 words in read command;Maximum update data length is 125 words in preset command.

Note:

Except the CEI0-21 and VDE-AR-N 4105 power management registers, you should refer the manufactory’ s suggestion when writing other registers.

6 Appendix table

Table 1: Inverter derating mode (Input 3086)

Derating Mode	Explanation	Derating Logic
0	No derating	NA
1	Bus voltage high derating	Derating starts when Bus>500V, reduction of 1%Pn for every 1V.
2	Aging fixed power derating	During the test before aging,the load is limited to 30% Pn 60% Pn and 80% Pn respectively.
3	Grid voltage high derating	When the grid voltage is >1.06Vn, the output is reduced based on the rated power.
4	Over-frequency reduce derating	When the grid frequency is higher then over-frequency decrease point, output reduce 33.33%Pn/Hz.
5	Single DC source mode derating	Single DC source Boost off, output limited to 3600W.
6	Inverter module over-temperature derating	When the module temperature is >109℃, the power decreases by 20%Pn every 1℃ it rises.
7	User activated setting to limit output derating	
8	Load speed process derating	
9	Over back by time derating	
10	Internal environment over-temperature derating	Temperature >75℃, for every 1℃ rise, power drops by 20%Pn.
11	External environment over-temperature derating	
12	Wire impedance derating	
13	Parallel inverter export limit derating	
14	Single inverter export limit derating	
15	Load first mode derating	
16	CT installation issue derating	When the meter or CT is turned on, it will take effect when the grid connection is successfully detected and the wrong or reversed connection is detected.
17	Zero current mode derating	IEEE1547 grid voltage <0.5Vn or >1.1Vn, output limited to 0.
18	Boost module over-temperature derating	Temperature>105 ℃, load derating 0.1%Pn every 200ms.
19	Zero power mode derating	
20	Under-frequency increase derating	When the grid frequency is lower then under-frequency increase point,output increase 33.33%Pn/Hz.
21	Bus bar current limit derating	

Table 2: Battery derating mode (Input 3165)

Derating Mode	Explanation
0	Normal, unrestricted
1	System fault
2	System warning
3	Maximum charging current of battery (charging)
4	Battery high temperature (charging)
5	Reserve (charging)
6	SOC setting limits (charging)
7	Battery low temperature (charging)
8	High bus voltage (charging)
9	Full charged(charging)
10	Reserve (charging)
11	System warning no charging (charging)
12	User setting the current of charging(charging)
13	BM charge current limited (charging)
14	Reserve (charging)
15	Reserve (charging)
16	Reserve (charging)
17	Maximum battery current limit (discharge)
18	Battery discharge Enable (discharge)
19	High bus discharge derating (discharge)
20	High temperature discharge derating (discharge)
21	System warning no discharge (discharge)
22	User setting the current of discharging(discharge)
23	BM discharge current limited (discharge)
24	Reserved (discharge)
25	Reserved (discharge)
26	Reserved (discharge)
27	Reserved (discharge)
28	Reserved (discharge)
29	Reserved (discharge)
30	Reserved (discharge)
31	Reserved (discharge)
32	Reserved (discharge)