RS485_MODBUS Communication Protocol

Translated on 2021.5.6

Content

Revision record

Version	Main Content	Person	Date
V000B000D000	First Draft		2015.04.29
V000B000D001	Add registers for P,Q,S,PF for upload	CHM	2015.10.29
V000B000D002	-	CHM	2015.11.11
V000B000D003	Add register for SN number for checking	CHM	2015.11.25
V000B000D004	1、 Add function code 02 and 05 2、 Function code 02 and 05 are only available for 30K series inverters (from HMI Version 21) and 4G models.	CHM	2016.10.20
V000B000D005	1、 Add reactive power control function in function code 06	CHM	2016.12.28
V000B000D006	1、 Add 3054 conrtol register. PF Setting 02, only available for AUS standards function 2、 Add 3052 checking register. Read PF for AUS standard function	CHM	2017.04.10
V000B000D007	1、 Add AGC/AVC setting function and 04 showing AGC/AVC power and adjusted value 2、 Add normal working status into the warning message. In function code 04, add explanation by each bit 3、 Add user-define standard setting 4、 Add Ileak and PViso setting values	CHM	2017.07.25
V000B000D008	1、 Add hybrid control and checking commands 2、 Add 3066 into function code 04. Factory setting flag 3、 Add 02 hybrid status and 05 alarm code 4、 Add SOC and SOH	CHM	2017.10.16
V000B000D009	1、 Add 3101-3106 meter info and 3080-3084 battery info from BMS into function code 04 2、 Add 5000-5004 into 04 for KEHUA PID function	CHM	2017.11.08
V000B000D00A	1、 Add meter info from 3250 2、 Add generation info 3121-3140. 3、 Add meter location 3250	CHM	2017.12.12
V000B000D00B	1、 Add SN number explanation 2、 Add datalogger restart and reset function into code 04 3066 3、 Add datalogger info acquiring. Into code 06 and 16 - 3250-3258	CHM	2018.01.03

V000B000D00C	1、 Modify the meter of hybrid generation value ratio from 100:1 to 1:1 2、 Modify the METER S to variant S32。 3、 Add SN number in ASCII. For Trina. Upload one of the two between this one and the 3061-3064. Rest is 00.	CHM	2018.01.12
V000B000D00D	1、 Delete part of the hybrid protocol. Hybrid has a individual protocol, address is long address 2、 Note the hybrid parts as blue	CHM	2018.06.15
V000B000D00E	1、 Add 4000 in code 04 with EPM info	CHM	2018.06.20
V000B000D00F	1 、 Add EPM checking and setting command.Use long address, no offset	CHM	2018.07.06
V000B000D010	1、 Add 3069 control command, power off saving function. For working mode 03,04,add 3051 and 3054 power saving function	CHM	2018.07.11
V000B000D011	1、Add EPM SN	CHM	2018.09.11
V000B000D012	1、 Add working mode selection ON/OFF function for 3073. For South Australia Project。	CHM	2018.12.03
V000B000D013	1、 Add DC reverse and grid reverse alarm	CHM	2019.01.05
V000B000D014	1、 Add 125k 20string voltage and current into code 04 from 3300 2、 Add 3240 into code 06 for acquiring IV curve command	CHM	2019/03/08
V000B000D015	1、Add Surge Fan alarm into code 02 2、 Add 3044ID/3072ID alarm into code 04	CHM	2019/04/17
V000B000D016	1、 Add 3250 meter location for 24 hour consumption monitoring	CHM	2019/06/05
V000B000D017	1、Add ground voltage into 3031	CHM	2019/06/17
V000B000D018	1、 Add Internal EPM Settings 1）、Add function code 04 Address 3111-3113 2）、Add function code 03,06,10 Address 3151-3153	CHM	2019/06/28
V000B000D019	1、 EPM device add consumption data and grid PF	CHM	2019/07/19
V000B000D01A	1、 Add Address 3007	CHM	2019/08/30
V000B000D01B	1、 Add function code 04 Address 3040 2、 Add function code 06/10 Address 3055 3、 Add function code 06 Address 3074 4、 Add function code06 Address 3075/3076 5、 Add function code 04 Address 3121-3142	CHM	2019/09/11

V000B000D01C	1、 Add Fault code between DSP and HMI in 3096-3100	CHM	2019/11/18
V000B000D01D	1、 Add function code 06 Address 3301, add fan self-check function 2、 05 function code ON/OFF explanation modified. 1 for ON changes to FF00H for ON. Correspond to actual inverters	CHM	2019/12/09
V001B000D01E	1、 Add function code 04 address 35000, distinguish protocol version and inverter model number	CHM	2020/02/20
V001B000D01F	1 、 Add function code 06,10 Address 3108-3115, set reconnection voltage and frequency. Startup voltage and frequency setting	CHM	2020/03/10
V001B000D020	1、 Optimize the model definition. Change from 1003 to 1030 to distinguish other models	CHM	2020/03/10
V001B000D021	1、 Modify alarm messages. DSP self-check alarm, bus voltage not correlate, abnormal grid phase angle 2、 Add user-define code 03.06.10 function code address 3108-3115 reconnection voltage and frequency and startup voltage and frequency	CHM	2020/03/11
V001B000D022	1、 Working mode can set the detailed parameters. Add function code 06,10 address 3130-3150 Volt-watt, volt-var, 10mins voltage. Start ramp rate (up and down) 2、 Add function code 06./10 Address 3077 AFCI function ON/OFF	CHM	2020/03/18
V001B000D023	1、 Fault status 05 update, add DRM not connected alarm	CHM	2020/04/22
V001B000D024	Add function code 04,address 3289-3298,set PV 21-30 current Add PV 11-15 voltage, address 3331-3335 Add code 06, address 3008, HMI code setting function	CHM	2020/05/14
V001B000D025	1. Add function code 06,10, address 3080, power control	CHM	2020/05/28
V001B000D026	1. Add model protocol recognization, address 3010, OGI 2. Add function code 06,10, address 3010-3021, self inspection protocol for	CHM	2020/06/23

	Italy		
V001B000D027	1. Add EMP transmission function on/off	CHM	2020/07/10
V001B000D028	1、Add display of internal fan and external fan 2、Add function code 04, address 3500, display of MPPT voltage and current. Maximum 25 inputs of MPPT with 50 strings.	CHM	2020/08/11
V001B000D02A	1. Add function of setting national standards parameter accuracy by master PC to address 3089	CHM	2020/10/10
V001B000D02B	1、Add function code 06, address 3023-3027, logic port for controlling active power output and DRM switch 2、Add function code 06, address 3304-3310, special function control and gridi voltage&current correction	CHM	2020/10/21
V001B000D02C	1. Add broadcast address 0xFF, non-reply address 0x00.	CHM	2021/01/05
V001B000D02D	1、Add note in 3220	CHM	2021/01/15
V001B000D02E	1、Add function code 04 address 3030 with alarm code upload 2、Add function code 04 address 3021 with HMI version control	CHM	2021/01/15
V001B000D02F	1、Add function code 04 address with 36060 with EPM code to classify EPM	CHM	2020/01/29
V001B000D030	1、Add L-Ground alarm function switch on function code 06 Special function control word	CHM	2021/03/16
V001B000D031	1、For EPM device change U16 to S16 for register write 36508 and read 36017	CHM	2021/04/10
V001B000D032	1、Add function code 04 3092/3093 for grounding resistance and AC module temperature(IGBT/NTC) 2、Add function code 06 3304 for L-Ground switch Note：Add for 50-70K-5G first	CHM	2021/05/04

1. Overview

This protocol adopted MODBUS RTU regulation, is applicable to the communication protocol between SOLIS grid-tied inverter and PC monitoring software. This protocol can read operational information and control the inverter in real time.

2. Physical interface

2.1 Adopts RS485 Receiver-Transmitter, Client-Server Model

----Baud rate：9600bps
----Parity checking：None
---- Data：8
---- Stop：1

2.2 Inter-frame interval requirement:

More than 300ms communications frame interval is required. Recommended max data frame 100 bytes (50 registers)

3. Data frame:

Slave Address	Function code	Data	CRC Check
8-Bits	8-Bits	Nx8-Bits	16-Bits

Slave Address: Is the corresponding slave address, it must be match with inverter address

Function code： 02H、03H、04H、05H、06H and 10H are available 。

Function code(Hex)	Name	Reg Address	Function
02H	Read switch input status	10001-19999	Read the fault info register
03H	Read the holding registers	40001-49999	Read the setting content of holding registers
04H	Read the input registers	30001-39999	Read the detail information of the inverter
05H	Write a single coil	00001-09999	Set ON/OFF function
06H	Write a single holding registers	40001-49999	Set single-byte functions
10H	Write multiple holding registers	40001-49999	Set multi-byte function

Data： Including the start register address, data length, the number of data bytes, data content. 02H low-byte and follow high-byte, others high-byte first, and follow by low byte.

CRC Check： CRC look-up table checking mode. High-byte first, and follow by low Byte

Note：When the slave device receives address 0xFF and the function code is "write", receive the command but not response. When the slave device receives address 0xFE, receive the command and response the data of the slave device

4. Error information and data process

Slave Response (Hex)

Slave Address	Function code	Error code	CRC Check	
			Low byte	High byte
xx	xx|0x80	xx	xx	xx

When the inverter communication module detected an error other than CRC error, it must response to the master device. (High byte of function code is 1 which is adding 128 to the function code)

Inverter com module response to the Error Code

0x01 illegal function code, the server doesn't understand the function code

0x02 illegal data address, in relation to requests

0x03 illegal data, in relation to requests.

0x04 Service failure, Inverter com module can't get access to the data during execution

5. Detail description of the Protocol

00001-09999**(0X)** register address is writable register type, support **0x05** function code，
10001-19999**(1X)** register address is read-only register type，support **0x02** function code，
30001-39999 **(3X)** register address is a read-only register type, support **0x04** function code,
40001-49999 (**4X**) register address is a readable and writable holding register
address, and support **0x03, 0x06, 0x10** function code
Note: In practice, however, the register address 0001-9999 is used in these function codes.

   5.1 Read one or more input states, <u>function code 0x02</u>. The addresses in the following table are the same as those in the actual information frame, which means no need of offset or other conversion.

Register address	Name	Remark	Address type
2501	Grid Over Voltage	0—No 1—Yes	1X
2502	Grid Under Voltage	0—No 1—Yes	1X
2503	Grid Over Frequency	0—No 1—Yes	1X
2504	Grid Under Frequency	0—No 1—Yes	1X
2505	Grid wrong polarity	0—No 1—Yes	1X
2506	No Grid	0—No 1—Yes	1X

2507	Grid Unbalance	0—No 1—Yes	1X
2508	Grid Frequency Fluctuation	0—No 1—Yes	1X
2509	Grid Over Current	0—No 1—Yes	1X
2510	Grid Current Tracking Fault	0—No 1—Yes	1X
2511	Reserve	0—No 1—Yes	1X
2512	Reserve	0—No 1—Yes	1X
2513	Reserve	0—No 1—Yes	1X
2514	Reserve	0—No 1—Yes	1X
2515	Reserve	0—No 1—Yes	1X
2516	Reserve	0—No 1—Yes	1X
2517	Reserve	0—No 1—Yes	1X
2518	DC Over Voltage	0—No 1—Yes	1X
2519	DC Bus Over Voltage	0—No 1—Yes	1X
2520	DC Bus Unbalance	0—No 1—Yes	1X
2521	DC Bus Under Voltage	0—No 1—Yes	1X
2522	DC Bus Unbalance 2	0—No 1—Yes	1X
2523	DC(Channel A) Over Current	0—No 1—Yes	1X
2524	DC(Channel B) Over Current	0—No 1—Yes	1X
2525	DC Over Current	0—No 1—Yes	1X
2526	DC wrong polarity	0—No 1—Yes	1X
2527	PV mid-point grounded	0—No 1—Yes	1X
2528	Reserve	0—No 1—Yes	1X
2529	Reserve	0—No 1—Yes	1X
2530	Reserve	0—No 1—Yes	1X
2531	Reserve	0—No 1—Yes	1X
2532	Reserve	0—No 1—Yes	1X
2533	Reserve	0—No 1—Yes	1X
2534	The Grid Interference Protection	0—No 1—Yes	1X
2535	The DSP Initial Protection	0—No 1—Yes	1X
2536	Over Temperature Protection	0—No 1—Yes	1X
2537	PV Insulation Fault	0—No 1—Yes	1X
2538	Leakage Current Protection	0—No 1—Yes	1X
2539	Relay Protection	0—No 1—Yes	1X
2540	DSP_B Protection	0—No 1—Yes	1X
2541	DC Injection Protection	0—No 1—Yes	1X
2542	12V Under Voltage Protection	0—No 1—Yes	1X
2543	Leakage Current Check Protection	0—No 1—Yes	1X
2544	Under Temperature PRO	0—No 1—Yes	1X
2545	Reserve	0—No 1—Yes	1X
2546	Reserve	0—No 1—Yes	1X
2547	Reserve	0—No 1—Yes	1X

2548	Reserve	0—No 1—Yes	1X
2549	Reserve	0—No 1—Yes	1X
2550	AFCI Check Fault	0—No 1—Yes	1X
2551	AFCI Fault	0—No 1—Yes	1X
2552	Reserve	0—No 1—Yes	1X
2553	Reserve	0—No 1—Yes	1X
2554	Reserve	0—No 1—Yes	1X
2555	Reserve	0—No 1—Yes	1X
2556	The Grid Interference 02 Protection	0—No 1—Yes	1X
2557	The Grid Current Sampling Error	0—No 1—Yes	1X
2558	IGBT Over Current	0—No 1—Yes	1X
2559	Reserve	0—No 1—Yes	1X
2560	Reserve	0—No 1—Yes	1X
2561	Reserve	0—No 1—Yes	1X
2562	Reserve	0—No 1—Yes	1X
2563	Reserve	0—No 1—Yes	1X
2564	Reserve	0—No 1—Yes	1X
2565	Reserve	0—No 1—Yes	1X
2566	Normal Operation	0—No 1—Yes	1X
2567	Initial Standby	0—No 1—Yes	1X
2568	Control to shutdown	0—No 1—Yes	1X
2569	Fault to shutdown	0—No 1—Yes	1X
2570	Standby	0—No 1—Yes	1X
2571	Derating	0—No 1—Yes	1X
2572	Limiting	0—No 1—Yes	1X
2573	Backup OVLoad	0—No 1—Yes	1X
2574	Grid surge(Warn)	0—No 1—Yes	1X
2575	Fan fault(Warn)	0—No 1—Yes	1X
2576	AC SPD fault(Warn)	0—No 1—Yes	1X
2577	DC SPD fault(Warn)	0—No 1—Yes	1X
2578	Fan fault(Warn External)	0—No 1—Yes	1X
2588	Reserve	0—No 1—Yes	1X

Note: The function code 0x02 applies to 30KW series and 4G models inverter, and 30KW series valid from version 21. Other models don't have this function now.

5.2 Inverter type information parameter address, corresponding function code is 0x04. The following table has the same address with the actual address of the message frame. No need extra offset or transform

Register address (Decimal)	Name	Data type	Remark
35000	SOLIS inverter type definition	U16	definition: 0000---no definition 1010---1phase inverter 1020---3 phase inverter 2030--- 1 phase low voltage energy storage inverter 2031--- 1 phase low voltage AC Couple energy storage inverter 2040---1 phase high voltage energy storage inverter 2050--- 3 phases low voltage energy storage inverter 2060--- 3 phases high voltage energy storage inverter 1070---external EPM 3010---OGI OFF GRID INVERTER description: 1、high 8 bit means protocol version, low 8 bit means inverter model 10：see《RS485_MODBUS(INV-3000ID EPM-36000ID)inverter protocol； 20：see《RS485_MODBUS(ESINV-33000ID)energy storage inverter protocol》 2、0000H-no definition model。 Master device can choose the device UI of related model 3、this address will not be limited with wake up time,it can get address information as soon as LCD is powered up

5.3 Register address of inverter operation information. The <u>function code is 0x04</u>, the register address needs to offset one bit.

Example: register address: 3000, the send address is 2999.

Register address	name	Data type	Unit	Remark	Address type
3000	Product model	U16		See Appendix 1	3X

3001	DSP software version	U16		Hex	3X
3002	LCD software version	U16		Hex	3X
3003	AC output type	U16		0- Single 1- 3P4Wires 2- 3P3Wires 3- 3P4Wires or 3P3Wires both available	3X
3004	DC input type	U16		0-1 DC input 1-2 DC input 2-3 DC input 3-4 DC input …… 19-20 DC input	3X
3005-3006	Active power	U32	1W		3X
3007-3008	Total DC output power	U32	1W		3X
3009-3010	Total energy	U32	1kWh		3X
3011-3012	Energy this month	U32	1kWh		3X
3013-3014	Energy last month	U32	1kWh		3X
3015	Energy today	U16	0.1kWh		3X
3016	Energy last day	U16	0.1kWh		3X
3017-3018	Energy this year	U32	1kWh	15k below, no function	3X
3019-3020	Energy last year	U32	1kWh	15k below, no function	3X
3021	HMI version	U16		2021/1/20 Internal use for Test department	3X
3022	DC voltage 1	U16	0.1V		3X
3023	DC current 1	U16	0.1A		3X
3024	DC voltage 2	U16	0.1V		3X
3025	DC current 2	U16	0.1A		3X
3026	DC voltage 3	U16	0.1V	15k below, no function	3X
3027	DC current 3	U16	0.1A	15k below, no function	3X
3028	DC voltage 4	U16	0.1V	15k below, no function	3X
3029	DC current 4	U16	0.1A	15k below, no function	3X
3030	Alarm code data	U16		2021/01/20 Add fault words according to requirements to	3X

				realize the differentiated display of fault information	
3031	Initialize ground voltage	U16	0.1V		3X
3032	DC busbar voltage	U16			3X
3033	DC half-busbar voltage	U16			3X
3034	AB line voltage / A phase voltage	U16	0.1V	AC output type(3003): 1<=>phase voltage 2<=>line voltage	3X
3035	BC line voltage / B phase voltage	U16	0.1V	AC output type(3003): 1<=>phase voltage 2<=>line voltage	3X
3036	CA line voltage / C phase voltage	U16	0.1V	AC output type(3003): 1<=>phase voltage 2<=>line voltage 0<=>single phase voltage	3X
3037	A phase current	U16	0.1A		3X
3038	B phase current	U16	0.1A		3X
3039	C phase current	U16	0.1A		3X
3040	Master/slave DSP upgrade switch	U16		00 – Master DSP upgrade 01 – Slave DSP upgrade	3X
3041	Working Mode	U16		Working Mode: 00---No response mode 01---Volt–watt default 02---Volt–var 03---Fixed power factor 04---Fix reactive power 05---Power-PF 06---Rule21Volt–watt	3X
3042	Inverter temperature	U16	0.1℃		3X
3043	Grid Frequency	U16	0.01Hz		3X
3044	Inverter status	U16		See Appendix 2	3X
3045-3046	Limit active power adjustment rated power	S32	1W		3X
3047-3048	Limit reactive power adjustment rated power	S32	1Var		3X
3049	Inverter control Word	U16		15k below, no function	3X
3050	Power limit actual	U16	1%	10000<-->100%	3X

	value			Set range（0-100%） 100% is rated power	
3051	Actual adjust value of power factor	S16	0.001	PF Low： （800<-->0.80， 1000<-->1.00） （-800<-->-0.80， -1000<-->-1.00） （PF 1.00 = -1.00） Set range（-0.80---0.80）	3X
3052	Actual adjust value of power factor	S16	0.01	PF Low： （800<-->0.80， 1000<-->1.00） （-800<-->-0.80， -1000<-->-1.00） （PF 1.00 = -1.00） Set range（-0.80---0.80） This function is only available for working mode 03 Fixed power factor	3X
3053	Reactive power limitation	S16	1%	10000<-->100% Set Range（-6000- +6000） Default：0 This function is only available for working mode 04 Fix reactive power	3X
3054	Country standard code	U16		See Appendix 3	3X
3055	Power curve code	U16			3X
3056-3057	Reactive power	S32	1Var	~~15k below, no function~~	
3058-3059	Apparent power	S32	1VA	15k below, no function	3X
3061	Inverter SN_1	U16		SN High 4 Example: (Hex) 3061 has 0x4321 3062 has 0x8765 3063 has 0xCBA9 3064 has 0x0FED The SN is 12345679ABCDEF	3X
3062	Inverter SN_2	U16		SN MID 4	3X
3063	Inverter SN_3	U16		SN MID 4	3X

3064	Inverter SN_4	U16		SN LOW 4	3X
3065	Reserved	U16			3X
3066	Setting Flag	U16		See Appendix 8	
3067	Fault code 01	U16		See Appendix 5	3X
3068	Fault code 02	U16			3X
3069	Fault code 03	U16			3X
3070	Fault code 04	U16			3X
3071	Fault code 05	U16			3X
3072	Working status	U16		See Appendix 6	3X
3073	System Time(Year)	U16			3X
3074	System Time(Month)	U16			3X
3075	System Time(day)	U16			3X
3076	System Time(hour)	U16			3X
3077	System Time(min)	U16			3X
3078	System Time(sec)	U16			3X
3079	Reserved	U16			3X
3080-3081	Meter Total Active Generation	U32	1Wh	1<=>1Wh	3X
3082	Meter Voltage	U16		10<-->1V	3X
3083	Meter Current	U16		10<-->1A	3X
3084-3085	Meter Active power	S32		1<-->1W +：to grid -：from grid	3X
3086	leakage current threshold	U16	1mA	1<-->1mA	3X
3087	PV-ISO threshold	U16	1kOhm	1<-->1k	3X
3088	Power Limit Switch operation bit	U16		BIT00:(0x55) 1：OFF (100% generation) 0：ON； BIT01: (0xAA) 1：Limitation effective； 0：Limitation ineffective； BIT02-BIT15:Reserved	3X
3089	Reactive power switch operation bit	U16		BIT00:(0x55) 1：OFF (PF=1,Reac = 0)； 0：ON。 BIT01: (0xA1) 1：Setting effective； 0：Setting ineffective；	3X

				BIT02: (0xA2) 1：PF 02 Setting effective； 0：PF 02 Setting ineffective； BIT03-BIT15: Reserved	
3090	Power Limit Switch	U16		0xAA　ON，0x55 OFF	
3091	Reactive power switch	U16		0x55 OFF, (PF=1,Reac = 0) 0xA1 Reactive power setting effective 0xA2 PF 02 setting effective	
3092	Groudning resistance	U16	1kΩ	Range:0-32000kΩ	3X
3093	AC NTC (IGBT) Module Temperature	S16	0.1℃		3X
3095	Fault Word 00	U16		AlarmData0 between HMI and DSP	
3096	Fault Word 01	U16		AlarmData1 between HMI and DSP	
3097	Fault Word 02	U16		AlarmData2 between HMI and DSP	
3098	Fault Word 03	U16		AlarmData3 between HMI and DSP	
3099	Fault Word 04	U16		AlarmData4 between HMI and DSP	
3100	Fault Word 05	U16		AlarmData5 between HMI and DSP	
3111	Internal EPM Switch	U16		Value=: 01：CT sensor 02：Meter in grid 03：Meter in load 04： 24hour consumption mode 05：EPM OFF For 4G 1P models	3X
3112	Internal EPM backflow power	S16	100W	Value=: 1←→100W + to grid - from grid	3X
3113	Internal EPM failsafe switch	U16		Value=: 0：FailSafe off	3X

				1：FailSafe on	
3114	EPM real time backflow power	U16	10W	Value: 1←→10W	3X
3115	Reserved	U16			3X
3116	Reserved	U16			3X
3117	Reserved	U16			3X
3118	Reserved	U16			3X
3119	Reserved	U16			3X
3120	Reserved	U16			3X
3121	Italy Single Self-Test	U16		Value: Start Single Protection Test 00---Null 01---59.S1(253.0V 3000ms) 02---59.S2(264.5V　200ms) 03---27.S1(195.5V 1500ms) 04---27.S2(34.5V　200ms) 05---81>.S1(50.2Hz 100ms) 06---81<.S1(49.8 Hz 100ms) 07---81>.S2F(51.5Hz 100ms) 08---81<.S2F(47.5 Hz 100ms) 09---81>.S2S(51.5Hz 1000ms) 10---81<.S2S(47.5 Hz 4000ms) Note: The setting has power-off saving function only available under Italy standard。	3X
3122	Italy Full Self-test	U16		Value: Start Complete Self Test 　1—In Single self-test condition. 　2—In Full Self-test condition Note: The setting has power-off saving function only available under Italy standard。	3X
3123	01-59.S1 Voltage	U16	0.1V	10←→1V	3X
3124	01-59.S1 Time	U16	1ms	1←→1ms	3X
3125	02-59.S2 Voltage	U16	0.1V	10←→1V	3X
3126	02-59.S2 Time	U16	1ms	1←→1ms	3X

3127	03-27.S1 Voltage	U16	0.1V	10←→1V	3X
3128	03-27.S1 Time	U16	1ms	1←→1ms	3X
3129	04-27.S2 Voltage	U16	0.1V	10←→1V	3X
3130	04-27.S2 Time	U16	1ms	1←→1ms	3X
3131	05-81>.S1Frequency	U16	0.01Hz	100←→1Hz	3X
3132	05-81>.S1 Time	U16	1ms	1←→1ms	3X
3133	06-81<.S1 Frequency	U16	0.01Hz	100←→1Hz	3X
3134	06-81<.S1 Time	U16	1ms	1←→1ms	3X
3135	07-81>.S2F Frequency	U16	0.01Hz	100←→1Hz	3X
3136	07-81>.S2F Time	U16	1ms	1←→1ms	3X
3137	08-81<.S2F Frequency	U16	0.01Hz	100←→1Hz	3X
3138	08-81<.S2F Time	U16	1ms	1←→1ms	3X
3139	09-81>.S2S Frequency	U16	0.01Hz	100←→1Hz	3X
3140	09-81>.S2S Time	U16	1ms	1←→1ms	3X
3141	10-81<.S2S Frequency	U16	0.01Hz	100←→1Hz	3X
3142	10-81<.S2S Time	U16	1ms	1←→1ms	3X
3143-3219	Reserved	U16			3X
3220	Batch upgrade flag	U16		First 8 bit	3220
3221	保留	U16			3X
3222	保留	U16			3X
3223	保留	U16			3X
3224	保留	U16			3X
3225	保留	U16			3X
3226	保留	U16			3X
3227	保留	U16			3X
3230-3249	SN Number			ASCII Display ie： 3230 = '01' 3231 = '23' Display：'0123'	
3250	Meter Location	U16		BIT00: Meter in load BIT01: Meter in grid BIT02: 24 hour consumption BIT03: Reserved BIT04: Reserved BIT05: Reserved	3X

				BIT06: Reserved BIT07-BIT15: Reserved	
3251	Meter AC V A	U16	0.1V	10<-->1V	3X
3252	Meter AC I A	U16	0.01A	100<-->1A	3X
3253	Meter AC V B	U16	0.1V	10<-->1V	3X
3254	Meter AC I B	U16	0.01A	100<-->1A	3X
3255	Meter AC V C	U16	0.1V	10<-->1V	3X
3256	Meter AC I C	U16	0.01A	100<-->1A	3X
3257	Meter P A	S32	0.001kW	1000<-->1kW	3X
3259	Meter P B	S32	0.001kW	1000<-->1kW	3X
3261	Meter P C	S32	0.001kW	1000<-->1kW	3X
3263	Meter Total P	S32	0.001kW	1000<-->1kW	3X
3265	Meter Q A	S32	1Var	1<-->1Var	3X
3267	Meter Q B	S32	1Var	1<-->1Var	3X
3269	Meter Q C	S32	1Var	1<-->1Var	3X
3271	Meter Total Q	S32	1Var	1<-->1Var	3X
3273	Meter S A	S32	1VA	1<-->1VA	3X
3275	Meter S B	S32	1VA	1<-->1VA	3X
3277	Meter S C	S32	1VA	1<-->1VA	3X
3279	Meter Total S	S32	1VA	1<-->1VA	3X
3281	Meter PF	S16	0.001	-1.000~-0.800 +0.800~+1.000 1Ph meter: DDSD151: Actual accuracy 0.001 ACR10RD16TE:Actual accuracy0.01	3X
3282	Meter Freq	U16	0.01Hz	100<-->1Hz	3X
3283-3284	Meter grid import active energy	U32	0.01kWh	100<-->1kWh	3X
3285-3286	Meter grid export active energy	U32	0.01kW	100<-->1kWh	3X
3287	Reserved	U16			
3289	PV21I	S16	0.1A	10<-->1A	3X
3290	PV22I	S16	0.1A	10<-->1A	3X
3291	PV23I	S16	0.1A	10<-->1A	3X
3292	PV24I	S16	0.1A	10<-->1A	3X
3293	PV25I	S16	0.1A	10<-->1A	3X
3294	PV26I	S16	0.1A	10<-->1A	3X
3295	PV27I	S16	0.1A	10<-->1A	3X
3296	PV28I	S16	0.1A	10<-->1A	3X
3297	PV29I	S16	0.1A	10<-->1A	3X
3298	PV30I	S16	0.1A	10<-->1A	3X

3299	Total PV V	U16	0.1V	10<-->1V	3X
3300	Total PV I	S16	0.1A	10<-->1A	3X
3301	PV1 I	S16	0.1A	10<-->1A	3X
3302	PV2 I	S16	0.1A	10<-->1A	3X
3303	PV3 I	S16	0.1A	10<-->1A	3X
3304	PV4 I	S16	0.1A	10<-->1A	3X
3305	PV5 I	S16	0.1A	10<-->1A	3X
3306	PV6 I	S16	0.1A	10<-->1A	3X
3307	PV7 I	S16	0.1A	10<-->1A	3X
3308	PV8 I	S16	0.1A	10<-->1A	3X
3309	PV9 I	S16	0.1A	10<-->1A	3X
3310	PV10 I	S16	0.1A	10<-->1A	3X
3311	PV11 I	S16	0.1A	10<-->1A	3X
3312	PV12 I	S16	0.1A	10<-->1A	3X
3313	PV13 I	S16	0.1A	10<-->1A	3X
3314	PV14 I	S16	0.1A	10<-->1A	3X
3315	PV15 I	S16	0.1A	10<-->1A	3X
3316	PV16 I	S16	0.1A	10<-->1A	3X
3317	PV17 I	S16	0.1A	10<-->1A	3X
3318	PV18 I	S16	0.1A	10<-->1A	3X
3319	PV19 I	S16	0.1A	10<-->1A	3X
3320	PV20 I	S16	0.1A	10<-->1A	3X
3321	PV1 V	U16	0.1V	10<-->1V Note：125K has 20 PV current，10PV voltage，1PV voltage -> 2PV current 230K series 30 strings	3X
3322	PV2 V	U16	0.1V	10<-->1V	3X
3323	PV3 V	U16	0.1V	10<-->1V	3X
3324	PV4 V	U16	0.1V	10<-->1V	3X
3325	PV5 V	U16	0.1V	10<-->1V	3X
3326	PV6 V	U16	0.1V	10<-->1V	3X
3327	PV7 V	U16	0.1V	10<-->1V	3X
3328	PV8 V	U16	0.1V	10<-->1V	3X
3329	PV9 V	U16	0.1V	10<-->1V	3X
3330	PV10 V	U16	0.1V	10<-->1V	3X
3331	PV11 V	U16	0.1V	10<-->1V	3X
3332	PV12V	U16	0.1V	10<-->1V	3X
3333	PV13V	U16	0.1V	10<-->1V	3X
3334	PV14V	U16	0.1V	10<-->1V	3X
3335	PV15V	U16	0.1V	10<-->1V	3X
3336-3340	Reserved	U16			3X

3341	This model IV curve number	U16		0---0 IV curve; 1---1 IV curve, 2---2 …….. Max 30	3X
3342	Current IV curve No.	U16		0---0 IV curve; 1---1 IV curve, 2--- 2……, Max 30	3X
3343	PVV1	U16	0.1V	10<-->1V	3X
3344	PVI1	S16	0.1A	10<-->1A	3X
3345	PVV2	U16	0.1V	10<-->1V	3X
3346	PVI2	S16	0.1A	10<-->1A	3X
3347	PVV3	U16	0.1V	10<-->1V	3X
3348	PVI3	S16	0.1A	10<-->1A	3X
3349	PVV4	U16	0.1V	10<-->1V	3X
3350	PVI4	S16	0.1A	10<-->1A	3X
3351	PVV5	U16	0.1V	10<-->1V	3X
3352	PVI5	S16	0.1A	10<-->1A	3X
3353-3460	……	…	…	…….	3X
3461	PVV60	U16	0.1V	10<-->1V	3X
3462	PVI60	S16	0.1A	10<-->1A	3X
3463	Reserved	U16			3X
3464-3999	Reserved	U16			3X
3500	MPPT 1V	U16	0.1V	10<-->1V	3X
3501	MPPT 2V	U16	0.1V	10<-->1V	3X
3502	MPPT 3V	U16	0.1V	10<-->1V	3X
3503	MPPT 4V	U16	0.1V	10<-->1V	3X
3504	MPPT 5V	U16	0.1V	10<-->1V	3X
3505	MPPT 6V	U16	0.1V	10<-->1V	3X
3506	MPPT 7V	U16	0.1V	10<-->1V	3X
3507	MPPT 8V	U16	0.1V	10<-->1V	3X
3508	MPPT 9V	U16	0.1V	10<-->1V	3X
3509	MPPT 10V	U16	0.1V	10<-->1V	3X
3510	MPPT 11V	U16	0.1V	10<-->1V	3X
3511	MPPT 12V	U16	0.1V	10<-->1V	3X
3512	MPPT 13V	U16	0.1V	10<-->1V	3X
3513	MPPT 14V	U16	0.1V	10<-->1V	3X
3514	MPPT 15V	U16	0.1V	10<-->1V	3X
3515	Reserved	U16			3X
3516	Reserved	U16			3X
3517	Reserved	U16			3X

3518	Reserved	U16			3X
3519-3529	Reserved	U16			3X
3530	MPPT 1I	S16	0.1A	10<-->1A	3X
3531	MPPT 2I	S16	0.1A	10<-->1A	3X
3532	MPPT 3I	S16	0.1A	10<-->1A	3X
3533	MPPT 4I	S16	0.1A	10<-->1A	3X
3534	MPPT 5I	S16	0.1A	10<-->1A	3X
3535	MPPT 6I	S16	0.1A	10<-->1A	3X
3536	MPPT 7I	S16	0.1A	10<-->1A	3X
3537	MPPT 8I	S16	0.1A	10<-->1A	3X
3538	MPPT 9I	S16	0.1A	10<-->1A	3X
3539	MPPT 10I	S16	0.1A	10<-->1A	3X
3540	MPPT 11I	S16	0.1A	10<-->1A	3X
3541	MPPT 12I	S16	0.1A	10<-->1A	3X
3542	MPPT 13I	S16	0.1A	10<-->1A	3X
3543	MPPT 14I	S16	0.1A	10<-->1A	3X
3544	MPPT 15I	S16	0.1A	10<-->1A	3X
3545	Reserved	U16			3X
3546	Reserved	U16			3X
3547	Reserved	U16			3X
3548	Reserved	U16			3X
3549	Reserved	U16			3X
3550	Reserved	U16			3X
3551-3999	Reserved	U16			3X

Note：METER SN: Use inverter SN + inverter slave address = meter SN, to identify whether the inverter has a meter or not. Single phase use data of phase A. Meter active power : "+" means power to grid. "-" means power from grid

PID info，Function code 04：

Register address	name	Data type	Unit	Remark	Address type
5000	Inverter status	U16		0— Standby 1— Grid-Tied 2— 2—Fault 3—Control to shutdown 4—Off-Grid	3X
5001	CRC16 Check	U16			3X
5002	DC bus voltage	U16	0.1V		3X
5003	Reserved	U16			3X
5004	Reserved	U16			3X

Note: Check this table if Anti-PID module is applied. Check once for all registers at the same time

5.4 EPM (external device) operating information. __Function code 0x04__. No need address offset

Register address	name	Data type	Unit	Remark	Address type
36000	EPM AC V A	U16		10<-->1V	3X
36001	EPM AC I A	U16		10<-->1A	3X
36002	EPM AC V B	U16		10<-->1V	3X
36003	EPM AC I B	U16		10<-->1A	3X
36004	EPM AC V C	U16		10<-->1V	3X
36005	EPM AC I C	U16		10<-->1A	3X
36006	EPM_Power A	S16		1<-->100W	3X
36007	EPM_Power B	S16		1<-->100W	3X
36008	EPM_Power C	S16		1<-->100W	3X
36009-36010	EPM_Power Total	S32		1<-->100W Note: Little Endian Low first, High Latter	3X
36011-36012	Inverter Total Power	S32		1<-->100W Note: Little Endian Low first, High Latter	3X
36013	Inverter Model Number	U16			3X
36014	EPM firmware version	U16			3X
36015	Power control percent	U16		10000<-->100%	3X
36016	CT ratio	U16		~~1<-->100~~ 1<-->10 Note:EPM-5G/ PLUS, 05+ Ver change to 1-10, Original is 1-100	3X
36017	Backflow power setting value	S16		1<-->100W	3X
36018	Inverter number setting value	U16			3X
36019	Year	U16		00-99 Years	3X
36020	Month	U16			3X
36021	Day	U16			3X
36022	Hours	U16			3X
36023	Mins	U16			3X
36024	Seconds	U16			3X
36025	FailSafe ON/OFF	U16		0←→OFF	3X

				1←→ON Default:OFF, After Ver06	
36026	Grid PF	S16		-1.0~-0.8 +0.8~+1.0	3X
36027	Grid Freq(Meter)	U16	0.01Hz	100<-->1Hz	3X
36028-36029	Total Load power	U32		1<-->100W Note ： Calculate from inverter power and EPM power Note: Little Endian Low first, High Latter	3X
36030-36049	SN	U16		ASCII display: 3031 = '01' 3233 = '23' Display：'0123' Low first, high latter Max SN 15 numbers	3X
36050-36051	Inverter total generation energy	U32	0.01kWh	100<-->1kWh Note: Little Endian Low first, High Latter	3X
36052-36053	Load total consumption energy	U32	0.01kWh	100<-->1kWh Note: Little Endian Low first, High Latter	3X
36054-36055	Grid import total active energy	U32	0.01kWh	100<-->1kWh Note: Little Endian Low first, High Latter	3X
36056-36057	Grid export total active energy	U32	0.01kWh	100<-->1kWh Note: Little Endian Low first, High Latter	3X
36058	EPM data transmission Switch	U16		0←→OFF； 1←→ON； Default is 0；	3X
36059	Batch upgrade flag	U16		0←→Not support batch upgrade； 1←→support batch upgrade； Default is 0；	3X
36060	EPM model	U16		00E0: 5G-EPM 0000：Unknown EPM or 2G-EPM (Hex)	3X
36061	Reserved	U16			3X
36062	Reserved	U16			3X
36063	Reserved	U16			3X
36064	Reserved	U16			3X

36065	Reserved	U16			3X
36066	Reserved	U16			3X
36067	Reserved	U16			3X
36068	Reserved	U16			3X

5.5 Register address of inverter gird on/off. Correspond to <u>function code 0x05</u>. The addresses in the following table are the same as those in the actual, which means no need of offset or other conversion

Register address	name	Data type	Unit	Remark
5000	Grid ON/OFF	U16	0xFF00: Grid On, ,0x0000 Grid OFF	0X

Note: The function code 0x05 applies to 30KW series and 4G models inverters, and 30KW series valid from version 21.

5.6 Register address of inverter setting: <u>The function code is 0x03, 0x06 and 0X10</u>, the register address needs to offset one bit.

Example: register address: 3007, the send address is 3006.

Register address	name	Data type	Unit	Remark	Address type
3000	Year	U16		00-99 years	4X
3001	Month	U16			4X
3002	Day	U16			4X
3003	Hours	U16			4X
3004	Mins	U16			4X
3005	Seconds	U16			4X
3006	Slave address	U16			4X
3007	ON/OFF	U16		0xBE-ON 0xDE-OFF 10H—Night ON enable 11H—Night ON disable	4X
3008	HMI Password	U16		Note: 0000-9999: Hex，can't send letters. Default psw: 0010H. Reset password: A5A5H. Ie: set 2020 password, send Hex:2020. If	4X

				send Hex:A0A0H, etc. Lock the setting function	
3009	Power curve number	U16		See Appendix 4	4X
3010	81>S1	U16	0.01 Hz	100<-->1Hz, 48-53Hz，Default50.2Hz 43038-43049 only effective under CEI021	4X
3011	81>S1-T	U16	0.01s	100<-->1S, 0.05-0.5S，Default0.10S	4X
3012	81<S1	U16	0.01 Hz	100<-->1Hz, 48-53Hz，Default49.8Hz	4X
3013	81<S1-T	U16	0.01s	100<-->1S, 0.05-0.5S，Default0.10S	4X
3014	81>S2F	U16	0.01 Hz	100<-->1Hz, 48-53Hz，Default51.5Hz	4X
3015	81>S2F-T	U16	0.01s	100<-->1S, 0.05-0.5S，Default0.10S	4X
3016	81<S2F	U16	0.01 Hz	100<-->1Hz, 45-49Hz，Default47.5Hz	4X
3017	81<S2F-T	U16	0.01s	100<-->1S, 0.05-0.5S，Default0.10S	4X
3018	81>S2S	U16	0.01 Hz	100<-->1Hz, 48-53Hz，Default51.5Hz	4X
3019	81>S2S-T	U16	0.01s	100<-->1S, 0.05-5.0S，Default1.0S	4X
3020	81<S2S	U16	0.01 Hz	100<-->1Hz, 45-49Hz，Default47.5Hz	4X
3021	81<S2S-T	U16	0.01s	100<-->1S, 0.05-5.0S，Default4.0S	4X
3022	Reserved	U16			4X
3023	DRM S1 Limit 1	U16		10000<-->100% Range（0-100%）	4X
3024	DRM S2 Limit 2	U16		10000<-->100% Range（0-100%）	4X
3025	DRM S3 Limit 3	U16		10000<-->100% Range（0-100%）	4X
3026	DRM S4 Limit 4	U16		10000<-->100% Range（0-100%）	4X
3027	DRM ON/OFF	U16		0x0000 — OFF， 0x00AA — ON， Default：0。 When this is ON, EPM function will be	4X

				OFF		
3029-3050	Reserved	U16				4X
3051	Reactive power limitation	S16	1%	10000<-->100% Range（-6000- +6000） default：0 Only available for working mode 04		4X
3052	Power limitation	U16	1%	10000<-->100% Range（0-100%） 100% = rated。 If need power off saving, set 3069 as 1		4X
3053	PF Setting	S16	0.01	PF： （800<-->0.80，1000<-->1.00） （-800<-->-0.80，-1000<-->-1.00） （PF 1.00 same with -1.00） range（-0.80---0.80） 15KW and below don't have this function		4X
3054	PF Setting 02	S16	0.01	PF Low： （800<-->0.80，1000<-->1.00） （-800<-->-0.80，-1000<-->-1.00） （PF 1.00 same with -1.00） range（-0.80---0.80） For working mode 03 fixed pf function		4X
3055	Master/Slave DSP upgrade	U16		00: Master DSP upgrade 01: Slave DSP upgrade No matter the upgrade master or slave DSP, each time the upgrade is sent, the corresponding open instruction is sent (for example: the master DSP sends 0, the slave DSP sends 1).		4X
3056-3057	Calibrate total generation	U32	1kWh			4X
3058-3059	Calibrate current month generation	U32	1kWh			4X
3060-3061	Calibrate last month generation	U32	1kWh			4X
3062	Calibrate today	U16	0.1kWh			4X

	generation				
3063	Calibrate yesterday generation	U16	0.1k Wh		4X
3064-3065	Calibrate this year generation	U32		15KW and below don't have this function	4X
3066-3067	Calibrate last year generation	U32		15KW and below don't have this function	4X
3068	Grid standard	U16		See appendix 3	4X
3069	Power-off saving function	U16		BIT00: 0- Power off not saving 　　　　1- Power off saving 　　　　For 3052/3149/3150 Reg BIT01: 0- Power off not saving 　　　　1- Power off saving 　　　　For 3053 Reg BIT02: 0- Power off not saving 　　　　1- Power off saving 　　　　For 3051, 3130-3146,3073 Reg BIT03: 0- Power off not saving 　　　　1- Power off saving 　　　　For 3054, 3130-3146, 3073 Reg BIT04-15:Reserved Note：Don't set 1 too frequently，　the flash has a limited write and read lifespan. Less than 10000 times.	4X
3070	Power limitation switch	U16		0xAA ON，0x55 OFF(Power to 100%)(for 3052 and 3081 Reg)。	4X
3071	Reactive power switch	U16		0x55 OFF，PF=1 Reactive =0 　0xA1 Reactive setting effective，PF =1 (for 3051 and 3083 Reg)； 0xA2 PF 02 setting effective，Reactive =0 (for 3054 Reg) 。	4X
3073	Working mode	U16		Working mode: 　00---No response mode 　01---Volt–watt default 　02---Volt–var 　03---Fixed power factor 　04---Fix reactive power	4X

				05---Power- F 06---Rule21Volt–watt	
3074	Italy Standard Switching Mode	U16		0：Off，Default: OFF (81>S1—50.2Hz/0.1s-Inverter 81<S1—49.8Hz/0.1s-Inverter) 1：Local Control (81>S2—51.5Hz/0.1s-Local 81<S2—47.5Hz/0.1s-Local) 2：External Signal (81>S2—51.5Hz/1.0s-External 81<S2—47.5Hz/4.0s-External) Note: The setting has power-off saving function only available under Italy standard。	4X
3075	Italy Single Test	U16		Value: Start Single Protection Test 00---Null 01---59.S1(253.0V 3000ms) 02---59.S2(264.5V 200ms) 03---27.S1(195.5V 1500ms) 04---27.S2(34.5V 200ms) 05---81>.S1(50.2Hz 100ms) 06---81<.S1(49.8 Hz 100ms) 07---81>.S2F(51.5Hz 100ms) 08---81<.S2F(47.5 Hz 100ms) 09---81>.S2S(51.5Hz 1000ms) 10---81<.S2S(47.5 Hz 4000ms) Note: The setting has power-off saving function only available under Italy standard。	4X
3076	Italy Full Test	U16		Value: Start Complete Self Test 0---Full test stop or not start 2---Full test starts Note: The setting has power-off saving function only available under Italy standard。	4X
3077	AFCI ON/OFF	U16		1 <--> ON 0 <--> OFF	4X
3078	Reserved	U16			4X
3079	Reserved	U16			4X
3080	Power control word	U16		Power control word: （Bit0---Max power limit flag： 0---Default is 1.09 rated P；1---Set as 1.1 rated P	4X

				When HMI or external 485 set once,ARM will save this flag in the flash and detect it after power on and send DSP the command Bit1---Resv）	
3081	Limit power actual value	S16	10W	1<-->10W Range:-327680W~327680W Use 06 code to open 3070 Reg, Then set 3081 Reg	4X
3082	Reserved	U16			4X
3083	Limiting reactive power adjustment value	S16	10Var	1<-->10Var Range: -327680Var~327680Var Use 06 code to open 3071 Reg, Then set 3083 Reg	
3084	Leakage current protection	U16	1mA	1<-->1mA Range：50-800mA；Default 240mA	4X
3085	PV insulation protection	U16	1kOhm	1<-->1k Range：20k-1000k；Default 200K	4X
3086	Reserved	U16			4X
3087	Reserved	U16			4X
3088	Reserved	U16			4X
3089	Grid code accuracy set flag	U16		3— Set accuracy V0.1V, time 0.01s, F 0.01Hz 0- Set accuracy V 1V, time 0.1s, F 0.1Hz Default is 0，Power off not saving。 This function has the upper computer to actively set the selection, the inverter according to the selection, the corresponding standard parameter setting function.。	4X
3090	OV-G-V 01	U16	1V	1<-->1V 1P range：240-270V default：260V 3P range：236-335V default：254V Note: User-defined standard setting must use function code 0x10	4X
3091	OV-G-V-T 01	U16	100ms	1<-->100mS Range：0.10-9.0s default：1.0s	4X
3092	OV-G-V 02	U16	1V	1<-->1V 1P range：240-300V default：280V	4X

				3P range：248-341V default：265V	
3093	OV-G-V-T 02	U16	100ms	1<-->100mS Range：0.10-1.0s default：0.2s	4X
3094	UN-G-V 01	U16	1V	10<-->1V 1P range：170-210V default：180V 3P range：173-236V default：190V	4X
3095	UN-G-V-T 01	U16	100ms	1<-->100mS Range：0.10-9.0s default：1.0s	4X
3096	UN-G-V 02	U16	1V	1<-->1V 1P range：110-210V default：180V 3P range：132-219V default：173V	4X
3097	UN-G-V-T 02	U16	100ms	1<-->100mS Range：0.10-1.0s default：0.2s	4X
3098	OV-G-F 01	U16	0.1Hz	10<-->1Hz Range：50.2-53.0Hz default：51.0Hz Range：60.2-63.0Hz default：61.0Hz	4X
3099	OV-G-F-T 01	U16	100ms	1<-->100mS Range：0.10-9.0s default：1.0s	4X
3100	OV-G-F 02	U16	0.1Hz	10<-->1Hz Range：51.0-53.0Hz default：51.0Hz Range：61.0-63.0Hz default：51.0Hz	4X
3101	OV-G-F-T 02	U16	100ms	1<-->100mS Range：0.10-9.0s default：0.2s	4X
3102	UN-G-F 01	U16	0.1Hz	10<-->1Hz Range：47.0-49.5Hz default：48.0Hz Range：57.0-59.5Hz default：48.0Hz	4X
3103	UN-G-F-T 01	U16	100ms	1<-->100mS Range：0.10-9.0s default：1.0s	4X
3104	UN-G-F 02	U16	0.1Hz	10<-->1Hz Range：47.0-49.0Hz default：47.0Hz Range：57.0-59.0Hz default：47.0Hz	4X
3105	UN-G-F-T 02	U16	100ms	1<-->100mS Range：0.10-9.0s default：0.2s	4X
3106	Startup time	U16	1s	1<-->1s Range：10-600s default：60s	4X
3107	Reconnect time	U16	1s	1<-->1s Range：10-600s default：60s	4X
3108	Recover V upper limit	U16	0.1V	10<-->1V；Resolution 0.1V；Default is the OVGV01	4X
3109	Recover V lower limit	U16	0.1V	10<-->1V；Resolution 0.1V；Default is the UNGV01	4X
3110	Recover F upper limit	U16	0.01Hz	100<-->1Hz；Resolution 0.1Hz；Default is the OVGF01	4X
3111	Recover F	U16	0.01	100<-->1Hz；Resolution 0.1Hz；Default	4X

3111	lower limit		Hz	is the UNGF01	
3112	Startup V upper limit	U16	0.1V	10<-->1V；Resolution 0.1V；Default is 253.0V	4X
3113	Startup V lower limit	U16	0.1V	10<-->1V；Resolution 0.1V；Default is 195.5V	4X
3114	Startup F upper limit	U16	0.01 Hz	100<-->1Hz；Resolution 0.1Hz；Default is 50.1Hz	4X
3115	Startup F lower limit	U16	0.01 Hz	100<-->1Hz；Resolution 0.1Hz；Default is 49.5Hz	4X
3130	01/06 working mode V1Set	U16	0.1V	10<-->1V； If need power off saving, set 3069 BIT03 or 02	4X
3131	01/06 working mode V2Set	U16	0.1V	10<-->1V；	4X
3132	01/06 working mode V3Set·	U16	0.1V	10<-->1V；	4X
3133	01/06 working mode V4Set·	U16	0.1V	10<-->1V；	4X
3134	01/06 working mode（P1% Set）	U16	1%	10000<-->100% Range（0-100%） 100%- P-rated	4X
3135	01/06 working mode（P2% Set）	U16	1%	10000<-->100% Range（0-100%） 100%- P-rated	4X
3136	01/06 working mode（P3% Set）	U16	1%	10000<-->100% Range（0-100%） 100%- P-rated	4X
3137	01/06 working mode（P4% Set）	U16	1%	10000<-->100% Range（0-100%） 100%- P-rated	4X
3138	02 working mode V1Set·	U16	0.1V	10<-->1V； If need power off saving, set 3069 BIT03 or 02	4X
3139	02 working mode V2Set	U16	0.1V	10<-->1V；	4X
3140	02 working	U16	0.1V	10<-->1V；	4X

	mode V3Set				
3141	02 working mode V4Set	U16	0.1V	10<-->1V;	4X
3142	02 working mode （MaxLeadingVar%）	U16	1%	10000<-->100% Range：0---60%; Default:30%	4X
3143	02 working mode （MaxLaggingVar%）	U16	1%	10000<-->100% Range：0---（-60%）; Default:-30%	4X
3144	05 working mode（Pb%Set）	U16	1%	（10000<-->100%）; Range：50---100%; Default:100% If need power off saving, set 3069 BIT03 or 02	4X
3145	05 working mode（Pc%Set）	U16	1%	（10000<-->100%）; Range：50---100%; Default:100%	4X
3146	05 working mode （PFcSet）	S16	0.01	Range：（-0.90---0.90）; Default:-0.95 （800<-->0.80，1000<-->1.00）	4X
3147	10mins over voltage	U16	0.1V	10<-->1V;	4X
3148	Power ramp rate (Wgra), general	U16	1%	：（10000<-->100%）; Range：5%---600%; Default:16.67%; Accuracy 1% Start up ramp rate	4X
3149	Power ramp up rate	U16	1%	3000<-->30%/min；Range：10%—100%; Default：16.66%，Only for AUS If need power off saving, set 3069 as 1	4X
3150	Power ramp down rate	U16	1%	3000<-->30%/min；Range：10%—100%; Default：50%，Only for AUS If need power off saving, set 3069 as 1	4X
3151	Internal EPM Switch	U16		Value=: 01：CT sensor 02：Meter in grid 03：Meter in load 04：24hour consumption mode(AU only)	4X

				05：EPM OFF For 4G 1P models	
3152	Internal EPM backflow power	S16	100 W	Value=: 1←→100W + to grid - from grid (Invalid)	4X
3153	Internal EPM failsafe switch	U16		Value=: 0：FailSafe off 1：FailSafe on	4X
3240	IV curve starting setting	U16		1- Start， 0- Don't scan， Default is 0 Note: After start the IV curve scanning, use function code 04, read 3341Reg. If READ THE IV curve number, the scan ends. If no number after 5mins, end with timeout. If 3 times of timeout, scanning error	4X
3241	IV curve start voltage	U16	1V	1<-->1V	4X
3242	IV curve interval voltage	U16	1V	1<-->1V	4X
3243	Get current IV curve number	U16		Note: Max number is 30 Step 1: Send IV curve scanning command, wait it ends Step 2: Send function 06 3243 Reg to set IV curve number, get IV curve info Step 3: Use function 04 read IV curve info Reg from 3341-3462	4X
3244-3249	Reserved	U16			4X
3250-3251	Datalogger SN	U32		Transfer the SN number to Dec and display it	4X
3252	Reserved	U16		Datalogger SN reserved	4X
3253	Reserved	U16		Datalogger SN reserved	4X
3254	Reserved	U16		Datalogger SN reserved	4X
3255-3256	Datalogger IP Address	U32		Transfer the IP address to Dec and display it	4X
3257	Datalogger signal	U16		Reserved for wireless devices	4X

	strength				
3258	Datalogger status word 1	U16		All 0000 = normal operation; BIT00:0---INV&logger COM normal 1--- INV&logger COM fail BIT01: 0---logger& Server COM normal 1--- logger& Server COM fail BIT02: Reserved BIT03-BIT15:Reserved	4X
3259-3300	Reserved	U16			4X
3301	Fan self-test	U16		0000H—Fan self test off 0001H—Fan self test On After send self-test command, check 04 function code 3044 register. If detect F011H, it means fan is abnormal	4X
3304	Special Function Control Word	U16		Special Function control word BIT0-BIT15（Power off saving） BIT00：Boost not working function OFF Control word 0---ON；1---OFF；Default 0 OFF-> Boost always working BIT01：DC injection adjustment function off control word 0---ON；1---OFF；Default 0 OFF-> Stop DC injection adjustment, for test purpose BIT02：0% Power Relay Trip Function Switch 1---Enabled；0--Disabled；Default is 0 (Note: When power control is set to 0%, the AC relay will disconnect if this function is enabled) BIT03-BIT04：AFCI Self-Check Function BIT05：L-Ground Fault Detection Function Switch; 0---Enabled; 1---Disabled; Default:0 BIT06-15：预留。	4X
3305	Grid V A compensation	S16	0.1V	10<-->1V Range：-5.0V~+5.0V Default 0 1Ph inverter only phase A	4X
3306	Grid V B	S16	0.1V	10<-->1V	4X

Register address	name	Data type	Unit	Remark	Address type
	compensation			Range：-5.0V~+5.0V Default 0	
3307	Grid V C compensation	S16	0.1V	10<-->1V Range：-5.0V~+5.0V Default 0	4X
3308	Grid I A compensation	S16	0.1A	10<-->1A	4X
3309	Grid I B compensation	S16	0.1A	10<-->1A	4X
3310	Grid I C compensation	S16	0.1A	10<-->1A	4X
3311	Reserved	U16			4X
3312	Reserved	U16			4X
3313	Reserved	U16			4X
3314	Reserved	U16			4X
3315	Reserved	U16			4X
3316	Reserved	U16			4X
3317	Reserved	U16			4X
3318	Reserved	U16			4X
3319	Reserved	U16			4X
3320	Reserved	U16			4X
3321	Reserved	U16			4X
3322	Reserved	U16			4X
3323	Reserved	U16			4X
3324	Reserved	U16			4X
3325	Reserved	U16			4X
3326	Reserved	U16			4X

5.7 EPM (External device) setting，function code 0x03,0x06 and 0x10

No need off set.

Register address	name	Data type	Unit	Remark	Address type
36500	Year	U16		00-99 Year	4X
36501	Month	U16			4X
36502	Day	U16			4X
36503	Hours	U16			4X

36504	Mins	U16			4X
36505	Seconds	U16			4X
36506	Slave Address	U16			4X
36507	CT ratio	U16	1<-->100		4X
36508	Backflow power	S16	1<-->100W		4X
36509	Inverter number	U16			4X
36510	EPM mode	U16	01：Sum of three phase power 02：Minimum power from one phase *3。		4X
36511	FailSafe ON/OFF	U16	0←→OFF 1←→ON Default:OFF		4X
36513	EPM data transmission Switch	U16	0←→OFF； 1←→ON； Default is 0；		4X
36514	Reserved	U16			4X
36515	Reserved	U16			4X
36516	Reserved	U16			4X
36517	Reserved	U16			4X
36518	Reserved	U16			4X
36519	Reserved	U16			4X
36520	Reserved	U16			4X

6 Example

Remark: The data was sent by minus 1 model when setting and inquiring register address, e.g.: if it is to acquire the data of address 3000, the data sending need to be sent by minus 1(which is 2999).

6.1 Acquiring an operation message

If slave address is 1, and you want to acquire 3X register address type - the data of address 3000:
Host sending (HEX):
01 04 0B B7 00 01 83 C8
Slave responding:
01 04 02 00 43 F8 C1
The corresponding model is 0x0043, which is the model No. 43 (inverter model)

6.2 Acquiring multiple operation message

If slave address is 1, and you want to acquire 3X register address type - the data of address 3000 - 3003:

Host sending (HEX):

01 04 0B B7 00 03 02 09

Slave responding:

01 04 06 00 43 02 07 00 02 14 E4

The corresponding model is 0x0043, DSP software version is 0x0207, LCD software version is 0x0002.

6.3 Acquiring a setting message

If slave address is 1, and you want to acquire 4X register address type, the data address is 3000:

Host sending (HEX):

01 03 0B B7 00 01 36 08

Slave responding:

01 03 02 00 13 F9 89

Note：Read year is 0x0013: 19 year

6.4 Acquiring multiple setting message

If slave address is 1, and you want to acquire 4X register address type, the data address is 3066-3068

Host sending (HEX):

01 03 0B B7 00 06 77 CA

Slave responding:

01 03 0C 00 13 00 02 00 14 00 17 00 16 00 32 91 87

Note：Read year   0x0013: 19 year，Month 0x0002: Feb，Day 0x0014: 20 days，Hour 0x0017:23 hours，Min 0x0016: 22mins，   Second 0x0032: 50 seconds。

6.5 Set a setting

If slave address is 1, and you want to set 4X register address type, the address is 3000

Host sending (HEX):

01 06 0B B7 00 13 7A 05

Slave responding:

01 06 0B B7 00 13 7A 05

OR

Host sending (HEX):

01 10 0B B7 00 01 02 00 13 46 DA

Slave responding:

01 10 0B B7 00 01 B3 CB

Note：Set the year as 0x0013: 19 year

6.6 Set multiple settings

If slave address is 1, and you want to set 4X register address type, the address is 3066-3068

Host sending (HEX):

01 10 0B F9 00 03 06 00 00 30 39 00 01 08 85

Slave responding:

01 10 0B F9 00 03 52 1D

Appendix 2：

3044H	Status		LCD	
	1P 2G	1、30KW series 2、15KW 3P 3、All 4G	1P 2G	1、30KW series 2、15KW 3P 3、All 4G
0000H	Normal	Waiting	Generating	Waiting
0001H	\	OpenRun	\	OpenRun
0002H	Waiting	SoftRun	Waiting	SoftRun
0003H	Initializing	Generating	Initializing	Generating
1004H	Grid off	\	Grid Off	\
…………	…………		…………	
F010H	Grid surge(Warning)		Surge Alarm	
F011H	FAN fault (Warning)		Fan Alarm	
F013H	AC SPD ERROR(Warning)		VgSpdFail	
F014H	DC SPD ERROR (Warning)		DcSpdFail	
F015H	Fan fault (Warning External)		Fan_H Alarm	
1010H	Grid Over Voltage		OV-G-V	
1011H	Grid Under Voltage		UN-G-V	
1012H	Grid Over Frequency		OV-G-F	
1013H	Grid Under Frequency		UN-G-F	
1014H	Grid reverse		Backfeed_Iac	
1015H	No Grid		NO-Grid	
1016H	Grid Unbalance		G-PHASE	
1017H	Grid Frequency Fluctuation		G-F-FLU	
1018H	Grid Over Current		OV-G-I	
1019H	Grid current tracking fault		IGFOL-F	
…………	…………		…………	
1020H	DC Over Voltage		OV-DC	
1021H	DC Bus Over Voltage		OV-BUS	
1022H	DC Bus Unbalance		UNB-BUS	
1023H	DC Bus Under Voltage		UN-BUS	
1024H	DC Bus Unbalance 2		UNB2-BUS	
1025H	DC(Channel A) Over Current		OV-DCA-I	

1026H	DC(Channel B) Over Current	OV-DCB-I
1027H	DC interference	DC-INTF.
1028H	DC reverse	Reve-DC
1029H	PV mid-point grounding	PvMidIso
…………	…………	…………
1030H	The Grid Interference Protection	GRID-INTF.
1031H	The DSP Initial Protection	INI-FAULT
1032H	Temperature Protection	OV-TEM
1033H	PV Insulation fault	PV ISO-PRO
1034H	Leakage Current Protection	ILeak-PRO
1035H	Relay Protection	RelayChk-FAIL
1036H	DSP_B Protection	DSP-B-FAULT
1037H	DC Injection Protection	DCInj-FAULT
1038H	12V Under Voltage Faulty	12Power-FAULT
1039H	Leakage Current Check Protection	ILeak-Check
103AH	Under temperature protection	UN-TEM
…………	…………	…………
1040H	AFCI Check Fault	AFCI-Check
1041H	AFCI Fault	ARC- FAULT
~~1042H~~	~~DSP SRAM Fault~~	~~RAM-FAULT~~
~~1043H~~	~~DSP FLAS Fault~~	~~FLASH-FAULT~~
~~1044H~~	~~DSP PC pointer fault~~	~~PC-FAULT~~
~~1045H~~	~~DSP Critical Reg fault~~	~~REG-FAULT~~
1046H	Grid INTF 02	GRID-INTF02
1047H	Grid current sampling error	IG-AD
1048H	IGBT over current	IGBT-OV-I
…………	…………	…………
…………	…………	…………
2011H	Fail Safe	Fail Safe

Appendix 3:

Code	3PH (5-136K) (3PH Hybrid)	1PH 4G (1PH Hybrid)	3PH(125K-1500V)	3PH(225K-1500V)
01H	G59/3	G59/3	G59/3	G59/3
02H	UL-480V(60Hz480V) Note：LV(60Hz270V)	UL-240V	UL-600V	UL-600V
03H	VDE0126(380V)	VDE0126	VDE0126	VDE0126
04H	AS4777/AS4777-15	AS4777/AS4777-15	AS4777-15	AS4777-15
05H	AS4777-NQ/AS4777-02	AS4777-NQ/AS4777-02	AS4777-02	AS4777-02
06H	CQC-B-380A	CQCA/CQC	CQC-600	CQC-800

07H	ENEL EN50438IE	ENEL EN50438IE	ENEL EN50438IE	ENEL EN50438IE
08H	UL-380V(60Hz380V) Note：LV UL-220V(60Hz220V)	UL-208V	UL-380V(60Hz380V)	UL-380V(60Hz380V)
09H	MEX-CFE	MEX-CFE	MEX-CFE	MEX-CFE
0AH	User-def	User-def	User-def	User-def
0BH	VDE4105(380V)	VDE4105	VDE4105(380V)	VDE4105(380V)
0CH	EN50438DK DK1	EN50438DK DK1	EN50438DK	EN50438DK
0DH	EN50438IE EN50549PO	EN50438IE EN50549PO	EN50549PO	EN50549PO
0EH	EN50438NL EN50549NL	EN50438NL EN50549NL	EN50549NL	EN50549NL
0FH	EN50438T EN50438SW EN50549SW	EN50438T EN50438SW EN50549SW	EN50549SW	EN50549SW
10H	EN50438L	EN50438L	EN50438L	EN50438L(800V)
11H	UL-480V-A	UL-240V-A	UL-600V-A	UL-800V
12H	UL-380V-A	UL-208V-A	UL-380V-A	UL-380V-A
13H	BRAZIL	BRAZIL	BRAZIL	BRAZIL
14H	AUS-Q-0.9	AUS-Q-0.9	AUS-Q-0.9	AUS-Q-0.9
15H	AUS-Q-0.8	AUS-Q-0.8	AUS-Q-0.8	AUS-Q-0.8
16H	G83/1	G83/1	G83/1	G83/1
17H	RD1699	RD1699	RD1699	RD1699
18H	IEC61727	IEC61727	IEC61727	IEC61727
19H	GN-380L	G83/1-A	GN-600L	GN-800L
1AH	CQC-480V CQC-B-480A	CQCB/GNB	CQC-480V	CQC-480V
1BH	GN-HV-L	CQCC/GNC	GN-HV-L	GN-HV-L
1CH	G59/3-A	NewZeal	G59/3-A	G59/3-A
1DH	4105/480(480V)	G83/2 G83/3	4105/480(480V)	4105/480(480V)
1EH	AS4777_480	Chile	AS4777_480	AS4777_480
1FH	NewZeal	NRS097	NewZeal	NewZeal
20H	CQC500	Philippin	CQC500	CQC500
21H	CQC540 CQC-B-540A	N4105-BEL	CQC540	CQC540
22H	GN540L	IEC61727L	GN540L	GN540L
23H	N4105-BEL	KS1 KSC856415	N4105-BEL	N4105-BEL
24H	CHILE	France	CHILE	CHILE
25H	NRS097	ISONE240	NRS097	NRS097
26H	GN380L-A	ISONE208	GN600L-A	GN800L-A
27H	GNHVL-A	ISONE240A	GNHVL-A	GNHVL-A

28H	NRS480	ISONE208A	NRS480	NRS480
29H	CQC380DZ	GN300V	CQC600DZ	CQC800DZ
2AH	GN380DZL	MEA(THAILAND)	GN600DZL	GN800DZL
2BH	ISONE480	R21P3-240	ISONE600	ISONE600
2CH	ISONE480A	R21P3-208	ISONE600A	ISONE800
2DH	KS1 KSC856415	R21P3-24A	KS1	KS1
2EH	R21P3-480	R21P3-20A	R21P3-600	R21P3-600
2FH	R21P3-48A	SRILANKA	R21P3-60A	R21P3-800
30H	Philippin	PEA(THAILAND)	Philippin	Philippin
31H	France	AS4777_SA	France	France
32H	SRILANKA	Mala230LV	SRILANKA	SRILANKA
33H	THAILANDMEA	Indon230V	THAILANDMEA	THAILANDMEA
34H	THAILANDPEA	G98	THAILANDPEA	THAILANDPEA
35H	4777SA-48(480)	G99	4777SA-48(480)	4777SA-48(480)
36H	Mala230LV	Generator50/KS2(special)	Mala230LV	Mala230LV
37H	Mala277LV	Generator60	Mala277LV	Mala277LV
38H	Mala277MV	TW220(TAIWAN)	Mala277MV	Mala277MV
39H	Indon230V	TW110(TAIWAN)	Indon230V	Indon230V
3AH	DEWA230LV	DK230V	DEWA230LV	DEWA230LV
3BH	DEWA277LV	Barbados（巴巴多斯）	DEWA277LV	DEWA277LV
3CH	DEWA277MV	BRAZIL-H	DEWA277MV	DEWA277MV
3DH	G98	G99-N	G98	G98
3EH	G99	CEI 0-21(Italy)	G99	G99
3FH	BDEW-230V	MEX-220V(MEX-110V Note: LV display)	BDEW-230V	BDEW-230V
40H	BDEW-277V	MEX220-A(MEX110-A (Note: LV display)	BDEW-277V	BDEW-277V
41H	Generator50	Singapore	Generator50	Generator50
42H	Generator60	AS4777-WA	Generator60	Generator60
43H	4777SA-40(380)	AS4777-NW	4777SA-40(380)	4777SA-40(380)
44H	KS2(Korean ODM)	EN50549L	KS2(Korean ODM)	KS2(Korean ODM)
45H	TW220(TAIWAN)	PH-L(Philippin)	TW220(TAIWAN)	TW220(TAIWAN)
46H	DK277V	C10/11	DK277V	DK277V
47H	DK230V	DK2	DK230V	DK230V
48H	Barbados	G98-NI	Barbados	Barbados
49H	IEC61727L	G99-NI	IEC61727L	IEC61727L
4AH	SG1 Singapore	Iran	SG1 Singapore	SG1 Singapore
4BH	G99-N	EIFS-SW(瑞典)	G99-N	G99-N
4CH	MEX-480V (MEX-220V Note: LV display)	R14-240A （Hawaii）	MEX-480V	MEX-480V

4DH	MEX480-A (MEX220-A Note：LV display)	R14-208A （Hawaii）	MEX480-A	MEX480-A
4EH	4777WA-40(380)	TOR	4777WA-40(380)	4777WA-40(380)
4FH	4777WA-48(480)	R14-240 （Hawaii）	4777WA-48(480)	4777WA-48(480)
50H	4777NW-40(380)	R14-208 （Hawaii）	4777NW-40(380)	4777NW-40(380)
51H	4777NW-48(480)	AS4777_NA	4777NW-48(480)	4777NW-48(480)
52H	EN50549L	GREECE230	EN50549L	EN50549L
53H	CEI 0-21(Italy)	HK230	CEI 0-21(Italy)	CEI 0-21(Italy)
54H	PH-L(Philippin)		PH-L(Philippin)	PH-L(Philippin)
55H	C10/11)		C10/11	C10/11
56H	DK2		DK2	DK2
57H	G98-NI		G98-NI	G98-NI
58H	G99-NI		G99-NI	G99-NI
59H	Iran		Iran	Iran
5AH	EIFS-SW		EIFS-SW	EIFS-SW
5BH	KS3		EN50549-2（600V）	EN50549-2(800V)
5CH	TOR		CEA600	CEA800
5DH	BRAZIL-H		Puerto600	Puerto600
5EH	CQC-A-380 (Only for 80-110K/90-136K)		BRAZIL-H	SG-800V
5FH	CQC-A-480 (Only for 80-110K/90-136K)			G99-B
60H	CQC-A-540 (Only for 80-110K/90-136K)			
61H	G99-B			
62H	4777NA-40(380)			
63H	4777NA-48(480)			
64H	GREECE230			
65H	HK230			
66H	RENBLAD			
67H	CEI 0-16			

Appendix 5：

Fault status 01:

BIT	Status	Code
BIT00	Grid Over Voltage	0—No 1—Yes

BIT01	Grid Under Voltage	0—No 1—Yes
BIT02	Grid Over Frequency	0—No 1—Yes
BIT03	Grid Under Frequency	0—No 1—Yes
BIT04	Grid reverse current	0—No 1—Yes
BIT05	No Grid	0—No 1—Yes
BIT06	Grid Unbalance	0—No 1—Yes
BIT07	Grid Frequency Fluctuation	0—No 1—Yes
BIT08	Grid Over Current	0—No 1—Yes
BIT09	Grid current tracking fault	0—No 1—Yes
BIT10	Grid abnormal phase angle	0—No 1—Yes
BIT11	Reserved	0—No 1—Yes
BIT12	Reserved	0—No 1—Yes
BIT13	Reserved	0—No 1—Yes
BIT14	Reserved	0—No 1—Yes
BIT15	Reserved	0—No 1—Yes

Fault status 02:

BIT	Status	Code
BIT00	DC Over Voltage	0—No 1—Yes
BIT01	DC Bus Over Voltage	0—No 1—Yes
BIT02	DC Bus Unbalance	0—No 1—Yes
BIT03	DC Bus Under Voltage	0—No 1—Yes
BIT04	DC Bus Unbalance 2	0—No 1—Yes

BIT		Code
BIT05	DC(Channel A) Over Current	0—No 1—Yes
BIT06	DC(Channel B) Over Current	0—No 1—Yes
BIT07	DC interference	0—No 1—Yes
BIT08	DC wrong polarity	0—No 1—Yes
BIT09	PV mid-point grounding	0—No 1—Yes
BIT10	Bus voltage not the same	0—No 1—Yes
BIT11	Reserved	0—No 1—Yes
BIT12	Reserved	0—No 1—Yes
BIT13	Reserved	0—No 1—Yes
BIT14	Reserved	0—No 1—Yes
BIT15	Reserved	0—No 1—Yes

Fault status 03:

BIT	Status	Code
BIT00	The Grid Interference Protection	0—No 1—Yes
BIT01	The DSP Initial Protection	0—No 1—Yes
BIT02	Temperature Protection	0—No 1—Yes
BIT03	Ground Fault	0—No 1—Yes
BIT04	Leakage Current Protection	0—No 1—Yes
BIT05	Relay Protection	0—No 1—Yes
BIT06	DSP_B Protection	0—No 1—Yes
BIT07	DC Injection Protection	0—No 1—Yes
BIT08	12V Under Voltage Faulty	0—No 1—Yes

BIT09	Leakage Current Check Protection	0—No 1—Yes
BIT10	Under temperature protection	0—No 1—Yes
BIT11	Reserved	0—No 1—Yes
BIT12	Reserved	0—No 1—Yes
BIT13	Reserved	0—No 1—Yes
BIT14	Reserved	0—No 1—Yes
BIT15	Reserved	0—No 1—Yes

Fault status 04:

BIT	Status	Code
BIT00	AFCI Check Fault	0—No 1—Yes
BIT01	AFCI Fault	0—No 1—Yes
BIT02	Reserved	0—No 1—Yes
BIT03	Reserved	0—No 1—Yes
BIT04	Reserved	0—No 1—Yes
BIT05	DSP self-check alarm	0—No 1—Yes
BIT06	Grid INTF 02	0—No 1—Yes
BIT07	Grid current sampling error	0—No 1—Yes
BIT08	IGBT over current	0—No 1—Yes
BIT09	Reserved	0—No 1—Yes
BIT10	Reserved	0—No 1—Yes
BIT11	Reserved	0—No 1—Yes
BIT12	Reserved	0—No 1—Yes

BIT		Code
BIT13	Reserved	0—No 1—Yes
BIT14	Reserved	0—No 1—Yes
BIT15	Reserved	0—No 1—Yes

Appendix 6：

Working status:

BIT	Status	Code
BIT00	Normal	0—No 1—Yes
BIT01	Initializing	0—No 1—Yes
BIT02	Grid off	0—No 1—Yes
BIT03	Fault to stop	0—No 1—Yes
BIT04	Standby	0—No 1—Yes
BIT05	Derating	0—No 1—Yes
BIT06	Limitating	0—No 1—Yes
BIT07	Backup OV Load	0—No 1—Yes
BIT08	Grid Surge　(Warn)	0—No 1—Yes
BIT09	Fan fault(Warn)	0—No 1—Yes
BIT10	Reserved	0—No 1—Yes
BIT11	AC SPD ERROR(VgSpdFail)	0—No 1—Yes
BIT12	DC SPD ERROR(DcSpdFail)	0—No 1—Yes
BIT13	Reserved	0—No 1—Yes
BIT14	Reserved	0—No 1—Yes
BIT15	Reserved	0—No 1—Yes

Appendix 8

Factory setting flag

BIT	Status	Code
BIT00	FLASH Timeout	0—No 1—Yes
BIT01	Clear generation flag	0—No 1—Done
BIT02	Reserved	0—No 1—Yes
BIT03	Reserved	0—No 1—Yes
BIT04	Reserved	0—No 1—Yes
BIT05	Reserved	0—No 1—Yes
BIT06	Reserved	0—No 1—Yes
BIT07	Reserved	0—No 1—Yes
BIT08	Datalogger restart	0—No 1—Restart
BIT09	Datalogger initialize	0—No 1—Initialize
BIT10	Reserved	0—No 1—Yes
BIT11	Reserved	0—No 1—Yes
BIT12	Reserved	0—No 1—Yes
BIT13	Reserved	0—No 1—Yes
BIT14	Reserved	0—No 1—Yes
BIT15	Reserved	0—No 1—Yes