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Revision record				
Page	Modification	Version	Revised by	modification date
	03、06 function code address: (39 line voltage sampling enable)、(40 monitorparallel judgment mark) ; 04 function code: (143 monitorparallel judgment	V1.1	李永彬	2019/12/5
	03、06 function code address: (41 line voltage sampling enable)、(42 monitorparallel judgment mark)、(44 grid power compensation) ; Namibian non-standard: 03, 06 function code address: (39 DG starting condition)、(40SOC_Star enable)、(99 battery cell voltage upper limit)、(100 battery cell voltage lower limit)、(101HPS/PCS temperature upper limit)、(102HPS/PCS temperature lower limit)、(103 Battery temperature upper limit)、(104 Battery temperature lower limit)、(107 load power upper limit)、(108 load power lower limit)、(109 Time limit of DG's starting)	V1.2	李永彬	2019/12/6
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	03、06 function code address: 25 add the setting "hardware version choice", Used to switch software code based on different hardware version。 6.3 fault information sheet: optimize the information instructions of "660~663, 1002~1005"	V1.6	朱宏伟朱文超	2020/3/24
	03、06 function code address: (77 the number of HPS paralleling) Fault information sheet 4.3.3, change the "Bypass cabinet communication Fault" to the "CAN bus communication fault"	V1.7	旷远军	2020/3/30
	03、06 function code address: (46 HPS DG upper power limit)、(47 HPS discharge cut-off SOC)、(78 PCS import power setting)、(130~132 system date time) Schneider non-standard: 03、06 function code address: (27 HPS Schneider contactor state)、(28 HPS Grid state) Schneider non-standard: 04 function code address: (149 SCR state)	V1.8	兰波	2020/5/6
	04 function code address: (150 PCS battery charging power)、(151 PCS output power)、(152 PBD output power)	V1.9	兰波	2020/5/12
	04 function code address: (153 HP STL HPS Charge power limit)	V2.0	朱宏伟	2020/6/3
	04 function code address: (154~157 PCS CP Current U、V、W, CP active power) model information sheet 4.1.1 and 4.1.2, model added PCS630.	V2.1	兰波	2020/6/4
	03、06 function code address: (24 Parallel enable, 38 Parallel Redundant Number)	V2.2	旷远军	2020/6/4
	03、06 function code address: (79 Frequency shift enable; 118 CP nominal power setting)	V2.3	兰波	2020/6/8
	03、06 function code address: (303~308 HP STL shiner master Anti-reflux parameter setting)	V2.4	朱宏伟	2020/6/9

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	04 function code address: (158~160 all model add INV active power INV reactive power、INV apparent power)	V2.5	朱宏伟	2020/6/12
	03、06 function code address: 126 Bypass Type setting; 133~143: PBD Calibration 04 function code address: 161 Bypass Type	V2.6	李永彬	2020/6/15
	04 function code address: 250~252 ATS/Bypass; DG grid select; DG/ grid power	V2.7	兰波	2020/6/23
	03 、06 function code address : 77 : Number of parallel ; 119 : Parallel address ; 265~275: EN-50549 certification function settings; 276~284: Parallel settings	V2.8	旷远军	2020/7/15
	04 function code address: 216~227 DG current、power; DG grid select; Total/Daily power intake (time) from DG	V2.9	兰波	2020/7/24
	03、06 function code address: 127add Boot and App Burn Selection ;set 0 will Burn App code ,set 1 will Burn Boot	V3.0	朱宏伟	2020/7/29
	03、06 function code address: 282 addParallel synchronization phase difference limiting coefficient	V3.1	旷远军	2020/7/31
	Fault information sheet 5.3.5, change the “Reseverd_Fault” to the “ShineMaster_Comunicate_Fault” Fault information sheet 4.3.8, change the “Reseverd_Fault” to the “Parallel_Uneven_Flow_Warning”	V3.2	朱宏伟	2020/8/5
	04 function code address: 162~163: system battery current、dry contact state 03、06 function code address: 144~147: system battery current calibration parameter. Address 148: DG synchronized state figure4.1.2 DTC model information, HPS7500TL	V3.3	兰波	2020/10/13

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	03 、 06 function code address : 164~168 : EMS droop mode. figure4.1.2 DTC model information, HPS30_V2/ HPS50_V2	V3.4	兰波	2020/11/5
	04 function code address : 270-299 : Hardware Softwareversion	V3.5	兰波	2020/11/18
	HPSTL/PBD Fault information shee 03、 06 function code address: 149: system battery current calibration parameter.	V3.6	朱宏伟 兰波	2020/12/18
	03、 06 function code address: 128: Starting voltage differential 129: DC soft star contactor enable 4 function code address: 229: CP power limit Fault information sheet 4.3.11	V3.7	兰波	2021/4/8
	DTC of new machine HPS15KTL-HPS40KTL , new insulation module related faults and insulation resistance	V3.8	李建华	2021/10/29
	03、 06 function code address: 202~203, 227~238: Back power set, Frequence controlled power output enable, Constant discharge current, Grid charge enable, Forced charge enable, SOC calibration set, SOH calibration set, Offline discharge cutoff SOC, Offline discharge restore SOC, DC contactor back check enable, Bypass communication station number, Bypass communication station number enable, Bypass numbers, Bypass shared enable 04 function code address: 231~234: Max discharge power, Charging pile max power, Diesel generator demand power, HPS start request Fault information sheet 4.3.3 SmokealarmFault changed to Fire fault	V3.9	胡星晨	2021/12/16
	03、06 Function Code: Address 206-209, 225、226、 241-242 AC overvoltage protection time (20ms), output voltage direct calibration U, output voltage direct calibration V, output voltage direct calibration W; Gridchargingpower、 Parallel signal test Enable、 SOC upper limit 1 , SOC lower limit 1. 03, 04, 06 Function code: Content renamed	V3.10	梁郁柱	2022/5/27

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	03、06 Function Code: Address 280, 281, 286, 287: active average flow KP, active average flow KI, reactive average flow KP, reactive average flow KI 26: Mode Select: Added mode 10 Grid load mode 04 Function Code: Address 192 Operation mode: added 15 grid load mode; Modify model information and DTC model information; Fault Information Update	V3.11	梁郁柱	2022/6/1
	03, 06 Function code: Address 222, 221: week, meter communication station number; Off-peak season schedule time setting 04 Function code: Address 243-249:Daily Energy From Meter、Total Energy From Meter High bit、Total Energy From Meter Low bit、Daily Energy To Meter、Total Energy To MeterHigh bit、otal Energy To Meter Low bit、Meter Power	V3.12	梁郁柱	2202/6/29
	03, 06 Function code: Address 220 : Parallel address switching Enable 、 Address205 CT ratio of meter 210: Bypass LoadCurr U 211: Bypass LoadCurr V 212: Bypass LoadCurr W 213: Bypass GridCurr U 214: Bypass GridCurr V 215: Bypass GridCurr W 216 : Bypass GenCurr U 217: Bypass GenCurr V 218: Bypass GenCurr W	V3.13	李路娜	2022/07/28
	03, 06 Function code: Address 219: Feedforward coefficient	V3.14	李路娜	2022/08/30

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	04 Function code:Address240 : Daily power generation of grid connected inverter 241 : Total power generation of grid connected inverter High bit 242 : Total power generation of grid connected inverter Low bit	V3.15	李路娜	2022/08/31
	03 Function code:Address186 : PCS generator switch 03, 06 Function code: Address 26: Mode10 Grid load mode modified to Smart meter mode, Added Mode11 Battery-Smart meter (non-standard) 04 Function code:Address192: Mode15 Grid load Mode modified to Smart meter mode, Added Mode16 Battery-Smart meter(non-standard).	V3.16	郭秉毅	2022/09/26
	03, 06 Function codes: 244, 245: Cell circulating voltage, CANb baud rate, address 26 added mode 12 Grid Access Control 04 Function code: Address 192: Added Mode 17 : Grid Access Control	V3.17	梁郁柱	2022/10/25

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	03, 06 Function codes: 288 OnToOff CurrLoop Impact Kp1、289 OnToOff CurrLoop Impact Ki1、290 OnToOff VoltLoop Impact Kp1、291 OnToOff VoltLoop Impact Ki1、292 OnToOff CurrLoop Impact Kp2、293 OnToOff CurrLoop Impact Ki2、294 OnToOff VoltLoop Impact Kp2、295 OnToOff VoltLoop Impact Ki2、296 OnToOff CurrLoop Impact Kp3、297 OnToOff CurrLoop Impact Ki3、298 OnToOff VoltLoop Impact Kp3、299 OnToOff VoltLoop Impact Ki3 26:Bat-SmartMeter changed from non-standard to standard program, Change "load priority"、"Battery priority"、"Battery-Smart meter"、"multi period charging and discharging" to "load First"、"Battery First"、"Bat-SmartMeter"、"Time schedule" 04 Function code: 253 MASTER_SLAVE Switching Signal、254 Parallel PLL Signal、255 Parallel Switch Signal 192:Bat-SmartMeter changed from non-standard to standard program , Change "load priority"、"Battery priority"、"Battery-Smart meter" to "load First"、"Battery First"、"Bat-SmartMeter"	V3.18	李路娜	2022/12/20
	Sort out the problem that function code parameters of 03 and 06 correspond to models, and the function code parameters of 03 and 06 do not correspond to each other	3.19	梁郁柱	2023/1/14

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	03,06 Function codes:246:485 Baud Rate(bps),247:Current limitin g period,248:Device type,249:Meter Com Switch E nable;309:Anti-overcharge Enable,310:Float discha rge coefficient,311:Float discharge limit,312:On gri d load drop limit,313:DC volt diff fault value 04Function codes:239:Non-critical Load Power. Fig4.3.9Fault alarm bit information8 :Meter_Communication_Warning Fig4.3.11Fault alarm bit information9 :Meter_Communication_Fault,Five Faults within ten minutes	3.20	李路娜	2023/4/24
	03,06 Function code 314: GEN starts SOC, 315: GEN stops SOC 04 Function code: 238:GEN volt U	3.21	杨健	2023/4/28
	03,06 功能码 ： 320-324： 电池放电功率 ， 325-329： 电池单体电压设置， 330-334： 电池目 标 SOC。 335： 充电截止电压， 336： 放电恢复 电压。 04 功能码： 201 ： ATS 继电器粘连告警， 电表 通信故障， 198： 交流继电器故障 03、06 功能码： 342:直流主接触器检测使能。 343:读取故障记录使能。 344:读取故障记录起始 位置。 345:读取故障记录结束位置 04 功能码： 660~724， 6.3 故障信息记录表 256: BypassCANA 波特率地址（PCS） ATS CANA 波特率地址（HPS） 257: 整流柜功率 258: 整流柜需求功率	3.22	杨健， 廖礼仲、梁 郁柱	2023/8/7

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1. Introduction

This document describes the internal and external communication protocol of monitoring software, which is applicable to HPS series, PCS series and PBD series model communication.

This agreement refers to <GBT 19582-2008 industrial automation network specification based on Modbus protocol>.

RS232 and RS485 can be used as physical interfaces.

Data signal transmission rate: 2400bps, 9600bps; default 9600bps.。

Note: the protocol is applicable to the following models:

Central typeHPS: HPS30、HPS50、HPS100、HPS120、HPS150。

String type HPS: HPS10KTL、HPS20KTL、HPS10KTLS、HPS7500TLS、HPS5KTLS、HPS3500TLS。

PCS: PCS50、PCS100、PCS250、PCS500、PCS630。

PBD: PBD250、PBD350。

2. MODBUSProtocol description

2.1 ModbusAddress rule

Modbus is the master - slave communication mode. The communication is initiated by the master, and the slave corresponding to the address responds

The host has no address, and the slave address range is: 1 ~ 247; 0 is the broadcast address. The slave address is unique on the Modbus serial bus

2.2 ModbusProtocol frame

Modbus protocol frame consists of address field, function code, data field and check code.

Fig2.1.1 General MODBUS frame

Address field	Function code	Data field	Verification code
---------------	---------------	------------	-------------------

Protocol frame is divided into two formats: RTU transmission mode and ASCII transmission mode.

2.3 RTU Transmission mode

2.3.1 Byte format

Byte includes: 1 start bit, 8 data bits (first send least significant bit), No parity bit, 2 stop bits, 11 bits in total

Each character or byte is sent in sub order (left to right): least significant bit (LSB) Most significant bit (MSB)

Fig 2.3.1 RTU Byte order in transmission mode

Start bit	Data bit								Stop bit	Stop bit
1	1	2	3	1	1	2	3	1	1	2

2.3.2 RTU Message frame

RTU message frame includes slave address, function code, data field and CRC verification

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The maximum frame size of RTU message is 256 bytes, and the maximum length of data field is 252 bytes

Fig2.3.2a RTU Message frame

Format	Slave address	Function code	Data	CRC verification	
Bytes	1byte	1byte	0~252bytes	2bytes	
				Low byte	High byte

In RTU mode, the message frame is separated by idle interval of at least 3.5 characters

The entire message frame must be sent in a continuous character stream

If the idle interval between two characters is more than 1.5 characters, the message frame is considered incomplete, and the receiving station should discard the message frame

Fig2.3.2b RTU Message frame sending sequence

	Modbus message				
Start	Slave address	Function code	Data	CRC verification	End
≥3.5 Character time	8 bytes	8 bytes	N*8 bytes	16 bytes	≥3.5 Character time

2.3.3 CRC verify

CRC contains a 16 bit value consisting of two 8-bit bytes

CRC field is attached to the message as the last field of the message. When this kind of addition is carried out, first attach the low byte of the field, then the high byte of the additional field. CRC high byte is the last byte sent in the message

Calculation of CRC:

The CRC calculation is started by preloading all 1 in a 16 bit register. Then, the 8-bit bytes in the subsequent message and the contents in the current register are calculated. Only 8 data bits in each character participate in the calculation of generating CRC. The start bit, stop bit and check bit do not participate in the CRC calculation

During the Generation of CRC, each 8-bit character is XOR with the value in the register. Then, move the result to the least significant bit (LSB), and fill the most significant bit (MSB) with zero. Extract and check LSB. If LSB is 1, the value in the register is XOR with a fixed preset value; if LSB is 0, no XOR operation is performed

This process will be repeated until 8 shifts are completed. After the last shift (bit 8), the next 8-bit byte is XOR with the current value of the register, and then repeat the process 8 times as described above. After all bytes in the message have been calculated, the final value of the register is CRC

2.4 ASCII transmission mode

2.4.1 Byte format

Byte frame includes: 1 start bit, 7 data bits (first send least significant bit), no check bit, 2 stop bits, a total of 10 bits

Each character or byte is sent in sub order (left to right): least significant bit (LSB) Most significant bit (MSB)

Fig 2.4.1 ASCII byte order in ASCII transmission mode

Start bit	Data bit							Stop bit	Stop bit
1	1	2	3	4	5	6	7	1	1

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2.4.2 ASCII Message frame

ASCII message frame includes: start character, slave address, function code, data, LRC check, end character.

The maximum length of ASCII message frame is 513 bytes, and the maximum length of data field is 2x252 bytes.

Fig 2.4.2 ASCII Message frame

Start Character	Slave address	Function code	Data	LRCVerification	Terminator
1 character	2 characters	2 characters	0~2x252 characters	2 characters	2 characters
:					CR, LF

2.4.3 LRC verification

The LRC field is a byte containing an 8-bit binary value.

LRC field is encoded as two byte ASCII code and placed before CRLF of ASCII mode message frame.

Calculation of LRC:

Sum up all consecutive 8-bit bytes in the message (excluding the fields from "colon" and "CRLF") and then calculate the binary complement of the result as the calculated LRC code

2.4.4 Data format

Data: the value is one byte char type. The transmission consists of two ASCII codes, first high and then low. The data range is as follows:

Signed char type: - 128 ~ + 127

Unsigned char type: 0 ~ 255

Data: the value is a two byte integer. The transmission consists of four ASCII codes, first high and then low. The data range is as follows:

Signed integer: - 32768 ~ + 32767

Unsigned integer: 0 ~ + 65535

2.5 Function code

Fig2.5.1 Only the function code applied in this agreement is listed

Fig2.5.1 Function code list

No	Function code	Description	Note
1	01H	Read output status	
2	02H	Read input status	
3	03H	Read holding register	
4	04H	Read input register	
5	05H	Write single output status	
6	06H	Write single register	
7	0FH	Write multiple output	

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		states	
8	10H	Write multiple registers	
9	14H	Read file record	
10	2BH	Read device ID	

2.6 Exception code

Fig2.4.1 List of exception codes

Code	Description	Note
01H	Illegal Function code	Function code received in query is not allowed
02H	Illegal data address	The data address received in the query is not allowed
03H	Illegal data value	The value included in the query is not allowed
06H	Slave busy	
08H	Storage parity error	

2.7 MODBUS communication

2.7.1 Read output status(Function code0x01)

Read output status request:

Function code	1byte	0x01
Initial address	2byte	0x0000~0xFFFF
Number of output states	2byte	1~2000(0x7D0)

Read output status response:

Function code	1byte	0x01
Bytes	1byte	N *
Output status value	N *byte	
* N=Number of output states/8, If the remainder is not 0, then N=N+1		

Read output status error response:

Abnormal Function code	1byte	0x81
Exception code	1byte	01 or 02 or 03 or 04

i.e.: Request Read output status20~38.

Read out output status example

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Request		Response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	01	Function code	01
Initial address Hi	00	Bytes	03
Initial address Lo	13	Output state20~27	CD
Output quantity Hi	00	Output state28~35	6B
Output quantity Lo	13	Output state36~38	05

Note:

- 1.Output state1 Corresponding address0x0000;
- 2.Output state20 Corresponding address 0x0013.

	Output state20~27								Output state28~35								Output state36~38							
Hexadecimal	CD								6B								05							
Binary	b0	b1	b2	b3	b4	b5	b6	b7	b0	b1	b2	b3	b4	b5	b6	b7	b0	b1	b2	b3	b4	b5	b6	b7
	1	0	1	1	0	0	1	1	1	1	0	1	0	1	1	0	1	0	1	0	0	0	0	0
Corresponding Output state	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	-	-	-	-	-

2.7.2 Read input status(Function code: 0x02)

Read input status request:

Function code	1byte	0x02
Initial address	2byte	0x0000~0xFFFF
Number of input states	2byte	1~2000(0x7D0)

Read input status response:

Function code	1byte	0x02
Bytes	1byte	N *
Input status value	N *byte	
* N=Number of output states/8, If the remainder is not 0, then N=N+1		

Read input status error response:

Abnormal Function code	1byte	0x82
Exception code	1byte	01or02or03or04

i.e.:Request Read input status197~218

Read input status example

request	response
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Field name	Hexadecimal	Field name	Hexadecimal
Function code	02	Function code	02
Initial addressHi	00	Bytes	03
Initial addressLo	C4	Input state197~204	AC
输入数量 Hi	00	Input state205~212	DB
输入数量 Lo	16	Input state218~213	35

	Input state197~204								Input state205~212								Input state218~213							
Hexadecimal	AC								DB								35							
Binary	b0	b1	b2	b3	b4	b5	b6	b7	b0	b1	b2	b3	b4	b5	b6	b7	b0	b1	b2	b3	b4	b5	b6	b7
	0	0	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	0	1	0	1	1	0	0
Corresponding Output state	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	-	-

2.7.3 Read holding register(Function code: 0x03)

Read holding registerrequest:

Function code	1byte	0x03
Initial address	2byte	0x0000~0xFFFF
Number of registers	2byte	1~125(0x7D)

Read holding registerresponse:

Function code	1byte	0x03
Bytes	1byte	2×N *
Register value	N * ×2byte	
* N=Number of registers		

Read holding registererrorresponse:

Abnormal function code	1byte	0x83
Exception code	1byte	01or02or03or04

i.e.: Request to read holding register[108~110].

Read holding registerexample

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	03	Function code	03
Initial addressHi	00	Bytes	06
Initial addressLo	6B	Register[108]Hi	02
Number of registersHi	00	Register[108]Lo	2B

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Number of registersLo	03	Register[109]Hi	00
		Register[109]Lo	00
		Register[110]Hi	00
		Register[110]Lo	64

Note:

- 1.Register[1] Corresponding address 0x0000;
- 2.Register[108] Corresponding address 0x006B.

2.7.4 Read input register(Function code: 0x04)

Read input register request:

Function code	1byte	0x04
Initial address	2byte	0x0000~0xFFFF
Number of registers	2byte	1~125(0x7D)

Read input register response:

Function code	1byte	0x04
Bytes	1byte	2×N *
Register value	N * ×2byte	
* N=Number of registers		

Read input register error response:

Abnormal Function code	1byte	0x84
Exception code	1byte	01or02or03or04

i.e.:Request Read input register9.

Read out input register example

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function	04	Function	04
Initial addressHi	00	Bytes	02
Initial addressLo	08	Register[09]Hi	00
Number of registersHi	00	Register[09]Lo	0A
Number of registersLo	01		

Note:

- 1.Address 0x0000 corresponds to register [1];
- 2.Address 0x0008 corresponds to register [9]

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2.7.5 Write single output status(Function code: 0x05)

Write single output status request

Function code	1byte	0x05
Output state address	2byte	0x0000~0xFFFF
Output status value	2byte	0x0000or0xFF00

Write single output status response

Function code	1byte	0x05
Output state address	2byte	0x0000~0xFFFF
Output status value	2byte	0x0000or0xFF00

Write single output status error response

Abnormal Function code	1byte	0x85
Exception code	1byte	01or02or03or04

i.e.:Request write status 173 as on.

Write single output status example

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	05	Function code	05
Output address Hi	00	Output address Hi	00
Output address Lo	AC	Output address Lo	AC
Output value Hi	FF	Output value Hi	FF
Output value Lo	00	Output value Lo	00

2.7.6 Write single holding register(Function code: 0x06)

Write single holding register request

Function code	1byte	0x06
Holding register address	2byte	0x0000~0xFFFF
Holding register value	2byte	0x0000~0xFFFF

Write single holding register response

Function code	1byte	0x06
Holding register address	2byte	0x0000~0xFFFF
Holding register value	2byte	0x0000~0xFFFF

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Write single holding register error response

Abnormal function code	1byte	0x86
Exception code	1byte	01or02or03or04

i.e.:Request to write 0x0003 to holding register[2].

Example of writing a single holding register

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	06	Function	06
Holding register address Hi	00	Holding register address Hi	00
Holding register address Lo	01	Holding register address Lo	01
Holding register value Hi	00	Holding register value Hi	00
Holding register value Lo	03	Holding register value Lo	03

2.7.7 Write multiple output states(Function code: 0x0F)

Write multiple output states request

Function code	1byte	0x0F
Initial address	2byte	0x0000~0xFFFF
Number of output states	2byte	0x0001~0x07B0
Bytes	1byte	N
Output status value	N×1byte	value
* N=Output quantity/8, If the remainder is not equal to 0, then N=N+1		

Write multiple output states response

Function code	1byte	0x0F
Initial address	2byte	0x0000~0xFFFF
Number of output states	2byte	0x0001~0x07B0

Write multiple output states error response

Abnormal function code	1byte	0x8F
Exception code	1byte	01or02or03or04

i.e.:Request write starts from output state [20] and there are 10 output states in total.

Write multiple output states example

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	0F	Function code	0F
Initial address Hi	00	Initial address Hi	00
Initial address Lo	13	Initial address Lo	13

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Number of output states Hi	00	Number of output states Hi	00
Number of output states Lo	0A	Number of output states Lo	0A
Bytes	02		
Output status value Hi	CD		
Output status value Lo	01		

	Output state20~27								Output state28~29							
Hexadecimal	CD								01							
Binary	b0	b1	b2	b3	b4	b5	b6	b7	b0	b1	b2	b3	b4	b5	b6	b7
	1	0	1	1	0	0	1	1	1	0	0	0	0	0	0	0
Corresponding Output state	20	21	22	23	24	25	26	27	28	29	-	-	-	-	-	-

2.7.8 Write multiple registers(Function code: 0x10)

Write multiple registers request

Function code	1byte	0x10
Initial address	2byte	0x0000~0xFFFF
Number of registers	2byte	1~123 (0x7B)
Bytes	1byte	2×N
Register value	N×2byte	value
* N=Number of registers		

Write multiple registers response

Function code	1byte	0x10
Initial address	2byte	0x0000~0xFFFF
Number of registers	2byte	1~123 (0x7B)

Write multiple registers error response

Abnormal function code	1byte	0x90
Exception code	1byte	01or02or03or04

i.e.: Request to write two registers with address from 0x0001.

Write multiple registers example

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	10	Function code	10
Initial address Hi	00	Initial address Hi	00
Initial address Lo	01	Initial address Lo	01
Number of registers Hi	00	Number of registers Hi	00
Number of registers Lo	02	Number of registers Lo	02
Bytes	04		

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Register value Hi	00		
Register value Lo	0A		
Register value Hi	01		
Register value Lo	02		

2.7.9 Read file record(Function code: 0x14)

Read file record request

Function code	1byte	0x14
Bytes	1byte	0x07~0xF5byte
Sub request x, reference type	1byte	0x06
Sub request x, Document number	2byte	0x0001~0xFFFF
Sub request x, Record number	2byte	0x0000~0x270F
Sub request x, Record length	2byte	N
Sub request x+1, ...	...	...

Read file record response

Function code	1byte	0x14
Response data length	1byte	0x07~0xF5
Sub request x, File response length	1byte	0x05~0xF5 (RUDY)
Sub request x, reference type	1byte	06
Sub request x, Recorded data	N×2byte	...
Sub request x+1, ...	...	...

Read file record error response

Abnormal function code	1byte	0x94
Exception code	1byte	01or02or03or04or08

i.e.:Group 1 includes 2 registers in file 4, starting with register 1 (address 0x0001).

Group 2 includes 2 registers in file 3, starting with register 9 (address 0x0009).

Examples of requesting to read two reference group from a remote device

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	14	Function code	14
Bytes	0E	Response data length	0C
Sub request 1, reference type	06	Sub request 1, File response length	05
Sub request 1, Document number Hi	00	Sub request 1, reference type	06
Sub request 1, Document number Lo	04	Sub request 1, Register data Hi	0D
Sub request 1, Record number Hi	00	Sub request 1, Register data Lo	FE
Sub request 1, Record number Lo	01	Sub request 1, Register data Hi	00

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Sub request 1, Record length Hi	00	Sub request 1, Register data Lo	20
Sub request 1, Record length Lo	02	Sub request 2, File response length	05
Sub request 2, reference type	06	Sub request 2, reference type	06
Sub request 2, Document number Hi	00	Sub request 2, Register data Hi	33
Sub request 2, Document number Lo	03	Sub request 2, Register data Lo	CD
Sub request 2, Record number Hi	00	Sub request 2, Register data Hi	00
Sub request 2, Record number Lo	09	Sub request 2, Register data Lo	40
Sub request 2, Record length Hi	00		
Sub request 2, Record length Lo	02		

2.7.10Read device ID(Function code: 0x2B)

Read device ID request

Function code	1byte	0x2B
MEI type	1byte	0x0E
Device ID code	1byte	01/02/03/04
Object ID	1byte	0x00~0xFF

Read device ID response

Function code	1byte	0x2B
MEI type	1byte	0x0E
Device ID code	1byte	01/02/03/04
Consistency level	1byte	0x01or0x02or0x03or0x81or0x82or0x83
Continuous marking	1byte	00/FF
Next object ID	1byte	Object ID number
Number of objects	1byte	...
List		
Object ID	1byte	...
Object length	1byte	...
Object value	Object length	Related to object ID

Read file record error response

Abnormal function code	1byte	0xAB
Exception code	1byte	01or02or03or04

Description:

1.Device ID code type (ReadDevId)

Device ID code	Description
01	Request get basic device ID (stream access)

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02	Request get regular device ID (stream access)
03	Request get extended device ID (stream access)
04	Request get specific device ID (single access)

2. Object ID

Object ID	Object name / description	Type	M/O	Class
0x00	Manufacturer name	ASCII string	Mandatory	Basic
0x01	Product code	ASCII string	Mandatory	
0x02	Primary and secondary version No	ASCII string	Mandatory	
0x03	Manufacturer website	ASCII string	Optional	Regular
0x04	Product name	ASCII string	Optional	
0x05	Model name	ASCII string	Optional	
0x06	User application name	ASCII string	Optional	
0x07 ... 0x7F	Reserved		Optional	
0x80 ... 0xFF	Optionally define private objects The range (0x80 ~ 0xff) is related to the product	Equipment related	Optional	Expanded

2.Consistency level

Consistency level	Description
0x01	Basic identity (stream access only)
0x02	General identity (stream access only)
0x03	General identity (stream access only)
0x81	Basic identity (stream access and single access)
0x82	General identity (stream access and single access)
0x83	Extended identity (stream access and single access)

Continuous marking

When the read device ID code is 01, 02 or (stream access): 00: no follow-up object; FF: there is follow-up object.
In case of reading device ID code 04: it must be set to 00.

Example 1: read device ID request for basic device ID.

Request basic device ID example

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function code	2B	Function code	2B
MEI type	0E	MEI type	0E
Device ID code	01	Device ID code	01
Object ID	00	Consistency level	01

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		Continuous marking	00
		Next object ID	00
		Number of objects	03
		Object ID	00
		Object length	16
		Object value	“Company identification”
		Object ID	01
		Object length	0D
		Object value	“product code XX”
		Object ID	02
		Object length	05
		Object value	“V2.11”

Example 2:

Transaction 1

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function	2B	Function	2B
MEI type	0E	MEI type	0E
Read Device ID code	01	Read Device ID code	01
Object ID	00	Consistency level	01
		Continuous marking	00
		Next object ID	00
		Number of objects	03
		Object ID	00
		Object length	16
		Object value	“Company identification”
		Object ID	01
		Object length	0D
		Object value	“Product code XXXXXXXXXXXXXXXXXX”

Example 3:

Transaction 2

request		response	
Field name	Hexadecimal	Field name	Hexadecimal
Function	2B	Function	2B
MEI type	0E	MEI type	0E
Read Device ID code	01	Read Device ID code	01
Object ID	02	Consistency level	01
		Continuous marking	00
		Next object ID	00

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		Number of objects	03
		Object ID	02
		Object length	05
		Object value	“V2.11”

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3、Read holding register address (function code: 0x03)

Read holding register address	content	Subordinate aircraft	Size	Range	Unit	Note
0	on/off	all model	2Byte			0: Off;1: On
1	Island Protection Level	HPS/PCS /HPSTL	2Byte			Input ranges from 0 to 9, with 1 to 9 indicating a level
2	Grid management enable		2Byte			0: Disable;1: Enable
3	GFDI enable		2Byte			0: Disable;1: Enable
4	GFCI enable		2Byte			0: Disable;1: Enable
5	Insulation Impedance Test Enable	all model	2Byte			0: Disable;1: Enable
6	Factory reset enable		2Byte			0: Invalid;1: Valid
7	GFDI Grounding Selection	HPS/PCS /HPSTL	2Byte			0: Ungrounded;1: Grounded
8	Grid & PV Charge Together Enable		2Byte			0: Disable;1: Enable
9	Low voltage ride through enable		2Byte			0: Disable;1: Enable
10	Active power regulation enable		2Byte			0: Disable;1: Enable
11	Reactive power regulation enable		2Byte			0: Disable;1: Enable
12	Manual Adjustment Enable		2Byte			0: Disable;1: Enable
13	Bypass CabinetEnable (PCS) ATS Enable (HPS)		2Byte			0: Disable;1: Enable
14	BMS communication enable	all model	2Byte			0: Disable;1: Enable
15	Fuse protection enable	HPS/PCS /HPSTL	2Byte			0: Disable;1: Enable
16	Anti-reflux enable		2Byte			0: Disable;1: Enable
17	Generator enable		2Byte			0: Disable;1: Enable
18	CP enable	PCS	2Byte			0: Disable;1: Enable
19	PBD350Enable		2Byte			0: Disable;1: Enable
20	Minimum insulation impedance	all model	2Byte	100~20000	0.1KΩ	
21	Type setting		2Byte	0~8		See fig4.1.1
22	Safety regulation setting		2Byte	0~6		See fig4.2.1

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23	Communication StationSetting		2Byte	1~32		
24	Parallel Enable		2Byte			0: Disable;1: Enable
25	hardware version choice		2Byte	0~100		
26	Mode selection		2Byte			0: load First 1: Battery First 2. Economic mode 3: peak shaving 4: Time schedule 5: manual dispatching 6: battery protection 7: backup power management 8: constant power discharge 9: forced charging 10:Smart meter mode 11: Bat-SmartMeter 12: Grid Access Control(mode 12 non-standard)
27	Schneider contactor state	HPS	2Byte			0: off; 1: on (Schneider project: non-standard)
28	Grid state	HPS	2Byte			0: abnormal; 1: normal (Schneider project: non-standard)
29	Forced OnGrid to OffGrid switch enable	HPS/PCS	2Byte			0: Disable;1: Enable
30	Charging direction enable	PCS	2Byte			0: Discharge;1: Charge
31	PBD250Enable	PCS	2Byte			0: Disable;1: Enable
32	EMS enable	all model	2Byte			0: Disable;1: Enable
33	PV power setting		2Byte	0~500	1KW	
34	Inverter rectifier directionflag bit	HPS	2Byte			0: Invert;1: rectify
35	Inverter rectifier power setting		2Byte	0~500	1KW	
36	DC source mode enable	PCS	2Byte			0: Disable;1: Enable
37	Battery current calibration enable	all model	2Byte			0: Disable;1: Enable
38	Parallel RedundantNumber	HPS/PCS	2Byte	0/1		
39	Generator start	HPS/PCS	2Byte			0: Disable; 1: Enable

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	condition					(Namibia project nonstandard)
40	SOC_Start enale	HPS/PCS	2Byte			0: Disable; 1: Enable (Namibia project nonstandard)
41	Line voltage sampling enable	PCS	2Byte			0: Disable;1: Enable
42	System ID sign	All model	2Byte	1~100		0: single unit The minimum parallel judgment value is 1; Same value: parallel (data accumulation)
43	DTC (protocol)	all model	2Byte	22001~22006		(Only HPS) See Fig4.1.2
				22008~22021		HPSTLSee Fig4.1.2
				21016~21039		PCS See Fig4.1.2
				23001~23003		PBD See Fig4.1.2
44	grid power compensation	HPS/PCS	2Byte	0~100	0.1KW	
45	PBD parallel number setting	PCS	2Byte	0~100	1	
46	Generator power Upper Limit	HPS/PCS /HPSTL	2Byte	0~500	1KW	
47	Discharge cut-off SOC	HPS/PCS	2Byte	0~100	%	
48	Output voltage setting	HPS/PCS /HPSTL	2Byte	380/400	1V	
49	Output Frequency setting		2Byte	50/60	1Hz	
50	Maximum DC voltage (PV)	All mode	2Byte	2000~10000	0.1V	
51	Grid voltage upper limit	HPS/PCS /HPSTL	2Byte	1600~5500	0.1V	
52	Grid voltage lower limit		2Byte	1600~5500	0.1V	
53	Grid frequency upper limit		2Byte	4500~6500	0.01 Hz	
54	Grid frequency lower limit		2Byte	4500~6500	0.01 Hz	
55	AC output currentupper limit		2Byte	10~20000	0.1A	
56	Check Time	All model	2Byte	0~1000	1S	
57	Shadow voltage variation		2Byte	1~150	0.1V	
58	Output powerupper limit		2Byte	0~120	%	

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59	Output power seting		2Byte	0~500	KW	
60	Start Voltage		2Byte	3000~8500	0.1V	
61	MaxMPPT Voltage		2Byte	3000~15000	0.1V	
62	Min MPPT Voltage		2Byte	3000~15000	0.1V	
63	Start Power		2Byte	0~500	0.1kW	
64	Battery ChargeCurrent		2Byte	0~800	1A/0.1A	Large and small inverters use different units HPS / PCS / PBD: 1A String type HPSTL: 0.1A
65	Grid Power UP Limit	HPS/PCS /HPSTL	2Byte	0~500	1kW	
66	SOC Up Limit	All mode	2Byte	0~100	%	
67	SOC DownLimit		2Byte	0~100	%	
68	Output voltageUp Limit	PBD	2Byte	2000~10000	0.1V	
69	Output voltageDownLimit		2Byte	2000~10000	0.1V	
70	PV Current Up Limit		2Byte	0~500	A	
71	PV Inductor Current Up Limit		2Byte	0~500	A	
72	Output Inductor Curr Up Limit		2Byte	0~500	A	
73	Output currentUp Limit		2Byte	0~500	A	
74	Voltage reference	PCS/HPST L	2Byte	0~800	V	
75	BMSSOCUp Limit	HPSTL	2Byte	0~100	%	
76	BMSSOCDownLimit		2Byte	0~100	%	
77	Number of parallel machines	HPS/PCS	2Byte	0~255	1	
78	Input power seting	PCS	2Byte	0~800	1	
79	Frequency shift enable	PCS	2Byte	0~2	1	0: Disable;1: mode1; 2: mode2
80	PV voltage	All mode	2Byte	2000~10000	0.1V	Calibration
81	Battery voltage		2Byte	2000~10000	0.1V	Calibration
82	Battery current		2Byte	10~20000	0.1A	Calibration
83	PV current		2Byte	10~20000	0.1A	Calibration
84	Output voltage U		2Byte	1600~5500	0.1V	Calibration
85	Output voltage V		2Byte	1600~5500	0.1V	Calibration
86	Output voltage W		2Byte	1600~5500	0.1V	Calibration
87	Grid current U		2Byte	10~20000	0.1A	Calibration
88	Grid current V		2Byte	10~20000	0.1A	Calibration
89	Grid current W		2Byte	10~20000	0.1A	Calibration
90	Grid voltage UV		2Byte	1600~5500	0.1V	Calibration

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91	Grid voltage VW		2Byte	1600~5500	0.1V	Calibration
92	Grid voltage WU		2Byte	1600~5500	0.1V	Calibration
93	Load current U		2Byte	10~20000	0.1A	Calibration
94	Load current V		2Byte	10~20000	0.1A	Calibration
95	Load current W		2Byte	10~20000	0.1A	Calibration
99	Upper limit of battery voltage	HPS/PCS	2Byte	0~65535	0.001	Namibia: Nonstandard
100	Lower limit of battery voltage		2Byte	0~65535	0.001	
101	HPS/PCS upper temperature limit		2Byte	0~100	1℃	
102	HPS/PCS lower temperature limit		2Byte	0~100	1℃	
103	Upper limit of battery temperature		2Byte	0~100	1℃	
104	Lower limit of battery temperature		2Byte	0~100	1℃	
105						
106						
107	Load power upper limit		2Byte	0~500	1KW	
108	Lower limit of load power		2Byte	0~500	1KW	
109	time limit of Generatorstarting		2Byte	0~1000	1min	
110	Battery charging small current positive and negative bias flag	All mode	2Byte	0~1		0:positive 1: negative
111	Small current bias value of battery charging		2Byte	0~200	0.1A	
112	Battery discharging small current positive and negative bias flag		2Byte	0~1		0:positive 1: negative
113	Small current bias value of battery discharge		2Byte	0~200	0.1A	
114	Battery charging calibration LCD current 1		2Byte	0~8000	0.1A	
115	Battery charging calibration actual current 1		2Byte	0~8000	0.1 A	
116	Battery charging calibration LCD current		2Byte	0~8000	0.1 A	

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	2					
117	Battery charging calibration actual current 2		2Byte	0~8000	0.1 A	
118	CP nominal power setting		2Byte	0~1000	1KW	
119	Parallel Address		2Byte	0~255		
120	High byte: year		1Byte	0~99	Year	Date of delivery
	Low byte: month		1Byte	1~12	Month	Date of delivery
121	High byte: day		1Byte	1~31	Day	Date of delivery
122	Battery discharging calibration LCD current 1		2Byte	0~8000	0.1 A	
123	Battery discharging calibration actual current 1		2Byte	0~8000	0.1 A	
124	Battery discharging calibration LCD current 2		2Byte	0~8000	0.1 A	
125	Battery discharging calibration actual current 2		2Byte	0~8000	0.1 A	
126	Bypass Type setting	PCS	2Byte	0~100		Bypass30:1; Bypass50:2 Bypass120:3; Bypass150:4; Bypass250:5; Bypass500:6; Bypass630:7; Bypass1000:8;
127	Boot and App Burn selection	All mode	2Byte	0~1		0:Burn App;1:Burn Boot
128	Starting voltage differential	PBD	2Byte	0~200	1V	
129	DC soft start contactor enable	PCS	2Byte	0~1		0: Disable;1: Enable
130	High byte: year	All mode	1Byte	12~100	Year	System date time
	Low byte: month		1Byte	1~12	Month	System date time
131	High byte: day		1Byte	1~31	Day	System date time
	Low byte: hour		1Byte	0~23	Hour	System date time

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132	High byte: minute		1Byte	0~59	Minute	System date time
	Low byte: second		1Byte	0~59	Second	System date time
133	PV1Voltage	PBD	2Byte	2000~10000	0.1V	Calibration
134	PV2Voltage		2Byte	2000~10000	0.1V	Calibration
135	PV3Voltage		2Byte	2000~10000	0.1V	Calibration
136	PV4Voltage		2Byte	2000~10000	0.1V	Calibration
137	PV5Voltage		2Byte	2000~10000	0.1V	Calibration
138	PV1 current		2Byte	10~20000	0.1A	Calibration
139	PV2 current		2Byte	10~20000	0.1A	Calibration
140	PV3 current		2Byte	10~20000	0.1A	Calibration
141	PV4 current		2Byte	10~20000	0.1A	Calibration
142	PV5 current		2Byte	10~20000	0.1A	Calibration
143	OutVoltage		2Byte	2000~10000	0.1V	Calibration
144	Systembattery charging current positive and negative bias flag	PCS	2Byte	0~1		0:positive 1: negative
145	current bias value of battery charging		2Byte	0~200	0.1A	
146	Systembattery discharge current positive and negative bias flag		2Byte	0~1		0:positive 1: negative
147	Small current bias value of battery discharge		2Byte	0~200	0.1A	
148	Generator synchronized state	PCS	2Byte			0: unsynchronized ; 1:synchronized
149	Systembattery current calibration enable	PCS	2Byte			0: Disable; 1: Enable
150	Battery charging satuation	All mode	2Byte	0~10	1	
151	Battery group number		2Byte	0~100	1	
152	Battery unit number		2Byte	0~50000	1	
153	Battery capacity		2Byte	0~50000	1AH	
154	Charging current limit		2Byte	0~10000	0.1A	
155	Discharging current limit		2Byte	0~10000	0.1A	
156	Floate charging voltage		2Byte	0~50000	0.001V	For each cell
157	Low voltage Warning		2Byte	0~50000	0.001V	For each cell
158	Low voltage fault		2Byte	0~50000	0.001V	For each cell
159	High voltage fault		2Byte	0~50000	0.001V	For each cell
160	Battery start voltage		2Byte	0~50000	0.001V	For each cell
161	Single PV to off-grid		2Byte	0~50000	0.001V	For each cell

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162	Discharge cut-off voltage		2Byte	0~50000	0.001V	For each cell
163	Floate charge current limit point setting		2Byte	0~100	0.01V	For each cell
164	Command to Active / Deactive Droop Mode		2Byte			Namibia: Nonstandard
165	Frequency Offset		2Byte		0.01Hz	Namibia: Nonstandard
166	Active power droop slope		2Byte		0.1%	Namibia: Nonstandard
167	Voltage Offset		2Byte		0.1V	Namibia: Nonstandard
168	Reactive power droop slope		2Byte		0.1%	Namibia: Nonstandard
169	Upper limit power feed from grid	HPS/PCS /HPSTL	2Byte	0~500	1kW	
170	Generator not charge enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable
171	Charging pile enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable
172	Battery discharging current	HPS	2Byte		1A	
173	Peak period limit power enable	PCS	2Byte	0~1		
174	Battery power export to grid set	HPS/PCS	2Byte	0~150	1kW	Poland 5 HPS
175	Generator charging power up limit	HPS/PCS	2Byte		0.1kW	
176	BMS voltage judge enable	HPS/PCS	2Byte	0~1		SOC judge logic are not used after BMS voltage judge enable
177	DischargeRecoverSOC	HPS/PCS	2Byte	0~100		After entering discharge stopstate, recover discharge
178	Charging cut off SOC	HPS/PCS	2Byte	0~100		The battery are not needed to charge to 100% SOC in some programs
179	Grid charge SOC	HPS	2Byte			Freedomcustomization
180	Serial number 0 bit	All mode	1Byte	'0'~'9'; 'A'~'Z'		Serial number is 10 bit: ASCII address: 180
	Serial number 1 bit		1Byte	'0'~'9'; 'A'~'Z'		
181	Serial number 2 bit		1Byte	'0'~'9'; 'A'~'Z'		
	Serial number 3 bit		1Byte	'0'~'9';		

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				‘A’~‘Z’		
182	Serial number 4 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 5 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
183	Serial number 6 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 7 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
184	Serial number 8 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 9 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
185	Serial number 10 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 11 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
186	Generator switch	PCS	2Byte	0~1		0:disable 1:enable Non-standard
187	Reserve					
188	Reserve					
189	Reserve					
190	BUCK current loop Kp	HPS/PCS/H PSTL	2Byte	0~65535	0.001	PIDparameter
191	BUCK current loop Ki		2Byte	0~65535	0.0001	PIDparameter
192	BUCK voltage loop Kp		2Byte	0~65535	0.001	PIDparameter
193	BUCK voltage loop Ki		2Byte	0~65535	0.0001	PID parameter
194	Impulse load current loop Kp		2Byte	0~65535	0.001	PID parameter
195	Impulse load current loop Ki		2Byte	0~65535	0.0001	PID parameter
196	Impulse load voltage loop Kp		2Byte	0~65535	0.001	PID parameter
197	Impulse load voltage loop Ki		2Byte	0~65535	0.0001	PID parameter
198	Normal current loop Kp		2Byte	0~65535	0.001	PID parameter
199	Normal current loop Ki		2Byte	0~65535	0.0001	PID parameter
200	Normal voltage loop Kp		2Byte	0~65535	0.001	PID parameter
201	Normal voltage loop Ki		2Byte	0~65535	0.0001	PID parameter

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202	Back power set					
203	Frequence controlled power output enable					Non-standard
204	FCCD Enable	PCS	2Byte			Non-standard
205	CT ratio of meter	HPS	2Byte	0~65535		
206	AC OverVolt time(20ms)	HPS/PCS	2Byte			
207	Outputvoltage directly calibrated U	PCS	2Byte	1600~5500	0.1	
208	Outputvoltage directly calibrated V	PCS	2Byte	1600~5500	0.1	
209	Outputvoltage directly calibrated W	PCS	2Byte	1600~5500	0.1	
210	Bypass LoadCurr U	PCS	2Byte	0~65535	0.0001A	
211	Bypass LoadCurr V	PCS	2Byte	0~65535	0.0001A	
212	Bypass LoadCurr W	PCS	2Byte	0~65535	0.0001A	
213	Bypass GridCurr U	PCS	2Byte	0~65535	0.0001A	
214	Bypass GridCurr V	PCS	2Byte	0~65535	0.0001A	
215	Bypass GridCurr W	PCS	2Byte	0~65535	0.0001A	
216	Bypass GenCurr U	PCS	2Byte	0~65535	0.0001A	
217	Bypass GenCurr V	PCS	2Byte	0~65535	0.0001A	
218	Bypass GenCurr W	PCS	2Byte	0~65535	0.0001A	
219	Feedforward coefficient	PBD	2Byte	0~100	0.01	
220	Parallel address switching Enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable

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221	Meter communication station number		2Byte			
222	week	HPS/PCS	2Byte	0-7		system time
223	Bat to non-critical enable	HPS	2Byte	0~1		0: disable; 1: enable
224	Cut-offchargingpower	HPS/PCS	2Byte		0.1kw	
225	Gird chargingpower	HPS/PCS	2Byte		0.1kw	
226	Parallel signal test Enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable
227	Constant discharge current	HPS	2Byte			Non-standard
228	Grid charge enable	HPS	2Byte			Non-standard
229	Forced charge enable	HPS/PCS	2Byte			
230	SOC calibration set		2Byte			Keep two decimal places
231	SOH calibration set		2Byte			Keep two decimal places
232	Offline discharge cutoff SOC		2Byte			Non-standard
233	Offline discharge restore SOC		2Byte			Non-standard
234	DC contactor back check enable	PCS	2Byte			The default is 1
235	Bypass communication station number (PCS) ATS communication station number (HPS)	HPS/PCS	2Byte			
236	Bypass communication station number enable (PCS) , ATScommunication station number enable (HPS)		2Byte			
237	Bypass numbers (PCS) ATS numbers (HPS)	HPS/PCS	2Byte			

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238	Bypass shared enable (PCS) ATS shared enable (HPS)	HPS/PCS	2Byte			
239	Charging current limit	HPS	2Byte	0~10000	0.1A	from 154 to here(non-standard)
240	Discharge current limit	HPS	2Byte	0~10000	0.1A	from 155 to here(non-standard)
241	SOC Up Limit 1	HPS	2Byte	0~100	%	Non-standard
242	SOC DownLimit 1	HPS	2Byte	0~100	%	Non-standard
243	Fan opening temperature	HPS	2Byte	0~100	℃	Non-standard
244	Cell circulating voltage	HPS	2Byte	0~50000	0.001V	For each cell (non-standard)
245	CANb baud rate	PCS	2Byte	0~1000	1kbps	
246	485 Baud Rate(bps)	HPS /PCS	2Byte	0-65535	bps	
247	Current limiting period	HPS /PCS	2Byte	0-14		
248	Device type	HPS	2Byte	0-10		
249	Meter Com Switch Enable	HPS	2Byte	0~1		0: disable; 1: enable
250	Reactive power regulation mode selection	HPS/PCS/H PSTL	2Byte	1~3		U16_RegIq_Mode_Select
251	Power factor reference symbol		2Byte	0~1		U16_RegIq_PF_Sign
252	Power factor reference		2Byte	0~1000	0.001	U16_RegIq_PF_Ref
253	Power reference point 1		2Byte	0~100	%	U16_RegIq_PF_P1
254	Power reference point 2		2Byte	0~100	%	U16_RegIq_PF_P2
255	Power reference point 3		2Byte	0~100	%	U16_RegIq_PF_P3
256	Power reference point 4		2Byte	0~100	%	U16_RegIq_PF_P4
257	Power reference point 5		2Byte	0~100	%	U16_RegIq_PF_P5
258	Power factor reference point 1		2Byte	0~1000	0.001	U16_RegIq_PF_PF1
259	Power factor reference		2Byte	0~1000	0.001	U16_RegIq_PF_PF2

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	point 2					
260	Power factor reference point 3		2Byte	0~1000	0.001	U16_RegIq_PF_PF3
261	Power factor reference point 4		2Byte	0~1000	0.001	U16_RegIq_PF_PF4
262	Power factor reference point 5		2Byte	0~1000	0.001	U16_RegIq_PF_PF5
263	Reactive reference symbol		2Byte	0~1		U16_RegIq_Q_Ref_Sign
264	Reactive reference		2Byte	0~300	kVar	U16_RegIq_Q_Ref
265	EN50549Enable	HPS(EN-50549 certification)	2Byte	0~1		0: Disable;1: Enable
266	ReductionFactorEnable		2Byte	0~1		0: Disable;1: Enable
267	ReactiveLockEnable		2Byte	0~1		0: Disable;1: Enable
268	Overfrequency download mode		2Byte	0~2		0: Disable; 1:Mode1;2:Mode2
269	Underfrequency loading mode		2Byte	0~2		0: Disable; 1:Mode1;2:Mode2
270	ResponseTime		2Byte	0~1000	S	
271	Power Rising Speed		2Byte	0~1000	1%/min	
272	Power Down Speed		2Byte	0~1000	1%/min	
273	Overvoltage drop active Enable		2Byte	0/1		0: Disable;1: Enable
274	StartVoltageU3		2Byte	0~1000	1V	
275	EndVoltageU4		2Byte	0~1000	1V	
276	ParallelPhaseSynCompensationCoefficient	HPS/PCS	2Byte	0~1000		
277	ParallelPhaseSynIntegralCoefficient		2Byte	0~1000		
278	ActiveSagCoefficient		2Byte	0~1000		
279	ReactiveSagCoefficient		2Byte	0~1000		
280	Active power flow Kp		2Byte	0~10000		
281	Active power flow Ki		2Byte	0~10000		
282	Parallel synchronization phase difference limiting coefficient		2Byte	0~1000		
283	reserve					
284	ParallelCirculationCalibration Enable		2Byte	0/1		0: Disable;1: Enable
285	Start up condition					0: not allowed turn on 1: allowed turn on
286	Reactive power flow Kp	HPS/PCS	2Byte	0~10000		

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287	Reactive power flow Ki	HPS/PCS	2Byte	0~10000		
288	OnToOff CurrLoop Impact Kp1	PCS	2Byte	0~65535	0.001	
289	OnToOff CurrLoop Impact Ki1	PCS	2Byte	0~65535	0.0001	
290	OnToOff VoltLoop Impact Kp1	PCS	2Byte	0~65535	0.001	
291	OnToOff VoltLoop Impact Ki1	PCS	2Byte	0~65535	0.0001	
292	OnToOff CurrLoop Impact Kp2	PCS	2Byte	0~65535	0.001	
293	OnToOff CurrLoop Impact Ki2	PCS	2Byte	0~65535	0.0001	
294	OnToOff VoltLoop Impact Kp2	PCS	2Byte	0~65535	0.001	
295	OnToOff VoltLoop Impact Ki2	PCS	2Byte	0~65535	0.0001	
296	OnToOff CurrLoop Impact Kp3	PCS	2Byte	0~65535	0.001	
297	OnToOff CurrLoop Impact Ki3	PCS	2Byte	0~65535	0.0001	
298	OnToOff VoltLoop Impact Kp3	PCS	2Byte	0~65535	0.001	
299	OnToOff VoltLoop Impact Ki3	PCS	2Byte	0~65535	0.0001	
300~302: reserve						
303	inverter Rated power	HPSTL	2Byte	0~100	0.1Kw	
304	shinemaster Anti-refluxfailure power setting		2Byte	0~1000	0.1%	
305	shinemaster Anti-refluxfailure flag		2Byte			0: communication normal; 1: Communication failure;
306	shinemaster Anti-reflux enable		2Byte			0: Disable;1: Enable
307	shinemaster Anti-refluxfailure time		2Byte	1~5000	1S	
308	shinemaster Anti-reflux inverter power		2Byte	0~1000	0.1%	
309	Anti-overcharge Enable	HPS	2Byte	0-1		Non-standard parameter
310	Float discharge coefficient	HPS	2Byte	0~5000		Non-standard parameter

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311	Float discharge limit	HPS	2Byte	0~5000		Non-standard parameter
312	On grid load drop limit	HPS	2Byte	0~5000		Non-standard parameter
313	DCvolt diff fault value	PCS	2Byte	0-100		Go here from 187 (PCS1.1.25)
314	GEN start SOC	HPSTL	2Byte	0~100	%	
315	GEN stop SOC		2Byte	0~100	%	
316	ON-grid SOC	PCS	2Byte	0~100		
317	OFF-grid SOC	PCS	2Byte	0~100		
318	ON-grid cell voltage	PCS	2Byte	0~65535	0.001V	
319	OFF-grid cell voltage	PCS	2Byte	0~65535	0.001V	
320	Battery Discharge Power 1	HPSTL	2Byte	0~100	1Kw	The multi-stage charge and discharge mode is used to set the battery discharge power.
321	Battery Discharge Power 2		2Byte	0~100	1Kw	
322	Battery Discharge Power 3		2Byte	0~100	1Kw	
323	Battery Discharge Power 4		2Byte	0~100	1Kw	
324	Battery Discharge Power 5		2Byte	0~100	1Kw	
325	Battery cell voltage setting 1		2Byte	0~65535	0.001V	The multi-stage charge and discharge mode is used to set the battery cell voltage.
326	Battery cell voltage setting 2		2Byte	0~65535	0.001V	
327	Battery cell voltage setting 3		2Byte	0~65535	0.001V	
328	Battery Cell Voltage 4		2Byte	0~65535	0.001V	
329	Battery Cell Voltage 5		2Byte	0~65535	0.001V	
330	Battery SOC 1		2Byte	0~100	%	The multi-stage charge and discharge mode is used to set the battery target SOC.
331	Battery SOC 2		2Byte	0~100	%	
332	Battery SOC 3		2Byte	0~100	%	
333	Battery SOC 4		2Byte	0~100	%	
334	Battery SOC 5		2Byte	0~100	%	
335	Charge Cutoff Voltage	HPSTL	2Byte		0.001V	
336	Discharge Recovery Voltage	HPSTL	2Byte		0.001V	

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337	Full anti-countercurrent enable	HPS/PCS	2Byte			0: disable; 1: enable
338	Bypass_CANA Baud (PCS) ATS_CANA Baud (HPS)	HPS/PCS	2Byte	5~1000K		
339	Inverter 485 address	HPS/PCS	2Byte			
340	grid charge cutoff SOC	HPS/PCS	2Byte	0-100	%	
341	grid charge cutoff voltage	HPS/PCS	2Byte	0~10000	0.001V	
342	Dc main contactor detection enabled	HPS	2Byte	0~1		0: disable; 1: enable
343	Read fault records enable	HPS/PCS	2Byte	0-1		0: Failure logs are not read; 1: Reading the failure log
344	Read the start position of the fault record	HPS/PCS	2Byte	1-200		
345	Read the end position of the fault record	HPS/PCS	2Byte	1-500		
346~379: reserve						
380	Power point 1 of low voltage passing through	HPS/PCS/H PSTL	2Byte	0~100	%	U16_LVRT_Volt_P1
381	Power point 2 of low voltage passing through		2Byte	0~100	%	U16_LVRT_Volt_P2
382	Power point 3 of low voltage passing through		2Byte	0~100	%	U16_LVRT_Volt_P3
383	Power point 4 of low voltage passing through		2Byte	0~100	%	U16_LVRT_Volt_P4
384	Power point 1 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Time_P1

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385	Power point 2 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Time_P2
386	Power point 3 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Time_P3
387	Power point 4 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Volt_P4
388	Sequence number 0 bits	Bypass/ATS	1Byte	‘0’~‘9’; ‘A’~‘Z’		The serial number is 10 bits ASIIC Base address: 388
	Sequence number 1 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
389	Sequence number 2 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Sequence number 3 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
390	Sequence number 4 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Sequence number 5 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
391	Sequence number 6 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Sequence number 7 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
392	Sequence number 8 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Sequence number 9 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
393	Sequence number 10 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Sequence number 11 bits		1Byte	‘0’~‘9’; ‘A’~‘Z’		
388~499: reserve						
500	RegIdByFreq_StepPer Hz	HPS/PCS/H PSTL	2Byte	0~1000	0.01	
501	RegIdByFreq Freq S	HPS/PCS/H	2Byte	4500~5500	0.01	

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	tart	PSTL				
502	RegIdByFreq_Freq_R ecover	HPS/PCS/H PSTL	2Byte	4500~5500	0.01	
503~619: reserve						
620	LVRT_Factor_K	HPS/PCS/H PSTL	2Byte	0~100		
621	LVRT_U0	HPS/PCS/H PSTL	2Byte	0~100		
622~749: reserve						
750.	GridVolt_High_Limit	HPS/PCS/H PSTL	2Byte			
751.	GridVolt_High_Back		2Byte			
752.	GridVolt_High_SetTi me		2Byte	1~60000		
753.	GridVolt_High_Clear Time		2Byte	1~60000		
754.	GridVolt_Low_Limit		2Byte			
755.	GridVolt_Low_Back		2Byte			
756.	GridVolt_Low_SetTi me		2Byte	1~60000		
757.	GridVolt_Low_ClearT ime		2Byte	1~60000		
758.	GridFreq_High_Limit		2Byte			
759.	GridFreq_High_Back		2Byte			
760.	GridFreq_High_SetTi me		2Byte	1~60000		
761.	GridFreq_High_Clear Time		2Byte	1~60000		
762.	GridFreq_Low_Limit		2Byte			
763.	GridFreq_Low_Back		2Byte			
764.	GridFreq_Low_SetTi me		2Byte	1~60000		
765.	GridFreq_Low_Clear Time		2Byte	1~60000		
766	Peak set power1	All mode	2Byte	1~500	1kw	Multistage power setting
767	Peak set power2		2Byte	1~500	1kw	Multistage power setting
768	Peak set power3		2Byte	1~500	1kw	Multistage power setting
769	Peak set power4		2Byte	1~500	1kw	Multistage power setting
770	Peak set power5		2Byte	1~500	1kw	Multistage power setting
771	Valley set power 1		2Byte	1~500	1kw	Multistage power setting
772	Valley set power 2		2Byte	1~500	1kw	Multistage power setting
773	Valley set power 3		2Byte	1~500	1kw	Multistage power setting
774	Valley set power 4		2Byte	1~500	1kw	Multistage power setting

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775	Valley set power 5		2Byte	1~500	1kw	Multistage power setting
776	Power set in normal period1		2Byte	1~500	1kw	Multistage power setting
777	Power set in normal period2		2Byte	1~500	1kw	Multistage power setting
778	Power set in normal period3		2Byte	1~500	1kw	Multistage power setting
779	Power set in normal period4		2Byte	1~500	1kw	Multistage power setting
780	Power set in normal period5		2Byte	1~500	1kw	Multistage power setting
781~799: reserved						
800	Peak time 1 high byte: Hour	all model	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
801	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
802	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
803	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
804	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
805	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
806	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
807	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time

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	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
808	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
809	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
810	Valley time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
811	Valley time1 High byte: Hour	all model	1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
812	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
813	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
814	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
815	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
816	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
817	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time

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818	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
819	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
820	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
821	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
822	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
823	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
824	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
825	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
826	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
827	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
828	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
829	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Set the time of off-season and peak season						
830	Off-season 1 high byte: month	PCS/HPS	1Byte	0~12	Month	Strat time
	Off-season 1 low byte: day		1Byte	0~31	Day	Strat time
831	Off-season 1 high byte: month		1Byte	0~12	Month	End time
	Off-season 1 low byte: day		1Byte	0~31	Day	End time
832	Off-season 2 high byte: month		1Byte	0~12	Month	Strat time
	Off-season 2 low byte: day		1Byte	0~31	Day	Strat time
833	Off-season 2 high byte: month		1Byte	0~12	Month	End time
	Off-season 2 low byte: day		1Byte	0~31	Day	End time
834	Off-season 3 high byte: month		1Byte	0~12	Month	Strat time
	Off-season 3low byte: day		1Byte	0~31	Day	Strat time
835	Off-season 3 high byte: month		1Byte	0~12	Month	End time
	Off-season 3low byte: day		1Byte	0~31	Day	End time
836	Off-season 4 high byte: month		1Byte	0~12	Month	Strat time
	Off-season 4 low byte: day		1Byte	0~31	Day	Strat time
837	Off-season 4 high byte: month		1Byte	0~12	Month	End time
	Off-season 4 low byte: day		1Byte	0~31	Day	End time
838	Peak season 1 high byte: month	PCS/HPS	1Byte	0~12	Month	Strat time

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	Peak season 1 low byte: day		1Byte	0~31	Day	Strat time
839	Peak season 1 high byte: month		1Byte	0~12	Month	End time
	Peak season 1 low byte: day		1Byte	0~31	Day	End time
840	Peak season 2 high byte: month		1Byte	0~12	Month	Strat time
	Peak season 2 low byte: day		1Byte	0~31	Day	Strat time
841	Peak season 2 high byte: month		1Byte	0~12	Month	End time
	Peak season 2 low byte: day		1Byte	0~31	Day	End time
842	Peak season 3 high byte: month		1Byte	0~12	Month	Strat time
	Peak season 3 low byte: day		1Byte	0~31	Day	Strat time
843	Peak season 3 high byte: month		1Byte	0~12	Month	End time
	Peak season 3 low byte: day		1Byte	0~31	Day	End time
844	Peak season 4 high byte: month		1Byte	0~12	Month	Strat time
	Peak season 4 low byte: day		1Byte	0~31	Day	Strat time
845	Peak season 4 high byte: month		1Byte	0~12	Month	End time
	Peak season 4 low byte: day		1Byte	0~31	Day	End time
Off-season working day:						
846	Peak time 1 high byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
847	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
848	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Peak time2 Low byte: Minute	PCS/HPS	1Byte	0~59	Minute	Strat time
849	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
850	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
851	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
852	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
853	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
854	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
855	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
856	Valley time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
857	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
858	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time

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859	Valley time2 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
860	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
861	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
862	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
863	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
864	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
865	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
866	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
867	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
868	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
869	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time

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	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
870	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
871	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
872	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
873	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
874	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
875	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Off-season Saturday time						
876	Peak time 1 high byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
877	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
878	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
879	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time

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	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
880	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
881	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
882	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
883	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
884	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
885	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
886	Valley time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
887	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
888	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
889	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time

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890	Valley time3 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
891	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
892	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
893	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
894	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
895	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
896	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
897	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
898	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
899	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
900	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
901	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
902	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
903	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
904	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
905	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Off-season Sunday time						
906	Peak time 1 high byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
907	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
908	Peak time2 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
909	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
910	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
911	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
912	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
913	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
914	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
915	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
916	Valley time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
917	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
918	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
919	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
920	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time

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921	Valley time3 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
922	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
923	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
924	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
925	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
926	Normal time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
927	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
928	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
929	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
930	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
931	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time

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	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
932	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
933	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
934	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
935	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Peak season working day:						
936	Peak time 1 high byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
937	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
938	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
939	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
940	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
941	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time

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	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
942	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
943	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
944	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
945	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
946	Valley time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
947	Valley time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
948	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
949	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
950	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
951	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time

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952	Valley time4 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
953	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
954	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
955	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
956	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
957	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
958	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
959	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
960	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
961	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
962	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
963	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
964	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
965	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Peak-season Saturday time						
966	Peak time 1 high byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
967	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
968	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
969	Peak time2 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
970	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
971	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
972	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
973	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
974	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
975	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
976	Valley time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
977	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
978	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
979	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
980	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
981	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
982	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time

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983	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
984	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
985	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
986	Normal time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
987	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
988	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
989	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
990	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
991	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
992	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
993	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time

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	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
994	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
995	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Peak-season Sunday time						
996	Peak time 1 high byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
997	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
998	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
999	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
1000	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
1001	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
1002	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
1003	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time

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	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
1004	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
1005	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
1006	Valley time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
1007	Valley time1 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
1008	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
1009	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
1010	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
1011	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
1012	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
1013	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time

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1014	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
1015	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
1016	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
1017	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
1018	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
1019	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
1020	Normal time3 High byte: Hour	PCS/HPS	1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
1021	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
1022	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
1023	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
1024	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
1025	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
1026						

4、Input register（Function code: 0x04）

Input register address	Name	Subordinate aircraft	Size	Range	Unit	Note
0	PV1 Voltage	all model (Except PCS)	2Byte	-15000~15000	0.1V	PCS50TL
1	Battery voltage	all model	2Byte	-9999~9999	0.1V	PCS50TL
2	Battery current		2Byte	-9999~9999	0.1A	PCS50TL
3	PV1 DC current	all model (Except PCS)	2Byte	-9999~9999	0.1A	PCS50TL
4	Output voltage UV	HPS/PCS /HPSTL	2Byte	0~9999	0.1V	PCS50TL
5	Output voltage VW		2Byte	0~9999	0.1V	PCS50TL
6	Output voltage WU		2Byte	0~9999	0.1V	PCS50TL
7	Bypass currentU		2Byte	0~65535	0.1A	PCS50TL
8	Bypass currentV		2Byte	0~65535	0.1A	PCS50TL
9	Bypass currentW		2Byte	0~65535	0.1A	PCS50TL
10	inductance1currentA		2Byte	0~65535	0.1A	PCS50TL
11	inductance1currentB		2Byte	0~65535	0.1A	PCS50TL
12	inductance1currentC		2Byte	0~65535	0.1A	PCS50TL
13	Grid bypass voltageUV		2Byte	0~65535	0.1V	PCS50TL
14	Grid bypass voltageVW		2Byte	0~65535	0.1V	PCS50TL
15	Grid bypass voltageWU		2Byte	0~65535	0.1V	PCS50TL
16	Output frequency		2Byte	0~9999	0.01Hz	
17	Battery power	all model	2Byte	-9999~9999	0.1kW	
18	Bypass apparent power	HPS/PCS	2Byte	0~9999	0.1kVA	

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19	Bypass active power	S /HPSTL	2Byte	-9999~9999	0.1kW	
20	Bypass reactive power		2Byte	-9999~9999	0.1kVar	
21	Grid frequency		2Byte	0~9999	0.01Hz	
22	Power factor symbol (screen none)		2Byte	0~1		
23	Power factor		2Byte	0~1000	0.001	
24	Battery daily discharge capacity	all model	2Byte	0~65535	0.1KWh	
25	Battery daily discharge time		2Byte	0~65535	0.1Min	
26	Battery daily charge capacity		2Byte	0~65535	0.1KWh	
27	Battery daily charge time		2Byte	0~65535	0.1Min	
28	PV2 insulation test positive	HPSTL	2Byte	0~65535	0.1KΩ	
29	PV2 insulation test negative		2Byte	0~65535	0.1KΩ	
30	Temperature of heat sink of converter	HPS/PC S /HPSTL	2Byte	-999~999	0.1℃	
31	Buck fin temperature	HPS/PC S	2Byte	-999~999	0.1℃	
32	Inductance temperature of converter		2Byte	-999~999	0.1℃	
33	Buck inductance temperature		2Byte	-999~999	0.1℃	
34	Temperature of DC radiator	HPSTL	2Byte	-999~999	0.1℃	
35	Transformer temperature	HPS/PC S	2Byte	-999~999	0.1℃	
36	Ambient temperature	all model	2Byte	-999~999	0.1℃	
37	Balance plate current	HPSTL	2Byte	-999~999	0.1A	
38	PV1 positive insulation impedance	all model (Except PCS)	2Byte	0~65535	0.1KΩ	
39	PV1 negative insulation impedance		2Byte	0~65535	0.1KΩ	
40	Battery positive insulation impedance	HPS/PC S /PBD25 0/PBD3 50	2Byte	0~65535	0.1KΩ	
41	Battery negative insulation impedance		2Byte	0~65535	0.1KΩ	
42	GFDI1 Leakage current	HP S /PCS	2Byte	0~65535	0.1A	
43	GFDI2 Leakage current		2Byte	0~65535	0.1A	

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44	Efficiency	HPSTL	2Byte	0~1000	0.1%	
45	Post time	all model	2Byte	0~1000	S	
46	Unit battery voltage		2Byte	0~65535	0.001V	
47	Battery percentage		2Byte	0~100	1%	
48	Apparent power of load	HPS/PC	2Byte	0~9999	0.1kVA	
49	Load active power	S	2Byte	0~9999	0.1kW	
50	Load reactive power	/HPSTL	2Byte	-9999~9999	0.1kVar	
51	PV1 power	all model (Except PCS)	2Byte	0~9999	0.1kW	
52	Load power factor	HPS/PC S /HPSTL	2Byte	0~1000	0.001	
53	Load current A		2Byte	-9999~9999	0.1A	
54	Load current B		2Byte	-9999~9999	0.1A	
55	Load current C		2Byte	-9999~9999	0.1A	
56	Output voltage U	HPS/PC S	2Byte	0~9999	0.1V	
57	Output voltage V		2Byte	0~9999	0.1V	
58	Output voltage W		2Byte	0~9999	0.1V	
59	Busbar voltage	HPSTL/ PBD250 /PBD350 /PCS	2Byte	-9999~9999	0.1V	
60	Busbar voltage positive	HPSTL/ PCS	2Byte	-9999~9999	0.1V	
61	Busbar voltage negative		2Byte	-9999~9999	0.1V	
62	PV daily power generation	all model (Except PCS)	2Byte	0~65535	0.1KWh	
63	PV daily power generation time		2Byte	0~65535	0.1Min	
64	PV total power generation High		2Byte	0~999999999	0.1kWh	
65	PV total power generation Low		2Byte			
66	PV total power generation time High		2Byte	0~999999999	0.1h	
67	PV total power generation time Low		2Byte			
68	Total discharge capacity of battery High	all model	2Byte	0~999999999	0.1kWh	
69	Total discharge capacity of battery Low		2Byte			

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70	Total battery discharge time High		2Byte	0~999999999	0.1h	
71	Total battery discharge time Low		2Byte			
72	Total charge capacity of battery High		2Byte	0~999999999	0.1kWh	
73	Total charge capacity of battery Low		2Byte			
74	Total battery charge time High		2Byte	0~999999999	0.1h	
75	Total battery charge time Low		2Byte			
76	PV1 inductance current	all model (Except PCS)	2Byte	-9999~9999	0.1A	
77	PV2 inductance current	HPSTL/ PBD250 /PBD35 0	2Byte	-9999~9999	0.1A	
78	Output apparent power	PCS	2Byte	0~9999	0.1kVA	
79	Output active power		2Byte	0~9999	0.1kW	
80	Output reactive power		2Byte	-9999~9999	0.1kVar	
81	Bypass frequency	HPS/PCS	2Byte	0~9999	0.01Hz	
82	Daily power consumption of load	HPS/PCS /HPSTL	2Byte	0~65535	0.1KWh	
83	Daily power time of load		2Byte	0~65535	0.1Min	
84	Total load consumption High		2Byte	0~999999999	0.1KWh	
85	Total load consumption Low		2Byte			
86	Total power consumption time of load High		2Byte	0~999999999	0.1h	
87	Total power consumption time of load Low		2Byte			
88	Daily power intake from grid		2Byte	0~65535	0.1KWh	
89	Daily power intake time from grid		2Byte	0~65535	0.1Min	
90	Total power intake from grid High		2Byte	0~999999999	0.1KWh	

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91	Total power intake from grid Low		2Byte			
92	Total power intake time from grid High		2Byte	0~999999999	0.1h	
93	Total power intake time from grid Low		2Byte			
94	Daily power fed to grid		2Byte	0~65535	0.1KWh	
95	Daily power fed to grid time		2Byte	0~65535	0.1Min	
96	Total power fed to grid High		2Byte	0~999999999	0.1KWh	
97	Total power fed to grid Low		2Byte			
98	Total power fed to grid time High		2Byte	0~999999999	0.1h	
99	Total power fed to grid time Low		2Byte			
100	BMS Max.Charge current	all model	2Byte	0~65535	0.1A	Battery parameter
101	BMSMax.Discharge current		2Byte	0~65535	0.1A	
102	Invert Phase voltage U	HPSTL	2Byte	0~9999	0.1V	
103	Invert Phase voltage V		2Byte	0~9999	0.1V	
104	Invert Phase voltage W		2Byte	0~9999	0.1V	
105	PV2 voltage	HPSTL/ PBD250 /PBD35 0	2Byte	-15000~15000	0.1V	
106	PV2 DC current		2Byte	-9999~9999	0.1A	
107	PV2 power		2Byte	-9999~9999	0.1KW	
108	PV total power		2Byte	-9999~9999	0.1KW	
109	Output voltage	PBD250 /PBD35 0	2Byte	-9999~9999	0.1V	
110	Output current		2Byte	-9999~9999	0.1A	
111	Output inductance1current		2Byte	-9999~9999	0.1A	
112	Output inductance2current		2Byte	-9999~9999	0.1A	
113	Output power		2Byte	-9999~9999	0.1KW	
114	PV Module temperature		2Byte	-999~999	0.1℃	
115	OUT Module temperature		2Byte	-999~999	0.1℃	
116	PV inductance temperature		2Byte	-999~999	0.1℃	
117	OUT inductance temperature		2Byte	-999~999	0.1℃	
118	Bus positive insulation impedance		2Byte	0~65535	0.1KΩ	
119	Bus negative insulation impedance		2Byte	0~65535	0.1KΩ	
120	Output daily discharge		2Byte	0~6000	0.1KWh	
121	Output total discharge High		2Byte	0~999999999	0.1kWh	
122	Output total discharge Low		2Byte			

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123	PV3 voltage		2Byte	-15000~15000	0.1V	
124	PV4 voltage		2Byte	-15000~15000	0.1V	
125	PV5 voltage		2Byte	-15000~15000	0.1V	
126	PV3 DC current		2Byte	-9999~9999	0.1A	
127	PV4 DC current		2Byte	-9999~9999	0.1A	
128	PV5 DC current		2Byte	-9999~9999	0.1A	
129	PV3inductancecurrent		2Byte	-9999~9999	0.1A	
130	PV4inductancecurrent		2Byte	-9999~9999	0.1A	
131	PV5 inductance current		2Byte	-9999~9999	0.1A	
132	PV3 power		2Byte	-9999~9999	0.1KW	
133	PV4 power		2Byte	-9999~9999	0.1KW	
134	PV5 power		2Byte	-9999~9999	0.1KW	
135	Output currentU	PCS	2Byte	-9999~9999	0.1A	
136	Output currentV		2Byte	-9999~9999	0.1A	
137	Output currentW		2Byte	-9999~9999	0.1A	
138	Battery inductance current	HPSTL	2Byte	-9999~9999	0.1A	
139	BMS Status display	HPSTL	2Byte	0/4/5		
140	SCR temperature	HPS	2Byte	-999~999	0.1℃	
141	BAT charge and discharge cycles	HPSTL	2Byte	0~9999	1	
142	Bat full load discharge time	HPSTL	2Byte	0~9999	0.1	
143	judgement symbol of parallel operation	All Model	2Byte	0~100	1	Same value: parallel Different value: single
144	Battery inductance cuuent 1	PCS50T L	2Byte	-9999~9999	0.1A	
145	Battery inductance cuuent 2		2Byte	-9999~9999	0.1A	
146	Busbar current		2Byte	-9999~9999	0.1A	
147	BAT mode temperature		2Byte	-999~999	0.1℃	
148	balance board mode temperature		2Byte	-999~999	0.1℃	
149	SCR state	HPS	2Byte			0: off; 1: on(Schneider project: non-standard)
150	PCS battery charging power	PBD	2Byte	-9999~9999	0.1KW	
151	PCS output power		2Byte	-9999~9999	0.1KW	
152	PBD output power	PCS	2Byte	-9999~9999	0.1KW	
153	HPS Charge power limit	HPSTL	2Byte	-9999~9999	0.1KW	
154	CP current U	PCS	2Byte	-9999~9999	0.1A	
155	CP current V		2Byte	-9999~9999	0.1A	
156	CP current W		2Byte	-9999~9999	0.1A	
157	CP active power		2Byte	-9999~9999	0.1KW	
158	INV active power	All	2Byte	-9999~9999	0.1KW	
159	INV reactive power	model	2Byte	-9999~9999	0.1KW	

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160	INV apparent power		2Byte	-9999~9999	0.1KW	
161	Bypass Type setting	HPS/PCS	2Byte	0~100		Bypass30:1; Bypass50:2 Bypass120:3; Bypass150:4; Bypass250:5; Bypass500:6; Bypass630:7; Bypass1000:8;
162	system battery current	PCS	2Byte	-9999~9999	0.1A	
163	dry contact state	PCS	2Byte			0: off; 1: on (non-standard)
164	BMS total voltage	all model	2Byte	-9999~9999	0.1V	
165	BMS total current		2Byte	-9999~9999	0.1A	
166	SOH		2Byte	0~99	1	
167	BMS maximum temperature group number		1Byte	1~255	1	
	BMS minimum temperature group number		1Byte	1~255		
168	Maximum voltage Group No. of BMS		1Byte	0~99	1	
	BMS minimum voltage group number		1Byte	0~99		
169	BMS high voltage relay status		2Byte	0~99	1	
170	Max. temperature box no. of BMS		1Byte	1~255	1	
	BMS minimum temperature box No		1Byte	1~255	1	
171	BMS maximum temperature		1Byte	-128~127	℃	
	BMS minimum temperature		1Byte	-128~127	℃	
172	BMS unit minimum voltage number		1Byte	1~255		
	BMS unit minimum voltage box No		1Byte	1~255		
173	Maximum voltage number of BMS unit		1Byte	1~255		
	Maximum voltage box no. of BMS		1Byte	1~255		
174	Maximum unit voltage		2Byte	0~65535	0.001V	
175	Minimum cell voltage		2Byte	0~65535	0.001V	
176	BMS battery status		1Byte	1~255	By numerical value	0: Hold 1: Charging and discharging disable 2: Charging disable 3:

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						Discharging disable 4: Charging 5: Discharging
	BMS system status		1Byte	1~255	Bitwise	Fig1.1.1
177	BMS level I alarm		2Byte		Bitwise	Fig1.1.2
178	BMS level II alarm		2Byte		Bitwise	Fig1.1.2
179	BMS level III Protection		2Byte		Bitwise	Fig1.1.3
180	Running state	HPS/PCS	2Byte	value		See Fig4.3.1
181	Fault alarm bit information1		2Byte	16bit, Low byte first		See Fig4.3.2
182	Fault alarm bit information2		2Byte	16bit, Low byte first		See Fig4.3.3
183	Fault alarm bit information3	HPS/PCS	2Byte	16bit, Low byte first		See Fig4.3.4
184	Fault alarm bit information4		2Byte	16bit, Low byte first		See Fig4.3.5
185	Fault alarm bit information5		2Byte	16bit, Low byte first		See Fig4.3.6
186	Fault alarm bit information6		2Byte	16bit, Low byte first		See Fig4.3.7
187	Fault alarm bit information7		2Byte	16bit, Low byte first		See Fig4.3.8
188	Fault alarm bit information8		2Byte	16bit, Low byte first		See Fig4.3.9
189	Reserved alarm		2Byte			Fixed data
190	running state		2Byte	Bitwise		See Fig4.3.10
191	BMS battery status		2Byte	1~255	By numerical value	0: Hold 1: Charging and discharging disable 2: Charging disable 3: Discharging disable 4: Charging 5: Discharging
192	Operation mode		2Byte	By numerical value		0: Peak 1: flat 2: Valley 3: DG 4: Battery First 5: load First6: peak shaving 7: Time schedule 8: EMS mode 9: DC source mode 10: manual dispatching11:battery protection 12: backup power management13PCS dispatching14Forced charging mode 15:Smart meter mode 16: Bat-SmartMeter17: Grid Access Control(mode 17

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						non-standard)
193	running state	HPSTL	2Byte	value		See Fig5.3.1
194	Fault alarm bit information1		2Byte	16bit, Low byte first		See Fig5.3.2
195	Fault alarm bit information2	HPSTL	2Byte	16bit, Low byte first		See Fig5.3.3
196	Fault alarm bit information3		2Byte	16bit, Low byte first		See Fig5.3.4
197	Fault alarm bit information4		2Byte	16bit, Low byte first		See Fig5.3.5
198	Fault alarm bit information5		2Byte	16bit, Low byte first		See Fig5.3.6
199	Fault alarm bit information6		2Byte	16bit, Low byte first		See Fig5.3.7
200	Fault alarm bit information7		2Byte	16bit, Low byte first		See Fig5.3.8
201	Fault alarm bit information8		2Byte	16bit, Low byte first		See Fig5.3.9
202	Reserved alarm		2Byte			Fixed data0
203	running state		2Byte	Bitwise		See Fig5.3.10
204	Reserved		2Byte			
205	Operation mode		2Byte	By numerical value		0: peak 1: fair 2: Valley 3: DG 4: Battery First 5: load First 6: Peak shaving 7: Time schedule 8: EMS mode 9: DC source mode 10: manual dispatching 11: battery protection 12: backup power management 13: constant power discharge 14: forced charge mode
206	running state	PBD	2Byte	value		See Fig6.3.1
207	Fault alarm bit information1		2Byte	16bit, Low byte first		See Fig6.3.2
208	Fault alarm bit information2		2Byte	16bit, Low byte first		See Fig6.3.3
209	Fault alarm bit information3		2Byte	16bit, Low byte first		See Fig6.3.4
210	Fault alarm bit information4		2Byte	16bit, Low byte first		See Fig6.3.5
211	Fault alarm bit information5		2Byte	16bit, Low byte first		See Fig6.3.6
212	Fault alarm bit information6		2Byte	16bit, Low byte		See Fig6.3.7

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				first		
213	running state		2Byte	Bitwise		See Fig6.3.10
214	Reserved		2Byte			
215	Operation mode		2Byte	By numerical value		0: Normal 1: EMSmode
216	DG currentU	HPS/PCS	2Byte	0~65535	0.1A	
217	DG currentV	HPS/PCS	2Byte	0~65535	0.1A	
218	DG currentW	HPS/PCS	2Byte	0~65535	0.1A	
219	DG apparent power	HPS/PCS	2Byte	0~9999	0.1kVA	
220	DG active power	HPS/PCS	2Byte	0~9999	0.1kW	
221	DG reactive power	HPS/PCS	2Byte	-9999~9999	0.1kVar	
222	Daily power intake from DG	HPS/PCS	2Byte	0~65535	0.1KWh	
223	Daily power intake time from DG	HPS/PCS	2Byte	0~65535	0.1Min	
224	Total power intake from DG High	HPS/PCS	2Byte	0~999999999	0.1KWh	
225	Total power intake from DG Low	HPS/PCS	2Byte			
226	Total power intake time from DG High	HPS/PCS	2Byte	0~999999999	0.1h	
227	Total power intake time from DG Low	HPS/PCS	2Byte			
228	System battery power	PCS	2Byte	-9999~9999	0.1KW	
229	CP power limit	PCS	2Byte	-9999~9999	0.1KW	
230	Max charge power	PCS	2Byte	-9999~9999	0.1KW	
231	Max discharge power	PCS	2Byte	-9999~9999	0.1KW	
232	Charging pile max power	PCS	2Byte	-9999~9999	0.1KW	
233	Diesel generator demand power	HPS	2Byte	-9999~9999	0.1KW	
234	HPS start request					0: no request 1: request start
235	Bypass communication number	HPS/PCS	2Byte	-9999~9999		
236	Insulation detection positive	Hps40ktl	2Byte	0~65535	0.1KΩ	
237	Insulation detection negative	Hps40ktl	2Byte	0~65535	0.1KΩ	
238	GEN voltage U	HPSTL	2Byte	0~65535	0.1V	HPSTLS-8K

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239	Non-critical Load Power	HPS	2Byte	0~65535	0.1KW	
240	Daily power generation of grid connected inverter	PCS	2Byte	0~65535	0.1kW.h	
241	Total power generation of grid connected inverter Highbit		2Byte	0~999999999	0.1kW.h	
242	Total power generation of grid connected inverter Lowbit		2Byte	0~999999999	0.1kW.h	
243	Daily Energy From Meter	HPS	2Byte	0~65535	0.1kW.h	
244	Total Energy From MeterHighbit	HPS	2Byte	0~999999999	0.1kW.h	
245	Total Energy From MeterLowbit	HPS	2Byte			
246	Daily Energy To Meter	HPS	2Byte	0~65535	0.1kW.h	
247	Total Energy To MeterHighbit	HPS	2Byte	0~999999999	0.1 kW.h	
248	Total Energy To MeterLowbit	HPS	2Byte			
249	Meter Power	HPS	2Byte	-9999~9999	0.1KW	
250	ATS/Bypass	HPS/PCS	2Byte	0-1	1	0 nothing; 1 have
251	DG grid select		2Byte	0-2	1	0 nothing; 1 grid; 2DG
252	DG/ gridpower		2Byte	-9999~9999	0.1KW	Display 251 select power
253	MASTER_SLAVE Switching Signal	HPS/PCS	2Byte	0~99	1	
254	Parallel PLL Signal	HPS/PCS	2Byte	0~99	1	
255	Parallel Switch Signal	HPS/PCS	2Byte	0~99	1	
256	Bypass CANA Baud rate (PCS) ATS CANA Baud rate (HPS)	HPS/PCS	2Byte	0~1000	1	
257	Rectifier power	PCS	2Byte	-9999~9999	0.1KW	
258	Rectifier Demand power	PCS	2Byte	-9999~9999	0.1KW	
259~269: reserved						
270	Hardware version 0 bit	All mode	1Byte	‘,’; ‘,’; ‘-’; ‘,’; ‘0’~‘9’; ‘A’~‘Z’		Hardware version20bit ASIIC Base address: 270
	Hardware version 1 bit		1Byte			
271	Hardware version 2 bit		1Byte			
	Hardware version 3 bit		1Byte			
272	Hardware version 4 bit		1Byte			
	Hardware version 5 bit		1Byte			

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273	Hardware version 6 bit		1Byte			
	Hardware version 7 bit		1Byte			
274	Hardware version 8 bit		1Byte			
	Hardware version 9 bit		1Byte			
275	Hardware version 10 bit		1Byte			
	Hardware version 11 bit		1Byte			
276	Hardware version 12 bit		1Byte			
	Hardware version 13 bit		1Byte			
277	Hardware version 14 bit		1Byte			
	Hardware version 15 bit		1Byte			
278	Hardware version 16 bit		1Byte			
	Hardware version 17 bit		1Byte			
279	Hardware version 18 bit		1Byte			
	Hardware version 19 bit		1Byte			
280	Software version 0 bit	All mode	1Byte	‘ ’; , ’; _’; , ’; ‘0’~‘9’; ‘A’~‘Z’		Software version 40 bit ASCII Base address: 280
	Software version 1 bit		1Byte			
281	Software version 2 bit		1Byte			
	Software version 3 bit		1Byte			
282	Software version 4 bit		1Byte			
	Software version 5 bit		1Byte			
283	Software version 6 bit		1Byte			
	Software version 7 bit		1Byte			
284	Software version 8 bit		1Byte			
	Software version 9 bit		1Byte			
285	Software version 10 bit		1Byte			
	Software version 11 bit		1Byte			
286	Software version 12 bit		1Byte			
	Software version 13 bit		1Byte			
287	Software version 14 bit		1Byte			
	Software version 15 bit		1Byte			
288	Software version 16 bit		1Byte			
	Software version 17 bit		1Byte			
289	Software version 18 bit		1Byte			
	Software version 19 bit		1Byte			
290	Software version 20 bit		1Byte			
	Software version 21 bit		1Byte			
291	Software version 22 bit		1Byte			
	Software version 23 bit		1Byte			
292	Software version 24 bit		1Byte			
	Software version 25 bit		1Byte			
293	Software version 26 bit		1Byte			

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	Software version 27 bit		1Byte			
294	Software version 28 bit		1Byte			
	Software version 29 bit		1Byte			
	Software version 30 bit		1Byte			
295	Software version 31bit		1Byte			
	Software version 32 bit		1Byte			
296	Software version 33 bit		1Byte			
	Software version 34 bit		1Byte			
297	Software version 35 bit		1Byte			
	Software version 36 bit		1Byte			
298	Software version 37 bit		1Byte			
	Software version 38 bit		1Byte			
299	Software version 39 bit		1Byte			
300	Daily charge capacity 1	all model	2Byte	0~1200	KWh	Daily charge capacity 60 data in total 300-359
...	...		2Byte	0~1200	KWh	
359	Daily charge capacity 60		2Byte	0~1200	KWh	
360	Daily discharge capacity 1		2Byte	0~1200	KWh	Daily discharge capacity 60 data in total 360-419
...	...		2Byte	0~1200	KWh	
419	Daily discharge capacity 60		2Byte	0~1200	KWh	
420	Fault warning bit information 1	HPS/PC S	2Byte	16bit, low byte first		See Fig4. 3. 2
421	Fault warning bit information 2		2Byte	16bit, low byte first		See Fig4.3.3
422	Fault warning bit information 3		2Byte	16bit, low byte first		See Fig4.3.4
423	Fault warning bit information 4		2Byte	16bit, low byte first		See Fig4.3.5
424	Fault warning bit information 5		2Byte	16bit, low byte first		See Fig4. 3. 6
425	Fault warning bit information 6		2Byte	16bit, low byte first		See Fig4.3.7
426	Fault warning bit information 7		2Byte	16bit, low byte first		See Fig4.3.8
427	Fault warning bit information 8		2Byte	16bit, low byte first		See Fig4.3.9
428	Fault warning bit information 9		2Byte	16bit, low byte first		See Fig4311
429	Fault warning bit information 1	HPSTL	2Byte	16bit, low byte first		See Fig5. 3. 2
430	Fault warning bit information 2		2Byte	16bit, low byte first		See Fig5.3.3
431	Fault warning bit		2Byte	16bit, low byte		See Fig5.3.4

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	information 3			first		
432	Fault warning bit information 4		2Byte	16bit, low byte first		See Fig5.3.5
433	Fault warning bit information 5		2Byte	16bit, low byte first		See Fig5. 3. 6
434	Fault warning bit information 6		2Byte	16bit, low byte first		See Fig5.3.7
435	Fault warning bit information 7		2Byte	16bit, low byte first		See Fig5.3.8
436	Fault warning bit information 8		2Byte	16bit, low byte first		See Fig5.3.9
437	reserved		2Byte	16bit, low byte first		Fixed data 0
438	Fault warning bit information 1	PBD	2Byte	16bit, low byte first		See Fig6. 3. 2
439	Fault warning bit information 2		2Byte	16bit, low byte first		See Fig6.3.3
440	Fault warning bit information 3		2Byte	16bit, low byte first		See Fig6.3.4
441	Fault warning bit information 4		2Byte	16bit, low byte first		See Fig6.3.5
442	Fault warning bit information 5		2Byte	16bit, low byte first		See Fig6. 3. 6
443	Fault warning bit information 6		2Byte	16bit, low byte first		See Fig6. 3. 7
444	reserved		2Byte			Fixed data 0
						445~469: reserved
470	Monthly charge capacity 1	all model	2Byte	0~12000	KWh	Monthly charge capacity 31 data in total 470~500
...	...		2Byte	0~12000	KWh	
500	Monthly charge capacity 31		2Byte	0~12000	KWh	
501	Monthly discharge capacity 1		2Byte	0~12000	KWh	Monthly discharge capacity 31 data in total 501~531
...	...		2Byte	0~12000	KWh	
531	Monthly discharge capacity 31		2Byte	0~12000	KWh	
						532~549:Reserved
550	Annual charge capacity 1	all model	2Byte	0~37200	10KWh	Annual charge capacity 12 data in total 550~561
...	...		2Byte	0~37200	10KWh	
561	Annual charge capacity 12		2Byte	0~37200	10KWh	
562	Annual discharge capacity 1		2Byte	0~37200	10KWh	Annual discharge capacity

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644	Software version 8 bit		1Byte			
	Software version 9 bit		1Byte			
645	Software version 10 bit		1Byte			
	Software version 11 bit		1Byte			
646	Software version 12 bit		1Byte			
	Software version 13 bit		1Byte			
647	Software version 14 bit		1Byte			
	Software version 15 bit		1Byte			
648	Software version 16 bit		1Byte			
	Software version 17 bit		1Byte			
649	Software version 18 bit		1Byte			
	Software version 19 bit		1Byte			
650	Software version 20 bit		1Byte			
	Software version 21 bit		1Byte			
651	Software version 22 bit		1Byte			
	Software version 23 bit		1Byte			
652	Software version 24 bit		1Byte			
	Software version 25 bit		1Byte			
653	Software version 26 bit		1Byte			
	Software version 27 bit		1Byte			
654	Software version 28 bit		1Byte			
	Software version 29 bit		1Byte			
655	Software version 30 bit		1Byte			
	Software version 31bit		1Byte			
656	Software version 32 bit		1Byte			
	Software version 33 bit		1Byte			
657	Software version 34 bit		1Byte			
	Software version 35 bit		1Byte			
658	Software version 36 bit		1Byte			
	Software version 37 bit		1Byte			
659	Software version 38 bit		1Byte			
	Software version 39 bit		1Byte			
660	High byte: year	All mode	1Byte	0~99	year	
	Low byte: month		1Byte	1~12	month	
661	High byte: day		1Byte	1~31	day	
	Low byte: hour		1Byte	0~23	hour	
662	High byte: minute		1Byte	0~59	minute	
	Low byte: second		1Byte	0~59	second	
663	High byte: information bit		1Byte	0~8	Different nodes	
	Low byte: fault bit		1Byte	0~15	correspond to different	

Reserved

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5、Write holding register（Function code: 0x06）

Read holding register address	content	Subordinate aircraft	Size	Range	Unit	Note
0	on/off	all model	2Byte			0: Off;1: On
1	Island Protection Level	HPS/PCS /HPSTL	2Byte			Input ranges from 0 to 9, with 1 to 9 indicating a level
2	Grid management enable		2Byte			0: Disable;1: Enable
3	GFDI enable		2Byte			0: Disable;1: Enable
4	GFCI enable		2Byte			0: Disable;1: Enable
5	Insulation Impedance Test Enable	all model	2Byte			0: Disable;1: Enable
6	Factory reset enable		2Byte			0: Invalid;1: Valid
7	GFDI Grounding Selection	HPS/PCS /HPSTL	2Byte			0: Ungrounded;1: Grounded
8	Grid & PV Charge Together Enable		2Byte			0: Disable;1: Enable
9	Low voltage ride through enable		2Byte			0: Disable;1: Enable
10	Active power regulation enable		2Byte			0: Disable;1: Enable
11	Reactive power regulation enable		2Byte			0: Disable;1: Enable
12	Manual Adjustment Enable		2Byte			0: Disable;1: Enable
13	Bypass Cabinet Enable (PCS) ATS Enable (HPS)		2Byte			0: Disable;1: Enable
14	BMS communication enable	all model	2Byte			0: Disable;1: Enable
15	Fuse protection enable	HPS/PCS /HPSTL	2Byte			0: Disable;1: Enable
16	Anti-reflux enable		2Byte			0: Disable;1: Enable
17	Generator enable		2Byte			0: Disable;1: Enable
18	CP enable	PCS	2Byte			0: Disable;1: Enable
19	PBD350Enable		2Byte			0: Disable;1: Enable
20	Minimum insulation impedance	all model	2Byte	100~20000	0.1KΩ	
21	Type setting		2Byte	0~8		See fig4.1.1
22	Safety regulation setting		2Byte	0~6		See fig4.2.1
23	Communication		2Byte	1~32		

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	StationSetting					
24	Parallel Enable		2Byte			0: Disable;1: Enable
25	hardware version choice		2Byte	0~100		
26	Mode selection		2Byte			0: load First 1: Battery First 2. Economic mode 3: peak shaving 4: Time schedule 5: manual dispatching 6: battery protection 7: backup power management 8: constant power discharge 9: forced charging 10:Smart meter mode 11: Bat-SmartMeter 12: Grid Access Control(mode 12 non-standard)
27	Schneider contactor state	HPS	2Byte			0: off; 1: on (Schneider project: non-standard)
28	Grid state	HPS	2Byte			0: abnormal; 1: normal (Schneider project: non-standard)
29	Forced OnGrid to OffGrid switch enable	HPS/PCS	2Byte			0: Disable;1: Enable
30	Charging direction enable	PCS	2Byte			0: Discharge;1: Charge
31	PBD250Enable	PCS	2Byte			0: Disable;1: Enable
32	EMS enable	all model	2Byte			0: Disable;1: Enable
33	PV power setting		2Byte	0~500	1KW	
34	Inverter rectifier directionflag bit	HPS	2Byte			0: Invert;1: rectify
35	Inverter rectifier power setting		2Byte	0~500	1KW	
36	DC source mode enable	PCS	2Byte			0: Disable;1: Enable
37	Battery current calibration enable	all model	2Byte			0: Disable;1: Enable
38	Parallel RedundantNumber	HPS/PCS	2Byte	0/1		
39	Generator start condition	HPS/PCS	2Byte			0: Disable; 1: Enable (Namibia project

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						nonstandard)
40	SOC_Start enale	HPS/PCS	2Byte			0: Disable; 1: Enable (Namibia project nonstandard)
41	Line voltage sampling enable	PCS	2Byte			0: Disable;1: Enable
42	System ID sign	All model	2Byte	1~100		0: single unit The minimum parallel judgment value is 1; Same value: parallel (data accumulation)
43	DTC (protocol)	all model	2Byte	22001~22006		(Only HPS) See Fig4.1.2
				22008~22021		HPSTLSee Fig4.1.2
				21016~21039		PCS See Fig4.1.2
				23001~23003		PBD See Fig4.1.2
44	grid power compensation	HPS/PCS	2Byte	0~100	0.1KW	
45	PBD parallel number setting	PCS	2Byte	0~100	1	
46	Generator power Upper Limit	HPS/PCS /HPSTL	2Byte	0~500	1KW	
47	Discharge cut-off SOC	HPS/PCS	2Byte	0~100	%	
48	Output voltage setting	HPS/PCS /HPSTL	2Byte	380/400	1V	
49	Output Frequency setting		2Byte	50/60	1Hz	
50	Maximum DC voltage (PV)	All mode	2Byte	2000~10000	0.1V	
51	Grid voltage upper limit	HPS/PCS /HPSTL	2Byte	1600~5500	0.1V	
52	Grid voltage lower limit		2Byte	1600~5500	0.1V	
53	Grid frequency upper limit		2Byte	4500~6500	0.01 Hz	
54	Grid frequency lower limit		2Byte	4500~6500	0.01 Hz	
55	AC output currentupper limit		2Byte	10~20000	0.1A	
56	Check Time	All model	2Byte	0~1000	1S	
57	Shadow voltage variation		2Byte	1~150	0.1V	
58	Output power upper limit		2Byte	0~120	%	
59	Output power seting		2Byte	0~500	KW	

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60	Start Voltage		2Byte	3000~8500	0.1V	
61	Max MPPT Voltage		2Byte	3000~15000	0.1V	
62	Min MPPT Voltage		2Byte	3000~15000	0.1V	
63	Start Power		2Byte	0~500	0.1kW	
64	Battery ChargeCurrent		2Byte	0~800	1A/0.1A	Large and small inverters use different units HPS / PCS / PBD: 1A String type HPSTL: 0.1A
65	Grid Power UP Limit	HPS/PCS /HPSTL	2Byte	0~500	1kW	
66	SOC Up Limit	All mode	2Byte	0~100	%	
67	SOC DownLimit		2Byte	0~100	%	
68	Output voltage Up Limit	PBD	2Byte	2000~10000	0.1V	
69	Output voltage DownLimit		2Byte	2000~10000	0.1V	
70	PV Current Up Limit		2Byte	0~500	A	
71	PV Inductor Current Up Limit		2Byte	0~500	A	
72	Output Inductor Curr Up Limit		2Byte	0~500	A	
73	Output currentUp Limit		2Byte	0~500	A	
74	Voltage reference	PCS/HPST L	2Byte	0~800	V	
75	BMS SOC Up Limit	HPSTL	2Byte	0~100	%	
76	BMS SOC DownLimit		2Byte	0~100	%	
77	Number of parallel machines	HPS/PCS	2Byte	0~255	1	
78	Input power seting	PCS	2Byte	0~800	1	
79	Frequency shift enable	PCS	2Byte	0~2	1	0: Disable;1: mode1; 2: mode2
80	PV voltage	All mode	2Byte	2000~10000	0.1V	Calibration
81	Battery voltage		2Byte	2000~10000	0.1V	Calibration
82	Battery current		2Byte	10~20000	0.1A	Calibration
83	PV current		2Byte	10~20000	0.1A	Calibration
84	Output voltage U		2Byte	1600~5500	0.1V	Calibration
85	Output voltage V		2Byte	1600~5500	0.1V	Calibration
86	Output voltage W		2Byte	1600~5500	0.1V	Calibration
87	Grid current U		2Byte	10~20000	0.1A	Calibration
88	Grid current V		2Byte	10~20000	0.1A	Calibration
89	Grid current W		2Byte	10~20000	0.1A	Calibration
90	Grid voltage UV		2Byte	1600~5500	0.1V	Calibration
91	Grid voltage VW		2Byte	1600~5500	0.1V	Calibration

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92	Grid voltage WU		2Byte	1600~5500	0.1V	Calibration
93	Load current U		2Byte	10~20000	0.1A	Calibration
94	Load current V		2Byte	10~20000	0.1A	Calibration
95	Load current W		2Byte	10~20000	0.1A	Calibration
99	Upper limit of battery voltage	HPS/PCS	2Byte	0~65535	0.001	Namibia: Nonstandard
100	Lower limit of battery voltage		2Byte	0~65535	0.001	
101	HPS/PCS upper temperature limit		2Byte	0~100	1℃	
102	HPS/PCS lower temperature limit		2Byte	0~100	1℃	
103	Upper limit of battery temperature		2Byte	0~100	1℃	
104	Lower limit of battery temperature		2Byte	0~100	1℃	
105						
106						
107	Load power upper limit		2Byte	0~500	1KW	
108	Lower limit of load power		2Byte	0~500	1KW	
109	time limit of Generator starting		2Byte	0~1000	1min	
110	Battery charging small current positive and negative bias flag	All mode	2Byte	0~1		0:positive 1: negative
111	Small current bias value of battery charging		2Byte	0~200	0.1A	
112	Battery discharging small current positive and negative bias flag		2Byte	0~1		0:positive 1: negative
113	Small current bias value of battery discharge		2Byte	0~200	0.1A	
114	Battery charging calibration LCD current 1		2Byte	0~8000	0.1A	
115	Battery charging calibration actual current 1		2Byte	0~8000	0.1 A	
116	Battery charging calibration LCD current 2		2Byte	0~8000	0.1 A	

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117	Battery charging calibration actual current 2		2Byte	0~8000	0.1 A	
118	CP nominal power setting		2Byte	0~1000	1KW	
119	Parallel Address		2Byte	0~255		
120	High byte: year		1Byte	0~99	Year	Date of delivery
	Low byte: month		1Byte	1~12	Month	Date of delivery
121	High byte': day		1Byte	1~31	Day	Date of delivery
122	Battery discharging calibration LCD current 1		2Byte	0~8000	0.1 A	
123	Battery discharging calibration actual current 1		2Byte	0~8000	0.1 A	
124	Battery discharging calibration LCD current 2		2Byte	0~8000	0.1 A	
125	Battery discharging calibration actual current 2		2Byte	0~8000	0.1 A	
126	Bypass Type setting	PCS	2Byte	0~100		Bypass30:1; Bypass50:2 Bypass120:3; Bypass150:4; Bypass250:5; Bypass500:6; Bypass630:7; Bypass1000:8;
127	Boot and App Burn selection	All mode	2Byte	0~1		0:Burn App;1:Burn Boot
128	Starting voltage differential	PBD	2Byte	0~200	1V	
129	DC soft start contactor enable	PCS	2Byte	0~1		0: Disable;1: Enable
130	High byte: year	All mode	1Byte	12~100	Year	System date time
	Low byte: month		1Byte	1~12	Month	System date time
131	High byte: day		1Byte	1~31	Day	System date time
	Low byte: hour		1Byte	0~23	Hour	System date time
132	High byte: minute		1Byte	0~59	Minute	System date time

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	Low byte: second		1Byte	0~59	Second	System date time
133	PV1 Voltage	PBD	2Byte	2000~10000	0.1V	Calibration
134	PV2 Voltage		2Byte	2000~10000	0.1V	Calibration
135	PV3 Voltage		2Byte	2000~10000	0.1V	Calibration
136	PV4 Voltage		2Byte	2000~10000	0.1V	Calibration
137	PV5 Voltage		2Byte	2000~10000	0.1V	Calibration
138	PV1 current		2Byte	10~20000	0.1A	Calibration
139	PV2 current		2Byte	10~20000	0.1A	Calibration
140	PV3 current		2Byte	10~20000	0.1A	Calibration
141	PV4 current		2Byte	10~20000	0.1A	Calibration
142	PV5 current		2Byte	10~20000	0.1A	Calibration
143	OutVoltage		2Byte	2000~10000	0.1V	Calibration
144	Systembattery charging current positive and negative bias flag	PCS	2Byte	0~1		0:positive 1: negative
145	current bias value of battery charging		2Byte	0~200	0.1A	
146	Systembattery discharge current positive and negative bias flag		2Byte	0~1		0:positive 1: negative
147	Small current bias value of battery discharge		2Byte	0~200	0.1A	
148	Generator synchronized state	PCS	2Byte			0: unsynchronized ; 1:synchronized
149	Systembattery current calibration enable		2Byte			0: Disable; 1: Enable
150	Battery charging satuation	All mode	2Byte	0~10	1	
151	Battery group number		2Byte	0~100	1	
152	Battery unit number		2Byte	0~50000	1	
153	Battery capacity		2Byte	0~50000	1AH	
154	Charging current limit		2Byte	0~10000	0.1A	
155	Discharging current limit		2Byte	0~10000	0.1A	
156	Floate charging voltage		2Byte	0~50000	0.001V	For each cell
157	Low voltage Warning		2Byte	0~50000	0.001V	For each cell
158	Low voltage fault		2Byte	0~50000	0.001V	For each cell
159	High voltage fault		2Byte	0~50000	0.001V	For each cell
160	Battery start voltage		2Byte	0~50000	0.001V	For each cell
161	Single PV to off-grid		2Byte	0~50000	0.001V	For each cell
162	Discharge cut-off voltage		2Byte	0~50000	0.001V	For each cell

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163	Floate charge current limit point setting		2Byte	0~100	0.01V	For each cell
164	Command to Active / Deactive Droop Mode		2Byte			
165	Frequency Offset		2Byte		0.01Hz	
166	Active power droop slope		2Byte		0.1%	
167	Voltage Offset		2Byte		0.1V	
168	Reactive power droop slope		2Byte		0.1%	
169	Upper limit power feed from grid	HPS/PCS /HPSTL	2Byte	0~500	1kW	
170	Generator not charge enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable
171	Charging pile enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable
172	Battery discharging current	HPS	2Byte		1A	
173	Peak period limit power enable	PCS	2Byte	0~1		
174	Battery power export to grid set	HPS/PCS	2Byte	0~150	1kW	Poland 5 HPS
175	Generator charging power up limit	HPS/PCS	2Byte		0.1kW	
176	BMS voltage judge enable	HPS/PCS	2Byte	0~1		SOC judge logic are not used after BMS voltage judge enable
177	DischargeRecoverSOC	HPS/PCS	2Byte	0~100		After entering discharge stop state, recover discharge
178	Charging cut off SOC	HPS/PCS	2Byte	0~100		The battery are not needed to charge to 100% SOC in some programs
179	Grid charge SOC	HPS	2Byte	0~1		Freedomcustomization
180	Serial number 0 bit	All mode	1Byte	'0'~'9'; 'A'~'Z'		Serial number is 10 bit: ASIIaddress: 180
	Serial number 1 bit		1Byte	'0'~'9'; 'A'~'Z'		
181	Serial number 2 bit		1Byte	'0'~'9'; 'A'~'Z'		
	Serial number 3 bit		1Byte	'0'~'9'; 'A'~'Z'		

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182	Serial number 4 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 5 bit		1Byte	‘0’~‘9’;‘A’~‘Z’ ,		
183	Serial number 6 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 7 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
184	Serial number 8 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 9 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
185	Serial number 10 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
	Serial number 11 bit		1Byte	‘0’~‘9’; ‘A’~‘Z’		
186	Generator switch	PCS	2Byte	0~1		0:disable 1:enable Non-standard
187	Reserve					
188	Reserve					
189	Reserve					
190	BUCK current loop Kp	HPS/PCS/H PSTL	2Byte	0~65535	0.001	PIDparameter
191	BUCK current loop Ki		2Byte	0~65535	0.0001	PIDparameter
192	BUCK voltage loop Kp		2Byte	0~65535	0.001	PIDparameter
193	BUCK voltage loop Ki		2Byte	0~65535	0.0001	PID parameter
194	Impulse load current loop Kp		2Byte	0~65535	0.001	PID parameter
195	Impulse load current loop Ki		2Byte	0~65535	0.0001	PID parameter
196	Impulse load voltage loop Kp		2Byte	0~65535	0.001	PID parameter
197	Impulse load voltage loop Ki		2Byte	0~65535	0.0001	PID parameter
198	Normal current loop Kp		2Byte	0~65535	0.001	PID parameter
199	Normal current loop Ki		2Byte	0~65535	0.0001	PID parameter
200	Normal voltage loop Kp		2Byte	0~65535	0.001	PID parameter
201	Normal voltage loop Ki		2Byte	0~65535	0.0001	PID parameter
202	Back power set					

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203	Frequency controlled power output enable					Non-standard
204	FCCD Enable	PCS	2Byte			Non-standard
205	CT ratio of meter	HPS	2Byte	0~65535		
206	AC OverVolt time(20ms)	HPS/PCS	2Byte			
207	Outputvoltage directly calibrated U	PCS	2Byte	1600~5500	0.1	
208	Outputvoltage directly calibrated V	PCS	2Byte	1600~5500	0.1	
209	Outputvoltage directly calibrated W	PCS	2Byte	1600~5500	0.1	
210	Bypass LoadCurr U	PCS	2Byte	0~65535	0.0001A	
211	Bypass LoadCurr V	PCS	2Byte	0~65535	0.0001A	
212	Bypass LoadCurr W	PCS	2Byte	0~65535	0.0001A	
213	Bypass GridCurr U	PCS	2Byte	0~65535	0.0001A	
214	Bypass GridCurr V	PCS	2Byte	0~65535	0.0001A	
215	Bypass GridCurr W	PCS	2Byte	0~65535	0.0001A	
216	Bypass GenCurr U	PCS	2Byte	0~65535	0.0001A	
217	Bypass GenCurr V	PCS	2Byte	0~65535	0.0001A	
218	Bypass GenCurr W	PCS	2Byte	0~65535	0.0001A	
219	Feedforward coefficient	PBD	2Byte	0~100	0.01	
220	Parallel address switching Enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable
221	Meter communication station number	HPS	2Byte			
222	week	HPS/PCS	2Byte	0-7		system time

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223	Bat to non-critical enable	HPS	2Byte	0~1		0: disable; 1: enable
224	Cut-off charging power	HPS/PCS	2Byte		0.1kw	
225	Gird charging power	HPS/PCS	2Byte		0.1kw	
226	Parallel signal test Enable	HPS/PCS	2Byte	0~1		0: disable; 1: enable
227	Constant discharge current	HPS	2Byte			Non-standard
228	Grid charge enable	HPS	2Byte			Non-standard
229	Forced charge enable	HPS/PCS	2Byte			
230	SOC calibration set		2Byte			Keep two decimal places
231	SOH calibration set		2Byte			Keep two decimal places
232	Offline discharge cutoff SOC		2Byte			Non-standard
233	Offline discharge restore SOC		2Byte			Non-standard
234	DC contactor back check enable	PCS	2Byte			The default is 1
235	Bypass communication station number (PCS) ATS communication station number (HPS)	HPS/PCS	2Byte			
236	Bypass communication station number enable (PCS) , ATS communication station number enable (HPS)		2Byte			
237	Bypass numbers (PCS) ATS numbers (HPS)	HPS/PCS	2Byte			
238	Bypass shared enable (PCS) ATS shared enable (HPS)	HPS/PCS	2Byte			
239	Charging current limit	HPS/PCS	2Byte	0~10000	0.1A	from 154 to here(non-standard)
240	Discharge current limit	HPS/PCS	2Byte	0~10000	0.1A	from 155 to here(non-standard)

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241	SOC Up Limit 1	HPS	2Byte	0~100	%	Non-standard
242	SOC DownLimit 1	HPS	2Byte	0~100	%	Non-standard
243	Fan opening temperature	HPS	2Byte	0~100	℃	Non-standard
244	Cell circulating voltage	HPS	2Byte	0~50000	0.001V	For each cell (non-standard)
245	CANb baud rate	PCS	2Byte	0~1000	1kbps	
246	485 Baud Rate(bps)	HPS /PCS	2Byte	0-65535	bps	
247	Current limiting period	HPS /PCS	2Byte	0-14		
248	Device type	HPS	2Byte	0-10		
249	Meter Com Switch Enable	HPS	2Byte	0~1		0: disable; 1: enable
250	Reactive power regulation mode selection	HPS/PCS/ HPSTL	2Byte	1~3		U16_RegIq_Mode_Select
251	Power factor reference symbol		2Byte	0~1		U16_RegIq_PF_Sign
252	Power factor reference		2Byte	0~1000	0.001	U16_RegIq_PF_Ref
253	Power reference point 1		2Byte	0~100	%	U16_RegIq_PF_P1
254	Power reference point 2		2Byte	0~100	%	U16_RegIq_PF_P2
255	Power reference point 3		2Byte	0~100	%	U16_RegIq_PF_P3
256	Power reference point 4		2Byte	0~100	%	U16_RegIq_PF_P4
257	Power reference point 5		2Byte	0~100	%	U16_RegIq_PF_P5
258	Power factor reference point 1		2Byte	0~1000	0.001	U16_RegIq_PF_PF1
259	Power factor reference point 2		2Byte	0~1000	0.001	U16_RegIq_PF_PF2
260	Power factor reference point 3		2Byte	0~1000	0.001	U16_RegIq_PF_PF3
261	Power factor reference point 4		2Byte	0~1000	0.001	U16_RegIq_PF_PF4
262	Power factor reference point 5		2Byte	0~1000	0.001	U16_RegIq_PF_PF5
263	Reactive reference		2Byte	0~1		U16_RegIq_Q_Ref_Sign

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	symbol					
264	Reactive reference		2Byte	0~300	kVar	U16_RegIq_Q_Ref
265	EN50549Enable	HPS(EN-50549 certification)	2Byte	0~1		0: Disable;1: Enable
266	ReductionFactorEnable		2Byte	0~1		0: Disable;1: Enable
267	ReactiveLockEnable		2Byte	0~1		0: Disable;1: Enable
268	Overfrequency download mode		2Byte	0~2		0: Disable; 1:Mode1;2:Mode2
269	Underfrequency loading mode		2Byte	0~2		0: Disable; 1:Mode1;2:Mode2
270	ResponseTime		2Byte	0~1000	S	
271	Power Rising Speed		2Byte	0~1000	1%/min	
272	Power Down Speed		2Byte	0~1000	1%/min	
273	Overvoltage drop active Enable		2Byte	0/1		0: Disable;1: Enable
274	StartVoltageU3		2Byte	0~1000	1V	
275	EndVoltageU4		2Byte	0~1000	1V	
276	ParallelPhaseSynCompensationCoefficient	HPS/PCS	2Byte	0~1000		
277	ParallelPhaseSynIntegralCoefficient	HPS/PCS	2Byte	0~1000		
278	ActiveSagCoefficient	HPS/PCS	2Byte	0~1000		
279	ReactiveSagCoefficient	HPS/PCS	2Byte	0~1000		
280	Active power flow Kp	HPS/PCS	2Byte	0~10000		
281	Active power flow Ki	HPS/PCS	2Byte	0~10000		
282	Parallel synchronization phase difference limiting coefficient	HPS/PCS	2Byte	0~1000		
283	reserve	HPS/PCS				
284	ParallelCirculationCalibratable	HPS/PCS	2Byte	0/1		0: Disable;1: Enable
285	Start up condition	HPS/PCS				0: not allowed turn on 1: allowed turn on
286	Reactive power flow Kp	HPS/PCS	2Byte	0~10000		
287	Reactive power flow Ki	HPS/PCS	2Byte	0~10000		
288	OnToOff CurrLoop Impact Kp1	PCS	2Byte	0~65535	0.001	
289	OnToOff CurrLoop Impact Ki1	PCS	2Byte	0~65535	0.0001	
290	OnToOff VoltLoop Impact Kp1	PCS	2Byte	0~65535	0.001	
291	OnToOff VoltLoop Impact Ki1	PCS	2Byte	0~65535	0.0001	

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292	OnToOff CurrLoop Impact Kp2	PCS	2Byte	0~65535	0.001	
293	OnToOff CurrLoop Impact Ki2	PCS	2Byte	0~65535	0.0001	
294	OnToOff VoltLoop Impact Kp2	PCS	2Byte	0~65535	0.001	
295	OnToOff VoltLoop Impact Ki2	PCS	2Byte	0~65535	0.0001	
296	OnToOff CurrLoop Impact Kp3	PCS	2Byte	0~65535	0.001	
297	OnToOff CurrLoop Impact Ki3	PCS	2Byte	0~65535	0.0001	
298	OnToOff VoltLoop Impact Kp3	PCS	2Byte	0~65535	0.001	
299	OnToOff VoltLoop Impact Ki3	PCS	2Byte	0~65535	0.0001	
300~302: reserve						
303	inverter Rated power	HPSTL	2Byte	0~100	0.1Kw	
304	shinemaster Anti-refluxfailure power setting		2Byte	0~1000	0.1%	
305	shinemaster Anti-refluxfailure flag		2Byte			0: communication normal; 1: Communication failure;
306	shinemaster Anti-reflux enable		2Byte			0: Disable;1: Enable
307	shinemaster Anti-refluxfailure time		2Byte	1~5000	1S	
308	shinemaster Anti-reflux inverter power		2Byte	0~1000	0.1%	
309	Anti-overcharge Enable	HPS	2Byte	0-1		Non-standard parameter
310	Float discharge coefficient	HPS	2Byte	0~5000		Non-standard parameter
311	Float discharge limit	HPS	2Byte	0~5000		Non-standard parameter
312	On grid load drop limit	HPS	2Byte	0~5000		Non-standard parameter
313	DCvolt diff fault value	PCS	2Byte	0-100		Go here from 187 (PCS1.1.25)
314	GEN start SOC	HPSTL	2Byte	0~100	%	
315	GEN stop SOC		2Byte	0~100	%	
320	Battery discharging power 1	HPSTL	2Byte	0~100	1Kw	The multi-stage charge and discharge mode is used to

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						set the battery discharge power
321	Battery discharging power 2		2Byte	0~100	1Kw	
322	Battery discharging power 3		2Byte	0~100	1Kw	
323	Battery discharging power 4		2Byte	0~100	1Kw	
324	Battery discharging power 5		2Byte	0~100	1Kw	
325	Battery cell voltage setting 1		2Byte	0~65535	0.001V	The multi-stage charge and discharge mode is used to set the battery cell voltage.
326	Battery cell voltage setting 2		2Byte	0~65535	0.001V	
327	Battery cell voltage setting 3		2Byte	0~65535	0.001V	
328	Battery cell voltage setting 4		2Byte	0~65535	0.001V	
329	Battery cell voltage setting 5		2Byte	0~65535	0.001V	
330	Battery SOC setting 1		2Byte	0~100	%	The multi-stage charge and discharge mode is used to set the battery target SOC.
331	Battery SOC setting 2		2Byte	0~100	%	
332	Battery SOC setting 3		2Byte	0~100	%	
333	Battery SOC setting 4		2Byte	0~100	%	
334	Battery SOC setting 5		2Byte	0~100	%	
335	Charge cutoff voltage	HPSTL	2Byte		0.001V	
336	Discharge Recovery Voltage	HPSTL	2Byte		0.001V	
337	Full Anti-countercurrent enable	HPS/PCS	2Byte			0: disable; 1: enable
338	Bypass_CANA Baud (PCS) ATS_CANA Baud (HPS)	HPS/PCS	2Byte	5~1000K		
339	Inverter 485 address	HPS/PCS	2Byte			
340	grid charge cutoff SOC	HPS/PCS	2Byte	0-100	%	
341	grid charge cutoff	HPS/PCS	2Byte	0~10000	0.001V	

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	voltage					
342	Dc main contactor detection enabled	HPS	2Byte	0~1		0: disable; 1: enable
343	Read fault records enable	HPS/PCS	2Byte	0-1		0:Failure logs are not read; 1: Reading the failure log
344	Read the start position of the fault record	HPS/PCS	2Byte	1-200		
345	Read the end position of the fault record	HPS/PCS	2Byte	1-500		
346~379: reserve						
380	Power point 1 of low voltage passing through	HPS/PCS/ HPSTL	2Byte	0~100	%	U16_LVRT_Volt_P1
381	Power point 2 of low voltage passing through		2Byte	0~100	%	U16_LVRT_Volt_P2
382	Power point 3 of low voltage passing through		2Byte	0~100	%	U16_LVRT_Volt_P3
383	Power point 4 of low voltage passing through		2Byte	0~100	%	U16_LVRT_Volt_P4
384	Power point 1 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Time_P1
385	Power point 2 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Time_P2
386	Power point 3 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Time_P3
387	Power point 4 of low voltage passing through		2Byte	0~5000	2ms	U16_LVRT_Volt_P4
388~499: reserve						
500	RegIdByFreq_StepPer Hz	HPS/PCS/ HPSTL	2Byte	0~1000	0.01	
501	RegIdByFreq_Freq_Start	HPS/PCS/ HPSTL	2Byte	4500~5500	0.01	
502	RegIdByFreq_Freq_Recover	HPS/PCS/ HPSTL	2Byte	4500~5500	0.01	

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503~619: 预留						
620	LVRT_Factor_K	HPS/PCS/ HPSTL	2Byte	0~100		
621	LVRT_U0	HPS/PCS/ HPSTL	2Byte	0~100		
622~749: 预留						
750.	GridVolt_High_Limit	HPS/PCS/ HPSTL	2Byte			
751.	GridVolt_High_Back	HPS/PCS/ HPSTL	2Byte			
752.	GridVolt_High_SetTime	HPS/PCS/ HPSTL	2Byte	1~60000		
753.	GridVolt_High_ClearTime	HPS/PCS/ HPSTL	2Byte	1~60000		
754.	GridVolt_Low_Limit	HPS/PCS/ HPSTL	2Byte			
755.	GridVolt_Low_Back	HPS/PCS/ HPSTL	2Byte			
756.	GridVolt_Low_SetTime	HPS/PCS/ HPSTL	2Byte	1~60000		
757.	GridVolt_Low_ClearTime	HPS/PCS/ HPSTL	2Byte	1~60000		
758.	GridFreq_High_Limit	HPS/PCS/ HPSTL	2Byte			
759.	GridFreq_High_Back	HPS/PCS/ HPSTL	2Byte			
760.	GridFreq_High_SetTime	HPS/PCS/ HPSTL	2Byte	1~60000		
761.	GridFreq_High_ClearTime	HPS/PCS/ HPSTL	2Byte	1~60000		
762.	GridFreq_Low_Limit	HPS/PCS/ HPSTL	2Byte			
763.	GridFreq_Low_Back	HPS/PCS/ HPSTL	2Byte			
764.	GridFreq_Low_SetTime	HPS/PCS/ HPSTL	2Byte	1~60000		
765.	GridFreq_Low_ClearTime	HPS/PCS/ HPSTL	2Byte	1~60000		
766	Peak set power1	All mode	2Byte	1~500	1kw	Multistage power setting
767	Peak set power2		2Byte	1~500	1kw	Multistage power setting
768	Peak set power3		2Byte	1~500	1kw	Multistage power setting
769	Peak set power4		2Byte	1~500	1kw	Multistage power setting

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770	Peak set power5		2Byte	1~500	1kw	Multistage power setting
771	Valley set power 1		2Byte	1~500	1kw	Multistage power setting
772	Valley set power 2		2Byte	1~500	1kw	Multistage power setting
773	Valley set power 3		2Byte	1~500	1kw	Multistage power setting
774	Valley set power 4		2Byte	1~500	1kw	Multistage power setting
775	Valley set power 5		2Byte	1~500	1kw	Multistage power setting
776	Power set in normal period1		2Byte	1~500	1kw	Multistage power setting
777	Power set in normal period2		2Byte	1~500	1kw	Multistage power setting
778	Power set in normal period3		2Byte	1~500	1kw	Multistage power setting
779	Power set in normal period4		2Byte	1~500	1kw	Multistage power setting
780	Power set in normal period5		2Byte	1~500	1kw	Multistage power setting
781~799: reserved						
800	Peak time 1 high byte: Hour	all model	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
801	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
802	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
803	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
804	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
805	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time

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806	Peak time4 High byte: Hour	all model	1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
807	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
808	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
809	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
810	Valley time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
811	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
812	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
813	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
814	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
815	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
816	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
817	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
818	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
819	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
820	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
821	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
822	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
823	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
824	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
825	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
826	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time

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827	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
828	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
829	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time

Set the time of off-season and peak season

830	Off-season 1 high byte: month	HPS/PCS	1Byte	0~12	Month	Strat time
	Off-season 1 low byte: day		1Byte	0~31	Day	Strat time
831	Off-season 1 high byte: month		1Byte	0~12	Month	End time
	Off-season 1 low byte: day		1Byte	0~31	Day	End time
832	Off-season 2 high byte: month		1Byte	0~12	Month	Strat time
	Off-season 2 low byte: day		1Byte	0~31	Day	Strat time
833	Off-season 2 high byte: month		1Byte	0~12	Month	End time
	Off-season 2 low byte: day		1Byte	0~31	Day	End time
834	Off-season 3 high byte: month		1Byte	0~12	Month	Strat time
	Off-season 3low byte: day		1Byte	0~31	Day	Strat time
835	Off-season 3 high byte: month		1Byte	0~12	Month	End time
	Off-season 3low byte: day		1Byte	0~31	Day	End time
836	Off-season 4 high byte: month		1Byte	0~12	Month	Strat time
	Off-season 4 low byte:		1Byte	0~31	Day	Strat time

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	day					
837	Off-season 4 high byte: month		1Byte	0~12	Month	End time
	Off-season 4 low byte: day		1Byte	0~31	Day	End time
838	Peak season 1 high byte: month		1Byte	0~12	Month	Strat time
	Peak season 1 low byte: day		1Byte	0~31	Day	Strat time
839	Peak season 1 high byte: month		1Byte	0~12	Month	End time
	Peak season 1 low byte: day		1Byte	0~31	Day	End time
840	Peak season 2 high byte: month		1Byte	0~12	Month	Strat time
	Peak season 2 low byte: day		1Byte	0~31	Day	Strat time
841	Peak season 2 high byte: month		1Byte	0~12	Month	End time
	Peak season 2 low byte: day		1Byte	0~31	Day	End time
842	Peak season 3 high byte: month		1Byte	0~12	Month	Strat time
	Peak season 3 low byte: day		1Byte	0~31	Day	Strat time
843	Peak season 3 high byte: month		1Byte	0~12	Month	End time
	Peak season 3 low byte: day		1Byte	0~31	Day	End time
844	Peak season 4 high byte: month		1Byte	0~12	Month	Strat time
	Peak season 4 low byte: day		1Byte	0~31	Day	Strat time
845	Peak season 4 high byte: month		1Byte	0~12	Month	End time
	Peak season 4 low byte: day		1Byte	0~31	Day	End time
Off-season working day:						
846	Peak time 1 high byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time

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	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
847	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
848	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
849	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
850	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
851	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
852	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
853	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
854	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
855	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
856	Valley time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time

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857	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
858	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
859	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
860	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
861	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
862	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
863	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
864	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
865	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
866	Normal time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
867	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time

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	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
868	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
869	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
870	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
871	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
872	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
873	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
874	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
875	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Off-season Saturday time						
876	Peak time 1 high byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time

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877	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
878	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
879	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
880	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
881	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
882	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
883	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
884	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
885	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
886	Valley time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
887	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time

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	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
888	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
889	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
890	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
891	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
892	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
893	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
894	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
895	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
896	Normal time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
897	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time

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898	Normal time2 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
899	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
900	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
901	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
902	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
903	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
904	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
905	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Off-season Sunday time						
906	Peak time 1 high byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
907	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time

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908	Peak time2 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
909	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
910	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
911	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
912	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
913	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
914	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
915	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
916	Valley time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
917	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
918	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
919	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
920	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
921	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
922	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
923	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
924	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
925	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
926	Normal time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
927	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
928	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time

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929	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
930	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
931	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
932	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
933	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
934	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
935	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time

Peak season working day:

936	Peak time 1 high byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
937	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
938	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time

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	Minute					
939	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
940	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
941	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
942	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
943	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
944	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
945	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
946	Valley time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
947	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
948	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
949	Valley time2 High		1Byte	0~23	Hour	End time

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	byte: Hour					
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
950	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
951	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
952	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
953	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
954	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
955	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
956	Normal time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
957	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
958	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
959	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low		1Byte	0~59	Minute	End time

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	byte: Minute					
960	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
961	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
962	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
963	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
964	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
965	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Peak-season Saturday time						
966	Peak time 1 high byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
967	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute	HPS/PCS	1Byte	0~59	Minute	End time
968	Peak time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
969	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time

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	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
970	Peak time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
971	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
972	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
973	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
974	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
975	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
976	Valley time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
977	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
978	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
979	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time

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980	Valley time3 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
981	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
982	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
983	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
984	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
985	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
986	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
987	Normal time1 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
988	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
989	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
990	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time

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	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
991	Normal time3 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
992	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
993	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
994	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
995	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
Peak-season Sunday time						
996	Peak time 1 high byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	Strat time
997	Peak time 1 high byte: Hour		1Byte	0~23	Hour	End time
	Peak time 1 low byte: Minute		1Byte	0~59	Minute	End time
998	Peak time2 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	Strat time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
999	Peak time2 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time2 Low byte: Minute		1Byte	0~59	Minute	End time
1000	Peak time3 High byte:		1Byte	0~23	Hour	Strat time

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	Hour					
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
1001	Peak time3 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time3 Low byte: Minute		1Byte	0~59	Minute	End time
1002	Peak time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
1003	Peak time4 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time4 Low byte: Minute		1Byte	0~59	Minute	End time
1004	Peak time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
1005	Peak time5 High byte: Hour		1Byte	0~23	Hour	End time
	Peak time5 Low byte: Minute		1Byte	0~59	Minute	End time
1006	Valley time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
1007	Valley time1 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time1 Low byte: Minute		1Byte	0~59	Minute	End time
1008	Valley time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
1009	Valley time2 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time2 Low byte: Minute		1Byte	0~59	Minute	End time
1010	Valley time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time3 Low		1Byte	0~59	Minute	Strat time

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	byte: Minute					
1011	Valley time3 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time3 Low byte: Minute		1Byte	0~59	Minute	End time
1012	Valley time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
1013	Valley time4 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time4 Low byte: Minute		1Byte	0~59	Minute	End time
1014	Valley time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
1015	Valley time5 High byte: Hour		1Byte	0~23	Hour	End time
	Valley time5 Low byte: Minute		1Byte	0~59	Minute	End time
1016	Normal time1 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	Strat time
1017	Normal time1 High byte: Hour	HPS/PCS	1Byte	0~23	Hour	End time
	Normal time1 Low byte: Minute		1Byte	0~59	Minute	End time
1018	Normal time2 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	Strat time
1019	Normal time2 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time2 Low byte: Minute		1Byte	0~59	Minute	End time
1020	Normal time3 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	Strat time
1021	Normal time3 High		1Byte	0~23	Hour	End time

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	byte: Hour					
	Normal time3 Low byte: Minute		1Byte	0~59	Minute	End time
1022	Normal time4 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	Strat time
1023	Normal time4 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time4 Low byte: Minute		1Byte	0~59	Minute	End time
1024	Normal time5 High byte: Hour		1Byte	0~23	Hour	Strat time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	Strat time
1025	Normal time5 High byte: Hour		1Byte	0~23	Hour	End time
	Normal time5 Low byte: Minute		1Byte	0~59	Minute	End time
1026						

6. Information description

6.1 batterystate and alarm protection

Fig1.1.1 BMS System status (logic 1 fig shows that the event is true; logic 0 fig shows that the event is false)

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
Syste m prepar ation	Charge done	Discharge done	level I alarm	level II alarm	level III protection	Reserved	Reserved

Fig1.1.2BMS level I and level II alarm (logic 1 fig shows that the event is true; logic 0 fig shows that the event is false)

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
High temperature	Low temperature	Large temperat ure differenc	Total voltage high	Total voltage low	High cell voltage	Low cell voltage	Large cell temperature difference

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		e					
Bit8	Bit9	Bit10	Bit11	Bit12	Bit13	Bit14	Bit15
Charge current high	Discharge current high	SOC high	SOC low	Low insulation resistance	Reserved	Reserved	Reserved

Fig1.1.3BMSlevel III protection(logic 1 fig shows that the event is true; logic 0 fig shows that the event is false)

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
High temperature	Low temperature	Large temperature difference	Total voltage high	Total voltage low	High cell voltage	Low cell voltage	Large cell temperature difference
Bit8	Bit9	Bit10	Bit11	Bit12	Bit13	Bit14	Bit15
Charge current high	Discharge current high	Charge short circuit	DisCharge short circuit	Battery short circuit	Data acquisition failure	Master slave board communication failure	Main communication failure

6.2 fault information code

Fig1.1.4 Fault information code

item Item	D0~D15bit	Represent information content		Note
		english	chinese	
1	0x01	电网 BypassACovervoltage	AC_OverVolt_Fault(V)	0.1V
2	0x02	电网 BypassACundervoltage	AC_UnderVolt_Fault(V)	0.1V
3	0x03	电网 Bypass 频率 over frequency	AC_OverFreq_Fault(Hz)	0.01Hz
4	0x04	电网 Bypass 频率 underfrequency	AC_UnderFreq_Fault(Hz)	0.01Hz
5	0x05	直流 overvoltage 保护	DC_OverVolt_Fault(V)	0.1V
6	0x06	ACovervoltage 保护	DC_OverCurr_Fault(Hz)	0.1V
7	0x07	ACcurrent 不平衡	AC_Curr_Unbalance_Fault(%)	%
8	0x08	电网 voltage 不平衡	AC_Volt_Unbalance_Fault(%)	%
9	0x09	直流感地 fault 保护	AC_Ground_Fault(KΩ)	0.1KΩ
10	0x0A	AC 侧 over current 保护	AC_OverCurr_Fault (V)	0.1V
11	0x0B	低 voltage 穿越保护	LVRT_Fault	
12	0x0C	逆变器自身 fault 保护	Inverter_Self_Fault	
13	0x0D	DSPfault 保护	DSP_Fault	
14	0x0E	直流断路器 open circuit	DC_Switch_Open_Fault	
15	0x0F	逆变器温度报警	Inverter_Temp_Warning(℃)	
16	0x10	逆变器温度超高	Inverter_OverTemp_Fault(℃)	0.1℃
17	0x11	防雷器 fault	SPD_Fault	

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18	0x12	过热保护	OverTemp_Fault(°C)	
19	0x13	防反放电保护	Reverse_Discharge_Fault(A)	0.1A
20	0x14	极性反接	DC_Inverse_Fault	
21	0x15	normal 停机	Normal_Stop	
22	0x16	fault 停机	Fault_Stop	
23	0x17	alarmrunning	Warning	

6.3 Fault log information sheet

firgue1.15fault log information sheet

Input register address	HPS/PCS/HPSTL	PBD
660	Fault record read sequence value	故障记录读取顺序数值
661	Fault information code	故障信息编码
662	Fault current value	故障电流值（瞬时故障时为瞬时电流，有效值故障时为有效值电流）
663	Fault voltage value	故障电压值（瞬时故障时为瞬时电压，有效值故障时为有效值电压）
664	Fault year and month	故障年月
665	Fault date and time	故障日时
666	Fault minute and second	故障分秒
667	PV voltage instantaneous value	PV 电压瞬时值
668	Battery voltage instantaneous value	电池电压瞬时值
669	PV current instantaneous value	PV 电流瞬时值
670	Battery current instantaneous value	电池电流瞬时值
671	Battery inductor current instantaneous value	电池一侧电感电流瞬时值
672	Inverter inductor A current instantaneous value	逆变电感 A 电流瞬时值
673	Inverter inductor B current instantaneous value	逆变电感 B 电流瞬时值
674	Inverter inductor C current instantaneous value	逆变电感 C 电流瞬时值
675	Grid UV line voltage instantaneous value	电网 UV 线电压瞬时值
676	Grid VW line voltage instantaneous value	电网 VW 线电压瞬时值
677	Grid WU line voltage instantaneous value	电网 WU 线电压瞬时值
678	Grid U Phase voltage instantaneous value	电网 U 相电压瞬时值
679	Grid V Phase voltage instantaneous value	电网 V 相电压瞬时值
680	Grid W Phase voltage instantaneous value	电网 W 相电压瞬时值
681	Bypass UV line voltage instantaneous value	旁路柜 UV 线电压瞬时值
682	Bypass VW line voltage instantaneous value	旁路柜 VW 线电压瞬时值
683	Bypass WU line voltage instantaneous value	旁路柜 WU 线电压瞬时值
684	Grid U Phase Current instantaneous value	电网 U 相电流瞬时值
685	Grid V Phase Current instantaneous value	电网 V 相电流瞬时值
686	Grid W Phase Current instantaneous value	电网 W 相电流瞬时值
687	Load U Phase Current instantaneous value	负载 U 相电流瞬时值

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688	Load V Phase Current instantaneous value	负载 V 相电流瞬时值
689	Load W Phase Current instantaneous value	负载 W 相电流瞬时值
690	PV voltage effective value	PV 电压有效值
691	Battery voltage effective value	电池电压有效值
692	Cell voltage effective value	电池单体电压有效值
693	PV current effective value	PV 电流有效值
694	Battery current effective value	电池电流有效值
695	Battery side inductor current effective value	电池侧电感电流有效值
696	Inverter inductor A current effective value	逆变电感 A 电流有效值
697	Inverter inductor B current effective value	逆变电感 B 电流有效值
698	Inverter inductor C current effective value	逆变电感 C 电流有效值
699	Grid UV line voltage effective value	电网 UV 线电压有效值
700	Grid VW line voltage effective value	电网 VW 线电压有效值
701	Grid WU line voltage effective value	电网 WU 线电压有效值
702	Grid U phase voltage effective value	电网 U 相电压有效值
703	Grid V phase voltage effective value	电网 V 相电压有效值
704	Grid W phase voltage effective value	电网 W 相电压有效值
705	Bypass UV line voltage effective value	旁路柜 UV 线电压有效值
706	Bypass VW line voltage effective value	旁路柜 VW 线电压有效值
707	Bypass WU line voltage effective value	旁路柜 WU 线电压有效值
708	Grid U line current effective value	电网 U 相电流有效值
709	Grid V line current effective value	电网 V 相电流有效值
710	Grid W line current effective value	电网 W 相电流有效值
711	Load U line current effective value	负载 U 相电流有效值
712	Load V line current effective value	负载 V 相电流有效值
713	Load W line current effective value	负载 W 相电流有效值
714	Converter IGBT radiator Temp.	变流器模块散热片温度
715	Buck IGBT radiator Temp.	Buck 模块散热片温度
716	Inverter inductor Temp.	变流器电感温度
717	SCR Temp.	SCR 温度
718	Ambient Temp.	环境温度
719	Active Power load()	
720	Grid Voltage d Axis Value.	
721	Grid Voltage q Axis Value.	
722	Grid Frequency	电网频率
723		预留
724		预留

6.4 model information and DTC

figure 4.1.1 model information

No	decimalism	Represent information content	New old mode note	notice
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1	0000	HPS30/ HPS30_V2	New old model	
2	0001	HPS50/HPS50_V2		
3	0002	HPS100		
4	0003	HPS120		
5	0004	HPS150		
6	0005	HPS250		
7	0006	HPS30_V2		
8	0007	HPS50_V2		
9	0000	HPS20KTL	new model	
10	0001	HPS10KTL		
11	0000	HPS10 KTLS		
12	0001	HPS75 00TLS		
13	0002	HPS5 KTLS		
14	0003	HPS3500TLS		
15	0004	HPS20KTLS		
16	0005	HPS15KTL		
17	0006	HPS30KTL		
18	0007	HPS40KTL		
19	0000	PCS50	old model	
20	0001	PCS50TL		
21	0002	PCS50U		
22	0003	PCS100		
23	0004	PCS100TL		
24	0005	PCS100U		
25	0006	PCS250		
26	0007	PCS250TL		
27	0008	PCS250U		
28	0009	PCS500		
29	0010	PCS500TL		
30	0011	PCS500U		
31	0000	PCS50	new model	
32	0001	PCS50TL		
33	0002	PCS50U		
34	0003	PCS100		
35	0004	PCS100TL		
36	0005	PCS100U		
37	0006	PCS250		
38	0007	PCS250TL		
39	0008	PCS250U		
40	0009	PCS500		
41	0010	PCS500TL		

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42	0011	PCS500U		
43	0012	PCS630		
44	0000	PBD350	old model	
45	0000	PBD350	new model	
46	0001	PBD250	new model	

figure4.1.2 DTC model information

No	decimalism	Represent information content	New old model note	notice
1	22001	HPS30	New old model	
2	22002	HPS50		
3	22003	HPS100		
4	22004	HPS120		
5	22005	HPS150		
6	22006	HPS250		
7	22007	HPS7500TL	new model	
8	22008	HPS20KTL		
9	22009	HPS10KTL		
10	22010	HPS10KTLS		
11	22011	HPS7500TLS		
12	22012	HPS5KTLS		
13	22013	HPS3500TLS		
14	22014	HPS20KTLS		
15	22015	HPS15KTL		
16	22016	HPS30KTL		
17	22017	HPS40KTL		
18	21016	PCS50	old model	
19	21017	PCS50TL		
20	21018	PCS50U		
21	21019	PCS100		
22	21020	PCS100TL		
23	21021	PCS100U		
24	21022	PCS250		
25	21023	PCS250TL		
26	21024	PCS250U		
27	21025	PCS500		
28	21026	PCS500TL		
29	21027	PCS500U		
30	21028	PCS50	new model	
31	21029	PCS50TL		
32	21030	PCS50U		
33	21031	PCS100		

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34	21032	PCS100TL		
35	21033	PCS100U		
36	21034	PCS250		
37	21035	PCS250TL		
38	21036	PCS250U		
39	21037	PCS500		
40	21038	PCS500TL		
41	21039	PCS500U		
42	21040	PCS630		
43	23001	PBD350	old model	
44	23002	PBD350	new model	
45	23003	PBD250		

6.5 safety standard information definition

figure4.2.1safety standard information

No	hexadecimal	respresentinformationcontent	notice
1	0x0000	UL	
2	0x0001	CE	
3	0x0002	Golden sun	
4	0x0003	TUV	
5	0x0004	DK5940	
6	0x0005	AS4777	
7	0x0006	RD1663	

6.6 state alarminformation

Figure 4.3.1running state （based on value）

No	hexadecimal value （based on value）	Respresent information content	notice
1	0x0000	waiting	
2	0x0001	inspection	
3	0x0002	on-grid	
4	0x0003	fault	
5	0x0004	permanentfault	
6	0x0005	off-grid	
7	0x0006	Single PVmode	
8	0x0007	Parallel operation switch to off-grid	
9	0x0008	Parallel operation switch to on-grid	

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figure4.3.10runningstate （based on bit）

No	D0~D15bit	Respresentinformation content	notice
1	D0	waiting	
2	D1	inspection	
3	D2	on-grid	
4	D3	fault	
5	D4	Permanent fault	
6	D5	off-grid	
7	D6	Single PV mode	
8	D7	Parallel operationswitch to off-grid	
9	D8	Parallel operation switch to on-grid	

figure4.3.2faultalarmbitinformation1

No	D0~D15bit	Respresent information content		notice
		english	chinese	
1	D0	PV_Inverse_Failure	PV 接反永久故障	1: the status is valid 0: the status is invalid
2	D1	IGBT_Failure	IGBT 永久故障	
3	D2	EEPROM_Write_Failure	EEPROM 写永久故障	
4	D3	EEPROM_Read_Failure	EEPROM 读永久故障	
5	D4	AC_MainContactor_Failure	主接触器永久故障	
6	D5	AC_SlaveContactor_Failure	辅接触器永久故障	
7	D6	GFDI_Failure	GFDI 永久故障	
8	D7	GFCI_Failure	GFCI 永久故障	
9	D8	RISO_Failure	绝缘阻抗永久故障	
10	D9	Reseverd_Failure	预留	
11	D10	Reseverd_Failure	预留	
12	D11	Reseverd_Failure	预留	
13	D12	Reseverd_Failure	预留	
14	D13	Reseverd_Failure	预留	
15	D14	Reseverd_Failure	预留	
16	D15	Reseverd_Failure	预留	

figure4.3.3faultalarmbitinformation2

No	D0~D15bit	figure 示 informationcontent		notice
		english	chinese	
1	D0	PV_VoltHigh_Fault	PV 电压高故障	1: state valid 0: state invalid
2	D1	CANb_Communication_Fault (HPS) Bypass_Communication_Fault (PCS)	CANb 通信故障 (HPS) 旁路柜通信故障 (PCS)	
3	D2	PV_CurrHigh_Fault	PV 电流过流故障	
4	D3	BMS_Communication_Fault	BMS 通信故障	

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5	D4	PV_Insulation_Fault	PV 对地绝缘阻抗故障
6	D5	BMS_Fault	BMS 故障
7	D6	DC_OCP_Fault	直流过流故障（Trip）
8	D7	Fire_Fault	消防故障
9	D8	INT_PV_OverVolt_Fault	PV 过压故障（INT）
10	D9	PBD250_Communication_Fault （PCS）	PBD250 通讯故障 （PCS）
11	D10	INT_PV_OverCurr_Fault	PV 过流故障（INT）
12	D11	EMS_Communication_Fault	EMS 通讯故障
13	D12	IGBT_Converter_Fault	变流器 IGBT 故障
14	D13	IGBT_Buck_Fault	BuckIGBT 故障
15	D14	Converter_L_OCP_Fault	变流器电感过流故障（Trip）
16	D15	Buck_L_OCP_Fault	Buck 电感过流故障（Trip）

Fig4.3.4Fault alarm bit information3

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	AC_NoUtility_Fault	交流无市电故障	1: Valid 0: Invalid
2	D1	AC_GridPhaseSeque_Fault	交流电网相序反故障	
3	D2	AC_PLL_Fault	交流锁相故障	
4	D3	AC_Volt_Unbalance_Fault	交流电压不平衡故障	
5	D4	AC_Curr_Unbalance_Fault	交流电流不平衡故障	
6	D5	Reseverd_Fault	预留	
7	D6	Reseverd_Fault	预留	
8	D7	Reseverd_Fault	预留	
9	D8	AC_WU_OverVolt_Fault	交流 WU 过压故障	
10	D9	AC_WU_UnderVolt_Fault	交流 WU 欠压故障	
11	D10	AC_VW_OverVolt_Fault	交流 VW 过压故障	
12	D11	AC_VW_UnderVolt_Fault	交流 VW 欠压故障	
13	D12	AC_UV_OverVolt_Fault	交流 UV 过压故障	
14	D13	AC_UV_UnderVolt_Fault	交流 UV 欠压故障	
15	D14	AC_OverFreq_Fault	交流过频故障	
16	D15	AC_UnderFreq_Fault	交流欠频故障	

Fig4.3.5Fault alarm bit information4

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	AC_GridCurr_DcHigh_Fault	电网直流量高故障	1: Valid 0: Invalid
2	D1	Converter_LCurr_DcHigh_Fault	变流器电感直流量高故障	
3	D2	Buck_LCurr_DcHigh_Fault	Buck 电感直流量高故障	
4	D3	GridCurr_High_Fault	电网电流高故障	
5	D4	Converter_LCurr_High_Fault	变流器电感过流故障（RMS）	

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6	D5	Buck_LCurr_High_Fault	Buck 电感过流故障（RMS）	
7	D6	AC_Overload_Fault	过载故障	
8	D7	AC_Lightload_Fault	轻载故障	
9	D8	AC_BackFeed_Fault	交流反灌故障	
10	D9	LVRT_Fault	低压穿越故障	
11	D10	Converter_Module_OverTemp_Fault	变流器模块过温故障	
12	D11	Buck_Module_OverTemp_Fault	Buck 模块过温故障	
13	D12	Converter_L_OverTemp_Fault	变流器电感过温故障	
14	D13	Buck_L_OverTemp_Fault	Buck 电感过温故障	
15	D14	Transformer_OverTemp_Fault	变压器过温故障	
16	D15	LowTemp_Fault	低温故障	

Fig4.3.6Fault alarm bit information5

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	EPO_Stop	紧急停机	1: the status is valid 0: the status is invalid
2	D1	KeyEmergencyStop	手动关机	
3	D2	LcdEmergencyStop	LCD 关机	
4	D3	CP_Communication_Fault	CP 通讯故障	
5	D4	AC_MainContactor_Fault	交流主接触器故障	
6	D5	DC_MainContactor_Fault	直流主接触器故障	
7	D6	PBD350_Communication_Fault (PCS)	PBD350 通讯故障 (PCS)	
8	D7	AC_SlaveContactor_Fault	交流辅接触器故障	
9	D8	GFDI_Ground_Fault	GFDI 接地故障	
10	D9	GFDI_HallSense_Fault	GFDI Hall 故障	
11	D10	GFDI_AirSwitch_Fault	GFDI 空开故障	
12	D11	PV_Thunder_Fault	PV 直流防雷器故障	
13	D12	AC_Thunder_Fault	交流防雷器故障	
14	D13	BAT_Thunder_Fault	BAT 直流防雷器故障	
15	D14	Converter_L_Rly_Fault	变流器电感温度继电器故障	
16	D15	Buck_L_Rly_Fault	Buck 电感温度继电器故障	

Fig4.3.7Fault alarm bit information6

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	DC_GFDI_Fault	直流 GFDI 故障	1: the status is valid 0: the status is invalid
2	D1	AC_GFDI_Fault	交流 GFDI 故障	
3	D2	PV_RISO_Fault	PV 绝缘阻抗故障	
4	D3	BAT_RISO_Fault	BAT 绝缘阻抗故障	

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5	D4	DC_GFCI_Fault	直流 GFCI 故障
6	D5	AC_GFCI_Fault	交流 GFCI 故障
7	D6	DC_Fuse_Fault	直流 Fuse 故障
8	D7	AC_Fuse_Fault	交流 Fuse 故障
9	D8	DC_SoftStart_Fault	DC 软启故障
10	D9	INV_SoftStart_Fault	交流软启故障
11	D10	INT_ConverterL_OverCurr_Fault	变流器电感过流故障 (INT)
12	D11	INT_BuckL_OverCurr_Fault	Buck 电感过流故障 (INT)
13	D12	Batt_OverVolt_Fault	电池过压故障
14	D13	Batt_UnderVolt_Fault	电池欠压故障
15	D14	Batt_OverCurr_Fault	电池过流故障
16	D15	Batt_OverCharge_Fault	电池过充故障

Fig4.3.8Fault alarm bit information7

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	Fault_Feedback_Warning	故障反馈告警	1: the status is valid 0: the status is invalid
2	D1	Fan_Buck_Fault_Warning	Buck 风扇故障告警	
3	D2	Fan_Inv_Fault_Warning	Inv 风扇故障告警	
4	D3	Parallel_Uneven_Flow_Warning	并机不均流告警	
5	D4	Temp_Derating_Warning	过温减载告警	
6	D5	Batt_UnderVolt_Warning	电池欠压告警	
7	D6	DCFuseOp_Alarm_Warning	DC FUSE 开路告警	
8	D7	ACFuseOp_Alarm_Warning	AC FUSE 开路告警	
9	D8	AC_WU_OverVolt_Rmt_Warning	交流旁路 WU 过压	
10	D9	AC_WU_UnderVolt_Rmt_Warning	交流旁路 WU 欠压	
11	D10	AC_VW_OverVolt_Rmt_Warning	交流旁路 VW 过压	
12	D11	AC_VW_UnderVolt_Rmt_Warning	交流旁路 VW 欠压	
13	D12	AC_UV_OverVolt_Rmt_Warning	交流旁路 UV 过压	
14	D13	AC_UV_UnderVolt_Rmt_Warning	交流旁路 UV 欠压	
15	D14	AC_OverFreq_Rmt_Warning	交流旁路过频	
16	D15	AC_UnderFreq_Rmt_Warning	交流旁路欠频	

Fig4.3.9Fault alarm bit information8

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	Batt_UnderVolt_Protect_Warning	电池低压告警（关逆变）	1: Valid 0: Invalid
2	D1	TimeSet_Warning	时间设置告警	
3	D2	Bypass_Contactor_Warning	旁路接触器警告	
4	D3	Bypass_Inter_Comm_Warning	旁路内部通信警告	

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5	D4	Bypass_Volt_different_Warning	旁路电压不同告警
6	D5	PBD_Communication_Warning	PBD 通信告警
7	D6	Meter_Communication_Warning	电表通信告警
8	D7		
9	D8	PBD250_Fault	PBD250 故障
10	D9	PBD350_Fault	PBD350 故障
11	D10	CP_Fault	CP 故障
12	D11	CANb_Communication_Fault （PCS）	CANb 通信故障（PCS）
13	D12		
14	D13		
15	D14	Parallel_PLL_Signal_Fault	并机锁相同步信号故障
16	D15	Parallel_Sync_Signal_Fault	并机切换同步信号故障

表 4.3.11 故障告警位信息 9

序号	D0~D15 位	表示信息内容		备注
		英文	中文	
1	D0	DC_CurrOver_Fault	直流过流故障	1: the status is valid 0: the status is invalid
2	D1	Bypass_Switch_shutdown_Fault	旁路开关关闭故障	
3	D2	DC_Contactor_Fault	直流接触器故障	
4	D3	Meter_Communication_Fault	电表通信故障	
5	D4	Five Faults within ten minutes	10 分钟内 5 次故障	
6	D5			
7	D6			
8	D7			
9	D8			
10	D9			
11	D10			
12	D11			
13	D12			
14	D13			
15	D14			
16	D15			

6.7Status alarm information

Fig5.3.1running state （By numerical value ）

No	Hexadecimalvalue （By numerical value ）	Represent information content	Note
1	0x0000	Hold	
2	0x0001	Check	
3	0x0002	Grid connected	

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4	0x0003	Error	
5	0x0004	Permanent Error	
6	0x0005	Off-grid	
7	0x0006	Single PV mode	

Fig5.3.10running state (Bitwise)

No	D0~D15 bit	Represent information content	Note
1	D0	Hold	
2	D1	Check	
3	D2	Grid connected	
4	D3	Error	
5	D4	Permanent Error	
6	D5	Off-grid	
7	D6	Single PV mode	

Fig5.3.2Fault alarm bit information1

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	PV_Reseverd_Failure	PV 反接永久故障	1: Valid 0: Invalid
2	D1	IGBT_Failure	IGBT 永久故障	
3	D2	EEPROM_Write_Failure	EEPROM 写永久故障	
4	D3	EEPROM_Read_Failure	EEPROM 读永久故障	
5	D4	AC_MainContactor_Failure	主接触器永久故障	
6	D5	AC_SlaveContactor_Failure	辅接触器永久故障	
7	D6	GFDI_Failure	GFDI 永久故障	
8	D7	GFCI_Failure	GFCI 永久故障	
9	D8	RISO_Failure	绝缘阻抗永久故障	
10	D9	BAT_MainContactor_Failure	电池主接触器永久故障	
11	D10	AC_BypassOverPower_Failure	电网功率过载故障	
12	D11	AC_U_BypassOverPower_Failure	电网 U 相功率过载故障	
13	D12	AC_V_BypassOverPower_Failure	电网 V 相功率过载故障	
14	D13	AC_W_BypassOverPower_Failure	电网 W 相功率过载故障	
15	D14	BAT_Reseverd_Failure	电池反接永久故障	
16	D15	Reseverd_Failure	预留	

Fig5.3.3Fault alarm bit information2

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	PV2_OverVolt_Fault	PV2 过压故障	1: Valid 0: Invalid
2	D1	BL_OCP_Fault	平衡板过流故障 (Trip)	
3	D2	PV_OCP_Fault	PV 过流故障 (Trip)	
4	D3	BMS_Communication_Fault	BMS 通信故障	

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5	D4	INT_PV2_OverCurr_Fault	PV2 过流故障 (INT)
6	D5	BMS_Fault	BMS 故障
7	D6	BAT_OCP_Fault	BAT 过流故障 (Trip)
8	D7	INT_BUS_unbalance_Fault	母线电压不平衡故障 (INT)
9	D8	PV1_OverVolt_Fault	PV1 过压故障
10	D9	INT_BAT_OverVolt_Fault	BAT 过压故障 (INT)
11	D10	INT_PV1_OverCurr_Fault	PV1 过流故障 (INT)
12	D11	INT_BAT_OverCurr_Fault	BAT 过流故障 (INT)
13	D12	INT_INV_OverVolt_Fault	INV 过压故障 (INT)
14	D13	INT_INV_OverCurr_Fault	INV 过流故障 (INT)
15	D14	INT_BL_OverCurr_Fault	平衡板过流故障 (INT)
16	D15	INT_BUS_OverVolt_Fault	BUS 过压故障 (INT)

Fig5.3.4Fault alarm bit information3

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	AC_NoUtility_Fault	交流无市电故障	1: Valid 0: Invalid
2	D1	AC_GridPhaseSeque_Fault	交流电网相序反故障	
3	D2	AC_PLL_Fault	交流锁相故障	
4	D3	AC_Volt_Unbalance_Fault	交流电压不平衡故障	
5	D4	AC_Curr_Unbalance_Fault	交流电流不平衡故障	
6	D5	INV_A_OCP_Fault	A 相过流故障 (Trip)	
7	D6	INV_B_OCP_Fault	B 相过流故障 (Trip)	
8	D7	INV_C_OCP_Fault	C 相过流故障 (Trip)	
9	D8	AC_WU_OverVolt_Fault	交流 WU 过压故障	
10	D9	AC_WU_UnderVolt_Fault	交流 WU 欠压故障	
11	D10	AC_VW_OverVolt_Fault	交流 VW 过压故障	
12	D11	AC_VW_UnderVolt_Fault	交流 VW 欠压故障	
13	D12	AC_UV_OverVolt_Fault	交流 UV 过压故障	
14	D13	AC_UV_UnderVolt_Fault	交流 UV 欠压故障	
15	D14	AC_OverFreq_Fault	交流过频故障	
16	D15	AC_UnderFreq_Fault	交流欠频故障	

Fig5.3.5Fault alarm bit information4

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	AC_GridCurr_DcHigh_Fault	电网直流量高故障	1: Valid 0: Invalid
2	D1	PV1_CurrHigh_Fault	PV1 过流故障	
3	D2	PV2_CurrHigh_Fault	PV2 过流故障	
4	D3	AC_GridCurr_High_Fault	电网电流高故障	
5	D4	AC_L1Curr_High_Fault	逆变电感过流故障 (RMS)	

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6	D5	AC_L1CurrDc_High_Fault	逆变电感直流量故障	
7	D6	AC_Overload_Fault	过载故障	
8	D7	AC_Lightload_Fault	轻载故障	
9	D8	AC_BackFeed_Fault	交流反灌故障	
10	D9	ShineMaster_Comunicate_Fault	Shinemaster 通讯故障	
11	D10	AC_OverTemp_Fault	变流器模块过温故障	
12	D11	DC_OverTemp_Fault	直流器模块过温故障	
13	D12	AC_BypassOverPower_Fault	电网过载故障	
14	D13	AC_U_BypassOverPower_Fault	电网 U 相过载故障	
15	D14	AC_V_BypassOverPower_Fault	电网 V 相过载故障	
16	D15	AC_W_BypassOverPower_Fault	电网 W 相过载故障	

Fig5.3.6Fault alarm bit information5

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	EPO_Stop	紧急停机	1: Valid 0: Invalid
2	D1	KeyEmergencyStop	手动关机	
3	D2	LcdEmergencyStop	LCD 关机	
4	D3	NO_Bat_Fault	预留	
5	D4	BAT_MainContactor_Fault	电池主接触器故障	
6	D5	AC_U_Overload_Fault	负载 U 相过载	
7	D6	AC_V_Overload_Fault	负载 V 相过载	
8	D7	AC_W_Overload_Fault	负载 W 相过载	
9	D8	GFDI_Ground_Fault	GFDI 接地故障	
10	D9	AC_Contactor_Fault	交流继电器故障	
11	D10	GFDI_AirSwitch_Fault	GFDI 空开故障	
12	D11	PV_Thunder_Fault	PV 直流防雷器故障	
13	D12	AC_Thunder_Fault	交流防雷器故障	
14	D13	BAT_Thunder_Fault	BAT 直流防雷器故障	
15	D14	BusVolt_Unbalance_Fault	变流器电感温度继电器故障	
16	D15	INT_PV3_OverCurr_Fault	PV3 过流故障 (INT)	

Fig5.3.7Fault alarm bit information6

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	DC_GFDI_Fault	直流 GFDI 故障	1: Valid 0: Invalid
2	D1	BMS_Warning	BMS 告警	
3	D2	PV1_RISO_Fault	PV1 绝缘阻抗故障	
4	D3	PV2_RISO_Fault	PV2 绝缘阻抗故障	
5	D4	DC_GFCI_Fault	直流 GFCI 故障	
6	D5	AC_GFCI_Fault	交流 GFCI 故障	

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7	D6	DC_Fuse_Fault	直流 Fuse 故障
8	D7	AC_Fuse_Fault	交流 Fuse 故障
9	D8	DC_SoftStart_Fault	DC 软启故障
10	D9	INV_SoftStart_Fault	交流软启故障
11	D10	INT_L1_OverCurr_Fault	逆变电感过流 (INT)
12	D11	INT_Bypass_Volt_Fault	电网过压 (INT)
13	D12	Batt_OverVolt_Fault	电池过压故障
14	D13	Batt_UnderVolt_Fault	电池欠压故障
15	D14	Batt_OverCurr_Fault	电池过流故障
16	D15	Batt_OverCharge_Fault	电池过充故障

Fig5.3.8Fault alarm bit information7

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	Fan1_Feedback_Warning	风扇 1 故障告警	1: Valid 0: Invalid
2	D1	Fan2_Feedback_Warning	风扇 2 故障告警	
3	D2	Fan3_Feedback_Warning	风扇 3 故障告警	
4	D3	Fan4_Feedback_Warning	风扇 4 故障告警	
5	D4	Temp_Derating_Warning	过温减载告警	
6	D5	Batt_UnderVolt_Warning	电池欠压告警	
7	D6	DCFuseOp_Alarm_Warning	DC FUSE 开路告警	
8	D7	ACFuseOp_Alarm_Warning	AC FUSE 开路告警	
9	D8	AC_WU_OverVolt_Rmt_Warning	交流旁路 WU 过压	
10	D9	AC_WU_UnderVolt_Rmt_Warning	交流旁路 WU 欠压	
11	D10	AC_VW_OverVolt_Rmt_Warning	交流旁路 VW 过压	
12	D11	AC_VW_UnderVolt_Rmt_Warning	交流旁路 VW 欠压	
13	D12	AC_UV_OverVolt_Rmt_Warning	交流旁路 UV 过压	
14	D13	AC_UV_UnderVolt_Rmt_Warning	交流旁路 UV 欠压	
15	D14	AC_OverFreq_Rmt_Warning	交流旁路过频	
16	D15	AC_UnderFreq_Rmt_Warning	交流旁路欠频	

Fig5.3.9Fault alarm bit information8

No	D0~D15 bit	Represent information content		Note
No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	Batt_UnderVolt_Protect_Warning	电池低压告警 (关逆变)	1: Valid 0: Invalid
2	D1	Hps_10min_3times_StopAlarm	直流电压启动不足故障	
3	D2	Reseverd	预留	
4	D3	Fan_5_Fault_Warning	风扇 5 告警	
5	D4	Reseverd	预留	
6	D5	Reseverd	预留	

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7	D6	ATS_Contactor_Warning	ATS 继电器粘连告警
8	D7	Reseverd	预留
9	D8	PV3_OverVolt_Fault	PV3 过压故障
10	D9	PV3_Curr_High_Fault	PV3 过流故障
11	D10	BATModule_OverTemp_Fault	电池模块过温故障
12	D11	INSUL_Rly_Fault	绝缘继电器故障
13	D12	RISO_Fault	绝缘电阻故障
14	D13	INSUL_Comunicate_Fault	绝缘模块通信故障
15	D14	INSUL_Modul_Fault	绝缘模块故障
16	D15	Meter_Communication_Fault	电表通信故障

Fig6.3.1running state (By numerical value)

No	Hexadecimalvalue (By numerical value)	Represent information content	Note
8	0x0000	Hold	
9	0x0001	Check	
10	0x0002	Run	
11	0x0003	Error	
12	0x0004	Permanent Error	
13	0x0006	Single PV mode	

Fig6.3.10running state (Bitwise)

No	D0~D15 bit	Represent information content	Note
8	D0	Hold	
9	D1	Check	
10	D2	Run	
11	D3	Error	
12	D4	Permanent Error	
13	D6	Single PV mode	

Fig6.3.2Fault alarm bit information1

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	PV_Inverse_Failure	PV 接反永久故障	1: Valid 0: Invalid
2	D1	IGBT_Failure	IGBT 永久故障	
3	D2	EEPROM_Write_Failure	EEPROM 写永久故障	
4	D3	EEPROM_Read_Failure	EEPROM 读永久故障	
5	D4	MainContactor_Failure	主接触器永久故障	
6	D5	SlaveContactor_Failure	辅接触器永久故障	
7	D6	RISO_Failure	绝缘阻抗永久故障	
8	D7	Reseverd_Failure	预留	

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9	D8	PV1_VoltHigh_Fault	PV1 过压故障	
10	D9	PV2_VoltHigh_Fault	PV2 过压故障	
11	D10	PV1_CurrHigh_Fault	PV1 过流故障	
12	D11	PV2_CurrHigh_Fault	PV2 过流故障	
13	D12	BAT_OverVolt_Fault	电池过压故障	
14	D13	BAT_UnderVolt_Fault	电池欠压故障	
15	D14	BAT_OverCurr_Fault	电池放电过流故障	
16	D15	BAT_OverCharge_Fault	电池充电过流故障	

Fig6.3.3Fault alarm bit information2

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	OUT_OverVolt_Fault	输出过压故障	1: Valid 0: Invalid
2	D1	OUT_OverCurr_Fault	输出过流故障	
3	D2	PV_L1_BuckOverCurr_Fault	PV 电感 1 过流故障	
4	D3	PV_L2_BuckOverCurr_Fault	PV 电感 2 过流故障	
5	D4	OUT_L1_BuckOverCurr_Fault	输出电感 1 过流故障	
6	D5	OUT_L2_BuckOverCurr_Fault	输出电感 2 过流故障	
7	D6	BMS_Communication_Fault	BMS 通讯故障	
8	D7	BMS_Fault	BMS 故障	
9	D8	PV_L1_BuckOverCurr_Fault(INT)	PV 电感 1 过流故障(INT)	
10	D9	PV_L2_BuckOverCurr_Fault(INT)	PV 电感 2 过流故障(INT)	
11	D10	OUT_L1_BuckOverCurr_Fault(INT)	输出电感 1 过流故障(INT)	
12	D11	OUT_L2_BuckOverCurr_Fault(INT)	输出电感 2 过流故障(INT)	
13	D12	PV1_OverVolt_Fault(INT)	PV1 过压故障(INT)	
14	D13	PV2_OverVolt_Fault(INT)	PV2 过压故障(INT)	
15	D14	BAT_OverVolt_Fault(INT)	电池过压故障(INT)	
16	D15	OUT_OverVolt_Fault(INT)	输出过压故障(INT)	

Fig6.3.4Fault alarm bit information3

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D1	BUS_OverVolt_Fault(INT)	母线过压故障(INT)	1: Valid 0: Invalid
2	D2	PV1_OverCurr_Fault(INT)	PV1 过流故障(INT)	
3	D2	PV2_OverCurr_Fault(INT)	PV2 过流故障(INT)	
4	D3	BAT_OverCurr_Fault(INT)	电池过流故障(INT)	
5	D4	OUT_OverCurr_Fault(INT)	输出过流故障(INT)	
6	D5	PV_L3_OverCurr_Fault(INT)	PV 电感 3 过流故障(INT)	
7	D6	PV_L4_OverCurr_Fault(INT)	PV 电感 4 过流故障(INT)	
8	D7	PV_L5_OverCurr_Fault(INT)	PV 电感 5 过流故障(INT)	

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9	D8	OUT1_OCP_Fault	输出电感 1 过流故障 (Trip)
10	D9	OUT2_OCP_Fault	输出电感 2 过流故障 (Trip)
11	D10	PV1_L1_OCP_Fault	PV 电感 1 过流故障 (Trip)
12	D11	PV2_L2_OCP_Fault	PV 电感 2 过流故障 (Trip)
13	D12	DC1_Thunder_Fault	直流 1 防雷器故障
14	D13	DC2_Thunder_Fault	直流 2 防雷器故障
15	D14	BAT_SoftStart_Fault	电池软启故障
16	D15	OUT_SoftStart_Fault	输出软启故障

Fig6.3.5Fault alarm bit information4

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	PV_Module_OverTemp_Fault	PV 模块过温故障	1: Valid 0: Invalid
2	D1	OUT_Module_OverTemp_Fault	输出模块过温故障	
3	D2	PV_Inductor_OverTemp_Fault	PV 电感过温故障	
4	D3	OUT_Inductor2_OverTemp_Fault	输出电感过温故障	
5	D4	LowTemp_Fault	低温故障	
6	D5	BUS_Insulation_Fault	母线对地绝缘阻抗故障	
7	D6	PV_IGBT_Fault	PV_ IGBT 故障	
8	D7	OUT_IGBT_Fault	OUT_ IGBT 故障	
9	D8	EPO_Stop	紧急停机	
10	D9	KeyEmergencyStop	手动关机	
11	D10	LcdEmergencyStop	LCD 关机	
12	D11	BAT_MainContactor1_Fault	电池主接触器故障	
13	D12	OUT_MainContactor2_Fault	输出主接触器故障	
14	D13	BAT_SlaveContactor_Fault	电池辅接触器故障	
15	D14	OUT_SlaveContactor_Fault	输出辅接触器故障	
16	D15	Reseverd_Failure	预留	

Fig6.3.6Fault alarm bit information5

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	Fault_Feedback_Warning	脱扣告警	1: Valid 0: Invalid
2	D1	Fan_1_Fault_Warning	风扇 1 故障告警	
3	D2	Fan_2_Fault_Warning	风扇 2 故障告警	
4	D3	Fan_3_Fault_Warning	风扇 3 故障告警	
5	D4	Temp_Derating_Warning	过温减载告警	
6	D5	BAT_UnderVolt_Warning	电池欠压告警	
7	D6	PCS_Communication_Warning	PCS 通信警告	
8	D7	Reseverd_Failure	预留	
9	D8	PV3_VoltHigh_Fault	PV3 过压故障	

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10	D9	PV4_VoltHigh_Fault	PV4 过压故障	
11	D10	PV5_VoltHigh_Fault	PV5 过压故障	
12	D11	PV3_CurrHigh_Fault	PV3 过流故障	
13	D12	PV4_CurrHigh_Fault	PV4 过流故障	
14	D13	PV5_CurrHigh_Fault	PV5 过流故障	
15	D14	PV_L3_OverCurr_Fault	PV 电感 3 过流故障	
16	D15	PV_L4_OverCurr_Fault	PV 电感 4 过流故障	

Fig6.3.7Fault alarm bit information6

No	D0~D15 bit	Represent information content		Note
		English	Chinese	
1	D0	PV_L5_OverCurr_Fault	PV 电感 5 过流故障	1: Valid 0: Invalid
2	D1	PV3_OverVolt_Fault(INT)	PV3 过压故障(INT)	
3	D2	PV4_OverVolt_Fault(INT)	PV4 过压故障(INT)	
4	D3	PV5_OverVolt_Fault(INT)	PV5 过压故障(INT)	
5	D4	PV3_OverCurr_Fault(INT)	PV3 过流故障(INT)	
6	D5	PV4_OverCurr_Fault(INT)	PV4 过流故障(INT)	
7	D6	PV5_OverCurr_Fault(INT)	PV5 过流故障(INT)	
8	D7	PVVolt_higher_Output	PV 电压高于输出	
9	D8	DC3_Thunder_Fault	直流 3 防雷器故障	
10	D9	DC4_Thunder_Fault	直流 4 防雷器故障	
11	D10	DC5_Thunder_Fault	直流 5 防雷器故障	
12	D11	PV1_L3_OCP_Fault	PV 电感 3 过流故障（Trip）	
13	D12	PV2_L4_OCP_Fault	PV 电感 4 过流故障（Trip）	
14	D13	PV2_L5_OCP_Fault	PV 电感 5 过流故障（Trip）	
15	D14	Reseverd_Failure	预留	
16	D15	Reseverd_Failure	预留	