

Modbus communication

Protocol V1.02

April 3, 2020

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1. Preface

1.1 Introduction

Modbus protocol based on 485 communication is suitable for upper computer communication or external communication of all equipment.

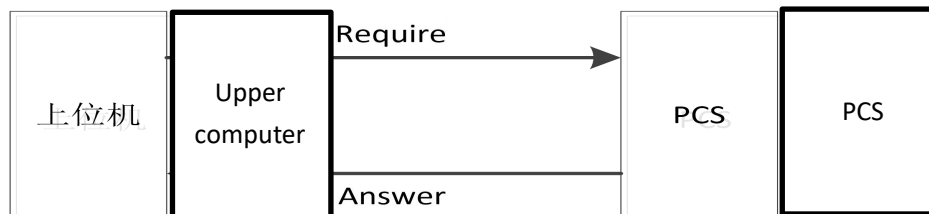
2. Communication protocol

2.1 Basic communication parameter

Communication parameter	value
Baud rate	9600bps
Word size	8bit
Parity	none
Stop bits	1 bit
Big-endian / Little-endian	Big-end (The high byte of data is stored in the low address of memory, the low byte of data is stored in the high address of memory)

2.2 Communication form

Upper computer actively requests the data from PCS, PCS response the upper computer. The protocol based on standard Modbus communication protocol, supporting the function code 0x03, 0x04, 0x06 which in Modbus communication protocol. The Address of PCS default to 1.



2.2.1 Multiple register read by functional code 0x03, 0x04

Request frame format

Address	1byte	0x01
Function code	1byte	0x04(reading the holding register),0x03(reading the input register)
Register starting address	1byte	High address
	1byte	Low address
Quantity of register	1byte	High address (maximum 125)
	1byte	Low address (maximum 125)
CRC check	1byte	Low address
	1byte	High address

Acknowledgement frame format

Address	1byte	0x01
Function code	1byte	0x03(reading the holding register),0x04(reading the input register)
Bytes	1byte	Register data * 2
The value of register	1byte	High address
	1byte	Low address

CRC check	1byte	Low address
	1byte	High address

2.2.2 Single register write by function code 0x06

Request frame format

Address	1byte	0x01
Function code	1byte	0x06
Register address	1byte	High address
	1byte	Low address
The value of register	1byte	High address
	1byte	Low address
CRC check	1byte	Low address
	1byte	High address

Acknowledgement frame format

Address	1byte	0x01
---------	-------	------

Function code	1byte	0x06
Register starting address	1byte	High address
	1byte	Low address
The value of register	1byte	High address
	1byte	Low address
CRC check	1byte	Low address
	1byte	High address

2.2.3 Multiple register write by function code 0x10

Multiple register write only fixed format is supported, please refer to the multiple register write function code for details

Request frame format

Address	1byte	0x01
Function code	1byte	0x10
Register address	1byte	High address
	1byte	Low address
Quantity of register	1byte	High address
	1byte	Low address
Data size	1byte	Data size
Data	1byte	High address
	1byte	Low address

CRC check	1byte	Low address
	1byte	High address

Acknowledgement frame format

Address	1byte	0x01
Function code	1byte	0x10
Register address	1byte	High address
	1byte	Low address
Quantity of register	1byte	High address
	1byte	Low address
CRC check	1byte	Low address
	1byte	High address

2.2.4 Multistage register read by function code 0x45

Request frame format

Address	1byte	0x01
Function code	1byte	0x45
Number of register segments	1byte	1~32
Register address1	1byte	High address
	1byte	Low address
Quantity of register1	1byte	High address
	1byte	Low address
Register address 2	1byte	High address
	1byte	Low address
Quantity of register 2	1byte	High address
	1byte	Low address
.....
CRC check	1byte	Low address
	1byte	High address

Acknowledgement frame format

Address	1byte	0x01
Function code	1 byte	0x45
Number of read register segments	1 byte	1~32
Register starting address1	2 byte	0x0000~0xFFFF
quantity of register1	1 byte	N
the value of register1	2xN byte	N/A
Register starting address2	2 byte	0x0000~0xFFFF
quantity of register2	1 byte	N
the value of register2	2xN byte	N/A
.....
CRC	2 byte	N/A

2.3 Error response frame

Address	1byte	0x01
Function code+0x80	1byte	Error Function code
error code	1byte	The following table
CRC check	1byte	Low address
	1byte	High address

error code	type
01	Function code not supported
02	Register address error
03	Write failed
04	Busy
05	Value error
TBD	
50	Insufficient battery power
51	The battery is full
TBD	

3. Message classification

3.1 Read the input register (function code 0x04,0x45)

3.1.1 PCS device information (read only)

Adr	register	Description	display	Note	Length	data type	model
10000	wMachine_Type	Machine Type	Machine Type	Follow table	2Byte	INT16	Grid-connected, energy storage
10001	TBD				1*2Byte	INT16	Grid-connected,

							energy storage
10002	TBD				1*2Byte	INT16	Grid-connected, energy storage
10003	TBD				1*2Byte	INT16	Grid-connected, energy storage
10004	VendorName	Manufacturers ASCII Left alignment	Vendor	NA	16*2	ASCII	Grid-connected, energy storage
10020	ModuleName	Name of model ASCII Left alignment	Modulename	NA	16*2	ASCII	Grid-connected, energy storage
10036	SeriesNumber	Serial number ASCII Left alignment	SN	NA	16*2	ASCII	Grid-connected, energy storage
10052	ProtocolVersion	Protocol version ASCII 0.01, Left alignment, point 一起传	Protocol Version	NA	3*2	ASCII	Grid-connected, energy storage
10055	MasterVersion	Main cpu version ASCII 0.01	MasterVersion	NA	3*2	ASCII	Grid-connected, energy storage
10058	SlaveVersion	Sub cpu version ASCII 0.01	SlaveVersion	NA	3*2	ASCII	Grid-connected, energy storage
10061	HMIVersion	Main cpu version ASCII 0.01	HMIVersion	NA	3*2	ASCII	Grid-connected, energy storage
10064	s_BMSVer	Bms software version	BMS Ver	NA	3*2	ASCII	energy storage
10067	TBD	Reserved space					
10068	TBD	Reserved space					

10069	TBD	Reserved space					
10070	PvInputNum	PV input number	Pv Input Num.	0-4	2Byte	UINT16	Grid-connected, energy storage
10071	PVConfigType	PV input model 0: invalid 1: individual : 2 parallel	PV input mode	0-2	2Byte	UINT16	Grid-connected, energy storage
10072	BatInputNum.	Battery input number	Battery Input Num.	0-4	2Byte	UINT16	energy storage
10073	TBD	Reserved space 10071-100499					

value	model	C/E
0	Single phase grid-connected	5_0k
1		4_6K
2		4_2K
3		3_6K
4-29		Reserved
30-49	Three phase grid-connected	Reserved
50	High voltage energy storage	5.0k
51		4.6k
52		4.2k
53		3.6k
50-69		Reserved
70-100	Low voltage AC energy storage	Reserved

3.1.2 PCS real time information

Table 3-1

Adr	register	Description	English display	Note	Length	data type	model
10500	MasterState	Master State	Master State	Table 3-2	2Byte	UINT16	Grid-connected, energy storage
10501	ConnectionTimeCnt	Check Time	Check Time	1S	2Byte	UINT16	Grid-connected, energy storage
10502	MeterConnect	Whether Meter Connect	Meter Connect	0;disconnect 1:connect	2Byte	UINT16	Grid-connected, energy storage
10503	GridYieldToday	Electricity generation-today	E_today	0.1kWh	2Byte	UINT16	Grid-connected, energy storage
10504	GridYieldTotal	Electricity generation-total	E_total	0.1kWh	2*2	UINT32	Grid-connected, energy storage
10506	FeedinPower	Feed-in Power	Feed-in Power	1W	2Byte	INT16	Grid-connected, energy storage
10507	OutputPower	OutputPower	Output Power	1W	2Byte	INT16	Grid-connected, energy storage
10508	Loadpower	Load power	Load power	1W	2Byte	INT16	Grid-connected, energy storage
10509	BatPower	Battery power	Bat Power	1W	2Byte	INT16	energy storage
	TBD	10510---10699					
10692	SafetyWriteState	Safety regulation writing status	3 means ok	0-3	2Byte	UINT16	Grid-connected, energy storage
10693	ISOBusPvalue	Iso +Measured value		K 欧	2Byte	UINT16	Grid-connected, energy storage
10694	ISOBusNvalue	Iso -Measured value		K 欧	2Byte	UINT16	Grid-connected, energy storage
10695	DrmATEstestFlag	DRM test mark	0: Not triggered 1: triggered		2Byte	UINT16	Grid-connected, energy storage

10696	MeterConnectFlag	Meter connection status	0: disconnect: 1: checking: 2: connect		2Byte	UINT16	Grid-connected, energy storage
10697	CTpower	Ct power checking		1w	2Byte	INT16	Grid-connected, energy storage
10698	VbusTest	BUS voltage	Vbus	0.1V	2Byte	UINT16	Grid-connected, energy storage
10699	USBtest	Usb ATE test mark	0: error 1: ok	1W	2Byte	UINT16	Grid-connected, energy storage
10700	GridVoltSqr_R	R phase grid voltage	Gird Voltage R	0.1V	2Byte	UINT16	Grid-connected, energy storage
10701	GridCurrentSqr_R	R phase grid current	Grid Current R	0.1A	2Byte	INT16	Grid-connected, energy storage
10702	GridFrequency_R	R phase grid frequency	GridFrequency R	0.01Hz	2Byte	UINT16	Grid-connected, energy storage
10703	GridWat_R	R phase output power	Current R Power	1W	2Byte	INT16	Grid-connected, energy storage
10704	GridVoltSqr_S	S phase grid voltage	Gird Voltage S	0.1V	2Byte	UINT16	Grid-connected, energy storage
10705	GridCurrentSqr_S	S phase grid current	Grid Current S	0.1A	2Byte	INT16	Grid-connected, energy storage
10706	GridFrequency_S	S phase grid frequency	GridFrequency S	0.01Hz	2Byte	UINT16	Grid-connected, energy storage
10707	GridWat_S	S phase output power	Current S Power	1W	2Byte	INT16	Grid-connected, energy storage
10708	GridVoltSqr_T	T phase grid voltage	Gird Voltage T	0.1V	2Byte	UINT16	Grid-connected, energy storage
10709	GridCurrentSqr_T	T phase grid current	Grid Current T	0.1A	2Byte	INT16	Grid-connected, energy storage

							storage
10710	GridFrequency_T	T phase grid frequency	GridFrequency T	0.01Hz	2Byte	UINT16	Grid-connected, energy storage
10711	GridWat_T	T phase output power	Current T Power	1W	2Byte	INT16	Grid-connected, energy storage
	TBD	10712-10899					
10800	PvVoltAvg[cPV1]	PV 1 voltage	Pv 1 Voltage	0.1V	2Byte	UINT16	Grid-connected, energy storage
10801	PvCurrentAvg[cPV1]	PV 1 current	Pv 1 Current	0.1A	2Byte	UINT16	Grid-connected, energy storage
10802	PVPower[cPV1]	PV1 power	Pv 1 Power	1W	2Byte	UINT16	Grid-connected, energy storage
10803	PvVoltAvg[cPV2]	PV2 voltage	Pv 2 Voltage	0.1V	2Byte	UINT16	Grid-connected, energy storage
10804	PvCurrentAvg[cPV2]	PV2 current	Pv 2 Current	0.1A	2Byte	UINT16	Grid-connected, energy storage
10805	PVPower[cPV2]	PV2 power	Pv 2 Power	1W	2Byte	UINT16	Grid-connected, energy storage
10806	PvVoltAvg[cPV3]	PV3 voltage	Pv 3 Voltage	0.1V	2Byte	UINT16	Grid-connected, energy storage
10807	PvCurrentAvg[cPV3]	PV3 current	Pv 3 Current	0.1A	2Byte	UINT16	Grid-connected, energy storage
10808	PVPower[cPV3]	PV3 power	Pv3 Power	1W	2Byte	UINT16	Grid-connected, energy storage
10809	PvVoltAvg[cPV4]	PV4 voltage	Pv 4 Voltage	0.1V	2Byte	UINT16	Grid-connected, energy storage
10810	PvCurrentAvg[cPV4]	PV4 current	Pv 4 Current	0.1A	2Byte	UINT16	Grid-connected, energy storage
10811	PVPower[cPV4]	PV4 power	Pv4 Power	1W	2Byte	UINT16	Grid-connected, energy storage
	TBD	10812-11199					
11200	ChargerTemperature	charger/Boost temperature	Charger /BoostTemperature	1°C	2Byte	INT16	Grid-connected, energy storage

11201	InvTemperature	inverter temperature	InvTemperature	1°C	2Byte	INT16	Grid-connected, energy storage
11202	ambient_temperature	Environment temperature	ambient Temperature	1°C	2Byte	INT16	Grid-connected, energy storage
	TBD	11203-11299					
11300	EPSVoltSqr_R	R phase Eps voltage	Eps Voltage R	0.1V	2Byte	INT16	energy storage
11301	EPSCurrentSqr_R	R phase Eps current	Eps Current R	0.1A	2Byte	INT16	energy storage
11302	EPSActivePowerAvg_R	Eps R phase active power	Eps Power R	1W	2Byte	INT16	energy storage
11303	EpsApparentPower_R	EpsR phase real power	Eps Apparent Power R	1VA	2Byte	INT16	energy storage
11304	Eps Freq R	R phase frequency	Freq R	0.01Hz	2Byte	INT16	energy storage
11305	EPSVoltSqr_S	S phaseEps voltage	Eps Voltage S	0.1V	2Byte	INT16	energy storage
11306	EPSCurrentSqr_S	S phaseEps current	Eps Current S	0.1A	2Byte	INT16	energy storage
11307	EPSActivePowerAvg_S	Eps S phase active power	Eps Power S	1W	2Byte	INT16	energy storage
11308	EpsApparentPower_S	EpsS phase real power	Eps Apparent Power S	1VA	2Byte	INT16	energy storage
11309	Eps Freq S	S phase frequency	Freq S	0.01Hz	2Byte	INT16	energy storage
11310	EPSVoltSqr_T	T phaseEps voltage	Eps Voltage T	0.1V	2Byte	INT16	energy storage
11311	EPSCurrentSqr_T	T phaseEps current	Eps Current T	0.1A	2Byte	INT16	energy storage
11312	EPSActivePowerAvg_T	Eps T phase active power	Eps Power T	1W	2Byte	INT16	energy storage
11313	EpsApparentPower_T	EpsT phase real power	Eps Apparent Power T	1VA	2Byte	INT16	energy storage
11314	Eps Freq T	T phase frequency	Freq T	0.01Hz	2Byte	INT16	energy storage
	TBD	11315-11499					

11500	Bat1PortVoltAvg	battery 1 voltage	Battery1 Voltage	0.1V	2Byte	UINT16	energy storage
11501	Bat1CurrentAvg	battery 1 current	Battery1 Current	0.1A	2Byte	INT16	energy storage
11502	Bat1WatlAvg	battery 1 power	Battery1 Power	1W	2Byte	INT16	energy storage
11503	Bat2PortVoltAvg	battery 2 voltage	Battery2 Voltage	0.1V	2Byte	UINT16	energy storage
11504	Bat2CurrentAvg	battery 2 current	Battery2 Current	0.1A	2Byte	INT16	energy storage
11505	Bat2WatlAvg	battery 2 power	Battery2 Power	1W	2Byte	INT16	energy storage
11506	Bat3PortVoltAvg	battery 3 voltage	Battery3 Voltage	0.1V	2Byte	UINT16	energy storage
11507	Bat3CurrentAvg	battery 3 current	Battery3 Current	0.1A	2Byte	INT16	energy storage
11508	Bat3WatlAvg	battery 3 power	Battery3 Power	1W	2Byte	INT16	energy storage
11509	Bat4PortVoltAvg	battery 4 voltage	Battery4 Voltage	0.1V	2Byte	UINT16	energy storage
11510	Bat4CurrentAvg	battery 4 current	Battery4 Current	0.1A	2Byte	INT16	energy storage
11511	Bat4WatlAvg	battery 4 power	Battery4 Power	1W	2Byte	INT16	energy storage
	TBD	10512-10799					
11800	FaultMessage.DWORD1	error list	FaultMessage.DWORD1	Schedule	2*2Byte	UINT32	Grid-connected, energy storage
11802	FaultMessage.DWORD2	error list	FaultMessage.DWORD2	Schedule	2Byte	UINT32	Grid-connected, energy storage
11804	FaultMessage.DWORD3	error list	FaultMessage.DWORD3	Schedule	2Byte	UINT32	Grid-connected, energy storage
11806	FaultMessage.DWORD4	error list	FaultMessage.DWORD4	Schedule	2Byte	UINT32	Grid-connected, energy storage
11808	FaultMessage.DWORD5	error list	FaultMessage.DWORD5	Schedule	2Byte	UINT32	Grid-connected, energy storage
11810	FaultMessage.DWORD6	error list	FaultMessage.DWORD6	Schedule	2Byte	UINT32	Grid-connected, energy storage
11812	FaultMessage.DWORD7	error list	FaultMessage.DWORD7	Schedule	2Byte	UINT32	Grid-connected, energy storage

11814	FaultMessage.DWORD8	error list	FaultMessage.DWORD8	Schedule	2Byte	UINT32	Grid-connected, energy storage
	TBD	11816-11999					

	Value	Chinese	English
cWaitState	0	Wait mode	Wait
cCheckState	1	Check mode	Check
cNormalState	2	Normal mode	Normal
cFaultState	3	Fault mode	Fault
cPermanentState	4	PermanentFault mode	PermanentFault
cEpsState	5	Eps mode	Eps
cIdleState	6	Idle mode	Idle
cSelf testState	7	Self test mode	Self test
cFlashState	8	Update mode	Update

4. PCS Electricity information

Adr	register	Description	English display	Note	Length	data type	Model
12000	GridYieldToday	Today generation	Today PCS Yield	0.1Kwh	2Byte	UINT16	Grid-connected, energy storage
12001	TBD						
12002	u32_GridYieldTotal (high 16 Bit)	Total generation	Total PCS Yield	0.1Kwh	2Byte	Uint32	Grid-connected, energy storage
12003	u32_GridYieldTotal (Low 16 bit)	Total generation	Total PCS Yield	0.1Kwh	2Byte		Grid-connected, energy storage
12004	BatChargeFromGridYieldTo day	Today quantity of input electricity	Today PCS In Yield	0.1Kwh	2Byte	UINT16	energy storage
12005	TBD						
12006	u32_BatChargeFromGridYiel	PCS total quantity of	Total PCS InYield	0.1Kwh	2Byte	Uint32	energy storage

	dTotal (High 16 bit)	input electricity					
12007	u32_BatChargeFromGridYiel dTotal (Low 16 bit)	PCS total quantity of input electricity	Total PCS In Yield	0.1Kwh	2Byte		energy storage
12008	GridExportYieldToday1	Today Grid Feed-in 1 Yield	Today Grid Feed-in 1 Yield	0.1Kwh	2Byte	UINT16	energy storage
12009	CgridImportYieldTotal1	Today Grid Feed-out 1 Yield	Today Grid Feed-out 1 Yield	0.1Kwh	2Byte	UINT16	energy storage
12010	u32_cGridExportYieldTotal1 (High 16 bit)	Total Grid Feed-in 1 Yield	Total Grid Feed-in 1 Yield	0.1Kwh	2Byte	Uint32	energy storage
12011	u32_cGridExportYieldTotal1 (Low 16 bit)	Total Grid Feed-in 1 Yield	Total Grid Feed-in 1 Yield	0.1Kwh	2Byte		energy storage
12012	u32_cGridImportYieldTotal1 (High 16 bit)	Total Grid Feed-out 1 Yield	Total Grid Feed-out 1 Yield	0.1Kwh	2Byte	Uint32	energy storage
12013	u32_cGridImportYieldTotal1 (Low 16 bit)	Total Grid Feed-out 1 Yield	Total Grid Feed-out 1 Yield	0.1Kwh	2Byte		energy storage
12014	GridExportYieldToday2	Today Grid Feed-in 2 Yield	Today Grid Feed-in 2 Yield	0.1Kwh	2Byte	UINT16	energy storage
12015	CgridImportYieldTotal2	Today Grid Feed-out 2 Yield	Today Grid Feed-out 2 Yield	0.1Kwh	2Byte	UINT16	energy storage
12016	u32_cGridExportYieldTotal2 (High 16 bit)	Total Grid Feed-in 2 Yield	Total Grid Feed-in 2 Yield	0.1Kwh	2Byte	Uint32	energy storage
12017	u32_cGridExportYieldTotal2 (Low 16 bit)	Total Grid Feed-in 2 Yield	Total Grid Feed-in 2 Yield	0.1Kwh	2Byte		energy storage
12018	u32_cGridImportYieldTotal2 (High 16 bit)	Total Grid Feed-out 2 Yield	Total Grid Feed-out 2 Yield	0.1Kwh	2Byte	Uint32	energy storage
12019	u32_cGridImportYieldTotal2 (Low 16 bit)	Total Grid Feed-out 2 Yield	Total Grid Feed-out 2 Yield	0.1Kwh	2Byte		energy storage
12020	LOAD Yield Today	Today Load Yield	Today Load Yield	0.1Kwh	2Byte	INT16	energy storage

12021	TBD						
12022	u32_Load Yield Total (High 16 bit)	Total Load Yield	Total Load Yield	0.1Kwh	2Byte	Int32	energy storage
12023	u32_Load Yield Total (Low 16 bit)	Total Load Yield	Total Load Yield	0.1Kwh	2Byte		energy storage
12024	u32_EPS Yield Today	Today EPS Yield	Today EPS Yield	0.1Kwh	2Byte	UINT16	energy storage
12025							
12026	u32_EPS Yield Total (High 16 bit)	Total EPS Yield	Total EPS Yield	0.1Kwh	2Byte	Uint32	energy storage
12027	u32_EPS Yield Total (Low 16 bit)	Total EPS Yield	Total EPS Yield	0.1Kwh	2Byte		energy storage
12028	Bat Discharge Yield Today	Today Bat Discharge Yield	Today Bat Discharge Yield	0.1Kwh	2Byte	UINT16	energy storage
12029	Bat Charge Yield Today	Today Battery Charge Yield	Today Battery Charge Yield	0.1Kwh	2Byte	UINT16	energy storage
12030	u32_Bat Discharge Yield Total (High 16 bit)	Bat Discharge Total Yield	Bat Discharge Total Yield	0.1Kwh	2Byte	Uint32	energy storage
12031	u32_Bat Discharge Yield Total (Low 16 bit)	Bat Discharge Total Yield	Bat Discharge Total Yield	0.1Kwh	2Byte		energy storage
12032	u32_Bat Charge Yield Total (High 16 bit)	Bat Charge Total Yield	Bat Charge Total Yield	0.1Kwh	2Byte	Uint32	energy storage
12033	u32_Bat Charge Yield Total (Low 16 bit)	Bat Charge Total Yield	Bat Charge Total Yield	0.1Kwh	2Byte		energy storage
	TBD	12034-12799					

3.1.4PCS Other information

Adr	register	Chinese display	English display	Note	Length	data type	model
12800	SYSTimer.u16_Year	System TimerYear	System TimerYear	1 year	2Byte	UINT16	Grid-connected, energy storage
12801	SYSTimer.u16_Month	System TimerMonth	System TimerMonth	1 month	1Byte	UINT8	Grid-connected, energy storage
	SYSTimer.u16_Day	System TimerDay	System TimerDay	1 day	1Byte	UINT8	Grid-connected, energy storage
12802	SYSTimer.u16_Hour	System TimerHour	System TimerHour	1 hour	1Byte	UINT8	Grid-connected, energy storage
	SYSTimer.u16_Minute	System TimerMinute	System TimerMinute	1 min	1Byte	UINT8	Grid-connected, energy storage
12803	Self Test_UVP_10Min_Set value	Italian safety regulations Self inspection results	10 min overvoltage setting value (59.S1)	0.1V	2Byte	UINT16	Grid-connected, energy storage
12804	Self Test_UVP_10Min_SetTime		10 min overvoltage setting time	1s	2Byte	UINT16	Grid-connected, energy storage
12805	Self Test_UVP_10Min_value		10 min overvoltage trip value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12806	Self Test_UVP_10Min_Time		10 min overvoltage trip time	1s	2Byte	UINT16	Grid-connected, energy storage
12807	Self Test_UVP_10Min_Real value		10 minute over voltage Real time value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12808	Self Test_OVP_Set value		59. S2 over voltage setting value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12809	Self Test_OVP_Set Time		Over voltage setting time	1ms	2Byte	UINT16	Grid-connected, energy storage
12810	Self Test_OVP_value		Over voltage trip value	0.1V	2Byte	UINT16	Grid-connected, energy storage

12811	Self Test_OVP_Time		Over voltage trip time	1ms	2Byte	UINT16	Grid-connected, energy storage
12812	Self Test_OVP_Real Value		Over voltage Real time value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12813	Self Test_UVP_Set value		27.S1 Under voltage set point	0.1V	2Byte	UINT16	Grid-connected, energy storage
12814	Self Test_UVP_Set Time		Under voltage setting time	1ms	2Byte	UINT16	Grid-connected, energy storage
12815	Self Test_UVP_value		Under voltage trip value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12816	Self Test_UVP_Time		Under voltage trip time	1ms	2Byte	UINT16	Grid-connected, energy storage
12817	Self Test_UVP_Real Value		Under voltage real time value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12818	Self Test_UVP2_Set value		27.S2 Under voltage set point	0.1V	2Byte	UINT16	Grid-connected, energy storage
12819	Self Test_UVP2_SetTime		Under voltage setting time	1ms	2Byte	UINT16	Grid-connected, energy storage
12820	Self Test_UVP2_value		Under voltage trip value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12821	Self Test_UVP2_Time		Under voltage trip time	1ms	2Byte	UINT16	Grid-connected, energy storage
12822	Self Test_UVP2_Real Value		Under voltage real time value	0.1V	2Byte	UINT16	Grid-connected, energy storage
12823	Self Test_OFPI_Set value		81>.S1 over frequency 1 setting value	0.01Hz	2Byte	UINT16	Grid-connected, energy storage
12824	Self Test_OFPI_Set Time		overfrequency1 setting time	1ms	2Byte	UINT16	Grid-connected, energy storage
12825	Self Test_OFPI_value		overfrequency1 trip value	0.01Hz	2Byte	UINT16	Grid-connected, energy storage
12826	Self Test_OFPI_Time		overfrequency1 trip time	1ms	2Byte	UINT16	Grid-connected, energy storage
12827	Self Test_OFPI_Real Value		overfrequency1 real time	0.01Hz	2Byte	UINT16	Grid-connected, energy storage

			value			storage
12828	Self Test_UFP1_Set value		81<.S1 overfrequency1 setting value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12829	Self Test_UFP1_Set Time		overfrequency1 setting time	1ms	2Byte	UINT16 Grid-connected, energy storage
12830	Self Test_UFP1_ value		overfrequency1 trip value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12831	Self Test_UFP1_Time		overfrequency1 trip time	1ms	2Byte	UINT16 Grid-connected, energy storage
12832	Self Test_UFP1_Real Value		overfrequency1 real time value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12833	Self Test_OF2_Set value		81>.S2 overfrequency2 setting value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12834	Self Test_OF2_Set Time		overfrequency2 setting time	1ms	2Byte	UINT16 Grid-connected, energy storage
12835	Self Test_OF2_ value		overfrequency2 trip value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12836	Self Test_OF2_Time		overfrequency2 trip time	1ms	2Byte	UINT16 Grid-connected, energy storage
12837	Self Test_OF2_Real Value		overfrequency2 real time value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12838	Self Test_UFP2_Set value		81<.S2 overfrequency2 setting value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12839	Self Test_UFP2_Set Time		overfrequency2 setting time	1ms	2Byte	UINT16 Grid-connected, energy storage
12840	Self Test_UFP2_ value		overfrequency2 trip value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
12841	Self Test_UFP2_Time		overfrequency2 trip time	1ms	2Byte	UINT16 Grid-connected, energy storage
12842	Self Test_UFP2_Real Value		overfrequency2 real time value	0.01Hz	2Byte	UINT16 Grid-connected, energy storage
	TBD	12817-12999				

3.1.6 Fault Message error list

Table 1 (General fault table)

	Error information (program table)	ENG Description	comment	ID number
31	No Utility	No utility	Grid voltage is zero	ID1
30	PV Config Wrong	PV Config Wrong	PV settings is wrong	ID2
29	Ground I Fault	Ground I fault Over Ground current	Ground current is too high	ID3
28	Relay Fault	Relay fault	Relay fault (total)	ID4
27	Inv Relay Fail	Inv Relay fault	Inv Relay fault	ID5
26	Eps Relay Fail	Eps Relay fault	Eps Relay is fault	ID6
25	Bat Relay Fail	Battery Relay fault	Battery Relay fault	ID7
24	By pass Relay Fail	By pass Relay Fault	By pass Relay fault	ID8
23	TBD			ID9
22	TBD			ID10
21	Comm Lose_HMI_S	HMI to S fail	Communication fails between HMI and Ctrl board	ID11
20	Comm Lose_M_S	Main to Secondary fault	Communication between main cpu and slave is failing	ID12

19	Comm Lose_HMI_C	HMI to C fault	Communication between salve cpu and collect board is failing	ID13
18	BmsLost	Bms lost	Communication Between battery to Device	ID14
17	Meter/CT lost	Meter/CT lost	Communication lost Between meter to Device	ID15
16	TBD			ID16
15	TBD			ID17
14	TBD			ID18
13	TBD			ID19
12	TBD			ID20
11	TBD			ID21
10	TBD			ID22
9	TBD			ID23
8	TBD			ID24
7	OCP Fault	OCP Fault	Over current fault (total)	ID25
6	Grid Volt Fault	Grid Volt Fault	Grid voltage fault (total)	ID26
5	Grid Freq Fault	Grid Freq Fault	Grid frequency fault (total)	ID27
4	TBD			ID28
3	TBD			ID29
2	TBD			ID30

1	TBD			ID31
0	TBD			ID32

Table 2 (PV&BUS input fault table)

	error information	ENG Description	comments	ID
31	Pv1 VoltOvr Fault	Pv1 OVP	Pv-1 input volt is too high	ID33
30	Pv2 VoltOvr Fault	Pv2 OVP	Pv-2 input volt is too high	ID34
29	Pv3 VoltOvr Fault	Pv3 OVP	Pv-3 input volt is too high	ID35
28	Pv4 VoltOvr Fault	Pv4 OVP	Pv-4 input volt is too high	ID36
27	TBD			ID37
26	TBD			ID38
25	Pv1 VoltLowFault	Pv1UVP	Pv-1 input volt is too low	ID39
24	Pv2 VoltLowFault	Pv2UVP	Pv-2 input volt is too low	ID40
23	Pv3 VoltLowFault	Pv3UVP	Pv-3 input volt is too low	ID41
22	Pv4 VoltLowFault	Pv4UVP	Pv-4 input volt is too low	ID42
21	TBD			ID43

20	TBD			ID44
19	PV Iso Fault	PV Isolator Fault	Isolation resistance of PV-plant is abnormal(single or multiple will report together)	ID45
18	Bat Iso Fault	Bat Isolator Fault	isolation resistance of battery is abnormal	ID46
17	PV Volt Fault	PV Volt Fault	PV voltage fault TOTAL	ID47
16	TBD			ID48
15	Pv1AveCur OvrFault	Sw OCP_PV1	Pv-1 input current is too high (Software mean protection)	ID49
14	Pv2AveCur OvrFault	Sw OCP_PV2	Pv-2 input current is too high (Software mean protection)	ID50
13	Pv3AveCur OvrFault	Sw CP_PV3	Pv-3 input current is too high (Software mean protection)	ID51
12	Pv4AveCur OvrFault	Sw OCP_PV4	Pv-4 input current is too high (Software mean protection)	ID52
11	Hw OCP_Boost 1	Hw OCP_BST1	Protection for boost-1 current over rating(unrecover)	ID53
10	Hw OCP_Boost 2	Hw OCP_BST2	Protection for boost-2 current over rating(unrecover)	ID54
9	HwOCP_Boost3	Hw OCP_BST3	Protection for boost-3 current over rating(unrecover)	ID55

8	HwOCP_B oost4	Hw OCP_ BST4	Protection for boost-4 current over rating(unrecover)	ID56
7	HwOCP_B oost	Hw OCP_ BST	Hardware protection for Boost current over rating Boost	ID57
6	SwOCP_Bo ost	Sw OCP_ BST	Hardware protection for Boost current over rating(unrecover)	ID58
5	TBD			ID59
4	TBD			ID60
3	TBD			ID61
2	uHWBusO VP	uHw Bus OVP	Hardware protection for Bus voltage over rating(unrecover)	ID62
1	Bus Low Fault	Bus UVP	DC Bus volt is low	ID63
0	Bus Over Fault	BusOVP	DC Bus volt is high	ID64

Table 3 (grid side fault table)

	error informatio n	ENG Description	comments	ID
31	VgridROve rRating	GridOVP_R R phaseover voltage	R phase Grid Volt Over Rating R phaseover voltage	ID65
30	VgridRUnd erRating	GridUVP_R R phase Undervoltage	R phase Grid Volt Under Rating R phase Undervoltage	ID66

29	VgridSOVerRating	GridOVP_S S phaseover voltage	S phase Grid Volt Over Rating S phaseover voltage	ID67
28	VgridSUnderRating	GridUVP_S S phase Undervoltage	S phase Grid Volt Under Rating S phase Undervoltage	ID68
27	VgridTOVerRating	GridOVP_T T phaseover voltage	T phase Grid Volt Over Rating T phaseover voltage	ID69
26	VgridTUnderRating	GridUVP_T T phase Undervoltage	T phase Grid Volt Under Rating T phase Undervoltage	ID70
25	GridOVP	GridOVP	Grid volt over rating	ID71
24	GridUVP	GridUVP	Grid volt under rating	ID72
23	FgridROVerRating	GridOFP_R R phase overfrequency	R phase Grid frequency Over Rating R phase overfrequency	ID73
22	FgridRUnderRating	GridUFP_R	R phase Grid frequency Under Rating	ID74
21	FgridSOVerRating	GridOFP_S R phase overfrequency	S phase Grid frequency Over Rating S phase overfrequency	ID75
20	FgridSUnderRating	GridUFP_S	S phase Grid frequency Under Rating	ID76
19	FgridTOVerRating	GridOFP_T R phase overfrequency	T phase Grid frequency Over Rating T phase overfrequency	ID77
18	FgridTUnderRating	Grid UFP_T	T phase Grid frequency Under Rating	ID78
17	GridOFR	Grid OFR	Grid frequency over rating	ID79
16	GridUFR	Grid UFR	Grid frequency under rating	ID80
15	VGridRSOverRating	Grid OVP_RS	RS line voltage is over rating	ID81

14	VGridSTOverRating	Grid OVP_ST	ST line voltage is over rating	ID82
13	VGridTROverRating	Grid OVP_TR T-R phaseover voltage	TR line voltage is over rating	ID83
12	VGridRSUnderRating	Grid UVP_RS	RS line voltage is under rating	ID84
11	VGridSTUnderRating	Grid UVP_ST	ST line voltage is under rating	ID85
10	VGridTRUnderRating	GridUVP_TR T-R phase Under voltage	TR line voltage is under rating	ID86
9	HwAcOCP_R	Hw Ac OCP_R	R phase Grid Current Over Ratingtrig the HW protect	ID87
8	HwAcOCP_S	HwAcOCP_S	S phase Grid Current Over Ratingtrig the HW protect	ID88
7	HwAcOCP_T	Hw Ac OCP_T	T phase Grid Current Over Ratingtrig the HW protect	ID89
6	HwAcOCP	HwAcOCP	Grid Current Over Rating	ID90
5	TBD			ID91
4	SwAcOCP_R	SwAcOCP_R	R phase Grid Current RMS value Over Rating R phaseRMS	ID92
3	SwAcOCP_S	SwAcOCP_S	S phase Grid Current RMSvalue Over Rating S phaseRMS	ID93
2	SwAcOCP_T	SwAcOCP_T	Tphase Grid Current RMSvalue Over Rating T phaseRMS	ID94
1	SwAcOCP	SwAcOCP	RSTphase Grid Current RMSvalue Over Rating	ID95
0	TBD			ID96

Table 4 (grid side fault table)

	error information	ENG Description	comments	ID
31	PLLFault	PLL fault	PLL fails	ID97
30	PhaseSequenceFault	Ph Seq fault	Sequence of Phase is incorrect	ID98
29	LVRTFault	LvrtFault	Low voltage ride through fails	ID99
28	TBD			ID100
27	TBD			ID101
26	TBD			ID102
25	TBD			ID103
24	TBD			ID104
23	TBD			ID105
22	TBD			ID106
21	TBD			ID107
20	TBD			ID108
19	TBD			ID109
18	TBD			ID110
17	TBD			ID111
16	TBD			ID112
15	TBD			ID113

14	TBD			ID114
13	TBD			ID115
12	TBD			ID116
11	TBD			ID117
10	TBD			ID118
9	TBD			ID119
8	TBD			ID120
7	ConsistFaultForVac	ConsistVac	Different value between Master and Slave for grid voltage	ID121
6	ConsistFaultForFac	Grid frequency inconsistent	Different value between Master and Slave for grid frequency	ID122
5	ConsistFaultForGFCI	Consist GFCI	Different value between Master and Slave for GFCI	ID123
4	ConsistFaultForDCI	Consist DCI	Different value between Master and Slave for output DC injection current	ID124
3	ConsistFault	Consist Fault	Consist Fault	ID125
2	BusUnbalance	Bus volt Uble	Bus voltage is unbalance	ID126
1	IacRmsUnbalance	Iac Rms unbalance	The Current of Tree phase are unbalance	ID127
0	VacRmsUnbalance	Vac Rms unbalance	The voltage of Tree phase are unbalance	ID128

Table 5 (grid side& temperature fault table)

	error information	ENG Description	comments	ID
31	DCIGridR OverLimit	DciOCP_R	R phase DC injection check for grid Current is over rating	ID129
30	DCIGridSO verLimit	DciOCP_S	S phase DC injection check for grid Current is over rating	ID130
29	DCIGridTO verLimit	DciOCP_T	T phase DC injection check for grid Current is over rating	ID131
28	DC_Inj_High	DciOCP	The DC injection check for grid Current is over rating	ID132
27	TBD			ID133
26	TBD			ID134
25	TBD			ID135
24	TBD			ID136
23	GFCIJump OverLimit1	GFCI > 30mA	Jump fault for Ground current over limit of 30mA	ID137
22	GFCIJump OverLimit2	GFCI > 60mA	Jump fault for Ground current over limit of 60mA	ID138

21	GFCIJump OverLimit3	GFCI > 150mA	Jump fault for Ground current over limit of 150mA	ID139
20	GFCIJump OverLimit4	GFCI > 300mA	Ground current is higher than 300mA	ID140
19	GFCIOverF ault	GFCIFault	Ground current is higher	ID141
18	GFCIDevic eFault	HW_GFCI	GFCI sense device is filed	ID142
17	TBD			ID143
16	TBD			ID144
15	INVModule OverTempF ault	INV OV Temp	INV Module over temperature	ID145
14	INVModule 1OverTemp Fault	INV1 OV Temp	INV Module1 over temperature	ID146
13	INVModule 2OverTemp Fault	INV2 OV Temp	INV Module 2 over temperature	ID147
12	INVModule 3OverTemp Fault	INV3 OV Temp	INV Module 3 over temperature	ID148
11	BSTModul eOverTemp Fault	BST OV Temp	Boost Module over temperature	ID149
10	BSTModul e1OverTem pFault	BST1 OV Temp	Boost Module1 over temperature	ID150
9	BSTModul e2OverTem pFault	BST2 OV Temp	Boost Module 2 over temperature	ID151
8	BSTModul e3OverTem pFault	BST3 OV Temp	Boost Module 3 over temperature	ID152
7	BSTModul e4OverTem pFault	BST4 OV Temp	Boost Module 4 over temperature	ID153

6	TBD			
5	TBD			
4	TBD			ID156
3	TBD			ID157
2	TBD			ID158
1	OverTemp	Over Temp	Over temperature fault	ID159
0	AMBModuleOverTemperatureFault	AMB OV Temp	Amb Over temperature too high	ID160

Table 6 (cpu fault)

	error information	ENG Description	comments	ID
31	RchipFault	Slave CPU fault	Slave CPU fault	ID161
30	MchipFault	Master CPU fault	Master CPU fault	ID162
29	HMIChipFault	HMI CPU fault	HMI CPU fault	ID163
28	TBD			ID164
27	EEPROM_Write_fault_Ctl	<u>Vice-Memory writing fault</u>	EEPROM can't write(unrecover) on control board	ID165
26	EEPROM_Read_fault_Ctl	<u>Vice-Memory reading fault</u>	EEPROM can't read (unrecover) on control board	ID166

25	EEPROM_Write_fault_HMI	Vice-Memory writing fault	EEPROM can't write (unrecover) on HMI board	ID167
24	EEPROM_Read_fault_HMI	HMI EEPROM reading fault	EEPROM can't read (unrecover) on HMI board	ID168
23	SampleFault	Sample Fault	AD General description	ID169
22	TBD			ID170
21	TBD			ID171
20	HwM_ADFaultVGrid	Main grid voltage AD fault	M CPU AD channel for Grid voltage fault	ID172
19	HwM_ADFaultVinv	Main inverter ad voltage fault	M CPU AD channel for INV voltage fault	ID173
18	HwM_ADFaultIGrid	HwM_ADIGrid Main output currentAD fault	M CPU AD channel for Grid current fault	ID174
17	HwM_ADFaultDCI	HwM_AD_DCI	M CPU AD channel for DCI fault	ID175
16	HwM_ADFaultGFCI	HwM_AD_GFCI	M CPU AD channel for GFCI fault	ID176
15	TBD			ID177
14	HwS_ADFaultVGrid	HwS_ADVGrid	S CPU AD channel for Grid voltage fault	ID178
13	HwS_ADFaultVinv	HwS_ADVInv	S CPU AD channel for INV voltage fault	ID179
12	HwS_ADFaultIGrid	HwS_ADIGrid	S CPU AD channel for Grid current fault	ID180
11	HwS_ADFaultDCI	HwS_AD_DCI	S CPU AD channel for DCI fault	ID181

10	HwS_ADFaultGFCI	HwS_AD_GFCI	S CPU AD channel for GFCI fault	ID182
9	TBD			ID183
8	TBD			ID184
7	TBD			
6	RTCRWFault	RTCRW fault	RTC on Communication board can't read or write	ID186
5	TBD			ID187
4	TBD			ID188
3	TBD			ID189
2	TBD			ID190
1	AuxPower1 Fault	HwSPS1Fault	Auxiliary power 1 fails	ID191
0	AuxPower2 Fault	HwSPS2Fault	Auxiliary power 2 fails	ID192

Table 7 (battery /EPS fault)

	error information	ENG Description	comments	ID
31	OCP_Bat	Over current fault_Bat	Battery over current	ID193
30	OVP_Bat	Over voltage fault_Bat	Battery over volt battery over voltage	ID194
29	OCP_Charge	Over current fault_Charge	chargeover current	ID195
28	OCP_Discharge	Over current fault_Discharge	dischargeovercurrent	ID196

27	Bat_power_low	Bat_power_low	Bat_power_low	ID197
26	Vbat_low	Bat_Voltage_low	Bat_Voltage_low	ID198
25	TBD			ID199
24	TBD			ID200
23	EPS_DCI_fault	Eps dci fault	Eps dci fault	ID201
22	EPS_overload	EPS overload	EPS overload	ID202
21	TBD			ID203
20	TBD			ID204
19	TBD			ID205
18	TBD			ID206
17	TBD			ID207
16	TBD			ID208
15	BmsTempHigh	Bms battery Temp High		ID209
14	BmsTempLow	Bms battery Temp Low		ID210
13	TBD			ID211
12	TBD			ID212
11	TBD			ID213
10	TBD			ID214
9	TBD			ID215
8	TBD			ID216

7	TBD			ID217
6	TBD			ID218
5	TBD			ID219
4	TBD			ID220
3	TBD			ID221
2	TBD			ID222
1	TBD			ID223
0	BMS_Cell mbalance	BMS_Cell unbalance		ID224

Table 8 (peripheral device fault)

	error information	ENG Description	comments	ID
31	DcFanFault	Fan alarm	Fan fails	ID225
30	DcFan1Fault	Fan-1 alarm	Fan-1 fails	ID226
29	DcFan2Fault	Fan-2 alarm	Fan-2 fails	ID227
28	TBD			ID228
27	TBD			ID229
26	TBD			ID230
25	TBD			ID231
24	TBD			ID232
23	LightingAlarm	Lighting Alarm	Lighting protection alarm	ID233
22	TBD			ID234

21	TBD			ID235
20	TBD			ID236
19	TBD			ID237
18	TBD			ID238
17	TBD			ID239
16	TBD			ID240
15	ExternalCommodulefault	Ex.Communication fault		ID241
14	TBD			ID242
13	TBD			ID243
12	TBD			ID244
11	TBD			ID245
10	TBD			ID246
9	TBD			ID247
8	TBD			ID248
7	TBD			ID249
6	TBD			ID250
5	TBD			ID251
4	TBD			ID252
3	TBD			ID253
2	TBD			ID254
1	TBD			ID255
0	TBD			ID256

4.1 Holding register write/read (function code 0x03、0x06、0x10)

2.Device configuration information

Adr	Register	R/W	Description	English display	Range	Note	Data type	机器类型
50200	Language	R/W	language	Language	0-1	NA	Uint16	Grid-connecte d, energy storage
50201	Safetytype	R/W	Safety country	Safety country	table	NA	Uint16	Grid-connecte d, energy storage
50202	ModbusAddress.	R/W	Modbus address	Modbus Address.	0-20	NA	Uint16	Grid-connecte d, energy storage
50203	Factorymode	R/W	Factory mode	0: Invalid, 1: Non-factory mode, 2: factory mode	0~2	NA	Uint16	Grid-connecte d, energy storage
50204	PV coConnfig	R/W	PV Input mode configuration	0: invalid 1: single 2: parallel	0-2	NA	Uint16	Grid-connecte d, energy storage
50205	DRMEnable	R/W	DRM Enable settings	DRMEnable	0: disable 1: enable	NA	Uint16	Grid-connecte d, energy storage
50206	MuteEnable	R/W	Beeper settings	Mute Enable	0: disable	NA	Uint16	

					1: enable			Grid-connecte d, energy storage
50207	startSelf test	R/W	Start Self test	Start Self test	1	NA	Uint16	Grid-connecte d, energy storage
50208	SaftyModeLock	R/W	ITALY Safety Mode Lock	Safety Mode Lock	0: disable 1: enable	NA	Uint16	Grid-connecte d, energy storage
50209	DI ONOFF	R/W	External switch signal enable	DI ONOFF	0: disable 1: enable	NA	Uint16	Grid-connecte d, energy storage
50210	TBD							
50211	TBD							
50212	EnableEps	R/W	EPS enable switch	EPS Enable	0: disable 1: enable	NA	Uint16	energy storage
50213	Operation Mode	R/W	Working mode	Operation Mode	Table	NA	Uint16	energy storage
	TBD		50214-50399	20				

value	Country	display
0	Australia	AS4777_AU
1	New Zealand	AS4777_NZ
2	Britain	G98-1
3	Britain	G99-1
4	Netherlands	Netherlands
5	Italy	CEI-021

6	Germany	VDE0126
7	Germany	ARN4105
8	Brazil	Brasil-220
9	Brazil	Brasil-240
10	India	IEC61727
11	Philippines	Philippines
12	South Africa	NRS 097-2-1
13	Viet Nam	Vietnam
14	Poland	Poland
15	Portugal	Portugal
16	Czech Republic	PPDS
17	Spain	UNE-206
18	Spain	RD 1699
19	Belgium	C10/11
20	France	VFR2014
Tbd		

TABLE

Working mode	Description	value
Self Use	Generate and use by Self	0
Forcetimeuse	Forced charge and discharge	1
Backup	Backup power supply	2
SellingFirst	Power sale priority	3
TBD		

5. Execution of orders

50600	CheckUserPassword	w	CheckUserPassword	NA	0~9999	Detail	UINT16	Grid-connected, energy storage
50601	CheckInstallerPassword	w	CheckInstallerPassword	NA	0~9999	Detail	UINT16	Grid-connected, energy storage
50602	CheckAdministratorPassword	w	CheckAdministratorPassword	NA	0~9999	Detail	UINT16	Grid-connected, energy storage

50603	ResetEToday	w	ResetEToday	ResetEnergytotay	1	NA	UINT16	Grid-connected, energy storage
50604	ResetETotal	w	ResetETotal	ResetEnergytotal	1	NA	UINT16	Grid-connected, energy storage
50605	ResetEventList	w	ResetEventList	Reseteventlist	1	NA	UINT16	Grid-connected, energy storage
50606	ON/OFF Remotecontrol	w	ON/OFF Remotecontrol	0: on 1: off	0~1	NA	UINT16	Grid-connected, energy storage
50607	WriteE_today	W	WriteE_today	E_today	0-65535	0.1 kW	Uint16	Grid-connected, energy storage
50608	WriteE_total	W	WriteE_total	E_total	2*2bytes	0.1 kW	Uint32	Grid-connected, energy storage
50610	ClearEpsOverLoad	w	ClearEpsOverLoad	ClearEps Over Load	1	NA	UINT16	energy storage
50611	DRM command	w	DRM command	High bit code drm0-8 type,low bit 0: Do not execute 1: execute				
50612	Enter ATE test	w	Send the command that enter ATE test	1. Inverter loading unlimited, countdown becomes short time	1			
50613	Stop command	w	Send the stop waiting command	0: cancel 1: stop				
	TBD		50611-50799					

6. Parameter setting

Safety parameter

Start parameter

Starting address is 50800, the length of register is 8, data length is 16

Adr	Register	R/W	comments	Range	Note	Data type	Machine type
50800	u16ConnectTime	R/W	Starting connect time	15~300	1S	Uint16	

							Grid-connected, energy storage
50801	u16LoadSpeed	R/W	Starting load speed	0-1000	0.1%/min	Uint16	Grid-connected, energy storage
50802	u16ReconnectTime	R/W	Re-connect time	0~60000	1s	Uint16	Grid-connected, energy storage
50803	u16ReloadSpeed	R/W	Re-connect load speed	0~1000	0.1%/min	Uint16	Grid-connected, energy storage
50804	u16VgridBackHigh	R/W	Upper limit of voltage before grid connection	2000-3000	0.1V	Uint16	Grid-connected, energy storage
50805	u16VgridBackLow	R/W	Lower limit of voltage before grid connection	500-2200	0.1V	Uint16	Grid-connected, energy storage
50806	u16FgridBackHigh	R/W	Upper limit of frequency before grid connection	4500-6500	0.01Hz	Uint16	Grid-connected, energy storage
50807	U16FgridBackLow	R/W	Lower limit of frequency before grid connection	4500-6500	0,01Hz	Uint16	Grid-connected, energy storage

							storage
	TBD		50808-50899	10			

Lower limit of voltage before grid connection < Upper limit of voltage before grid connection

Lower limit of frequency before grid connection < Upper limit of frequency before grid connection

Grid voltage parameter setting

Starting Address is 50900,register length is 14,data length is 28

50900	VoltProCon	R/W	Voltage protection enable setting	Table	NA	Uint16	Grid-connected, energy storage
50901	u16Vmax1Limit	R/W	upper limit of grid voltage 1	2000~3000	0.1V	Uint16	Grid-connected, energy storage
50902	u16Vmax1ProtectTime	R/W	upper limit of grid voltage 1 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
50903	u16Vmax2Limit	R/W	upper limit of grid voltage 2	2000~3000	0.1V	Uint16	Grid-connected, energy storage
50904	u16Vmax2ProtectTime	R/W	upper limit of grid voltage 2 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
50905	u16Vmax3Limit	R/W	upper limit of grid voltage 3	2000~3000	0.1V	Uint16	Grid-connected, energy storage
50906	u16Vmax3ProtectTime	R/W	upper limit of grid voltage 3 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
50907	u16Vmin1Limit	R/W	Lower limit of grid voltage1	500~2200	0.1V	Uint16	Grid-connected, energy storage

50908	u16Vmin1ProtectTime	R/W	Lower limit of grid voltage1 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
50909	u16Vmin2Limit	R/W	Lower limit of grid voltage2	500~2200	0.1V	Uint16	Grid-connected, energy storage
50910	u16Vmin2ProtectTime	R/W	Lower limit of grid voltage2 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
50911	u16Vmin3Limit	R/W	Lower limit of grid voltage3	500~2200	0.1V	Uint16	Grid-connected, energy storage
50912	u16Vmin3ProtectTime	R/W	Lower limit of grid voltage3 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
50913	u16Vgrid10minPro	R/W	10 minute overvoltage protection value of power grid	2000~3000	0.1V	Uint16	Grid-connected, energy storage
	TBD		50914-51099	20			

BIT	option	comments
Bit0	OVP1Enableover voltage1	0: invalid1 enable
Bit1	OVP2Enableover voltage2	0: invalid1 enable
Bit2	OVP3Enableover voltage3	0: invalid1 enable
Bit3	UVP1Enable Undervoltage 1	0: invalid1 enable
Bit4	UVP2Enable Undervoltage 2	0: invalid1 enable
Bit5	UVP3Enable Undervoltage 3	0: invalid1 enable
Bit6	OVP1MovEnable 10min over voltage	0: invalid1 enable
Bit7	Reserve	reserve

Lower limit of grid voltage3<= Lower limit of grid voltage2<= Lower limit of grid voltage1 < upper limit of grid voltage 1<= upper limit of grid voltage 2<= upper limit of grid voltage 3

grid frequency parameter setting

starting address is 51100, register length is 10, data length is 20

51100	FreProCon	R/W	Frequency Module protection enable setting	表	NA	Uint16	Grid-connected, energy storage
51101	u16Fmax1Limit	R/W	upper limit of grid frequency1	4500~6500	0.01Hz	Uint16	Grid-connected, energy storage
51102	u16Fmax1ProtectTime	R/W	upper limit of grid frequency1 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
51103	u16Fmax2Limit	R/W	upper limit of grid frequency2	4500~6500	0.01Hz	Uint16	Grid-connected, energy storage
51104	u16Fmax2ProtectTime	R/W	upper limit of grid frequency2 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
51105	u16Fmin1Limit	R/W	lower limit of grid frequency 1	4500~6500	0.01Hz	Uint16	Grid-connected, energy storage
51106	u16Fmin1ProtectTime	R/W	lower limit of grid frequency 1 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
51107	u16Fmin2Limit	R/W	lower limit of grid frequency 2	4500~6500	0.01Hz	Uint16	Grid-connected, energy storage
51108	u16Fmin2ProtectTime	R/W	lower limit of grid frequency 2 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
51109	Rocof	R/W	Frequency jump fast	0-50	0.1Hz/s	Uint16	Grid-connected

		protection				ted, energy storage
	TBD	51109-51299	20			

BIT	option	comments
Bit0	OF1Enable overfrequency1	0: invalid1 enable
Bit1	OF2Enable overfrequency2	0: invalid1 enable
Bit2	UFP1Enable Underfrequency1	0: invalid1 enable
Bit3	UFP2Enable Underfrequency2	0: invalid1 enable
Bit4	ROCOF	0: invalid1 enable
Bit5	Italy Wide/narrow frequency	0: invalid1 enable
Bit6	reserve	reserve
Bit7	reserve	reserve

lower limit of grid frequency 2 ≤ lower limit of grid frequency 1 < upper limit of grid frequency1 ≤ upper limit of grid frequency2

Over frequency Load reduction parameter setting

starting address is 51300, register length is 8, data length is 16

Address	Register Name	Access	Description	Start	End	Resolution	Unit	Notes
51300	Power Fr eCon	R/W	Over frequency Load reduction module enable setting			NA	Uint16	Grid-connected, energy storage
51301	u16FreqPoint	R/W	overfrequency Load reduction starting address	4750-6500		0.01Hz	Uint16	Grid-connected, energy storage
51302	u16FreqSpeed	R/W	Load reduction rate	0—1000		0.1%/Hz	Uint16	Grid-connected, energy storage
51303	u16FbackUp	R/W	Reload frequency point	4750-6500		0.01Hz	Uint16	Grid-connected, energy storage

51304	u16FbackDown	R/W	Lower limit of Reload frequency	4750-6500	0.01Hz	Uint16	Grid-connected, energy storage
51305	u16WaitTimeBack	R/W	Reload waiting time	0-65535	1s	Uint16	Grid-connected, energy storage
51306	u16FreqbackSpeed	R/W	Reload rate	0—1000	0.1%/min	Uint16	Grid-connected, energy storage
51307	WaittimeOverFreq	R/W	overfrequency Load reduction waiting time	0-10000	1ms	Uint16	Grid-connected, energy storage
	TBD		51499	10			

BIT	option	comments
Bit0	FreDerating Enable over frequency Load reduction	0: invalid 1: enable
Bit1	Power Follow Freq when the Frequency rebound, the change of power	0: unchanged 1: change
Bit2	reserve	reserve
Bit3	reserve	reserve
Bit4	reserve	reserve
Bit5	reserve	reserve
Bit6	reserve	reserve
Bit7	reserve	reserve

Reload frequency < Reload frequency point < over frequency Load reduction starting address

Reactive power setting

starting address is 51500, register length is 26, data length is 52

51500	ReactiveCon	R/W	Reactive power module enable setting	table	NA	Uint16	Grid-connected, energy storage
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51501	PF_mode	R/W	Pf control model	0-5	表	Uint16	Grid-connected, energy storage
51502	Pfcosphi	R/W	Pf fixed cosphi value	80-100	0.01	int16	Grid-connected, energy storage
51503	PFQvar	R/W	Pf fixed Qvar value	-1000-1000	0.1%	int16	Grid-connected, energy storage
51504	Pfcosphi1	R/W	Pf Curve point 1 cosphi	80-100	0.01	iint16	Grid-connected, energy storage
51505	Pfpowerpoint1	R/W	Pf Curve point 1 power	0-100	1%	Uint16	Grid-connected, energy storage
51506	Pfcosphi2	R/W	Pf Curve point 2 cosphi	80-100	0.01	iint16	Grid-connected, energy storage
51507	Pfpowerpoint2	R/W	Pf Curve point 2 power	0-100	1%	Uint16	Grid-connected, energy storage
51508	Pfcosphi3	R/W	Pf Curve point 3 cosphi	80-100	0.01	iint16	Grid-connected, energy storage
51509	Pfpowerpoint3	R/W	Pf Curve point 3 power	0-100	1%	Uint16	Grid-connected, energy storage
51510	Pfcosphi4	R/W	Pf Curve point 4 cosphi	80-100	0.01	iint16	Grid-connected, energy storage
51511	Pfpowerpoint4	R/W	Pf Curve point 4 power	0-100	1%	Uint16	Grid-connected, energy storage

							storage
51512	PflockinV	R/W	PFP Trigger voltage	0-400V	0.1V	Uint16	Grid-connected, energy storage
51513	PflockoutV	R/W	PFP exit voltage	0-400V	0.1V	Uint16	Grid-connected, energy storage
51514	VU1	R/W	Q(u) model voltage point 1	0-400V	0.1V	Uint16	Grid-connected, energy storage
51515	QU1	R/W	Point 1 reactive value	-1000-1000	0.1%	int16	Grid-connected, energy storage
51516	VU2	R/W	Q(u)model voltage point 2	0-400V	0.1V	Uint16	Grid-connected, energy storage
51517	QU2	R/W	point 2 reactive power	-1000-1000	0.1%	int16	Grid-connected, energy storage
51518	VU3	R/W	Q(u)model voltage point 3	0-400V	0.1V	Uint16	Grid-connected, energy storage
51519	QU3	R/W	point 3 reactive power	-1000-1000	0.1%	int16	Grid-connected, energy storage
51520	VU4	R/W	Q(u)model voltage point 4	0-400V	0.1V	Uint16	Grid-connected, energy storage
51521	QU4	R/W	point 4 reactive power	-1000-1000	0.1%	int16	Grid-connected, energy storage
51522	QulockinP	R/W	Q(u)model trigger power	0-100	1%	Uint16	Grid-conne

							ted, energy storage
51523	QulockoutP	R/W	Q(u)model exit power	0-100	1%	Uint16	Grid-connected, energy storage
51524	Qmax	R/W	Q(u)model maximum Qvar	0-10000	0.01%	Uint16	Grid-connected, energy storage
51525	Waittime	R/W	Delay time	0-10	1s	Uint16	Grid-connected, energy storage
	TBD		51521-51699	30			

BIT	option	comments
Bit0	reserve	reserve
Bit1	fixed cosphi leading	0: invalid1 enable
Bit2	fixed cosphi lagging	0: invalid1 enable
Bit3	PFLineMode	0: invalid1 enable
Bit4	fixed Qvar	0: invalid1 enable
Bit5	Q(u)mode	0: invalid1 enable
Bit6	reserve	reserve
Bit7	reserve	reserve

value	model
0	invalid
1	fixed cosphi leading
2	fixed cosphi lagging
3	PFLineMode
4	fixed Qvar
5	Q(u)mode
reserve	

Power of PF Curve point 1 < power of PF Curve point 2 < power of PF Curve point 3 < power of PF Curve point 4

Q(u)model voltage point 1 < Q(u)model voltage point 2 < Q(u)model voltage point 3 < Q(u)model voltage point 4

PflockinV > PflockoutV

Dci setting

starting address is 51700, register length is 6, data length is 12

51700	DCIProCon	R/W	Dci protection enable setting	table	NA	Uint16	Grid-connected, energy storage
51701	Dcilimit1	R/W	Dci level 1 protection value	0-1500	1mA	Uint16	Grid-connected, energy storage
51702	Dcilimit1time	R/W	Dci level 1 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
51703	Dcilimit2	R/W	Dci level 2 protection value	0-1500	1mA	Uint16	Grid-connected, energy storage
51704	Dcilimit2time	R/W	Dci level 2 Protection time	0-65536	0.01s	Uint16	Grid-connected, energy storage
51705	Dcitest	R/W	Dci testing Injection value	0-5000	1mA	Uint16	Grid-connected, energy storage
	TBD		51706-51799	10			

BIT	option	comments
Bit0	DCI1Enable DC component Lv 1	0: invalid1 enable
Bit1	DCI2Enable DC component Lv 2	0: invalid1 enable
Bit2	DCITestEnable DCI testing Injection	0: invalid1 enable
Bit3	reserve	reserve
Bit4	reserve	reserve
Bit5	reserve	reserve
Bit6	reserve	reserve

Bit7	reserve	reserve
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Dci level 1 protection value \geq Dci level 2 protection value

Fault ride-through

Start address=5xxx0, number of registers=21, length=42

5xxx0	Enable	R/W	Enable	表	NA	Uint16	Grid-connected, energy storage
01	LT1	R/W	LVRT curve, point 1, time (10 millisecond per count, the same below)	0-60000	10 ms	Uint16	Grid-connected, energy storage
02	LV1	R/W	LVRT curve, point 1, voltage ratio (per-mill of grid rated voltage, the same below)	0-2000	Per-mill	Uint16	Grid-connected, energy storage
03	LT2	R/W	LVRT curve, point 2, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
04	LV2	R/W	LVRT curve, point 2, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage
05	LT3	R/W	LVRT curve, point 3, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
06	LV3	R/W	LVRT curve, point 3, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage
07	LT4	R/W	LVRT curve, point 4, time	0-60000	10 ms	Uint16	Grid-connected, energy storage

08	LV4	R/W	LVRT curve, point 4, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage
09	LT5 (reserved)	R/W	LVRT curve, point 5, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
10	LV5 (reserved)	R/W	LVRT curve, point 5, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage
11	HT1	R/W	HVRT curve, point 1, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
12	HVT	R/W	HVRT curve, point 1, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage
13	HT2	R/W	HVRT curve, point 2, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
14	HV2	R/W	HVRT curve, point 2, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage
15	HT3	R/W	HVRT curve, point 3, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
16	HV3	R/W	HVRT curve, point 3, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage
17	HT4	R/W	HVRT curve, point 4, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
18	HV4	R/W	HVRT curve, point 4, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage

							storage
19	HT5 (reserved)	R/W	HVRT curve, point 5, time	0-60000	10 ms	Uint16	Grid-connected, energy storage
20	HV5 (reserved)	R/W	HVRT curve, point 5, voltage ratio	0-2000	Per-mill	Uint16	Grid-connected, energy storage

BIT	option	comments
Bit0	Low/under voltage ride through	0: invalid 1 enable
Bit1	High/over voltage ride through	0: invalid 1 enable
Bit2	reserve	reserve
Bit3	reserve	reserve
Bit4	reserve	reserve
Bit5	reserve	reserve
Bit6	reserve	reserve
Bit7	reserve	reserve

active Scheduling settings

starting address is 51800, register length is 4, data length is 8

51800	PowerRemoteCon	R/W	Power Remote control model setting	table	NA	Uint16	Grid-connected, energy storage
51801	ActivePowerLimit	R/W	Limit of Remote power	0-100	1%	Uint16	Grid-connected, energy storage
51802	RemoteONorOFF	R/W	Remote turn on/off	0—1 1: off	NA	Uint16	Grid-connected, energy storage
51803	ExportPower	R/W	The limit of power the can feedback grid	0-6999	w	Uint16	Grid-connected, energy storage

TBD	51803-51899	10			
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BIT	option	comments
Bit0	Remote Derating Enable Limit of Remote power	0: invalid1 enable
Bit1	Remote ONOFF Enable Remote turn off	0: invalid1 off
Bit2	reserve	reserve
Bit3	reserve	reserve
Bit4	reserve	reserve
Bit5	reserve	reserve
Bit6	reserve	reserve
Bit7	reserve	reserve

ACover voltage Load reduction setting

starting address is51900, register length is 5, data length is 10

51900	AC Power Down Con	R/W	AC too high, power limit model setting	table	NA	Uint16	Grid-connected, energy storage
51901	Start point	R/W	AC too high the start point of power limit	2200-3000	0.1V	Uint16	Grid-connected, energy storage
51902	Speed	R/W	Load reduction rate	0-1000	0.1%/v	Uint16	Grid-connected, energy storage
51903	Back time	R/W	Load reduction waiting time	0-1000	1s	Uint16	Grid-connected, energy storage
51904	Back speed	R/W	Reload rate	0-1000	0.1%/min	Uint16	Grid-connected, energy storage
TBD			51905-51999	10			

BIT	option	comments
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Bit0	AC High Power Down Enable AC too high Load reduction	0: invalid1 enable
Bit1	reserve	reserve
Bit2	reserve	reserve
Bit3	reserve	reserve
Bit4	reserve	reserve
Bit5	reserve	reserve
Bit6	reserve	reserve
Bit7	reserve	reserve

System time setting

starting address is 52100, register length is 0x03, data length is 0x06

52100	SYSTimer.u16_Year	R/W	System TimerYear	System TimerYear	2000~2100	NA	Uint16	Grid-connected, energy storage
52101	SYSTimer.u16_Month	R/W	System TimerMonth	System TimerMonth	1~12	NA	Uint8	Grid-connected, energy storage
	SYSTimer.u16_Day	R/W	System TimerDay	System TimerDay	1~31	NA	Uint8	Grid-connected, energy storage
52102	SYSTimer.u16_Hour	R/W	System TimerHour	System TimerHour	0~23	NA	Uint8	Grid-connected, energy storage
	SYSTimer.u16_Minute	R/W	System TimerMinute	System TimerMinute	0~59	NA	Uint8	Grid-connected, energy storage
52103	SYSTimer.u16_Second	R/W	System TimerSecond	System TimerSecond	0~59	NA	Uint8	Grid-connected, energy storage
	TBD							
	TBD		52104-52199					

meter parameter setting

starting address is 52200, register length is 0x03, data length is 0x06

52200	MeterFunction	R/W	meter、ct enable switch	Meter/CT Function	0-3	NA	Uint16	Grid-connected, energy storage
52201	Meter address1	R/W	Meter 1 address	Meter 1 address	0-FF	NA	Uint16	energy storage
52202	Meter address2	R/W	Meter 2 address	Meter 2 address	0-FF	NA	Uint16	energy storage
	Tbd		52203-52299	10				

model	description	数值
Disable	invalid	0
CT	CT	1
Single meter	Single meter	2
Double meter	Double meter	3
TBD		

7. Protocol connection description

There are two pieces of general monitoring information data, the first one is multiple register read information (0x04), as 3.1.1 showing, read the register from 10000 to 10070

Address	1byte	0x01
Function code	1byte	0x04
Register starting address	1byte	High address
	1byte	Low address
Quantity of register	1byte	0
	1byte	71
CRC check	1byte	Low address
	1byte	High address

The second to the sixth instructions is multiple register reading the real time information (0x04) as 3.1.2, divide in to 5 part

Address	1byte	0x01
Function code	1byte	0x04
Register address	1byte	
	1byte	10500
Quantity of register	1byte	0
	1byte	8
CRC check	1byte	Low address
	1byte	High address

Address	1byte	0x01
Function code	1byte	0x04
Register address	1byte	
	1byte	10700
Quantity of register	1byte	0
	1byte	4 single phase, only read R phase
CRC check	1byte	Low address
	1byte	High address

Address	1byte	0x01
Function code	1byte	0x04
Register address	1byte	
	1byte	10800
Quantity of register	1byte	0
	1byte	3*2 According to the first instruction, decide how many to read
CRC check	1byte	Low address
	1byte	High address

Address	1byte	0x01
Function code	1byte	0x04
Register address	1byte	
	1byte	11200
Quantity of register	1byte	0
	1byte	3
CRC check	1byte	Low address
	1byte	High address

Address	1byte	0x01
Function code	1byte	0x04

Register address	1byte	
	1byte	11800
Quantity of register	1byte	0
	1byte	8
CRC check	1byte	Low address
	1byte	High address

Remote parameter setting part (Temporarily read the current setting value of the corresponding item when entering the setting page, and display the loading with a circle when reading)

1. Basic configuration information>>>>[can read first three information(language, safety country, modbus address) from the table 4.12.(Device configuration information) together, but only one data can be set at a time,so we need set them one by one]

Language,Current value display,option,confirm popup (ENGLISH only now, will add other language latter)

safety,Current value display,option,confirm popup(Refer to the safety regulation table of equipment configuration information. There are 21 at present, which will be added later)

Modbus address modbusAddress. Writing window (read current value) ,confirm popup system time setting

CT/meter setting CT/metersetting

PV input model setting PV config

DRM enable setting DRM Enable

Beeper setting Mute Enable

External switch signal enable DI ON/OFF Enable

2.advanced configuration data>>>>>

Clear generation data of the day Reset Electricity Today set button confirm popup

Clear total generation data Reset Electricity Total set button confirm popup

Clear the event list Reset Event List set button confirm popup

Write generation data of the day Write Electricity today writing window Confirm popup

Write total generation data Write E_total writing window Confirm popup

Remote ON/OFF on/off,confirm switch (current status can get from 51800 active setting)

3 safety parameter setting , safety parameter setting>>>>>

Starting parameter , connect parameter

grid voltage parameter, Grid Voltage parameter

grid frequency parameter, Grid frequency parameter

Over frequency Load reduction parameter, Over frequency protect parameter

Reactive parameter Reactive power control

active parameter Active power control

Dci setting Dci setting

AC over voltage Load reduction setting AC Over voltage power down

specific parameter setting See the previous description table for details.

Italy automatic test

	Vo	To
59.S1 (253V)	253V±1%Vn	600.0s to 603s
59.S2 (264.5V)	264.5V±1%Vn	200±20 ms
27.S1 (195.5V)	195.5V±1%Vn	400±20 ms
27.S2 (92.0V)	92.0V±1%Vn	200±20 ms
81>.S1 (50.5Hz)	50.5Hz±20 mHz	100±20 ms
81<.S1 (49.5Hz)	49.5Hz±20 mHz	100±20 ms
81>.S2 (51.5Hz)	51.5Hz±20 mHz	100±20 ms
81<.S2 (47.5Hz)	47.5Hz±20 mHz	100±20 ms

8 items in the above table are tested, The start is triggered by the auto test start button on the local setting interface. Then need the Confirm popup, after confirmation, send the start test command (as shown in the equipment configuration information address 50207). After the inverter replies, prompt that the test is in progress. Waiting for the test finish (during this time, send the command to read the Self test results, the inverter need reply the information from PCS address 12803 to the end)

After reading the results, the test report will be displayed on the interface. Please refer to the following interface



Need to list the test items, the setting value of every items, setting time, trip value, trip time, real

time value, test result (the result write pass)