GoodWe Modbus Protocol Hybrid

For ES G2/ET(15-30) Series Ver 1.0

UPDATED ON DEC 31TH,2022

1. PROTOCOL DESCRIPTION

This is a map document of standard MODBUS RTU protocol for only GoodWe energy storage inverters compatible with HV battery – ET, EH, BT, BH,EHB,AES,ABP,BTC series.

Inverter Address: Can be assigned from 1~247. 247 is factory default assignment.

Communication baud rate: The default baud rate is 9600 bps

Error Code Returned From Inverter Device:

CRC Verification:

02H: Register address fault or overflow of read register number 03H: Data error 04H: Built-in verification code error 05H: Communication time-out	CRC Verification formula : X16+X12+X5+1 CRC Verification code refer to No.10 Chapter.

Function code:

Byte Format:

03H:Reading 06H: writing single register 10H:writing multiple registers	Every byte consists of 1 start bit, 8-bit binary code and 1 stop bit, 10 bit in total. The byte transmit sequence is described as below. D0 is the lowest bit of data and D7 is the highest
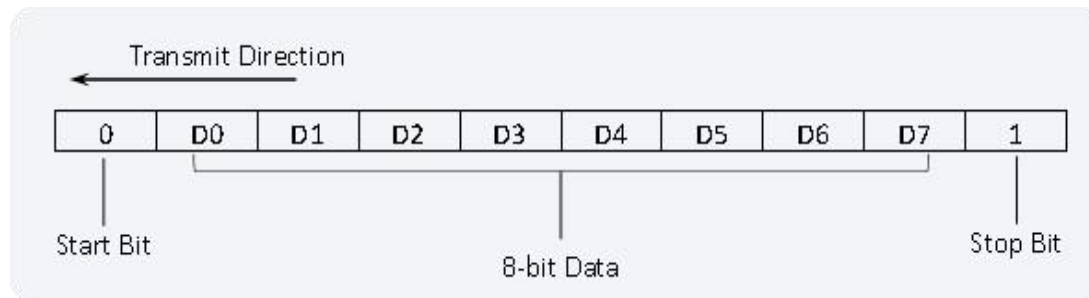
Communication Data Format:

Data is transmitted as word or double word format.

Data Type	Amount of Register	Amount of Byte	Description
Byte Data	1	1	
Integer Data	1	2	Return at one time, from high bit to low bits
Long integer	2	4	Return in two parts, from high bit to low bits
Floating Point Data			

2. Data Frame Format

2.1 Read Register (Function Code: 03H)

2.1.1 Data Frame Format from Host PC

Data NO	Content	Sample	Description
1	Inverter Address	1	Communication address(1-247, Default 0XF7)
2	03H	03H	Function code
3	High byte of first register	00H	Address of register 0001H
4	Low byte of first register	01H	
5	Amount. of High bit Register	00H	Amount of register 02H
6	Amount. of Low bit Register	02H	
7	CRC16 Verification (high bit)	95H	CRC Code of verification
8	CRC16 Verification (low bit)	CBH	

2.1.2 Data Frame Format from Inverter (If Data Reading Successfully)

Data NO	Content	Description
1	Inverter Address	Communication address(1-247, default 0xF7)
2	03H	Function code
3	Amount of byte of data (2N)	Amount of byte of data
4	High byte of data of first register	High byte of first register
5	Low byte of data of first register	Low byte of first register
…	…	…
2N+2	High byte of data of the Nth register	High byte of the Nth register
2N+3	Low byte of data of the Nth register	Low byte of the Nth register

| 2N+4 | High byte of CRC16 verification code | High byte of CRC verification code |
| 2N+5 | Low byte of CRC16 verification code | Low byte of CRC verification code |

2.1.3 Data Frame Format from Inverter (Register Addr. or register number is wrong)

Data NO	Content	Description
1	Inverter Address	Communication Address (1-247)
2	83H	Function code
3	02H	Error Code
4	High byte of CRC16 verification code	CRC verification code
5	Low byte of CRC16 verification code	CRC verification code

2.2Set/Writing Register（Function code: 10H）

2.2.1 Data Frame Format from AP

Sr.	CODE	Sample	Description
1	Inverter Address	0xF7	Communication Address (1-247, default 0xF7)
2	10H	10H	Function Code
3	High byte of data of first register	00H	Address of register: 0000H
4	Low byte of data of first register	00H	
5	High byte of amount of registers	00H	Amount of registers: 01H
6	Low byte of amount of registers	01H	
7	Amount of bytes (N)	02H	No. of Register Bytes 02H
8	High byte of data	0AH	Data: 0AF0H
9	Low byte of data	F0H	
10	High byte of CRC16 verification code	A0H	CRC verification
11	Low byte of CRC16 verification code	B4H	

2.2.2Data Frame Format from Inverter (when OK)

Sr.	CODE	SAMPLE	EXPLANATION
1	Device Addr.	0xF7	Device communication address（1-247）
2	10H	10H	Function Code
3	High Bit of Start Register Addr.	00H	Register Address 0000H
4	Low Bit of Start Register Addr.	00H	
5	High Bit of Register No.	00H	Number of Register 01H
6	Low Bit of Register No.	01H	

| 7 | CRC16 Verification (high bit) | 01H | CRC Verification |
| 8 | CRC16 Verification (low bit) | C9H | |

2.2.3Data Frame Format from Inverter (when data is faulty)

Sr.	CODE	EXPLANATION
1	Device Address	Device communication address (1-247)
2	90H	Function Code
3	03H	Error Code
4	CRC16 Verification (high bit)	CRC Verification
5	CRC16 Verification (low bit)	

2.2.4 Data Frame Format from Inverter (when address or amount of register is faulty)

Sr.	CODE	EXPLANATION
1	Device Address	Device communication address (1-247)
2	90H	Function Code
3	02H	Error Code
4	CRC16 Verification (high bit)	CRC Verification
5	CRC16 Verification (low bit)	

2.3 Writing single register (function code 06H)

2.3.1 Frame Format From Host Computer

Sr.	CODE	SAMPLE	EXPLANATION
1	Device Addr.	1	Device communication address (1-247)
2	06H	06H	Function Code
3	High Bit of Start Register Addr.	00H	Register Address 0000H
4	Low Bit of Start Register Addr.	00H	
5	High Bit of Data	0AH	Data 0AF0H
6	Low Bit of Data	F0H	
7	CRC16 Verification (high bit)	8FH	CRC Verification
8	CRC16 Verification (low bit)	2EH	

2.3.2 Frame Format Return from Device (data writing successfully)

Sr.	CODE	SAMPLE	EXPLANATION
1	Device Addr.	1	Device communication address (1-247)
2	06H	06H	Function Code
3	High Bit of Start Register Addr.	00H	Register Address 0000H
4	Low Bit of Start Register Addr.	00H	
5	High Bit of Data	0AH	Data 0AF0H
6	Low Bit of Data	F0H	
7	CRC16 Verification (high bit)	8FH	CRC Verification
8	CRC16 Verification (low bit)	2EH	

3. System Wiring Instruction

This is the basic wiring and instructions before starting reading interactive log between GoodWe energy storage inverter and the compatible device, which is to be connected by EMS port on inverter.

Position	EMS
1	485_A
2	485_B
3	485_A
4	NC
5	NC
6	485_B
7	NC
8	NC
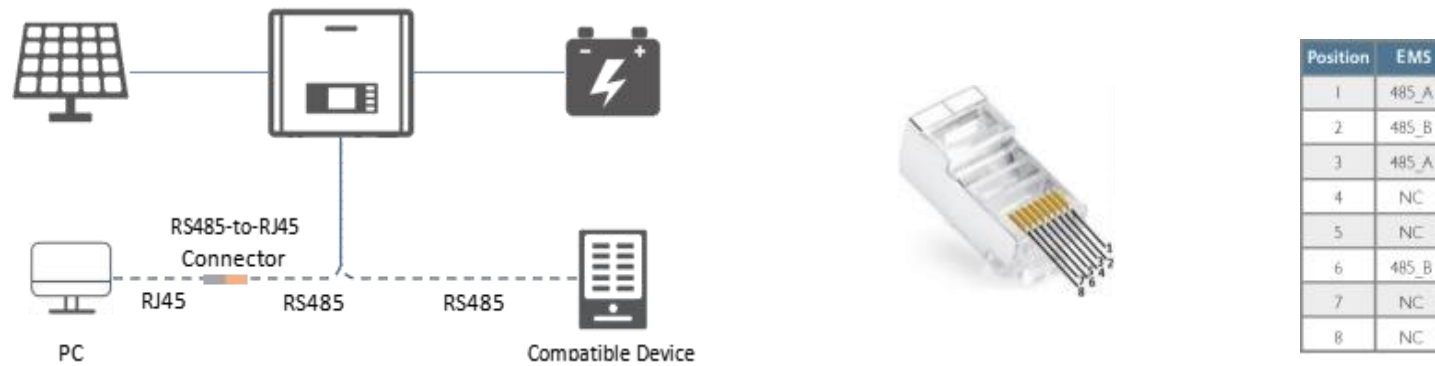
Solar inverter must be powered up by DC or AC power before it can communicate successfully to the compatible device.

Address	Name	R/W	Type	Unit	Mutiple	Nr	Range	Remart
设备信息数据/Device Parameters								
35001	RatePower	RO	U16	N/A	1	1		Inverter rated power
35003	INVSN	RO	STR	N/A	1	8		Inverter serial number. ASCII,16 bytes,read together, include OEM products.
35011	Modelname	RO	STR	N/A	1	5		ASCII，10 bytes
35016	FMVersion_DSP_M	RO	U16			1		Master DSP firmware version
35017	FMVersion_DSP_S	RO	U16			1		Slave DSP firmware version
35018	BetaVersion_DSP	RO	U16			1		DSP beta version（small version number）
35019	FMVersion_ARM	RO	U16			1		ARM firmware version
35020	BetaVersion_ARM	RO	U16			1		ARM beta version（small version number）
35035	FMVersion_DSP_DCDC	RO	U16			1		Only For BTC.DCDC module firmware version
35036	BetaVersion_DCDC	RO	U16			1		Only For BTC.DCDC module beta version
35037	FMVersion_DSP_MPPT	RO	U16			1		Only For BTC.MPPT module firmware version
35038	BetaVersion_MPPT	RO	U16			1		Only For BTC.MPPT module beta version
35039	FMVersion_DSP_STS	RO	U16			1		Only For BTC.STS module firmware version
35040	BetaVersion_STS	RO	U16			1		Only For BTC.STS module beta version
逆变器运行数据/Inverter running data 1								
35050	SIMCCID	RO	STR			10		ID of GPRS/4G module
35100	RTC_YM	RO	U16	N/A	1	1		Hbyte-year/Lbyte-month: 13-99/1-12
35101	RTC_DH	RO	U16	N/A	1	1		Hbyte-day/Lbyte-hour: 1-31/0-23
35102	RTC_MS	RO	U16	N/A	1	1		Hbyte-minute/Lbyte-second: 0-59/0-59
35103	Vpv1	RO	U16	V	10	1		PV1 voltage
35104	Ipv1	RO	U16	A	10	1		PV1 current
35105	Ppv1	RO	U32	W	1	2		PV1 Power
35107	Vpv2	RO	U16	V	10	1		PV2 voltage
35108	Ipv2	RO	U16	A	10	1		PV2 current
35109	Ppv2	RO	U32	W	1	2		PV2 Power
35111	Vpv3	RO	U16	V	10	1		PV3 voltage

35112	Ipv3	RO	U16	A	10	1		PV3 current
35113	Ppv3	RO	U32	W	1	2		PV3 Power
35115	Vpv4	RO	U16	V	10	1		PV4 voltage
35116	Ipv4	RO	U16	A	10	1		PV4 current
35117	Ppv4	RO	U32	W	1	2		PV4 Power
35119	PV Mode	RO	U32	N/A		2	Table 8-3 & 8-4	To check each MPPT mode
35121	Vgrid_R	RO	U16	V	10	1		R phase Grid voltage
35122	Igrid_R	RO	U16	A	10	1		R phase Grid current
35123	Fgrid_R	RO	U16	Hz	100	1		R phase Grid Frequency
35124	Pgrid_R	RO	S32	W	1	2		R phase Grid Power(Inv power)
35126	Vgrid_S	RO	U16	V	10	1		S phase Grid voltage
35127	Igrid_S	RO	U16	A	10	1		S phase Grid current
35128	Fgrid_S	RO	U16	Hz	100	1		S phase Grid Frequency
35129	Pgrid_S	RO	S32	W	1	2		S phase Grid Power(Inv power)
35131	Vgrid_T	RO	U16	V	10	1		T phase Grid voltage
35132	Igrid_T	RO	U16	A	10	1		T phase Grid current
35133	Fgrid_T	RO	U16	Hz	100	1		T phase Grid Frequency
35134	Pgrid_T	RO	S32	W	1	2		T phase Grid Power (Inv power)
35136	Grid Mode	RO	U16			1	Refer to Table 8-10	Grid connection status
35137	Total INV Power	RO	S32	W	1	2		Total Power of Inverter(Inv power)
35139	AC ActivePower	RO	S32	W	1	2		Total Active Power Of Inverter. (If meter connection ok, it is meter power.If meter connection fail, it is inverter on-grid port power)
35141	AC ReactivePower	RO	S32	Var	1	2		Total Reactive Power Of Inverter
35143	AC ApparentPower	RO	S32	VA	1	2		Total Apparent Power Of Inverter
35145	Back-Up Vload_R	RO	U16	V	10	1		R phase Load voltage on Back-Up. Use R phase data for 1-phase inverter
35146	Back-Up Iload_R	RO	U16	A	10	1		R phase Load current of Back-Up
35147	Back-Up Fload_R	RO	U16	Hz	100	1		R phase Load Frequency of Back-Up

35148	Load Mode_R	RO	U16			1	refer to Table 8-11	Off means there is No voltage of Backup port. Also used for 1-p inverter
35149	Back-Up Pload_R	RO	S32	W	1	2		R phase Load Power of Back-Up
35151	Back-Up Vload_S	RO	U16	V	10	1		S phase Load voltage of Back-Up
35152	Back-Up Iload_S	RO	U16	A	10	1		S phase Load current of Back-Up
35153	Back-Up Fload_S	RO	U16	Hz	100	1		S phase Load Frequency of Back-Up
35154	Load Mode_S	RO	U16			1	refer to Table 8-11	not for 1-phase inverter
35155	Back-Up Pload_S	RO	S32	W	1	2		S phase Load Power of Back-Up
35157	Back-Up Vload_T	RO	U16	V	10	1		T phase Load voltage of Back-Up
35158	Back-Up Iload_T	RO	U16	A	10	1		T phase Load current of Back-Up
35159	Back-Up Fload_T	RO	U16	Hz	100	1		T phase Load Frequency of Back-Up
35160	Load Mode_T	RO	U16			1	refer to Table 8-11	not for 1-phase inverter
35161	Back-Up Pload_T	RO	S32	W	1	2		T phase Load Power of Back-Up
35163	PLoad_R	RO	S32	W	1	2		R phase on-grid Load Power (backup not
35165	PLoad_S	RO	S32	W	1	2		S phase on-grid Load Power (backup not
35167	PLoad_T	RO	S32	W	1	2		T phase on-grid Load Power (backup not
35169	Total Back-Up Load Power	RO	S32	W	1	2		Load Power of Back-Up
35171	Total Load power	RO	S32	W	1	2		Total Power of on-grid load(backup not included)
35173	Ups Load Percent	RO	U16	%	100	1		BackupLoad Power/Rated power
35174	Airtemp	RO	S16	C	10	1		Inverter Internal Temperature
35175	Modeltemp	RO	S16	C	10	1		Inverter Unit Temperature
35176	Hitsinktemp	RO	S16	C	10	1		Inverter Heat Sink Temperature
35177	FunctionBitValue	RO	U16			1		
35178	BUSVoltage	RO	U16	V	10	1		BUS Voltage
35179	NBUSVoltage	RO	U16	V	10	1		NBUS Voltage
35180	Vbattery1	RO	U16	V	10	1		First group battery voltage. If BMS communication successfully, it is the voltage BMS send to inverter
35181	Ibattery1	RO	S16	A	10	1		First group battery current
35182	Pbattery1	RO	U32	W	1	2		First group battery power
35184	Battery1 Mode	RO	U16			1	Refer toTable 8-9	The charging and discharging status of the battery
35185	Warning code	RO	U16			1		

35186	SafetyCountry	RO	U16			1	Refer to Table 8-21	
35187	Work Mode	RO	U16			1	Refer to Table 8-1	
35189	Error Message	RO	U32			2	Table 8-2	
35191	PV E-Total	RO	U32	1KW.Hr	10	2		The total PV production energy from installation
35193	PV E-Day	RO	U32	1KW.Hr	10	2		Total PV production energy of the day
35197	h-Total	RO	U32	H	1	2		Accumulated operation hours from installation
35199	E-Day-Sell	RO	U16	1KW.Hr	10	1		The accumulated exporting energy to grid of the
35202	E-Day-Buy	RO	U16	1KW.Hr	10	1		The accumulated energy imported from grid of the
35203	E-Total-Load	RO	U32	1KW.Hr	10	2		The accumulated load consumption energy from the installation date, not include backup load
35205	E-Load-Day	RO	U16	1KW.Hr	10	1		Accumulated load consumption energy of the day, not include backup load
35206	E-BatteryCharge	RO	U32	1KW.Hr	10	2		the accumulated energy charged to battery from the installation date, not include backup load
35208	E-Charge-Day	RO	U16	1KW.Hr	10	1		the accumulated energy charged to battery of the day Not from BMS
35209	E-BatteryDischarge	RO	U32	1KW.Hr	10	2		the accumulated energy battery discharged, from the installation date Not from BMS
35211	E-discharge-Day	RO	U16	1KW.Hr	10	1		the accumulated energy battery discharged, of the day Not from BMS
35212	BattStrings	RO	U16			1		number of battery modules
35213	CPLD warning code	RO	U16			1	Refer to Table 8-17	only for after-sales
35218	DiagStatusH	RO	U32			2	Refer to Table 8-13	
35220	DiagStatusL	RO	U32			2	Refer to Table 8-14	
35225	EH battery function active	RO	U16			1		only for HER 0: failure, 1: Activated 2: Deactivated, 3: Locked
35226	ARC selfchk status	RO	U16	1		1		only for inverters with AFCI protection 0: failure, 1: Activated

逆变器运行数据扩展段/Inverter running data 2								
35250	SafetyDetailedErrorMsg	RO	U64	NA	1	4	Refer to Table 8-30	Detail information of grid failure
35254	InvDetailedErrorMsg	RO	U64	NA	1	4	Refer to Table 8-31	Detail information of inverter failure
35258	InvDetailedStatusMsg	RO	U64	NA	1	4	Refer to Table 8-32	
35268	maxGridFeq within 1min	RO	U16	Hz	100	1		Max grid Frequency in the last minutes
35269	minGridFeq within 1min	RO	U16	Hz	100	1		Min grid Frequency in 1min
35270	maxGridVoltage within 1min R	RO	U16	V	10	1		Phase R max grid voltage in 1min
35271	minGridVoltage within 1min R	RO	U16	V	10	1		Phase R min grid voltage in 1min
35272	maxGridVoltage within 1min S	RO	U16	V	10	1		Phase S max grid voltage in 1min
35273	minGridVoltage within 1min S	RO	U16	V	10	1		Phase S min grid voltage in 1min
35274	maxGridVoltage within 1min T	RO	U16	V	10	1		Phase T max grid voltage in 1min
35275	minGridVoltage within 1min T	RO	U16	V	10	1		Phase T min grid voltage in 1min
35276	maxBackupPower within 1min R	RO	U32	W	1	2		Phase R max backup power in 1min
35278	maxBackupPower within 1min S	RO	U32	W	1	2		Phase S max backup power in 1min
35280	maxBackupPower within 1min T	RO	U32	W	1	2		Phase T max backup power in 1min
35282	maxBackupPower within 1min Total	RO	U32	W	1	2		Max total backup power in 1min
35284	GridHvrtEventTimes	RO	U16		1	1		Hvrt event times
35285	GridLvrtEventTimes	RO	U16		1	1		Lvrt event times
35286	InvErrorMsgRecordForEms	RO	U32		1	2	Only For ODM	
35288	InvWarningCodeRecordForEms	RO	U32		1	2	Only For ODM	
35290	InvCpldWarningRecordForEms	RO	U32		1	2	Only For ODM	
35292	Offline To Online Delay Second	RO	U16		1	1		delay time for offlgrid to ongrid
35293	Grid Hvrt Status	RO	U16		1	1		Grid Hvrt Status
35294	Grid Lvrt Status	RO	U16		1	1		Grid Lvrt Status
35295	Safety National Category Flag	RO	U16		1	1		Safety National Category Flag

35298	Battery1 Sample Voltage	RO	U16	V	10	1		Battery1 Sample Voltage
35299	Battery2 Sample Voltage	RO	U16	V	10	1		Battery2 Sample Voltage
35301	PV Total Power	RO	U32	W	1	2		PV Total Power
35303	PV channel	RO	U16		1	1		PV channel
35304	PV5 Voltage	RO	U16	V	10	1		PV5 Voltage
35305	PV5 Current	RO	U16	A	10	1		PV5 Current
35306	PV6 Voltage	RO	U16	V	10	1		PV6 Voltage
35307	PV6 Current	RO	U16	A	10	1		PV6 Current
35308	PV7 Voltage	RO	U16	V	10	1		PV7 Voltage
35309	PV7 Current	RO	U16	A	10	1		PV7 Current
35310	PV8 Voltage	RO	U16	V	10	1		PV8 Voltage
35311	PV8 Current	RO	U16	A	10	1		PV8 Current
35312	PV9 Voltage	RO	U16	V	10	1		PV9 Voltage
35313	PV9 Current	RO	U16	A	10	1		PV9 Current
35314	PV10 Voltage	RO	U16	V	10	1		PV10 Voltage
35315	PV10 Current	RO	U16	A	10	1		PV10 Current
35316	PV11 Voltage	RO	U16	V	10	1		PV11 Voltage
35317	PV11 Current	RO	U16	A	10	1		PV11 Current
35318	PV12 Voltage	RO	U16	V	10	1		PV12 Voltage
35319	PV12 Current	RO	U16	A	10	1		PV12 Current
35320	PV13 Voltage	RO	U16	V	10	1		PV13 Voltage
35321	PV13 Current	RO	U16	A	10	1		PV13 Current
35322	PV14 Voltage	RO	U16	V	10	1		PV14 Voltage
35323	PV14 Current	RO	U16	A	10	1		PV14 Current
35324	PV15 Voltage	RO	U16	V	10	1		PV15 Voltage

35325	PV15 Current	RO	U16	A	10	1		PV15 Current
35326	PV16 Voltage	RO	U16	V	10	1		PV16 Voltage
35327	PV16 Current	RO	U16	A	10	1		PV16 Current
35328	Warning Message	RO	U32		N/A	2		Warning information, bit mode, different from 35185. See the fault table for specific faults
35330	Grid10minAvgVoltR	RO	U16	V	10	1		Grid R phase 10min Average Voltage
35331	Grid10minAvgVoltS	RO	U16	V	10	1		Grid S phase 10min Average Voltage
35332	Grid10minAvgVoltT	RO	U16	V	10	1		Grid T phase 10min Average Voltage
35333	Error Message Extend	RO	U32		N/A	2		Error information, bit mode, extend from 35189.
35335	Warning Message Extend	RO	U32		N/A	2		Warningr information, bit mode, extend from
35337	MPPT Power 1	RO	U16	W	1	1		MPPT Power 1
35338	MPPT Power 2	RO	U16	W	1	1		MPPT Power 2
35339	MPPT Power 3	RO	U16	W	1	1		MPPT Power 3
35340	MPPT Power 4	RO	U16	W	1	1		MPPT Power 4
35341	MPPT Power 5	RO	U16	W	1	1		MPPT Power 5
35342	MPPT Power 6	RO	U16	W	1	1		MPPT Power 6
35343	MPPT Power 7	RO	U16	W	1	1		MPPT Power 7
35344	MPPT Power 8	RO	U16	W	1	1		MPPT Power 8
35345	MPPT Current 1	RO	U16	A	10	1		MPPT Current 1
35346	MPPT Current 2	RO	U16	A	10	1		MPPT Current 2
35347	MPPT Current 3	RO	U16	A	10	1		MPPT Current 3
35348	MPPT Current 4	RO	U16	A	10	1		MPPT Current 4
35349	MPPT Current 5	RO	U16	A	10	1		MPPT Current 5
35350	MPPT Current 6	RO	U16	A	10	1		MPPT Current 6
35351	MPPT Current 7	RO	U16	A	10	1		MPPT Current 7

35352	MPPT Current 8	RO	U16	A	10	1		MPPT Current 8
35353	Inventer Reactive Power R	RO	S32	VAR	1	2		Inventer Reactive Power R
35355	Inventer Reactive Power S	RO	S32	VAR	1	2		Inventer Reactive Power S
35357	Inventer Reactive Power T	RO	S32	VAR	1	2		Inventer Reactive Power T
35359	Inventer Apparent Power R	RO	S32	VA	1	2		Inventer Apparent Power R
35361	Inventer Apparent Power S	RO	S32	VA	1	2		Inventer Apparent Power S
35363	Inventer Apparent Power T	RO	S32	VA	1	2		Inventer Apparent Power T
35366	generator cumulative energy	RO	U32	1kw.h	10	2		generator cumulative energy
35368	BMS_Temperature	RO	S16	℃	10	1		BMS_Temperature

BTC模块新增寄存器/For BTC

35600	Hitsinktemp-dcdc	RO	S16	C	10	1		Only for BTC Series
35601	Hitsinktemp-mppt	RO	S16	C	10	1		Only for BTC Series
35602	Hitsinktemp-sts	RO	S16	C	10	1		Only for BTC Series
36000	commode	RO	U16			1	01:wifi 02:gprs 03:lan e20 04:a21 wifi 05:a21 lan	04:Wifi mode of WIFi+LAN module 05:Lan mode of WIFi+LAN module
36001	RSSI	RO	U16			1		RSSI of wifi module

METER相关寄存器/Meter data

36003	bMeterConnectStatus	RO	U16			1	1: connect correctly, 2: connect reverse (CT), 4:connect incorrectly,	For example: 0X0124 means Phase R connect incorrectly , Phase S connect reverse, Phase T connect correctly
36004	Meter comm Status	RO	U16			1	1: OK, 0: NG	
36005	MeterActivepowerR	RO	S16	W	1	1	Pmeter R	If ARM Version>9,please refer to 36019~36041
36006	MeterActivepowerS	RO	S16	W	1	1	Pmeter S	If ARM Version>9,please refer to 36019~36041
36007	MeterActivepowerT	RO	S16	W	1	1	Pmeter T	If ARM Version>9,please refer to 36019~36041
36008	MeterTotalActivepower	RO	S16	W	1	1	Pmeter	If ARM Version>9,please refer to 36019~36041. If three phase meter, it is total power.
36009	MeterTotalReactivepower	RO	S16	W	1	1	Pmeter reactive power	If ARM Version>9,please refer to 36019~36041
36010	MeterPF_R	RO	S16		100	1		Meter power factor R
36011	MeterPF_S	RO	S16		100	1		Meter power factor S
36012	MeterPF_T	RO	S16		100	1		Meter power factor T
36013	MeterPowerFactor	RO	S16		100	1		Meter power factor
36014	MeterFrequence	RO	U16		100	1		
36015	E-Total-Sell	RO	float			2		Total Feed Energy To Grid. Read from meter
36017	E-Total-Buy	RO	float			2		Total Energy From Grid. Read from meter
36019	MeterActivepowerR	RO	S32	W	1	2		ARM>09 Pmeter R
36021	MeterActivepowerS	RO	S32	W	1	2		ARM>09Pmeter S
36023	MeterActivepowerT	RO	S32	W	1	2		ARM>09Pmeter T

36025	MeterTotalActivepower	RO	S32	W	1	2		ARM>09Pmeter
36027	MeterReactivepowerR	RO	S32	W	1	2		Pmeter R Reactive Power
36029	MeterReactivepowerS	RO	S32	W	1	2		Pmeter S Reactive Power
36031	MeterReactivepowerT	RO	S32	W	1	2		Pmeter T Reactive Power
36033	MeterTotalReactivepower	RO	S32	W	1	2		Pmeter Reactive Power
36035	MeterApparentpowerR	RO	S32	W	1	2		Pmeter R Apparent Power
36037	MeterApparentpowerR	RO	S32	W	1	2		Pmeter S Apparent Power
36039	MeterApparentpowerR	RO	S32	W	1	2		Pmeter T Apparent Power
36041	MeterTotalApparentpower	RO	S32	W	1	2		Pmeter Apparent Power
36043	Meter Type	RO	U16	NA	1	1		Only for GoodWe Smart Meter (0: Single phase, 1: 3P3W, 2: 3P4W, 3: HomeKit, 4:
36044	Meter software version	RO	U16	NA	1	1		Only for GoodWe Smart Meter
36045	MeterCT2Activepower	RO	S32	W	1	2		Only for AC Couple inverter. Detect PV inverter
36047	CT2-E-Total-sell	RO	U32	1KW.Hr	100	2		
36049	CT2-E-Total-buy	RO	U32	1KW.Hr	100	2		
36051	MeterCT2status	RO	U16	NA	1	1		
36052	meter voltage R	RO	U16	V	10	1		Phase R voltage from meter
36053	meter voltage S	RO	U16	V	10	1		Phase S voltage from meter
36054	meter voltage T	RO	U16	V	10	1		Phase T voltage from meter
36055	meter current R	RO	U16	A	10	1		Phase R current from meter
36056	meter current S	RO	U16	A	10	1		Phase S current from meter
36057	meter current T	RO	U16	A	10	1		Phase T current from meter
36065	ARC fault channel	RO	U16		1	1		
36066	ezlogger pro comm status	RO	U16	NA	1	1	0: NG 1: Success	Communication between SEC1000S and
36067	ARC software version	RO	U16	NA	1	1		AFCI version
36092	ActiveEtotalSell_R	RO		1KW.Hr	100	4	Only for BTC Series	
36096	ActiveEtotalSell_S	RO		1KW.Hr	100	4	Only for BTC Series	
36100	ActiveEtotalSell_T	RO		1KW.Hr	100	4	Only for BTC Series	
36104	ActiveEtotalSell_Total	RO		1KW.Hr	100	4	Only for BTC Series	
36108	ActiveEtotalBuy_R	RO		1KW.Hr	100	4	Only for BTC Series	
36112	ActiveEtotalBuy_S	RO		1KW.Hr	100	4	Only for BTC Series	

36116	ActiveEtotalBuy_T	RO		1KW.Hr	100	4	Only for BTC Series	
36120	ActiveEtotalBuy_Total	RO		1KW.Hr	100	4	Only for BTC Series	
36124	Real-Time Clock_Year Month	RO	U16	N/A	1	1		High Byte Year/Low Byte Month:13-99/1-12
36125	Real-Time Clock_Day Hour	RO	U16	N/A	1	1		High Byte Day/Low Byte Hour:1-31/0-23
36126	Real-Time Clock_Minute Second	RO	U16	N/A	1	1		High Byte minute/Low Byte Second:0-59/0-59
36127	Meter Active Power R	RO	S32	W	1	2		Meter Active Power R
36129	Meter Active Power S	RO	S32	W	1	2		Meter Active Power S
36131	Meter Active Power T	RO	S32	W	1	2		Meter Active Power T
36133	Meter Total Active Power	RO	S32	W	1	2		Meter Total Active Power
36135	Active Energy Total Sell_R	RO	U64	1KW.Hr	100	4		Active Energy Total Sell_R
36139	Active Energy Total Sell_S	RO	U64	1KW.Hr	100	4		Active Energy Total Sell_S
36143	Active Energy Total Sell_T	RO	U64	1KW.Hr	100	4		Active Energy Total Sell_T
36147	Active Energy Total Sell_Total	RO	U64	1KW.Hr	100	4		Active Energy Total Sell_Total
36151	Active Energy Total Buy_R	RO	U64	1KW.Hr	100	4		Active Energy Total Buy_R
36155	Active Energy Total Buy_S	RO	U64	1KW.Hr	100	4		Active Energy Total Buy_S
36159	Active Energy Total Buy_T	RO	U64	1KW.Hr	100	4		Active Energy Total Buy_T
36163	Active Energy Total Buy_Total	RO	U64	1KW.Hr	100	4		Active Energy Total Buy_Total

BMS运行数据/BMS information (Initial data from battery BMS)								
37000	DRMStatus	RO	U16	NA	NA	1	Refer Table 8-15	DRED only for Australia
37002	BMS Status	RO	U16	NA	NA	1		BMS Com. Status
37003	BMS Pack Temperature	RO	U16	℃	10	1		
37004	BMS Charge Imax	RO	U16	A	1	1		
37005	BMS Discharge Imax	RO	U16	A	1	1		
37006	BMS Error Code L	RO	U16	NA	NA	1	Refer to Table 8-7	
37007	SOC	RO	U16	%	1	1		First group battery capacity
37008	BMS SOH	RO	U16	%	1	1		SOH From BMS
37009	BMS Battery strings	RO	U16	NA	NA	1		
37010	BMS Warning Code L	RO	U16	NA	NA	1	Refer to Table 8-8	
37011	Battery protocol	RO	U16	NA	NA	1	Refer to Table 8-33	
37012	BMS Error Code H	RO	U16	NA	NA	1	Refer to Table 8-7	
37013	BMS Warning Code H	RO	U16	NA	NA	1	Refer to Table 8-8	
37014	BMS Software Version	RO	U16	NA	1	1		
37015	Battery Hardware Version	RO	U16	NA	1	1		
37016	Maximum cell temperature ID	RO	U16	NA	1	1	Battery module ID(1Byte)+Battery sampling point(1Byte)	
37017	Minimum cell temperature ID	RO	U16	NA	1	1		
37018	Maximum cell voltage ID	RO	U16	NA	1	1		
37019	Minimum cell voltage ID	RO	U16	NA	1	1		
37020	Maximum cell temperature	RO	U16	℃	10	1		
37021	Minimum cell temperature	RO	U16	℃	10	1		
37022	Maximum cell voltage	RO	U16	mV	1	1		
37023	Minimum cell voltage	RO	U16	mV	1	1		
37024	Pass Infomation1	RO	U16	NA	NA	1		
37025	Pass Infomation2	RO	U16	NA	NA	1		
37026	Pass Infomation3	RO	U16	NA	NA	1		
37027	Pass Infomation4	RO	U16	NA	NA	1		
37028	Pass Infomation5	RO	U16	NA	NA	1		

37029	Pass Infomation6	RO	U16	NA	NA	1		
37030	Pass Infomation7	RO	U16	NA	NA	1		
37031	Pass Infomation8	RO	U16	NA	NA	1		
37032	Pass Infomation9	RO	U16	NA	NA	1		
37033	Pass Infomation10	RO	U16	NA	NA	1		
37034	Pass Infomation11	RO	U16	NA	NA	1		
37035	Pass Infomation12	RO	U16	NA	NA	1		
37036	Pass Infomation13	RO	U16	NA	NA	1		
37037	Pass Infomation14	RO	U16	NA	NA	1		
37038	Pass Infomation15	RO	U16	NA	NA	1		
37039	Pass Infomation16	RO	U16	NA	NA	1		
37040	Pass Infomation17	RO	U16	NA	NA	1		
37041	Pass Infomation18	RO	U16	NA	NA	1		
37042	Pass Infomation19	RO	U16	NA	NA	1		
37043	Pass Infomation20	RO	U16	NA	NA	1		
37044	Pass Infomation21	RO	U16	NA	NA	1		
37045	Pass Infomation22	RO	U16	NA	NA	1		
37046	Pass Infomation23	RO	U16	NA	NA	1		
37047	Pass Infomation24	RO	U16	NA	NA	1		
37048	Pass Infomation25	RO	U16	NA	NA	1		
37049	Pass Infomation26	RO	U16	NA	NA	1		
37050	Pass Infomation27	RO	U16	NA	NA	1		
37051	Pass Infomation28	RO	U16	NA	NA	1		
37052	Pass Infomation29	RO	U16	NA	NA	1		
37053	Pass Infomation30	RO	U16	NA	NA	1		
37054	Pass Infomation31	RO	U16	NA	NA	1		
37055	Pass Infomation32	RO	U16	NA	NA	1		
37056	Battery Total Charge Energy	RO	U32	kwh	10	2		
37058	Battery Total Discharge Energy	RO	U32	kwh	10	2		
37060	battery SN	RO	STR	N/A	N/A	16		battery 1 SN
39000	BMS2 Status	RO	U16	N/A	N/A	1		

39001	BMS2 Package Temperature	RO	U16	℃	10	1		
39002	Max BMS2 Charge Current	RO	U16	A	1	1		
39003	Max BMS3 Discharge Current	RO	U16	A	1	1		
39004	BMS2 Error Code Low	RO	U16	N/A	N/A	1		
39005	BMS2 SOC	RO	U16	%	1	1		
39006	BMS2 SOH	RO	U16	%	1	1		
39007	BMS2 Battery Strings	RO	U16	N/A	N/A	1		
39008	BMS2 Warning Code Low	RO	U16	N/A	N/A	1		
39009	Battery Protocol	RO	U16	N/A	N/A	1		
39010	BMS2 Error Code High	RO	U16	N/A	N/A	1		
39011	BMS2 Warning Code High	RO	U16	N/A	N/A	1		
39012	BMS2 Software Version	RO	U16	N/A	1	1		
39013	Battery2 Hardware Version	RO	U16	N/A	1	1		
39014	BMS2 Maximum Cell Temperature ID	RO	U16	N/A	1	1		Battery module ID(1Byte) + Battery sample
39015	BMS2 Minimum Cell Temperature ID	RO	U16	N/A	1	1		point(1Byte)
39016	BMS2 Maximum Cell Voltage ID	RO	U16	N/A	1	1		Battery module ID(1Byte) + Battery
39017	BMS2 Minimum Cell Voltage ID	RO	U16	N/A	1	1		number(1Byte)
39018	BMS2 Maximum Cell Temperature	RO	U16	℃	10	1		
39019	BMS2 Minimum Cell Temperature	RO	U16	℃	10	1		
39020	BMS2 Maximum Cell Voltage	RO	U16	mV	1	1		
39021	BMS2 Minimum Cell Voltage	RO	U16	mV	1	1		
39022	BMS2 Pass Infomation1	RO	U16	N/A	N/A	1		
39023	BMS2 Pass Infomation2	RO	U16	N/A	N/A	1		
39024	BMS2 Pass Infomation3	RO	U16	N/A	N/A	1		
39025	BMS2 Pass Infomation4	RO	U16	N/A	N/A	1		
39026	BMS2 Pass Infomation5	RO	U16	N/A	N/A	1		
39027	BMS2 Pass Infomation6	RO	U16	N/A	N/A	1		
39028	BMS2 Pass Infomation7	RO	U16	N/A	N/A	1		
39029	BMS2 Pass Infomation8	RO	U16	N/A	N/A	1		
39030	BMS2 Pass Infomation9	RO	U16	N/A	N/A	1		
39031	BMS2 Pass Infomation10	RO	U16	N/A	N/A	1		

39032	BMS2 Pass Infomation11	RO	U16	N/A	N/A	1		
39033	BMS2 Pass Infomation12	RO	U16	N/A	N/A	1		
39034	BMS2 Pass Infomation13	RO	U16	N/A	N/A	1		
39035	BMS2 Pass Infomation14	RO	U16	N/A	N/A	1		
39036	BMS2 Pass Infomation15	RO	U16	N/A	N/A	1		
39037	BMS2 Pass Infomation16	RO	U16	N/A	N/A	1		
39038	BMS2 Pass Infomation17	RO	U16	N/A	N/A	1		
39039	BMS2 Pass Infomation18	RO	U16	N/A	N/A	1		
39040	BMS2 Pass Infomation19	RO	U16	N/A	N/A	1		
39041	BMS2 Pass Infomation20	RO	U16	N/A	N/A	1		
39042	BMS2 Pass Infomation21	RO	U16	N/A	N/A	1		
39043	BMS2 Pass Infomation22	RO	U16	N/A	N/A	1		
39044	BMS2 Pass Infomation23	RO	U16	N/A	N/A	1		
39045	BMS2 Pass Infomation24	RO	U16	N/A	N/A	1		
39046	BMS2 Pass Infomation25	RO	U16	N/A	N/A	1		
39047	BMS2 Pass Infomation26	RO	U16	N/A	N/A	1		
39048	BMS2 Pass Infomation27	RO	U16	N/A	N/A	1		
39049	BMS2 Pass Infomation28	RO	U16	N/A	N/A	1		
39050	BMS2 Pass Infomation29	RO	U16	N/A	N/A	1		
39051	BMS2 Pass Infomation30	RO	U16	N/A	N/A	1		
39052	BMS2 Pass Infomation31	RO	U16	N/A	N/A	1		
39053	BMS2 Pass Infomation32	RO	U16	N/A	N/A	1		
39054	Battery Total Charge Energy	RO	U32	kwh	10	2		
39056	Battery Total Discharge Energy	RO	U32	kwh	10	2		
39058	battery SN	RO	STR	N/A	N/A	16		battery 2 SN

Address	Name	R/W	Type	Unit	Mutiple	Nr.	Range	Remark
40000	SN	RW	STR	N/A	1	8	ASCII , 16 bytes	read and write inverter serial No.
40008	EMS Check	R	U16	N/A	1	1	0 : checking 1 : Normal 2 : Fault	to read inverter operation status
Only for BTC and ETC								
42000	EMSPowerMode					1		
42001	EMSPowerSet					2		
42003	FeedPowerEnable					1	[0,1]	0:Disable 1:Enable Used together with register 42004
42004	FeedPowerPara		S32			2	[-50000,50000]	As FeedPowerEnable is set as 1, then use this register to set the max export power allowed
42006	3 Phase FeedPowerEnable	RW	U16			1	[0,1]	
42007	R phase FeedPowerPara	RW	S32			2	[-20000,20000]	
42009	S phase FeedPowerPara	RW	S32			2	[-20000,20000]	
42011	T phase FeedPowerPara	RW	S32			2	[-20000,20000]	
42101	Remote Comm Loss Time	RW	U16	S	1	1	[0,65536]	Config Remote Communication Loss Time 0: Disable Remote communication loss detection feature
42200	STS Module Installed	RW	U16	N/A	1	1	[0,1]	Config installation of STS module 0:STS module not installed 1:STS module installed

Address	Name	R/W	Type	Unit	Mutiple	Nr.	Range	Remark
45127	Modbus address	RW	U16	N/A	1	1	[0,247]	The default is 247. if multiple inverters are connected to the same controller, addr of each inverter must be different and 247 should not be used for any inverter
45132	Modbus Baud rate	RW	U32	N/A	1	2	[9600,115200]	9600；19200；38400；57600；115200 if set wrong, EMS communicaiton fails
45153	Modbus Protocol Type	RW	STR	N/A	1	1		"0"goodwe "1" sunspec
45200	RTC setting	RW	U16	N/A	1	1	[13,99]-[1,12]	HByte:Year/LByte:Month
45201	RTC setting	RW	U16	N/A	1	1	[1,31]-[0,23]	HByte:Date/LByte:Hour
45202	RTC setting	RW	U16	N/A	1	1	[0,59]-[0,59]	HByte:Minute/LByte:Second
45216	Factory setting	WO	U16	N/A	1	1	[1]	Choose "Warehouse" safety code first and then Set "1" to factory settings
45217	Clear data	WO	U16	N/A	1	1	[1]	Reset inverter accumulated data like E-total, E-day, error log running data etc.
45220	restart	WO	U16	N/A	1	1	[1]	Inverter will recheck and reconnect to utility again. Inverter does not shutdown
45222	PV E-Total	RW	U32	1KW.Hr	10	2		to read or write the total PV production energy from the installation date
45224	PV E-Day	RW	U32	1KW.Hr	10	2		to read or write the total PV production energy of the day
45226	E-Total-Sell	RW	U32	1KW.Hr	10	2		to read or write the accumulated exporting energy to grid from the installation date
45228	h-Total	RW	U32	H	1	2		to read or write the accumulated operation hours from the installation date
45230	E-Day-Sell	RW	U16	1KW.Hr	10	1		to read or write the accumulated exporting energy to grid of the day
45231	E-Total-Buy	RW	U32	1KW.Hr	10	2		to read or write the accumulated energy imported from grid from the installation date
45233	E-Day-Buy	RW	U16	1KW.Hr	10	1		to read or write the accumulated energy imported from grid of the day
45234	E-Total-Load	RW	U32	1KW.Hr	10	2		to read or write the accumulated load consumption energy from the installation date, not include backup load.

45236	E-Load-Day	RW	U16	1KW.Hr	10	1		to read or write the accumulated load consumption energy of the day Not include backup loads
45237	E-BatteryCharge	RW	U32	1KW.Hr	10	2		to read or write the accumulated energy charged to battery from the installation date Not from BMS
45239	E-Charge-Day	RW	U16	1KW.Hr	10	1		to read or write the accumulated energy charged to battery of the day Not from BMS
45240	E-BatteryDischarge	RW	U32	1KW.Hr	10	2		to read or write the accumulated energy battery discharged, from the installation date Not from BMS
45242	E-discharge-Day	RW	U16	1KW.Hr	10	1		to read or write the accumulated energy battery discharged, of the day Not from BMS
45244	SafetyCountry	RW	U16	N/A	1	1	[0,65535] Table 8-21	to set safety code for inverter or read the preset safety code for the inverter
45245	Iso Limit	RW	U16	KΩ	1	1	[0,1000]	default 100kΩ, to read or set Isolation protection threshold for the inverter
45246	LVRT/HVRT	RW	U16	N/A	1	1	[0,1,2]	as default is deactivated, set "1" to activate LVRT functtion, Set "2" to activate HVRT The same as 45499
45250	PV start voltage	RW	U16	V	10	1	[1800,8500]	to write or read the start up PV voltage of the inverter.Please refer to the user manual
45251	EnableMPPT4Shadow	RW	U16		1	1	[0: Off, 1: On]	as default is deactivated, set "1" to activate "Shadow Scan" functtion
45252	BackUpEnable	RW	U16		1	1	[0: Off, 1: On]	as default is activated, set "0" to deactivate "Backup" functtion
45253	AutoStartBackup	RW	U16		1	1	[0: Off, 1: On]	Off-Grid Auto startup, as default is deactivated, set "1" to activate "Shadow Scan" functtion
45254	GridWaveCheckLevel	RW	U16		1	1	[0: High sensitivity, 1: low sensitivity, 2: close]	As default is "0"
45255	RapaidCutOff	RW	U16		1	1	[0: Off, 1: On]	Rapid shutdown. To cut grid connection, system turn to off-grid operation.
45256	BackupStartDly	RW	U16	N*20ms	1	1	[0,65535]	Default is 1500 (30s)
45257	UpsStdVoltType	RW	U16			1	[0:208V, 1:220V, 2 :240V, 3:230V]	

45263	DerateRate(VDE)	RW	U16	%		1	[0,100]	Only can set 70, only for German
45264	three Phase unbalanced output	RW	U16			1	[0,1]	this function is deactivated as default, set "1" to activate. After activated, All power needs to be turned off and restarted
45266	HighImpMode	RW	U16			1	[0,1]	For weak grid area
45271	ARC self check	WO	U16	1		1	[1450]	only for inverters with AFCI function
45272	ARC fault remove	WO	U16	1		1	[1290]	only for inverters with AFCI function
45275	ISOCheckMode	RW	U16	1		1	[0,1]	0:Normal mode 1: cancel ISO test when offgrid to ongrid
45276	OffGridToOnGridDelay	RW	U16	sec		1	[10,7200]	The delay time when grid is available
45277	OffGrid Under Voltage Protect Coff	RW	U16	%		1	[50,90]	If set 80%, when offgrid output voltage less than 230*80%=184V, inverter will have the error.Default setting is
45278	BatteryModePvChargeEnable	RW	U16	1	1	1	[0,1]	When offgrid and the battery SOC is low, PV charge the battery first.
45279	DCV check coff	RW	U16			1	[1,20]	Default setting is 1
45280	Force MircoGrid Run	RW	U16	1		1	[0 , 1]	Only for A-BP inverter USA
45281	Battery PreChgFunc	RW	U16	1		1	[0 , 1]	
45286	GL Operation Mode Control Duration	RW	U16	sec	N/A	1	[0,65535]	
45288	PE Relay Switch	RW	U16	N/A	N/A	1	[0,1]	1 close 0 open
45289	GFCI fault remove	WO	U16	N/A	N/A	1	[0 , 0x050A]	
45291	PV Connect Mode	RW	U16	N/A	N/A	1	[0 , 255]	PV Connect Mode , Set 0 for each MPPT , Set 1 for 12,34MPPT,Set 2 for 1MPPT
45292	GFCI Disable Check	RW	U16	N/A	N/A	1	[0,1]	0:Normal mode 1:cancel GFCI check
45293	SPD enable	RW	U16	N/A	N/A	1	[0,1]	
45294	Force MircoGrid Frequence Adjust	RW	U16	N/A	N/A	1	[0 , 1]	Only for MircoGrid Function inverter
Battery Charge/Discharge Protection Parameters on inverter side								
45352	BattChargeVoltMax	RW	U16		10	1	[1500,6000]	these registers is to set the protection parameters on battery charge/discharge operation ON INVERTER SIDE. The real operation will still follow battery BMS limitations (or registers 47900~47916) if it is not out of the range.
45353	BattChargeCurrMax	RW	U16		10	1	[0,1000]	
45354	BattVoltUnderMin	RW	U16		10	1	[1500,6000]	
45355	BattDisChgCurrMax	RW	U16		10	1	[0,1000]	Eg. Set BattChargeCurrMax (45353) as 25A, but battery BMS limit the max charge current as 20A, then the battery charge at
45356	BattSOCUnderMin	RW	U16		1	1	[0,100]	

45357	BattOfflineVoltUnderMin	RW	U16		10	1	[1500,6000]	max 20A. but if battery BMS limit max charge current as 50A,
45358	BattOfflineSOCUnderMin	RW	U16			1	[0,100]	then the real charge current of the battery will exceed 25A.
45389	Separate Battery Mode	RW	U16	N/A	1	1	[0,1]	
45390	Batt_Absorp_Chrg_Vol	RW	U16	v	10	1		
45391	Batt_Equal_Chrg_Vol	RW	U16	v	10	1		
45392	Batt_InterRes	RW	U16	mΩ	1	1		
Safety Parameters								
45400	GridVoltHighS1	RW	U16	V	10	1	[600,3000]	Overvoltage
45401	GridVoltHighS1Time	RW	U16	periods	1	1	[1,65535]	
45402	GridVoltLowS1	RW	U16	V	10	1	[600,3000]	
45403	GridVoltLowS1Time	RW	U16	periods	1	1	[1,65535]	
45404	GridVoltHighS2	RW	U16	V	10	1	[600,3000]	Overvoltage
45405	GridVoltHighS2Time	RW	U16	periods	1	1	[1,65535]	
45406	GridVoltLowS2	RW	U16	V	10	1	[600,3000]	
45407	GridVoltLowS2Time	RW	U16	periods	1	1	[1,65535]	
45408	GridVoltQualit	RW	U16	V	10	1	[600,3000]	
45409	GridFreqHighS1	RW	U16	Hz	100	1	[3000,8000]	OverFrequency
45410	GridFreqHighS1Time	RW	U16	periods	1	1	[1,65535]	
45411	GridFreqLowS1	RW	U16	Hz	100	1	[3000,8000]	
45412	GridFreqLowS1Time	RW	U16	periods	1	1	[1,65635]	
45413	GridFreqHighS2	RW	U16	Hz	100	1	[3000,8000]	OverFrequency
45414	GridFreqHighS2Time	RW	U16	periods	1	1	[1,65635]	
45415	GridFreqLowS2	RW	U16	Hz	100	1	[3000,8000]	
45416	GridFreqLowS2Time	RW	U16	periods	1	1	[1,65635]	
45417	GridVoltHigh	RW	U16	V	10	1	[600,3000]	Connect voltage
45418	GridVoltLow	RW	U16	V	10	1	[600,3000]	
45419	GridFreqHigh	RW	U16	Hz	100	1	[3000,8000]	
45420	GridFreqLow	RW	U16	Hz	100	1	[3000,8000]	
45421	GridRecoverTime	RW	U16	s	1	1	[1,1200]	
45422	GridVoltRecoverHigh	RW	U16	V	10	1	[600,3000]	Reconnect voltage
45423	GridVoltRecoverLow	RW	U16	V	10	1	[600,3000]	

45424	GridFreqRecoverHigh	RW	U16	Hz	100	1	[3000,8000]	
45425	GridFreqRecoverLow	RW	U16	Hz	100	1	[3000,8000]	
45426	GridVoltRecoverTime	RW	U16	s	1	1	[1,1200]	
45427	GridFreqRecoverTime	RW	U16	s	1	1	[1,1200]	
45428	Power rate limit (generate)	RW	U16	s	100	1	[0,1200]	Power rate limit
45429	Power rate limit (reconnect)	RW	U16	s	100	1	[0,1200]	
45430	Power rate limit (reduction)	RW	U16	s	100	1	[0,1200]	
45431	GridProtect	RW	U16	NA	1	1	[0: Enable, 1: Disable]	
cos φ (P)								
45432	power slope enable	RW	U16	NA	1	1	[0: Enable, 1: Disable]	
45433	EnableCurve	RW	U16	NA	1	1	[0: Enable, 1: Disable]	
45434	A point power	RW	S16	‰	1	1	[-1000, 1000]	
45435	A point cos φ	RW	S16	NA	1	1	[-100, 100]	
45436	B point power	RW	S16	‰	1	1	[-1000, 1000]	
45437	B point cos φ	RW	S16	NA	1	1	[-100, 100]	
45438	C pointpower	RW	S16	‰	1	1	[-1000, 1000]	
45439	C point cos φ	RW	S16	NA	1	1	[-100, 100]	
45440	lock in voltage	RW	U16	V	10	1	[600, 3000]	
45441	lock out voltage	RW	U16	V	10	1	[600, 3000]	
45442	lock out power	RW	S16	‰	1	1	[-1000, 1000]	
Power								
45443	Power and frequency curve	RW	U16	NA	1	1	[0,1]	bit0: 0: off, 1: on bit1: response mode, 1: fstop, 0: slope
45444	Ffrozen-DCH (frequency of Pm)	RW	U16	Hz	100	1	[3000,8000]	
45445	Ffrozen-CH (frequency of	RW	U16	Hz	100	1	[3000,8000]	
45446	fstop-DCH	RW	U16	Hz	100	1	[3000,8000]	
45447	fstop-CH	RW	U16	Hz	100	1	[3000,8000]	
45448	OF Recovery waiting time	RW	U16	s	100	1	[0,1200]	
45449	Recovery frequency1	RW	U16	Hz	100	1	[3000,8000]	

45450	Recovery frequency2	RW	U16	Hz	100	1	[3000,8000]	
45451	OF Recovery slope	RW	U16	s	1	1	[0,1200]	
45452	cFP_Settings	RW	U16	NA	1	1	[0,65535]	
45453	cFP_OFSlopePerc	RW	U16	‰/Hz	1	1	[-1000, 1000]	
45454	cFP_UFSlopePerc	RW	U16	‰/Hz	1	1	[-1000, 1000]	
45455	cFP_OF_RecoverPowerPerc	RW	U16	‰/Min	1	1	[-1000, 2000]	
QU curve								
45456	QU curve	RW	U16	NA	1	1	[0,1]	
45457	lock in power	RW	S16	‰	1	1	[-1000, 1000]	
45458	lock out power	RW	S16	‰	1	1	[-1000, 1000]	
45459	V1 voltage	RW	U16	V	10	1	[600, 3000]	
45460	V1 value (var % rated VA)	RW	S16	‰	1	1	[-1000, 1000]	
45461	V2 voltage	RW	U16	V	10	1	[600, 3000]	
45462	V2 value (var % rated VA)	RW	S16	‰	1	1	[-1000, 1000]	
45463	V3 voltage	RW	U16	V	10	1	[600, 3000]	
45464	V3 value (var % rated VA)	RW	S16	‰	1	1	[-1000, 1000]	
45465	V4 voltage	RW	U16	V	10	1	[600, 3000]	
45466	V4 value (var % rated VA)	RW	S16	‰	1	1	[-1000, 1000]	
45467	K value	RW	U16	NA	1	1	[0,65535]	
45468	time constant	RW	U16	NA	1	1	[0,4096]	
45469	Miscellanea	RW	U16	NA	1	1	[0,65535]	
45470	Rated Voltage(korea)	RW	U16	NA	1	1	[0,65535]	
45471	response time(korea)	RW	U16	NA	1	1	[0,65535]	
PU curve								
45472	PU curve	RW	U16	NA	1	1	[0,1]	
45473	Power change rate	RW	U16	s	100	1	[0,1200]	
45474	V1 voltage	RW	U16	V	10	1	[600,3000]	
45475	V1 value ((P/Pn)%)	RW	S16	‰	1	1	[-1000,1000]	
45476	V2 voltage	RW	U16	V	10	1	[600,3000]	
45477	V2 value ((P/Pn)%)	RW	S16	‰	1	1	[-1000,1000]	

45478	V3 voltage	RW	U16	V	10	1	[600,3000]	
45479	V3 value ((P/Pn)%)	RW	S16	‰	1	1	[-1000,1000]	
45480	V4 voltage	RW	U16	V	10	1	[600,3000]	
45481	V4 value ((P/Pn)%)	RW	S16	‰	1	1	[-1000,1000]	
45482	Fixed Power Factor	RW	U16	NA	1	1	[0,20]||[80,100]	80=Pf 0.8, 20= -0.8Pf
45483	Fixed reactive power	RW	S16	‰	1	1	[-600, 600]	Set the percentage of rated power of the inverter
45484	Fixed active power	RW	U16	‰	1	1	[0, 1000]	
45485	GridLimitByVolStartVol	RW	U16	NA	1	1	[0,65535]	
45486	GridLimitByVolStartPer	RW	U16	NA	1	1	[0,65535]	only for Japan
45487	GridLimitByVolSlope	RW	U16	NA	1	1	[0,65535]	
45491	All Power Curve Disable	RW	U16	NA	1	1	[0,1]	this must be turned off to do Meter test . "1" means Off
45492	R phase fixed active power	RW	U16	‰	1	1	[0,1000]	if it is 1-phase inverter, then use only R phase. Unbalance
45493	S phase fixed active power	RW	U16	‰	1	1	[0,1000]	output function must be turned on to set different values for
45494	T phase fixed active power	RW	U16	‰	1	1	[0,1000]	R/S/T phases
45495	GridVoltHighS3	RW	U16	V	10	1	[2200,2992]	only for countries where it needs 3-stage grid voltage protection, Eg. Czech Republic
45496	GridVoltHighS3Time	RW	U16	periods	1	1	[1,65535]	
45497	GridVoltLowS3	RW	U16	V	10	1	[33,220]	
45498	GridVoltLowS3Time	RW	U16	periods	1	1	[1,65535]	
For								
45499	ZvrtConfig	RW	U16	NA	1	1	[0,3]	0: Disable, 1: Only Lvrt, 2: Only Hvrt , 3: Both Lvrt&Hvrt
45500	LvrtStartVolt	RW	U16	V	10	1	[0,2300]	
45501	LvrtEndVolt	RW	U16	V	10	1	[0,2300]	
45502	LvrtStartTripTime	RW	U16	periods	1	1	[1,65535]	
45503	LvrtEndTripTime	RW	U16	periods	1	1	[1,65535]	
45504	LvrtTripLimitVolt	RW	U16	V	10	1	[0,2300]	
45505	HvrtStartVolt	RW	U16	V	10	1	[2300,3000]	
45506	HvrtEndVolt	RW	U16	V	10	1	[2300,3000]	
45507	HvrtStartTripTime	RW	U16	periods	1	1	[1,65535]	
45508	HvrtEndTripTime	RW	U16	periods	1	1	[1,65535]	

45509	HvrtTripLimitVolt	RW	U16	V	10	1	[2300,3000]	
Additiona								
45510	PF time constant	RW	U16	NA	1	1	[0, 4096]	
45511	Power Freq time constant	RW	U16	NA	NA	1	[0, 4096]	
45512	PU time constant	RW	U16	NA	1	1	[0, 4096]	Additional settings for P(U) Curve
45513	D pointpower	RW	S16	‰	1	1	[-1000, 1000]	
45514	D point cos φ	RW	S16	NA	1	1	[-100, 100]	
45515	UF Recovery waiting time	RW	U16	s	100	1	[0,1200]	Additional settings for UF Curve
45516	UF Recovery slope	RW	U16	s	1	1	[0,1200]	
45517	cFP_UF_RecoverPowerPerc	RW	U16	‰/Min	1	1	[-1000, 2000]	
45518	Power charge limit	RW	U16	s	100	1	[0,1200]	
45519	Power charge limit (reconnect)	RW	U16	s	100	1	[0,1200]	
45520	cExtUFChrgeStop	RW	U16	Hz	100	1	[3000,8000]	
45521	cExtOFDischgStop	RW	U16	Hz	100	1	[3000,8000]	
45522	cExtTWOSTEPFflg	RW	U16	NA	1	1	[0,1]	
45523	Frequency Extension Function Bit	RW	U16	N/A	1	1	[0,2]	Holu special requirements: 0:No effect 1:Enable only over frequency curve 2:Enable only under frequency curve
45526	PQ Curve Enable	RW	U16	N/A	1	1	[0,1]	
45527	Point1 Active Power	RW	S16	‰	1	1	[-1000,1000]	
45528	Point1 Reactive Power	RW	S16	‰	1	1	[-1000,1000]	
45529	Point2 Active Power	RW	S16	‰	1	1	[-1000,1000]	
45530	Point2 Reactive Power	RW	S16	‰	1	1	[-1000,1000]	
45531	Point3 Active Power	RW	S16	‰	1	1	[-1000,1000]	
45532	Point3 Reactive Power	RW	S16	‰	1	1	[-1000,1000]	
45533	Point4 Active Power	RW	S16	‰	1	1	[-1000,1000]	
45534	Point4 Reactive Power	RW	S16	‰	1	1	[-1000,1000]	
45535	Point5 Active Power	RW	S16	‰	1	1	[-1000,1000]	
45536	Point5 Reactive Power	RW	S16	‰	1	1	[-1000,1000]	
45537	Point6 Active Power	RW	S16	‰	1	1	[-1000,1000]	

45538	Point6 Reactive Power	RW	S16	‰	1	1	[-1000,1000]	
45539	Fixed Power Factor Flag	RW	U16	N/A	1	1	[0,1]	
45540	Power Factor	RW	U16	N/A	100	1	[0,1000]	
45541	Fixed PF Power Factor Over\Under	RW	U16	N/A	1	1	[0,1]	
45542	Fixed Q Power Flag	RW	U16	s	100	1	[0,1]	
45543	Fixed P Power Flag	RW	U16	N/A	1	1	[0,1]	
45544	QU Reference Voltage Adjust Flag	RW	U16	N/A	1	1	[0,1]	
45545	QU Reference Voltage Adjust Time	RW	U16	s	100	1	[300,5000]	1547-1 Communication Requirements
45546	QU Reference Voltage Adjust Value	RW	U16	V	10	1	[2000,2560]	
45547	Frequency Droop Dead Beat	RW	U16	Hz	100	1	[0,200]	
45548	Frequency Droop Dead Beat	RW	U16	Hz	100	1	[0,200]	
45549	Power Frequency Curve Slope of Over Frequency and Decrease Load	RW	U16	Hz/‰	100	1	[200,500]	
45550	Power Frequency Curve Slope of Over Frequency and Increase Load	RW	U16	Hz/‰	100	1	[200,500]	
45551	Power Frequency Curve Reponse Time	RW	U16	s	100	1	[0,10]	
45552	FCAS Ready Enable	RW	U16	N/A	1	1	[0,1]	
45553	Under Frequency Start	RW	U16	Hz	100	1	[3000,8000]	
45554	Over Frequency Start	RW	U16	Hz	100	1	[3000,8000]	
45555	Under Frequency End	RW	U16	Hz	100	1	[3000,8000]	
45556	Over Frequency End	RW	U16	Hz	100	1	[3000,8000]	
45557	Frequency Response Resolution Ratio	RW	U16	Hz	100	1	[1,1000]	
45558	Min Discharge SOC	RW	U16	%	1	1	[0 , 100]	
45559	Max Charge SOC	RW	U16	%	1	1	[0 , 100]	

45560	Discharge Duration	RW	U16	sec	1	1	[0,65535]	FCAS Function Requirements
45561	Discharge Max Power Delta	RW	U16	W	1	1	0-4600	
45562	Charge Duration	RW	U16	sec	1	1	[0,65535]	
45563	Charge Max Power Delta	RW	U16	W	1	1	0-4600	
45564	Battery Power Charge/Discharge Enable	RW	U16	N/A	1	1	[0,1]	
45565	Battery Charge Limit	RW	U16	W	1	1	0-4600	
45566	Battery Discharge Limit	RW	U16	W	1	1	0-4600	
45567	Inverter AC Input/Output	RW	U16	W	1	1	0-4600	
45568		RW	U16	N/A	N/A	1		
45569		RW	U16	N/A	N/A	1		
45570		RW	U16	N/A	N/A	1		
45571		RW	U16	N/A	N/A	1		
45572		RW	U16	N/A	N/A	1		
45573		RW	U16	N/A	N/A	1		
45574		RW	U16	N/A	N/A	1		
45575		RW	U16	N/A	N/A	1		
45576		RW	U16	N/A	N/A	1		
45577	AS477 Parameters	RW	U16	N/A	1	1	[0,65535]	"Japanese safety Parameters, corresponding to the old version 0x056D (1:on 0:off) Bit14:Effective power Bit13:Reverse power prevention Bit12:OVR detection function Bit11:EMS Loss Check Bit10:Enable manual recovery Bit9:Reactive power oscillation suppression Bit8:Voltage imbalance detection Bit7:FRT. Bit6:Passive islanding Bit5:Active anti-islanding Bit4:Step reactive power injection Bit3:Frequency feedback reactive power injection Bit2:Reserved Bit1:Reserved Bit0:Invalid power"
45578	Voltage Rise Suppression V1	RW	U16	N/A	10	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x0591

45579	Voltage Rise Suppression Limit Power	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x0592
45580	Anti-Island(Passive) Angle	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x0593
45581	Volt Rise Suppression V2	RW	U16	N/A	10	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x0594
45582	Anti-Island Status	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x7150 0:regular 1:standby
45583	On Grid Waiting Manual Recover Set	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x7151 Bit0:Recovery manually
45584	Frequency Feedback Inject Effciency	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x7152 0.25p.u/0.001Hz
45585	Action Signal Pin Setting	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters, corresponding to the old version 0x7153 0:MODE0 1:MODE1 2:MODE2
45586	Output Control Time Set	RW	S16	min	1	1	[0,10]	Japanese safety Parameters 0:Disable 5-10:5min-10min
45587	Output Control Power Set	RW	S16	‰	1	1	[0,1000]	Japanese safety Parameters
45588	Number of Standby Transfer Set	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters
45589	Recovery Cycle Setting When the Number of Standby Transfer is Less	RW	U16	periods	1	1	[0,65535]	Japanese safety Parameters
45590	Recovery Cycle Setting When the Number of Standby Transfer is Less	RW	U16	periods	1	1	[0,65535]	Japanese safety Parameters
45591	Lost Communication Flag	RW	U16	N/A	1	1	[0,65535]	Japanese safety Parameters

45592	Frequency Feedback Reactive Power Infection Standard Unit Value	RW	U16	0.0001p.u	1	1	[0,2500]	Japanese safety Parameters
45593	Upper limit of the generator operating voltage range	RW	U16	V	1	1	[80, 280]	default 280v
45594	Lower limit of the generator operating voltage range	RW	U16	V	1	1	[80, 280]	default 180v
45595	Upper limit of the generator operating frequency range	RW	U16	HZ	100	1	[4500, 5500]	default 550
45596	Lower limit of the generator operating frequency range	RW	U16	HZ	100	1	[4500, 5500]	default 450

Meter Control (ARM)							
47000	AppModeIndex	RW				0:selfuse mode 1: off gird mode 2: backup mode 3:economic mode	The same function as that for Operation Mode on PV Master App
47001	MeterCheckValue	R			1	[0, 60000]	
47002	wMeterConnectCheckFlag	RW				0:Finish the test 1: Checking, 2: Wait	to read the Meter Test status
47005	log data enable				1	[0: OFF, 1: ON]	
47006	data send interval			*5s	1	[2,256]	
47007	DRED cmd	RW			1	[0,255]	
47009	wifi or lan switch	W			1	[4:wifi, 5:lan]	
47012	LED Blink time	RW		second	1		
47013	wifi led state	RW			1	[1,5]	
47014	com led state	RW			1	[1,5]	
47015	MeterCT1reverseEnable	RW			1	[0,1]	
47016	Error log read page	RW			1	[0,255]	
47017	ModbusTCP without internet	RW			1	[0,1]	1:on 0:off If not connect to Internet, please set 1
47018	backup led	RW			1	[1,5]	1: off, 2: on, 3: flash 1x, 4: flash 2x, 5: flash 4x
47019	grid led	RW			1	[1,5]	1: off, 2: on, 3: flash 1x, 4: flash 2x, 5: flash 4x
47020	soc led 1	RW			1	[1,5]	1: off, 2: on, 3: flash 1x, 4: flash 2x, 5: flash 4x
47021	soc led 2	RW			1	[1,5]	1: off, 2: on, 3: flash 1x, 4: flash 2x, 5: flash 4x
47022	soc led 3	RW			1	[1,5]	
47023	soc led 4	RW			1	[1,5]	1: off, 2: on, 3: flash 1x, 4: flash 2x, 5: flash 4x
47024	battery led	RW			1	[1,5]	
47025	system led	RW			1	[1,5]	
47026	fault led	RW			1	[1,5]	
47027	energy led	RW			1	[1,5]	1: off, 2: on, 3: flash 1x, 4: flash 2x, 5: flash 4x
47028	LED external control	RW			1	[42343]	

47038	StopModeSaveEn	RW	U16		1	1	[0,1]	1 Enable, After restart the inverter, setting saved
47040	WIFI Modbus TCP Enable	RW	U16	N/A	1	1	[0,1]	
47117	API Remote TimeOut Enable	RW	U16	N/A	1	1	[0,1]	
47118	API time out	RW	U16	min	1	1	[1,60]	
47505	ManufacturerCode						2	
47509	FeedPowerEnable						[0, 1: Enable]	Use FeedPowerEnable (47509) to activate export power limit function. and EMSPowerSet (47510) to set the max allowed export power to grid
47510	FeedPowerPara		S16				[0,10000]	
47511	EMSPowerMode							Refer to 8-16
47512	EMSPowerSet					1	[0,10000]	
47514	Battery protocol						[0,511]	Refer to 8-33
Economi								
47515	StartTime_1	RW	U16				[0,23]-[0,59]	hh:mm
47516	EndTime_1	RW	U16				[0,23]-[0,59]	hh:mm
47517	BatPowerPercent_1	RW	S16				[-100,100]	%
47518	WorkWeek_1	RW	U16				Table 8-34	
47519	StartTime_2	RW	U16				[0,23]-[0,59]	hh:mm
47520	EndTime_2	RW	U16				[0,23]-[0,59]	hh:mm
47521	BatPowerPercent_2	RW	S16				[-100,100]	%
47522	WorkWeek_2	RW	U16				Table 8-34	
47523	StartTime_3	RW	U16				[0,23]-[0,59]	hh:mm
47524	EndTime_3	RW	U16				[0,23]-[0,59]	hh:mm
47525	BatPowerPercent_3	RW	S16				[-100,100]	%
47526	WorkWeek_3	RW	U16				Table 8-34	
47527	StartTime_4	RW	U16				[0,23],[0,59]	hh:mm
47528	EndTime_4	RW	U16				[0,23],[0,59]	hh:mm
47529	BatPowerPercent_4	RW	S16				[-100,100]	%
47530	WorkWeek_4	RW	U16				Table 8-34	

47531	startchgSOC			%	10	1		To set the SOC level to start/stop battery force charge. (this is not the command from BMS, but the protection on inverter side. Eg. StartchgSOC (47531) is set as 5%, but the battery BMS gives a force charge signal at SOC 6%, then
47532	stopchgSOC			%	10	1		battery will start force charge at 6% SOC; if BMS does not send force charge command at 5% SOC, then battery will still start force charge at 5% SOC.) Note: the default setting is 5% SOC to start and 10% to stop. force charge power is 1000W from PV or Grid as well.
47533	clearECOtime	W				1		to clear all economical mode settings (47515~47530) , enter Self-Use Mode
47539	Wifi Reset	WO	U16			1	[1: Reset]	
47541	Wifi Reload	WO	U16			1	[1: Reload]	
47542	peakshaving power limit	RW	U32	W		2		to set the threshold of importing power, where peak-shaving acts. Eg. If set peak-shaving power as 20kW, then battery will only discharge when imported power from grid exceed 20kW to make sure the importing power keeps below 20kW
47544	peakshaving soc	RW	U16	%		1		to set the mimum battery SOC reserved to respind peak-shaving use only.
47545	FastChargeEnable	RW	U16	1		1	[0,1]	0: Disable 1:Enable
47546	FastChargeStopSoc	RW	U16	1		1	[0,100]	
Economi								
47547	StartTime_1	RW	U16			1	[0,23],[0,59]	hh:mm
47548	EndTime_1	RW	U16			1	[0,23],[0,59]	hh:mm
47549	WorkWeek_1	RW	U16			1	Table 8-34	
47550	parameter1_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47551	parameter1_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0,100]/NA/[0,1440]	
47552	parameter1_3	RW				1		

47553	StartTime_2	RW	U16			1	[0,23],[0,59]	hh:mm
47554	EndTime_2	RW	U16			1	[0,23],[0,59]	hh:mm
47555	WorkWeek_2	RW	U16			1	Table 8-34	
47556	parameter2_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47557	parameter2_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0，100]/NA/[0,1440]	
47558	parameter2_3	RW				1		
47559	StartTime_3	RW	U16			1	[0,23],[0,59]	hh:mm
47560	EndTime_3	RW	U16			1	[0,23],[0,59]	hh:mm
47561	WorkWeek_3	RW	U16			1	Table 8-34	
47562	parameter3_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47563	parameter3_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0，100]/NA/[0,1440]	
47564	parameter3_3	RW				1		
47565	StartTime_4	RW	U16			1	[0,23],[0,59]	hh:mm
47566	EndTime_4	RW	U16			1	[0,23],[0,59]	hh:mm
47567	WorkWeek_4	RW	U16			1	Table 8-34	
47568	parameter4_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47569	parameter4_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0，100]/NA/[0,1440]	
47570	parameter4_3	RW				1		
47571	StartTime_5	RW	U16			1	[0,23],[0,59]	hh:mm
47572	EndTime_5	RW	U16			1	[0,23],[0,59]	hh:mm
47573	WorkWeek_5	RW	U16			1	Table 8-34	

47574	parameter5_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47575	parameter5_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0，100]/NA/[0,1440]	
47576	parameter5_3	RW				1		
47577	StartTime_6	RW	U16			1	[0,23],[0,59]	hh:mm
47578	EndTime_6	RW	U16			1	[0,23],[0,59]	hh:mm
47579	WorkWeek_6	RW	U16			1	Table 8-34	
47580	parameter6_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47581	parameter6_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0，100]/NA/[0,1440]	
47582	parameter6_3	RW				1		
47583	StartTime_7	RW	U16			1	[0,23],[0,59]	hh:mm
47584	EndTime_7	RW	U16			1	[0,23],[0,59]	hh:mm
47585	WorkWeek_7	RW	U16			1	Table8-1	
47586	parameter7_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47587	parameter7_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0，100]/NA/[0,1440]	
47588	parameter7_3	RW				1		
47589	StartTime_8	RW	U16			1	[0,23],[0,59]	hh:mm
47590	EndTime_8	RW	U16			1	[0,23],[0,59]	hh:mm
47591	WorkWeek_8	RW	U16			1	Table8-1	
47592	parameter8_1	RW	S16/NA/U16/U16	%/NA/KW/KW	1/NA/100/100	1	[-100,100]/NA/[0,10000]/[0,50000]	
47593	parameter8_2	RW	U16/NA/U16	%/NA/min	1/NA/1	1	[0，100]/NA/[0,1440]	

47594	parameter8_3	RW				1		
47595	LoadRegulationIndex	RW	U16	NA		1	[0 : Disable 1 : switching mode 2 : Time manage mode	Only for inverter with ARM version >18 To select Load control mode
47596	LoadSwitchStatus	RW	U16			1	[0,1]	Only for inverter with ARM version >18, to read the load control status
47597	BackupSwitchSOCMin	RW	U16			1	[0,100]	For load control function, if the controlled load on Backup side, use this to switch the load off when battery reaches the SOC
47599	Hardware Feedpower	RW	U16			1	[0,1]	
47600	PCS Powersave Mode	RW	U16	N/A	N/A	1	[0,1]	When enabLed,discharge mode turn to wait when the SPI Battery disables discharge
47601	Old Meter Protocol	RW	U16	N/A	N/A	1	[0,1]	
47602	DOD Holding Enable	RW	U16	N/A	N/A	1	[0,1]	
47604	Load Regulation or Generator Flag	RW	U16	N/A	N/A	1		Dry node function configuration, deFault load control, version≥18 0:generator 1:load safety
47605	Backup Mode Enable	RW	U16	N/A	N/A	1	1Enable	
47606	Max Charge Power from	RW	U16	‰	N/A	1	[0,1000]	
47607	Reserved	RW	U32	N/A	N/A	2		
47609	Smart Charging Mode	RW	U16	N/A	N/A	1	1Enable	
47610	Reserved	RW	U32	N/A	N/A	2		
47612	ECO Mode Enable	RW	U16	N/A	N/A	1		
47613	PV sell first	RW	U16	N/A	N/A	1		
47614	Reserved	RW	U16	N/A	N/A	1		
47615	Battery Current Coff	RW	U16	%	1	1	[0,100]	
47616	Parallel Strong Charge Power	RW	U16	‰	1	1	[0,1000]	
47618	Battery2 Protocol	RW	U16	N/A	N/A	1	[0,511]	Refer to 8-33
47619	Feed Power Start Time_1	RW	U32	S	N/A	2		
47621	Feed Power limit_1	RW	S32	W	N/A	2		

47623	Feed Power Period_1	RW	U16	S	N/A	1		
47624	Feed Power Start Time_2	RW	U32	S	N/A	2		
47626	Feed Power limit_2	RW	S32	W	N/A	2		
47628	Feed Power Period_2	RW	U16	S	N/A	1		
47629	Feed Power Start Time_3	RW	U32	S	N/A	2		
47631	Feed Power limit_3	RW	S32	W	N/A	2		
47633	Feed Power Period_3	RW	U16	S	N/A	1		
47634	Feed Power Start Time_4	RW	U32	S	N/A	2		
47636	Feed Power limit_4	RW	S32	W	N/A	2		
47638	Feed Power Period_4	RW	U16	S	N/A	1		
47639	Feed Power Start Time_5	RW	U32	S	N/A	2		
47641	Feed Power limit_5	RW	S32	W	N/A	2		
47643	Feed Power Period_5	RW	U16	S	N/A	1		
47644	Feed Power Start Time_6	RW	U32	S	N/A	2		
47646	Feed Power limit_6	RW	S32	W	N/A	2		
47648	Feed Power Period_6	RW	U16	S	N/A	1		
47649	Feed Power Start Time_7	RW	U32	S	N/A	2		
47651	Feed Power limit_7	RW	S32	W	N/A	2		
47653	Feed Power Period_7	RW	U16	S	N/A	1		
47654	Feed Power Start Time_8	RW	U32	S	N/A	2		
47656	Feed Power limit_8	RW	S32	W	N/A	2		
47658	Feed Power Period_8	RW	U16	S	N/A	1		
47659	Feed Power Start Time_9	RW	U32	S	N/A	2		
47661	Feed Power limit_9	RW	S32	W	N/A	2		
47663	Feed Power Period_9	RW	U16	S	N/A	1		
47664	Feed Power Start Time_10	RW	U32	S	N/A	2		
47666	Feed Power limit_10	RW	S32	W	N/A	2		
47668	Feed Power Period_10	RW	U16	S	N/A	1		
47669	Feed Power Start Time_11	RW	U32	S	N/A	2		
47671	Feed Power limit_11	RW	S32	W	N/A	2		
47673	Feed Power Period_11	RW	U16	S	N/A	1		
47674	Feed Power Start Time_12	RW	U32	S	N/A	2		

47676	Feed Power limit_12	RW	S32	W	N/A	2		
47678	Feed Power Period_12	RW	U16	S	N/A	1		
47679	Feed Power Start Time_13	RW	U32	S	N/A	2		
47681	Feed Power limit_13	RW	S32	W	N/A	2		
47683	Feed Power Period_13	RW	U16	S	N/A	1		
47684	Feed Power Start Time_14	RW	U32	S	N/A	2		
47686	Feed Power limit_14	RW	S32	W	N/A	2		
47688	Feed Power Period_14	RW	U16	S	N/A	1		
47689	Feed Power Start Time_15	RW	U32	S	N/A	2		
47691	Feed Power limit_15	RW	S32	W	N/A	2		
47693	Feed Power Period_15	RW	U16	S	N/A	1		
47694	Feed Power Start Time_16	RW	U32	S	N/A	2		
47696	Feed Power limit_16	RW	S32	W	N/A	2		
47698	Feed Power Period_16	RW	U16	S	N/A	1		
47699	Feed Power Start Time_17	RW	U32	S	N/A	2		
47701	Feed Power limit_17	RW	S32	W	N/A	2		
47703	Feed Power Period_17	RW	U16	S	N/A	1		
47704	Feed Power Start Time_18	RW	U32	S	N/A	2		
47706	Feed Power limit_18	RW	S32	W	N/A	2		
47708	Feed Power Period_18	RW	U16	S	N/A	1		
47709	Feed Power Start Time_19	RW	U32	S	N/A	2		
47711	Feed Power limit_19	RW	S32	W	N/A	2		
47713	Feed Power Period_19	RW	U16	S	N/A	1		
47714	Feed Power Start Time_20	RW	U32	S	N/A	2		
47716	Feed Power limit_20	RW	S32	W	N/A	2		
47718	Feed Power Period_20	RW	U16	S	N/A	1		
47719	Feed Power Start Time_21	RW	U32	S	N/A	2		
47721	Feed Power limit_21	RW	S32	W	N/A	2		
47723	Feed Power Period_21	RW	U16	S	N/A	1		
47724	Feed Power Start Time_22	RW	U32	S	N/A	2		
47726	Feed Power limit_22	RW	S32	W	N/A	2		
47728	Feed Power Period_22	RW	U16	S	N/A	1		

47729	Feed Power Start Time_23	RW	U32	S	N/A	2		
47731	Feed Power limit_23	RW	S32	W	N/A	2		
47733	Feed Power Period_23	RW	U16	S	N/A	1		
47734	Feed Power Start Time_24	RW	U32	S	N/A	2		
47736	Feed Power limit_24	RW	S32	W	N/A	2		
47738	Feed Power Period_24	RW	U16	S	N/A	1		
47739	SAPN UP Rate	RW	U16	%Pn/min	100	1		
47740	SAPN Down Rate	RW	U16	%Pn/min	100	1		
47741	SAPN Feed Power Preset	RW	S32	W	N/A	2		
47743	Single Battery Paral Enable	RW	U16	N/A	N/A	1		
47744	Battery Busbar Mode	RW	U16	N/A	N/A	1		
Real-Time BMS Data for EMS Control (the data directly from BMS. Please refer to the comments on registers 45352~45358)								
47900	BMSVersion		U16			1		
47901	BattStrings		U16			1		
47902	wBMSBatChargeVMax		U16			1		the REAL-TIME max charge voltage limit from battery BMS
47903	wBMSBatChargeIMax		U16			1		the REAL-TIME max charge current limit from battery BMS
47904	wBMSBatDisChargeVMin		U16			1		the REAL-TIME min discharge voltage limit from battery BMS
47905	wBMSBatDisChargeIMax		U16			1		the REAL-TIME max discharge current limit from battery BMS
47906	wBMSBatVoltage		U16			1		the REAL-TIME battery voltage (Battery BMS detected)
47907	wBMSBatCurrent		U16			1		the REAL-TIME battery charge/discharge current (Battery BMS detected)
47908	wBMSBatSOC		U16			1		
47909	wBMSBatSOH		U16			1		
47910	wBMSBatTemperature		U16			1		
47911	BMSWarningCode		U32			2		
47913	BMSAlarmCode		U32			2		
47915	BMSStatus		U16			1		
47916	EBMSCommLossDisable		U16			1		
47917	BMSBatteryStringRateVoltag	RW	U16	V	10	1	[200,2000]	
47918	BMS Version2	RW	U16	N/A	N/A	1		
47919	Battery Strings2	RW	U16	N/A	N/A	1		

47920	Max BMS Battery2 Charge Voltage	RW	U16	V	N/A	1		
47921	Max BMS Battery2 Charge Current	RW	U16	A	N/A	1		
47922	Min BMS Battery2 Discharge Voltage	RW	U16	V	N/A	1		
47923	Min BMS Battery2 Discharge Current	RW	U16	A	N/A	1		
47924	BMS Battery2 Voltage	RW	U16	V	N/A	1		
47925	BMS Battery2 Current	RW	U16	A	N/A	1		
47926	BMS Battery2 SOC	RW	U16	%	N/A	1		
47927	BMS Battery2 SOH	RW	U16	N/A	N/A	1		
47928	BMS Battery2 Temperature	RW	U16	℃	10	1		
47929	BMS2 Warning Code	RW	U32	N/A	N/A	2		
47931	BMS2 Alarm Code	RW	U32	N/A	N/A	2		
47933	BMS2 Status	RW	U16	N/A	N/A	1		
47934	BMS2 Communication Loss Disable	RW	U16	N/A	N/A	1		
47935	BMS Battery String2 RateVoltage	RW	U16	V	10	1	[200,2000]	
47936	Max BMS Battery Discharge Current Offline	RW	U16	A	10	1		
47937	Max BMS Battery Discharge Current Offline2	RW	U16	A	10	1		

Table 8-1 Work Mode

Mode	Code	Description
Wait	0x00	cut off all the connection to Inverter
On-Grid	0x01	PV intputs to Inverter, Inverter outputs to Grid
Off-Grid	0x02	PV inputs to Inverter(1st),Battery inputs to Inverter(2nd),Inverter work as AC source
Fault	0x03	Fault ,fault mode, something is in fault mode
Flash	0x04	Inverter upgrade
Check	0x05	Power on self-check of inverter

Table 8-2 Error Message

Bit NO	Error message	Description
Bit31	Internal Communication Failure	Communication between microcontrollers is failure
Bit30	EEPROM R/W Failure	EEPROM cannot be read or written
Bit29	Fac Failure	The grid frequency is out of tolerable range
Bit28	DSP communication failure	Communication between ARM and DSP is failure
Bit27	PhaseAngleFailure	Phase angle out of range (110°~140°)
Bit26	TBD	NA
Bit25	Relay Check Failure	Relay check is failure
Bit24	TBD	NA
Bit23	Vac Consistency Failure	Different value between Master and Slave for grid voltage
Bit22	Fac Consistency Failure	Different value between Master and Slave for grid frequency
Bit21	TBD	NA
Bit20	Back-Up Over Load	NA
Bit19	DC Injection High	The DC injection to grid is too high
Bit18	Isolation Failure	Isolation resistance of PV-plant too low
Bit17	Vac Failure	Grid voltage out of tolerable range

Bit16	External Fan Failure	The external fan failure
Bit15	PV Over Voltage	Pv input voltage is over the tolerable maximum value
Bit14	Utility Phase Failure	Utility Phase Failure
Bit13	Over Temperature	Temperature is too high
Bit12	InternalFan Failure	The fan in case failure
Bit11	DC Bus High	Dc bus is too high
Bit10	Ground I Failure	Ground current is too high
Bit9	Utility Loss	Utility is unavailable
Bit8	AC HCT Failure	AC HCT check failure 3 times
Bit7	Relay Device Failure	Relay check failure 3 times
Bit6	GFCI Device Failure	GFCI check failure 3 times
Bit5	TBD	NA
Bit4	GFCI Consistency Failure	Different GFCI values on Master &Slave
Bit3	DCI Consistency	Different DCI value on Master and Slave
Bit2	TBD	NA
Bit1	AC HCT Check Failure	The output current sensor is abnormal
Bit0	GFCI Device Check Failure	The GFCI detecting circuit is abnormal

Table 8-3 PV Mode

Byte	Description
0	PV1 mode, refer to table 8-4
1	PV2mode, refer to table 8-4
2	PV3 mode, refer to table 8-4
3	PV4 mode, refer to table 8-4

Table 8-4 PV Mode Code

Mode Code	Description
0x00	NO PV, inverter disconnects to PV
0x01	Standby, PV does not output power
0x02	Work, PV output power

Table 8-7 BMS Alarm Code

Bit31	Bit30	Bit29	Bit28	Bit27
Reserved	Reserved	Reserved	Reserved	Reserved
Bit15	Bit14	Bit13	Bit12	Bit11
Charging over-voltage3	Discharge	Cell High	Communication failure2	Charging circuit Failure
Bit7	Bit6	Bit5	Bit4	Bit3
DC bus fault	Precharge fault	Discharging	Charging overcurrent2	Cell Low temperature2

Table 8-8 BMS Warning Code

Bit31~Bit15	Bit14	Bit13	Bit12	Bit11
Reserved				System High temperature
Bit7	Bit6	Bit5	Bit4	Bit3
System Reboot	communication	Discharge over-	Charge over-current1	Cell Low temperature1

Table 8-9 Battery Status

Mode Code	Description
0x00	No Battery, or battery disconnected
0x01	Standby, no discharging or charging
0x02	Discharging
0x03	Charging

Table 8-10 Grid Status

Mode Code	Description
0x00	Loss, inverter disconnects to Grid
0x01	OK, inverter connects to Grid
0x02	Fault, something is wrong

Table 8-11 Backup Status

Mode Code	Description
0x00	ON, inverter connects to Load
0x01	OFF, inverter disconnects to Load

Table 8-12 Operation Mode

Mode Code	Description
0x01	Cut off all the connection to Inverter(wait mode)
0x02	PV intputs to Inverter, Inverter outputs to Grid(online mode)
0x04	PV inputs to Inverter(First),Battery inputs to Inverter(Second),Inverter work as AC source(battery mode)
0x10	Fault, fault mode, something is in fault mode(fault mode)

Table 8-13 Diagnostic Status

Code	Diagnose Info	Expalantion

0x00000001	Battery Precharge Relay Off	Battery Precharge Relay Off
0x00000002	ByPass Relay Stick	Bypass relay is sticking
0x10000000	Meter voltage sample fault	Meter voltage sample fault
0x20000000	External Stop Mode Enable	DRED or ESD stop the inverter
0x40000000	Battery Offgrid DOD	Battery SOC less than Offgrid DOD
0x80000000	Battery SOC Adjust Enable	Only for BYD, adjust the SOC

Table 8-14 Diagnostic Status

Bit	Diagnose Info	Explanation	Type
0	BatteryVoltLow	1:Battery not discharge caused by low battery voltage	Affect discharge
1	BatterySOCLow	1:Battery not discharge caused by low SOC	
2	BatterySOCInBack	1:Battery SOC not recover to allow-discharge level	
3	BMSDischargeDisable	1:BMS not allow discharge	
4	DischargeTimeOn	Discharge time is set, 1: On, 0: OFF	
5	ChargeTimeOn	Charge time is set, 1: On, 0: OFF	
6	DischargeDriveOn	1:Discharge driver is turned on	
7	BMSDischgCurrentLow	1:BMS discharge current limit is too low	
8	DischargeCurrentLow	1:Discharge current limit is too low (from App)	
9	MeterCommLoss	1:Smart Meter communication failure	
10	MeterConnectReverse	1:Smart Meter connection reversed	
11	SelfUseLoadLight	1:Low load power, cannot activate battery discharge	
12	EMSDischargeIZero	1:Discharge current limit 0A from EMS	
13	DischargeBUSHigh	1:Battery not discharge caused by over high PV voltage	
14	BatteryDisconnect	1:Battery disconnected	Affect charging
15	BatteryOvercharge	1:Battery overcharged	
16	BMSOverTemperature	1:Lithium battery over temperature	
17	BMSOvercharge	1:Lithium battery overcharged or an individual cell voltage is higher	
18	BMSChargeDisable	1:BMS does not allow charge	
19	SelfUseOff	1:Self-use mode turned off	Affect discharge
20	SOCDeltaOverRange	1:SOC Jumps abnormally	Other
21	BatterySelfDischarge	1:Battery discharge at low current for long time, continuously over 30% of battery	
22	OffgridSOCLow	1:SOC is low under off-grid statues	
23	GridWaveUnstable	1:Grid wave is bad, switch to back-up mode frequently	
24	FeedPowerLimit	1:Export power limit is set	
25	PFValueSet	1:PF value is set	
26	RealPowerLimit	1:Active power value is set	
28	SOCProtectOff	1:SOC protect Off	

Table 8-15 DRM Status

Value	DRMx	Description
0	DRM0	Operate the disconnection device
1	DRM1	Do not consume power
2	DRM2	Do not consume at more than 50% of rated power
3	DRM3	Do not consume at more than 75% of rated power and source reactive power if capable
4	DRM4	Increase power consumption(Subjects to constraints from other active DRMs)
5	DRM5	Do not generate power
6	DRM6	Do not generate at more than 50% of rated power
7	DRM7	Do not generate at more than 50% of rated power and sink reactive power if capable
8	DRM8	Increase power generation(Subjects to constraints from other active DRMs)
0xFF	No	Disable

Table 8-16 EMS Power Mode

Application scenarios	MODE	COMMAND		PV	Grid	Battery
		EMSPowerMode	EMSPowerSet	Power priority (Green is the control object)		
System shutdown	Stopped	0x00FF	NA			
	Note :Stop working and switch to wait mode					
Self-use	Auto	0x0001	NA			
	Note: PBattery =PInv - Pmeter – Ppv (Discharge/Charge)					
	The battery power is controlled by the meter power when the meter communication is normal.					
Control the battery to keep charging	Charge-PV	0x0002	Xmax [2]	High	Low [1]	Energy In
	Note :PBattery =Xmax + PV (Charge)					
	Xmax is to allow the power to be taken from the grid, and PV power is preferred. When set to 0, only PV power is used. Charging power will be limited by charging current limit.					
Control the battery to keep discharging	Dischg+PV	0x0003	Xmax	High	Energy Out	Low
	Note : PBattery = Xmax (Discharge)					
	Xmax is the allowable discharge power of the battery. When the power fed into the grid is limited, PV power will be used first.					

The inverter is used as a unit for power grid energy scheduling	Import-AC	0x0004	Xset [3]	Low	High	Energy In
	Note :PBattery = Xset + PV (Charge)					
	Xset refers to the power purchased from the power grid. The power purchased from the grid is preferred. If the PV power is too large, the MPPT power will be limited.(grid side load is not considered)					
	Export-AC	0x0005	Xset	High	Energy Out	Low
	Note : PBattery = Xset (Discharge)					
	Xset is to sell power to the grid. PV power is preferred. When PV energy is insufficient, the battery will discharge.PV power will be limited by x.(grid side load is not considered)					
Off-grid reservation mode	Conserve	0x0006	NA			
	Note : PBattery = PV (Charge)					
	In on-grid mode, the battery is continuously charged, and only PV power (AC Couple model takes 10% of the rated power of the power grid) is used. The battery can only discharge in off-grid mode. PV do not support the loads first.					
Off-Grid Mode	Off-Grid	0x0007	NA			
	Note : PBattery =Pbackup – Ppv (Charge/Discharge)					
	Forced off-grid operation (Disconnect from grid)					
No battery mode for hybrid inverter	Battery standby	0x0008	NA			
	Note : PBattery =0 (Standby)					
	The battery does not charge and discharge					
Regional energy management	Buy Power	0x0009	Xset	Low	High	Energy In/Out
	Note :PBattery = PInv – (Pmeter + Xset)– Ppv (Charge/Discharge)					
	When the meter communication is normal, the power purchased from the power grid is controlled as Xset. When the PV power is too large, the MPPT power will be limited. When the load is too large, the battery will discharge.					
	Sell Power	0x000A	Xset	High	Energy Out	Low
	Note : PBattery = PInv – (Pmeter – Xset) – Ppv (Charge/Discharge)					
	When the communication of electricity meter is normal, the power sold from the power grid is controlled as Xset, PV power is preferred, and the battery discharges when PV energy is insufficient.PV power will be limited by Xset.					

Force the battery to work at set power value	Charge-BAT	0x000B	Xset	High	Low	Energy In
	Note : PBattery = Xset (Charge)					
	Xset is the charging power of the battery. PV power is preferred. When PV power is insufficient, it will buy power from the power grid. The charging power is also affected by the charging current limit.					
	Discharge-BAT	0x000C	Xset	Low	Energy In	High
	Note : PBattery = Xset (Discharge)					
	Xset is the discharge power of the battery, and the battery discharge has priority. If the PV power is too large, MPPT will be limited. Discharge power is also affected by discharge current limit.					

Note:

[1] for low-priority energy sources, when the battery charging power is limited or the rated output power of the inverter is limited, the load shall be reduced first.

[2] Xmax represents the upper limit of the power control value, and the actual power will be adjusted according to the working condition.

[3] Xset represents the target value of power control, and the actual power must reach the set value.

Table 8-17 CPLD Warning Code

VALUE	Error message
1	PV1 Over Current HW
2	PV2 Over Current HW
3	Battery Over Current HW
4	Bus Over Voltage HW
5	R InvOverCurr HW
6	S InvOverCurr HW
7	T InvOverCurr HW
8	BatRelayFail

Table 8-18 Power Factor

Data	Description
1	0.99 lagging
2	0.98 lagging
3	0.97 lagging
4	0.96 lagging
5	0.95 lagging
6	0.94 lagging
7	0.93 lagging
8	0.92 lagging
9	0.91 lagging
10	0.90 lagging
11	0.89 lagging
12	0.88 lagging
13	0.87 lagging
14	0.86 lagging
15	0.85 lagging
16	0.84 lagging
17	0.83 lagging
18	0.82 lagging
19	0.81 lagging
20	0.80 lagging
80	0.80 leading
81	0.81 leading
82	0.82 leading
83	0.83 leading
84	0.84 leading
85	0.85 leading
86	0.86 leading
87	0.87 leading
88	0.88 leading
89	0.89 leading

90	0.90 leading
91	0.91 leading
92	0.92 leading
93	0.93 leading
94	0.94 leading
95	0.95 leading
96	0.96 leading
97	0.97 leading
98	0.98 leading
99	0.99 leading
100	1

Table 8-20 Weekly schedule

	Bit NO	Definition
High byte	Bit15~8	0xFF :enable
		0x00 : disable
Low byte	Bit7	NA
	Bit6	Saturday
	Bit5	Friday
	Bit4	Thursday
	Bit3	Wednesday
	Bit2	Tuesday
	Bit1	Monday
	Bit0	Sunday

Table 8-21

Code	Description	Grid connection standards
0x00	Italy	ENEL (Un: 230Vac)
0x01	Czech	EN50438(CZ) (Un: 230Vac)
0x02	Germany	VDE-AR-N 4105(Un: 230Vac)
0x03	Spain	RD1699(Un: 230Vac)
0x04	GreeceMainland	EN50438(GR) (Un: 230Vac)
0x05	Danmark	EN50438(DK)
0x06	Belgium	C10/C11(Un: 230Vac)
0x07	Romania	(Un: 230Vac)
0x08	G98	G83/2 G59/3 (Un: 230Vac)
0x09	Australia	AS/NZS 4777.2
0x0A	France	VDE0126
0x0B	China	NB-T
0x0C	60Hz Grid Default	CSA
0x0D	Poland	EN50438
0x0E	South Africa	(Un: 230Vac)
0x0F	AustraliaL	AS/NZS 4777.2
0x10	Brazil	(Un: 220Vac)
0x11	Thailand MEA	MEA
0x12	Thailand PEA	PEA
0x13	Mauritius	(Un: 230Vac)
0x14	Holland	EN50438
0x15	G99	Northern Ireland
0x16	ChinaHigher	NB-T
0x17	French 50Hz	(Un: 230Vac)
0x18	French 60Hz	(Un: 230Vac)
0x19	Australia Ergon	AS/NZS 4777.2
0x1A	Australia Energex	AS/NZS 4777.2
0x1B	Holland 16/20A	EN50438
0x1C	Korea	(Un: 220Vac)
0x1D	China Station	NB-T

0x1E	Austria	(Un: 230Vac)
0x1F	India	IEC61727
0x20	50Hz Grid Default	Default
0x21	Warehouse	Warehouse
0x22	Philippines	Philippines
0x23	Ireland	EN50438 Ireland
0x24	Taiwan	(Un: 230Vac)
0x25	Bulgaria	EN50438
0x26	Barbados	(Un: 230Vac)
0x27	ChinaHighest	NB-T
0x28	G99 reserve	G59/3 (Un: 230Vac)
0x29	Sweden	EN50438 (Un: 230Vac)
0x2A	Chile	BISI 4.0 (Un: 220Vac)
0x2B	Brazil LV	(Un: 220Vac)
0x2C	NewZealand	AS/NZS 4777.2
0x2D	IEEE1547 208Vac	IEEE1547 (Un: 120/208Vac)
0x2E	IEEE1547 220Vac	IEEE1547 (Un: 127/220Vac)
0x2F	IEEE1547 240Vac	IEEE1547 (Un: 138.6/240Vac)
0x30	60Hz LV Default	60Hz LV Default
0x31	50Hz LV Default	50Hz LV Default
0x32	Australia Western	AS/NZS 4777.2
0x33	Australia MicroGrid	AS/NZS 4777.2
0x34	JP_50Hz	JP_50Hz
0x35	JP_60Hz	JP_60Hz
0x36	India Higher	IEC61727 (Un: 230Vac))
0x37	DEWA LV	DEWA (Un:230Vac)
0x38	DEWA MV	DEWA (Un:230Vac)
0x39	Slovakia	EN50438(SV) (Un: 230Vac)
0X3A	GreenGrid	AS/NZS 4777.2
0x3B	Hungary	(Un: 230Vac)
0x3C	SriLanka	(Un: 230Vac)
0x3D	SpainIslands	RD1699 (Un: 230Vac)
0x3E	Ergon30K	(Un: 230Vac)
0x3F	Energe30K	(Un: 230Vac)

0x40	IEEE1547_230VAC	IEEE1547 (Un: 230/400Vac)
0x41	IEC61727_60Hz	IEC61727 (Un: 230Vac)
0x42	Switzerland	VDE-AR-N 4105 (Un: 230Vac)
0x43	CEI_016	CEI-016 (Un: 230Vac)
0x44	Australia Horizon	AS/NZS 4777.2
0x45	Cyprus	(Un: 230Vac)
0x46	Australia SAPN	AS/NZS 4777.2
0x47	Australia Ausgrid	AS/NZS 4777.2
0x48	Australia Essential	AS/NZS 4777.2
0x49	Australia Pwcore_CitiPW	AS/NZS 4777.2
0x4A	China Hongkong	
0x4B	Poland MV	
0x4C	Holland MV	
0x4D	Sweden MV	
0x4E	VDE4110	
0x4F	Germany	
0x50	Spain MV	
0x51	Australia Endeavour	
0x52	Argentina	
0x53	AustralianB	
0x54	AustralianC	

Table 8-22

DRED0	DRED1	DRED2	DRED3	DRED4
0x00FF	0x0001	0x0002	0x0004	0x0008

Table 8-30

Bit NO	Grid detailed fault	Description
Bit0	GridZeroLossErr	电网停电/Power outage
Bit1	GridVoltLowErrSt1	电网欠压一级故障/Grid undervoltage first level failure
Bit2	GridVoltLowErrSt2	电网欠压二级故障/Grid undervoltage second level fault
Bit3	GridVoltLowErrSt3	电网欠压三级故障/Grid undervoltage third level fault
Bit4	GridVoltHighErrSt1	电网过压一级故障/Grid overvoltage first level failure
Bit5	GridVoltHighErrSt2	电网过压二级故障/Grid overvoltage second level fault
Bit6	GridVoltHighErrSt3	电网过压三级故障/Grid overvoltage third level fault
Bit7	Grid10minAvgVoltErr	电网平均电压高故障/Grid average voltage high fault
Bit8	GridFreqLowErrSt1	电网欠频一级故障/Grid underfrequency first level failure
Bit9	GridFreqLowErrSt2	电网欠频二级故障/Grid underfrequency second level fault
Bit10	GridIslandFreqLowErr	孤岛保护欠频故障/Islanding protection underfrequency fault
Bit11	GridFreqHighErrSt1	电网过频一级故障/Grid overfrequency first level failure
Bit12	GridFreqHighErrSt2	电网过频二级故障/Grid overfrequency second level fault
Bit13	GridIslandFreqHighErr	孤岛保护过频故障/Islanding protection overfrequency fault
Bit14	GridFreqShiftChkErr	电网频移故障/Grid frequency shift fault
Bit15	GridWaveCheckErr	电网波形检测故障/Grid waveform check fault
Bit16	GridLLVoltErrFlag	电网线电压故障标志/Grid line voltage fault flag
Bit17	GridLvrtErr	电网低电压穿越故障/Grid low voltage ride-through fault
Bit18	GridHvrtErr	电网高电压穿越故障/Grid high voltage ride-through fault
Bit19	GridVoltSampOverErr	电网电压超出采样上限/ Grid voltage exceeds the upper sampling limit
Bit20	GridConnVoltHighErr	电网连接电压高/Grid connection voltage high
Bit21	GridConnVoltLowErr	电网连接电压低/Grid connection voltage low
Bit22	GridConnFreqHighErr	电网连接频率高/Grid connection Frequency high
Bit23	GridConnFreqLowErr	电网连接频率低/Grid connection Frequency low
Bit...		
Bit63		

Table 8-31

Bit NO	Inverter detailed error	Description
Bit0	BattLLCHardOCErr	LLC硬件过流/LLC hardware overcurrent
Bit1	BattBoostHardOCErr	电池boost硬件过流/Battery boost hardware overcurrent
Bit2	BattBoostSoftOCErr	电池boost软件过流/ Battery boost software overcurrent
Bit3	BattBMSFaultErr	电池BMS故障/Battery BMS fault
Bit4	BattBMSDischgDisErr	电池BMS禁止放电/Battery BMS discharge disable
Bit5	BattCurrRmsOCErr	电池电流有效值过流/Battery current rms overcurrent
Bit6	OffgridBmsCurrLimitErr	离网模式超出BMS限流/Off-grid mode exceeds BMS current limit
Bit7	BusSoftStartFailedErr	Bus电压软启动失败/Bus voltage soft start failed
Bit8	BusVoltTooLowErr	Bus电压过低/Bus voltage is too low
Bit9	BusSampVoltTooHigh	Bus采样电压过高/ Bus voltage is too High
Bit10	InvHardOCErr	逆变硬件过流/Inverter hardware overcurrent
Bit11	InvCurrSoftOCErr	逆变软件过流/Inverter software overcurrent
Bit12	PvBoostHardOCErr	PV boost硬件过流/PV boost hardware overcurrent
Bit13	PvBoostSoftOCErr	PV boost软件过流/PV boost software overcurrent
Bit14	GridBackflowErr	电网倒灌/Grid backflow
Bit15	OffgridBattVoltLowErr	离网电池电压低/Off-grid mode battery voltage is low
Bit16	OffgridUpsVoltHighErr	离网AC电压过高/Off-grid mode AC voltage is too low
Bit17	OffgridUpsVoltLowErr	离网AC电压过低/ Off-grid mode AC voltage is too high
Bit18	UpsOverLoadErr	Backup overload
Bit19	OffGridZeroLossErr	离网过零错误/OffGridZero Error
Bit20	PowerFastRetrackErr	功率快速重追错误/Power fast retrack Error
Bit21	BypassRelaySwErr	Backup旁路继电器切换错误/Bypass Relay Switch Error
Bit22	LoadRelaySwErr	Backup负载继电器闭合错误/Backup load Relay switch Error
Bit23		
Bit...		
Bit63		

Table 8-32

Bit NO	Inverter detailed	Description
Bit0	SafetyOverFreqCurveF	进入过频曲线/Over-frequency curve running
Bit1	SafetyUnderFreqCurve	进入欠频曲线/Under frequency curve running
Bit2	SafetyFreqRecoCurve	频率曲线退出恢复中/Frequency curve exiting recovery
Bit3	SafetyPUCurveOVFlag	进入PU过压曲线/PU overvoltage curve running
Bit4	SafetyPUCurveUVFlag	进入PU欠压曲线/PU undervoltage curve running
Bit5	SafetyQUCurveFlag	进入QU曲线/QU curve running
Bit6	SafetyPFCurveFlag	进入PF曲线/PF curve running
Bit7	FixedPFSettingFlag	固定PF已设定/Fixed PF is set
Bit8	FixedQSettingFlag	固定无功已设定/Fixed reactive power is set
Bit9	InvOverTempFlag	机器过温降载/Inverter over-temp. derating curve operation
Bit10	DREDSellPowerLimitFl	澳洲DRED卖电/Australian DRED electricity sale status
Bit11	DREDBuyPowerLimitFl	澳洲DRED买电/Australian DRED purchase status
Bit12	ActivePowerSettingFla	有功功率限制已设定/Active power limit is set
Bit13	GeDratePowerFlag	德国70%降额打开70% derating (Germany) has been opened
Bit14	AutoTestEnableFlag	CEI021 selftest running
Bit15	GridVoltSt1DrateFlag	一级电压保护前降载/Inverter first level overvoltage derate
Bit16	ForceOffGridFlag	外部强制离网标志/Force OffGrid Flag
Bit17	ForceStopModeFlag	外部强制停机标志/Force StopMode Flag
Bit18	OffGridMpptChgUpsOff	离网充电关backup输出标志/PV charge,Off backup output Flag
Bit19	SafetyQUCurveOVFlag	QU曲线过压状态/QUCurveOverVoltageFlag
Bit20	SafetyQUCurveUVFlag	QU曲线欠压状态/QUCurveUnderVoltageFlag
Bit...		

Table 8-33

Battery manufacture	Battery series	Code	comments
GoodWe	SECU-S/LX S-H/LX F-H	0x122	
PYLONTECH	Powercube H1/Force H1/Force	0x101	
BYD	BYD-Box H	0x102	
BYD	BYD-Box Premium HVS	0x106	
BYD	BYD-Box Premium HVM/HVL	0x105	
LG	RESU_HV_Type-R	0x104	
OLOID	LBS	0x11E	
DYNESS	Tower	0x11E	
Soluna	HV BATTERY	0x11E	
EMS Use	EMS Battery	0x10F	Used when there is no direct communication between inverter and battery
GoodWe_LV	SECU-A/LX U	0x22	
BYD_LV	BYD-Box Pro/BYD-Box L/BYD-Box Res/BYD-Box Premium	0x09	
LG_LV	LG RESU	0x08	
PYLONTECH	PYLONTECH US	0x0C	
SUNVOLT	SUNVOLT	0x22	
OLOID	LBS051100A-A02/LBS051200A-A02/LBSA051100AB/LBSA051100AB	0x1E	
Soluna	Soluna 4K/Soluna 5K/SolunaEOS	0x1E	
UZENERGY	L051100-A	0x1E	
Tecloman	Firefly	0x1E	
DYNESS	DYNESS-LV/PowerBox F	0x1E	

Table 8-34

	Not set	0x55
H-byte	ECO mode	0xFF-Enable
		0x00-Disable
	Dry contact load mode	0xFE-Enable
		0x01-Disable
	Dry contact smart load mode	0xFD-Enable
		0x02-Disable
	peakshaving function	0xFC-Enable
		0x03-Disable

L-byte	Back-up mode		0xFB-Enable
			0x04-Disable
	ECO mode(new for 745 platform)		0xF9-Enable
			0x06-Disable
	Smart charge mode		0xFA-Enable
			0x05-Disable
	Day select		bit0-Sunday
			bit1-Monday
			bit2-Tuesday
			bit3-Wednesday
			bit4-Thuesday
			bit5-Friday
			bit6-Saturday

Table 8-36

Battery manufacture	Battery series	Code	comments		
BYD	BYD-Box H	0x102			
GOODWE	GOODWE-LX C-A01	0x500	Use when PCS communicate with BMS by Goodwe RS485		
EVE	EVE-LF-90K	0x501			
GOODWE	GOODWE-LX C-A01/EVE-LX C-B01	0x502	Use when PCS communicate with BMS by Goodwe CAN protocol		

```c
const INT8U auchCRCHi[] = {0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40
};
const INT8U auchCRCLo[] = { 0x00, 0xC0, 0xC1, 0x01, 0xC3, 0x03, 0x02, 0xC2, 0xC6, 0x06, 0x07, 0xC7,
0x05, 0xC5, 0xC4, 0x04,
```

0xCC, 0x0C, 0x0D, 0xCD, 0x0F, 0xCF, 0xCE, 0x0E, 0x0A, 0xCA, 0xCB, 0x0B, 0xC9, 0x09, 0x08, 0xC8,
0xD8, 0x18, 0x19, 0xD9, 0x1B, 0xDB, 0xDA, 0x1A, 0x1E, 0xDE, 0xDF, 0x1F, 0xDD, 0x1D, 0x1C, 0xDC,
0x14, 0xD4, 0xD5, 0x15, 0xD7, 0x17, 0x16, 0xD6, 0xD2, 0x12, 0x13, 0xD3, 0x11, 0xD1, 0xD0, 0x10,
0xF0, 0x30, 0x31, 0xF1, 0x33, 0xF3, 0xF2, 0x32, 0x36, 0xF6, 0xF7, 0x37, 0xF5, 0x35, 0x34, 0xF4, 0x3C,
0xFC, 0xFD, 0x3D, 0xFF, 0x3F, 0x3E, 0xFE, 0xFA, 0x3A, 0x3B, 0xFB, 0x39, 0xF9, 0xF8, 0x38, 0x28,
0xE8, 0xE9, 0x29, 0xEB, 0x2B, 0x2A, 0xEA, 0xEE, 0x2E, 0x2F, 0xEF, 0x2D, 0xED, 0xEC, 0x2C, 0xE4,
0x24, 0x25, 0xE5, 0x27, 0xE7, 0xE6, 0x26, 0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0, 0xA0, 0x60,
0x61, 0xA1, 0x63, 0xA3, 0xA2, 0x62, 0x66, 0xA6, 0xA7, 0x67, 0xA5, 0x65, 0x64, 0xA4, 0x6C, 0xAC,
0xAD, 0x6D, 0xAF, 0x6F, 0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB, 0x69, 0xA9, 0xA8, 0x68,
0x78, 0xB8, 0xB9, 0x79, 0xBB, 0x7B, 0x7A, 0xBA, 0xBE, 0x7E, 0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C,
0xB4, 0x74, 0x75, 0xB5, 0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71, 0x70, 0xB0, 0x50,
0x90, 0x91, 0x51, 0x93, 0x53, 0x52, 0x92, 0x96, 0x56, 0x57, 0x97, 0x55, 0x95, 0x94, 0x54, 0x9C, 0x5C,
0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E, 0x5A, 0x9A, 0x9B, 0x5B, 0x99, 0x59, 0x58, 0x98, 0x88, 0x48, 0x49,
0x89, 0x4B, 0x8B, 0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F, 0x8D, 0x4D, 0x4C, 0x8C, 0x44, 0x84, 0x85,
0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42, 0x43, 0x83, 0x41, 0x81, 0x80, 0x40
};

```c
INT16U sCRC16(INT8U *puchMsg, INT16U usDataLen)
{
INT8U uchCRCHi = 0xFF ;
INT8U uchCRCLo = 0xFF ;
INT8U uIndex ;
while (usDataLen--)
{
uIndex = uchCRCHi ^ *puchMsg++ ;
uchCRCHi = uchCRCLo ^ auchCRCHi[uIndex] ;
uchCRCLo = auchCRCLo[uIndex] ;
}
```

```
return ((INT16U)uchCRCHi << 8 | uchCRCLo) ;
}
```