

CPS Inverter Model Data Mapping Specification For 403X

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ABSTRACT

This document describes the Shanghai Chint Powr System(CPS) Inverter model specificaton

Change history

Date	Versio	Modification	Author
2018-10-25	0.01	The initial version	Nsb
2018-11-7	0.02	Add the register 0x262A,0x2024,0x2025	Nsb
2019-4-15	0.03	Add the register 0x251E~0x2537	Nsb
2019-7-17	0.04	Modify the document structure	LII

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ESSENTIAL COMPLIANCE INFORMATION

(1). In the CPS MODBUS protocol, implementations should leave unused or unsupported data points set to the “Not Implemented” value specified in the model mapping. The Not Implemented value for different data type has different value, here are the defined:

Not Implemented for a int8 is 0x80.

Not Implemented for a uint8 is 0xFF.

Not Implemented for a int16 is 0x8000.

Not Implemented for a uint16 is 0xFFFF.

Not Implemented for a int32 is 0x80000000.

Not Implemented for a uint32 is 0xFFFFFFFF.

Not Implemented for a string is 0x00.

(2). **CPS Units:** Units and Scale Factors are defined by CPS Units. As an alternative to floating point format, values are represented by integer values with a signed scale factor applied. For example:

Start	End	Size	R/W	Name	Type	CPS Units	Contents	Description
0x001F	0x001F	1	RO	Uab	uint16	0.1V		Grid voltage Uab

The Uab unit is V, if current real-time value is Uab=389.5V, the value Uab in register 0x001F is 3895

decimal (0x0F37 hex). So 0.1V indicates that the Uint is V, and Scale factor was Magnified 10 times, so real-time value is 3895/10=389.5

(3).Scale Factor: As an alternative to floating point format, values are represented by integer values with a signed scaled factor applied. The scale factor explicitly shifts the decimal point to the left (negative value) or the right (positive value). Scale factors had been fixed and specified in the documentation of a value. Scale factor signed range:-10----10. For example

Start	End	Size	R/W	Name	Type	Unit	Scale Factor	Description
0x001F	0x001F	1	RO	Uab	uint16	V	-1	Grid voltage Uab

The Uab unit is V, if current real-time value is Uab=389.5V, the value Uab in register 0x001F is 3895 decimal (0x0F37 hex).Scale Factor is -1, it explicitly shifts the decimal point to the left one bit, then real-time value is 389.5,

(4) Data Encoding

The MODBUS specification is not explicit on how to encode numbers other than 16-bit integers. Differences do exist between one manufacturer's implementation and another's.

32-bit intege Value

Values are stored in big-endian order per the MODBUS specification and consist of a single register.

MODBUS Register	1			2		
byte	0		1	2		3
bits	31---24		23---16		15---8	
					7---0	

64-bit intege Value

64-bit integers are stored using for registers in big-endian order.

MODBUS Register	1			2		
byte	0		1	2		3
bits	63---56		55---48		47---40	
					39---32	

MODBUS Register	3			4		
byte	4		5	6		7
bits	31---24		23---16		15---8	
					7---0	

String Value

Store variable length string values in a fixed size register range using a NULL(0 value)to terminate or pad the string. For example, up to 14 characters can be stored in 7 contiguous registers as follows:

MODBUS Register	1		2		3		4		5		6		7	
byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13
character	S	C	1	0	0	K	T	L	/	C	N	0	0	0

Not_Implemented value:all registers filled with 0x0000.

(5) Basic register address is 0x0000.

1.0 Abbreviations

ADU Application Data Unit

IP Internet Protocol

MB MODBUS

MBAP MODBUS Application Protocol

PDU Protocol Data Unit

TCP Transport Control Protocol

CPS Chint Power System

uint8 unsigned char

uint16 unsigned int

uint32 unsigned long

Int8 signed char

int16 signed int

int32 signed long

2.0 Protocol Description

1. Protocol Type: Modbus RTU

2. Communication Port Parameters:

BaudRate: optional

DataBits: 8

Parity: None

StopBit: 1

DTR: Disable

RTS: Disable

3. Frame Format:

start	Addr	Function Code	Data	CRC16	end
T1-T2-T3-T4	1Byte	1Byte	N	2Byte	T1-T2-T3-T4

3.0 Inverter Input Registers Data Mapping(For public)

The MODBUS read function code is 0x04, and the basic register address is 0x0000.

3.1 Input Registers Data Mapping(For all)

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Mode	Description
0x0000	0x0000	1	RO	Device	uint16	1	NULL	0	NULL	NULL	0x4031/ 0x4032 0x4033 0x4034	ALL	This register value represents the type of device. 0x4032 for 60kW inverter embedded with old MCU, 0x4034 for 60kW inverter embedded with new MCU,
0x0001	0x0001	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x0002	0x0002	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x0003	0x0003	1	RO	RegNum	uint16	1	NULL	0	NULL	NULL	NULL	ALL	This register represents the number of input registers that this version of the program can support, and one register consists of 16-bit.
0x0004	0x0004	1	RO	ProVer	uint16	0.01	NULL	-2	NULL	NULL	NULL	ALL	This register represents the latest version of the protocol.
0x0005	0x0005	1	RO	MinorVer	uint16	0.01	NULL	-2	NULL	NULL	NULL	ALL	This register represents the software version under this model. If the value of this register is 0xAABB, then AA represents the low byte of the software version of the DSP, and BB represents the low byte of the software version of the LCD.

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Mode	Description
													Remark: The register "MinorVer" is associated with the register "MajorVer".
0x0006	0x0009	4	RO	SN	uint64	BCD	NULL	0	NULL	NULL	NULL	ALL	The values of these four registers represent the serial number of the machine. Remark: Serial number is composed of 16 characters(8 bytes), the most significant 3 characters is not used, only used the left 13 characters. Such as 0x0001010091114001, it represents the inverter serial number is 1010091114001
0x000a	0x0013	10	RO	model	string20	1	NULL	0	NULL	NULL	NULL	ALL	These 10 registers represent the model of the device. The value of the register is a character type, e.g. SC60KTL-DO/IT
0x0014	0x0014	1	RO	RWRegSum	uint16	1	NULL	0	NULL	NULL	NULL	ALL	number of R/W registers supported by this device
0x0015	0x0015	1	RO	RWRegAdd	uint16	1	NULL	0	NULL	NULL	0x1000	ALL	R/W register start address offset
0x0016	0x0017	2	RO	TYield	uint32	1kWh	kWh	0	0	NULL	NULL	ALL	Total energy to grid eg.0X01562318=22422296kWh, Register (addr 0X0016)=High 16 bit (data 0X0156) Register (addr 0X0017)=Low 16 bit (data 0X2318)
0x0018	0x0018	1	RO	DYield	uint16	0.1kWh	kWh	-1	0	NULL	NULL	ALL	The accumulated kWh of that day
0x0019	0x0019	1	RO	Eff	uint16	0.1%	%	-3	0	NULL	NULL	ALL	Inverter efficiency
0x001A	0x001A	1	RO	PF	int16	0.001	NULL	-3	NULL	NULL	NULL	ALL	Power factor.
0x001B	0x001B	1	RO	Pmax	uint16	0.1kW	kW	-1	NULL	NULL	NULL	ALL	AC maximum active power of that day
0x001C	0x001C	1	RO	RunT	uint16	0.1Min	Min	-1	NULL	NULL	NULL	ALL	The cumulative time from the start feeding grid to the current on the same day.
0x001D	0x001D	1	RO	Pac	uint16	0.1kW	kW	-1	NULL	NULL	NULL	ALL	AC active power

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Mode	Description
0x001E	0x001E	1	RO	Sac	uint16	0.1kVA	kVA	-1	NULL	NULL	NULL	ALL	AC Apparent power
0x001F	0x001F	1	RO	Uab	uint16	0.1V	V	-1	NULL	NULL	NULL	ALL	Grid voltage Uab
0x0020	0x0020	1	RO	Ubc	uint16	0.1V	V	-1	NULL	NULL	NULL	ALL	Grid voltage Ubc
0x0021	0x0021	1	RO	Uca	uint16	0.1V	V	-1	NULL	NULL	NULL	ALL	Grid voltage Uca
0x0022	0x0022	1	RO	Ia	uint16	0.1A	A	-1	NULL	NULL	NULL	ALL	Grid A phase current
0x0023	0x0023	1	RO	Ib	uint16	0.1A	A	-1	NULL	NULL	NULL	ALL	Grid B phase current
0x0024	0x0024	1	RO	Ic	uint16	0.1A	A	-1	NULL	NULL	NULL	ALL	Grid C phase current
0x0025	0x0025	1	RO	Upv1	uint16	0.1V	V	-1	NULL	NULL	NULL	ALL	PV voltage
0x0026	0x0026	1	RO	Ipv1	int16	0.1A	A	-1	NULL	NULL	NULL	ALL	PV current
0x0027	0x0027	1	RO	Upv2	uint16	0.1V	V	-1	NULL	NULL	NULL	ALL	PV2 voltage
0x0028	0x0028	1	RO	Ipv2	int16	0.1A	A	-1	NULL	NULL	NULL	ALL	PV2 current
0x0029	0x0029	1	RO	Upv3	uint16	0.1V	V	-1	NULL	NULL	NULL	ALL	PV3 voltage
0x002A	0x002A	1	RO	Ipv3	int16	0.1A	A	-1	NULL	NULL	NULL	ALL	PV3 current
0x002B	0x002B	1	RO	Freq	uint16	0.1Hz	Hz	-1	NULL	NULL	NULL	ALL	Grid frequency
0x002C	0x002C	1	RO	Tmod	int16	0.1C	C	-1	NULL	NULL	NULL	ALL	Heatsink temperature
0x002D	0x002D	1	RO	Tamb	int16	0.1C	C	-1	NULL	NULL	NULL	ALL	Ambient temperature
0x002E	0x002E	1	RO	Reserve	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x002F	0x002F	1	RO	Mode	uint16	1	NULL	0	NULL	NULL	NULL	ALL	0x8000: Fault 0x4000: Check 0x2000: Standby 0x1000: Running 0x0800: Derate
0x0030	0x0033	4	RO	Time	uint64	BCD	NULL	0	NULL	NULL	NULL	ALL	timestamp(yyyy-mm-dd-hh-mm-ss-NULL) of model, eg. 0x2012071615181000=2012-7-16 15:18:10
0x0034	0x0034	1	RO	PFault	uint16	1	NULL	0	NULL	NULL	NULL	ALL	permanent fault code of model, for detail see " Inverter Events Descriptor "
0x0035	0x0035	1	RO	Warn	uint16	1	NULL	0	NULL	NULL	NULL	ALL	warn code of model, for detail see " Inverter

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Mode	Description
													Events Descriptor"
0x0036	0x0036	1	RO	Fault0	uint16	1	NULL	0	NULL	NULL	NULL	ALL	faultl code0 of model, for detail see " Inverter Events Descriptor
0x0037	0x0037	1	RO	Fault1	uint16	1	NULL	0	NULL	NULL	NULL	ALL	faultl code1 of model, for detail see " Inverter Events Descriptor I
0x0038	0x0038	1	RO	Fault2	uint16	1	NULL	0	NULL	NULL	NULL	ALL	faultl code2 of model, for detail see " Inverter Events Descriptor
0x0039	0x0039	1	RO	Fault3	uint16	1	NULL	0	NULL	NULL	NULL	ALL	faultl code3of model, for detail see " Inverter Events Descriptor
0x003A	0x003A	1	RO	Fault4	uint16	1	NULL	0	NULL	NULL	NULL	ALL	faultl code4 of model, for detail see " Inverter Events Descriptor
0x003B	0x003B	1	RO	Qac	int16	0.1kvar	kvar	-1	NULL	NULL	NULL	ALL	AC ractive power
0x003C	0x003C	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x003D	0x003D	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x003E	0x003E	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x003F	0x003F	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x0040	0x0040	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL
0x0041	0x0041	1	RO	MajorVer	uint16	NULL	NULL	NULL	NULL	NULL	NULL	ALL	This register represents the software version under this model. If the value of this register is 0xAABB, then AA represents the high byte of the software version of the DSP, and BB represents the high byte of the software version of the LCD. Remark: The register "MinorVer" is associated with the register "MajorVer".
0x0042	0x0042	1	RO	Reserve	uint16	NULL	NULL	NULL	NULL	NULL	NULL	ALL	NULL
0x0043	0x0043	1	RO	BusCapacitan ce	int16	1uF	uF	0	NULL	NULL	NULL	ALL	Bus capacitance

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Mode	Description
0x0044	0x0044	1	RO	AcCapacitance	int16	1uF	uF	0	NULL	NULL	NULL	ALL	AC capacitance
0x0045	0x0045	1	RO	Pdc	uint16	0.1kW	kW	-1	NULL	NULL	NULL	ALL	PV input total power
0x0046	0x0046	1	RO	PmaxLim	uint16	NULL	%	NULL	100	110	NULL	ALL	Maximum active power
0x0047	0x0047	1	RO	SmaxLim	uint16	NULL	%	NULL	100	110	NULL	ALL	Maximum apparent power
0x0048	0x0048	1	RO	DspSafetyVer	uint16	NULL	NULL	NULL	NULL	NULL	NULL	ALL	DSP Security specification version number

4.0 Inverter Holding Registers Mapping

The MODBUS read function code is 0x03, and write function codes is 0x06.

4.1 Holding Registers Mapping(For remote scheduling)

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Mode	Description
0x1000	0x1000	1	RW	OnOff	uint16	1	NULL	0	0x5555	0xAAAA	0x5555/ 0xAAAA	All	Evices power on or off command, 0xAAAA power on, 0x5555 power off.
0x1001	0x1001	1	RW	PSet	uint16	0.1%	NULL	-3	0	1000	NULL	All	Remote electric dispatch Active Power setting value, range [0.0%,100.0%], E.g. 70.7%, then PSet =0x02c3
0x1002	0x1002	1	RW	PFSet	int16	0.001	NULL	-3	-1000 -800	800 1000	NULL	All	Remote electric dispatch Power factor Setting, Rang [-1.000,-0.800]U[0.800, 1.000], E.g. 0.931, then PFSet =0x03A3; -0.931 PFSet =0xFC5D

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Mode	Description
0x1003	0x1003	1	RW	QSet	int16	0.1%	NULL	-1	-600	600	NULL	All	Remote electric dispatch Reactive Power setting value, range [-100.0%,100.0%], E.g. 70.7%,then QSet =0x02c3
0x1004	0x1007	4	RW	TimeSet	uint64	BCD	NULL	0	NULL	NULL	NULL	All	System time setting,format as :yyyy-mm-dd-hh-mm-ss-NUL, eg.0x2012071615181000=2012-7-16 15:18:10
0x1047	0x1047	1	RW	RemoteReactivePw ModeSeclect	uint16	1	NULL	0	NULL	NULL	NULL	All	The reactive mode of Remote dispatch 0: None 1: dispatch(remote control) 2:Q (local EEPROM set) 3:PF (local EEPROM set) 4:PF(P) 5:Q(U)
0x105B	0x105B	1	R/W	ClearARCFault	UINT16	1	NULL	0	NULL	NULL	NULL	All	W: only can write 0xbbbb; R: 0xbbbb=ARCclear successfully; 0xaaaa = ARC clear failurely; 0x5555 = clearing ARC; 0x0000 = no action about ARC

4.2 Holding Registers Mapping

Assignment of Holding Register Groups

Address Range	Group Name
0x2000 ~ 0x20FF	Grid Protection Parameters
0x2100 ~ 0x21FF	Active Power Derating Parameters
0x2200 ~ 0x22FF	Reactive Power Derating Parameters
0x2300 ~ 0x23FF	Arc Detection Parameters
0x2400 ~ 0x24FF	LVRT/HVRT Parameters
0x2500 ~ 0x25FF	Others Parameters
0x2600 ~ 0x26FF	Enable/disable control Parameters
0x2700 ~ 0x27FF	Control Command
0x2800 ~ 0x28FF	NA
0x2900 ~ 0x29FF	Inverter Basic Information

Holding Registers Data Mapping

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	mode	Description
Group 0 Grid Protection Parameters													
0x2000	0x2000	1	RW	GridVoltMax1	uint16	0.01%	%	-2	10000	13500	NULL	All	The first maximum operational grid voltage
0x2001	0x2001	1	RW	VoltMaxTripT1	uint16	0.01s	s	-2	0	65500	NULL	All	The first maximum grid voltage trip time
0x2002	0x2002	1	RW	GridVoltMax2	uint16	0.01%	%	-2	10000	13500	NULL	All	The 2nd maximum operational grid voltage
0x2003	0x2003	1	RW	VoltMaxTripT2	uint16	0.01s	s	-2	0	65500	NULL	All	The 2nd maximum grid voltage trip time
0x2004	0x2004	1	RW	GridVoltMax3	uint16	0.01%	%	-2	10000	13500	NULL	All	The 3rd maximum operational grid voltage
0x2005	0x2005	1	RW	VoltMaxTripT3	uint16	0.01s	s	-2	0	65500	NULL	All	The 3rd maximum grid voltage trip time

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2006	0x2006	1	RW	GridVoltMin1	uint16	0.01%	%	-2	3000	10000	NULL	All	The first minimum operational grid voltage
0x2007	0x2007	1	RW	VoltMinTripT1	uint16	0.01s	s	-2	0	65500	NULL	All	The first minimum grid voltage trip time
0x2008	0x2008	1	RW	GridVoltMin2	uint16	0.01%	%	-2	3000	10000	NULL	All	The 2nd minimum operational grid voltage
0x2009	0x2009	1	RW	VoltMinTripT2	uint16	0.01s	s	-2	0	65500	NULL	All	The 2nd minimum grid voltage trip time
0x200A	0x200A	1	RW	GridVoltMin3	uint16	0.01%	%	-2	3000	10000	NULL	All	The 3rd minimum operational grid voltage
0x200B	0x200B	1	RW	VoltMinTripT3	uint16	0.01s	s	-2	0	65500	NULL	All	The 3rd minimum grid voltage trip time
0x200C	0x200C	1	RW	VoltMax	uint16	0.01%	1%	-2	8000	13500	NULL	All	The upper limit grid voltage recovery
0x200D	0x200D	1	RW	VoltMin	uint16	0.01%	%	-2	2000	10000	NULL	All	The lower limit grid voltage recovery
0x200E	0x200E	1	RW	VoltRecoveryT	uint16	0.01s	s	-2	0	65500	NULL	All	The time of grid voltage recovery
0x200F	0x200F	1	RW	GridFrqMax1	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	5500@50Hz 6600@60Hz	NULL	All	The first maximum operational grid frequency
0x2010	0x2010	1	RW	FrqMaxTripT1	uint16	0.01s	s	-2	0	65500	NULL	All	The first maximum grid frequency trip time
0x2011	0x2011	1	RW	GridFrqMax2	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	5500@50Hz 6600@60Hz	NULL	All	The 2nd maximum operational grid frequency

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2012	0x2012	1	RW	FrqMaxTripT2	uint16	0.01s	s	-2	0	65500	NULL	All	The 2nd maximum grid frequency trip time
0x2013	0x2013	1	RW	GridFrqMax3	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	5500@50Hz 6600@60Hz	NULL	All	The 3rd maximum operational grid frequency
0x2014	0x2014	1	RW	FrqMaxTripT3	uint16	0.01s	s	-2	0	65500	NULL	All	The 3rd maximum grid frequency trip time
0x2015	0x2015	1	RW	GridFrqMin1	uint16	0.01Hz	Hz	-2	4500@50Hz 5400@60Hz	5000@50Hz 6000@60Hz	NULL	All	The first minimum operational grid frequency
0x2016	0x2016	1	RW	FrqMinTripT1	uint16	0.01s	s	-2	0	65500	NULL	All	The first minimum grid frequency trip time
0x2017	0x2017	1	RW	GridFrqMin2	uint16	0.01Hz	Hz	-2	4500@50Hz 5400@60Hz	5000@50Hz 6000@60Hz	NULL	All	The 2nd minimum operational grid frequency
0x2018	0x2018	1	RW	FrqMinTripT2	uint16	0.01s	s	-2	0	65500	NULL	All	The 2nd minimum grid frequency trip time
0x2019	0x2019	1	RW	GridFrqMin3	uint16	0.01Hz	Hz	-2	4500@50Hz 5400@60Hz	5000@50Hz 6000@60Hz	NULL	All	The 3rd minimum operational grid frequency
0x201A	0x201A	1	RW	FrqMinTripT3	uint16	0.01s	s	-2	0	65500	NULL	All	The 3rd minimum grid frequency trip time
0x201B	0x201B	1	RW	FrqMax	uint16	0.01Hz	Hz	-2	4500@50Hz 5400@	5500@50Hz 6600@60Hz	NULL	All	The upper limit grid frequency recovery

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
									60Hz	0Hz			
0x201C	0x201C	1	RW	FrqMin	uint16	0.01Hz	Hz	-2	4500@50Hz 5400@60Hz	5000@50Hz 6000@60Hz	NULL	All	The lower limit grid frequency recovery
0x201D	0x201D	1	RW	FrqRecoveryT	uint16	0.01s	s	-2	0	65500	NULL	All	The time of grid frequency recovery
0x201E	0x201E	1	RW	VoltMax	uint16	0.01%	%	-2	10000	13500	NULL	All	The upper limit grid voltage of moving average filter
0x201F	0x201F	1	RW	MaxTripT	uint16	0.01s	s	-2	0	65500	NULL	All	The trip time of the upper limit grid voltage of moving average filter
0x2020	0x2020	1	RW	VoltMin	uint16	0.01%	%	-2	8000	10000	NULL	All	The lower limit grid voltage of moving average filter
0x2021	0x2021	1	RW	MinTripT	uint16	0.01s	s	-2	0	65500	NULL	All	The trip time of the lower limit grid voltage of moving average filter
0x2022	0x2022	1	NA	NULL	uint16	NULL	NULL	NULL	NULL	NULL	NULL	All	NA
0x2023	0x2023	1	RW	GridVoltUnbalance	uint16	0.01%	%	-2	1	1000	NULL	All	Unbalance rate of grid voltage
0x2024	0x2024	1	RW	Phase-PETripVolt	uint16	0.01%	%	-2	1	10000	NULL	All	The trip voltage of Phase-PE
0x2025	0x2025	1	RW	Phase-PERcvVolt	uint16	0.01%	%	-2	1	10000	NULL	All	The recovery voltage of Phase-PE
0x2024	0x20FE		NA	NULL	uint16	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x20FF	0x20FF	1	RO	AvaRegNumGP0	uint16	NULL	NULL	NULL	NULL	NULL	NULL	All	The available Register number in this group (this register is not implemented).

Group 1 Active Power Derating Parameters

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2100	0x2100	1	RW	OvrVoltTrip	uint16	0.01%	%	-2	10000	13500	NULL	All	The trigger voltage of OverVoltage derating
0x2101	0x2101	1	NA	Reserver	uint16	NULL	NULL	NULL	NULL	NULL	NULL	All	NA
0x2102	0x2102	1	RW	OvrVoltSlop	uint16	0.1%	%	-1	0	1000	NULL	All	Grid over-voltage derating slope (calculated slope according to 10% of rated voltage) formula: $\frac{\Delta S}{\Delta V} \times (10\% \times V_N)$ ΔS Derating power change, such as 80% change ΔV Derating is the amplitude of the grid voltage change, such as the change of 100V
0x2103	0x2103	1	RW	OvrVoltFilterT	uint16	1s	s	0	1	90	NULL	All	The filtering time of OverVoltage derating
0x2104	0x2104	1	RW	OvrFrqMin	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	6000@50Hz 7200@60Hz	NULL	All	The trigger frequency of OverFrequency derating
0x2105	0x2105	1	RW	OvrFrqMax	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	6000@50Hz 7200@60Hz	NULL	All	The end frequency or Rate of Overfrequency derating (Depends on the specific standard)
0x2106	0x2106	1	RW	OvrFrqSlop	uint16	0.01%	%	-2	1	10000	NULL	All	The Rate of Overfrequency derating.
0x2107	0x2107	1	RW	RecoveryFrq	uint16	0.01Hz	Hz	-2	4900@50Hz 5880@60Hz	5500@50Hz 6600@60Hz	NULL	All	The recovery frequency of OverFrequency derating

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2108	0x2108	1	RW	OvrFrqRecoveryT	uint16	1s	s	0	0	1200	NULL	All	The recovery time of OverFrequency derating
0x2109	0x2109	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x210A	0x210A	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x210B	0x210B	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x210C	0x210C	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x210D	0x210D	1	RW	VirtualDamping	uint16	0.001Ω	Ω	-3	0	5000	NULL	All	Resonance damping coefficient
0x210E	0x210E	1	RW	OperationOverVol	uint16	0.01%	%	-2	10000	13500	NULL	All	Over Voltage Operate
0x210F	0x210F	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x2110	0x2110	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x2111	0x2111	1	RW	VwCurveV1	uint16	0.01%	%	-2	10500	10900	NULL	All	Grid overvoltage derating starting voltage V1
0x2112	0x2112	1	RW	VwCurveP1	uint16	0.1%	%	-1	0	1000	NULL	All	Grid overvoltage derating starting power P1
0x2113	0x2113	1	RW	VwCurveV2	uint16	0.01%	%	-2	10600	11000	NULL	All	Grid overvoltage derating end voltage V2
0x2114	0x2114	1	RW	VwCurveP2	uint16	0.1%	%	-1	0	1000	NULL	All	Grid overvoltage derating end power P2
0x2115	0x2115	1	RW	OpenLoopRespT	uint16	0.1s	s	-1	5	900	NULL	All	Open loop response time
0x2116	0x21FE		NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x21FF	0x21FF	1	RO	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	The available Register number in this group (this register is not implemented).
Group 2 Reactive Power Derating Parameters													
0x2200	0x2200	1	RW	PFSetValue	uint16	0.001	NULL	-3	-1000 ~ -800	800 ~ 1000	NULL	All	Local Power Factor Setting

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2201	0x2201	1	RW	PFpCurveP1	uint16	0.1%	%	-1	0	1100	NULL	All	Power of PF(P)Curve point 1
0x2202	0x2202	1	RW	PFpCurvePF1	uint16	0.001	NULL	-3	-1000 ~ -800	800 ~ 1000	NULL	All	PF of PF(P)Curve point 1
0x2203	0x2203	1	RW	PFpCurveP2	uint16	0.1%	%	-1	0	1100	NULL	All	Power of PF(P)Curve point 2
0x2204	0x2204	1	RW	PFpCurvePF2	uint16	0.001	NULL	-3	-1000 ~ -800	800 ~ 1000	NULL	All	PF of PF(P)Curve point 2
0x2205	0x2205	1	RW	PFpCurveTriVolt	uint16	0.01%	%	-2	10000	11000	NULL	All	The trigger voltage of PF(P)Curve
0x2206	0x2206	1	RW	PFpCurveUndoVolt	uint16	0.01%	%	-2	9000	10000	NULL	All	The end voltage of PF(P)Curve
0x2207	0x2207	1	RW	QuCurveU1	uint16	0.01%	%	-2	10000	11000	NULL	All	Voltage of Q(U)Curve point 1
0x2208	0x2208	1	RW	QuCurveQ1	uint16	0.1%	%	-1	-660	660	NULL	All	Reactive power of Q(U)Curve point 1
0x2209	0x2209	1	RW	QuCurveU2	uint16	0.01%	%	-2	10800	11000	NULL	All	Voltage of Q(U)Curve point 2
0x220A	0x220A	1	RW	QuCurveQ2	uint16	0.1%	%	-1	-660	660	NULL	All	Reactive power of Q(U)Curve point 2
0x220B	0x220B	1	RW	QuCurveU1i	uint16	0.01%	%	-2	9000	9900	NULL	All	Voltage of Q(U)Curve point 1i
0x220C	0x220C	1	RW	QuCurveQ1i	uint16	0.1%	%	-1	-660	660	NULL	All	Reactive power of Q(U)Curve point 1i
0x220D	0x220D	1	RW	QuCurveU2i	uint16	0.01%	%	-2	8000	10000	NULL	All	Voltage of Q(U)Curve point 2i
0x220E	0x220E	1	RW	QuCurveQ2i	uint16	0.1%	%	-1	-660	660	NULL	All	Reactive power of Q(U)Curve point 2i
0x220F	0x220F	1	RW	QuCurveTriPower	uint16	0.1%	%	-1	50	1000	NULL	All	The trigger power of Q(U)Curve
0x2210	0x2210	1	RW	QuCurveUndoPower	uint16	0.1%	%	-1	50	1000	NULL	All	The end power of Q(U)Curve
0x2211	0x22FE		NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x22FF	0x22FF	1	RO	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	The available Register number in this group (this register is not implemented).
Group 3 ARC Parameters													
0x2300	0x2300	1	RW	Bandwidth1	uint16	1K	K	0	0	100	NULL	All	ArcFactoryB1
0x2301	0x2301	1	RW	StartFrq1	uint16	1K	K	0	0	100	NULL	All	ArcFactoryI1
0x2302	0x2302	1	RW	Proportion1	uint16	1	1	0	0	1000	NULL	All	ArcFactoryF1
0x2303	0x2303	1	RW	Filter1	uint16	1%	%	0	0	100	NULL	All	ArcFactoryD1
0x2304	0x2304	1	RW	Threshold1	uint16	1dB	dB	0	0	2000	NULL	All	ArcFactoryT1
0x2305	0x2305	1	RW	SigPerApdLmt1	uint16	1dB	dB	0	0	100	NULL	All	ArcFactoryC1
0x2306	0x2306	1	RW	Bandwidth2	uint16	1K	K	0	0	100	NULL	All	ArcFactoryB2
0x2307	0x2307	1	RW	StartFrq2	uint16	1K	K	0	0	100	NULL	All	ArcFactoryI2
0x2308	0x2308	1	RW	Proportion2	uint16	1	1	0	0	1000	NULL	All	ArcFactoryF2
0x2309	0x2309	1	RW	Filter2	uint16	1%	%	0	0	100	NULL	All	ArcFactoryD2
0x230A	0x230A	1	RW	Threshold2	uint16	1dB	dB	0	0	2000	NULL	All	ArcFactoryT2
0x230B	0x230B	1	RW	SigPerApdLmt2	uint16	1dB	dB	0	0	100	NULL	All	ArcFactoryC2
0x230C	0x230C	1	RW	Bandwidth1base	uint16	1K	K	0	0	100	NULL	All	Bandwidth1base
0x230D	0x230D	1	RW	Bandwidth2base	uint16	1K	K	0	0	100	NULL	All	Bandwidth2base
0x230E	0x230E	1	RW	Bandwidth1differ	uint16	1K	K	0	0	100	NULL	All	Bandwidth1differ
0x230F	0x230F	1	RW	Bandwidth2differ	uint16	1K	K	0	0	100	NULL	All	Bandwidth2differ
0x2310	0x2310	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x2311	0x2311	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x2312	0x2312	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2313	0x2313	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x2314	0x23FE		NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x23FF	0x23FF	1	RO	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	The available Register number in this group (this register is not implemented).
Group 4 LVRT/HVRT													
0x2400	0x2400	1	RW	LVRTVolt1	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara1
0x2401	0x2401	1	RW	LVRTTime1	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara1
0x2402	0x2402	1	RW	LVRTVolt2	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara2
0x2403	0x2403	1	RW	LVRTTime2	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara2
0x2404	0x2404	1	RW	LVRTVolt3	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara3
0x2405	0x2405	1	RW	LVRTTime3	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara3
0x2406	0x2406	1	RW	LVRTVolt4	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara4
0x2407	0x2407	1	RW	LVRTTime4	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara4
0x2408	0x2408	1	RW	LVRTVolt5	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara5
0x2409	0x2409	1	RW	LVRTTime5	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara5
0x240A	0x240A	1	RW	LVRTVolt6	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara6
0x240B	0x240B	1	RW	LVRTTime6	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara6
0x240C	0x240C	1	RW	LVRTVolt7	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara7
0x240D	0x240D	1	RW	LVRTTime7	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara7
0x240E	0x240E	1	RW	LVRTVolt8	uint16	0.01%	%	-2	0	10000	NULL	All	LVRTVoltPara8
0x240F	0x240F	1	RW	LVRTTime8	uint16	0.01s	S	-2	0	65500	NULL	All	LVRTTimePara8
0x2410	0x2410	1	RW	HVRTVolt1	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara1

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2411	0x2411	1	RW	HVRTTime1	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara1
0x2412	0x2412	1	RW	HVRTVolt2	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara2
0x2413	0x2413	1	RW	HVRTTime2	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara2
0x2414	0x2414	1	RW	HVRTVolt3	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara3
0x2415	0x2415	1	RW	HVRTTime3	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara3
0x2416	0x2416	1	RW	HVRTVolt4	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara4
0x2417	0x2417	1	RW	HVRTTime4	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara4
0x2418	0x2418	1	RW	HVRTVolt5	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara5
0x2419	0x2419	1	RW	HVRTTime5	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara5
0x241A	0x241A	1	RW	HVRTVolt6	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara6
0x241B	0x241B	1	RW	HVRTTime6	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara6
0x241C	0x241C	1	RW	HVRTVolt7	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara7
0x241D	0x241D	1	RW	HVRTTime7	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara7
0x241E	0x241E	1	RW	HVRTVolt8	uint16	0.01%	%	-2	10000	13500	NULL	All	HVRTVoltPara8
0x241F	0x241F	1	RW	HVRTTime8	uint16	0.01s	S	-2	0	65500	NULL	All	HVRTTimePara8
0x2420	0x2420	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x2421	0x2421	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x2422	0x24FE		NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x24FF	0x24FF	1	RO	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	The available Register number in this group (this register is not implemented).
Group 5 Others Parameters													
0x2500	0x2500	1	RW	PowerOnDelay	uint16	1s	s	0	1	1200	NULL	All	Startup delay time

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2501	0x2501	1	RW	PVStartupVolt	uint16	1V	V	0	300	400	NULL	All	PV start-up voltage
0x2502	0x2502	1	RW	PVSlowStartPwDelta	uint16	0.01%	%	-2	1	1000	NULL	All	The output power should be slow increased due to the change of PV illumination at the Rule21 standard.
0x2503	0x2503	1	RW	ErrSoftStartP	uint16	0.01%	%	-2	1	1000	NULL	All	Power startup step after Grid Fault
0x2504	0x2504	1	RW	NormSoftStopP	uint16	0.01%	%	-2	1	10000	NULL	All	Normal power step in soft stop
0x2505	0x2505	1	RW	NormSoftStartP	uint16	0.01%	%	-2	1	10000	NULL	All	Normal power step in soft startup
0x2506	0x2506	1	RW	NormDeratingStep	uint16	0.01%	%	-2	1	10000	NULL	All	Normal power derating step
0x2507	0x2507	1	RW	StartUpMinTemp	uint16	0.1℃	℃	-1	-350	-200	NULL	All	The minimum startup temperature
0x2508	0x2508	1	RW	FaultPowerT	uint16	0.1℃	℃	0	950	950	NULL	All	The trigger temperature of module
0x2509	0x2509	1	RW	FaultEnvT	uint16	0.1℃	℃	0	830	830	NULL	All	The trigger temperature of enviroment
0x250A	0x250A	1	RW	HVRTTripVolt	uint16	0.1%	%	-1	1000	1350	NULL	All	The trigger voltage of HVRT
0x250B	0x250B	1	RW	LVRTTripVolt	uint16	0.1%	%	-1	700	1000	NULL	All	The trigger voltage of LVRT
0x250C	0x250C	1	RW	LVRTPstReactiveI	uint16	0.1%	%	-1	0	3000	NULL	All	The coefficient of positive sequence reactive current
0x250D	0x250D	1	RW	LVRTNegReactiveI	uint16	0.1%	%	-1	0	3000	NULL	All	The coefficient of negtive sequence reactive current
0x250E	0x250E	1	RW	Percentage	uint16	0.1%	%	-1	0	1100	NULL	All	Local electric dispatch Active Power setting value
0x250F	0x250F	1	RW	Percentage	uint16	0.1%	%	-1	-660	660	NULL	All	Local electric dispatch Reactive Power setting value

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2510	0x2510	1	RW	ISOProtection	uint16	1KΩ	KΩ	0	1	2000	NULL	All	Minimum insulation resistance
0x2511	0x2511	1	RW	GFCIStaticValue	uint16	1mA	mA	0	100	1000	NULL	All	The threshold value of Leakage current
0x2512	0x2512	1	RW	GFCIStaticT	uint16	0.01s	s	-2	0	65500	NULL	All	The upper limit of Leakage current
0x2513	0x2513	1	RW	GFCIDynProFactor	uint16	0.1%	%	-1	0	2000	NULL	All	The upper limit of Leakage current
0x2514	0x2514	1	RW	DCIProtection1	uint16	0.01%	%	-2	10	500	NULL	All	maximun DCI value1
0x2515	0x2515	1	RW	DCIProtectionT1	uint16	0.01s	s	-2	0	12000	NULL	All	Trip time 1 of DCI value
0x2516	0x2516	1	RW	DCIProtection2	uint16	1mA	A	-3	5	5000	NULL	All	maximun DCI value2
0x2517	0x2517	1	RW	DCIProtectionT2	uint16	0.01s	s	-2	0	12000	NULL	All	Trip time 2 of DCI value
0x2518	0x2518	1	RW	DuplicationControl	uint16	1%	%	0	0	100	NULL	All	Parameter of repetitive control
0x2519	0x2519	1	RW	MPPTScanPeriod	uint16	10s	s	1	30	540	NULL	All	MPPTScan Cycle
0x251A	0x051A	1	RW	ChecksumGroup1_6	uint16	0	0	0	NULL	NULL	NULL	All	CeckSum from group 1 to group 6 in EEPROM
0x251B	0x251B	1	RW	PhaseLoseCoeff	uint16	0.1%	%	0	5	300	NULL	All	PhaseLoseCoeff
0x251C	0x251C	1	RW	PhaseLoseRcvCoeff	uint16	0.1%	%	0	5	300	NULL	All	PhaseLoseRcvCoeff
0x251D	0x251D	1	RW	PhaseLoseVUnbalance	uint16	0.01%	%	-2	1	1000	NULL	All	PhaseLose Voltage Unbalance
0x251E	0x251E	1	RW	ReactiveStep	uint16	0.01%	%	-2	1	60000	NULL	All	Reactive Step
0x251F	0x251F	1	RW	PVSlowStartStep	uint16	0.01%	%	-2	1	10000	NULL	All	PVSlowStartStep
0x2520	0x2520	1	RW	OptiVoltMinMppt1	uint16	0.1V	V	-1	2000	15000	NULL	All	OptiVoltMinMppt1
0x2521	0x2521	1	RW	OptiVoltMaxMppt1	uint16	0.1V	V	-1	2000	15000	NULL	All	OptiVoltMaxMppt1
0x2522	0x2522	1	RW	OptiVoltMinMppt2	uint16	0.1V	V	-1	2000	15000	NULL	All	OptiVoltMinMppt2
0x2523	0x2523	1	RW	OptiVoltMaxMppt2	uint16	0.1V	V	-1	2000	15000	NULL	All	OptiVoltMaxMppt2

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2524	0x2524	1	RW	OptiVoltMinMppt3	uint16	0.1V	V	-1	2000	15000	NULL	All	OptiVoltMinMppt3
0x2525	0x2525	1	RW	OptiVoltMaxMppt3	uint16	0.1V	V	-1	2000	15000	NULL	All	OptiVoltMaxMppt3
0x2526	0x25FE		RO	Reserved	uint16	NULL	NULL	NULL	NULL	NULL	NULL	All	Reserved
0x25FF	0x25FF	1	RO	NULL	uint16	NULL	NULL	NULL	NULL	NULL	NULL	All	The available Register number in this group (this register is not implemented).
Group 6 Enable/disable control Parameters													
0x2600	0x2600	1	RW	CtrParaGroup	uint16	0	NULL	0	0	4	NULL	All	The enabled control parameters group.
0x2601	0x2601	1	RW	CtrMode	uint16	0	NULL	0	0	5	NULL	All	The control mode of reactive power 0: Disable dispatch mode. 1: Remote dispatch mode. 2: Local control ,by Q 3: Local control ,by PF 4: PF(P)curve 5: Q(U) curve
0x2602	0x2602	1	RW	CtrMode	uint16	0	NULL	0	0	2	NULL	All	The control mode of active power 0: Disable dispatch mode. 1: Remote dispatch mode. 2: Local control.
0x2603	0x2603	1	RW	MPPTScanEn	uint16	0	NULL	1	0	1	NULL	All	MPPT scan enable/disable control 0: Disable 1: Enable
0x2604	0x2604	1	RW	ARCEnable	uint16	0	NULL	1	0	1	NULL	All	Arc detection enable/disable

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
													control 0: Disable 1: Enable
0x2605	0x2605	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NA
0x2606	0x2606	1	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NA
0x2607	0x2607	1	RW	Island Protect	uint16	0	0	1	0	1	NULL	All	Island enable/disable control 0: Disable 1: Enable
0x2608	0x2608	1	RW	LVRTModeSetting	uint16	0	0	1	0	2	NULL	All	0: Disable 1: Enable, no reactive power output 2: Enable, reactive power output
0x2609	0x2609	1	RW	HVRTModeSetting	uint16	0	0	1	0	2	NULL	All	0: Disable 1: Enable, no reactive power output 2: Enable, reactive power output
0x260A	0x260A	1	RW	NormSoftStopPEn	uint16	0	0	1	0	1	NULL	All	soft stop enable/disable control
0x260B	0x260B	1	RW	PID Check Settings	uint16	0	0	1	0	1	NULL	All	PID Checking enable/disable control
0x260C	0x260C	1	RW	GridVoltMax1En	uint16	0	0	1	0	1	NULL	All	Over grid voltage triggering enable/disable control 0: Disable 1: Enable
0x260D	0x260D	1	RW	GridVoltMax2En	uint16	0	0	1	0	1	NULL	All	Over grid voltage triggering enable/disable control 0: Disable 1: Enable
0x260E	0x260E	1	RW	GridVoltMax3En	uint16	0	0	1	0	1	NULL	All	Over grid voltage triggering

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
													enable/disable control 0: Disable 1: Enable
0x260F	0x260F	1	RW	GridVoltMin1En	uint16	0	0	1	0	1	NULL	All	Under grid voltage triggering enable/disable control 0: Disable 1: Enable
0x2610	0x2610	1	RW	GridVoltMin2En	uint16	0	0	1	0	1	NULL	All	Under grid voltage triggering enable/disable control 0: Disable 1: Enable
0x2611	0x2611	1	RW	GridVoltMin3En	uint16	0	0	1	0	1	NULL	All	Under grid voltage triggering enable/disable control 0: Disable 1: Enable
0x2612	0x2612	1	RW	GridFrqMax1En	uint16	0	0	1	0	1	NULL	All	Over grid frequency triggering enable/disable control 0: Disable 1: Enable
0x2613	0x2613	1	RW	GridFrqMax2En	uint16	0	0	1	0	1	NULL	All	Over grid frequency triggering enable/disable control 0: Disable 1: Enable
0x2614	0x2614	1	RW	GridFrqMax3En	uint16	0	0	1	0	1	NULL	All	Over grid frequency triggering enable/disable control 0: Disable 1: Enable
0x2615	0x2615	1	RW	GridFrqMin1En	uint16	0	0	1	0	1	NULL	All	Under grid frequency triggering enable/disable control

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
													0: Disable 1: Enable
0x2616	0x2616	1	RW	GridFrqMin2En	uint16	0	0	1	0	1	NULL	All	Under grid frequency triggering enable/disable control 0: Disable 1: Enable
0x2617	0x2617	1	RW	GridFrqMin3En	uint16	0	0	1	0	1	NULL	All	Under grid frequency triggering enable/disable control 0: Disable 1: Enable
0x2618	0x2618	1	RW	VoltMaxMovAvgEn	uint16	0	0	1	0	1	NULL	All	Enable/disable control of limiting the upper of moving average filter 0: Disable 1: Enable
0x2619	0x2619	1	RW	VoltMinMovAvgEn	uint16	0	0	1	0	1	NULL	All	Enable/disable control of limiting the lower of moving average filter 0: Disable 1: Enable
0x261A	0x261A	1	RW	GFCIStaticEn	uint16	0	0	1	0	1	NULL	All	GFCI static detection enable/disable control 0: Disable 1: Enable
0x261B	0x261B	1	RW	GFCIDynProEn	uint16	0	0	1	0	1	NULL	All	GFCI dynamic detection enable/disable control
0x261C	0x261C	1	RW	OvrFrqDeratingMode	uint16	0	0	1	0	1	NULL	All	Over frequency derating enable/disable control 0: Disable 1: Enable

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x261D	0x261D	1	RW	DCIProtection1En	uint16	0	0	1	0	1	NULL	All	DCI protection1 enable/disable control 0: Disable 1: Enable
0x261E	0x261E	1	RW	DCIProtection2En	uint16	0	0	1	0	1	NULL	All	DCI protection2 enable/disable control 0: Disable 1: Enable
0x261F	0x261F	1	RW	GridVoltUnbalanceEn	uint16	0	0	1	0	1	NULL	All	Unbalance rate of grid voltage detection enable/disable control 0: Disable 1: Enable
0x2620	0x2620	1	RW	UFDerEn	uint16	0	0	1	0	1	NULL	All	Under frequency derating enable/disable control 0: Disable 1: Enable
0x2621	0x2621	1	RW	OvrVoltDerEn	uint16	0	0	1	0	1	NULL	All	Grid voltage derating enable/disable control 0: Disable 1: Enable
0x2622	0x2622	1	RW	PVSlowStartSEn (HECO)	uint16	0	0	1	0	1	NULL	All	soft startup function after power saltation 0: Disable 1: Enable
0x2623	0x2623	1	RW	ISOProtectionEn	uint16	0	0	1	0	1	NULL	All	ISO detection enable/disable control 0: Disable 1: Enable
0x2624	0x2624	1	RW	FANDetect	uint16	0	0	1	0	1	NULL	All	Fan detection enable/disable

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
													control 0: Disable 1: Enable
0x2625	0x2625	1	RW	ACSPDDetectEnSet	uint16	0	0	1	0	1	NULL	All	AC SPD detection enable/disable control 0: Disable 1: Enable
0x2626	0x2626	1	RW	OperationOverVolEn	uint16	0	0	1	0	1	NULL	All	Operating overvoltage enable/disable control 0: Disable 1: Enable
0x2627	0x2627	1	RW	ActivePowerOver	uint16	0	0	0	0	1	NULL	All	Active overpower enable setting
0x2628	0x2628	1	RW	ReactivePowerOver	uint16	0	0	0	0	1	NULL	All	Reactive over-power enable setting
0x2629	0x2629	1	RW	PhaseLoseCoeffEnable	uint16	0	0	0	0	2	NULL	All	PhaseLose protection enable 0: Disable 1: Enable before the grid connection 2: Always enabled 3: Enhanced (associated with Voltage unbalance)
0x262A	0x262A	1	RW	Phase-PEEnable	uint16	0	0	0	0	1	NULL	All	Phase-PE enable/disable control 0: Disable 1: Enable
0x2630	0x26EF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	All	NA
0x26F0	0x26F0	1	RO	AvaRegNumGP6	uint16	0	0	0	NULL	NULL	NULL	All	The available Register number in this group (this register is not

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
													implemented).
0x26F1	0x26F1	1	RO	GP6RegAttriBitmask	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	Bit0:The access type of register "0x0600"
					NULL	NULL	NULL	NULL	NULL	NULL	All	Bit1: The access type of register "0x0601"	
					NULL	NULL	NULL	NULL	NULL	NULL	All	Bit2: The access type of register "0x0602"	
					NULL	NULL	NULL	NULL	NULL	NULL	All	Bit3~Bit15: The access type of register "0x0602"~"0x060F"	
.....			RO	ditto	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL	
0x26F2	0x26FF	1	RO	ditto	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL	
Group 7 Control Command													
0x2700	0x2700	1	RW	PowerOnOff	uint16	NULL	NULL	0	NULL	NULL	NULL	All	Power on or power off device command, 0x5555 power on , 0x7777 power off
0x2701	0x2701	1	RW	ForceRestart	uint16	NULL	NULL	0	NULL	NULL	NULL	All	Device force restart command, valid value is 0x5AAA
0x2702	0x2702	1	RW	FactoryDefaults	uint16	NULL	NULL	0	NULL	NULL	NULL	All	Device factory reset command, valid value is 0x5AAA
0x2703	0x2703	1	RW	AutoTest(CEI)	uint16	NULL	NULL	0	NULL	NULL	NULL	All	Device auto test command, valid value is 0x5AAA
0x2704	0x2704	1	RW	MPPTScan	uint16	NULL	NULL	0	NULL	NULL	NULL	All	MPPT scan command, valid value is 0x5AAA
0x2705	0x2705	1	RW	ARCDetect	uint16	NULL	NULL	0	NULL	NULL	NULL	All	Arc Detection command, valid value is 0x5AAA
0x2706	0x2706	1	RW	ARCClear	uint16	NULL	NULL	0	NULL	NULL	NULL	All	Clear Arc alarm, valid value is 0x5AAA

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2707	0x2707	1	RW	PFSetValueRemote	uint16	0.001	NULL	-3	-1000 ~ -800	800~1000	NULL	All	Remote electric dispatch Power Factor setting value
0x2708	0x2708	1	RW	PSetPercentRemote	uint16	0.1%	NULL	0	0	1100	NULL	All	Remote electric dispatch Active Power setting value
0x2709	0x2709	1	RW	QSetPercentRemote	uint16	0.1%	NULL	0	-660	660	NULL	All	Remote electric dispatch Reactive Power setting value
0x270A	0x270A	1	RW	FreqLv2PrtEn(CEI)	uint16	1	NULL	1	0	1	NULL	All	The 2nd frequency protection enable/disable control (CEI standard)
0x270B	0x27FE	NA	NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL
0x27FF	0x27FF	1	RO	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	The available Register number in this group (this register is not implemented).
Group 9 Inverter Basic Information													
0x2900	0x2900	1	RO	MachineVersion	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	Machine Version
0x2901	0x2901	1	RO	DSPFWVersion	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	DSP App Firmware Version
0x2902	0x2902	1	RO	DSPFWChkSum	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	DSP App Firmware Code CheckSum
0x2903	0x2903	1	RO	BootFWVersion	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	DSP Boot Loader Firmware Version
0x2904	0x2904	1	RO	BootFWCodeChkSum	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	DSP Boot Loader Firmware Code CheckSum
0x2905	0x2905	1	RO	CPLDVersion	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	CPLD Version
0x2906	0x2906	1	RW	SN20~17	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	Serial number , as BCD code
0x2907	0x2907	1	RW	SN16~13	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	
0x2908	0x2908	1	RW	SN12~9	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	mode	Description
0x2909	0x2909	1	RW	SN8~5	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	
0x290A	0x290A	1	RW	SN4~1	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	
0x290B	0x290B	1	RO	ProductCode	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	Product Code , as BCD code
0x290C	0x290C	1	RW	GridConnectionRule	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	Grid Connection Rule 10=IEEE1547 19=Rule-21 20=HECO-HM 21=HECO-ML 27=ISO-NE
0x290D	0x290D	1	RW	NeutralLineSetting	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	Neutral Line 0x5A5A: connected to N line 0xA5A5: not connected to N line
0x290E	0x290E	1	RW	PVInputMode	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	PV Link Status 0x5A5A: independent connection 0xA5A5: parallel connection
0x290F	0x290F	1	RO	DSPSafetyFirmwareCodeCheckSum	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	DSP Safety Firmware Code CheckSum
0x2910	0x2910	1	RO	miniMCUFirmwareVersion	BCD	NULL	NULL	NULL	NULL	NULL	NULL	All	miniMCU Firmware Version
0x2911	0x2911	1	RO	ThisFieldCheckSum	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	This field CheckSum
0x2912	0x2912	1	RO	DspSafetyVer	Hex	NULL	NULL	NULL	NULL	NULL	NULL	All	DSP Security specification version number
0x2913	0x29FE		NA	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	All	NULL

5.0 Input Registers Data Mapping

As with the holding register, the input register is allocated as a number of blocks according to the data type, and the address range of each block is as shown in the following table "Input register block address allocation table"; the parameter definition in each block And address assignments, as shown in the following table "Input Register Assignment Table". Use the 0x04 function code to read.

Input register block address allocation table

Address range	Data type
0x8000 ~ 0x80FF	Power grid state information data area.
0x8100 ~ 0x81FF	Inverter output status information data area.
0x8200 ~ 0x82FF	Inverter (PV) input state information data area.
0x8300 ~ 0x83FF	Internal state information data area of inverter.
0x8400 ~ 0x84FF	Inverter fault state information data area.
0x8500 ~ 0x85FF	Fault resolution information data area.

Input register allocation table

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x8000	Uab	0.1 V /Hex	R	NULL
0x8001	Ubc	0.1 V /Hex	R	NULL
0x8002	Uca	0.1 V /Hex	R	NULL
0x8003	Ua	0.1 V /Hex	R	NULL

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x8004	Ub	0.1 V /Hex	R	NULL
0x8005	Uc	0.1 V /Hex	R	NULL
0x8006	FreqA	0.1Hz /Hex	R	A phase grid frequency
0x8007	FreqB	0.1Hz /Hex	R	B phase grid frequency
0x8008	FreqC	0.1Hz /Hex	R	C phase grid frequency
0x8009	GridPhaseSequence	0: NA, 1: Positive,2: negative	R	Power grid phase sequence
0x800A	GridVoltUnbalance	0.1% /Hex	R	Unbalance degree of power network voltage
0x800B	FreqT	0.1Hz / Hex	R	Power system frequency
0x800C	NPEVolt	1V /Hex	R	Voltage between N line and PE ground of power grid
0x800D	IaMcu	1A /Hex	R	MCU detection of R phase current in power grid
0x800E	IbMcu	1A /Hex	R	MCU detection of S phase current in power grid
0x800F	IcMcu	1A /Hex	R	MCU detection of T phase current in power grid
0x8010	UaMcu	1V/Hex	R	MCU detection of R phase voltage in power grid
0x8011	UbMcu	1V/Hex	R	MCU detection of S phase voltage in power grid
0x8012	UcMcu	1V/Hex	R	MCU detection of T phase voltage in power grid
0x8013	Voltage harmonics(L1)	0.01%	R	Voltage harmonics(L1)
0x8014	Voltage harmonics(L2)	0.01%	R	Voltage harmonics(L2)
0x8015	Voltage harmonics(L3)	0.01%	R	Voltage harmonics(L3)

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x8016	Current harmonics(L1)	0.01%	R	Current harmonics(L1)
0x8017	Current harmonics(L2)	0.01%	R	Current harmonics(L2)
0x8018	Current harmonics(L3)	0.01%	R	Current harmonics(L3)
0x8019 ~ 0x80FE	Reserved area of power grid state information	NULL	R	NULL
0x80FF	The number of registers in this zone (temporarily not used)	Hex	R	NULL
0x8100	A phase current	0.1A/ Hex	R	NULL
0x8101	B phase current	0.1A/ Hex	R	NULL
0x8102	C phase current	0.1A/ Hex	R	NULL
0x8103	PacA	0.1KW/ Hex	R	Active power of A phase
0x8104	PacB	0.1KW/ Hex	R	Active power of B phase
0x8105	PacC	0.1KW/ Hex	R	Active power of C phase
0x8106	PacT	0.1KW/ Hex	R	3 phase total active power
0x8107	QacA	0.1KVar/ Hex	R	Reactive power of A phase
0x8108	QacB	0.1KVar/ Hex	R	Reactive power of B phase
0x8109	QacC	0.1KVar/ Hex	R	Reactive power of C phase
0x810A	QacT	0.1KVar/ Hex	R	3 phase total reactive power
0x810B	PFa	0.01/ Hex	R	A phase power factor
0x810C	PFb	0.01/Hex	R	B phase power factor
0x810D	PFc	0.01/ Hex	R	C phase power factor
0x810E	Pft	0.01	R	Three phase power factor
0x810F	UinvA	0.1V/Hex	R	Inverting A phase voltage
0x8110	UinvB	0.1V/Hex	R	Inverting B phase voltage

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x8111	UinvC	0.1V/Hex	R	Inverting C phase voltage
0x8112	P Ref	0.1%	R	P Ref
0x8113	Q Ref	0.1%	R	if the value that LCD get from DSP is 0xaaaa, LCD don't display this value.
0x8114	PF Ref	0.001	R	PF Ref
0x8115 ~ 0x81FE	Reserved area of inverter output state information	NULL	R	NULL
0x81FF	The number of registers in this zone (temporarily not used)	Hex	R	NULL
0x8200	PVInputMode	Parallel / independent	R	PV Input Mode 0=not detected 1=Parallel 2=Independent
0x8201	Pdc	0.1kW /Hex	R	DC total input power
0x8202	Upv1	0.1V /Hex	R	PV voltage1
0x8203	Ipv1	0.1A /Hex	R	PV current 1
0x8204	Upv2	0.1V /Hex	R	PV voltage 2
0x8205	Ipv2	0.1A /Hex	R	PV current 2
0x8206	Upv3	0.1V /Hex	R	PV voltage 3
0x8207	Ipv3	0.1A /Hex	R	PV current 3
0x8208	Iboost1	0.1A /Hex	R	Boost1 Current
0x8209	Iboost2	0.1A /Hex	R	Boost2 Current
0x820A	Iboost3	0.1A /Hex	R	Boost3 Current
0x820B	Iboost4	0.1A /Hex	R	Boost4 Current

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x820C	lboost5	0.1A /Hex	R	Boost5 Current
0x820D	lboost6	0.1A /Hex	R	Boost6 Current
0x820E	lvp1MPPT	0.1A /Hex	R	PV1 MPPT Current
0x820F	lvp2MPPT	0.1A /Hex	R	PV2 MPPT Current
0x8210	lvp3MPPT	0.1A /Hex	R	PV3 MPPT Current
0x8211	First line PV voltage curve 1-25 data	1V/Hex	R	25 16-bit data
0x8212	First line PV voltage curve 26-50 data	1V/Hex	R	25 16-bit data
0x8213	First line PV voltage curve 51-75 data	1V/Hex	R	25 16-bit data
0x8214	First line PV voltage curve 76-100 data	1V/Hex	R	25 16-bit data
0x8215	First line PV current curve 1-25 data	0.1A/Hex	R	25 16-bit data
0x8216	First line PV current curve 26-50 data	0.1A/Hex	R	25 16-bit data
0x8217	First line PV current curve 51-75 data	0.1A/Hex	R	25 16-bit data
0x8218	First line PV current curve 76-100 data	0.1A/Hex	R	25 16-bit data
0x8219	Second line PV voltage curve 1-25 data	1V/Hex	R	25 16-bit data
0x821A	Second line PV voltage curve 26-50 data	1V/Hex	R	25 16-bit data
0x821B	Second line PV voltage curve 51-75 data	1V/Hex	R	25 16-bit data
0x821C	Second line PV voltage curve 76-100 data	1V/Hex	R	25 16-bit data
0x821D	Second line PV current curve 1-25 data	0.1A/Hex	R	25 16-bit data
0x821E	Second line PV current curve 26-50 data	0.1A/Hex	R	25 16-bit data

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x821F	Second line PV current curve 51-75 data	0.1A/Hex	R	25 16-bit data
0x8220	Second line PV current curve 76-100 data	0.1A/Hex	R	25 16-bit data
0x8221	Third line PV voltage curve 1-25 data	1V/Hex	R	25 16-bit data
0x8222	Third line PV voltage curve 26-50 data	1V/Hex	R	25 16-bit data
0x8223	Third line PV voltage curve 51-75 data	1V/Hex	R	25 16-bit data
0x8224	Third line PV voltage curve 76-100 data	1V/Hex	R	25 16-bit data
0x8225	Third line PV current curve 1-25 data	0.1A/Hex	R	25 16-bit data
0x8226	Third line PV current curve 26-50 data	0.1A/Hex	R	25 16-bit data
0x8227	Third line PV current curve 51-75 data	0.1A/Hex	R	25 16-bit data
0x8228	Third line PV current curve 76-100 data	0.1A/Hex	R	25 16-bit data
0x8229	The first PV IV curve reads the data and completes the sign	NULL	R	The value of 3 means read completion
0x822A	The second PV IV curve reads the data and completes the sign	NULL	R	The value of 3 means read completion
0x822B	The third PV IV curve reads the data and completes the sign	NULL	R	The value of 3 means read completion
0x822C	The first road mppt scans the maximum power point power	0.1kw/Hex	R	NULL
0x822D	The first road mppt scans the maximum power point voltage	1V/Hex	R	NULL
0x822E	The second road mppt scans the maximum power point power	0.1kw/Hex	R	NULL

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x822F	The second road mppt scans the maximum power point voltage	1V/Hex	R	NULL
0x8230	The third road mppt scans the maximum power point power	0.1kw/Hex	R	NULL
0x8231	The third road mppt scans the maximum power point voltage	1V/Hex	R	NULL
0x8232 ~ 0x82FE	"PV input status information" reserved area		R	NULL
0x82FF	The number of this area register (temporarily not used)	Hex	R	NULL
0x8300	InverterOperatingMode	NULL	R	Inverter operating mode
0x8301	PowerOnOffSta	NULL	R	LCD switch machine command execution status feedback, If the LCD does not send a switch machine command, then reply 0xFFFF.
0x8302	Tmod	0.1°C/Hex	R	Module temperature
0x8303	Tinter	0.1°C/Hex	R	Internal temperature
0x8304	ISO	1kΩ /Hex	R	Insulation resistance detection(ISO)
0x8305	GFCI	1mA /Hex	R	Leakage current detection value(GFCI)
0x8306	DCIA	1mA /Hex	R	A phase DC component(DCI)
0x8307	DCIB	1mA /Hex	R	B phase DC component(DCI)
0x8308	DCIC	1mA /Hex	R	C phase DC component(DCI)
0x8309	UbusPst	1V /Hex	R	Positive bus voltage
0x830A	UbusNgt	1V /Hex	R	Negative bus voltage

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x830B	UbusPstNgt	1V /Hex	R	Positive and negative bus voltage
0x830C	CntDwPwrOn	0.1s/Hex	R	Start countdown
0x830D	Usamplso	1V /Hex	R	ISO sampling circuit detection voltage
0x830E	BusCapacitance	1uF	R	Bus capacitance
0x830F	AcCapacitance	1uF	R	AC capacitance
0x8310	NULL	NULL	NULL	NULL
0x8311	NULL	NULL	NULL	NULL
0x8312	NULL	NULL	NULL	NULL
0x8313	NULL	NULL	NULL	NULL
0x8314	DeratingState	uint16	R	0: No derating 1 : Self derating (For example: Over temperature derating) 2: Power limit derating (For example: Remote power dispatch derating)
0x8315	NULL	NULL	NULL	NULL
0x8316	NULL	NULL	NULL	NULL
0x8317 ~ 0x83FE	"Inverter internal status information" reserved area	NULL	R	NULL
0x83FF	The number of this area register (temporarily not used)	NULL	R	NULL
0x8400	Internal warning failure	Hex	R	For detail see "Inverter Events Descriptor".
0x8401	Internal recoverable failure 1			
0x8402	Internal recoverable failure 2			
0x8403	Internal recoverable failure 3			
0x8404	Internal recoverable failure 4			

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x8405	Internal recoverable failure 5			
0x8406	Internal permanent failure			
0x8407 ~ 0x84FE	"Inverter fault status information" reserved area.	NULL	R	NULL
0x84FF	The number of this area register (temporarily not used)	NULL	R	
0x8500	Alarm resolution message number 1	NULL	R	<p>Note: When the fault occurs, in order to be able to read the operation information with the fault response, therefore, in the event of failure, must match the operation of the fault information stored, and then passed to the LCD, in order to facilitate the scene analysis of the cause of the malfunction. The specific data storage format is as follows: "60KW software system fault information finishing instructions 20160330.doc" as shown in the 485 protocol, the transfer data register is 0x8500 ~ 0x85FF.</p>
0x8501	Alarm resolution message data 1	NULL	R	
0x8502	Alarm resolution message number 2	NULL	R	
0x8503	Alarm resolution message data 2	NULL	R	
0x8504	Alarm resolution message number 3	NULL	R	
0x8505	Alarm resolution message data 3	NULL	R	
0x8506	Alarm resolution message number 4	NULL	R	
0x8507	Alarm resolution message data 4	NULL	R	
0x8508	Alarm resolution message number 5	NULL	R	
0x8509	Alarm resolution message data 5	NULL	R	
0x850A	Alarm resolution message number 6	NULL	R	
0x850B	Alarm resolution message data 6	NULL	R	
0x850C	Alarm resolution message number 7	NULL	R	
0x850D	Alarm resolution message data 7	NULL	R	
0x850E	Alarm resolution message number 8	NULL	R	NULL
0x850F	Alarm resolution message data 8	NULL	R	NULL
0x8510	Alarm resolution message number 9	NULL	R	NULL
0x8511	Alarm resolution message data 9	NULL	R	NULL

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x8512	Alarm resolution message number 10	NULL	R	NULL
0x8513	Alarm resolution message data 10	NULL	R	NULL
0x8514	Recover fault resolution information number 1	NULL	R	NULL
0x8515	Recover fault resolution information data 1	NULL	R	NULL
0x8516	Recover fault resolution information number 2	NULL	R	NULL
0x8517	Recover fault resolution information data 2	NULL	R	NULL
0x8518	Recover fault resolution information number 3	NULL	R	NULL
0x8519	Recover fault resolution information data 3	NULL	R	NULL
0x851A	Recover fault resolution information number 4	NULL	R	NULL
0x851B	Recover fault resolution information data 4	NULL	R	NULL
0x851C	Recover fault resolution information number 5	NULL	R	NULL
0x851D	Recover fault resolution information data 5	NULL	R	NULL
0x851E	Recover fault resolution information number 6	NULL	R	NULL
0x851F	Recover fault resolution information data 6	NULL	R	NULL
0x8520	Recover fault resolution information number 7	NULL	R	NULL
0x8521	Recover fault resolution information data 7	NULL	R	NULL
0x8522	Recover fault resolution information number 8	NULL	R	NULL
0x8523	Recover fault resolution information data 8	NULL	R	NULL
0x8524	Recover fault resolution information number 9	NULL	R	NULL
0x8525	Recover fault resolution information data 9	NULL	R	NULL
0x8526	Recover fault resolution information number 10	NULL	R	NULL
0x8527	Recover fault resolution information data 10	NULL	R	NULL
0x8528	Permanent fault resolution information number 1	NULL	R	NULL
0x8529	Permanent fault resolution information data 1	NULL	R	NULL

Register address (1Word)	Data variable description	Unit / Storage format	Read and write rule	Description (1Word)
0x852A	Permanent fault resolution information number 2	NULL	R	NULL
0x852B	Permanent fault resolution information data 2	NULL	R	NULL
0x852C	Permanent fault resolution information number 3	NULL	R	NULL
0x852D	Permanent fault resolution information data 3	NULL	R	NULL
0x852E	Permanent fault resolution information number 4	NULL	R	NULL
0x852F	Permanent fault resolution information data 4	NULL	R	NULL
0x8530	Permanent fault resolution information number 5	NULL	R	NULL
0x8531	Permanent fault resolution information data 5	NULL	R	NULL
0x8532	Permanent fault resolution information number 6	NULL	R	NULL
0x8533	Permanent fault resolution information data 6	NULL	R	NULL
0x8534	Permanent fault resolution information number 7	NULL	R	NULL
0x8535	Permanent fault resolution information data 7	NULL	R	NULL
0x8536	Permanent fault resolution information number 8	NULL	R	NULL
0x8537	Permanent fault resolution information data 8	NULL	R	NULL
0x8538	Permanent fault resolution information number 9	NULL	R	NULL
0x8539	Permanent fault resolution information data 9	NULL	R	NULL
0x853A	Permanent fault resolution information number 10	NULL	R	NULL
0x853B	Permanent fault resolution information data 10	NULL	R	NULL
0x853C ~ 0x85FE	"Fault resolution information" reservation area	NULL	R	NULL
0x85FF	The number of this area register (temporarily not used)	NULL	R	NULL

6.0 Inverter Events Descriptor

When one bit is set to "1", it indicates that the representative of the fault is occurring, and if the bit is set to "0", it indicates that the representative of the fault has not occurred.

Fault code table

Register address	Storage data	LCD show	Fault description	
0x0035	Warn	Bit15	Reserved	NULL
		Bit14	Reserved	NULL
		Bit13	PVStrErr	1: PVStrErr 0:Normal
		Bit12	Pid Box communication fail	1:Pid Box CommErr 0:Normal
		Bit11	Pid Box fail	1:Pid Box Err 0:Normal
		Bit10	AC side MOV is abnormal	1:Warn0100 0:Normal
		Bit9	Reserved	NULL
		Bit8	Reserved	NULL
		Bit7	AC side lightning arrester is abnormal	1:Warn0070 0:Normal
		Bit6	Reserved	NULL
		Bit5	Temperature sensor is abnormal	1:Warn0050 0:Normal

		Bit4	DC side lightning protection device is abnormal	1:Warn0040 0:Normal
		Bit3	Eeprom problem	1:Warn0030 0:Normal
		Bit2	Internal communication failed	1:CommErr 0:Normal
		Bit1	Internal fan alarm	1:IntFanErr 0:Normal
		Bit0	External fan alarm	1:ExtFanErr 0:Normal
0x0036	Fault0	Bit15	Inverter current bias	1:Protect0010 0:Normal
		Bit14	Over-temperature protection	1:TempOver 0:Normal
		Bit13	Grid relay protection	1:Protect0020 0:Normal
		Bit12	Out of phase	1:GridV.OutLim 0:Normal
		Bit11	Grid frequency is low	1:GridF.OutLim 0:Normal
		Bit10	Grid frequency is high	1:GridF.OutLim 0:Normal
		Bit9	High inverter current	1:Protect0030 0:Normal
		Bit8	Grid phase voltage overrun	1:GridV.OutLim 0:Normal
		Bit7	Power line voltage exceeds the limit	1:GridV.OutLim 0:Normal
		Bit6	PV1 high current	1:Protect0040 0:Normal
Bit5	Reserved	NULL		

		Bit4	Inverter soft start overtime	1:Protect0050 0:Normal
		Bit3	Bus soft start overtime	1:Protect0060 0:Normal
		Bit2	Bus voltage difference is high	1:Protect0070 0:Normal
		Bit1	Reserved	NULL
		Bit0	Bus voltage and high	1:Protect0090 0:Normal
0x0037	Fault1	Bit15	Leakage current sensor is abnormal	1:Protect0100 0:Normal
		Bit14	Bus hardware overvoltage	1:Protect0110 0:Normal
		Bit13	Reserved	NULL
		Bit12	Power module protection	1:Protect0120 0:Normal
		Bit11	Inverter current imbalance	1:Protect0130 0:Normal
		Bit10	Reserved	NULL
		Bit9	Grid voltage is unbalanced	1:GridV.OutLim 0:Normal
		Bit8	Inverter hardware overcurrent	Protect0140
		Bit7	MCU protection	Protect0150
		Bit6	Reserved	NULL
		Bit5	Abnormal frequency selection	Protect0160
		Bit4	Leakage current is too high	GFCIErr
		Bit3	Insulation resistance is too low	IsolationErr
		Bit2	DCI current is too high	Protect0170
		Bit1	DCI current bias	Protect0180
Bit0	Reserved	NULL		

0x0038	Fault2	Bit15	Reserved	NULL
		Bit14	Reserved	NULL
		Bit13	Reserved	NULL
		Bit12	PV3 voltage is too high	PV3VoltOver
		Bit11	PV3 input reverse	PV3Reverse
		Bit10	PV1 voltage is too high	PV1VoltOver
		Bit9	PV1 input is reversed	PV1Reverse
		Bit8	Reserved	NULL
		Bit7	Power inverter open-loop self-test	Protect0230
		Bit6	PV source input is abnormal	1: Protect0260 0:Normal
		Bit5	PV2 voltage is too high	PV2VoltOver
		Bit4	PV2 input overcurrent	Protect0240
		Bit3	PV2 input is reversed	PV2Reverse
		Bit2	Reserved	NULL
		Bit1	Internal hardware error	Protect0210
Bit0	Reserved	NULL		
0x0039	Fault3	Bit15	ARC protection	ARC Protect
		Bit14	Reserved	NULL
		Bit13	Hardware driver power supply is abnormal	Protect0330
		Bit12	Reserved	NULL
		Bit11	Reserved	NULL
		Bit10	Reserved	NULL
		Bit9	Reserved	NULL
		Bit8	Reserved	NULL
		Bit7	Reserved	NULL
		Bit6	Reserved	NULL
		Bit5	Reserved	NULL
		Bit4	Reserved	NULL
Bit3	Reserved	NULL		

		Bit2	Reserved	NULL
		Bit1	Reserved	NULL
		Bit0	Reserved	NULL
0x003A	Fault4	Bit15	Phase-to-ground voltage anomaly protection	Protect0470
		Bit14	Reserved	NULL
		Bit13	Reserved	NULL
		Bit12	Reserved	NULL
		Bit11	Reserved	NULL
		Bit10	CPLD clock is abnormal	Protect0520
		Bit9	CPLD program version is abnormal	Protect0530
		Bit8	Abnormal product model	Protect0540
		Bit7	Bst hardware overcurrent	Protect0550
		Bit6	Control board voltage is low 3.3V	Protect0560
		Bit5	Capture PLL lock exception	Protect0570
		Bit4	PV3 input overcurrent	Protect0580
		Bit3	Battery overboard	Protect0590
		Bit2	Arc board failure	Arcboard Err
		Bit1	Steady-state GFCI protection	Protect0610
Bit0	Control board voltage is low 5V	Protect0620		
0x0034	PFault	Bit15	Control board voltage and drive power failure	Fault0160
		Bit14	Open-loop self-test failed failure	Fault0150
		Bit13	Internal hardware failure	Fault0140
		Bit12	Permanent power module failure	Fault0010
		Bit11	Bus hardware overvoltage fault	Fault0020
		Bit10	Reserved	NULL
		Bit9	Reserved	NULL
		Bit8	Inverter hardware overcurrent fault	Fault0050
		Bit7	CPLD clock is faulty	Fault0060
		Bit6	DCI is too high	Fault0070

		Bit5	Bst Hardware overcurrent fault	Fault0080
		Bit4	Steady-state GFCI failure	Fault0090
		Bit3	Relay failure	Fault0100
		Bit2	Bus high failure	Fault0110
		Bit1	Reserved	NULL
		Bit0	Bus and high fault	Fault0130

7.0 Operating Instructions

Suppose the RS485 address of the inverter is 1.

7.1 Example of reading a single input register (read the AB phase voltage)

Send: 01 (communication address) 04 (function code) 00 1F (register address) 0001 (register number) 00 0C (CRC16 check code)

Receive: 01 (communication address) 04 (function code) 02 (register word total number) 0E D9 (register value) 7C CA (CRC16 check code)

Description: "AB phase voltage" register value is 0x0ED9, by Table2-1 know "AB phase voltage" is uint16 type, unit is 0.1V, so AB phase voltage is 380.1V.

7.2 Examples of reading multiple input registers (read three phase voltage, three phase current)

Send: 01 (communication address) 04 (function code) 00 1F (register address) 0006 (register number) 41 CE (CRC16 check code)

Receive: 01 (communication address) 04 (function code) 0C (register total bytes) 0E D9 (Uab) 0E DA (Ubc) 0E D6 (Uca) 0E D9 (Uab) 0E D9 (Uab) 0E D9 (Uab) 7C CA (CRC16 check code)

Description: $Uab = 0x0ED9 * 0.1V = 380.1V$, $Ubc = 0x0EDA * 0.1V = 380.2V$, $Uca = 0x0ED6 * 0.1V = 379.8V$, $Ia = 0x033A * 0.1A = 82.6A$, $Ib = 0x033F * 0.1A = 83.1A$, $Ic = 0x033E * 0.1A = 83.0A$.

7.3 Example of reading a single hold register (read the upper limit of the two level of the grid voltage)

Send: 01 (communication address) 03 (function code) 2002 (register address) 0001 (register number) 2E 0A (CRC16 check code)

Receive: 01 (communication address) 03 (function code) 02 (read the total number of register words) 10 6A (register value) 35 AB (CRC16 check code)

Description: "grid voltage two upper limit" register value is 0x106A, by Table4-2 know "grid voltage two upper limit" is uint16 type, unit is 0.1V, so the grid voltage level two upper limit is 420.2V.

7.4 Examples of read multiple memory registers (read the upper limit and protection time of the grid voltage two)

Send: 01 (communication address) 03 (function code) 2002 (register address) 0002 (register number) 6E 0B (CRC16 check code)

Receive: 01 (communication address) 03 (function code) 04 (read the total number of bytes register) 10 6A (GridV.Max2) 2713 (VolMaxTripTime_2) 84 D2 (CRC16 checksum)

Description: $GridV.Max2 = 0x106A * 0.1V = 420.2V$, $VolMaxTripTime_2 = 0x2713 * 0.01s = 100.03s$.

7.5 Write a single hold register for example (write the upper limit of the grid voltage two)

Send: 01 (communication address) 06 (function code) 2002 (register address) 10 6A (register value) AE 25 (CRC16 check code)

Receive: 01 (communication address) 06 (function code) 2002 (register address) 10 6A (register value) AE 25 (CRC16 check code), that is, return as original.

Description: The "grid voltage two upper limit" written as 420.2V, by Table4-2 know "grid voltage two upper limit" is uint16 type, unit is 0.1V, so the grid voltage two level upper limit should write "0x106A".

7.6 Examples of writing multiple holding registers (write two upper limit and protection time of grid voltage)

Send: 01 (communication address) 10 (function code) 2002 (register number) 04 (register bytes) 10 6A ("two level voltage limit register value) 2713 (" voltage level two cap protection time ") 9556 (CRC16 check code)

Receive: 01 (communication address) 10 (function code) 2002 (register address) 0002 (register number) EB C8 (CRC16 check code)

Description: The "upper limit of grid voltage two" is written as "420.2V", and the "upper limit time of grid voltage two" is written as "the protection time of the upper limit of the grid voltage".