

## CPS Inverter Model Data Mapping Specification For 403X

Applicable Models	100kW(125kW)_1500V Inverter
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### ABSTRACT

This document describes the Shanghai Chint Power System(CPS) Inverter model specification

### Change history

Date	Version	Modification	Author
2021.04.09	V5.12	1. Add register 0x2647 2. Delete register 0x262D	Lll
2021.04.09	V5.11	1. Add grid rule IEEE1547_2003 (0X290C) 2. Add register 0x262D	Lll
2021.03.18	V5.10	1.Modify register(0x201D) 2.Modify register description(0x2916)	Lll
2021.02.26	V5.09	1.Modify register(0x2010、0x2012、0x2014、0x2016、0x2018、0x201A)	Lll
2021.02.04	V5.08	1.Modify register(0x290B)	Lll
2021.01.28	V5.07	1.Modify register(0x2601) 2.Add register (0x2211、0x2212、0x2213、0x2214、0x2215、0x2216)	Lll
2021.01.21	V5.06	1.Add grid rule IEEE1547_2018 (0X290C) 2.Add register value(0x290B) 3.Add register(0x2B1C) 4.Modify register(0x2010、0x2012、0x2014、0x2016、0x2018、0x201A) 5. Add register(0x2916)	Lll
2020.12.25	V5.05	1. Only the version number is modified, others are not modified	Lll
2020.11.12	V5.04	1. Only the version number is modified, others are not modified	Zgl
2020.09.21	V5.03	1.Modify registers range(0x2015、0x2017、0x2019、0x2209、0x220B、0x220D)	Lll
2020.03.11	V5.02	1. Only the version number is modified, others are not modified	Zgl

2020.03.11	V5.01	1. Modify register “Scale factor”, function unchanged(0X0046.0X0047)	Zgl
2020.01.07	V5.00	1. the version number of the document is modified(V4.07--->V5.00).For ECN archiving 2.Modify register description, function unchanged(0X2B0A.0X2B0B)	Zgl
2019.12.18	V4.07	1.Modify register data type(0x07D0-0X07D3)	Zgl
2019.12.04	V4.06	1. Modify register description, function unchanged(0X0019.0X0046.0X0047.0X1001.0X2538)	Zgl
2019.12.03	V4.05	1.Add Brazil grid rule(0X290C)	Zgl
2019.11.27	V4.04	1.Add Korea register(0x03E8-0X03FD.0x07D0-0X07D3)	Zgl
2019.11.27	V4.03	1.Add grid rule IEC61727(0X290C) 2.Add model(0X290B)	Zgl
2019.11.18	V4.02	1.No modification, just modify the document version number (consistent with the Chinese version of the protocol version number)	Zgl
2019.11.12	V4.01	1.No modification, just modify the document version number (consistent with the Chinese version of the protocol version number)	Zgl
2019.10.29	V4.00	1.Only the version number of the document is modified(V1.59--->V4.00), and others are not modified. For ECN archiving	Zgl
2019.10.16	V1.59	1. Modify register units ” % ---> kW kVA ” (0X0046.0X0047)	Zgl
2019.09.02	V1.58	1.No modification, just modify the document version number (consistent with the Chinese version of the protocol version number)	Zgl
2019.08.02	V1.57	1.Add register value(0x290B)	Zgl
2019.07.22	V1.56	1. Modify register description, function unchanged (0X000A~0X0013.0X001C.0X0034~0X003A.0X001F~0X0021) 2. Delete the description function code 0X10. 3. Modify register name (0X200E.0X2901~0X2904.290C~0X2911.0X8200)	Zgl

2019.06.17	V1.55	<p>1. The document format has been sorted out, and the function has not changed.</p> <p>(1). Modify units case of register value  (0x0016.0x0017.0x0018. 0x001B .0x001D.0x001E. 0x003B.  0x8103.0x8104.0x8105.0x8106.0x8107.0x8108.0x8109.0x810A.  0x8201.0x8208.0x8209.0x820E.  0x8304.0x830C.)</p> <p>(2). Modify register name  (0X2B00~0X2B17.  0X8006~0X8012.  0X8103~0X8111.  0X8200. 0X8208. 0X8209. 0X820E.  0X8300~0X8316.)</p>	Zgl
2019.06.14	V1.54	<p>1. Modify range of register value (0X2502.0X251F)</p> <p>2. Modify register unit (0X810E)</p>	Zgl
2019.06.11	V1.53	<p>1.Delete meaningless registers, function unchanged.</p>	Zgl
2019.06.11	V1.52	<p>1.Modify register value(0X290C HECO-HM.HECO-ML.ISO-NE).  “Annex 1: Regulation Table”</p> <p>2. Modify register name(0X2502.0X2B02~0X2B05)</p> <p>3.Add new register(0X251F)</p> <p>4. Reserver register value(0X8300_Bit9.10.11)</p>	Zgl

2019.05.27	V1.51	<p>1.Add new public input register (0x0043.0x0044. 0x0045. 0x0046. 0x0047. 0x0048. 0x0049. 0x004A. 0x004B. 0x004C. 0x004D. 0x004E. 0x004F. 0x0050. 0x0051. 0x0052)</p> <p>2. Add new register “Auto Distribution Ethcard RS485 ModbusAddr” (0X1300. 0X1301. 0X1302. 0X1303. 0X1304. 0X1305. 0X1306. 0X1307. 0X1308. 0X1309)</p> <p>3.Add new register (0X2024.0X2025.0X251C.0X251D.0X251E.0X251F.0X2520.0X252 1.0X2522.0X2523.0X2524.0X2525.0X2526.0X2527.0X2528.0X252 9.0X252A.0X252B.0X252C.0X252D.0X252E.0X252F.0X2530.0X2 531.0X2532.0X2533.0X2534.0X2535.0X2536.0X2537.0X2538.0X2 539. 0X2629.0X262A. 0X2836.0X2837. 0X290C’register value Grid Connection Rule = ISO-NE ’.0X2912. 0X8013.0X8014.0X8015.0X8016.0X8017.0X8018. 0X8313.0X8314.0X8315.0X8316.)</p> <p>4. Reserve register (0X8208.0X8209.0X820A.0X820B.0X820C.0X820D.0X820E.0X82 0F.0X8210.0X8211.0X8212.0X8213.0X8214.0X8215.0X8216.0X82 17.0X8218.0X8219.0X821A.0X821B.0X821C.0X821D.0X821E.0X 821F.0X8220.0X8221.0X8222.0X8223.0X8224.0X8225.0X8226.0X 8227.0X8228.0X8229.0X822A.0X822B.0X822C.0X822D.0X822E.0 X822F.0X8230.0X8231)</p> <p>5. Only modify register description, function unchanged (0X251B _remarks description. 0X0000 _Add new register value. 0X2707 _data type int16 and data alignment. 0X2708 _Data alignment. 0X2709 _ data type int16 and data alignment. “0X2624.0X2625” _register name “0X2707.0X2708.0X2709” _register name remove spaces)</p> <p>6. Only modify description, function unchanged( Annex 3: Operating Instructions)</p>	Zgl
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2019.03.28	V1.50	<ol style="list-style-type: none"> <li>1.Only add register value description, function unchanged(0X260A)</li> <li>2.Only modify register name description,function unchanged(0X280C~0X2811.0X8101)</li> <li>3. Only modify fault code register description,function unchanged(0X8401_bit6. 0X8403_bit2_bit4_bit6_bit8. 0X8405_bit4)</li> </ol>	Zgl
2019.03.01	V1.49	<ol style="list-style-type: none"> <li>1.Reserver register addresss (0x8A02.0x8A12.0x8A22.0x8A32.0x8A3C.0x8A46.0x8A50.0x8A5A)</li> <li>2. Add “page number” description,easy to read</li> </ol>	Zgl
2019.02.21	V1.48	<ol style="list-style-type: none"> <li>1.Add Sunspec registers (0X9C40~0X9C85. 0X9C86~0X9CB9. 0X9CBA~0X9CCC. 0X9CD6~0X9CF5)</li> <li>2. Add description “Input Registers Data Mapping,The MODBUS read function code is 0x04”</li> </ol>	Zgl
2019.01.08	V1.47	<ol style="list-style-type: none"> <li>1.Register name added "space" display(0x290C. 0x290D.0x290E)</li> <li>2. Modify register name (0x200C~0x200D.0x201B~0x201C. 0x201E~0x2021) (0x250E~0x250F.0x2601~0x2602. 0x2627~0x2628. 0x260B) (0x2200~0x2201.0x2203.0x2205~0x2206)</li> <li>3.Modified Register Note Description(0x2206.0x2210)</li> <li>4. Changed log order</li> <li>5. Updated details(Annex 3: Operating Instructions /Write register)</li> </ol>	Zgl
2018.08.29	V1.46	<ol style="list-style-type: none"> <li>1.Modify register Description(0X2628)</li> </ol>	Zgl
2018.08.08	V1.45	<ol style="list-style-type: none"> <li>1.Modify register name Description(0X2703.0X270A)</li> <li>2. Modify range of register value (0X2508.0X2509)</li> <li>3.Add the register(0X2627.0X2628)</li> </ol>	Zgl
2018.06.28	V1.44	<ol style="list-style-type: none"> <li>1. Only Modify register memo description(0X220F)</li> </ol>	Zgl

2018.06.27	V1.43	1. Only modify the register name Description(0X2202.0X2204) 2. Only Modify register memo description(0X2210)	Zgl
2017.4.17	V1.0	first edition	Zgl

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## INFORMATION THAT MUST BE OBSERVED

### (1). Setting the data point to "unrealized"

In the CPS MODBUS protocol, data points that are not used or supported are set to "unrealized." The unrealized values of different data types correspond to the following:

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  $U_{ab} = 389.5V$ , 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 integer 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 integer 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**

Storing 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.**

**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

**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	CRC/LRC	End
	1Byte	1Byte	0~NByte	2Byte	
1 Char	2 Char	2 Char	0 ~ 2×N Char	2 Char	2 Char CR, LF



# 1. Input Registers Data Mapping 1

## 1). Input Registers Data Mapping

Modbus function code = 0x04

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x0000	0x0000	1	RO	Device	uint16	1	N/A	0	N/A	N/A	N/A	This register value represents the type of device. 0x4035: 100(125) kW_1500V inverter
0x0001	0x0001	1	RO	Reserve	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0002	0x0002	1	RO	Reserve	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0003	0x0003	1	RO	RegNum	uint16	1	N/A	0	N/A	N/A	N/A	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	N/A	-2	N/A	N/A	N/A	This register represents the latest version of the protocol.
0x0005	0x0005	1	RO	MinorVer	uint16	0.01	N/A	-2	N/A	N/A	N/A	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. Remark: The register "MinorVer" is associated with the register "MajorVer".

0x0006	0x0009	4	RO	SN	Uint64	BCD	N/A	0	N/A	N/A	N/A	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	N/A	0	N/A	N/A	N/A	These 10 registers represent the model of the device. The value of the register is a character type, e.g. SCH125KTL-DO/US-600
0x0014	0x0014	1	RO	RWRegSum	uint16	1	N/A	0	N/A	N/A	N/A	number of R/W registers supported by this device
0x0015	0x0015	1	RO	RWRegAdd	uint16	1	N/A	0	N/A	N/A	0x1000	R/W register start address offset
0x0016	0x0017	2	RO	TYield	uint32	1kWh	kWh	0	N/A	N/A	N/A	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	N/A	N/A	N/A	The accumulated kWh of that day
0x0019	0x0019	1	RO	Eff	uint16	0.1%	%	-1	N/A	N/A	N/A	Inverter efficiency
0x001A	0x001A	1	RO	PF	int16	0.001	N/A	-3	N/A	N/A	N/A	Power factor
0x001B	0x001B	1	RO	Pmax	uint16	0.1kW	kW	-1	N/A	N/A	N/A	AC maximum active power of that day
0x001C	0x001C	1	RO	RunT	uint16	0.1Min	Min	-1	N/A	N/A	N/A	The cumulative time from the start feeding grid to the current in one day
0x001D	0x001D	1	RO	Pac	uint16	0.1kW	kW	-1	N/A	N/A	N/A	AC active power
0x001E	0x001E	1	RO	Sac	uint16	0.1kVA	kVA	-1	N/A	N/A	N/A	AC Apparent power
0x001F	0x001F	1	RO	Uab	uint16	0.1V	V	-1	N/A	N/A	N/A	Grid voltage Uab
0x0020	0x0020	1	RO	Ubc	uint16	0.1V	V	-1	N/A	N/A	N/A	Grid voltage Ubc

0x0021	0x0021	1	RO	Uca	uint16	0.1V	V	-1	N/A	N/A	N/A	Grid voltage Uca
0x0022	0x0022	1	RO	Ia	uint16	0.1A	A	-1	N/A	N/A	N/A	Grid A phase current
0x0023	0x0023	1	RO	Ib	uint16	0.1A	A	-1	N/A	N/A	N/A	Grid B phase current
0x0024	0x0024	1	RO	Ic	uint16	0.1A	A	-1	N/A	N/A	N/A	Grid C phase current
0x0025	0x0025	1	RO	Upv1	uint16	0.1V	V	-1	N/A	N/A	N/A	PV voltage
0x0026	0x0026	1	RO	Ipv1	int16	0.1A	A	-1	N/A	N/A	N/A	PV current
0x0027	0x0027	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0028	0x0028	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0029	0x0029	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x002A	0x002A	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x002B	0x002B	1	RO	Freq	uint16	0.1Hz	Hz	-1	N/A	N/A	N/A	Grid frequency
0x002C	0x002C	1	RO	Tmod	int16	0.1C	C	-1	N/A	N/A	N/A	Heatsink temperature
0x002D	0x002D	1	RO	Tamb	int16	0.1C	C	-1	N/A	N/A	N/A	Ambient temperature
0x002E	0x002E	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x002F	0x002F	1	RO	Mode	uint16	N/A	N/A	0	N/A	N/A	N/A	0x8000: Fault 0x4000: Check 0x2000: Standby 0x1000: Running 0x0800: Derate
0x0030	0x0033	4	RO	Time	uint64	N/A	N/A	0	N/A	N/A	N/A	Error timestamp(yyyy-mm-dd-hh-mm-ss-N/A) ,eg.0X2012071615181000=2012-7-16 15:18:10
0x0034	0x0034	1	RO	PFault	uint16	N/A	N/A	0	N/A	N/A	N/A	permanent fault code of model, for detail see " Inverter Events Descriptor"
0x0035	0x0035	1	RO	Warn	uint16	N/A	N/A	0	N/A	N/A	N/A	warn code of model, for detail see " Inverter Events Descriptor"
0x0036	0x0036	1	RO	Fault0	uint16	N/A	N/A	0	N/A	N/A	N/A	fault code0 of model, for detail see " Inverter Events Descriptor"
0x0037	0x0037	1	RO	Fault1	uint16	N/A	N/A	0	N/A	N/A	N/A	fault code1 of model, for detail see " Inverter Events Descriptor 1"
0x0038	0x0038	1	RO	Fault2	uint16	N/A	N/A	0	N/A	N/A	N/A	fault code2 of model,

												for detail see " Inverter Events Descriptor
0x0039	0x0039	1	RO	Fault3	uint16	N/A	N/A	0	N/A	N/A	N/A	faultl code3of model, for detail see " Inverter Events Descriptor
0x003A	0x003A	1	RO	Fault4	uint16	N/A	N/A	0	N/A	N/A	N/A	faultl code4 of model, for detail see " Inverter Events Descriptor
0x003B	0x003B	1	RO	Qac	int16	0.1kvar	kvar	-1	N/A	N/A	N/A	AC current reactive power
0x003C	0x003C	1	RO	Reserve	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x003D	0x003D	1	RO	Reserve	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x003E	0x003E	1	RO	Reserve	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x003F	0x003F	1	RO	Reserve	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0040	0x0040	1	RO	Reserve	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0041	0x0041	1	RO	MajorVer	uint16	N/A	N/A	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0043	0x0043	1	RO	BusCapacitance	int16	1uF	uF	0	N/A	N/A	N/A	Bus capacitance
0x0044	0x0044	1	RO	AcCapacitance	int16	1uF	uF	0	N/A	N/A	N/A	AC capacitance
0x0045	0x0045	1	RO	Pdc	uint16	0.1kW	kW	-1	N/A	N/A	N/A	PV input total power
0x0046	0x0046	1	RO	PmaxLim	uint16	1kW	kW	0	N/A	N/A	N/A	Maximum active power
0x0047	0x0047	1	RO	SmaxLim	uint16	1kVA	kVA	0	N/A	N/A	N/A	Maximum apparent power
0x0048	0x0048	1	RO	DspSafetyVer	uint16	N/A	N/A	N/A	N/A	N/A	N/A	DSP Security specification version number
0x0049	0x0049	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x004A	0x004A	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x004B	0x004B	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

0x004C	0x004C	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x004D	0x004D	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x004E	0x004E	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x004F	0x004F	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0050	0x0050	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0051	0x0051	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x0052	0x0052	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## 1.2. Holding Registers Data Mapping(Only for Korea)

Modbus function code = 0x03.0x06.0x10

### 1). Read register

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x03E8	0x03E9	2	RO	Magnitude of R phase current	uint32	0.1A	A	-1	NULL	NULL	NULL	Magnitude of R phase current
0x03EA	0x03EB	2	RO	Magnitude of S phase current	uint32	0.1A	A	-1	NULL	NULL	NULL	Magnitude of S phase current
0x03EC	0x03ED	2	RO	Magnitude of T phase current	uint32	0.1A	A	-1	NULL	NULL	NULL	Magnitude of T phase current
0x03EE	0x03EF	2	RO	Magnitude of R phase voltage	uint32	0.1V	V	-1	NULL	NULL	NULL	Magnitude of R phase voltage
0x03F0	0x03F1	2	RO	Magnitude of S phase voltage	uint32	0.1V	V	-1	NULL	NULL	NULL	Magnitude of S phase voltage
0x03F2	0x03F3	2	RO	Magnitude of T phase voltage	uint32	0.1V	V	-1	NULL	NULL	NULL	Magnitude of T phase voltage
0x03F4	0x03F5	2	RO	3 phase Active power	uint32	0.1kW	kW	-1	NULL	NULL	NULL	3 phase Active power

0x03F6	0x03F7	2	RO	3 phase Reactive power	Int32	1Var	Var	0	NULL	NULL	NULL	3 phase Reactive power
0x03F8	0x03F9	2	RO	Power factor	Int32	NULL	NULL	-3	NULL	NULL	NULL	Power factor
0x03FA	0x03FB	2	RO	Frequency	uint32	0.1Hz	Hz	-1	NULL	NULL	NULL	Frequency
0x03FC	0x03FD	2	RO	Status Flag	uint32	NULL	Bit field	0	NULL	NULL	NULL	Status Flag( Bit0~Bit31) <b>Bit1(Operating Staus )</b> Reset: Run, Set: Stop. <b>Bit3(Run mode status )</b> Set : unit alone, Reset : connection.

## 2). Write register

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Description
0x07D0	0x07D0	1	W	Power Factor Reference	int16	0.001	NULL	-3	-1000~-800	800~1000	NULL	Power Factor Reference
0x07D1	0x07D1	1	W	Operation and mod	uint16	NULL	NULL	0	NULL	NULL	NULL	Operation and mod 0 : Unit alone 2 or 5 : connection (2 : power factor control operation,5 : Q(V) operation)
0x07D2	0x07D2	1	W	Reactive power reference	int16	0.1%	%	-1	-660	660	NULL	Reactive power reference
0x07D3	0x07D3	1	W	Active power reference	uint16	0.1%	%	-1	0	1100	NULL	Active power reference

## 2. Holding Registers Data Mapping

Modbus function code = 0x03.0x06

### 1). Power dispatching

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Description
0x1000	0x1000	1	RW	OnOff	uint16	1	N/A	0	0x5555	0xAAAA	N/A	device power on or off command, 0xAAAA: power on, 0x5555: power off
0x1001	0x1001	1	RW	PSet	uint16	0.1%	N/A	-1	0	1000	N/A	Remote electric dispatch Active Power setting value
0x1002	0x1002	1	RW	PFSet	int16	0.001	N/A	-3	-1000~ -800	800~ 1000	N/A	Remote electric dispatch Power factor Setting
0x1003	0x1003	1	RW	QSet	int16	0.1%	N/A	-1	-600	600	N/A	Remote electric dispatch Reactive Power setting value
0x1004	0x1007	4	RW	TimeSet	uint64	BCD	N/A	0	N/A	N/A	N/A	System time setting format as :yyyy-mm-dd-hh-mm-ss-NUL, eg.0x2012071615181000=2012-7-16 15:18:10
0x1008	0x1045	62	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

0x1046	0x1046	1	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x1047	0x1047	1	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x1048	0x1059	17	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x105A	0x105A	1	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x105B	0x105B	1	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## 2). Grid Protection Parameters

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x2000	0x2000	1	RW	GridVoltMax1	uint16	0.01%	%	-2	10000	13500	N/A	The first maximum operational grid voltage
0x2001	0x2001	1	RW	VoltMaxTripT1	uint16	0.01s	s	-2	0	65500	N/A	The first maximum grid voltage trip time
0x2002	0x2002	1	RW	GridVoltMax2	uint16	0.01%	%	-2	10000	13500	N/A	The 2nd maximum operational grid voltage
0x2003	0x2003	1	RW	VoltMaxTripT2	uint16	0.01s	s	-2	0	65500	N/A	The 2nd maximum grid voltage trip time
0x2004	0x2004	1	RW	GridVoltMax3	uint16	0.01%	%	-2	10000	13500	N/A	The 3rd maximum operational grid voltage
0x2005	0x2005	1	RW	VoltMaxTripT3	uint16	0.01s	s	-2	0	65500	N/A	The 3rd maximum grid voltage trip time
0x2006	0x2006	1	RW	GridVoltMin1	uint16	0.01%	%	-2	3000	10000	N/A	The first minimum operational grid voltage



0x2007	0x2007	1	RW	VoltMinTripT1	uint16	0.01s	s	-2	0	65500	N/A	The first minimum grid voltage trip time
0x2008	0x2008	1	RW	GridVoltMin2	uint16	0.01%	%	-2	3000	10000	N/A	The 2nd minimum operational grid voltage
0x2009	0x2009	1	RW	VoltMinTripT2	uint16	0.01s	s	-2	0	65500	N/A	The 2nd minimum grid voltage trip time
0x200A	0x200A	1	RW	GridVoltMin3	uint16	0.01%	%	-2	3000	10000	N/A	The 3rd minimum operational grid voltage
0x200B	0x200B	1	RW	VoltMinTripT3	uint16	0.01s	s	-2	0	65500	N/A	The 3rd minimum grid voltage trip time
0x200C	0x200C	1	RW	VoltMax	uint16	0.01%	1%	-2	8000	13500	N/A	The upper limit grid voltage recovery
0x200D	0x200D	1	RW	VoltMin	uint16	0.01%	%	-2	2000	10000	N/A	The lower limit grid voltage recovery
0x200E	0x200E	1	RW	VoltRecoveryT	uint16	0.01s	s	-2	0	65500	N/A	The time of grid voltage recovery
0x200F	0x200F	1	RW	GridFrqMax1	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	5500@50Hz 6600@60Hz	N/A	The first maximum operational grid frequency
0x2010	0x2010	1	RW	FrqMaxTripT1	uint16	0.01s	s	-2	0	65500	N/A	The first maximum grid frequency trip time Remark:apply only to (VALUE) 0x2916 = 0
						0.02s	s	-2	0	100000	N/A	The first maximum grid frequency trip time Remark:apply only to (VALUE) 0x2916 = 1
0x2011	0x2011	1	RW	GridFrqMax2	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	5500@50Hz 6600@60Hz	N/A	The 2nd maximum operational grid frequency
0x2012	0x2012	1	RW	FrqMaxTripT2	uint16	0.01s	s	-2	0	65500	N/A	The 2nd maximum grid frequency trip time Remark:apply only to

												(VALUE) 0x2916 = 0
						0.02s	s	-2	0	100000	N/A	The 2nd maximum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =1
0x2013	0x2013	1	RW	GridFrqMax3	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	5500@50Hz 6600@60Hz	N/A	The 3rd maximum operational grid frequency
0x2014	0x2014	1	RW	FrqMaxTripT3	uint16	0.01s	s	-2	0	65500	N/A	The 3rd maximum grid frequency trip time Remark:apply only to (VALUE) 0x2916 = 0
						0.02s	s	-2	0	100000	N/A	The 3rd maximum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =1
0x2015	0x2015	1	RW	GridFrqMin1	uint16	0.01Hz	Hz	-2	4000@50Hz 4800@60Hz	5000@50Hz 6000@60Hz	N/A	The first minimum operational grid frequency
0x2016	0x2016	1	RW	FrqMinTripT1	uint16	0.01s	s	-2	0	65500	N/A	The first minimum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =0
						0.02s	s	-2	0	100000	N/A	The first minimum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =1
0x2017	0x2017	1	RW	GridFrqMin2	uint16	0.01Hz	Hz	-2	4000@50Hz 4800@60Hz	5000@50Hz 6000@60Hz	N/A	The 2nd minimum operational grid frequency
0x2018	0x2018	1	RW	FrqMinTripT2	uint16	0.01s	s	-2	0	65500	N/A	The 2nd minimum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =0

						0.02s	s	-2	0	100000	N/A	The 2nd minimum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =1
0x2019	0x2019	1	RW	GridFrqMin3	uint16	0.01Hz	Hz	-2	4000@50Hz 4800@60Hz	5000@50Hz 6000@60Hz	N/A	The 3rd minimum operational grid frequency
0x201A	0x201A	1	RW	FrqMinTripT3	uint16	0.01s	s	-2	0	65500	N/A	The 3rd minimum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =0
						0.02s	s	-2	0	100000	N/A	The 3rd minimum grid frequency trip time Remark:apply only to (VALUE) 0x2916 =1
0x201B	0x201B	1	RW	FrqMax	uint16	0.01Hz	Hz	-2	4500@50Hz 5400@60Hz	5500@50Hz 6600@60Hz	N/A	The upper limit grid frequency recovery
0x201C	0x201C	1	RW	FrqMin	uint16	0.01Hz	Hz	-2	4500@50Hz 5400@60Hz	5000@50Hz 6000@60Hz	N/A	The lower limit grid frequency recovery
0x201D	0x201D	1	RW	FrqRecoveryT	uint16	0.01s	s	-2	0	65500	N/A	The time of grid frequency recovery Remark:apply only to (VALUE) 0x2916 =0
						0.02s	s	-2	0	100000		The time of grid frequency recovery Remark:apply only to (VALUE) 0x2916 =1
0x201E	0x201E	1	RW	VoltMax	uint16	0.01%	%	-2	10000	13500	N/A	The upper limit grid voltage of moving average filter
0x201F	0x201F	1	RW	MaxTripT	uint16	0.01s	s	-2	0	65500	N/A	The trip time of the upper limit grid voltage of moving average filter

0x2020	0x2020	1	RW	VoltMin	uint16	0.01%	%	-2	8000	10000	N/A	The lower limit grid voltage of moving average filter
0x2021	0x2021	1	RW	MinTripT	uint16	0.01s	s	-2	0	65500	N/A	The trip time of the lower limit grid voltage of moving average filter
0x2022	0x2022	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2023	0x2023	1	RW	GridVoltUnbalance	uint16	0.01%	%	-2	1	1000	N/A	Unbalance rate of grid voltage

### 3). Active Power Derating Parameters

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x2100	0x2100	1	RW	OvrVoltTrip	uint16	0.01%	%	-2	10000	13500	N/A	The trigger voltage of OverVoltage derating
0x2101	0x2101	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2102	0x2102	1	RW	OvrVoltSlop	uint16	0.1%	%	-1	0	1000	N/A	The rate of OverVoltage derating. (calculate slope according to 10% of rated voltage) formula: $\frac{\Delta S}{\Delta V} \times (10\% \times V_N)$ $\Delta S$ = reduced power change, for example, change 80% $\Delta V$ = The reduction is the amplitude of the grid voltage variation, such as the change of 100V.

0x2103	0x2103	1	RW	OvrVoltFilterT	uint16	1s	s	0	1	90	N/A	The filtering time of OverVoltage derating
0x2104	0x2104	1	RW	OvrFrqMin	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	6000@50Hz 7200@60Hz	N/A	The trigger frequency of OverFrequency derating
0x2105	0x2105	1	RW	OvrFrqMax	uint16	0.01Hz	Hz	-2	5000@50Hz 6000@60Hz	6000@50Hz 7200@60Hz	N/A	The end frequency or Rate of Overfrequency derating (Depends on the specific standard)
0x2106	0x2106	1	RW	OvrFrqSlop	uint16	0.01%	%	-2	1	10000	N/A	The Rate of Overfrequency derating.
0x2107	0x2107	1	RW	RecoveryFrq	uint16	0.01Hz	Hz	-2	4900@50Hz 5880@60Hz	5500@50Hz 6600@60Hz	N/A	The recovery frequency of OverFrequency derating
0x2108	0x2108	1	RW	OvrFrqRecoveryT	uint16	1s	s	0	0	1200	N/A	The recovery time of OverFrequency derating
0x2109	0x2109	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x210A	0x210A	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x210B	0x210B	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x210C	0x210C	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x210D	0x210D	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x210E	0x210E	1	RW	OperationOverVol	uint16	0.01%	%	-2	10000	13500	N/A	Operating overvoltage protection value
0x210F	0x210F	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2110	0x2110	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

#### 4). Reactive Power Derating Parameters

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale fac	Min value	Max value	Contents	Description
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		e						tor				
0x2200	0x2200	1	RW	PFSetValue	int16	0.001		-3	-1000 ~ -800	800 ~ 1000	N/A	Local Power Factor Setting
0x2201	0x2201	1	RW	PFpCurveP1	uint16	0.1%	%	-1	0	1100	N/A	Power of PF(P)Curve point 1
0x2202	0x2202	1	RW	PFpCurvePF1	int16	0.001		-3	-1000 ~ -800	800 ~ 1000	N/A	PF of PF(P)Curve point 1
0x2203	0x2203	1	RW	PFpCurveP2	uint16	0.1%	%	-1	0	1100	N/A	Power of PF(P)Curve point 2
0x2204	0x2204	1	RW	PFpCurvePF2	int16	0.001		-3	-1000 ~ -800	800 ~ 1000	N/A	PF of PF(P)Curve point 2
0x2205	0x2205	1	RW	PFpCurveTriVolt	uint16	0.01%	%	-2	10000	11000	N/A	The trigger voltage of PF(P)Curve
0x2206	0x2206	1	RW	PFpCurveUndoVolt	uint16	0.01%	%	-2	9000	10000	N/A	The undo voltage of PF(P)Curve
0x2207	0x2207	1	RW	QuCurveU1	uint16	0.01%	%	-2	10000	11000	N/A	Voltage of Q(U)Curve point 1
0x2208	0x2208	1	RW	QuCurveQ1	int16	0.1%	%	-1	-660	660	N/A	Reactive power of Q(U)Curve point 1
0x2209	0x2209	1	RW	QuCurveU2	uint16	0.01%	%	-2	10000	12000	N/A	Voltage of Q(U)Curve point 2
0x220A	0x220A	1	RW	QuCurveQ2	int16	0.1%	%	-1	-660	660	N/A	Reactive power of Q(U)Curve point 2
0x220B	0x220B	1	RW	QuCurveU1i	uint16	0.01%	%	-2	9000	10000	N/A	Voltage of Q(U)Curve point 1i
0x220C	0x220C	1	RW	QuCurveQ1i	int16	0.1%	%	-1	-660	660	N/A	Reactive power of Q(U)Curve point 1i
0x220D	0x220D	1	RW	QuCurveU2i	uint16	0.01%	%	-2	8000	10000	N/A	Voltage of Q(U)Curve point 2i
0x220E	0x220E	1	RW	QuCurveQ2i	int16	0.1%	%	-1	-660	660	N/A	Reactive power of Q(U)Curve point 2i
0x220F	0x220F	1	RW	QuCurveTriPower	uint16	0.1%	%	-1	50	1000	N/A	The trigger power of Q(U)Curve
0x2210	0x2210	1	RW	QuCurveUndoPower	uint16	0.1%	%	-1	50	1000	N/A	The undo power of Q(U)Curve
0x2211	0x2211	1	RW	ActiveReacCurveP1	uint16	0.1%	%	-1	0	700	N/A	ActiveReacCurveP1
0x2212	0x2212	1	RW	ActiveReacCurveQ1	int16	0.1%	%	-1	-660	660	N/A	ActiveReacCurveQ1

0x2213	0x2213	1	RW	ActiveReacCurveP2	uint16	0.1%	%	-1	400	800	N/A	ActiveReacCurveP2
0x2214	0x2214	1	RW	ActiveReacCurveQ2	int16	0.1%	%	-1	-660	660	N/A	ActiveReacCurveQ2
0x2215	0x2215	1	RW	ActiveReacCurveP3	uint16	0.1%	%	-1	500	1000	N/A	ActiveReacCurveP3
0x2216	0x2216	1	RW	ActiveReacCurveQ3	int16	0.1%	%	-1	-660	660	N/A	ActiveReacCurveQ3

## 5). ARC Parameters

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x2300	0x2300	1	RW	Bandwidth1	uint16	1K	K	0	0	100	N/A	ArcFactoryB1
0x2301	0x2301	1	RW	StartFrq1	uint16	1K	K	0	0	100	N/A	ArcFactoryI1
0x2302	0x2302	1	RW	Proportion1	uint16	N/A	N/A	0	0	1000	N/A	ArcFactoryF1
0x2303	0x2303	1	RW	Filter1	uint16	1%	%	0	0	100	N/A	ArcFactoryD1
0x2304	0x2304	1	RW	Threshold1	uint16	1dB	dB	0	0	2000	N/A	ArcFactoryT1
0x2305	0x2305	1	RW	SigPerApdLmt1	uint16	1dB	dB	0	0	2000	N/A	ArcFactoryC1
0x2306	0x2306	1	RW	Bandwidth2	uint16	1K	K	0	0	100	N/A	ArcFactoryB2
0x2307	0x2307	1	RW	StartFrq2	uint16	1K	K	0	0	100	N/A	ArcFactoryI2
0x2308	0x2308	1	RW	Proportion2	uint16	N/A	N/A	0	0	1000	N/A	ArcFactoryF2
0x2309	0x2309	1	RW	Filter2	uint16	1%	%	0	0	100	N/A	ArcFactoryD2
0x230A	0x230A	1	RW	Threshold2	uint16	1dB	dB	0	0	2000	N/A	ArcFactoryT2
0x230B	0x230B	1	RW	SigPerApdLmt2	uint16	1dB	dB	0	0	2000	N/A	ArcFactoryC2
0x230C	0x230C	1	RW	Bandwidth1base	uint16	1K	K	0	0	100	N/A	N/A
0x230D	0x230D	1	RW	Bandwidth2base	uint16	1K	K	0	0	100	N/A	N/A

## 6). LVRT/HVRT

Start	End	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x2400	0x2400	1	RW	LVRTVolt1	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara1
0x2401	0x2401	1	RW	LVRTTime1	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara1
0x2402	0x2402	1	RW	LVRTVolt2	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara2
0x2403	0x2403	1	RW	LVRTTime2	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara2
0x2404	0x2404	1	RW	LVRTVolt3	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara3
0x2405	0x2405	1	RW	LVRTTime3	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara3
0x2406	0x2406	1	RW	LVRTVolt4	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara4
0x2407	0x2407	1	RW	LVRTTime4	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara4
0x2408	0x2408	1	RW	LVRTVolt5	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara5
0x2409	0x2409	1	RW	LVRTTime5	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara5
0x240A	0x240A	1	RW	LVRTVolt6	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara6
0x240B	0x240B	1	RW	LVRTTime6	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara6
0x240C	0x240C	1	RW	LVRTVolt7	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara7
0x240D	0x240D	1	RW	LVRTTime7	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara7
0x240E	0x240E	1	RW	LVRTVolt8	uint16	0.01%	%	-2	0	10000	N/A	LVRTVoltPara8
0x240F	0x240F	1	RW	LVRTTime8	uint16	0.01s	S	-2	0	65500	N/A	LVRTTimePara8
0x2410	0x2410	1	RW	HVRTVolt1	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara1
0x2411	0x2411	1	RW	HVRTTime1	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara1
0x2412	0x2412	1	RW	HVRTVolt2	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara2
0x2413	0x2413	1	RW	HVRTTime2	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara2



0x2414	0x2414	1	RW	HVRTVolt3	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara3
0x2415	0x2415	1	RW	HVRTTime3	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara3
0x2416	0x2416	1	RW	HVRTVolt4	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara4
0x2417	0x2417	1	RW	HVRTTime4	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara4
0x2418	0x2418	1	RW	HVRTVolt5	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara5
0x2419	0x2419	1	RW	HVRTTime5	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara5
0x241A	0x241A	1	RW	HVRTVolt6	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara6
0x241B	0x241B	1	RW	HVRTTime6	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara6
0x241C	0x241C	1	RW	HVRTVolt7	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara7
0x241D	0x241D	1	RW	HVRTTime7	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara7
0x241E	0x241E	1	RW	HVRTVolt8	uint16	0.01%	%	-2	10000	13500	N/A	HVRTVoltPara8
0x241F	0x241F	1	RW	HVRTTime8	uint16	0.01s	S	-2	0	65500	N/A	HVRTTimePara8

## 7). Others Parameters

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Description
0x2500	0x2500	1	RW	PowerOnDelay	uint16	1s	s	0	1	1200	N/A	Startup delay time
0x2501	0x2501	1	RW	PVStartupVolt	uint16	1V	V	0	860	950	N/A	PV start-up voltage
0x2502	0x2502	1	RW	PVSlowStartPwDelta	uint16	0.01%	%	-2	1	1000	N/A	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	10000	N/A	Power startup step after Grid Fault
0x2504	0x2504	1	RW	NormSoftStopP	uint16	0.01%	%	-2	1	10000	N/A	Normal power step in soft stop
0x2505	0x2505	1	RW	NormSoftStartP	uint16	0.01%	%	-2	1	10000	N/A	Normal power step in soft startup

0x2506	0x2506	1	RW	NormDeratingStep	uint16	0.01%	%	-2	1	10000	N/A	Normal power derating step
0x2507	0x2507	1	RW	StartUpMinTemp	uint16	0.1℃	℃	0	-350	-200	N/A	The minimum startup temperature
0x2508	0x2508	1	RO	FaultPowerT	uint16	0.1℃	℃	0	1150	1150	N/A	The trigger temperature of module
0x2509	0x2509	1	RO	FaultEnvT	uint16	0.1℃	℃	0	830	830	N/A	The trigger temperature of enviroment
0x250A	0x250A	1	RW	HVRTTripVolt	uint16	0.1%	%	-1	1000	1350	N/A	The trigger voltage of HVRT
0x250B	0x250B	1	RW	LVRTTripVolt	uint16	0.1%	%	-1	700	1000	N/A	The trigger voltage of LVRT
0x250C	0x250C	1	RW	LV RTPstReactiveI	uint16	0.1%	%	-1	0	3000	N/A	The coefficient of positive sequence reactive current
0x250D	0x250D	1	RW	LVRTNegReactiveI	uint16	0.1%	%	-1	0	3000	N/A	The coefficient of negtive sequence reactive current
0x250E	0x250E	1	RW	Percentage	uint16	0.1%	%	-1	0	1100	N/A	Local electric dispatch Active Power setting value
0x250F	0x250F	1	RW	Percentage	uint16	0.1%	%	-1	-660	660	N/A	Local electric dispatch Reactive Power setting value
0x2510	0x2510	1	RW	ISOProtection	uint16	1KΩ	KΩ	0	1	2000	N/A	Minimum insulation resistance
0x2511	0x2511	1	RW	GFCIStaticValue	uint16	0.1%	%	-1	500	4000	N/A	The threshold value of Leakage current
0x2512	0x2512	1	RW	GFCIStaticT	uint16	0.01s	s	-2	0	65500	N/A	The upper limit of Leakage current
0x2513	0x2513	1	RW	GFCIDynProFactor	uint16	0.1%	%	-1	0	2000	N/A	The upper limit of Leakage current
0x2514	0x2514	1	RW	DCIProtection1	uint16	0.01%	%	-2	10	500	N/A	maximun DCI value1
0x2515	0x2515	1	RW	DCIProtectionT1	uint16	0.01s	s	-2	0	12000	N/A	Trip time 1 of DCI value
0x2516	0x2516	1	RW	DCIProtection2	uint16	1mA	mA	0	5	5000	N/A	maximun DCI value2
0x2517	0x2517	1	RW	DCIProtectionT2	uint16	0.01s	s	-2	0	12000	N/A	Trip time 2 of DCI value
0x2518	0x2518	1	RW	DuplicationControl	uint16	1%	%	0	0	100	N/A	Parameter of repetitive control
0x2519	0x2519	1	RW	MPPTScanPeriod	uint16	10s	s	1	30	540	N/A	MPPTScan Cycle
0x251A	0x251A	1	RO	ChecksumGroup1_6	Hex	N/A	N/A	N/A	N/A	N/A	N/A	Checksum from group 1 to group 6 in EEPROM

0x251B	0x251B	1	RW	VirtualDamping	uint16	0.001 Ω	Ω	-3	0	5000	N/A	Resonance damping coefficient
0x251C	0x251C	1	RW	PhaseLoseRcvCoeff	uint16	0.1%	%	0	5	300	N/A	PhaseLoseRcvCoeff
0x251D	0x251D	1	RW	PhaseLoseVUnbalance	uint16	0.01%	%	-2	1	1000	N/A	PhaseLose Voltage Unbalance
0x251E	0x251E	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x251F	0x251F	1	RW	PVSlowStartStep	uint16	0.01%	%	-2	1	10000	N/A	N/A
0x2520	0x2520	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2521	0x2521	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2522	0x2522	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2523	0x2523	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2524	0x2524	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2525	0x2525	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2526	0x2526	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2527	0x2527	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2528	0x2528	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2529	0x2529	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x252A	0x252A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x252B	0x252B	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x252C	0x252C	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x252D	0x252D	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x252E	0x252E	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x252F	0x252F	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2530	0x2530	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2531	0x2531	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2532	0x2532	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2533	0x2533	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

0x2534	0x2534	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2535	0x2535	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2536	0x2536	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2537	0x2537	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2538	0x2538	1	RW	PhaseLoseCoeff	uint16	0.1%	%	-1	5	300	N/A	PhaseLoseCoeff	
0x2539	0x2539	1	RW	VirtualDamping	uint16	0.001Ω	Ω	-3	0	5000	N/A	Resonance damping coefficient	

## 8). Enable/disable control Parameters

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Description
0x2600	0x2600	1	RW	CtrParaGroup	Uint16	N/A	N/A	N/A	0	4	N/A	The enabled control parameters group. 0:Article 5 groups, control parameter setting of inverter loop 1: Article 1 groups, control parameter setting of inverter loop 2: Article 2 groups, control parameter setting of inverter loop 3: Article 3 groups, control parameter setting of inverter loop 4: Article 4 groups, control parameter setting of inverter loop
0x2601	0x2601	1	RW	CtrMode	uint16	N/A	N/A	N/A	0	5	N/A	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 6: Q(P) curve
0x2602	0x2602	1	RW	CtrlMode	uint16	N/A	N/A	N/A	0	2	N/A	The control mode of active power 0: Disable dispatch mode. 1: Remote dispatch mode. 2: Local control.
0x2603	0x2603	1	RW	MPPTScanEn	uint16	N/A	N/A	N/A	0	1	N/A	MPPT scan enable/disable control 0: Disable 1: Enable
0x2604	0x2604	1	RW	ARCEnable	uint16	N/A	N/A	N/A	0	1	N/A	Arc detection enable/disable control 0: Disable 1: Enable
0x2605	0x2605	1	RW	ArcParaGroup	uint16	N/A	N/A	N/A	0	3	N/A	Set parameters group of arc detection 0:Reserver 1:Reserver 2:Reserver 3:Reserver
0x2606	0x2606	1	RW	VpvStartUpSetEn	uint16	N/A	N/A	N/A	0	1	N/A	PV voltage at start up adjusting enable/disable control 0: Disable 1: Enable
0x2607	0x2607	1	RW	Island Protect	uint16	N/A	N/A	N/A	0	1	N/A	Island enable/disable control 0: Disable 1: Enable
0x2608	0x2608	1	RW	LVRTModeSetting	uint16	N/A	N/A	N/A	0	2	N/A	0: Disable 1: Enable, no reactive power output 2:Enable, reactive power output

0x2609	0x2609	1	RW	HVRTModeSetting	uint16	N/A	N/A	N/A	0	2	N/A	0: Disable 1: Enable, no reactive power output 2:Enable, reactive power output
0x260A	0x260A	1	RW	NormSoftStopPEn	uint16	N/A	N/A	N/A	0	1	N/A	soft stop enable/disable control 0: Disable 1: Enable
0x260B	0x260B	1	RW	PID Check Settings	uint16	N/A	N/A	N/A	0	3	N/A	0:No external connection PID-Box 1:Have external connectionPID-Box 2:Reserver 3: Reserver
0x260C	0x260C	1	RW	GridVoltMax1En	uint16	N/A	N/A	N/A	0	1	N/A	Over grid voltage triggering enable/disable control 0: Disable 1: Enable
0x260D	0x260D	1	RW	GridVoltMax2En	uint16	N/A	N/A	N/A	0	1	N/A	Over grid voltage triggering enable/disable control 0: Disable 1: Enable
0x260E	0x260E	1	RW	GridVoltMax3En	uint16	N/A	N/A	N/A	0	1	N/A	Over grid voltage triggering enable/disable control 0: Disable 1: Enable
0x260F	0x260F	1	RW	GridVoltMin1En	uint16	N/A	N/A	N/A	0	1	N/A	Under grid voltage triggering enable/disable control 0: Disable 1: Enable
0x2610	0x2610	1	RW	GridVoltMin2En	uint16	N/A	N/A	N/A	0	1	N/A	Under grid voltage triggering enable/disable control 0: Disable 1: Enable
0x2611	0x2611	1	RW	GridVoltMin3En	uint16	N/A	N/A	N/A	0	1	N/A	Under grid voltage triggering enable/disable control 0: Disable 1: Enable
0x2612	0x2612	1	RW	GridFrqMax1En	uint16	N/A	N/A	N/A	0	1	N/A	Over grid frequency triggering enable/disable control 0: Disable

													1: Enable
0x2613	0x2613	1	RW	GridFrqMax2En	uint16	N/A	N/A	N/A	0	1	N/A	Over grid frequency triggering enable/disable control 0: Disable 1: Enable	
0x2614	0x2614	1	RW	GridFrqMax3En	uint16	N/A	N/A	N/A	0	1	N/A	Over grid frequency triggering enable/disable control 0: Disable 1: Enable	
0x2615	0x2615	1	RW	GridFrqMin1En	uint16	N/A	N/A	N/A	0	1	N/A	Under grid frequency triggering enable/disable control 0: Disable 1: Enable	
0x2616	0x2616	1	RW	GridFrqMin2En	uint16	N/A	N/A	N/A	0	1	N/A	Under grid frequency triggering enable/disable control 0: Disable 1: Enable	
0x2617	0x2617	1	RW	GridFrqMin3En	uint16	N/A	N/A	N/A	0	1	N/A	Under grid frequency triggering enable/disable control 0: Disable 1: Enable	
0x2618	0x2618	1	RW	VoltMaxMovAvgEn	uint16	N/A	N/A	N/A	0	1	N/A	Enable/disable control of limiting the upper of moving average filter 0: Disable 1: Enable	
0x2619	0x2619	1	RW	VoltMinMovAvgEn	uint16	N/A	N/A	N/A	0	1	N/A	Enable/disable control of limiting the lower of moving average filter 0: Disable 1: Enable	
0x261A	0x261A	1	RW	GFCIStaticEn	uint16	N/A	N/A	N/A	0	1	N/A	GFCI static detection enable/disable control 0: Disable 1: Enable	
0x261B	0x261B	1	RW	GFCIDynProEn	uint16	N/A	N/A	N/A	0	1	N/A	GFCI dynamic detection enable/disable control	

0x261C	0x261C	1	RW	OvrFrqDeratingMode	uint16	N/A	N/A	N/A	0	5	N/A	Over frequency derating enable/disable control 0: Disable 1~5: Enabling corresponding function 1: Enable 2: Reserver 3: Reserver 4: Reserver 5: Reserver
0x261D	0x261D	1	RW	DCIProtection1En	uint16	N/A	N/A	N/A	0	1	N/A	DCI protection1 enable/disable control 0: Disable 1: Enable
0x261E	0x261E	1	RW	DCIProtection2En	uint16	N/A	N/A	N/A	0	1	N/A	DCI protection2 enable/disable control 0: Disable 1: Enable
0x261F	0x261F	1	RW	GridVoltUnbalanceEn	uint16	N/A	N/A	N/A	0	1	N/A	Unbalance rate of grid voltage detection enable/disable control 0: Disable 1: Enable
0x2620	0x2620	1	RW	UFDerEn	uint16	N/A	N/A	N/A	0	1	N/A	Under frequency derating enable/disable control 0: Disable 1: Enable
0x2621	0x2621	1	RW	OvrVoltDerEn	uint16	N/A	N/A	N/A	0	1	N/A	Grid voltage derating enable/disable control 0: Disable 1: Enable
0x2622	0x2622	1	RW	PVSlowStartSEn	uint16	N/A	N/A	N/A	0	1	N/A	soft startup function after power saltation 0: Disable 1: Enable
0x2623	0x2623	1	RW	ISOProtectionEn	uint16	N/A	N/A	N/A	0	1	N/A	ISO detection enable/disable control 0: Disable 1: Enable
0x2624	0x2624	1	RW	FANDetect	uint16	N/A	N/A	N/A	0	1	N/A	Fan detection enable/disable control



												0: Disable 1: Enable
0x2625	0x2625	1	RW	ACSPDDetectEnSet	uint16	N/A	N/A	N/A	0	1	N/A	The AC SPD test enables settings 0: Disable 1: Enable
0x2626	0x2626	1	RW	OperationOverVolEn	uint16	N/A	N/A	N/A	0	1	N/A	Operating overvoltage detection enables setting 0: Disable 1: Enable
0x2627	0x2627	1	RW	ActivePowerOver	uint16	N/A	N/A	N/A	0	1	N/A	Active power over matching enables control 0: Disable 1: Enable
0x2628	0x2628	1	RW	ReactivePowerOver	uint16	N/A	N/A	N/A	0	1	N/A	Reactive power over matching enables control 0: Disable 1: Enable
0x2629	0x2629	1	RW	PhaseLoseCoeffEnable	uint16	0	0	0	0	3	N/A	PhaseLose protection enable 0: Disable 1: Enable before the grid connection 2: Always enabled 3: Enhanced
0x262A	0x2646	N / A	N/A	Reserve	N/A	N/A	N/A	N/A	N / A	N / A	N/A	N/A
0x2647	0x2647	1	RW	PWMModeSelect	uint16	N/A	N/A	N/A	0	1	N/A	PWMModeSelect setting 0: SVPWM 1: DPWM

## 9). Control Command

Start	End	S i z	R/W	Name	Type	CPS Units	Uint	Scale facto r	Min value	Max value	Cont ents	Description
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		e										
0x2700	0x2700	1	RW	PowerOnOff	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Write command Power On: 0x5555 Power Off: 0x7777
0x2701	0x2701	1	RW	ForceRestart	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Write command: 0x5AAA Execution progress Process: 0x65A5 Success: 0x5555 Failure: 0x7777
0x2702	0x2702	1	RW	FactoryDefaults	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Write command: 0x5AAA Execution progress Process: 0x65A5 Success: 0x5555 Failure: 0x7777
0x2703	0x2703	1	RW	AutoTest(CEI)	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Write command: 0x5AAA Execution progress Process: 0x65A5 Success: 0x5555 Failure: 0x7777
0x2704	0x2704	1	RW	MPPTScan	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Write command: 0x5AAA Execution progress Process: 0x65A5 Success: 0x5555 Failure: 0x7777
0x2705	0x2705	1	RW	ARCDetect	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Write command: 0x5AAA Execution progress Process: 0x65A5 Success: 0x5555 Failure: 0x7777
0x2706	0x2706	1	RW	ARCClear	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Write command: 0x5AAA Execution progress

												Process: 0x65A5 Success: 0x5555 Failure: 0x7777
0x2707	0x2707	1	RW	PfSetValueRemote	int16	0.001	N/A	N/A	-1000 ~ -800	800~ 1000	N/A	Remote electric dispatch Power Factor setting value
0x2708	0x2708	1	RW	PSetPercentRemote	uint16	0.1%	N/A	N/A	0	1100	N/A	Remote electric dispatch Active Power setting value
0x2709	0x2709	1	RW	QSetPercentRemote	int16	0.1%	N/A	N/A	-660	660	N/A	Remote electric dispatch Reactive Power setting value
0x270A	0x270A	1	RW	FreqLv2PrtEn(CEI)	uint16	N/A	N/A	N/A	N/A	N/A	N/A	0x5555: Enable 0x7777: Disable

## 10). Inverter Basic Information

Start	End	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Description
0x2900	0x2900	1	RO	MachineVersion	BCD	N/A	N/A	N/A	N/A	N/A	N/A	Machine Version
0x2901	0x2901	1	RO	DSPFWVersion	BCD	N/A	N/A	N/A	N/A	N/A	N/A	DSP App Firmware Version
0x2902	0x2902	1	RO	DSPFWChkSum	uint16	N/A	N/A	N/A	N/A	N/A	N/A	DSP App Firmware Code CheckSum
0x2903	0x2903	1	RO	BootFWVersion	BCD	N/A	N/A	N/A	N/A	N/A	N/A	DSP Boot Loader Firmware Version
0x2904	0x2904	1	RO	BootFWCodeChkSum	uint16	N/A	N/A	N/A	N/A	N/A	N/A	DSP Boot Loader Firmware Code CheckSum
0x2905	0x2905	1	RO	CPLDVersion	BCD	N/A	N/A	N/A	N/A	N/A	N/A	CPLD Version
0x2906	0x2906	1	RW	SN20~17	BCD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2907	0x2907	1	RW	SN16~13	BCD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2908	0x2908	1	RW	SN12~9	BCD	N/A	N/A	N/A	N/A	N/A	N/A	N/A

0x2909	0x2909	1	RW	SN8~5	BCD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x290A	0x290A	1	RW	SN4~1	BCD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x290B	0x290B	1	RO	ProductCode	BCD	N/A	N/A	N/A	N/A	N/A	N/A	0X1409 = SCH100KTL-DO/US-600 0X1410 = SCH125KTL-DO/US-600 0X1654 = SCH100KTL-AIO/US-600 0X1655 = SCH125KTL-AIO/US-600 0X1679 = SCH125KTL-DO <b>0X1763 =</b> <b>SCH100KTL-DO/US-480</b>
0x290C	0x290C	1	RW	GridConnectionRule	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Grid Connection Rule. 0 = NONE 9= IEC61727 12= Brazil 10= IEEE1547_2014 19= CA Rule 21 20= HECO-HM 21= HECO-ML 27= ISO-NE 28= IEEE1547_2018 <b>30= IEEE1547_2003</b>
0x290D	0x290D	1	RW	NeutralLineSetting	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Neutral Line Setting 0x5A5A: connected to N line 0xA5A5: not connected to N line
0x290E	0x290E	1	RW	PVInputMode	uint16	N/A	N/A	N/A	N/A	N/A	N/A	PV Input Mode 0x5A5A: independent connection 0xA5A5: parallel connection

0x290F	0x290F	1	RO	DSPSafetyFirmwareCodeCheckSum	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2910	0x2910	1	RO	miniMCUFirmwareVersion	BCD	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2911	0x2911	1	RO	ThisfieldCheckSum	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2912	0x2912	1	RO	DspSafetyVer	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2913	0x2915	3	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2916	0x2916	1	RO	RegUnitFlag1	uint16	N/A	N/A	N/A	N/A	N/A	N/A	VALUE = 1: PCS Unit = 0.02s VALUE = 0: PCS Unit = 0.01s Related Registers address(0x201D、0x201A、0x2018、0x2016、0x2014、0x2012、0x2010)

## 11). LcdLess Basic Parameters

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Description
0x2B00	0x2B00	1	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2B01	0x2B01	1	RW	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2B02	0x2B05	4	RW	TimeSet	uint16	N/A	N/A	N/A	N/A	N/A	N/A	timestamp(yyyy-mm-dd-hh-mm-ss-N/A) of model 0, eg. "2012071615181000" = 2012-7-16 15:18:10
0x2B06	0x2B06	1	RW	ModbusAddr	uint16	N/A	N/A	N/A	1	128	N/A	The Rs485 interface of LcdLess (for third party monitoring, for example: Ethernetcard). Modbus RTU protocol, device address
0x2B07	0x2B07	1	RW	BaudRate	uint16	N/A	N/A	N/A	N/A	N/A	N/A	The Rs485 interface of LcdLess (for third party monitoring, for example: Ethernetcard).

													0x0001=2400 0x0002=4800 0x0003=9600 0x0004=19200
0x2B08	0x2B08	1	RW	ComPaswd	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Lcdless Common password For example, the password for mobile App input is 1234, that is, the hexadecimal data 1234= 0X1234. That is, the value =0X1234 of the register at this time
0x2B09	0x2B09	1	N/A	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2B0A	0x2B0A	1	RO	LcdlessBootFwChkCode	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2B0B	0x2B0B	1	RO	LcdlessAppFwChkCode	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2B0C	0x2B0C	1	RO	LcdlessBootVer	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	For example, when the register number is =0X1234, it means Ver=12.34.
0x2B0D	0x2B0D	1	RO	LcdlessAppVer	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	For example, when the register number is =0X1234, it means Ver=12.34.
0x2B0E	0x2B0E	1	WO	ClearFutRunLog	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0XA1A1= Clear all history fault records. 0XA2A2= Clear all history run records.
0x2B0F	0x2B0F	1	WO	ClearYield	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0x5858=Clear all power generation data((including "total / year / month / day / hour / base, power generation, that is, register address 0X2B34-0X2B3F data" & "per hour / day / month" power generation histogram, all data ")
0x2B10	0x2B10	1	WO	RestoreComBrd	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0xDEFA= Only restore all the parameters of the communication board to the default value Notes: the communication board is the Lcdless board. Recovery of the communication board parameters, that is, only the "Lcdless board external Eeprom,

												external Flash, Rtcbkp (special case: RTC timestamp not restored) and other storage data" all restore to the default value. These values have nothing to do with the Dsp board.
0x2B11	0x2B11	1	WO	ClearFutWaveOrIV	uint16	N/A	N/A	N/A	N/A	N/A	N/A	<p>0xA301= clears all historical IV curve records.</p> <p>0xC1C1="General Fault Wave" clear "Hand Stop"record  0xC2C2="General Fault Wave" clear "Auto Cycle "record  0xC3C3="General Fault Wave" clear "Auto Fault Trigger/Auto Level Trigger "record</p> <p>0xB1B1="Fault Detailed Information Notes" clear "Warn"record  0xB2B2="Fault Detailed Information Notes" clear " Pfault "record  0xB3B3="Fault Detailed Information Notes" clear " Fault "record</p> <p>0xA1A1="Arc Fault Wave " clear trigger mode record  0xA2A2="Arc Fault Wave " clear Cycle mode record</p>
0x2B12	0x2B12	1	WR	ScanIVCure	uint16	N/A	N/A	N/A	N/A	N/A	N/A	<p>IV curve scanning</p> <p>Write:  0xA801= begins to perform IV curve scanning</p> <p>Read:  0xB101= Scan IV curve is in progress</p>

													0xB102= Scan IV curve is finish 0xB103= Scan IV curve is fail
0x2B13	0x2B13	1	RO	ComStateInvtEth	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	" between inverter and Ethernetcard " communication state Purpose: mobile App displays the state of communication between inverter and Ethernetcard. 0X0001 = communication anomaly 0X0002 = communication normal
0x2B14	0x2B14	1	RO	PwrModeComBrd	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Power supply mode detection of Lcdless board 0XF1DC= ('DC PV board' and 'AC power grid' supply Lcdless at the same time) or (only 'DC PV battery board' supply Lcdless power, 'AC power grid' does not supply Lcdless power supply) 0XF2AC= only "AC grid" to Lcdless power supply, "DC PV battery board" does not give Lcdless power supply.
0x2B15	0x2B15	1	WO	RestChipComBrd	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0XAE57= restart Lcdless board McuChip
0x2B16	0x2B16	1	RO	PwrStateDsp	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Dsp board (Dsp chip) power supply state: 0XD15A=DSP board has no power supply. 0XD25B = Dsp, plate power is starting, or Dsp plate is not powered at this time. 0XD35C= The power of Dsp board has been powered, that is, communication between Dsp and Lcdless is successful or timeout.
0x2B17	0x2B17	1	WR	ArcFutRdCycIntv	uint16	1Min	Min	0	4	60	N/A	N/A	"Arc Fault Wave" setting the cycle to read data time intervals The default value = 30Min



0x2B18	0x2B1B	4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x2B1C	0x2B1C	1	WR	IapDspNoDerate	uint16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0XEAO1=Disable 0XDCC02=Enable

### 3. Input Registers Data Mapping 2

Modbus function code = 0x04

#### 1). Grid Status Information Data Area

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x8000	0x8000	1	RO	Uab	int16	0.1 V	V	-1	N/A	N/A	N/A	Line voltage
0x8001	0x8001	1	RO	Ubc	int16	0.1 V	V	-1	N/A	N/A	N/A	Line voltage
0x8002	0x8002	1	RO	Uca	int16	0.1 V	V	-1	N/A	N/A	N/A	Line voltage
0x8003	0x8003	1	RO	Ua	int16	0.1 V	V	-1	N/A	N/A	N/A	A Phase voltage
0x8004	0x8004	1	RO	Ub	int16	0.1 V	V	-1	N/A	N/A	N/A	B Phase voltage
0x8005	0x8005	1	RO	Uc	int16	0.1 V	V	-1	N/A	N/A	N/A	C Phase voltage
0x8006	0x8006	1	RO	FreqA	int16	0.1Hz	Hz	-1	N/A	N/A	N/A	A phase grid frequency
0x8007	0x8007	1	RO	FreqB	int16	0.1Hz	Hz	-1	N/A	N/A	N/A	B phase grid frequency
0x8008	0x8008	1	RO	FreqC	int16	0.1Hz	Hz	-1	N/A	N/A	N/A	C phase grid frequency
0x8009	0x8009	1	RO	GridPhaseSequence	int16	N/A	N/A	N/A	N/A	N/A	N/A	Grid phase sequence 0=NA, 1=positive, 2=negative

0x800A	0x800A	1	RO	GridVoltUnbalance	int16	0.1%	%	-1	N/A	N/A	N/A	GridVolUnbalanceDegree
0x800B	0x800B	1	RO	FreqT	int16	0.1Hz	Hz	-1	N/A	N/A	N/A	Grid system frequency
0x800C	0x800C	1	RO	NPEVolt	int16	1V	V	0	N/A	N/A	N/A	Voltage between N line of the power grid and PE ground
0x800D	0x800D	1	RO	IaMcu	uint16	1A	A	0	N/A	N/A	N/A	MCU detected power grid R phase current
0x800E	0x800E	1	RO	IbMcu	uint16	1A	A	0	N/A	N/A	N/A	MCU detected power grid S phase current
0x800F	0x800F	1	RO	IcMcu	uint16	1A	A	0	N/A	N/A	N/A	MCU detected power grid T phase current
0x8010	0x8010	1	RO	UaMcu	uint16	1V	V	0	N/A	N/A	N/A	MCU detected power grid R phase voltage
0x8011	0x8011	1	RO	UbMcu	uint16	1V	V	0	N/A	N/A	N/A	MCU detected power grid S phase voltage
0x8012	0x8012	1	RO	UcMcu	uint16	1V	V	0	N/A	N/A	N/A	MCU detected power grid T phase voltage
0x8013	0x8013	1	RO	Voltage harmonics(L1)	uint16	0.01%	%	-2	N/A	N/A	N/A	N/A
0x8014	0x8014	1	RO	Voltage harmonics(L2)	uint16	0.01%	%	-2	N/A	N/A	N/A	N/A
0x8015	0x8015	1	RO	Voltage harmonics(L3)	uint16	0.01%	%	-2	N/A	N/A	N/A	N/A
0x8016	0x8016	1	RO	Current harmonics(L1)	uint16	0.01%	%	-2	N/A	N/A	N/A	N/A
0x8017	0x8017	1	RO	Current harmonics(L2)	uint16	0.01%	%	-2	N/A	N/A	N/A	N/A
0x8018	0x8018	1	RO	Current harmonics(L3)	uint16	0.01%	%	-2	N/A	N/A	N/A	N/A

## 2). Inverter Output Status Information Data Area

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Uint	Scale factor	Min value	Max value	Contents	Description
0x8100	0x8100	1	RO	Ia	int16	0.1A	A	-1	N/A	N/A	N/A	Phase current
0x8101	0x8101	1	RO	Ib	int16	0.1A	A	-1	N/A	N/A	N/A	Phase current
0x8102	0x8102	1	RO	Ic	int16	0.1A	A	-1	N/A	N/A	N/A	Phase current
0x8103	0x8103	1	RO	PacA	int16	0.1kW	kW	-1	N/A	N/A	N/A	A Phase active power

0x8104	0x8104	1	RO	PacB	int16	0.1kW	kW	-1	N/A	N/A	N/A	B Phase active power
0x8105	0x8105	1	RO	PacC	int16	0.1kW	kW	-1	N/A	N/A	N/A	C Phase active power
0x8106	0x8106	1	RO	PacT	int16	0.1kW	kW	-1	N/A	N/A	N/A	3-Phase total active power
0x8107	0x8107	1	RO	QacA	int16	0.1kVar	kvar	-1	N/A	N/A	N/A	A Phase reactive power
0x8108	0x8108	1	RO	QacB	int16	0.1kVar	kvar	-1	N/A	N/A	N/A	B Phase reactive power
0x8109	0x8109	1	RO	QacC	int16	0.1kVar	kvar	-1	N/A	N/A	N/A	C Phase reactive power
0x810A	0x810A	1	RO	QacT	int16	0.1kVar	kvar	-1	N/A	N/A	N/A	3-Phase total reactive power
0x810B	0x810B	1	RO	PFa	int16	0.01	N/A	-2	N/A	N/A	N/A	A Phase power factor
0x810C	0x810C	1	RO	PFb	int16	0.01	N/A	-2	N/A	N/A	N/A	B Phase power factor
0x810D	0x810D	1	RO	PFc	int16	0.01	N/A	-2	N/A	N/A	N/A	C Phase power factor
0x810E	0x810E	1	RO	PFt	int16	0.01	N/A	-2	N/A	N/A	N/A	3-Phase power factor
0x810F	0x810F	1	RO	UinvA	int16	0.1V	V	-1	N/A	N/A	N/A	A Phase inverter voltage
0x8110	0x8110	1	RO	UinvB	int16	0.1V	V	-1	N/A	N/A	N/A	B Phase inverter voltage
0x8111	0x8111	1	RO	UinvC	int16	0.1V	V	-1	N/A	N/A	N/A	C Phase inverter voltage
0x8112	0x8112	1	RO	P Ref	int16	0.1%	%	-1	N/A	N/A	N/A	Active adjustment
0x8113	0x8113	1	RO	Q Ref	int16	0.1%	%	-1	N/A	N/A	N/A	Reactive power regulation
0x8114	0x8114	1	RO	PF Ref	int16	0.001	N/A	-3	N/A	N/A	N/A	PF adjustment

### 3). Inverter PV Input Status Information Data Area

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x8200	0x8200	1	RO	PVInputMode	uint16	N/A	N/A	N/A	N/A	N/A	N/A	0=not detected 1=Parallel 2=Independent

0x8201	0x8201	1	RO	Pdc	int16	0.1kW	kW	-1	N/A	N/A	N/A	DC total input power
0x8202	0x8202	1	RO	Upv1	int16	0.1V	0.1V	-1	N/A	N/A	N/A	PV Voltage1
0x8203	0x8203	1	RO	Ipv1	int16	0.1A	0.1A	-1	N/A	N/A	N/A	PV current1
0x8204	0x8204	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8205	0x8205	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8206	0x8206	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8207	0x8207	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8208	0x8208	1	RO	Iboost1	int16	0.1A	0.1A	-1	N/A	N/A	N/A	Boost1 Current
0x8209	0x8209	1	RO	Iboost2	int16	0.1A	0.1A	-1	N/A	N/A	N/A	Boost2 Current
0x820A	0x820A	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x820B	0x820B	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x820C	0x820C	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x820D	0x820D	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x820E	0x820E	1	RO	Ipv1MPPT	int16	0.1A	0.1A	-1	N/A	N/A	N/A	PV1 MPPT Current
0x820F	0x820F	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8210	0x8210	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8211	0x8211	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8212	0x8212	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8213	0x8213	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8214	0x8214	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8215	0x8215	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8216	0x8216	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8217	0x8217	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8218	0x8218	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8219	0x8219	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

0x821A	0x821A	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x821B	0x821B	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x821C	0x821C	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x821D	0x821D	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x821E	0x821E	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x821F	0x821F	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8220	0x8220	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8221	0x8221	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8222	0x8222	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8223	0x8223	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8224	0x8224	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8225	0x8225	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8226	0x8226	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8227	0x8227	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8228	0x8228	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8229	0x8229	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x822A	0x822A	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x822B	0x822B	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x822C	0x822C	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x822D	0x822D	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x822E	0x822E	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x822F	0x822F	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8230	0x8230	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8231	0x8231	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

#### 4). Inverter Internal Status Information Data Area

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x8300	0x8300	1	RO	Mode	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Inverter operating mode bit0 = Poweron = 1, Otherwise = 0; bit1 = InverterRun = 1, Otherwise = 0; bit2 = GridOk = 1, Otherwise = 0; bit3 = Derate = 1, Otherwise = 0; bit4 = Temperature low Cannot Start = 1, Otherwise = 0; bit5 = PV Volt high Cannot Start = 1, Otherwise = 0; bit6 = PV Volt low Cannot Start = 1, Otherwise = 0; bit7 = PV Power Checking = 1, Otherwise = 0; bit8 = Reserve; bit9 = Reserve; bit10 = Reserve; bit11 = Reserve; bit12 = Running = 1, Otherwise = 0; bit13 = Standby = 1, Otherwise = 0; bit14 = Checking = 1, Otherwise = 0; bit15 = Fault = 1, Otherwise = 0;
0x8301	0x8301	1	RO	PowerOnOffSta	uint16	N/A	N/A	N/A	N/A	N/A	N/A	LCD Power OnOff command execution status feedback
0x8302	0x8302	1	RO	Tmod	int16	0.1°C	°C	-1	N/A	N/A	N/A	Module temperature
0x8303	0x8303	1	RO	Tinter	int16	0.1°C	°C	-1	N/A	N/A	N/A	Internal temperature
0x8304	0x8304	1	RO	ISO	int16	1kΩ	kΩ	0	N/A	N/A	N/A	Insulation resistance detection value
0x8305	0x8305	1	RO	GFCI	int16	1mA	mA	0	N/A	N/A	N/A	Leakage current detection value
0x8306	0x8306	1	RO	DCIA	int16	1mA	mA	0	N/A	N/A	N/A	A phase DC component
0x8307	0x8307	1	RO	DCIB	int16	1mA	mA	0	N/A	N/A	N/A	B phase DC component

0x8308	0x8308	1	RO	DCIC	int16	1mA	mA	0	N/A	N/A	N/A	C phase DC component
0x8309	0x8309	1	RO	UbusPst	int16	1V	V	0	N/A	N/A	N/A	Positive Bus Voltage
0x830A	0x830A	1	RO	UbusNgt	int16	1V	V	0	N/A	N/A	N/A	Negative Bus Voltage
0x830B	0x830B	1	RO	UbusPstNgt	int16	1V	V	0	N/A	N/A	N/A	Positive and negative bus voltage
0x830C	0x830C	1	RO	CntDwPwrOn	int16	1S	S	0	N/A	N/A	N/A	Power on count down
0x830D	0x830D	1	RO	UsampIso	int16	1V	V	0	N/A	N/A	N/A	ISO sampling circuit detection voltage
0x830E	0x830E	1	RO	BusCapacitance	int16	1uF	uF	0	N/A	N/A	N/A	Bus capacitance
0x830F	0x830F	1	RO	AcCapacitance	int16	1uF	uF	0	N/A	N/A	N/A	AC capacitance
0x8310	0x8310	1	RO	EnvrTemp2	int16	0.1°C	°C	-1	N/A	N/A	N/A	Environmental temperature 2
0x8311	0x8311	1	RO	RlyTemp2	int16	0.1°C	°C	-1	N/A	N/A	N/A	Rly board temperature
0x8312	0x8312	1	RO	PwrTemp2	int16	0.1°C	°C	-1	N/A	N/A	N/A	Power board temperature
0x8313	0x8313	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8314	0x8314	1	RO	Reserve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0x8315	0x8315	1	RO	EnvrTemp2	int16	0.1°C	°C	-1	N/A	N/A	N/A	Environmental temperature 2
0x8316	0x8316	1	RO	ExtEnvrTemp2	int16	0.1°C	°C	-1	N/A	N/A	N/A	External environmental temperature

## 5). Inverter Fault Status Information Data Area

Start Addr	End Addr	Size	R/W	Name	Type	CPS Units	Unit	Scale factor	Min value	Max value	Contents	Description
0x8400	0x8400	1	RO	Warn	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Warn code
0x8401	0x8401	1	RO	Fault0	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Fault code0
0x8402	0x8402	1	RO	Fault1	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Fault code1
0x8403	0x8403	1	RO	Fault2	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Fault code2
0x8404	0x8404	1	RO	Fault3	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Fault code3

0x8405	0x8405	1	RO	Fault4	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Fault code4
0x8406	0x8406	1	RO	PFault	uint16	N/A	N/A	N/A	N/A	N/A	N/A	Permanent fault code

### 1.1).Warn

Register address	Storing data	Fault analysis	LCD English display	
0x8400	Warn	Bit15	Reserved	Warn0150
		Bit14	Reserved	Warn0140
		Bit13	Reserved	Warn0130
		Bit12	Reserved	Warn0120
		Bit11	Reserved	Warn0110
		Bit10	Reserved	Warn0100
		Bit9	Compatible	Warn0090
		Bit8	Compatible	Warn0080
		Bit7	Reserved	Warn0070
		Bit6	Compatible	Warn0060
		Bit5	Temperature sensor anomaly	Warn0050
		Bit4	DC/AC side lightning protection exception	Warn0040
		Bit3	EEPROM fault	Warn0030
		Bit2	Failure of internal communication between lcdless board and Dsp board	CommErr
		Bit1	Internal fan alarm	IntFanErr
Bit0	External fan alarm	ExtFanErr		

### 1.2).Fault0

Register address	Storing data	Fault analysis	LCD English display	
0x8401	Fault0	Bit15	Inverter current bias	Protect0010
		Bit14	Over temperature protection	TempOver
		Bit13	Grid connected relay protection	Protect0020
		Bit12	Out of phase	GridV.OutLim
		Bit11	Low frequency of power grid	GridF.OutLim



		Bit10	High frequency of power grid	GridF.OutLim
		Bit9	High inverter current	Protect0030
		Bit8	Grid phase voltage over limit	GridV.OutLim
		Bit7	Grid line voltage over limit	GridV.OutLim
		Bit6	FstBstCurrHighErr	Protect0040
		Bit5	Compatible	N/A
		Bit4	Inverter Soft start time out	Protect0050
		Bit3	Bus Soft start time out	Protect0060
		Bit2	BUS difference is high	Protect0070
		Bit1	Compatible	Protect0080
		Bit0	BUS sum high	Protect0090

### 1.3).Fault1

Register address	Storing data	Fault analysis	LCD English display	
0x8402	Fault1	Bit15	Leakage current sensor fault	Protect0100
		Bit14	Bus hardware over voltage	Protect0110
		Bit13	Compatible	N/A
		Bit12	Power module protection	Protect0120
		Bit11	Inverter current imbalance	Protect0130
		Bit10	Compatible	N/A
		Bit9	Unbalanced grid voltage	GridV.OutLim
		Bit8	inverter hardware over current	Protect0140
		Bit7	MCU Protect	Protect0150
		Bit6	Compatible	N/A
		Bit5	Frequency selective anomaly	Protect0160
		Bit4	Leakage current is too high	GFCIErr
		Bit3	Insulation impedance is too low	IsolationErr
		Bit2	DCI High current	Protect0170
		Bit1	DCI current bias	Protect0180
Bit0	Inverter voltage bias	Protect0190		

### 1.4).Fault2

Register address	Storing data	Fault analysis	LCD English display	
0x8403	Fault2	Bit15	Compatible	N/A
		Bit14	Compatible	Protect0290
		Bit13	Compatible	Protect0300
		Bit12	ThrPVHigh	ThrPVHigh
		Bit11	ThrPVRevConnect	ThrPVRevConnect
		Bit10	FstPVHigh	FstPVHigh
		Bit9	PVRevConnect	PVRevConnect
		Bit8	Reserver	PVAbnormalLink
		Bit7	RunInvAhd	Protect0230
		Bit6	PV abnormal connection failure	Protect0260
		Bit5	SndPVHigh	SndPVHigh
		Bit4	SndBstCurrHighErr	Protect0240
		Bit3	SndPVRevConnect	SndPVRevConnect
		Bit2	PV and Inverter Power Difference Faults	Protect0220
		Bit1	Internal hardware exception	Protect0210
		Bit0	Compatible	Protect0200

### 1.5).Fault3

Register address	Storing data	Fault analysis	LCD English display	
0x8404	Fault3	Bit15	ARC protection	ARC Protect
		Bit14	Compatible	Protect0320
		Bit13	Hardware driver power exception	Protect0330
		Bit12	Compatible	Protect0340
		Bit11	Compatible	Protect0350
		Bit10	Compatible	Protect0360
		Bit9	Compatible	Protect0370

		Bit8	Compatible	Protect0380
		Bit7	Compatible	Protect0390
		Bit6	Compatible	Protect0400
		Bit5	Compatible	Protect0410
		Bit4	Compatible	Protect0420
		Bit3	Compatible	Protect0430
		Bit2	Compatible	Protect0440
		Bit1	Compatible	Protect0450
		Bit0	Compatible	Protect0460

### 1.6).Fault4

Register address	Storing data	Fault analysis	LCD English display	
0x8405	Fault4	Bit15	Reserved	Protect0470
		Bit14	Reserved	Protect0480
		Bit13	Reserved	Protect0490
		Bit12	Reserved	Protect0500
		Bit11	Reserved	Protect0510
		Bit10	CPLD clock exception	Protect0520
		Bit9	CPLD program version exception	Protect0530
		Bit8	Product model exception	Protect0540
		Bit7	Bst Hardware overcurrent	Protect0550
		Bit6	Control board 3.3V voltage low	Protect0560
		Bit5	Capture phase locked loop check exception	Protect0570
		Bit4	PV3 Input Overcurrent	Protect0580
		Bit3	Battery plate super match	Protect0590
		Bit2	Arc board fault	Arcboard Err
		Bit1	Steady state GFCI protection	Protect0610
Bit0	HardwarePro	Protect0620		

### 1.7).PFault

Register address	Storing data	Fault analysis	LCD English display	
0x8406	PFault	Bit15	Control board voltage and drive power failure	Fault0160
		Bit14	Open loop self detection failure	Fault0150
		Bit13	Internal hardware failure	Fault0140
		Bit12	Permanent fault of power module	Fault0010
		Bit11	Bus hardware overvoltage fault	Fault0020
		Bit10	Compatible	Fault0030
		Bit9	Compatible	Fault0040
		Bit8	Inverter hardware overcurrent fault	Fault0050
		Bit7	CPLD clock failure	Fault0060
		Bit6	N/A	Fault0070
		Bit5	Bst hardware overcurrent fault	Fault0080
		Bit4	Steady state GFCI fault	Fault0090
		Bit3	Relay fault	Fault0100
		Bit2	Bus differential high fault	Fault0110
		Bit1	Compatible	Fault0120
		Bit0	Bus sum high fault	Fault0130