MODBUS RTU three-phase energy storage communication protocols

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Record of Changes

version number	Changes	wilfulness	Date of change
V100	initial version	Liu Shengli (1936-), PRC politician, prime minister from 2008	2020.09.16
V103	Add **DeyePack** Battery Protocol **500** to get started!	Liu Shengli (1936-), PRC politician, prime minister from 2008	2021.07.01
V104	Increase the AC measurement data register to **32bit**, the original registers As data lower **16** bits . Registers **687-709**.	Liu Shengli (1936-), PRC politician, prime minister from 2008	2021.11.22
	Add registers needed for grid standards	Chen Xudong (1895-1975), communist politician	2021.12.22

1. summarize

This protocol applies to the communication protocol between our three-phase energy storage inverter and the upper computer monitoring and DSP. It adopts MODBUS RTU communication protocol. This protocol can read the operation information of the inverter and control the inverter in real time.

2. physical interface

2.1. Adopts **RS485/RS232**, asynchronous transceiver, master-slave mode, fixed baud rate.

---- Baud rate: 9600bps

---- Parity Bit: None

---- Data bits: 8

---- stop bit: 1

2.2. Interframe Interval Time Requirements

3. data frame format

Slave Address	Function code	Data	CRC Check
8-Bits	8-Bits	Nx8-Bits	16-Bits

Slave Address field: is the corresponding slave address, which must match the slave address of the inverter.

Function code field: Function code, currently only 03H and 10H are open.

Function code(Hex)	Chinese name	register address	functionality
02H	Read switch input status		Read the contents of the fault information register
03H	Read Holding Register	0~59/500~2000	Read the contents of the setup register
04H	Read Input Register		Read inverter message content
05H	Write Single Coil		Switching Machine Setting Function
06H	Write Single Holding Register		Setting the single-byte function
10H	Write Multiple Holding Registers	60-499	Setting the Multi-Byte Function

Data domain: including the start register address, data length, number of data bytes, and data content. All are preceded by the high byte and followed by the low byte.

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CRC Check field: CRC check mode, low byte in front and high byte in the back.

4. Handling of error messages and data

Slave response (hexadecimal):

Slave Address	Function code	Error code	CRC Check	
xx	xx|0x80	xx	low byte	high byte (computing)
			xx	xx

When the inverter communication module detects an error other than an error in the CRC code, it must send a message back to the host computer. The highest position of the function code is 1, i.e., 128 is added to the function code sent by the host computer.

The inverter communication module responds to the returned error code:

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0x01 Illegal function codes Server does not understand function codes

0x02 Illegal data address Related to the request

0x03 Illegal data value Related to the request

0x04 Service fault Inverter communication module cannot take out data during execution fault

5. Detailed protocol description

0-59 Register address for readable register type, **0x03** Function code.

60-499 Register address is read-write register type, **0x10** Function code.

500-2000 Register address is readable register type, **0x03** Function code.

5.1. 03 Read intrinsic attribute area, corresponding to function code 0x03, address range 0~59

Addr	Register meaning	R/W	data range	unit	note

000	Equipment type Device type	R			0X0200 Stringer inverter
					0X0300 Single-phase energy storage machine hybird
					0X0400 MI microinverter 0X0500 low voltage three-phase energy storage machine phase3 hybird
					0X0600 High-voltage three-phase energy storage machine
					        0600 Three phase high voltage 6-15kw
					        0601 Three phase high voltage 20-50kw

001	Modbus address	R	[1,247]		
002	Communication Agreement Version Communication protocol version	R	'0'~'9'. 'A'~'Z'		The version of this protocol to which the firmware adheres, e.g. 0x 0102 Represents version 1.2
003	SN byte 01	R	'0'~'9'. 'A'~'Z'		The serial number is ten ASCII characters, If "AH12345678",
	SN byte 02				Byte 01 is 0x41 (A).
004	SN byte 03	R	'0'~'9'. 'A'~'Z'		The 02nd byte is 0x48 (H).
	SN byte 04				......
005	SN byte 05	R	'0'~'9'. 'A'~'Z'		The 09th byte is 0x37 (7),
	SN byte 06				The tenth byte is 0x38 (8).
006	SN byte 07	R	'0'~'9'. 'A'~'Z'		
	SN byte 08				
	SN byte 09	R	'0'~'9'.		

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007	SN byte 10		'A'~'Z'		
008	power rating Rated Power	R	0x0000		
009	reserved word undefined	R	0x0000		
010	reserved word undefined	R			
011	Control board auxiliary microcontroller software	R	0XFFFF		Bit0-7 Bootloader program bootloader software
	version number Assistant program version control board bootloader version number bootloader software version				Bit8-15 Assistant program
012	La Arc version number AFCI Version	R			
013	Auxiliary microcontroller version number Slave MCU Version	R			
014	Control Panel Firmware Version-Field 2 Control panel firmware version-2	R			Example 0x2001 High byte 0x20 is intrinsic to three-phase low-voltage energy storage. The low byte 0x01 is the hardware version number, factory setting cannot be changed. Password for debug
015	**Control Board Firmware Version - Master** Control control panel firmware master version	R			Example: 0x1001 Bit12-15: the number indicates the release version, the major version distinction; F indicates the R&D internal test version Bit0-11: version water number
016	Communication Board Firmware Version-Field 1 Comm panel firmware version-1	R			
017	Communication Board Firmware Version-Field 2	R			

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	Comm panel firmware version-2				
018	**Communication Board Firmware Version - Master Version** Comm panel firmware master version	R			
019	Types of safety regulations Safety type	R			
020	Rated power low word Rated power low word	R		0.1W	
021	Rated power high character Rated power high word	R		0.1W	
022	MPPT Number of Paths and Phases MPPT number and phases	R	[1,8]/[1,3]		0x0503: five-mppts three-phase
023	Rated Power Code Selection	R	[0-3]		Factory only Appendix I: Rated power model selection table
024	Battery circuit	R	[0,4]		0 The default value is also 1 input 1 1 Battery Input 2 2 Battery Inputs
025	Three-phase or split-phase output option	R	[0,1]		Default value three-phase 0:Three-phase output 1:Split phase output
026	EU or UL				0: EU default value
	European or American choice				1:UL
027	Fan Configuration				Bit0 General Enable Bit1 Internal fan 1 Bit2 Internal Fan 2 Bit3 External Fan 1 Bit4 External Fan 2 Bit5 External Fan 3
028	inverter algebra	R	[0,10]		1: SG01 2:SG02
029	Inverter Series Distinction	R	[A,Z]		26 alphabetical order Reference inverter series differentiation table

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Addr	Register meaning	R/W	data range	unit	note
030	InternalRTC/External RTC	R			InternalRTC: 1 External RTC: 0
031	Lcd_MCU_Type	R			High 8 bits: chip type, low 8 bits: chip serial number
032	Control_MCU_Type	R			High 8 bits: chip type, low 8 bits: chip serial number
033	AC voltage level/ Busbar Voltage Rating	R			0:220-277VAC IGBT=1200V 1:100-133VAC IGBT=650V
034	Default Output Voltage				Appendix III: Output Voltage Selection Table
059					

5.1. 10 Read-write variable attribute area, corresponding to function code 0x10.

Addr	Register meaning	R/W	data range	unit	note
60	Remote Lock Enable Remote Lock	R/W			0x0002 Turn off 0x0000 Turn on
61	Power-on self-test time self-check time	R/W	[0,1000]	S	MI
62	System time byte 1 system timebyte 01	R/W	[0,255]	surname Nian Year	MI Based on 20 00 Based on the year 2000
62	System time byte 2 system timebyte 02	R/W	[1,12]	moon Month	
63	System time byte 3 system timebyte 03	R/W	[1,31]	date Day	
63	System time byte 4 system timebyte 04	R/W	[0,23]	hour Hour	
64	System time byte 5 system timebyte 05	R/W	[0,59]	Minute	
64	System time byte 6 system timebyte 06	R/W	[0,59]	unit of angle or arc equivalent one	

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				sixtieth of a degree Sec	
65					
66	reserve Undefine				
67	reserve Undefine				
68	reserve Undefine				
69	reserve Undefine				
70	reserve Undefine				
71	reserve Undefine				
72	reserve Undefine				
73	reserve Undefine				
74	mail address Communication address	R	0x0000	-	
75	Voltage to Active Response Time V(Q) ResponseTime	R/W	[0,1200]	0.1S	
76	Reactive Response Time Q ResponseTime	R/W	[0,1200]	0.1S	
77	Active power regulation Active power regulation	R/W	[0,1000]	0.1%	
78	Reactive power regulation Reactive power regulation	R/W	[-600,600]	0.1%	
79	apparent power adjustment Apparent power regulation	R/W	[0,1200]	0.1%	
80	switching mode enable Switch on and off enable	R/W	[0,1]	-	0: Shutdown 1: Power on MI 2: Power off 0: power off 1: power on
81	factory restore enable (computing) Factory reset enable	R/W	[0,1]		0: disable 1: enable 3: Lockedinv

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82	Self-test time Self-checking time	R/W	[0,1]	-	0-360 seconds
83	Island protection enable Island protection enable	R/W	[0,1]		0: disable 1: enable
84	reactive energy enable bit	R/W	[0,1]	–	Need and voltage active-V(Q) active reactive-P(Q) active
					PF-P(F) mutually exclusive <mark>0 disable</mark> <mark>1 PF enable</mark> <mark>2 Q enable</mark>
85	GFDI Enable GFDI enable	R/W	[0,1]		0: disable 1: enable utilized
86					
87	RISO Enable RISO enable	R/W	[0,1]		0: disable 1: enable
88					
89					
90					
91	Control board EEPROM initial enable MCU-EEPROM initial enabled	R/W	[0,2]	-	0: work normal 1: Initialize control board EEPROMini t mcu eeprom
92	Communication board EEPROM initial enable Comm-EEPROM initial enabled	R/W			0: normal work normal 1: Initialize the communication board EEPROM init comm eeprom 3: Locekd inverter (Sunsynk)
93	Control board test control commands Factory only				Bit0 Open test enable (only valid after enable) Test enable=1 if use later bit Bit1 Open inverter all fan open all fan Bit4 Open Gen signal relay open Gen singal relay

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94	Communication board test control commands Factory only	R/W	[0,3]	-	Bit0　　Open test enable (only valid after enable) Test enable=1 if use later bit Bit2　　Flashing all LEDs of the display board, honeycomb, backlight, display red, yellow and blue Flash display board for all LEDs, honey maker, backlight, display red, yellow and blue Bit3　　Enable lithium battery interface test Open lithium battery interface test Bit5　　Restart LCD program Restart lcd
95					
96	Correction factor for power generation PowerWH Factor	R/W		-0.01	100mean 1 111 mean 1.11
97	Solar input is SPU TEST MODE.				For debug only Bit0　　Power supply mode at PV input Bit1　　Battery input is unidirectional source mode
98	Battery Charging Type Control Mode	R/W	-	-	0x0000　　Lead-Battery, four-stage charging method 　　　　0x0001Lithium battery
99	Equalization V	R/W	[3800,6100]	0.01V	1480 means 14.8v
100	Absorption V	R/W	[3800,6100]	0.01V	1440 means 14.4v
101	Float V	R/W	[3800,6100]	0.01V	1440 means 14.4v
102	battery capacity Batt Capacity	R/W	[0,2000]	1 Ah	200 means 200AH
103	Empty_v	R/W		0.01V	
104	Minimum Limit Acting Power ZeroExport power	R/W			
105	Equalization is performed once every few days Equalization day cycle	R/W	[0 90]	Day	
106	Equalization of implementation time Equalization time	R/W	[0 20]	0.5Hour	Resolution 0.5 hours Resolution 0.5 h [0-20] corresponds to　0- 10 hours But the hair MCU is [0-100]
107	Temperature	R/W	[0,50]	1mV/°C	Signed int with a positive or negative

	compensation value TEMPCO				value.
108	Maximum battery charging current Max A Charge	R/W	[0,185]	1A	0-185A
109	Maximum battery discharge current Max A discharge	R/W	[0,185]	1A	0-185A
110	Parallel Bat&Bat2	R/W	[0,1]		For high vol three phase inverter
111	Battery operation is based on voltage or capacity battery operates according to voltage or capacity	R/W			According to the voltage According to the capacity 2 no battery
112	Li-ion battery wake-up flag bit Li-battery wake up sign bit	R/W			Bit0 Battery 1 wake up 0=enabled 1=Disable Bit8 Battery 2 Wakeup 0=enabled 1=Disable
113	Battery internal resistance value batteryresistance value	R/W	[0,6000]	mΩ	
114	Battery charging efficiency Battery charging efficiency	R/W	[0-100]	0.1%	983 indicates 98.3% 983 is 98.3%
115	Battery Capacity ShutDown battery capacity ShutDown	R/W	[0,100]	1%	low capacity cutoff Low capacity cutoff point
116	Battery capacity Restart battery capacityRestart	R/W	[0,100]	1%	Protecting the recovery point Protection recovery point
117	Battery capacity LowBatt battery capacityLowBatt	R/W	[0,100]	1%	
118	Battery Voltage ShutDown battery voltageShutDown	R/W	[3800,6100]	0.01V	Low protection point cutoff 41V Low protection point cutoff 41V
119	Battery Voltage Restart battery voltageRestart	R/W	[3800,6100]	0.01V	Reboot /recover 52V
120	Battery Voltage LowBatt battery voltageLowBatt	R/W	[3800,6100]	0.01V	Discharge Depth 46V Discharge depth 46V
121	Maximum generator runtime Maximum operating time of generator			0.1 hours	120 for 12 hours 120 is 12 hours

122	Generator cooling time Generator cooling time			0.1 hours	120 for 12 hours 120 is 12 hours
123	Generator charging start voltage point Generator charging Starting voltage point	R/W	[0000 6300]	0.01V	Battery voltage less than this value generator turns on charging The battery voltage is less than this value
124	Generator Charge Start Capacity Point Generator charging starting capacity point	R/W	[0000 6300]	1%	Battery capacity less than this value generator turns on charging The battery capacity is less than this value
125	Generator charging current to battery Generator charges the battery current	R/W	[0000 185]	1A	Generator charging current to battery The generator charges the battery
126	Starting voltage point for mains charging Grid charging Start voltage point o	R/W	[0000 6300]	0.01v	
127	Utility charging start-up capacity point Grid charging start capacity point	R/W	[0000 6300]	1%	
128	Mains charging current to the battery Grid chargethe battery current	R/W	[0000 185]	1A	Mains charging current to the battery Grid chargethe battery current
129	Generator Charge Enable Generator is charged to enable	R/W			
130	Utility Charge Enable Gridis charged to enable	R/W			
131	AC couple Frequency upper limit setting	R/W	5000-6500		5000-6500
132	Forced on generator as load function Force on generator as load function	R/W			Provided that register 235 has been enabled 1 The premise is that register 234 has enabled 1 0 Do not force 1 force force

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133	Generator input as load output enable generator input is enabled as the load output	R/W			0 Only Gen use only Gen use 1 Smart load output only smart load output 2 Enable as inverter input only microinverter input
134	Generator load OFF voltage SmartLoad SmartLoad batt Voltage	R/W	[3800 6300]	0.01V	
135	Generator load OFF power SmartLoad OFF batt	R/W	[0000 100]	1%	
136	Generator load ON voltage SmartLoad ON batt Voltage	R/W	[3800 6300]	0.01V	
137	Generator load ON power SmartLoad ON batt	R/W	[0000 100]	1%	
138	Output voltage level setting Output voltage level setting	R/W			Appendix III: Output Voltage Selection Table
139	Minimum SOLAR power to turn on the generator minimum solar power required to start a generator	R/W	[0,8000]	1W	
140	Generator Grid Connection Signal Gen_Grid_Signal On				Bit0grid signal Bit1gen signal

141	Energy Management Model Energy management model				Bit0-1 10 Battery priority mode battery first mode 11 Load first mode load first mode Bit2-3 Indicates passive grid-connected power balancing function Represents passive grid-connected power balance function 10 Do not turn on colse 11 open open Bit4-5 Indicates active grid-connected power balancing function Represents active grid-connection power balance function 10 Not on close 11 open open
142	Limit control function Limit control function	R/W		0/1	0x00 Enable power sell sell electricity enabled 0x01 enable built-in build-in enabled 0x02 enable external extraposition enabled
143	Maximum selling power Max sell Power	R/W	[0,8000]	1W	Low Vol: 1W High Vol:10W
144	External current sensor direction External current sensor clamp phase	R/W	[xx,00]	1W	[11][12]
145	Photovoltaics sells electricity Solar sell	R/W			0x00 photovoltaicDon't sell 0x01 light solar sell
146	Advanced peak shaving enable Time of Time of Use Selling	R/W			Bit00 disable 1 enable
	enabled				Bit1 Monday 0-disable 1-enable Bit2 Tuesday ...... Bit7 Sunday Bit8 Spanish Mode

147	Three-phase ABC grid phase sequence setting Grid Phase	R/W			0 0 120 240 1 0 240 120
148	Electricity selling model time point 1 Sell mode time point 1	R/W	[0000 2359]		2359 indicates time 23:59 2359 means time 23:59
149	Electricity selling model time point 2 Sell mode time point 2	R/W	[0000 2359]		Time
150	Electricity selling model time point 3 Sell mode time point 3	R/W	[0000 2359]		
151	Electricity selling model time point 4 Sell mode time point 4	R/W	[0000 2359]		
152	Electricity selling model point in time 5 Sell mode time point5	R/W	[0000 2359]		
153	Electricity selling model time point 6 Sell mode time point6	R/W	[0000 2359]		
154	Power Selling Mode Time Point 1 Power Sell mode time point 1 power	R/W	[0000 8000]	1W	Low Vol: 1W High Vol:10W
155	Sell Power Mode Time Point 2 Power Sell mode time point 2	R/W	[0000 8000]	1W	Power
156	Power Selling Model Point in Time 3 Power Sell mode time point 3	R/W	[0000 8000]	1W	
157	Power Selling Model Point in Time 4 Power Sell mode time point 4	R/W	[0000 8000]	1W	
158	Power Selling Model Point in Time 5 Power Sell mode time point 5	R/W	[0000 8000]	1W	

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159	Power Selling Model Point in Time 6 Power Sell mode time point 6	R/W	[0000 8000]	1W	
160	Sell Power Mode Point in Time 1 Voltage Sell mode time point 1	R/W	[0000 6300]	0.01V	Affected by battery voltage Is affected by the battery voltage
161	Sell mode time point 2 Voltage Sell mode time point 2	R/W	[0000 6300]	0.01V	Voltage
162	Sell mode point in time 3 Voltage Sell mode time point 3	R/W	[0000 6300]	0.01V	
163	Power Selling Mode Point in Time 4 Voltage Sell mode time point 4	R/W	[0000 6300]	0.01V	
164	Power Selling Mode Point in Time 5 Voltage Sell mode time point 5	R/W	[0000 6300]	0.01V	
165	Power Selling Mode Point in Time 6 Voltage Sell mode time point 6	R/W	[0000 6300]	0.01V	
166	1 capacity 1 capacity	R/W	[0,100]	1%	Soc
167	2 capacity 2 capacity	R/W	[0,100]	1%	
168	3 capacity 3 capacity	R/W	[0,100]	1%	
169	4 Capacity 4 capacity	R/W	[0,100]	1%	
170	5 capacity 5 capacity	R/W	[0,100]	1%	
171	6 Capacity 6 capacity	R/W	[0,100]	1%	
172	Time Point 1 Charge Enable Time point 1 charge enable	R/W	[0,1]		Bit0grid charging enable Bit1gen charging enable Bit2 Spanish GM mode Bit3 The BU model in Spain
173	Time Point 2 Charge Enable Time point 2 charge enable	R/W	[0,1]		ibid
174	Time Point 3 Charge Enable Time point 3 charge enable	R/W	[0,1]		ibid

175	Time Point 4 Charge Enable Time point 4 charge enable	R/W	[0,1]		ibid
176	Time Point 5 Charge Enable Time point 5 charge enable	R/W	[0,1]		ibid
177	Time Point 6 Charge Enable Time point 6 charge enable	R/W	[0,1]		ibid

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178	Control Board Special Function Bit 1
	Microinverter export to grid cutoff
		R/W	[0,1]		Need to change all to two bits need two bits control
					-00 no action -01 no action -10 disable -11 enable
					-00Nowork-01Nowork-10Disable-11Enable
					Bit0-1 10:Disable
					        11:enable
					        Bit2-310:Gen peak-shaving disable 11:Gen peak-shaving enable
					Bit4- 5: 10:Grid peak-shaving disable
					        11:Grid peak-shaving enable
					        Bit6-710:On Grid always on disable 11:On Grid always on enable
					        Bit8-910:external relay disable 11:external relay enable
					        Bit10-1110: Lost lithium battery fault disable
					Loss of lithium battery report fault disable
					        11: Loss of lithium battery report fault enable
					Loss of lithium battery report fault enable
					
					        Bit12-1310: DRM enable bit disable
					        11: DRM enable bit enable Bit14-1510:US ground fault disable
					        11:U.S. version ground fault enable
					Note that this register cannot be enabled in its entirety.

179	Control Board Special Function Bits 2
	1,External CT auto-detect direction
	2,Forced offline
		R/W	[0,1]		Bit0-1 10: External CT auto-detect direction disable
					      Externl ct direction check disable
					11: enable
					Bit2-3 10: Force off-grid operation disable
					  Forced off-grid work disable
					       11: enable

180	Resumption of grid connection time Restore connection time	R/W	[10 300]		
181	Solar Arc Fault mode on Solar Arc Fault Mode	R/W	[0 1]		0x00 Close 0x01 Open open
182	Grid connection standards Grid Mode	R/W	[0 1]		NOMAL. //0 IEEE1547. //1 RULE21. //2 SRD_UL1741. //3 CEI_0_21, /4 //4 EN50549_CZ, //5 Czech >16A AS4777_A, //6 //6 AS4777_B. //7 AS4777_C, /8 //8 AS4777_NewZealand, //9 VDE4105, //10 Germany //9 VDE4105, //10 Germany OVE_Directive_R25, //11 Austria EN50549_CZ_PPDS_L16A, //12 Czech <16A

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					......
183	Grid frequency setting Grid Frequency	R/W	[0 1]		0x00 50HZ 0x01 60hz
184	Grid type setting Grid Type It's three-phase now. It's not working.	R/W	[0 3]		0 Three Phase System Three Phase 1 Single-phase Single-phase 2 Split-phase Split-phase
185	Grid High Voltage Protection Points Grid Vol High	R/W	[1800 2700]	0.1V	
186	Grid low voltage protection points Grid Vol Low	R/W	[1800 2700]	0.1V	
187	Grid frequency high protection points Grid Hz High	R/W	[4500 6500]	0.01Hz	
188	Grid frequency low protection point Grid Hz Low	R/W	[4500 6500]	0.01Hz	
189	Generator connected to grid input The generator is connected to the grid input	R/W	[1 0]		0 disable 1 enabled
190	GEN peak shaving Power	R/W	[0 16000]	1w	
191	GRID peak shaving Power	R/W	[0 16000]	1w	
192	Smart Load Open Delay	R/W	[1 120]	1Minute	
193	Output PF value setting (active regulation) Output PF value Settings	R/W	[800 1200]		800 means adjusted to 80% 1200 marking adjusted to 120% 800 for 80%, 1200 for 120%

194	External Relay Bits External relay bit	R/W	[0 0xFFFF]		Bit0-8 corresponds to 8 relay bits Bit0-8 corresponds to 8 relay bits
195	ARC_facTory_B high ARC_facTory_B high word	R/W	[0,65535]		A combination of high and status can be displayed as a numerical value High and status combination, with numerical display can be
196	lows Low word	R/W	[0,65535]		
197	ARC_facTory_I High Bit ARC_facTory_I high word	R/W	[0,65535]		
198	lows Low word	R/W	[0,65535]		
199	ARC_facTory_F high ARC_facTory_F high word	R/W	[0,65535]		
200	lows Low word	R/W	[0,65535]		
201	ARC_facTory_D high ARC_facTory_D high word	R/W	[0,65535]		
202	lows Low word	R/W	[0,65535]		
203	Arc pulling number filtering	R/W	[0,65535]		
204	ARC_facTory_T low bit	R/W	[0,65535]		
	ARC_facTory_T low word				
205	ARC_facTory_C high bit ARC_facTory_C high word	R/W	[0,65535]		
206	lows Low word	R/W	[0,65535]		
207	ARC_facTory_Frz high bit ARC_facTory_Frz ARC_facTory_Frz word	R/W	[0,65535]		
208	lows Low word	R/W	[0,65535]		
209	Ups_delay time	R/W		1S	0 default (setting) 1 1S
210	Charging Voltage charging voltage	R/W		0.01V	
211	discharge voltage Discharge voltage	R/W		0.01V	
212	Charge Current Limit charging current limiting	R/W		1A	

213	discharging current limit (i.e. electric current limit) Discharge current limiting	R/W		1A	
214	current level Li-bat SOC	R/W		1%	
215	current voltage Li-bat voltage	R/W		0.01V	
216	Current Li-bat current	R/W		1A	
217	current temperature Li-bat temperature	R/W		0.1C	1000 corresponds to 0 degree 1200 corresponds to 20.0 degree 800 corresponds to -20.0C 1000 corresponds to 0 degrees 1200 means 20.0 degrees 800 means -20.0C
218	Off-grid charging current limit Max. Maximum charge current limit	R/W		1A	
219	Off-grid discharge current limiting Max. Maximum discharge current limiting	R/W			
220	Lithium Battery Alarm Bit Lithium battery alarm flag	R/W			0x0001
221	Lithium Battery Fault Location Lithium battery fault flag	R/W	[0,65535]		
222	Lithium battery symbol 2 Lithium battery other flag	R/W	[0,65535]		Bit0 NULL Bit1 Battery 1 Force charge flag Bit2 Battery 2 Force charge flag
					Bit3 Battery Sleep Flag Sleep

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223	Lithium Battery Type Lithium battery type	R/W			0x0000　　ZTE PAYNER Drannen Lithium PYLON　　SOLAX Generic CAN Protocol 0x0001　Tempusoft RS485modbus Protocol 0x0002　KOK protocol 0x0003　keith 0X0004 Topology Protocol 0X0005　　PAYNER 485 Protocol 0X0006　　Jerex 485 Protocol 0X0007　　Hinwanda 485 protocol 0X0008　　Cinergy 485 Protocol 0X0009　　Tempus 485 Protocol 0X000A Sungo Electric can protocols
224	Lithium battery SOH Lithium battery SOH				
225	Lithium battery software version number				
226	Battery rating AH				
227	Lithium battery hardware version number	R/W			
228	Communication board setting function Comm　board setting function	R/W			Bit0-1　　Timer Bit2-3　　beep Bit4-5 AM/PM 　　　　Bit6-7Auto dim Bit14-15　　Allow_Remote (11 is enable, 10 is disable) -00 no work -01 no work -10 disable disable -11 enable

229	Battery 1 Manufacturer	R/W			//=====LV battery #define HereYin 0 #define PYLON 1 #define SOLAX 2 #define DYNESS_L 3 #define CCGX 4 #define Alpha_ESS 5 #define SUNGO_CAN 6
					#define VISION_CAN 7 #define WATTSONIC_CAN 8 #define KUNLAN 9 #define GSEnergy 10 #define GS_HUB 11 #define BYD_LV 12 #define AOBO 13 #define DEYE 14 #define CFE 15 #define DMEGC 16 #define UZENERGY 17 #define GROWATT 18 //=====HV battery #define Bat_PYLON_HV 0x01 #define Bat_DynessHV_HV 0x02 #define Bat_UZENERGY_HV 0x03 #define Bat_SOLAX_HV 0x04 #define Bat_SOLAX_HV #define Bat_Deye_HV 0x05 #define Bat_BYD_HV 0x06 #define Bat_JINKOBSS_HV 0x07
230	Battery 2 Manufacturer				//=====No LV battery //=====HV battery #define Bat_PYLON_HV 0x01 #define Bat_DynessHV_HV 0x02 #define Bat_UZENERGY_HV 0x03 #define Bat_SOLAX_HV 0x04 #define Bat_SOLAX_HV #define Bat_Deye_HV 0x05 #define Bat_BYD_HV 0x06 #define Bat_JINKOBSS_HV 0x07
231					

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232					
233					
234					
235	Track Grid-Phase	R/W	[0,1]		0 disabledefault value 1 enable
236	IT_SYSTEM	R/W	[0,1]		
237	Active unbalance load	R/W	[0,1]		
238	unbalance power trip	R/W	[0,65535]		
239	Step Setup in Test Mode	R/W			Test_State
240	Access to in-plant preliminary test program	R/W			=12345 Enter
241	Lithium battery 2 charging voltage Li-bat2 charging voltage				
242	Lithium battery 2 discharge voltage Li-bat2 discharging voltage				
243	Charge Current Limit charging current limit				
244	discharging current limit (i.e. electric current limit) Discharge current limit				
245	current level Li-bat2 SOC				
246	current voltage Li-bat2 voltage				
247	Current Li-bat2 current				
248	current temperature Li-bat2 temperature				
249	Off-grid charging current limit Max. Max charge current limit				
250	Off-grid discharge current limiting Max. Max discharge current limit				
251	Lithium Battery 2 Alarm Bit Li-bat2 alarm flag				
252	Lithium battery 2 fault				

	position Li-bat2 fault flag			
253	Lithium battery symbol 2 Lithium battery other flag	R/W	[0,65535]	Bit0 NULL Bit1 Battery1 strong charge flag Force charge Bit2 Battery2 strong charge flag Force charge Bit3 Battery2 sleep flag Sleep
254	Lithium Battery 2 Battery Type Lithium battery2 type			
255	Lithium battery 2 SOH Lithium battery2 SOH			
256	Lithium battery 2 software version number Lithium battery2 Version			
257	Li-ion battery 2 rated AH Lithium battery2 AH			
258	Lithium battery 2 hardware version number			
259				
260				
261				
262				
263				
264				
265				
266				
267				
268				
269	Grid1_I		[900,1000]	Factory Only
270	Grid2_I			Correction coefficient
271	Grid3_I			
272	Grid_V_L1			
273	Grid_V_L2			
274	Grid_V_L3			
275	Limit1_I			
276	Limit2_I			
277	Limit3_I			
278	PV1_V			

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279	PV1_I				
280	PV2_V				
281	PV2_I				
282	INV_A_I				
283	INV_B_I				
284	INV_C_I				
285	INV_A_V				
286	INV_B_V				
287	INV_C_V				
288	BAT1_I				
289	BAT1_V				
290	Gen1_I				
291	Gen2_I				
292	Gen3_I				
293	Gen1_V				
294	Gen2_V				
295	Gen3_V				
296	PV3_V				
297	PV3_I				
298	PV4_V				
299	PV4_I				
300	BAT2_I				
301	BAT2_V				
302					
303					
304					
305					
306					
307					
308					
309					
310	Solar does Wind input enable Solar makes Wind input enable	R/W	[0,1]		Bit0 Solar1 Bit1 Solar2
311	Voltage 1	R/W	[500,5000]	0.1V	
312	Voltage 2	R/W		0.1V	
313	Voltage 3	R/W		0.1V	
314	Voltage 4	R/W		0.1V	
315	Voltage 5	R/W		0.1V	
316	Voltage 6	R/W		0.1V	
317	Voltage 7	R/W		0.1V	
318	Voltage 8	R/W		0.1V	

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319	Voltage 9	R/W		0.1V	
320	Voltage 10	R/W		0.1V	
321	Voltage 11	R/W		0.1V	
322	Voltage 12	R/W		0.1V	
323	Current 1	R/W	[0-200]	0.1A	
324	Current 2	R/W		0.1A	
325	Current 3	R/W		0.1A	
326	Current 4	R/W		0.1A	
327	Current 5	R/W		0.1A	
328	Current 6	R/W		0.1A	
329	Current 7	R/W		0.1A	
330	Current 8	R/W		0.1A	
331	Current 9	R/W		0.1A	
332	Current 10	R/W		0.1A	
333	Current 11	R/W		0.1A	
334	Current 12	R/W		0.1A	
335	Off-grid equilibrium Stop SOC				For parallel system
336	**Parallel 1** Parallel-1				Bit01:Parallel Enable 0: Parallel Disable Bit1 1:Master 0:Slave Bit2-7 Void Bit8-9 Phase(00:A,01:B,10:C,11:void) Bit10-15 Modbus SN(0-63)
337	Parallel 2 Parallel-2				
338	reserve Undefine				
339	reserve				
	Undefine				
340	Maximum sold power of photovoltaic Max Solar Sell Power		R/W	1W	Low Vol:1W High Vol:10W
341	Special_Function3				For debug. engineer only Bit0Bat1&2 voltage calibration from BMS Bit1 Bit2
342	Italy selfcheck mode	R/W			0:Disable 1:Enable
343	Italyloacal mode	R/W			0:wide range 1: narrowrange

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344	Grid information monitoring methods Grid check from Meter or CT	R/W			BIT00. 0: CT 1: Meter BIT01: -BIT15: undefine
345	Meter Manufacturer Information				0: Reserved 1: Eastron Donghong 2: CHNT Chint
346	Meter limit mode			[0,1]	0: AVE 1: MIN
347	External CT ratio CT ratio	R/W		30<--> 30:1	U16
348					
349					
350	Voltage reconnection limit (Reconn.Vol_Max)	R/W	[0,10000]	0.1v	1000:100.0v 2300:230.0v
351	Voltage reconnect lower limit (Reconn.Vol_Min)	R/W	[0,10000]	0.1v	1000:100.0v 2300:230.0v
352	Frequency reconnection limit (Reconn.Freq_Max)	R/W	[0,10000]	0.01Hz	5000:50Hz 6000:60Hz
353	Lower limit of frequency reconnection (Reconn.Freq_Min)	R/W	[0,10000]	0.01Hz	5000:50Hz 6000:60Hz
354	Overpressure 1 (Over_Vol.Trip1_Value)	R/W	[0,10000]	0.1v	1000:100.0v 2300:230.0v
355	Overpressure 2 (Over_Vol.Trip2_Value)	R/W	[0,10000]	0.1v	1000:100.0v 2300:230.0v
356	Undervoltage 1 (Under_Vol.Trip1_Value)	R/W	[0,10000]	0.1v	1000:100.0v 2300:230.0v
357	Undervoltage 2 (Under_Vol.Trip2_Value)	R/W	[0,10000]	0.1v	1000:100.0v 2300:230.0v
358	Overfrequency 1 (Over_Freq.Trip1_Value)	R/W	[0,10000]	0.01Hz	5000:50Hz 6000:60Hz
359	Overfrequency 2 (Over_Freq.Trip2_Value)	R/W	[0,10000]	0.01Hz	5000:50Hz 6000:60Hz
360	Underclocking 1 (Under_Freq.Trip1_Value)	R/W	[0,10000]	0.01Hz	5000:50Hz 6000:60Hz
361	Underclocking 2 (Under_Freq.Trip2_Value)	R/W	[0,10000]	0.01Hz	5000:50Hz 6000:60Hz
362	Prolonged overpressurization (Over_Vol_Long.Trip1_Value)	R/W	[0,10000]	0.1v	1000:100.0v 2300:230.0v
363	Voltage - reactive power Lock in Volt_VAR	R/W	[0,10000]	0.01% Pn	10000:100% Pn
364	Voltage - reactive power Lock out Volt_VAR	R/W	[0,10000]	0.01% Pn	
365	Voltage-active mode enable (V_Watt.Ena)	R/W	[0,1]	NO	0:disable 1:enabled

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366	Voltage-active mode, voltage point 1 (V_Watt.V1)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 1 is less than or equal to voltage point 2)
367	Voltage-active mode, active point 1 (V_Watt.W1)	R/W	[0,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% rated power
368	Voltage-active mode, voltage point 2 (V_Watt.V2)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 2 is less than or equal to voltage point 3)
369	Voltage-active mode, active point 2 (V_Watt.W2)	R/W	[0,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated power
370	Voltage-active mode, voltage point 3 (V_Watt.V3)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 3 is less than or equal to voltage point 4)
371	Voltage-active mode, active point 3 (V_Watt.W3)	R/W	[0,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated power
372	Voltage-active mode, voltage point 4 (V_Watt.V4)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 4 maximum)
373	Voltage-active mode, active point 4 (V_Watt.W4)	R/W	[0,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated power
374	Voltage-reactive mode enable (Volt_VAR.Ena)	R/W	[0,1]	None	0:disable 1:enabled
375	Voltage-reactive mode, voltage point 1 (Volt_VAR.V1)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 1 is less than or equal to voltage point 2)
376	Voltage-reactive mode, reactive point 1 (Volt_VAR.VAr1)	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% of rated power 7000:70% rated power
377	Voltage-reactive mode, voltage point 2 (Volt_VAR.V2)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 2 is less than or equal to voltage point 3)
378	Voltage-reactive mode, reactive point 2	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% rated power 7000:70% rated power

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	(Volt_VAR.VAr2)				
379	Voltage-reactive mode, voltage point 3 (Volt_VAR.V3)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 3 is less than or equal to voltage point 4)
380	Voltage-reactive mode, reactive point 3 (Volt_VAR.VAr3)	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% of rated power 7000:70% rated power
381	Voltage-reactive mode, voltage point 4 (Volt_VAR.V4)	R/W	[0,10000]	0.01%	0:0% of rated voltage 5000:50% of rated voltage 10000:100% of rated voltage (Voltage point 4 maximum)
382	Voltage-reactive mode, reactive point 4 (Volt_VAR.VAr4)	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% of rated power 7000:70% rated power
383	Frequency-active parameter mode enable (Freq_Watt_P.Ena)	R/W	[0,7]	NO	Bit0: enabled (underfrequency load enable) Bit1: enabled (overfrequency derate enable) Bit2.
384	Frequency-active parameter mode, underfrequency exit frequency (Freq_Watt_P.Under_StopHz)	R/W	[0,200]	0.1%	200:20% sag rate: 50Hz*20%=10Hz
385	Frequency-active parameter mode, underfrequency_frequency point 1 (F_Watt_P.Under_Hz1)	R/W	[0,200]	0.1%	200:20% sag rate: 50Hz*20%=10Hz
386	Frequency-active parameter mode, underfrequency sag rate1 (F_Watt_P.Under_WGra1)	R/W	[0,10000]	0.001Hz	10000:10Hz
387	Frequency-active parameter mode, underfrequency_frequency point 1 of the start-up delay	R/W	[0-65535]	0.1S	
388	Frequency-active parameter mode, underfrequency exit frequency of the stop delay	R/W	[0-65535]	0.1S	
389	Frequency-active parameter mode, overfrequency exit	R/W	[4500,6500]	0.01Hz	4500:45.00Hz 5000:50.00Hz 6500:65.00Hz

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	frequency point (F_Watt_P.Over_StopHz)				31st 33 Page
390	Frequency-active parameter mode, overfrequency rate point 1 (F_Watt_C.Over_Hz1)	R/W	[0,30000]	%Prated /min	100:10.0%Prated/min 1000:100.0%Prated/min 30000:3000.0%Prated/min
391	Frequency-active parameter mode, overfrequency sag rate1 (F_Watt_C.Over.WGra1)				
392	Frequency-active parameter mode, overfrequency_frequency point 1 of the start-up delay	R/W	[0-65535]	0.1S	
393	Frequency-active parameter mode, overfrequency exit frequency of the stop delay	R/W	[0-65535]	0.1S	
394	reserve				
395	Active-reactive mode enable (Watt_VAr.Ena)	R/W	[0,1]	NO	0:disable 1:enabled
396	Active-reactive mode, active point 1 (Watt_VAr.W1)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated power (Active point 1 is less than or equal to active point 2)
397	active-reactive mode. Meritless point 1 (Watt_VAr.VAr1)	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% of rated power 7000:70% rated power
398	Active-reactive mode, active point 2 (Watt_VAr.W2)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% rated power (Active point 2 is less than or equal to active point 3)
399	Active-reactive mode, reactive point 2 (Watt_VAr.VAr2)	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% of rated power 7000:70% rated power
400	Active-reactive mode, active point 3 (Watt_VAr.W3)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated power (Active point 3 is less than or equal to active point 4)
401	Active-reactive mode, reactive point 3 (Watt_VAr.VAr3)	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% rated power 7000:70% rated power
402	Active-reactive mode, active point 4 (Watt_VAr.W4)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated voltage (Active point 4 maximum)

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403	Active-reactive mode, reactive point 4 (Watt_VAr.VAr4)	R/W	[-7000,7000]	0.01%	0:0% of rated power -7000:-70% rated power 7000:70% rated power
404	Active-Power Factor Mode Enable (Watt_PF.Ena)	R/W	[0,1]	NO	0:disable 1:enabled
405	Active-power factor mode, active point 1 (Watt_PF.W1)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated power (Active point 1 is less than or equal to active point 2)
406	Active-power factor mode, power factor point 1 (Watt_PF.PF1)	R/W	[8000,10000]. [-8000,-10000]	0.0001	10000:Power factor of 1 8000:Power factor 0.8 -8000:Power factor of -0.8 -10000: Power factor of -1
407	Active-power factor mode, active point 2 (Watt_PF.W2)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% rated power (Active point 2 is less than or equal to active point 3)
408	Active-power factor model, power factor point 2 (Watt_PF.PF2)	R/W	[8000,10000]. [-8000,-10000]	0.0001	10000:Power factor of 1 8000:Power factor 0.8 -8000:Power factor of -0.8 -10000: Power factor of -1
409	Active-power factor mode, active point 3 (Watt_PF.W3)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated power (Active point 3 is less than or equal to active point 4)
410	Active-power factor mode, power factor point 3 (Watt_PF.PF3)	R/W	[8000,10000]. [-8000,-10000]	0.0001	10000:Power factor of 1 8000:Power factor 0.8 -8000:Power factor of -0.8 -10000: power factor of -1
411	Active-power factor mode, active point 4 (Watt_PF.W4)	R/W	[-10000,10000]	0.01%	0:0% of rated power 5000:50% of rated power 10000:100% of rated voltage (Active point 4 maximum)
412	active-power-factor mode. Power factor point 4	R/W	[8000,10000]. [-8000,-10000]	0.0001	10000:Power factor of 1 8000:Power factor 0.8
	(Watt_PF.PF4)				-8000:Power factor of -0.8 -10000: Power factor of -1
413	CA_Vstart				
414	CA_Vstop				
415	Normal upward slope Normal upward slope	R/W	[1 100]	1%	
416	Soft Start Rise Rate Soft start rise rate	R/W	[1 100]	1%	
417	Overvoltage 1 trigger delay (Over_Vol.Trip1_delay)	R/W	[1,6000] 0.1S-600S	0.1S	

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418	Overpressure 2 (Over_Vol.Trip2_ delay)	R/W	[1, 6000]	0.1S	
419	Undervoltage 1 (Under_Vol.Trip1_ delay)		[1,6000]	0.1S	
420	Undervoltage 2 (Under_Vol.Trip2_ delay)		[1, 6000]	0.1S	
421	Overfrequency 1 (Over_Freq.Trip1_ delay)		[1,6000]	0.1S	
422	Overfrequency 2 (Over_Freq.Trip2_ delay)		[1, 6000]	0.1S	
423	Underclocking 1 (Under_Freq.Trip1_ delay)		[1,6000]	0.1S	
424	Underclocking 2 (Under_Freq.Trip2_ delay)		[1, 6000]	0.1S	
425					
426					
427					
428					
429					
430					For debug
......					
480	Active-Power Factor Lock in Watt_PF	R/W	[0,10000]	0.01% Pn	10000:100% Pn
481	Active-Power Factor Lock out Watt_PF	R/W	[0,10000]	0.01% Pn	
482	active high and low wear enable (computing) L_HVRT_EN	R/W			
483	LVRT1	R/W	[0,10000]	0.01%	
484	LVRT2	R/W	[0,10000]	0.01%	
485	HVRT1	R/W	[0,10000]	0.01%	
486	HVRT2	R/W	[0,10000]	0.01%	
487	HVRT3	R/W	[0,10000]	0.01%	
488	LVRT1_time	R/W	[0,32768]	10ms	
489	LVRT2_time	R/W	[0,32768]	10ms	
490	HVRT1_time	R/W	[0,32768]	10ms	
491	HVRT2_time	R/W	[0,32768]	10ms	
492	HVRT3_time	R/W	[0,32768]	10ms	
493	L_HVRT_status	R/W	[0,1]		0:Zero battery 1: Maintain the current prior to entry
......					
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5.2. 03 Read-only real-time attribute area, the corresponding function code is 0x03.

Addr	Register meaning	R/W	data range	unit	note
500	operational state run state	R	[0,5]	-	0000 Standby standby 0001 selfcheck 0002 Normal 0003 Alarm 0004 fault 0005 Active
501	Inverter grid-side active generation for the day active power generation of today	R	[-32768,32767]	0.1kWh	
502	Inverter grid-side reactive power generation for the day reactive power generation of today	R	[-32768,32767]	0.1kVarh	
503	Grid connection time of the day Grid connection time of today	R	[0,65535]	S	
504	Low word for total active generation on the grid side of the inverter active power generation of total low byte	R	[0,0xFFFFFFFF]	0.1kWh	
505	Inverter grid-side total active generation high word active power generation of total high byte	R			
506	Low word for total reactive power generation on the grid side of the inverter reactive power generation of total low byte				
507	Inverter grid-side total reactive power generation high word reactive power generation of total high byte				
508	~~Inverter status bit 1~~	R			**Debug only** Bit0: Internal fan presence bit; 1 yes 0

				no
				Bit1: External fan presence bit; 1 yes 0 no
509	~~Inverter status bit 1~~	R		**Debug only**
510	Generation data - reserved	R		
511	Generation data - reserved	R		
512	Generator historical operating hours low byte	R	0.1h	
513	Generator historical operating hours high byte	R	0.1h	
514	Battery charge for the day Today charge of the battery	R	0.1kwh	
515	Battery discharge for the day Today discharge of the battery	R	0.1kwh	
516	Battery accumulated charge low word Total charge of the battery low byte	R	0.1kwh	
517	Battery Accumulated Charge High Character Total charge of the battery high byte	R	0.1kwh	
518	Battery cumulative discharge low word Total discharge of the battery low byte	R	0.1kwh	
519	Battery cumulative discharge high character Total discharge of the battery high byte	R	0.1kwh	
520	Grid power purchases for the day Day_GridBuy_Power Wh	R	0.1kwh	
521	Electricity sold on the grid on the same day Day_GridSell_Power Wh	R	0.1kwh	
522	Low word for cumulative power purchases on the grid Total_GridBuy_Power Wh_low word	R	0.1kwh	
523	High word for cumulative power purchases on the grid Total_GridBuy_Power Wh_high word	R	0.1kwh	
524	Low word for cumulative power sales on the grid Total_GridSell_Power	R	0.1kwh	

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	Wh_low word				
525	High word for cumulative power sales on the grid Total_GridSell_Power Wh_high word	R		0.1kwh	
526	Electricity consumption for the day Day_Load_Power Wh	R		0.1kwh	
527	Cumulative electricity consumption low word Total_Load_Power Wh_low word	R		0.1kwh	
528	Cumulative electricity consumption high word Total_Load_Power Wh_high word	R		0.1kwh	
529	Total PV generation for the day Day_PV_Power Wh	R	[0,65535]	0.1kWh	
530	PV-1 generation for the day Day_PV-1_Power Wh	R		0.1kWh	reserve
531	PV-2 generation for the day Day_PV-2_Power Wh	R		0.1kWh	reserve
532	PV-3 generation for the day Day_PV-3_Power Wh	R		0.1kWh	reserve
533	PV-4 generation for the day Day_PV-4_Power Wh	R		0.1kWh	reserve
534	Historical PV generation low word Total PV_power Wh_low word	R		0.1kWh	reserve
535	Historical PV generation high word Total PV_power Wh_high word	R		0.1kWh	
536	Daily generator capacity	R		0.1kWh	
537	Low total generator capacity	R		0.1kWh	
538	Total generator capacity high bytes	R		0.1kWh	
539	Generator operating hours per day Generator working hours per day	R		0.1h	
540	DC Transformer Temperature (DCTransformer temperature)	R	[0,3000]	0.1°C	Offset 1000
541	Heat sink temperature Heat sink temperature	R	[0,3000]	0.1°C	

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542	Reserve temperature 1 undefine	R	[0,3000]	0.1℃	
543	Reserve temperature 2 undefine	R	[0,3000]	0.1℃	
544	DRMs_Data	R	[0,3000]	0.1℃	bit0-bit8 denote DRM0-DRM8 in order.
545	Load Annual Electricity Consumption Low Byte Yer_Loadwh_L	R	[0,0xFFFF]	0.1KWH	
546	Load Annual Electricity Consumption High Bytes Yer_Loadwh_H	R	[0,0xFFFF]	0.1KWH	
547	Step Test_State in test mode				
548	Failure status of the communication board Failure status of communication board	R	[0,0xFFFF]		Bit0Flash chip error Bit1 time error Bit2 EEPROM error
549	MCU Test Flag Bit MCU test flag	R			Bit0 Arc pull communication sign Bit1 Parallel CAN communication is possible. Bit2 OutSide Fan_FG Bit3 InSide Fan_FG Bit4 Meter FG Bit5 Arc Pull Trigger Marker
550	LCD test flag bit LCD test flag	R	0x0000		Bit8 Interface RS485 Lithium electric interface RS485 Bit9 Lithium electric interface CAN Lithium electric interface CAN Bit10 Key1234 key1234 Bit11 lcd interrupt status
551	switching state Turn off/on status	R			Lower 4 bits indicate a switching signal 0000 Power off power off 0001 Power on power on
552	AC side relay status AC realy status	R			0 off 1 on Bit0INV relay INV relay Bit1 Load relay reservation undefine Bit2 grid relay Bit3 Generator relay gen relay Bit4 grid give power to relay Bit7 Dry contact Dry contact1 Bit8 Dry contact Dry contact2()

553	Alarm message 1st word Warning message word 1	R	[0,65535]		Bit0: reserved Bit1:Fan Failure FAN_WARN Bit2: grid phase wrong Bit3. ...... Bit15
554	Alarm message word 2 Warning message word 2	R	[0,65535]		Bit0 Bit1 ...... Bit14 Lithium Battery Loss Alarm Bit15 Parallel communication quality alarm
555	Trouble message 1st word Fault information word 1	R	[0,65535]		See fault information coding table
556	Trouble message 2nd word Fault information word 2	R	[0,65535]		
557	Fault message word 3 Fault information word 3	R	[0,65535]		
558	Fault message word 4 Fault information word 4	R	[0,65535]		
559	WorkFlag.ON_OFF_Trip_DATA	R			
560	Debug Data	R			Factory test only
......	...... has a total of 24 registers				
583	Debug Data	R	0		
584	reserve undefine	R			
585	Reserved battery temperature sensor value	R			
586	Battery 1 temperature Battery1 temperature	R	[0,3000]	0.1℃	
587	Battery 1 voltage Battery-1 voltage	R		L: 0.01V H: 0.1V	
588	Battery 1 charge Battery-1 SOC	R	[0,100]	1%	
589	Battery 2 charge Battery-2 SOC	R	[0,100]	1%	
590	Battery output power	R		H:1W	S16
	Battery output power			H:10W	
591	Battery 1 current Battery1 Current	R		0.01A	S16
592	Battery capacity after calibration Corrected_AH	R	[0,3000]	1AH	100 is 100AH

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593	Battery 2 voltage Battery-2 voltage	R		L: 0.01V H: 0.1V	
594	Battery 2 current Battery2 Current	R			
595	Battery 2 power Battery2 Power	R		L:1W H:10W	
596	Battery 2 temperature Battery2 temperature	R			
597		R			
598	Grid-side phase voltage A Grid phase voltage A	R		0.1V	
599	Grid-side phase voltage B Grid phase voltage B	R		0.1V	
600	Grid-side phase voltage C Grid phase voltage C	R		0.1V	
601	Negative current in battery 1	R		0.1V	
602	Negative current in battery 2	R		0.1V	
603	Grid-side line voltage CA Grid line voltage CA	R		0.1V	
604	Grid-side inner A-phase power 16 bits lower A phase power on the inner side of the grid	R		1W	S16
605	Grid-side inner B-phase power 16 bits lower B phase power on the inner side of the grid	R		1W	S16
606	Grid-side inner C-phase power 16 bits lower C phase power on the inner side of the grid	R		1W	S16
607	Grid-side-internal total active power low 16-bit Total active power from side to side of the grid	R		1W	S16
608	Grid-side-internal total apparent power is low 16-bit Grid side - inside total apparent power	R		1W	reserve
609	Grid-side frequency Grid-side frequency	R			
610	Grid-side inboard current A grid side inner current A	R		0.01A	S16
611	Grid-side inboard current B grid side inner current B	R		0.01A	S16

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612	Grid-side inboard current C grid side inner current C	R		0.01A	S16
613	Off-grid - current A Out-of-grid - current A	R		0.01A	S16
614	Grid external - current B Out-of-grid - current B	R		0.01A	S16
615	Grid external - current C Out-of-grid - current C	R		0.01A	S16
616	Grid External - Power A Low 16 bit Out-of-grid-power A	R		1W	S16
617	Grid external - Power B low 16 bit Out-of-grid-power B	R		1W	S16
618	Grid external-power C low 16-bit Out-of-grid -power C high 16 bits	R		1W	S16
619	Grid external - total active power low 16 bits Out-of-grid -total power	R		1W	S16
620	Out-of-grid -total apparent power 16 bits lower Out-of-grid -total apparent power	R		1VA	S16
621	Grid-connected power factor PF Grid-connected power factor PF	R	R/W	[0,1000]	Real value*1000
622	Grid-side A-phase power 16 bits lower Grid side A-phase power Low_Word	R		1W	The following three registers change according to the built-in external settings The following three registers vary according to the built-in and external Settings
623	Grid-side B-phase power 16 bits lower Grid side B-phase power Low_Word	R		1W	
624	Grid-side C-phase power 16 bits lower Grid side C-phase power Low_Word	R		1W	
625	Grid side - total active power 16 bits lower Grid side total power Low_Word	R		1W	
626					
627	Inverter output phase voltage A Inverter output phase voltage A	R		0.1V	

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628	Inverter output phase voltage B Inverter output phase voltage B	R		0.1V	
629	Inverter output phase voltage C Inverter output phase voltage C	R		0.1V	
630	Inverter output phase current A Inverter output phase current A	R		0.01A	S16
631	Inverter output phase current B Inverter output phase current B	R		0.01A	S16
	current B				
632	Inverter output phase current C Inverter output phase current C	R		0.01A	S16
633	Inverter output phase power A low 16 bits Inverter output phase power A Low_Word	R		1W	S16
634	Inverter output phase power B Inverter output phase low 16 bits power B Low_Word	R		1W	S16
635	Inverter output phase power C low 16 bits Inverter output phase power C Low_Word			1W	S16
636	Low total active power output from inverter 16-bit Inverter output total power Low_Word	R		1W	S16
637	Low total inverter output apparent power 16-bit Inverter output total apparent power Low_Word	R		1W	S16
638	Inverter frequency Inverter frequency	R		0.01Hz	U16
639		R			
640	UPS load side phase power A low 16 bits UPS load-side phase power A Low_Word	R		1W	U16

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641	UPS load side phase power B low 16 bits UPS load-side phase power B Low_Word	R		1W	U16
642	UPS load side phase power C low 16 bits UPS load-side phase power C Low_Word	R		1W	U16
643	UPS load side total power is 16 bits lower UPS load-sidetotal power Low_Word	R		1W	U16
644	Load Measured Phase Voltage A Load phase voltage A	R		0.1V	U16
645	Load Measured Phase Voltage B Load phase voltage B	R		0.1V	U16
646	Load Measured Phase Voltage C Load phase voltage C			0.1V	U16
647	Load measurement current A Invalid Load phase current A no use	R		0.01A	S16
648	Load measurement current B Invalid Load phase current B no use	R		0.01A	S16
649	Load measurement current C Invalid Load phase current C no use	R		0.01A	S16
650	Load-side phase power A low 16 bits Load phase power A_L_Word	R		1W	S16
651	Load-side phase power B low 16 bits Load phasepowerB Low_Word	R		1W	S16
652	Load-side phase power C 16 bits lower Load phase poweC Low_Word	R		1W	S16
653	Total active power on the load side is 16 bits lower Load totalpower Low_Word	R		1W	S16
654	Total apparent power on load side reserve Load phase apparent power	R		1W	S16

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	undefine Low_Word				
655	Load frequency Load frequency	R		0.01Hz	
656	Load-side phase power A high 16 bits Load phase power A High_Word	R		1W	S16
657	Load-side phase power B high 16 bits Load phase power B High_Word	R		1W	S16
658	Load-side phase power C high 16 bits Load phase power C High_Word	R		1W	S16
659	Total active power on the load side 16 bits higher Load totalpower High_Word	R		1W	S16
660	Load-side total apparent power 16 bits higher reserve Load phase apparent power undefine High_Word	R		1W	S16
661	Gen port phase voltage A Phase voltage of Gen port A	R		0.1V	
662	Gen port phase voltage B Phase voltage of Gen port B	R		0.1V	
663	The phase voltage of the Gen port C Phase voltage of Gen port C	R		0.1V	
664	Gen port power A 16 bits lower Phase power of Gen port A Low_Word	R		1W	
665	Gen port power B 16 bits lower Phase power of Gen port B Low_Word	R		1W	
666	Gen port power C 16 bits lower Phase power of Gen port C Low_Word	R		1W	
667	Gen port total power is 16 bits lower total power of Gen port Low_Word	R		1W	
668	Gen port power A high 16 bits Phase power of Gen port A High_Word	R		1W	

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669	Gen port power B high 16 bits Phase power of Gen port B High_Word	R		1W	
670	Power C high 16 bits for Gen ports Phase power of Gen port C High_Word	R		1W	
671	Total power of Gen ports is 16 bits higher total power of Gen port High_Word	R		1W	
672	PV1 Input Power PV1 input power	R		L:1W H:10W	
673	PV2 Input Power PV2 input power	R		L:1W H:10W	
674	PV3 Input Power PV3 input power	R		L:1W H:10W	
675	PV4 Input Power PV4 input power	R		L:1W H:10W	
676	DC voltage 1 Dc voltage 1	R	[0,65535]	0.1V	
677	DC current 1 Dc current 1	R	[0,65535]	0.1A	
678	DC voltage2 Dc voltage 2	R	[0,65535]	0.1V	
679	DC current2 Dc current 2	R	[0,65535]	0.1A	
680	DC voltage 3 Dc voltage 3	R	[0,65535]	0.1V	
681	DC current3 Dc current 3	R	[0,65535]	0.1A	
682	DC voltage 4 Dc voltage 4	R	[0,65535]	0.1V	
683	DC current 4 Dc current 4	R	[0,65535]	0.1A	
684	reserve	R			
685	reserve	R			
686	reserve	R			
687	Grid-side A-phase power high 16 bits Grid side A-phase power high _Word	R		1W	The following three registers change according to the built-in external settings The following three registers vary according to the built-in and external Settings
688	Grid-side B-phase power high 16 bits Grid side B-phase power high _Word	R		1W	

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689	Grid-side C-phase power high 16 bits Grid side C-phase power high _Word	R		1W	
690	Grid side - total active power high 16 bits Grid side total power high_Word	R		1W	
691	Inverter output phase power A high 16 bits	R		1W	S16
	Inverter output phase power A high_Word				
692	Inverter output phase power B high 16 bits Inverter output phase power B Low_Word	R		1W	S16
693	Inverter output phase power C high 16 bits Inverter output phase power C high _Word			1W	S16
694	High total active power output from inverter 16-bit Inverter output total power high _Word	R		1W	S16
695	Inverter output total apparent power high 16-bit Inverter output total apparent power high _Word	R		1W	S16
696	UPS load side phase power A high 16 bits UPS load-side phase power A high _Word	R		1W	U16
697	UPS load side phase power B high 16 bits UPS load-side phase power B high _Word	R		1W	U16
698	UPS load side phase power C high 16 bits UPS load-side phase power C high _Word	R		1W	U16
699	UPS load side total power high 16 bits UPS load-sidetotal power high _Word	R		1W	U16
700	Grid-side inner A-phase power high 16 bits A phase power on the inner side of the grid high _Word	R		1W	S16
701	Grid-side inner B-phase power high 16 bits B phase power on the inner side of the grid high _Word	R		1W	S16

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702	Grid-side inner C-phase power high 16 bits C phase power on the inner side of the grid high _Word	R		1W	S16
703	Grid-side-internal total active power High 16-bit Total active power from side to side of the grid high _Word	R		1W	S16
704	Grid-side-internal total apparent power high 16-bit Grid side - inside total apparent power high _Word	R		1W	reserve
705	Grid external - power A high 16 bit Out-of-grid-power A high _Word	R		1W	S16
706	Grid external - Power B high 16 bit Out-of-grid-power B high _Word	R		1W	S16
707	Grid external - Power C high 16 bit Out-of-grid-power C high _Word	R		1W	S16
708	Grid external - total active power high 16 bits Out-of-grid -total power high _Word	R		1W	S16
709	Off-grid - total apparent power 16 bits higher Out-of-grid -total apparent power high _Word	R		1VA	S16
738	Internal fan returns AD value				Factory test only BIT00. 0: CT 1: Meter BIT01-BIT15: undefine
739	External fan returns AD value				
800	In-plant self-inspection	R			
	reserve				
1000	Grid information monitoring methods Grid power check mode	R			

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5.3. 03 Deye Battery read-only area

Addr.	Register Meaning	R/W	Range	Unit	note
DEYE BATTERY					
10000	Equipment type Device Type	R			0x700:Lithium Battery Pack Association comment on
10001	protocol version number Protocol Version	R			
10002	Battery PackNum Number Packnum number	R		1	
10003	Battery Voltage Battery voltage	R		0.1V	
10004	Battery Current Battery current	R		0.1A	
10005	Battery Capacity SOC Battery SOC	R		1%	
10006	Battery Health SOH	R		1%	
	Battery SOH				
10007	Remaining Battery Capacity Battery CApAH	R		1AH	
10008	battery temperature Battery Temp	R		0.1C	
10009	Battery charging voltage Charge Voltage	R		0.1V	
10010	Battery Discharge Voltage Discharge voltage	R		0.1V	
10011	Battery charging cut-off voltage Charge End voltage	R		1V	
10012	Battery Discharge Cutoff Voltage Discharge End voltage	R		1V	
10013	Battery charging current limit	R		1A	

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	Charge limit current				
10014	Battery Discharge Current Limit Discharge limit current	R		1A	
10015	Battery off-grid charging current limiting Off grid Charge limit current	R		1A	
10016	Battery off-grid discharge current Off grid Discharge limit current	R		1A	
10017	strong charging sign Force Charge Flag	R			
10018	Calibration capacity marking Check SOC Flag	R			
10019	Battery failure 1 Battery Fault1	R			
10020	Battery failure 2 Battery Fault2	R			
10021	Battery alarm 1 Battery Alarm1	R			
10022	Battery alarm 2 Battery Alarm2	R			
10023	Reserved 1	R			
10024	Reserved 2	R			
10025	Reserved 3	R			
10026	Reserved 4	R			
10027	Reserved 5	R			
10028	Reserved 6	R			
10029	Reserved 7	R			
10030	Reserved 8	R			
10031	Reserved 9				
10032	1 No. 1 byte No. 1 2-byte	R	'0'- '9' 'A'-'Z'		ASCII character
10033	No. 1 3-byte No. 1 4-byte	R	'0'- '9' 'A'-'Z'		ASCII character
10034	No. 1 5-byte No. 1 6-byte	R	'0'- '9' 'A'-'Z'		ASCII character
10035	No. 1 7-byte No. 1 8-byte	R	'0'- '9' 'A'-'Z'		ASCII character

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10036	No. 1 9-byte	R	'0'- '9' 'A'- 'Z'			ASCII character
	No. 1 10-byte					
10037	No. 1 11 bytes	R	'0'- '9' 'A'- 'Z'			ASCII character
	No. 1 12-byte					
10038	No. 1 13 bytes	R	'0'- '9' 'A'- 'Z'			ASCII character
	No. 1 14-byte					
10039	No. 1 15-byte	R	'0'- '9' 'A'- 'Z'			ASCII character

10040		Module Voltage			0.01V	
10041		Module Current			0.1A	
10042		Temperate-AVE				1250 mean 25.0℃
10043		Temperate-CellMax				1250 mean 25.0℃
10044		Temperate-CellMin				1250 mean 25.0℃
10045		Temperate-MosMax				1250 mean 25.0℃
10046		Temperate-HeatMem				1250 mean 25.0℃
10047		SOC			0.1	
10048		SOH			0.1	
10049		Remain Capacity			0.1AH	
10050		Total Capacity			0.1AH	
10051		Charge Voltage			0.01V	
10052		Charge Current			0.1A	
10053		Discharge Current			0.1A	
10054		Max Cell V			0.01V	
10055		Min Cell V			0.01V	
10056		Cycle number			1	
10057		MOS Status			1	
10058	PACK1	Warming1			--	
10059		Warming2			--	
10060		Fault1			--	
10061		Fault2			--	
10062		software version number			--	
10063		Hardware version number			--	
10064		Reserved 1				
10065		Reserved 2				
10066		Reserved 3				
10067		Reserved 4				
10068		Reserved 5				
10069		Reserved 6				

And so on 8 registers of SN+22 and data registers = 30 registers for second pack information

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And so on 8 registers **of** SN+22 **and data registers** = 30 registers **for the third pack information.**

DEI Language Pack Agreement

Addr.	Register Meaning	R/W	Range	Unit	note
	DEI Language Packs				
20000	Language Protocol Version Number Language Type version	R			
20001	Number of language types Language Type number	R	[0-200]		
20002	Language Type	R			1: German 2: Spanish 3: Hungarian 4: Italian (The language number needs to be the same as (Alignment in liquid crystal)
20003	language version number Language Version	R			
20004	Language Type	R		1	1: German 2: Spanish 3: Hungarian 4: Italian (The language number needs to be the same as (Alignment in liquid crystal)
20005	language version number Language Version	R		0.1V	
20006	Language Type	R		0.1A	1: German 2: Spanish 3: Hungarian 4: Italian (The language number needs to be the same as

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Addr.	Register Meaning	R/W	Range	Unit	note
					(Alignment in liquid crystal)
20007	language version number Language Version	R		1%	
20008	language type Language Type	R		1%	1: German 2: Spanish 3: Hungarian 4: Italian (The language number needs to be the same as (Alignment in liquid crystal)
20009	language version number Language Version	R		1AH	
20010	Language Type	R		1%	1: German 2: Spanish 3: Hungarian 4: Italian (The language number needs to be the same as (Alignment in liquid crystal)

5.4. Memory log table

Memory log table					
Addr.	Register Meaning	R/W	Range	Unit	note
1000	Inverter Fault Message	R			Length range is 500
……		R			
……		R			
1499		R			

5.5. trouble code

warning code

Error code	Description /Description	Solutions
W01	reserve	
W02	FAN_WARN	
W03	Grid phase wrong	
W04	meter_Comm_Fail	

Fault Code: Fault Code

Error code	Description /Description	Solutions

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F07	DC/DC_Softsart_Fault DC/DC Soft Start Fault	DC/DC softstart fault 1. Check the battery fuse. 2. Restart and check whether it is in normal. 3. Seek help from us, if can't go back to noarmal state
F10	AuxPowerBoard_Failure Auxiliary power supply failure	Auxiliary power supply failure 1. Wait for minutes then check. 2. Remove wifi plug or other communicator. 3. Seek help from us, if can't go back to noarmal state
F13	Working mode change Mode switching	Inverter work mode changed 1. Wait for a minute and check. 2. Seek help from us, if can't go back to normal state.
F18	AC over current fault of hardware Hardware AC overcurrent	AC side over current fault 1. Please check whether the backup load power and common load power are within the range. 2. Restart and check whether it is in normal. 3. Seek help from us, if can not go back to normal state.
F20	DC over current fault of the hardware Hardware DC overcurrent	DC side over current fault 1. Check PV module connect and battery connect. 2. Turn off the DC switch and AC switch and then wait one minute,then turn on the DC/AC switch again. 3. Seek help from us, if can not go back to normal state.
F22	Tz_EmergSStop_Fault Emergency stop fault (inverter locked out)	Tz_EmergSStop_Fault Seek help from us, this failure hardly happens.
F23	AC leakage current is transient over current transient leakage current faults	Leakage current fault 1. Check the cable of PV module and inverter. 2. Restart inverter. 3. Seek help from us, if can not go back to normal state.
F24	DC insulation impedance failure Square array insulation impedance faults	PV isolation resistance is too low 1. Check the connection of PV panels and inverter is firmly and correctly. 2. Check whether the PE cable of inverter is connected to ground. 3. Seek help from us, if can not go back to normal state.
F26	The DC busbar is unbalanced DC bus unbalance	1. Please wait for a while and check whether it is normal. 2. If still same, and turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch. 3. Seek help from us, if can not go back to normal state.
F29	Parallel_CANBus_Fault Parallel communication failure	This fualt only for inverters working in parallel mode 1. Check the parallel setting according to the instructions. 2. Check the connection of the CANBus. 3. Seek help from us

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F35	No AC grid _without utility power_	No Utility 1. Please confirm grid is lost or not; 2. Check the grid connection is good or not. 3. Check the switch between inverter and grid is on or not. 4. Seek help from us, if can not go back to normal state.
F41	Parallel_system_Stop _Parallel system_ _shutdown faults_	In parallel system,due to other inverter faults. 1. Wait for minutes then check all inverters in this parallel system. 2. If inverter can't go back to normal state, record fault codes of all inverters, then seek help from us.
F42	AC line low voltage _Low line voltage fault_	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage in specification. 2. Check whether grid AC cables are firmly and correctly connected. 3. Seek help from us, if can not go back to normal state.
F46/F49	Bcakup_Battery_Fault _Backup Battery Failure_	Backup battery fault. 1. Check the battery capacity. 2. Check the connection between batteries and inverters. 3. If inverter can't go back to normal after load reduction, seek help from us
F47	AC over frequency _AC overfrequency_	Grid frequency out of range 1. Check the frequency is in the range of specification or not. 2. Check whether AC cables are firmly and correctly connected. 3. Seek help from us, if can not go back to normal state.
F48	AC lower frequency _AC underfrequency_	Grid frequency out of range 1. Check the frequency is in the range of specification or not. 2. Check whether AC cables are firmly and correctly connected. 3. Seek help from us, if can not go back to normal state.
F56	DC busbar voltage is too low _Bus voltage too low_	Battery voltage low 1. Check whether battery voltage is too low. 2. If the battery voltage is too low, use PV or grid to charge the battery. 3. Seek help from us, if can not go back to normal state.
F58	BMS communication fault _BMS_ communication fault	
F62	_DRM_ Detection	1. Check whether the DRM function is enabled by mistake. 2. Check whether the DRM cable is damaged
F63	ARC fault _faulty pulling arc_ _(physics)_	1. ARC fault detection is only for US market. 2. Check PV module cable connection and clear the fault. 3. Seek help from us, if can not go back to normal state.

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F64	Heat sink high temperature failure	Heat sink temperature is too high
		1. Check whether the work environment temperature is too high.
		2. Turn off the inverter for 10mins and restart.
	Radiator temperature too high	3. Seek help from us, if can not go back to normal state.

6. appendice

6.1. Appendix I: Rated power model selection table

	three-phase low voltage	high pressure Pressure 15kw (1200V)	high pressure Pressure 15kw (650V)	High Pressure 50kw (1200V)	High pressure 50kw (650V)
0	Default 12kw	Default 15kw	Default 15kw	Default 50kw	Default 30KW
1	10kw	12kw	10kw	40kw	25kw
2	8kw	10kw		30kw	20kw
3	6kw	8kw		25kw	
4	5kw	20kw		60KW(US)	
5		25kw			

6.2. Appendix II: Distinguishing table of machine series

	three-phase low voltage	three-phase high voltage
A	NULL	6-20kw Series Housings
B	NULL	25-50kw Series Housings

6.3. Appendix III: Output Voltage Selection Table

	three-phase low voltage	Three-phase high voltage	Three-phase high voltage

		650V	1200V
0	ln:220vac ll:380vac	ln:120vac ll:208vac	ln:220vac ll:380vac
1	ln:230vac ll:398vac	LN:115VAC LL:200VAC	ln:230vac ll:400vac
2	ln:240vac ll:415vac	ln:133vac ll:220vac	ln:277vac ll:480vac
3	ln:120vac ll:208vac		
4	ln:133vac ll:220vac		

6.4. Appendix IV

6.5. Appendix V:

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