GoodWe Modbus Protocol of Inverter

Grid-tied MTG2/SMT/SDTG2/MS/DNS/XS series (Customer Version)

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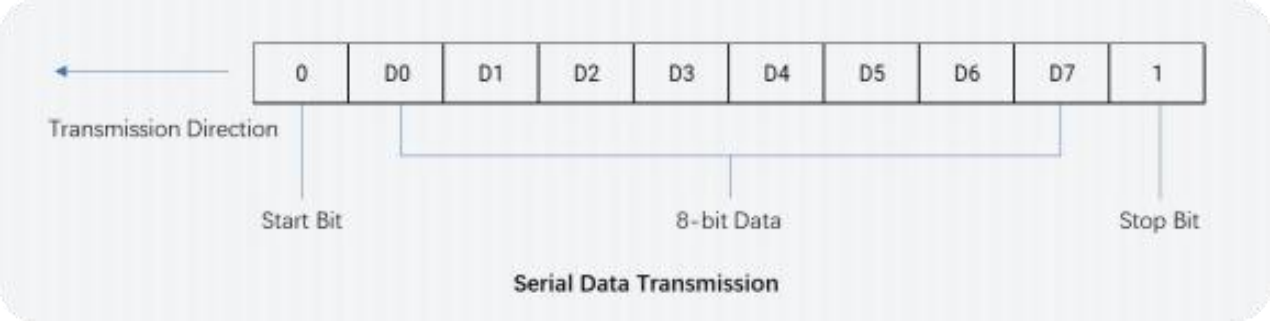
RTU mode is applied in this protocol. Baudrate of data transmitting is 9600bps.

1.Byte Format



A byte is of 8 binary digits working together with 1 start bit (0) and 1 stop bit (1) in transmission, 10 bits in total. As illustrated below, D0 is the least significant bit (LSB) and D7 is the most significant bit (MSB). Pass to the least significant bit first, then to the most significant bit.

2. Communication Data Format

Data are exchanged in the form of word or doubleword:

Data Type	Register Size	Byte Size	Description
Byte Data	1	1	
Integer Data	1	2	One forwarding at one time, from the most significant bit to the least significant bit.
Long Integer Data	2	4	Two separate forwarding, from the most significant bit to the least significant bit.
Floating-point Data			

3. Frame Format

3.1 Read the Content of Register (Function code: 03H)

3.1.1 Frame format from host device

No.	Code	Example	Description
1	Device Address	1	The device's communication address range 1-247
2	03H	03H	Function code
3	MSB of First Register	00H	The address of first register
4	LSB of First Register	01H	
5	MSB of Register Number	00H	Register number
6	LSB of register Number	02H	
7	CRC16 MSB of Checksum	95H	CRC Checksum Data
8	CRC16 LSB of Checksum	CBH	

3.1.2 Frame format by device (normal data)

No.	Code	Description
1	Device Address	The device's communication address range 1-247
2	03H	Function code
3	Byte Number of Receiving Data (2N)	Number of data
4	MSB of First Register Data	High bit of Data 1
5	LSB of First Register Data	Low bit of Data 1
...	...	...
2N+2	MSB of Register Data N	High bit of Data N
2N+3	LSB of Register Data N	Low bit of Data N
2N+4	CRC16 MSB of Checksum	High bit of checksum
2N+5	CRC16 LSB of Checksum	Low bit of checksum

3.1.3 Frame format by device (error of first register address or number)

No.	Code	Description
1	Device Address	The device's communication address range 1-247
2	83H	Function code
3	02H	Error Code
4	CRC16 MSB of Checksum	High bit of checksum
5	CRC16 LSB of Checksum	Low bit of checksum

3.2 Set the Content of Register（Function code: 10H）

3.2.1 Frame format from host device

No.	Code	Example	Description
1	Device address	1	The device's communication address range 1-247
2	10H	10H	Function code
3	MSB of First Register	00H	Address of register 0000H
4	LSB of First Register	00H	
5	MSB of Register Number	00H	Register number 01H
6	LSB of Register Number	01H	
7	Byte Number（N）	02H	Byte number of register 02H
8	MSB of Data	0AH	Data 0AF0H
9	LSB of Data	F0H	
10	CRC16 MSB of Checksum	A0H	CRC Checksum Data
11	CRC16 LSB of Checksum	B4H	

3.2.2 Frame format by device (write successful)

No.	Code	Example	Description
1	Device Address	1	The device's communication address range 1-247
2	10H	10H	Function code
3	MSB of First Register	00H	Address of register 0000H
4	LSB of First Register	00H	
5	MSB of Register Number	00H	Register number 01H
6	LSB of Register Number	01H	
7	CRC16 MSB of Checksum	01H	CRC Checksum Data
8	CRC16 LSB of Checksum	C9H	

3.2.3 Frame format by device (data error)

No.	Code	Description
1	Device Address	The device's communication address range 1-247
2	90H	Function code
3	03H	Error code
4	CRC16 MSB of Checksum	CRC Checksum Data
5	CRC16 LSB of Checksum	

3.2.4 Frame format by device (error of register address or number)

No.	Code	Description
1	Device Address	The device's communication address range 1-247
2	90H	Function code
3	02H	Error code
4	CRC16 MSB of Checksum	CRC Checksum Data
5	CRC16 LSB of Checksum	

4.Baud Rate of Communication: 9600bps no parity, 2 Stopbits

5.Device Address: The range of device address is 1 – 247 with 247 as default setting before delivery. You may set the address onsite according to SOP.

6.Function Code

03H: read (Note: read of one or more consecutive addresses are supported.)

10H: write (Note: RTC time should be written together.)

7.CRC Checking of Communication

7.1 The CRC checking is performed from the first byte to the last byte before the MSB of CRC checksum.

8. Register Address of Device

# Address (Dec)	English Name	# R/W	# Type	# Length	# SF Gain	# Units	Range	Note
0	Power on voltage	RW	U16	1	10	V	[0, 0]	(60.0~600.0V)
1	Reconnect time	RW	U16	1	1	s	[0, 1200]	
2	Lower limit of grid voltage	RW	U16	1	10	V	[0, 0]	[0.15*Vn,1*Vn]
3	Upper limit of grid voltage	RW	U16	1	10	V	[0, 0]	[1*Vn,1.36*Vn]
4	Lower limit of grid frequency	RW	U16	1	100	Hz	[4500, 6000]	
5	Upper limit of grid frequency	RW	U16	1	100	Hz	[5000, 6500]	
16	Device RTC time Year/Month	RW	U16	1	1	NA	[0, 0]	MSB Year/LSB Month 13-99/1-12
17	Device RTC time Day/Hour	RW	U16	1	1	NA	[0, 0]	MSB Day/LSB Hour 1-31/0-23
18	Device RTC time Minute/Second	RW	U16	1	1	NA	[0, 0]	MSB Minute/LSB Second 0-59/0-59
256	Active power adjust	RW	U16	1	1	%	[0,100]	Corresponds to 0%-100% active power (1547 use)
257	PF reactive power adjust	RW	U16	1	1	%	[0, 0]	[1,20], [80,100] 1-20,lagging 0.99-0.8 80-100,leading 0.80-1, Note: if read command returns to 0xffff, it means that the inverter is not in PF setting mode (1547 use)
258	Reactive power adjust	RW	S32	2	1	Var	[0, 0]	The amount of reactive power regulation (32 bits), Note: If the read command returns 0xffffffff, it means that the inverter is not in reactive power regulation mode.
260	Max value of reactive power	RO	U32	2	1	Var		Read-only, workless regulation can be set to a maximum value, typically 60% of nominal
262	Export Power Limit Adjust Range	WO	S16	1	1	%	High byte: 0-100，-100-0，128；	Load reduction and full load restoration by specified range，Load reduction and full load

							Low byte: 0~256, ID command;	restoration by specified range. Less than 0 load reduction, Load over 0, 128 Resume full load. Output power adjustment amplitude and command ID
263	TaiWan Safety Vpset	RW	U16	1	10	V	[0, 0]	Taiwan safety regulations(Default 220) (1.05~1.1)*Un
264	TaiWan Safety PF adjust	RW	U16	1	100	%	[80, 100]	For Taiwan safety regulations (80-100)
265	TaiWan Safety reactive power adjust	RW	S16	1	1	%	[-60, 60]	For Taiwan safety regulations (-60%~60%)
266	TaiWan Safety active power adjust	RW	U16	1	1	%	[1, 100]	For Taiwan safety regulations (1, 100)
267	Export power limit Communication Overtime set	RW	U16		1	s	1-65535	Unit: second (For Taiwan safety regulations)
268	TaiWan VPC curve switch	RW	U16	1	1	N/A	[0,1]	0-Off,1-On
288	Power On(Allow on grid self-test)	WO	U16	1	1	NA	0	Write 0 to take effect
289	Power Off(Not allow on grid self-test)	WO	U16	1	1	NA	0	Write 0 to take effect
290	Restart	WO	U16	1	1	NA	0	Write 0 to take effect
291	On Grid Export Power Limit Switch	RW	U16	1	1	NA	[0, 1]	0-Off,1-On India Bosh Special ARM Support
292	Set the Export power percentage(Need to turn on the limit switch)	RW	U16	1	1	%	[0, 100]	Export power limit
293	Set the Export power percentage(No need to turn on the limit switch)	RW	U16	1	10	%	[0, 1000]	ARM 11 version Import (024D command)
304	Automatic Reactive power Adjust	WO	U16	1	1	NA		High byte: bit1(0 :off 1 :on) Bit2(0: dec 1 :inc) Low byte: PF Inc or dec value (1=0.01) PF Inc or dec value range(0~20)
305	Automatic Reactive power Adjust ID	WO	U32	2	1	NA	4bytes ID	The ID of the automatic reactive power compensation command needs to be changed each time it is sent

307	Battery Mode Switch(Brazil)	WO	U16	1	1	NA	[0, 1]	0-Off,1-On
308	Battery Voltage set(Brazil)	WO	U16	1	10	V	[0,6000]	
312	Shadow mode switch	RW	U16	1	1	NA	[0, 1]	0-Off,1-On
512	Device Serial Number	RO	STR	8	1	NA		ASCII code, 16 bytes
528	Device Type	RO	STR	5	1	NA		ASCII code, 16 bytes
NON MT-MODELS !!!	**Address 544-566 for non-MT models only**							
544	Error Message	RO	U32	2	1	NA		Failure description for status 'failure' Table8-2
546	High Byte of Total Feed Power to grid /Total power generation	RO	U16	1	10	KWH		Total Feed Power to grid
547	Low Byte of Total Feed Power to grid/Total power generation	RO	U16	1	10	KWH		Total Feed Power to grid
548	High Byte of Total feeding hours/Hourly power generation	RO	U16	1	1	Hr		Total feeding hours
549	Low Byte of Total feeding hours/Hourly power generation	RO	U16	1	1	Hr		Total feeding hours
550	Vpv1 /PPV1 input voltage	RO	U16	1	10	V		PV1 voltage
551	Vpv2 /PV2 input voltage	RO	U16	1	10	V		PV2 voltage
552	Ipv1 /PV1 input current	RO	U16	1	10	A		PV1 current
553	Ipv2 /PV2 input current	RO	U16	1	10	A		PV2 current
554	Vac1 /L1 Phase voltage	RO	U16	1	10	V		Phase L1 voltage
555	Vac2 /L2 Phase voltage	RO	U16	1	10	V		Phase L2 voltage
556	Vac3 /L3 Phase voltage	RO	U16	1	10	V		Phase L3 voltage
557	Iac1 /L1 Phase current	RO	U16	1	10	A		Phase L1 current
558	Iac2 /L2 Phase current	RO	U16	1	10	A		Phase L2 current

559	Iac3 /L3 Phase current	RO	U16	1	10	A		Phase L3 current
560	Fac1 /L1 Phase frequency	RO	U16	1	100	Hz		Phase L1 frequency
561	Fac2 /L2 Phase frequency	RO	U16	1	100	Hz		Phase L2 frequency
562	Fac3 /L3 Phase frequency	RO	U16	1	100	Hz		Phase L3 frequency
563	Pac L /Inverter current output power	RO	U16	1	1	W		
564	Work Mode	RO	U16	1	1	NA		0:cWaitMode 1:cNormalMode 2:cFaultMode
565	Inverter internal temperature	RO	U16	1	10	degree C		Inverter internal temperature
566	E-Day /Daily power generation	RO	U16	1	10	KWH		Feed power to grid in today
The following registers are only applicable to MT/SMT inverters								
768	Vpv1 /PV1 input voltage	RO	U16	1	10	V		PV1 voltage
769	Vpv2 /PV2 input voltage	RO	U16	1	10	V		PV2 voltage
770	Ipv1 /PV1 input current	RO	U16	1	10	A		PV1 current
771	Ipv2 /PV2 input current	RO	U16	1	10	A		PV2 current
772	Vac1 /L1 Phase voltage	RO	U16	1	10	V		Phase L1 voltage
773	Vac2 /L2 Phase voltage	RO	U16	1	10	V		Phase L2 voltage
774	Vac3 /L3 Phase voltage	RO	U16	1	10	V		Phase L3 voltage
775	Iac1 /L1 Phase current	RO	U16	1	10	A		Phase L1 current
776	Iac2 /L2 Phase current	RO	U16	1	10	A		Phase L2 current
777	Iac3 /L3 Phase current	RO	U16	1	10	A		Phase L3 current
778	Fac1 /L1 Phase frequency	RO	U16	1	100	Hz		Phase L1 frequency
779	Fac2 /L2 Phase frequency	RO	U16	1	100	Hz		Phase L2 frequency
780	Fac3 /L3 Phase frequency	RO	U16	1	100	Hz		Phase L3 frequency
781	Pac L /Inverter current output power	RO	U16	1	1	W		low Byte of Feeding power

782	Work Mode	RO	U16	1	1	NA		0:cWaitMode 1:cNormalMode 2:cFaultMode
783	Inverter internal temperature	RO	U16	1	10	degre e C		Inverter internal temperature
784	Error Message H	RO	U16	1	1	NA		Failure description for status 'failure' Table8-2
785	Error Message L	RO	U16	1	1	NA		Failure description for status 'failure' Table8-2
786	High Byte of Total Feed Power to grid/Total power generation	RO	U16	1	10	KWH		Total Feed Power to grid
787	Low Byte of Total Feed Power to grid/Total power generation	RO	U16	1	10	KWH		Total Feed Power to grid
788	High Byte of Total feeding hours/Hourly power generation	RO	U16	1	1	Hr		Total feeding hours
789	Low Byte of Total feeding hours/Hourly power generation	RO	U16	1	1	Hr		Total feeding hours
790	Firmware Version	RO	U16	1	1	NA		Firmware Version
791	Warning Code	RO	U16	1	1	NA		Warning Code
792	RSVD	RO	U16	1	10	V		PV2 voltage fault value
793	Function Status Bits	RO	U16	1	1	N/A		Table 8-3
794	RSVD	RO	U16	1	10	V		
795	RSVD	RO	U16	1	10	V		
796	BUS Voltage	RO	U16	1	10	V		BUS Voltage
797	NBUS Voltage	RO	U16	1	10	V		NBUS Voltage
798	RSVD	RO	U16	1	100	Hz		RSVD
799	Safety Code	RO	U16	1	1	1mA		GFCI check value(/Safety Country)
800	Feed Power to grid in today/ Daily power	RO	U16	1	10	KWH		Feed Power to grid in today

	generation							
804	Vpv5 /PV5 input voltage	RO	U16	1	10	V		For SMT50/60K
805	Ipv5 /PV5 input current	RO	U16	1	10	V		For SMT50/60K
806	Vpv6 /PV6 input voltage	RO	U16	1	10	A		For SMT50/60K
807	Ipv6 /PV6 input current	RO	U16	1	10	A		For SMT50/60K
827	Year :Month	RO	U16	1	1	NA		High byte :Year; Low byte:Month
828	Date :Hour	RO	U16	1	1	NA		High byte :Date; Low byte:Hour
829	Minute :Second	RO	U16	1	1	NA		High byte :Minute; low byte:Second
830	Manufacture ID	RO	U16	1	1	NA		Manufacturer Identifier for Hanneng
831	Wireless signal strength	RO	U16	1	1	%		Strength of Signal（WiFi/GPRS Effective）
832	High Byte of PV Mode（SMT only）	RO	U16	1	1	NA		High Byte:PV2; Low Byte:PV1
833	Low Byte of PV Mode（SMT only）	RO	U16	1	1	NA		Refer to Table 8-4
850	High Byte of Power	RO	U16	1	1	W		High Byte of Feeding power
851	Low Byte of Power	RO	U16	1	1	W		low Byte of Feeding power
852	Firmware Version of ARM	RO	U16	1	1	NA		Firmware Version of ARM
853	GPRS Burn-in Mode	RO	U16	1	1	NA		0x00: normal mode
854	Pac H /High Byte of Power	RO	U16	1	1	W		used with register 563
855	Vpv3 /PV3 input voltage	RO	U16	1	10	V		PV3 voltage
856	Vpv4 /PV4 input voltage	RO	U16	1	10	V		PV4 voltage
857	Ipv3 /PV3 input current	RO	U16	1	10	A		PV3 current
858	Ipv4 /PV4 input current	RO	U16	1	10	A		PV4 current
859	Istr1/PV String1 Current	RO	U16	1	10	A		PV String1 Current
860	Istr2/PV String2 Current	RO	U16	1	10	A		PV String2 Current
861	Istr3/PV String3 Current	RO	U16	1	10	A		PV String3 Current

862	Istr4/PV String4 Current	RO	U16	1	10	A		PV String4 Current
863	Istr5/PV String5 Current	RO	U16	1	10	A		PV String5 Current
864	Istr6/PV String6 Current	RO	U16	1	10	A		PV String6 Current
865	Istr7/PV String7 Current	RO	U16	1	10	A		PV String7 Current
866	Istr8/PV String8 Current	RO	U16	1	10	A		PV String8 Current
867	Istr9/PV String9 Current	RO	U16	1	10	A		PV String9 Current
868	Istr10/PV String10 Current	RO	U16	1	10	A		PV String10 Current
869	Istr11/PV String11 Current	RO	U16	1	10	A		PV String11 Current
870	Istr12/PV String12 Current	RO	U16	1	10	A		PV String12 Current
871	Istr13/PV String13 Current	RO	U16	1	10	A		PV String13 Current
872	Istr14/PV String14 Current	RO	U16	1	10	A		PV String14 Current
873	Istr15/PV String15 Current	RO	U16	1	10	A		PV String15 Current
874	Istr16/PV String16 Current	RO	U16	1	10	A		PV String16 Current
875	Istr17/PV String17 Current	RO	U16	1	10	A		Table 8-5
876	Istr18/PV String18 Current	RO	U16	1	10	A		PV String18 Current
877	Istr19/PV String19 Current	RO	U16	1	10	A		PV String19 Current
878	Istr20/PV String20 Current	RO	U16	1	10	A		PV String20 Current
879	PID&SPD Status	RO	U16	1	1	NA		Table 8-6
880	Output control state	RO	U16	1	1	NA		For Japanese models: 0-unprotected, 1-protected
886	Power Factor	RO	U16	1	1000	NA		Power Factor
893	High Byte of AC reactive power	RO	U16	1	1000	kVar		AC reactive power high byte
894	Low Byte of AC reactive power	RO	U16	1	1000	kVar		AC reactive power low byte
895	ISO detection value	RO	U16	1	1	K		ISO Detection value
896	Leak current Value	RO	U16	1	1	mA		leak current Value
The following registers are only applicable to MT/SMT inverters with Korean safety regulations								

1000	Current R phase size	RO	U32	2	10	0.1A		
1002	Current S phase size	RO	U32	2	10	0.1A		
1004	Current T phase size	RO	U32	2	10	0.1A		
1006	Current R phase size	RO	U32	2	10	0.1V		
1008	Current S phase size	RO	U32	2	10	0.1V		
1010	Current T phase size	RO	U32	2	10	0.1V		
1012	3 phase effective power	RO	U32	2	10	0.1KW		
1014	3 phase ineffective power	RO	U32	2		Var		
1016	3 Phase force rate	RO	I32	2	1000	0.001	(+ PF): 800~1000 (- PF):-800~-1000,-1000 Handled as PF=1	
1018	Frequency	RO	U32	2	10	0.1Hz		
1020	Status Flag1	RO	U32	2		Bit Field	Bit 1:Working Status (set: Stop,Reset: Work) Bit2:CB Working Status (set:fail,Reset: normal) Bit3:Operation mode status (set:separate, Reset:contact1)	
2000	PF	WR	S16	1	1000	0.001	(+ PF): 800~1000 (- PF):-800~-990	
2001	Work and Mode	WR	U16	1		0	0: Separate operation 2: Power rate operation 5: Q(v)operation	
2002	Constant Reactive Power	WR	S16	1	10	%	(-)600 : (+)600	
2003	Constant Active Power	WR	U16	1	10	%	0.694444444	

Note:

- **U16: 16 bit unsigned number**
- **S16: 16 bit signed number**
- **U32: 32 bit unsigned number**
- **S32: 32 bit signed number**
- **RO:read only WO:write only R/W:read & write**
- **Register setting range column [0,0] indicates that no range limit is set. If there are special instructions in the remarks, the instructions shall prevail**
- **Register setting range represents the data range that communication can fill in, the actual setting range may be slightly different according to different models. The data result of the frame returned by MODBUS writing data shall prevail.**

Table 8-2 Error code table

Bit NO	DEC	HEX	Error message	Description
Bit31	2147483648	0x80000000	SPI Fail	1. An occasional situation, caused by external factors like external magnetic field etc.|2. Control board has a problem.
Bit30	1073741824	0x40000000	EEPROM R/W Fail	1. An occasional situation, caused by external factors like external magnetic field etc.|2.Inverter Inside components fail.
Bit29	536870912	0x20000000	Grid frequency overrun	1. Safety country of Inverter is set wrong.|2. Grid frequency is not stable.
Bit28	268435456	0x10000000	AFCI Fault	1. Poor contact of PV string | 2. Abnormal insulation of PV string to ground
Bit27	134217728	0x08000000	Night SPS Fail	1. The device is abnormal
Bit26	67108864	0x04000000	L-PE Short Circuit	The live wire connection of the inverter output terminal is abnormal
Bit25	33554432	0x02000000	Relay Check Fail	1. Cable between control board and power board (for DT) is not tight.|2. Neutral & ground cable are not connected well on AC side. |3. Control board problem.
Bit24	16777216	0x01000000	N-PE Fail	1. The connection between the N line and the earth is abnormal|2. Abnormal wiring of the N wire at the output of the inverter
Bit23	8388608	0x00800000	Export Power Limit Fault -Hardware	1. Abnormal Export Power Limit function (Australian safety regulations)
Bit22	4194304	0x00400000	PV Reverse Fault	1. PV string reverse connection
Bit21	2097152	0x00200000	String Over Current	Some string current is too high.
Bit20	1048576	0x00100000	LCD Communication Fail	The cable inside for communication of LCD gets loosen.
Bit19	524288	0x00080000	High DC component	Inverter detects a higher DC component in AC output.
Bit18	262144	0x00040000	Isolation Fail	1. The Ground cable of panels is not connected or not connected well.|2. DC cable is broken.|3. Neutral & ground cable are not connected well on AC side.|4. The ISO failure happens on rainy days or early morning or sunset, when the humidity is comparatively heavy.
Bit17	131072	0x00020000	Vac Fail (Grid voltage overrun)	1. Safety country of Inverter is set wrong.|2. Grid voltage is not stable.|3. AC (to grid) cable too small or too long

				which makes resistance value is high.|4. AC cables are not connected well, which cause a abnormal voltage on AC side.
Bit16	65536	0x00010000	External Fan Fail	1. External fan is blocked by something.|2. Fan cable is not connected well in the inverter.
Bit15	32768	0x00008000	PV Over Voltage	The total voltage (open-circuit voltage) of each PV string is higher than the max DC input voltage of the inverter.
Bit14	16384	0x00004000	00004000	Please contact after sales.
Bit13	8192	0x00002000	Over temperature	1. Inverter stays in a high-temperature environment for long time.|2. Installing place is not good for cooling system working.
Bit12	4096	0x00001000	Internal Fan Fail	1. Internal fan is blocked by something.|2. Fan cable is not connected well in the inverter.
Bit11	2048	0x00000800	DC Bus High	1. The total voltage of PV string is higher than max DC input voltage.|2. There is a problem of control board.
Bit10	1024	0x00000400	Ground I Fail	1. Neutral & ground cable are not connected well on AC side.|2. The Ground I Failure happens on rainy days or early morning or sunset, when the humidity is comparatively heavy.
Bit9	512	0x00000200	Utility Loss	1. Grid power fails.|2. AC connection is not good.|3. AC breaker fails 4. Grid is not connected.
Bit8	256	0x00000100	AC HCT Fail	1. An occasional situation, caused by external factors like external magnetic field etc.|2. Control board has a problem.
Bit7	128	0x00000080	Relay Fail	1. An occasional situation, caused by external factors like external magnetic field etc.|2. Control board has a problem.
Bit6	64	0x00000040	GFCI Fail	1. An occasional situation, caused by external factors like external magnetic field etc.|2. Control board has a problem.
Bit5	32	0x00000020	00000020	Please contact after sales.
Bit4	16	0x00000010	DC SPD Fail	Inverter suffering from lighting strike
Bit3	8	0x00000008	DC Switch Fail	The number of times of use of the DC trip switch exceeds the service life
Bit2	4	0x00000004	Ref 1.5V Fail	1. An occasional situation, caused by external factors like external magnetic field etc.|2. Control board has a problem.
Bit1	2	0x00000002	AC HCT Check Fail	1. Try to restart inverter, check if it still happens, if not, means it is just an occasional situation.|2. If restart cannot solve the problem, Please contact after sales.
Bit0	1	0x00000001	GFCI Check Fail	1. Try to restart inverter, check if it still happens, if not, means it is just an occasional situation.|2. If restart cannot solve the problem, Please contact after sales.

Table 8-3

Bit No	Definition	Status	
		1	0
Bit15	High Impedance Flag	-	
Bit14			
Bit13	Ground Fault Flag	NG	OK

Bit12	Battery activation function （for ES）	ON	OFF
Bit11	Export Power Limit (for ES)	ON	OFF
Bit10	EMS Mode(for ES)	ON	OFF
Bit9	Auto battery management mode (for ES)	ON	OFF
Bit8	Meter	OK	NG
Bit7	MPPT shadow scan	ON	OFF
Bit6	TBD	ON	OFF
Bit5	TBD	ON	OFF
Bit4	TBD	ON	OFF
Bit3	Power Limit Function	ON	OFF
Bit2	Burn-in Mode	ON	OFF
Bit1	LVRT	ON	OFF
Bit0	Anti-Islanding Function	ON	OFF

Table 8-5

Bit No	Definition	Status	
		1	**0**
Bit15	Istring16	Normal	Failure
Bit14	Istring15	Normal	Failure
Bit13	Istring14	Normal	Failure
Bit12	Istring13	Normal	Failure
Bit11	Istring12	Normal	Failure
Bit10	Istring11	Normal	Failure
Bit9	Istring10	Normal	Failure
Bit8	Istring9	Normal	Failure
Bit7	Istring8	Normal	Failure
Bit6	Istring7	Normal	Failure
Bit5	Istring6	Normal	Failure
Bit4	Istring5	Normal	Failure
Bit3	Istring4	Normal	Failure
Bit2	Istring3	Normal	Failure
Bit1	Istring2	Normal	Failure
Bit0	Istring1	Normal	Failure

Table 8-6

Bit No	Definition	Status	
		1	**0**

Bit15	TBD	-	-
Bit14	TBD	-	-
Bit13	TBD	-	-
Bit12	Wietap5	Normal	Failure
Bit11	Wietap4	Normal	Failure
Bit10	Wietap3	Normal	Failure
Bit9	Wietap2	Normal	Failure
Bit8	Wietap1	Normal	Failure
Bit7	TBD	-	-
Bit6	TBD	-	-
Bit5	TBD	-	-
Bit4	TBD	-	-
Bit3	TBD	-	-
Bit2	TBD	-	-
Bit1	PID Box Status	Normal	Failure
Bit0	PID Box	Connect	Disconnect

Table 8-7

	ID	Bit(0...31)	Remark
Status Flag1	Working Status	1	Set : Stop, Reset : Work
	CB Working Status	2	Set : Fail, Reset : Normal
	Operation mode status	3	Set : Separate, Reset : Contact 1

Table 8-8

	ID	Value(decimal)	Remark
Working Mode	Operation Mode	0,2,5	0: Separate operation 2 or 5: Contact operation (2: Power rate operation，5: Q(V) operation

cWaitMode: Machine in waiting, self-test state

cNormalMode：The machine is in power generation mode

cFaultMode：The machine is in an error state

For an understanding of the units in the list see 10.1 Example

9. Example

9.1 Read start-up voltage (read single data)

Host device sending

01H	03H	00H	00H	00H,01H	84H	0AH
Device Address	Read function	The address of first register		Register number	CRC Checksum	

Device Return

01H	03H	02H	0AH	FOH	BEH	A0H
Device Address	Read function	Byte number	MSB	LSB	CRC Checksum	

The starting voltage data is 2800, multiplied by the unit 0.1v and converted to the actual value 280v

9.2 Read start-up voltage and reconnect time (multiple data read continuously)

Host device sending

01H	03H	00H	00H	00H,02H	C4H	0BH
Device Address	Read function	The address of first register		Register number	CRC Checksum	

Device Return

01H	03H	04H	0AH	FOH	00H	1EH	79H	D0H
Device Address	Read function	Byte number	Starting Voltage MSB	Starting Voltage LSB	Reconnect time MSB	Reconnect time LSB	CRC Checksum	

Start-up voltage data is 2800, multiplied by 0.1v, which is converted to the actual value of 280v
Reconnect time data is 30, multiplied by 1s, which is converted to the actual value of 30s

9.3 Read serial number (read single data)

Host device sending

01H	03H	02H	00H	00H,08H	45H	B4H
Device Address	Read function	The address of first register		Register number	CRC Checksum	

Device Return

01H	03H	10H	41H,41H,41H,41H,41H,41H,41H,41H,42H,42H,42H,42H,42H,42H,42H,42H	7EH	B7H
Device Address	Read function	Byte number	Data	CRC Checksum	

Device serial number：AAAAAAAABBBBBBBB

9.4 Set Reconnect time （Write single data）

Host device sending

01H	10H	00H	01H	00H,01H	02H	00H	3CH	A7H	90H
Device Address	Read function	The address of first register		Register number	Byte number	Data		CRC Checksum	

Set the reconnect time data to 60, multiply it by 1s, and convert it to the actual value of 60s.

Device Return

01H	10H	00H	01H	00H,01H	50H	09H
Device Address	Read function	The address of first register		Register number	CRC Checksum	

9.5 Set starting voltage （Write single data）

Host device sending

01H	10H	00H	00H	00H,01H	02H	0AH	F0H	A0H	B4H
Device Address	Read function	The address of first register		Register number	Byte number	Data		CRC Checksum	

Set the starting voltage data to 2800, multiply it by 0.1V, and convert it to the actual value of 280v.

Device Return

01H	10H	00H	00H	00H,01H	01H	C9H
Device Address	Read function	The address of first register		Register number	CRC Checksum	