

H3 Hybrid Inverter MODBUS Protocol



Change logger

sn	Version	author	Logger	date
1	V1.00	WangYaKun	Initial version	2022.06.30
2	V1.01	WangYaKun	Add reactive power reg	2022.07.10
3	V1.02	WangYaKun	Add 41000、41007~41014	2022.07.16
4	V1.03	WangYaKun	Add 41015 PowerLimit	2022.11.02
5	V1.04	WangYaKun	Add 44000~44015、 41022~41024	2022.12.29
6	V1.05	ChenXiong	Add peak shaving	2023.03.22
7	V1.06	ChenXiong	Add 30028~30029、 31052~31085	2023.04.06
8	V 1.07	ChenXiong	Add 31086~31089 Add 44016~44029 Add Fault message	2023.04.13
9	V1.08	ChenXiong	Add 41025~41026	2023.04.24
10	V1.09	ChenXiong	Add 31090~31092 Add 40006、40008、40009 Add 41012、44030 Add Fault message : Fault6:InvBatVoltLow	2023.06.21
11	V1.10	ChenXiong	Add 30044~30165 Add 31065~31116 Add 47000~47064 Add Battery Family Type	2023.08.09
12	V1.11	ChenXiong	Add 31117~31126 Add 47032~47128 Modify Inv Fault message Add Battery Fault message Add Battery Family Type	2023.10.09
fiction		check	standardization	authorize

Catalog

1. Protocol description	4
2. Communication Parameters	4
2.1. Basic parameters of communication	4
2.2. Protocol Format	4
2.2.1. Single write register.....	4
2.2.2. Chip write register	5
2.2.3. Read Register.....	5
2.3. Register data description	6

1. Protocol description

This protocol is to solve the data communication between PCS and monitoring platform, complete data transmission and data decoding, and realize the two-way communication function.

2. Communication Parameters

2.1. Basic parameters of communication

MODBUS protocol based on RS485 communication is suitable for all equipment communication with host computer or external communication.

Comm paras	Setting value
Band Rate	9600bps
Data length	8bits
parity	none
Stop bits	1bit

2.2. Protocol Format

2.2.1. Single write register

Slave Address	Function code	Reg address	data	CRC
0xF7	0x06	2 Bytes	2 Bytes	2 Bytes

Data Format Description:

- a) Slave Address: 0xF7
- b) Function code: 0x06
- c) Reg address: The address of the first register to be operated on.
- d) data: Data written to a register.
- e) CRC: MODBUS CRC16 Checksum, low before high after, without data frame head

2.2.2. Chip write register

Slave Address	Function code	Reg address	Reg number	Data length	data	CRC
0xF7	0x10	2 Bytes	2 Bytes	1 Bytes	2 Bytes	2 Bytes

Data Format Description:

Slave Address: 0xF7

Function code: 0x10

Reg address: The address of the first register to be operated on.

Reg number: The number of registers operated on

Date length: The length of data written to a register.

data: Data written to a register.

CRC: MODBUS CRC16 Checksum, low before high after, without data frame header

2.2.3. Read Register

Slave Address	Function code	Reg address	Reg number	CRC
0xF7	0x03	2 Bytes	2 Bytes	2 Bytes

Data Format Description:

a) Slave Address: 0xF7

b) Function code: 0x03

c) Reg address: The address of the first register to be operated on.

d) Reg number: The number of registers operated on.

e) CRC: MODBUS CRC16 Checksum, low before high after, without data frame header

2.3. Register data description

Signal Name	Read/Write	Type	Unit	Gain	Addresses	Quantity	Scope
Model	RO	STR	N/A	1	30000	16	
Firmware Master	RO	U16	N/A	1	30016	1	
Firmware Slave	RO	U16	N/A	1	30017	1	
Firmware Manager	RO	U16	N/A	1	30018	1	
Firmware Battery Master	RO	U16	N/A	1	30019	1	
Firmware Battery Slave1	RO	U16	N/A	1	30020	1	
Firmware Battery Slave2	RO	U16	N/A	1	30021	1	
Firmware Battery Slave3	RO	U16	N/A	1	30022	1	
Firmware Battery Slave4	RO	U16	N/A	1	30023	1	
Firmware Battery Slave5	RO	U16	N/A	1	30024	1	
Firmware Battery Slave6	RO	U16	N/A	1	30025	1	
Firmware Battery Slave7	RO	U16	N/A	1	30026	1	
Firmware Battery Slave8	RO	U16	N/A	1	30027	1	
Modbus Protocol Version	RO	U16	N/A	1	30028	1	
Serial Number	RO	STR	N/A	1	30029	15	
BmsFamilyType	RO	U16	N/A	1	30044	1	
BmsMasterSn	RO	STR	N/A	1	30045	15	
BmsSlave1Sn	RO	STR	N/A	1	30060	15	
BmsSlave2Sn	RO	STR	N/A	1	30075	15	
BmsSlave3Sn	RO	STR	N/A	1	30090	15	
BmsSlave4Sn	RO	STR	N/A	1	30105	15	
BmsSlave5Sn	RO	STR	N/A	1	30120	15	
BmsSlave6Sn	RO	STR	N/A	1	30135	15	
BmsSlave7Sn	RO	STR	N/A	1	30150	15	
BmsSlave8Sn	RO	STR	N/A	1	30165	15	
PV1 voltage	RO	I16	V	10	31000	1	
PV1 current	RO	I16	A	10	31001	1	
PV1 power	RO	I16	W	1	31002	1	
PV2 voltage	RO	I16	V	10	31003	1	
PV2 current	RO	I16	A	10	31004	1	
PV2 power	RO	I16	W	1	31005	1	

Grid voltageR	RO	U16	V	10	31006	1	
Grid voltageS	RO	U16	V	10	31007	1	
Grid voltageT	RO	U16	V	10	31008	1	
Inv currentR	RO	I16	A	10	31009	1	
Inv currentS	RO	I16	A	10	31010	1	
Inv currentT	RO	I16	A	10	31011	1	
Inv powerR	RO	I16	W	1	31012	1	
Inv powerS	RO	I16	W	1	31013	1	
Inv powerT	RO	I16	W	1	31014	1	
Grid Frequency	RO	U16	Hz	100	31015	1	Only L1 phase
Eps voltageR	RO	U16	V	10	31016	1	
Eps voltageS	RO	U16	V	10	31017	1	
Eps voltageT	RO	U16	V	10	31018	1	
Eps currentR	RO	I16	A	10	31019		
Eps currentS	RO	I16	A	10	31020		
Eps currentT	RO	I16	A	10	31021	1	
Eps powerR	RO	I16	W	1	31022	1	
Eps powerS	RO	I16	W	1	31023		
Eps powerT	RO	I16	W	1	31024		
Eps Frequency	RO	U16	Hz	100	31025	1	Only L1 phase
Meter powerR	RO	I16	W	1	31026	1	
Meter powerS	RO	I16	W	1	31027	1	
Meter powerT	RO	I16	W	1	31028	1	
Load powerR	RO	I16	W	1	31029	1	
Load powerS	RO	I16	W	1	31030	1	
Load powerT	RO	I16	W	1	31031	1	
Inverter temperature	RO	I16	°C	10	31032	1	
Internal temperature	RO	I16	°C	10	31033	1	
Battery voltage	RO	I16	V	10	31034	1	
Battery current	RO	I16	A	10	31035	1	
Battery power	RO	I16	W	1	31036	1	
Battery temperature	RO	I16	°C	10	31037	1	
SoC	RO	U16	%	1	31038	1	
Maximum charge current	RO	U16	A	10	31039	1	
Maximum discharge current	RO	U16	A	10	31040	1	
Inverter state	RO	U16	N/A	1	31041	1	0: waiting 1: selfcheck 2: ongrid 3: EPS 4, 5: fault 8: idlestate

BMS connect state	RO	U16	N/A	1	31042	1	
Meter connect state	RO	U16	N/A	1	31043	1	
Fault 1	RO	Bitfield16	N/A	1	31044	1	如下附件I所示
Fault 2	RO	Bitfield16	N/A	1	31045	1	如下附件I所示
Fault 3	RO	Bitfield16	N/A	1	31046	1	如下附件I所示
Fault 4	RO	Bitfield16	N/A	1	31047	1	如下附件I所示
Fault 5	RO	Bitfield16	N/A	1	31048	1	如下附件I所示
Fault 6	RO	Bitfield16	N/A	1	31049	1	如下附件I所示
Fault 7	RO	Bitfield16	N/A	1	31050	1	如下附件I所示
Fault 8	RO	Bitfield16	N/A	1	31051	1	如下附件I所示
Inv voltageR	RO	U16	V	10	31052	1	
Inv voltageS	RO	U16	V	10	31053	1	
Inv voltageT	RO	U16	V	10	31054	1	
Total Inverter Apparent Power	RO	I32	VA	1	31055	2	
Inverter Apparent PowerR	RO	I16	VA	1	31057	1	
Inverter Apparent PowerS	RO	I16	VA	1	31058	1	
Inverter Apparent PowerT	RO	I16	VA	1	31059	1	
Inverter FrequencyR	RO	U16	Hz	100	31060	1	
Inverter FrequencyS	RO	U16	Hz	100	31061	1	
Inverter FrequencyT	RO	U16	Hz	100	31062	1	
PV Power	RO	I32	W	1	31063	2	
TotalGridActive Power	RO	I32	W	1	31065	2	
GridActive PowerR	RO	I32	W	1	31067	2	
GridActive PowerS	RO	I32	W	1	31069	2	
GridActive PowerT	RO	I32	W	1	31071	2	

TotalGridReactive Power	RO	I32	Var	1	31073	2	
GridReactive PowerR	RO	I32	Var	1	31075	2	
GridReactive PowerS	RO	I32	Var	1	31077	2	
GridReactive PowerT	RO	I32	Var	1	31079	2	
TotalGridPower Factor	RO	I16	%	100	31081	1	
GridPower FactorR	RO	I16	%	100	31082	1	
GridPower FactorS	RO	I16	%	100	31083	1	
GridPower FactorT	RO	I16	%	100	31084	1	
Grid FrequencyS	RO	U16	Hz	100	31085	1	
Grid FrequencyT	RO	U16	Hz	100	31086	1	
Grid currentR	RO	I16	A	10	31087	1	
Grid currentS	RO	I16	A	10	31088	1	
Grid currentT	RO	I16	A	10	31089	1	
BatSOH	RO	U16	%	1	31090	1	
Battery Capacity	RO	U16	Ah	10	31091	1	
Available import power	RO	U32	W	1	31092	2	
Available export power	RO	U32	W	1	31094	2	
Meter2 connect state	RO	U16	N/A	1	31096	1	
Total Load Power	RO	I32	W	1	31097	2	
DC Link Voltage	RO	U16	V	10	31099	1	
Cell Voltage High	RO	U16	V	10	31100	1	
Cell Voltage Low	RO	U16	V	10	31101	1	
Cell Temperature High	RO	I16	°C	10	31102	1	
Cell Temperature Low	RO	I16	°C	10	31103	1	
BatVoltage	RO	U16	V	10	31104	1	
BatCurrent	RO	U16	A	10	31105	1	
BatTemperature	RO	I16	°C	10	31106	1	
Meter 2 Total Power	RO	I32	W	1	31107	2	
Meter 2 PowerR	RO	I32	W	1	31109	2	
Meter 2 PowerS	RO	I32	W	1	31111	2	
Meter 2 PowerT	RO	I32	W	1	31113	2	

Grid-connected Time	RO	U16	s	1	31115	1	
Collector status	RO	U16	N/A	1	31116	1	0: 与采集器通讯丢失 1: 采集器已联网 2: 采集器未联网
Bms Fault 1	RO	Bitfield16	N/A	1	31117	1	如下附件II所示
Bms Fault 2	RO	Bitfield16	N/A	1	31118	1	如下附件II所示
Bms Fault 3	RO	Bitfield16	N/A	1	31119	1	如下附件II所示
Bms Fault 4	RO	Bitfield16	N/A	1	31120	1	如下附件II所示
Bms Fault 5	RO	Bitfield16	N/A	1	31121	1	如下附件II所示
Bms Fault 6	RO	Bitfield16	N/A	1	31122	1	如下附件II所示
Bat Remain Energy	RO	U16	10Wh	1	31123	1	
Total Inv power	RO	I32	W	1	31124	2	
Total PV energy	RO	U32	KWh	10	32000	2	
Today PV energy	RO	U16	KWh	10	32002	1	
Total charge energy	RO	U32	KWh	10	32003	2	
Today charge energy	RO	U16	KWh	10	32005	1	
Total discharge energy	RO	U32	KWh	10	32006	2	
Today discharge energy	RO	U16	KWh	10	32008	1	
Total feed-in energy	RO	U32	KWh	10	32009	2	
Today feed-in energy	RO	U16	KWh	10	32011	1	
Total Consumption energy	RO	U32	KWh	10	32012	2	
Today Consumption energy	RO	U16	KWh	10	32014	1	
Total output energy	RO	U32	KWh	10	32015	2	
Today output energy	RO	U16	KWh	10	32017	1	
Total input energy	RO	U32	KWh	10	32018	2	

Today input energy	RO	U16	KWh	10	32020	1	
Total load energy	RO	U32	KWh	10	32021	2	
Today load energy	RO	U16	KWh	10	32023	1	
RTC-year	RW	U16	N/A	1	40000	1	0-99
RTC-month	RW	U16	N/A	1	40001	1	1-12
RTC-day	RW	U16	N/A	1	40002	1	1-31
RTC-hour	RW	U16	N/A	1	40003	1	0-59
RTC-minute	RW	U16	N/A	1	40004	1	0-59
RTC-second	RW	U16	N/A	1	40005	1	0-59
Grid code	RW	U16	N/A	1	40006	1	
Meter	RW	U16	N/A	1	40008	1	0: enable 1: disable
Meter2	RW	U16	N/A	1	40009	1	0: enable 1: disable
Work mode	RW	U16	N/A	1	41000	1	0:SelfUse 1:Feedin 2:BackUp 4:Peakshaving
Maximum set charge current	RW	U16	A	10	41007	1	Unit: 0.1A
Maximum set discharge current	RW	U16	A	10	41008	1	Unit: 0.1A
Minimum SoC	RW	U16	N/A	1	41009	1	Unit: 1%
Maximum SoC	RW	U16	N/A	1	41010	1	Unit: 1%
Minimum SoC-On Grid	RW	U16	N/A	1	41011	1	Unit: 1% Must be greater than "Minimum SoC"
Export limit	RW	U32	W	1	41012	2	
Sys on/off	RW	U16	N/A	1	41014	1	0:OFF 1:ON
Power Limit	WO	U16	%	1	41015	1	0%~100%
Balance Load	RW	U16	N/A	1	41025	1	0:Disable 1:Enable
BalanceLogicFirst	RW	U16	N/A	1	41026	1	0:Disable 1:Enable
Remote Control	RW	U16	N/A	1	44000	1	Bit0: enable/disable Bit1 :

							definition for positive direction 0 power-generation system 1 power-consumption system Bit2 : controlled target 0 Ac 1 battery
Remote Timeout_Set	RW	U16	s	1	44001	1	Info provided by ARM
Remote control-Active power command	RW	I16/I32 Note 1	W	1	44002	1/2	Confirm system direction according to Control bit1
Remote control-Reactive power command	RW	I16/I32 Note 1	Var	1	44003	1/2	Confirm system direction according to Remote Control bit1
Remote TimeoutCountdo	RO	U16	s	1	44004	1	Info provided by ARM
Remote TakeEffect	RO	U16	N/A	1	44005	1	0:not active 1:active
Remote not active reasons	RO	U16	N/A	1	44006	1	0 Nothing 1 Enset 2 HostOffline 3 OffGrid 4 BatInput 5 Unknown
Pwr_limit Ac_P_Up	RO	I16/I32 Note 1	W	1	44007	1/2	Max active power can be Provided by the inverter
Pwr_limit Ac_P_Dn	RO	I16/I32 Note 1	W	1	44008	1/2	Max active power can be Input to the inverter(negative figure)
Pwr_limit Ac_Q_Up	RO	I16/I32 Note 1	Var	1	44009	1/2	Max reactive power can be Provided by the inverter
Pwr_limit Ac_Q_Dn	RO	I16/I32 Note 1	Var	1	44010	1/2	Max reactive power can be Input to the inverter(negative figure)
Pwr_limit Bat_up	RO	I16/I32 Note	W	1	44011	1/2	Max power that can be provided By pcs from battery

		1					
Pwr_limit Bat_up	RO	I16/I 32 Note 1	W	1	44012	1/2	Max power that can be input to battery(negative figure)
Pwr_limit Pv	RO	I16/I 32 Note 1	W	1	44013	1/2	Max power that can be accepted By the inverter
Pwr_limit_Reason Ac	RO	U16	N/A	1	44014	1	Bit0~7 outputlimit Bit8~15 outputlimit
Pwr_limit_Reason Dc	RO	U16	N/A		44015	1	Bit0~3 BatDischarge Bit4~7 Batcharge Bit8~11 PV Bit12~15 Rev
Peakshaving-Importlimit	RW	I32	W		44016-17	2	Import power (0~100000) W
Peakshaving-ThresholdSOC	RW	U16	%		44018	1	
Peakshaving-Exportpeaklimit	RW	U32	W		44019-20	2	Import power (0~100000) W
Peakshaving-ChrInLowImport	RW	U16	N/A		44021	1	1: NC Mode 2: NO Mode 3: Timing Mode
ChrInLowTime1-StartHour	RW	U16	N/A	1	44022	1	0-23
ChrInLowTime1-StartMinute	RW	U16	N/A	1	44023	1	0-59
ChrInLowTime1-EndHour	RW	U16	N/A	1	44024	1	0-23
ChrInLowTime1-EndMinute	RW	U16	N/A	1	44025	1	0-59
ChrInLowTime2-StartHour	RW	U16	N/A	1	44026	1	0-23
ChrInLowTime2-StartMinute	RW	U16	N/A	1	44027	1	0-59
ChrInLowTime2-EndHour	RW	U16	N/A	1	44028	1	0-23
ChrInLowTime2-EndMinute	RW	U16	N/A	1	44029	1	0-59
MPPT-Switchoff	RW	U16	N/A		44030	1	Bit0:MPPT1 Bit1:MPPT2 (对应Bit位, 0为开启, 1为关闭)
AP name	RW	STR	N/A	1	47032	32	
Password	RW	STR	N/A	1	47064	64	

Note 1: Due to parallel applications in the system, all power displays and settings have 32-bit write functionality, but users are allowed to use 16-bit write and read.

Appendix

I Inv Fault message

Fault 1

Bit	Fault message	Remark	Saverity
0	GridLostFault	市电丢失	Minor
1	GridVoltFault	市电电压过、欠压	Minor
2	GridFreqFault	市电频率过、欠频	Minor
3	Grid10minVoltFault	市电10分钟过压	Minor
4	PLL_OverTime	锁相超时报错	Minor
5	SwInvCurFault	逆变侧软件过流	Minor
6	DciFault	逆变电流直流分量错误	Minor
7	PhaseAngleFault	3相电压相角位置异常	Minor
8	HardWareTrip	硬件保护（过流，bus过压）	Minor
9	SwBusVoltFault	bus电压不平衡	Minor
10	BatVoltFault	电池过压	Minor
11	SwBatCurFault	电池软件过流	Minor
12	IsoFault	绝缘检测故障	Minor
13	ResCurFault	漏电流过流	Minor
14	PvVoltFault	PV过压	Minor
15	SwPvCurFault	PV过流	Minor

Fault 2

Bit	Fault message	Remark	Saverity
0	TempFault	过温错误	Minor
1	GroundConnFault	接地错误	Minor
2	OverLoadFault	并网模式下 过载	Minor
3	EpsOverLoadFault	离网模式下 过载	Minor
4	BatPowerLowFault	离网模式下 电池电量低	Minor
5	Eps_OCP	离网模式下交流过流	Minor
6	Dcv_OVP	离网电压直流偏移过大	Minor
7	DirectArcFault	Pv拉弧检测报错	Minor
8	SciFault	与arm通讯丢失	Minor
9	MasterSpiFault	master与slave通讯丢失	Minor

10	BmsLostFault	inv与bms的通讯丢失	Minor
11	ParallelFault	并机通信异常	Minor
12	TBD		
13	TBD		
14	ArmVerFault	ARM软件版本错误	Minor
15	SlaveVerFault	SLAVE软件版本错误	Minor

Fault 3

Bit	Fault message	Remark	Saverity
0	BatInvalid	电池无效	Minor
1	BatExceptionLimit	电池异常限制	Minor
2	TBD		
3	TBD		
4	TBD		
5	TBD		
6	TBD		
7	TBD		
8	TBD		
9	TBD		
10	TBD		
11	TBD		
12	TBD		
13	TBD		
14	TBD		
15	TBD		

Fault 4

Bit	Fault message	Remark	Saverity
0	SampleCircuitOffset	采样零偏故障	Major
1	RCDeviceFault	漏电流检测设备故障	Major
2	InvEepromFault	Master的EEprom读写错误	Major
3	SampleConsFault	主从机采样一致性故障	Major
4	BatRelayOpenFault	电池继电器错误-常开	Major
5	BatRelayCloseFault	电池继电器错误-常闭	Major
6	BatBuckFault	电池侧BUCK管故障	Major
7	BatBoostFault	电池侧BOOST管故障	Major
8	EpsRelayFault	离网继电器错误	Major
9	TBD		
10	BatConnDirFault	电池连接方向错误	Major
11	MainRelayOpenFault	市电继电器错误	Major
12	InvRelayOpenFault	逆变侧继电器错误	Major
13	ByPassRelayOpenFault	旁路继电器错误	Major

14	TBD		
15	SystemFault	软件系统设计错误程序运行到逻辑管控范围外	Major

注：关于逆变器的Major错误，当逆变器重启三次还继续报错时需要去现场处理。

Fault 5

Bit	Fault message	Remark	Saverity
0	GridVoltConsFault	市电采样不一致	Minor
1	GridFreqConsFault	频率采样不一致	Minor
2	DciConsFault	逆变电流采样不一致	Minor
3	ResCurConsFault	漏电流采样不一致	Minor
4	TBD		
5	TBD		
6	SlaveSpiFault	Slave通信丢失	Minor
7	SlaveSampleFault	采样电路零偏错误	Minor
8	TBD		
9	TBD		
10	TBD		
11	TBD		
12	TBD		
13	TBD		
14	TBD		
15	TBD		

Fault 6

Bit	Fault message	Remark	Saverity
0	ArmEepromFault	Manager的EEPROM故障	Minor
1	MeterLostFault	电表通讯故障	Minor
2	FanAlarm	电扇停止故障	Minor
3	InvBatVoltLow	逆变器侧电池电压低	Minor
4	BmsConLost	电池通讯丢失	Minor
5	TBD		
6	TBD		
7	TBD		
8	TBD		
9	TBD		
10	TBD		
11	TBD		
12	TBD		
13	TBD		
14	TBD		
15	TBD		

Fault 7

Bit	Fault message	Remark	Saverity
0	TBD		
1	TBD		
2	TBD		
3	TBD		
4	TBD		
5	TBD		
6	TBD		
7	TBD		
8	TBD		
9	TBD		
10	TBD		
11	TBD		
12	TBD		
13	TBD		
14	TBD		
15	TBD		

Fault 8

Bit	Fault message	Remark	Saverity
0	TBD		
1	TBD		
2	TBD		
3	TBD		
4	TBD		
5	TBD		
6	TBD		
7	TBD		
8	TBD		
9	TBD		
10	TBD		
11	TBD		
12	TBD		
13	TBD		
14	TBD		
15	TBD		

II Battery Fault message

Bms Fault 1

Bit	Fault message	Remark	Saverity
0	EXT_COM	External Communication Error	Critical
1	INT_COM	Internal communication	Critical
2	OV	Over voltage(Cell voltage High or Total voltage High)	Minor
3	UV	Under voltage(Cell voltage low or Total voltage low)	Minor
4	OCC	Over current when charging	Minor
5	OCD	Over current when discharging	Minor
6	OT	Over temperature	Minor
7	UT	Under temperature	Minor
8	CB	BMS CellImblance,电芯不均衡, 可以充放电	Critical
9	Hardware Protect	Hardware Protect,硬件保护, 不用关心具体故障明细, 禁止充放电	Minor
10	Circuit Fault	电路故障	Warning
11	RSV		
12	VoltSensor Fault	电压传感器故障	Critical
13	TempSensor Fault	温度传感器故障	Critical
14	CurrSensor Fault	电流传感器故障	Critical
15	Relay_Fault	继电器故障	Critical

Bms Fault 2

Bit	Fault message	Remark	Saverity
0	BMS_Type_Unmatch	(容量不一致)	Major
1	BMS_Version_Unmatch	(软件版本不一致)	Warning
2	BMS_Manufacturer_Unmatch	(电芯厂商不一致)	Warning
3	BMS_SW&HW_Unmatch	(从控软硬件不匹配)	Warning
4	BMS_M&S_Unmatch	(主从控软件不匹配)	Warning
5	BMS_CR_Unresponsive	(充电请求未响应)	Warning
6	BMSSupplyFault	BMS电源故障	Warning
7	RSV		
8	SelfChk_Fault	(自检错误)	Warning
9	CellTempDiff_Fault	(温差故障)	Warning
10	CellVoltBreakLine_Fault	(断线故障)	Warning
11	SelfChk_SysVoltMismatch_Fault	(模块压差故障)	Warning
12	PreChg_Fault	(预充故障)	Critical

13	SelfChk_Hvb_Fault	(自检总压故障)	Warning
14	SelfChk_PackCur_Fault	(自检电流故障)	Warning
15	SelfChk_SysMismatch_Fault	(自检匹配故障)	Warning

Bms Fault 3

Bit	Fault message	Remark	Saverity
0	Actor_Fault	继电器驱动故障	Critical
1	SOH_LOW	SOH 过低	Major
2	Charge PowerHigh	充电过功率	Minor
3	DisCharge PowerHigh	放电过功率	Minor
4	SUV	欠压永久失效	Major
5	CellVolt High Invaild	过压永久失效	Warning
6	Cell temperature High Invaild	温度过高永久失效	Minor
7	Balance Temperture High	均衡温度过高	Critical
8	PreChg_ResTemperature High	预充电阻温度过高	Critical
9	short current	硬件过流	Critical
10	AFE Communication fault	AFE 通讯故障	Critical
11	AFE Fault	AFE UT/OT/UV/OV	Minor
12	IVU communication fault	IVU 通讯故障	Critical
13	OldBmuFault	BMS1.0模组故障	Warning
14	Module serise address fault	串联编址故障	Critical
15	RSV		

Bms Fault 4

Bit	Fault message	Remark	Saverity
0	TBD		
1	TBD		
2	TBD		
3	TBD		
4	TBD		
5	TBD		
6	TBD		
7	TBD		
8	TBD		
9	TBD		
10	TBD		
11	TBD		

12	TBD		
13	TBD		
14	TBD		
15	TBD		

Bms Fault 5

Bit	Fault message	Remark	Saverity
0	TBD		
1	TBD		
2	TBD		
3	TBD		
4	TBD		
5	TBD		
6	TBD		
7	TBD		
8	TBD		
9	TBD		
10	TBD		
11	TBD		
12	TBD		
13	TBD		
14	TBD		
15	TBD		

Bms Fault 6

Bit	Fault message	Remark	Saverity
0	TBD		
1	TBD		
2	TBD		
3	TBD		
4	TBD		
5	TBD		
6	TBD		
7	TBD		
8	TBD		
9	TBD		
10	TBD		
11	TBD		
12	TBD		
13	TBD		
14	TBD		

15	TBD		
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III Battery Family Type

Family Type	0x52	HV2600
	0x53	ECS
	0x54	HV2600-2
	0x55	ECS2900-2
	0x56	ECS4100-2
	0x57	Mira-HV25
	0x58	ECS4000-2
	0x59	ECS4300
	0x5A	Mira-HV28
	0x5B	ECS4800
	0x5C	ECS2800
	0x5D	Q.SAVE B4.5F
	0x5E	Q.SAVE B6.4F
	0x5F	EP5
	0x60	EP11
	0x61	EP3
	0x62	EP4
	0xFF	Common Serise