Modbus_RTU/TCP Protocol

Version information

Version	Date	Remarks	Author
V 1.0	2017.09.09		Vincent
V 1.1	2017.10.08		Vincent
V 1.2	2018.03.28	Modify number of register to 2bytes when Master to read data	Vincent
V 1.3	2019.11.21	Modify content of register	Witt
V 1.4	2019.12.23	Add Modbus TCP	Witt
V 1.5	2019.12.24	Modify battery content of register	Stephen
V 1.6	2020.1.3	Add DI/DO register	Witt
V 1.7	2020.1.13	Add Battery Power、Remaining time	Witt
V 1.8	2020.2.20	Add state pattern alarm failure analysis	Ben
V1.9	2020.3.23	Modify Sery battery Fault	Witt
V1.10	2020.3.26	Add Register	Witt
V1.12	2020.4.16	Add Meter set	Witt
V1.13	2020.6.5	Add Bat mos control	Witt
V1.14	2020.6.8	Add Safety Test Tab	Ben
V1.15	2020.6.15	Add bat register	Witt
V1.16	2020.6.30	Add ATE TEST	Chalice
V1.17	2020.8.11	ADD Industry Battery	Chen

1.ModBus RTU

1.1Communication flow chart:

1.2 Communication description:

RS485/MODBUS-RTU Communication
Communication interface: RS485
Communication connection mode: two-wire(RS85+,RS485-),shielded twisted pair conductors
Communication working mode: half-duplex
Communication speed: 9600bps
Communication response time：less-than 300ms
Communication instruction interval：greater than 300ms
Communication timeout ： greater than 10S

1.3 Transmission mode :

The information transmit in asynchronous mode in bytes , The Communication information transmitting between the host computer and the slave computer is the 10 bits format, including one initial bit ,8 data bit(Firstly Transmitting the least effective bit). Without parity check bit . 1 stop bit .

Data frame format
Master:

Address code	Function	Data	CRC check code
1 byte	1 byte	N byte	2 byte

Slave

Address code	Function	Data	CRC check code
1 byte	1 byte	N byte	2 byte

Address code: address code is loacated at beginning of frame ,decimal system is 1~247 in the inverter. **The default address is 0x55. Data area’ s illustration at part 3.**

Function code: function code tell the target terminal to execute what function, Below table list: function code used in this inverter, and their meaning and function.

Data area: data area includes the data needed by terminal for executing specific function, or the collected data when terminal is responding enquiry.

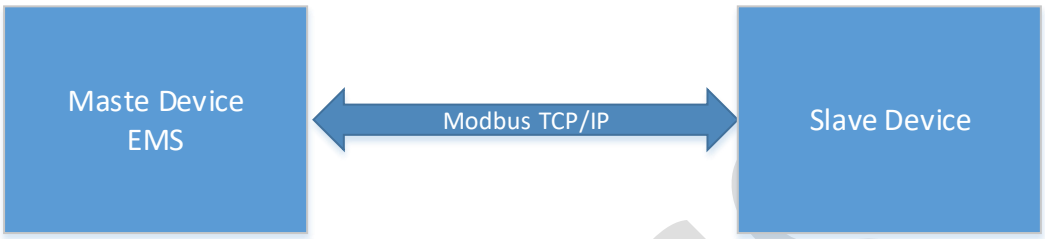
CRC check code : Error check(CRC) domain occupies 2 byte, including one 16 bit binary system value. CRC value is calculated by transmission device . and then attached to the data frame, the receiving device . while receiving, it calculates the CRC value again ,then comparing it with the receiving CRC domain value ,if these two values are not equal, it an error occurs.

Base on C language for CRC check code :

```
u16   CRC16_Check(const u8 *P   ,u16 ubCRCNum)          //CRC check code
{
      u8 temp;
      u8 i;
      u16 c;
      u8 TT;
      u16 crc = 0xffff;
      for(c=0;c<ubCRCNum;c++)
      {
            temp = P[c];
            crc =crc^temp;
            for(i=0;i<8;i++)
            {
                  TT = crc & 1;
                  crc = crc>>1;
                  crc = crc&0x7fff;
                  if(TT == 1)
                  {
                        crc = crc^0xa001;
                  }
                  crc = crc&0xffff;
            }
      }
      return crc;
}
```

2.ModBus TCP (In the developing)

2.1 Communication flow chart:



2.2 Communication description:

MODBUS-TCP Communication
Communication interface: TCP/IP
EMS device is server, open a local port 0x502.

2.3 Transmission mode :

The information transmit in asynchronous mode in bytes , The Communication information transmitting between the host computer and the slave computer . **The default address is 0x55. Data area' s illustration at part 3.**

Data frame format
Master:

Transaction Identifier		Protocol Identifier		length	Unit Identifier	Funtion Code	Data
0x00	0x01	0x00	0x00	2 byte	1 byte	1byte	N byte

Slave

Transaction Identifier		Protocol Identifier		length	Unit Identifier	Funtion Code	Data
0x00	0x01	0x00	0x00	2 byte	1 byte	1byte	N byte

3.Data area

Function code: function code tell the target terminal to execute what function, Below table list: function code used in this inverter, and their meaning and function.

Read hold register(0x03):

Frame Format From Master:

Data	Explain
0x03H (Hexadecimal)	Read data register
High Byte of Start Register Addr.	
Low Byte of Start Register Addr.	
High Byte of Register No.	
Low Byte of Register No.	

Frame Format From Slave(data reading successfully)

Data	Explain
03H (Hexadecimal)	Read data register
No. of Bytes(2*N)	Length of retruned data.
No.1 High Byte of Data	Data1 high byte.
No.1 Low Byte of Data	Data1 low byte.
.....	
.....	
No.N High Byte of Data	DataN high byte.
No.N High Byte of Data	DataN low byte.

Write register(0x10):

Frame Format From Master:

Data	Explain
0x10H (Hexadecimal)	Write data register
High Byte of Start Register Addr.	
Low Byte of Start Register Addr.	
High Byte of Register No.	
Low Byte of Register No.	
No. of Bytes	
No.1 High Byte of Data	Data1 high byte.
No.1 Low Byte of Data	Data1 low byte.
.....	
.....	
No.N High Byte of Data	DataN high byte.
No.N High Byte of Data	DataN low byte.

Frame Format From Slave(data writing successfully):

Data	Explain

0x10H (Hexadecimal)	Write data register
High Byte of Start Register Addr.	
Low Byte of Start Register Addr.	
High Byte of Register No.	
Low Byte of Register No.	

Write single register(0x06):

Frame Format From Master:

Data	Explain
0x06H (Hexadecimal)	Write data register
High Byte of Start Register Addr.	
Low Byte of Start Register Addr.	
High Byte of Data	high byte.
Low Byte of Data	low byte.

Frame Format From Slave(data writing successfully):

Data	Explain
0x06H (Hexadecimal)	Write data register
High Byte of Start Register Addr.	
Low Byte of Start Register Addr.	
High Byte of Data	high byte.
Low Byte of Data	low byte.

Error operation salve return:

	Explain
Unit Identifier	设备地址
Function Code + 0x80	错误帧功能码
Error Code	故障码

4. Parameter address table

Address Register	variable	Belong to R/W	Data format	Data Model	Remarks
Meter					
0000H 0001H	Active power of A phase(Grid Meter)	R	Occupy 4 byte	int	1w/bit
0002H 0003H	Active power of B phase(Grid Meter)	R	Occupy 4 byte	int	1w/bit
0004H 0005H	Active power of C phase(Grid Meter)	R	Occupy 4 byte	int	1w/bit
0006H 0007H	Total Active power(Grid Meter)	R	Occupy 4byte	int	1w/bit
0008H 0009H	Total energy feed to grid(Grid Meter)	R	Occupy 4 byte	unsigned int	0.01KWh/bit
000AH 000BH	Total energy consume from grid(Grid Meter)	R	Occupy 4 byte	unsigned int	0.01KWh/bit
000CH 000DH	Active power of A phase(PV Meter)	R	Occupy 4 byte	int	1w/bit
000EH 000FH	Active power of B phase(PV Meter)	R	Occupy 4 byte	int	1w/bit
0010H 0011H	Active power of C phase(PV Meter)	R	Occupy 4 byte	int	1w/bit
0012H 0013H	Total Active power(PV Meter)	R	Occupy 4 byte	int	1w/bit
0014H 0015H	Total energy feed to grid(PV Meter)	R	Occupy 4 byte	unsigned int	0.01KWh/bit
0016H	Grid Meter CT Enable	R/W	Occupy 2byte	unsigned short	1/bit
0017H	Grid Meter CT Rate	R/W	Occupy 2byte	unsigned short	1/bit
0018H	PV Meter CT Enable	R/W	Occupy 2byte	unsigned short	1/bit
0019H	PV Meter CT Rate	R/W	Occupy 2byte	unsigned short	1/bit
Household Battery					
0100H	Battery voltage	R	Occupy 2 byte	unsigned short	0.1V/bit

0101H	Battery current	R	Occupy 2 byte	short	0.1A/bit
0102H	Battery SOC	R	Occupy 2 byte	unsigned short	0.1/bit
0103H	Battery status	R	Occupy 2 byte	unsigned short	Note1
0104H	Battery relay status	R	Occupy 2 byte	unsigned short	Note2
0105H	Pack ID of min cell voltage	R	Occupy 2 byte	unsigned short	0.001V/bit
0106H	Cell ID of min cell voltage	R	Occupy 2 byte	unsigned short	0.001V/bit
0107H	Min cell voltage	R	Occupy 2 byte	unsigned short	0.001V/bit
0108H	Pack ID of max cell voltage	R	Occupy 2 byte	unsigned short	0.001V/bit
0109H	Cell ID of max cell voltage	R	Occupy 2 byte	unsigned short	0.001V/bit
010AH	Max cell voltage	R	Occupy 2 byte	unsigned short	0.001V/bit
010BH	Pack ID of min cell temperature	R	Occupy 2 byte	unsigned short	0.1℃/bit
010CH	Cell ID of min cell temperature	R	Occupy 2 byte	unsigned short	0.1℃/bit
010DH	Min cell temperature	R	Occupy 2 byte	short	0.1℃/bit
010EH	Pack ID of max cell temperature	R	Occupy 2 byte	unsigned short	0.1℃/bit
010FH	Cell ID of max cell temperature	R	Occupy 2 byte	unsigned short	0.1℃/bit
0110H	Max cell temperature	R	Occupy 2 byte	short	0.1℃/bit
0111H	Battery max charge current	R	Occupy 2 byte	unsigned short	0.1A/bit
0112H	Battery max discharge current	R	Occupy 2 byte	unsigned short	0.1A/bit
0113H	Battery charge cut-off voltage	R	Occupy 2 byte	unsigned short	0.1V/bit

0114H	Battery discharge cut-off voltage	R	Occupy 2 byte	unsigned short	0.1V/bit
0115H	BMU software version	R	Occupy 2 byte	unsigned short	
0116H	LMU software version	R	Occupy 2 byte	unsigned short	
0117H	ISO software version	R	Occupy 2 byte	unsigned short	
0118H	Battery num	R	Occupy 2 byte	unsigned short	Battery module number
0119H	Battery capacity	R	Occupy 2 byte	unsigned short	0.1KWH/bit
011AH	Battery type	R	Occupy 2 byte	unsigned short	Note3
011BH	Battery SOH	R	Occupy 2 byte	unsigned short	0.1/bit
011CH 011DH	Battery warning	R	Occupy 4 byte	unsigned int	Reserve
011EH 011FH	Battery fault	R	Occupy 4 byte	unsigned int	Note4
0120H 0121H	Battery charge energy	R/W	Occupy 4 byte	unsigned int	0.1KWH/bit
0122H 0123H	Battery discharge energy	R/W	Occupy 4 byte	unsigned int	0.1KWH/bit
0124H 0125H	Battery energy charge from grid	R/W	Occupy 4 byte	unsigned int	0.1KWH/bit
0126H	Battery Power	R	Occupy 2 byte	short	1W/bit（ -：Charge、 +：Discharge）
0127H	Battery remaining time	R	Occupy 2 byte	unsigned short	1Minute/bit
0128H	Battery Implementation Charge SOC	R	Occupy 2 byte	unsigned short	0.1/bit(Rate_SOC-UPS_SOC)
0129H	Battery Implementation Discharge SOC	R	Occupy 2 byte	unsigned short	0.1/bit(Rate_SOC-UPS_SOC)
012AH	Battery Remaining Charge SOC	R	Occupy 2 byte	unsigned short	0.1/bit(Rate_SOC-Remain_SOC)
012BH	Battery Remaining Discharge SOC	R	Occupy 2 byte	unsigned short	0.1/bit(Remain_SOC - UPS_SOC)
012CH	Battery Max charge power	R	Occupy 2 byte	unsigned short	1W/bit

012DH	Battery Max Discharge power	R	Occupy 2 byte	unsigned short	1W/bit
012EH	Battery MOS Control	R/W	Occupy 2 byte	unsigned short	0:Open, 1:Close
012FH	Battery SOC Calibration	R	Occupy 2 byte	unsigned short	0:Disable, 1: Enable
0130H	Battery Single cut error code	R	Occupy 2 byte	unsigned short	
Household Inverter					
0400H	Inverter_Voltage_L1	R	Occupy 2 byte	unsigned short	0.1V/bit
0401H	Inverter _Voltage_L2	R	Occupy 2 byte	unsigned short	0.1V/bit
0402H	Inverter_Voltage_L3	R	Occupy 2 byte	unsigned short	0.1V/bit
0403H	Inverter_Current_L1	R	Occupy 2 byte	short	0.1A/bit
0404H	Inverter_Current_L2	R	Occupy 2 byte	short	0.1A/bit
0405H	Inverter_Current_L3	R	Occupy 2 byte	short	0.1A/bit
0406H 0407H	Inverter_Power_L1	R	Occupy 4 byte	int	1W/bit
0408H 0409H	Inverter_Power_L2	R	Occupy 4 byte	int	1W/bit
040AH 040BH	Inverter_Power_L3	R	Occupy 4 byte	int	1W/bit
040CH 040DH	Inverter_Power_Total	R	Occupy 4 byte	int	1W/bit
040EH	Inverter_Backup_Voltage_L1	R	Occupy 2 byte	unsigned short	0.1V/bit
040FH	Inverter_Backup_Voltage_L2	R	Occupy 2 byte	unsigned short	0.1V/bit
0410H	Inverter_Backup_Voltage_L3	R	Occupy 2 byte	unsigned short	0.1V/bit
0411H	Inverter_Backup_Current_L 1	R	Occupy 2 byte	unsigned short	0.1A/bit

0412H	Inverter_Backup_Current_L2	R	Occupy 2 byte	unsigned short	0.1A/bit
0413H	Inverter_Backup_Current_L3	R	Occupy 2 byte	unsigned short	0.1A/bit
0414H 0415H	Inverter_Backup_Power_L1	R	Occupy 4 byte	unsigned int	1W/bit
0416H 0417H	Inverter_Backup_Power_L2	R	Occupy 4 byte	unsigned int	1W/bit
0418H 0419H	Inverter_Backup_Power_L3	R	Occupy 4 byte	unsigned int	1W/bit
041AH 041BH	Inverter_Backup_Power_Total	R	Occupy 4 byte	unsigned int	1W/bit
041CH	Inverter Grid Frequency	R	Occupy 2 byte	unsigned short	0.01Hz/bit
041DH	PV1 Voltage	R	Occupy 2 byte	unsigned short	0.1V/bit
041EH	PV1 Current	R	Occupy 2 byte	unsigned short	0.1A/bit
041FH 0420H	PV1 power	R	Occupy 4 byte	unsigned int	1w/bit
0421H	PV2 Voltage	R	Occupy 2 byte	unsigned short	0.1V/bit
0422H	PV2 Current	R	Occupy 2 byte	unsigned short	0.1A/bit
0423H 0424H	PV2 power	R	Occupy 4 byte	unsigned int	1w/bit
0425H	PV3 Voltage	R	Occupy 2 byte	unsigned short	0.1V/bit
0426H	PV3 Current	R	Occupy 2 byte	unsigned short	0.1A/bit
0427H 0428H	PV3 power	R	Occupy 4 byte	unsigned int	1w/bit
0429H	INV Temperature	R	Occupy 2 byte	unsigned short	0.1℃/bit
042AH 042BH	Inverter warning	R	Occupy 4 byte	unsigned int	Reserve
042CH 042DH	Inverter fault		Occupy 4 byte	unsigned int	Reserve
042EH 042FH	Inverter Totol PV Energy	R/W	Occupy 4 byte	unsigned int	0.1KWH/bit
0430H	Inverter work mode	R	Occupy 2 byte	unsigned short	Note5

0431H	PV Capacity of Inverter	R/W	Occupy 2byte	unsigned short	1W/bit
System					
0700H	Feed into grid percent	R/W	Occupy 2 byte	unsigned short	1%/bit
0701H 0702H	System fault	R	Occupy 4 byte	unsigned int	Note6
0703H	System_time：(year)-(month)	R/W	Occupy 2 byte	unsigned short	Data format hex; 0xYYMM, example：Send 0x1109; year:0x11(2017) month:0x09(09);
0704H	System_time：(day)-(hour)	R/W	Occupy 2 byte	unsigned short	Data format hex; 0xDDHH, example：Send 0x1109; day:0x11(The 17 day) hour:0x09(09);
0705H	System_time：(minute)-(second)	R/W	Occupy 2 byte	unsigned short	Data format hex; 0xmmss, example：Send 0x1109; min:0x11(17) second:0x09(09);
0706H	EMS SN byte1-2	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x414C==’AL’
0707H	EMS SN byte3-4	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x3132==’12’
0708H	EMS SN byte5-6	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x3132==’12’
0709H	EMS SN byte7-8	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x3132==’12’
070AH	EMS SN byte9-10	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x3132==’12’
070BH	EMS SN byte11-12	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x3132==’12’

070CH	EMS SN byte13-14	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x3132==’12’
070DH	EMS SN byte15-16	R	Occupy 2 byte	unsigned short	EMS SN :ASCII 0x3132==’12’
070EH	EMS DO0	W	Occupy 2 byte	unsigned short	Bypass Control function
070FH	EMS DO1	W	Occupy 2 byte	unsigned short	System fault output.
0710H	EMS DI0	R	Occupy 2 byte	unsigned short	EPO，Battery MOS cut off.
0711H	EMS DI1	R	Occupy 2 byte	unsigned short	Reserved
0712H	UPS Reserve Soc	R/W	Occupy 2 byte	unsigned short	0.1/bit
0713H	Time discharge start time1	R/W	Occupy 2 byte	unsigned short	1H/bit
0714H	Time discharge stop time1	R/W	Occupy 2 byte	unsigned short	1H/bit
0715H	Time discharge start time2	R/W	Occupy 2 byte	unsigned short	1H/bit
0716H	Time discharge stop time2	R/W	Occupy 2 byte	unsigned short	1H/bit
0717H	Charge Cut Soc	R/W	Occupy 2 byte	unsigned short	0.1/bit
0718H	Time charge start time1	R/W	Occupy 2 byte	unsigned short	1H/bit
0719H	Time charge stop time1	R/W	Occupy 2 byte	unsigned short	1H/bit
071AH	Time charge start time2	R/W	Occupy 2 byte	unsigned short	1H/bit
071BH	Time charge stop time2	R/W	Occupy 2 byte	unsigned short	1H/bit

071CH	System mode	R/W	Occupy 2 byte	unsigned short	1/bit
071DH	System laguage	R/W	Occupy 2 byte	unsigned short	1/bit
071EH 071FH	PV Capacity of pv inverter	R/W	Occupy 4 byte	unsigned int	1W/bit
0720H 0721H	PV Inverter Totol PV Energy	R/W	Occupy 4 byte	unsigned int	0.1KWH/bit
0722H	Dispatch Start	R/W	Occupy 2 byte	unsigned short	1:start；0：stop
0723H 0724H	Dispatch Active power	R/W	Occupy 4 byte	int	1W/bit Offset:32000 charge:<32000 discharge:>32000
0725H 0726H	Dispatch Reactive power	R/W	Occupy 4 byte	int	1Var/bit Offset:32000 charge:<32000 discharge:>32000
0727H	Dispatch Mode	R/W	Occupy 2 byte	unsigned short	Note7
0728H	Dispatch SOC	R/W	Occupy 2 byte	unsigned short	0.4%/bit example：Send SOC=95,corresponding to the SOC of 38%.
0729H	EMS Version High	R	Occupy 2 byte	unsigned short	
072AH	EMS Version Middle	R	Occupy 2 byte	unsigned short	
072BH	EMS Version Low	R	Occupy 2 byte	unsigned short	
072CH	User Mode	R/W	Occupy 2 byte	unsigned short	0：Green mode 1：Economic model 2：Secure mode
072DH	Battery Mode	R/W	Occupy 2 byte	unsigned short	0：Auto mode 1：Charge mode 2：Discharge mode 3：Standby mode

072EH	Set Battery Power	R/W	Occupy 2 byte	short	1W/bit Charge mode or Dis charge mode Set Battery Power
072FH	Set PV Power	R/W	Occupy 2 byte	unsigned short	Set Photovoltaic (pv) power
0730H	Echonet Enable	R/W	Occupy 2 byte	unsigned short	0:Disable 1:Enable
Safety TEST					
1000H	Grid_Regulation	R/W	Occupy 2 byte	unsigned short	Note8
1001H	Safety Test Enable	R/W	Occupy 2 byte	unsigned short	Safety Test Enable 0 ： Disable 1 ： Enable
1002H 1003H	Safety Mode Enable	R/W	Occupy 4 byte	unsigned int	Note9
1004H	Starting_slope	R/W	Occupy 2 byte	unsigned short	0.01%Pn/min
1005H	Phase state	R/W	Occupy 2 byte	unsigned short	0：advance 1：phase lag
1006H	PF Value	R/W	Occupy 2 byte	short	0.01
1007H	Volt-WATT Starting	R/W	Occupy 2 byte	unsigned short	0.1V
1008H	Volt-WATT Stop	R/W	Occupy 2 byte	unsigned short	0.1V
1009H	Set Battery Power	R/W	Occupy 2 byte	short	1W/bit Charge mode or Dis charge mode Set Battery Power
100AH	Set PV Power	R/W	Occupy 2 byte	unsigned short	Set Photovoltaic (pv) power supply network
100BH	Ovp	R/W	Occupy 2 byte	unsigned short	0.1V
100CH	OvpT	R/W	Occupy 2 byte	unsigned short	1ms

100DH	Ovp10	R/W	Occupy 2 byte	unsigned short	0.1V
100EH	Ovp10T	R/W	Occupy 2 byte	unsigned short	1S
100FH	Uvp	R/W	Occupy 2 byte	unsigned short	0.1V
1010H	UvpT	R/W	Occupy 2 byte	unsigned short	1ms
1011H	Uvp2	R/W	Occupy 2 byte	unsigned short	0.1V
1012H	Uvp2T	R/W	Occupy 2 byte	unsigned short	1ms
1013H	Ofp	R/W	Occupy 2 byte	unsigned short	0.01HZ
1014H	OfpT	R/W	Occupy 2 byte	unsigned short	1ms
1015H	Ofp2	R/W	Occupy 2 byte	unsigned short	0.01HZ
1016H	Ofp2T	R/W	Occupy 2 byte	unsigned short	1ms
1017H	Ufp	R/W	Occupy 2 byte	unsigned short	0.01HZ
1018H	UfpT	R/W	Occupy 2 byte	unsigned short	1ms
1019H	Ufp2	R/W	Occupy 2 byte	unsigned short	0.01HZ
101AH	Ufp2T	R/W	Occupy 2 byte	unsigned short	1ms
ATE TEST					
1100H	Reset Mode	W	Occupy 2 byte	unsigned short	0：None 1：Energy Reset 2：Meter Reset

					4：Factory Reset
Industry Battery					
A000H A001H	Topbmu SN	R	Occupy 4 byte	unsigned int	
A002H	Topbmu soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A003H	Topbmu protocol version	R	Occupy 2 byte	unsigned short	
A004H	Topbmu hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A005H	Topbmu max charge current	R	Occupy 2 byte	unsigned short	0.1A /bit
A006H	Topbmu max discharge current	R	Occupy 2 byte	unsigned short	0.1A /bit
A007H	Topbmu status flag	R	Occupy 2 byte	unsigned short	Note10
A008H	Topbmu max pole temperature	R	Occupy 2 byte	short	0.1℃/bit -40
A009H	Topbmu voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A00AH	Topbmu current	R	Occupy 2 byte	short	0.1 A/bit
A00BH	Topbmu insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A00CH	Topbmu SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A00DH	Topbmu SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit

A00EH	Topbmu min cell voltage	R	Occupy 2 byte	unsigned short	0.001v/bit
A00FH	Topbmu min cell voltage ID	R	Occupy 2 byte	unsigned short	
A010H	Topbmu max cell voltage	R	Occupy 2 byte	unsigned short	0.001v/bit
A011H	Topbmu max cell voltage ID	R	Occupy 2 byte	unsigned short	
A012H	Topbmu min cell temperature	R	Occupy 2 byte	short	0.1℃/bit -40
A013H	Topbmu min cell temperature ID	R	Occupy 2 byte	unsigned short	
A014H	Topbmu max cell temperature	R	Occupy 2 byte	short	0.1℃/bit -40
A015H	Topbmu max cell temperature ID	R	Occupy 2 byte	unsigned short	
A016H	Topbmu max pole temperature ID	R	Occupy 2 byte	unsigned short	
A017H	Topbmu version	R	Occupy 2 byte	unsigned short	22:TOPBMU-M48112-S/0:无 TOPBMU 42：TOPBMU-M38344-S/57：TOPBMU-M48240-S
A018H	Topbmu BMU version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086/56:HV900120-HE
A019H	Topbmu ISO version	R	Occupy 2 byte	unsigned short	14：LMU-M48112-S/25：LMU-M4856-S/37:LMU-M38210-S/49:M19360-S/40：LMU-M38344-S/55:

					LMU-M48240-S
A01AH	Topbmu LMU version	R	Occupy 2 byte	unsigned short	14：LMU-M48112-S/25：LMU-M4856-S/37:LMU-M38210-S/49:M19360-S/40：LMU-M38344-S/55:LMU-M48240-S
A01BH	Topbmu reset log	R	Occupy 2 byte	unsigned short	Note11
A01CH	Topbmu restarts number	R	Occupy 2 byte	unsigned short	
A01DH	Topbmu clusters number	R	Occupy 2 byte	unsigned short	
A01EH~ A0FFH					Reserve
A100H A101H	Toperror charge over current cluster high	R	Occupy 4 byte	unsigned int	
A102H A103H	Toperror charge over current cluster low	R	Occupy 4 byte	unsigned int	
A104H A105H	Toperror discharge over current cluster high	R	Occupy 4 byte	unsigned int	
A106H A107H	Toperror discharge over current cluster low	R	Occupy 4 byte	unsigned int	
A108H A109H	Toperror pole over current cluster high	R	Occupy 4 byte	unsigned int	
A10AH A10BH	Toperror pole over current cluster low	R	Occupy 4 byte e	unsigned int	
A10CH A10DH	Toperror cell over temperature cluster high	R	Occupy 4 byte	unsigned int	
A10EH A10FH	Toperror cell over temperature cluster low	R	Occupy 4 byte	unsigned int	

A110H A111H	Toperror charge low temperature cluster high	R	Occupy 4 byte	unsigned int	
A112H A113H	Toperror charge low temperature cluster low	R	Occupy 4 byte	unsigned int	
A114H A115H	Toperror discharge low temperature cluster high	R	Occupy 4 byte	unsigned int	
A116H A117H	Toperror discharge low temperature cluster low	R	Occupy 4 byte	unsigned int	
A118H A119H	Toperror cell over voltage cluster high	R	Occupy 4 byte	unsigned int	
A11AH A11BH	Toperror cell over voltage cluster low	R	Occupy 4 byte	unsigned int	
A11CH A11DH	Toperror cell under voltage cluster high	R	Occupy 4 byte	unsigned int	
A11EH A11FH	Toperror cell under voltage cluster low	R	Occupy 4 byte	unsigned int	
A120H A121H	Toperror cell temperature difference cluster high	R	Occupy 4 byte	unsigned int	
A122H A123H	Toperror cell temperature difference cluster low	R	Occupy 4 byte	unsigned int	
A124H A125H	Toperror cell voltage difference cluster high	R	Occupy 4 byte	unsigned int	
A126H A127H	Toperror cell voltage difference cluster low	R	Occupy 4 byte	unsigned int	
A128H A129H	Toperror insulation cluster high	R	Occupy 4 byte	unsigned int	
A12AH A12BH	Toperror insulation cluster low	R	Occupy 4 byte	unsigned int	
A12CH A12DH	Toperror LMU communication failure cluster high	R	Occupy 4 byte	unsigned int	
A12EH A12FH	Toperror LMU communication failure cluster low	R	Occupy 4 byte	unsigned int	

A130H A131H	Toperror temperature sensor failure cluster high	R	Occupy 4 byte	unsigned int	
A132H A133H	Toperror temperature sensor failure cluster low	R	Occupy 4 byte	unsigned int	
A134H A135H	Toperror Wireharness failure cluster high	R	Occupy 4 byte	unsigned int	
A136H A137H	Toperror Wireharness failure cluster low	R	Occupy 4 byte	unsigned int	
A138H A139H	Toperror high voltage box communication failure cluster high	R	Occupy 4 byte	unsigned int	
A13AH A13BH	Toperror high voltage box communication failure cluster low	R	Occupy 4 byte	unsigned int	
A13CH A13DH	Toperror total pressure detect cluster high	R	Occupy 4 byte	unsigned int	
A13EH A13FH	Toperror total pressure detect cluster low	R	Occupy 4 byte	unsigned int	
A140H A141H	Toperror relay failure cluster high	R	Occupy 4 byte	unsigned int	
A142H A143H	Toperror relay failure cluster low	R	Occupy 4 byte	unsigned int	
A144H A145H	Toperror cluster excision cluster high	R	Occupy 4 byte	unsigned int	
A146H A147H	Toperror cluster excision cluster low	R	Occupy 4 byte	unsigned int	
A148H A149H	Toperror ISO communication failure cluster high	R	Occupy 4 byte	unsigned int	
A14AH A14BH	Toperror ISO communication failure cluster low	R	Occupy 4 byte	unsigned int	
A14CH A14DH	Toperror LMU SN repeat cluster high	R	Occupy 4 byte	unsigned int	
A14EH A14FH	Toperror LMU SN repeat cluster low	R	Occupy 4 byte	unsigned int	

A150H A151H	Toperror LMU ID repeat cluster high	R	Occupy 4 byte	unsigned int	
A152H A153H	Toperror LMU ID repeat cluster low	R	Occupy 4 byte	unsigned int	
A154H A155H	Toperror LMU ID discontinuity cluster high	R	Occupy 4 byte	unsigned int	
A156H A157H	Toperror LMU ID discontinuity cluster low	R	Occupy 4 byte	unsigned int	
A158H A159H	Toperror current sensor failure cluster high	R	Occupy 4 byte	unsigned int	
A15AH A15BH	Toperror current sensor failure cluster low	R	Occupy 4 byte	unsigned int	
A15CH A15DH	Toperror no LMU failure cluster high	R	Occupy 4 byte	unsigned int	
A15EH A15FH	Toperror no LMU failure cluster low	R	Occupy 4 byte	unsigned int	
A160H A161H	Toperror no bottom failure cluster high	R	Occupy 4 byte	unsigned int	
A162H A163H	Toperror no bottom failure cluster low	R	Occupy 4 byte	unsigned int	
A164H A165H	Toperror force close relay failure cluster high	R	Occupy 4 byte	unsigned int	
A166H A167H	Toperror force close relay failure cluster low	R	Occupy 4 byte	unsigned int	
A168H A169H	Toperror force close relay mode cluster high	R	Occupy 4 byte	unsigned int	
A16AH A16BH	Toperror force close relay mode cluster low	R	Occupy 4 byte	unsigned int	
A16CH A16DH	Toperror factory test mode cluster high	R	Occupy 4 byte	unsigned int	
A16EH A16FH	Toperror factory test mode cluster low	R	Occupy 4 byte	unsigned int	

A170H A171H	Toperror bmu warn and state cluster	R	Occupy 2 byte	unsigned short	Note12
A172H~ A1FFH					Reserve
A200H A201H	Bmu01 SN	R	Occupy 4 byte	unsigned int	
A202H	Bmu01 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A203H	Bmu01 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A204H	Bmu01 state	R	Occupy 2 byte	unsigned short	Note13
A205H	Bmu01 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A206H	Bmu01 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A207H	Bmu01 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A208H	Bmu01 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A209H	Bmu01 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
A20AH A20BH	Bmu01 LMU communication failure	R	Occupy 4 byte	unsigned int	
A20CH A20DH	Bmu01 temperature sensor failure	R	Occupy 4 byte	unsigned int	
A20EH A20FH	Bmu01 wireharness failure	R	Occupy 4 byte	unsigned int	
A210H A211H	Bmu01 equalization	R	Occupy 4 byte	unsigned int	
A212H A213H	Bmu01 equalization mos failure	R	Occupy 4 byte	unsigned int	

A214H	Bmu01 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
A215H	Bmu01 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A216H A217H	Bmu01 Passive equalization	R	Occupy 4 byte	unsigned int	
A218H A219H	Bmu01 BOOST equalization	R	Occupy 4 byte	unsigned int	
A21AH A21BH	Bmu01 BUCK equalization	R	Occupy 4 byte	unsigned int	
A21CH	Bmu01 LMU number	R	Occupy 2 byte	unsigned short	
A21DH	Bmu01 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
A21EH	Bmu01 reset log	R	Occupy 2 byte	unsigned short	Note15
A21FH	Bmu01 restarts number	R	Occupy 2 byte	unsigned short	
A220H	Bmu01 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
A221H	Bmu01 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A222H	Bmu01 min cell voltage ID	R	Occupy 2 byte	unsigned short	
A223H	Bmu01 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A224H	Bmu01 max cell voltage ID	R	Occupy 2 byte	unsigned short	

A225H	Bmu01 min cell temperature	R	Occupy 2 byte	short	
A226H	Bmu01 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A227H	Bmu01 max cell temperature	R	Occupy 2 byte	short	
A228H	Bmu01 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A229H~ A2FFH					Reserve
A300H A301H	Bmu02 SN	R	Occupy 4 byte	unsigned int	
A302H	Bmu02 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A303H	Bmu02 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A304H	Bmu02 state	R	Occupy 2 byte	unsigned short	Note13
A305H	Bmu02 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A306H	Bmu02 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A307H	Bmu02 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A308H	Bmu02 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A309H	Bmu02 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
A30AH A30BH	Bmu02 LMU communication failure	R	Occupy 4 byte	unsigned int	
A30CH A30DH	Bmu02 temperature sensor failure	R	Occupy 4 byte	unsigned int	

A30EH A30FH	Bmu02 wireharness failure	R	Occupy 4 byte	unsigned int	
A310H A311H	Bmu02 equalization	R	Occupy 4 byte	unsigned int	
A312H A313H	Bmu02 equalization mos failure	R	Occupy 4 byte	unsigned int	
A314H	Bmu02 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
A315H	Bmu02 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A316H A317H	Bmu02 Passive equalization	R	Occupy 4 byte	unsigned int	
A318H A319H	Bmu02 BOOST equalization	R	Occupy 4 byte	unsigned int	
A31AH A31BH	Bmu02 BUCK equalization	R	Occupy 4 byte	unsigned int	
A31CH	Bmu02 LMU number	R	Occupy 2 byte	unsigned short	
A31DH	Bmu02 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
A31EH	Bmu02 reset log	R	Occupy 2 byte	unsigned short	Note15
A31FH	Bmu02 restarts number	R	Occupy 2 byte	unsigned short	
A320H	Bmu02 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
A321H	Bmu02 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V

A322H	Bmu02 min cell voltage ID	R	Occupy 2 byte	unsigned short	
A323H	Bmu02 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A324H	Bmu02 max cell voltage ID	R	Occupy 2 byte	unsigned short	
A325H	Bmu02 min cell temperature	R	Occupy 2 byte	short	
A326H	Bmu02 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A327H	Bmu02 max cell temperature	R	Occupy 2 byte	short	
A328H	Bmu02 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A329H~ A3FFH					Reserve
A400H A401H	Bmu03 SN	R	Occupy 4 byte	unsigned int	
A402H	Bmu03 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A403H	Bmu03 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A404H	Bmu03 state	R	Occupy 2 byte	unsigned short	Note13
A405H	Bmu03 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A406H	Bmu03 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A407H	Bmu03 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A408H	Bmu03 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit

A409H	Bmu03 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
A40AH A40BH	Bmu03 LMU communication failure	R	Occupy 4 byte	unsigned int	
A40CH A40DH	Bmu03 temperature sensor failure	R	Occupy 4 byte	unsigned int	
A40EH A40FH	Bmu03 wireharness failure	R	Occupy 4 byte	unsigned int	
A410H A411H	Bmu03 equalization	R	Occupy 4 byte	unsigned int	
A412H A413H	Bmu03 equalization mos failure	R	Occupy 4 byte	unsigned int	
A414H	Bmu03 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
A415H	Bmu03 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A416H A417H	Bmu03 Passive equalization	R	Occupy 4 byte	unsigned int	
A418H A419H	Bmu03 BOOST equalization	R	Occupy 4 byte	unsigned int	
A41AH A41BH	Bmu03 BUCK equalization	R	Occupy 4 byte	unsigned int	
A41CH	Bmu03 LMU number	R	Occupy 2 byte	unsigned short	
A41DH	Bmu03 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
A41EH	Bmu03 reset log	R	Occupy 2 byte	unsigned short	Note15
A41FH	Bmu03 restarts number	R	Occupy 2 byte	unsigned short	
A420H	Bmu03 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-

					HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
A421H	Bmu03 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A422H	Bmu03 min cell voltage ID	R	Occupy 2 byte	unsigned short	
A423H	Bmu03 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A424H	Bmu03 max cell voltage ID	R	Occupy 2 byte	unsigned short	
A425H	Bmu03 min cell temperature	R	Occupy 2 byte	short	
A426H	Bmu03 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A427H	Bmu03 max cell temperature	R	Occupy 2 byte	short	
A428H	Bmu03 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A429H~ A4FFH					Reserve
A500H A501H	Bmu04 SN	R	Occupy 4 byte	unsigned int	
A502H	Bmu04 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A503H	Bmu04 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A504H	Bmu04 state	R	Occupy 2 byte	unsigned short	Note13
A505H	Bmu04 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit

A506H	Bmu04 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A507H	Bmu04 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A508H	Bmu04 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A509H	Bmu04 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
A50AH A50BH	Bmu04 LMU communication failure	R	Occupy 4 byte	unsigned int	
A50CH A50DH	Bmu04 temperature sensor failure	R	Occupy 4 byte	unsigned int	
A50EH A50FH	Bmu04 wireharness failure	R	Occupy 4 byte	unsigned int	
A510H A511H	Bmu04 equalization	R	Occupy 4 byte	unsigned int	
A512H A513H	Bmu04 equalization mos failure	R	Occupy 4 byte	unsigned int	
A514H	Bmu04 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
A515H	Bmu04 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A516H A517H	Bmu04 Passive equalization	R	Occupy 4 byte	unsigned int	
A518H A519H	Bmu04 BOOST equalization	R	Occupy 4 byte	unsigned int	
A51AH A51BH	Bmu04 BUCK equalization	R	Occupy 4 byte	unsigned int	
A51CH	Bmu04 LMU number	R	Occupy 2 byte	unsigned short	
A51DH	Bmu04 single cut fault code	R	Occupy 2 byte	unsigned short	Note14

A51EH	Bmu04 reset log	R	Occupy 2 byte	unsigned short	Note15
A51FH	Bmu04 restarts number	R	Occupy 2 byte	unsigned short	
A520H	Bmu04 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
A521H	Bmu04 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A522H	Bmu04 min cell voltage ID	R	Occupy 2 byte	unsigned short	
A523H	Bmu04 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A524H	Bmu04 max cell voltage ID	R	Occupy 2 byte	unsigned short	
A525H	Bmu04 min cell temperature	R	Occupy 2 byte	short	
A526H	Bmu04 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A527H	Bmu04 max cell temperature	R	Occupy 2 byte	short	
A528H	Bmu04 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A529H~ A5FF					Reserve
A600H A601H	Bmu05 SN	R	Occupy 4 byte	unsigned int	
A602H	Bmu05 soft version	R	Occupy 2 byte	unsigned short	0.01/bit

A603H	Bmu05 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A604H	Bmu05 state	R	Occupy 2 byte	unsigned short	Note13
A605H	Bmu05 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A606H	Bmu05 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A607H	Bmu05 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A608H	Bmu05 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A609H	Bmu05 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
A60AH A60BH	Bmu05 LMU communication failure	R	Occupy 4 byte	unsigned int	
A60CH A60DH	Bmu05 temperature sensor failure	R	Occupy 4 byte	unsigned int	
A60EH A60FH	Bmu05 wireharness failure	R	Occupy 4 byte	unsigned int	
A610H A611H	Bmu05 equalization	R	Occupy 4 byte	unsigned int	
A612H A613H	Bmu05 equalization mos failure	R	Occupy 4 byte	unsigned int	
A614H	Bmu05 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
A615H	Bmu05 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A616H A617H	Bmu05 Passive equalization	R	Occupy 4 byte	unsigned int	
A618H A619H	Bmu05 BOOST equalization	R	Occupy 4 byte	unsigned int	

A61AH A61BH	Bmu05 BUCK equalization	R	Occupy 4 byte	unsigned int	
A61CH	Bmu05 LMU number	R	Occupy 2 byte	unsigned short	
A61DH	Bmu05 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
A61EH	Bmu05 reset log	R	Occupy 2 byte	unsigned short	Note15
A61FH	Bmu05 restarts number	R	Occupy 2 byte	unsigned short	
A620H	Bmu05 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
A621H	Bmu05 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A622H	Bmu05 min cell voltage ID	R	Occupy 2 byte	unsigned short	
A623H	Bmu05 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A624H	Bmu05 max cell voltage ID	R	Occupy 2 byte	unsigned short	
A625H	Bmu05 min cell temperature	R	Occupy 2 byte	short	
A626H	Bmu05 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A627H	Bmu05 max cell temperature	R	Occupy 2 byte	short	
A628H	Bmu05 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40

A629H~ A6FFH					Reserve
A700H A701H	Bmu06 SN	R	Occupy 4 byte	unsigned int	
A702H	Bmu06 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A703H	Bmu06 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A704H	Bmu06 state	R	Occupy 2 byte	unsigned short	Note13
A705H	Bmu06 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A706H	Bmu06 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A707H	Bmu06 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A708H	Bmu06 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A709H	Bmu06 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
A70AH A70BH	Bmu06 LMU communication failure	R	Occupy 4 byte	unsigned int	
A70CH A70DH	Bmu06 temperature sensor failure	R	Occupy 4 byte	unsigned int	
A70EH A70FH	Bmu06 wireharness failure	R	Occupy 4 byte	unsigned int	
A710H A711H	Bmu06 equalization	R	Occupy 4 byte	unsigned int	
A712H A713H	Bmu06 equalization mos failure	R	Occupy 4 byte	unsigned int	
A714H	Bmu06 ISO soft version	R	Occupy 2 byte	unsigned short	0.01

A715H	Bmu06 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A716H A717H	Bmu06 Passive equalization	R	Occupy 4 byte	unsigned int	
A718H A719H	Bmu06 BOOST equalization	R	Occupy 4 byte	unsigned int	
A71AH A71BH	Bmu06 BUCK equalization	R	Occupy 4 byte	unsigned int	
A71CH	Bmu06 LMU number	R	Occupy 2 byte	unsigned short	
A71DH	Bmu06 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
A71EH	Bmu06 reset log	R	Occupy 2 byte	unsigned short	Note15
A71FH	Bmu06 restarts number	R	Occupy 2 byte	unsigned short	
A720H	Bmu06 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
A721H	Bmu06 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A722H	Bmu06 min cell voltage ID	R	Occupy 2 byte	unsigned short	
A723H	Bmu06 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A724H	Bmu06 max cell voltage ID	R	Occupy 2 byte	unsigned short	
A725H	Bmu06 min cell temperature	R	Occupy 2 byte	short	

A726H	Bmu06 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A727H	Bmu06 max cell temperature	R	Occupy 2 byte	short	
A728H	Bmu06 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A729H A7FFH					Reserve
A800H A801H	Bmu07 SN	R	Occupy 4 byte	unsigned int	
A802H	Bmu07 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A803H	Bmu07 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A804H	Bmu07 state	R	Occupy 2 byte	unsigned short	Note13
A805H	Bmu07 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A806H	Bmu07 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A807H	Bmu07 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A808H	Bmu07 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A809H	Bmu07 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
A80AH A80BH	Bmu07 LMU communication failure	R	Occupy 4 byte	unsigned int	
A80CH A80DH	Bmu07 temperature sensor failure	R	Occupy 4 byte	unsigned int	
A80EH A80FH	Bmu07 wireharness failure	R	Occupy 4 byte	unsigned int	

A810H A811H	Bmu07 equalization	R	Occupy 4 byte	unsigned int	
A812H A813H	Bmu07 equalization mos failure	R	Occupy 4 byte	unsigned int	
A814H	Bmu07 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
A815H	Bmu07 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A816H A817H	Bmu07 Passive equalization	R	Occupy 4 byte	unsigned int	
A818H A819H	Bmu07 BOOST equalization	R	Occupy 4 byte	unsigned int	
A81AH A81BH	Bmu07 BUCK equalization	R	Occupy 4 byte	unsigned int	
A81CH	Bmu07 LMU number	R	Occupy 2 byte	unsigned short	
A81DH	Bmu07 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
A81EH	Bmu07 reset log	R	Occupy 2 byte	unsigned short	Note15
A81FH	Bmu07 restarts number	R	Occupy 2 byte	unsigned short	
A820H	Bmu07 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
A821H	Bmu07 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A822H	Bmu07 min cell voltage ID	R	Occupy 2 byte	unsigned short	

A823H	Bmu07 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A824H	Bmu07 max cell voltage ID	R	Occupy 2 byte	unsigned short	
A825H	Bmu07 min cell temperature	R	Occupy 2 byte	short	
A826H	Bmu07 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A827H	Bmu07 max cell temperature	R	Occupy 2 byte	short	
A828H	Bmu07 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A829H~ A8FFH					Reserve
A900H A901H	Bmu08 SN	R	Occupy 4 byte	unsigned int	
A902H	Bmu08 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
A903H	Bmu08 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
A904H	Bmu08 state	R	Occupy 2 byte	unsigned short	Note13
A905H	Bmu08 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
A906H	Bmu08 cluster current	R	Occupy 2 byte	short	0.1 A/bit
A907H	Bmu08 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
A908H	Bmu08 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
A909H	Bmu08 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit

A90AH A90BH	Bmu08 LMU communication failure	R	Occupy 4 byte	unsigned int	
A90CH A90DH	Bmu08 temperature sensor failure	R	Occupy 4 byte	unsigned int	
A90EH A90FH	Bmu08 wireharness failure	R	Occupy 4 byte	unsigned int	
A910H A911H	Bmu08 equalization	R	Occupy 4 byte	unsigned int	
A912H A913H	Bmu08 equalization mos failure	R	Occupy 4 byte	unsigned int	
A914H	Bmu08 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
A915H	Bmu08 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
A916H A917H	Bmu08 Passive equalization	R	Occupy 4 byte	unsigned int	
A918H A919H	Bmu08 BOOST equalization	R	Occupy 4 byte	unsigned int	
A91AH A91BH	Bmu08 BUCK equalization	R	Occupy 4 byte	unsigned int	
A91CH	Bmu08 LMU number	R	Occupy 2 byte	unsigned short	
A91DH	Bmu08 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
A91EH	Bmu08 reset log	R	Occupy 2 byte	unsigned short	Note15
A91FH	Bmu08 restarts number	R	Occupy 2 byte	unsigned short	
A920H	Bmu08 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-

					HV90086
A921H	Bmu08 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A922H	Bmu08 min cell voltage ID	R	Occupy 2 byte	unsigned short	
A923H	Bmu08 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
A924H	Bmu08 max cell voltage ID	R	Occupy 2 byte	unsigned short	
A925H	Bmu08 min cell temperature	R	Occupy 2 byte	short	
A926H	Bmu08 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A927H	Bmu08 max cell temperature	R	Occupy 2 byte	short	
A928H	Bmu08 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
A929H~ A9FFH					Reserve
AA00H AA01H	Bmu09 SN	R	Occupy 4 byte	unsigned int	
AA02H	Bmu09 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
AA03H	Bmu09 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
AA04H	Bmu09 state	R	Occupy 2 byte	unsigned short	Note13
AA05H	Bmu09 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
AA06H	Bmu09 cluster current	R	Occupy 2 byte	short	0.1 A/bit

AA07H	Bmu09 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
AA08H	Bmu09 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
AA09H	Bmu09 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
AA0AH AA0BH	Bmu09 LMU communication failure	R	Occupy 4 byte	unsigned int	
AA0CH AA0DH	Bmu09 temperature sensor failure	R	Occupy 4 byte	unsigned int	
AA0EH AA0FH	Bmu09 wireharness failure	R	Occupy 4 byte	unsigned int	
AA10H AA11H	Bmu09 equalization	R	Occupy 4 byte	unsigned int	
AA12H AA13H	Bmu09 equalization mos failure	R	Occupy 4 byte	unsigned int	
AA14H	Bmu09 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
AA15H	Bmu03 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
AA16H AA17H	Bmu09 Passive equalization	R	Occupy 4 byte	unsigned int	
AA18H AA19H	Bmu09 BOOST equalization	R	Occupy 4 byte	unsigned int	
AA1AH AA1BH	Bmu09 BUCK equalization	R	Occupy 4 byte	unsigned int	
AA1CH	Bmu09 LMU number	R	Occupy 2 byte	unsigned short	
AA1DH	Bmu09 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
AA1EH	Bmu09 reset log	R	Occupy 2 byte	unsigned short	Note15

AA1FH	Bmu09 restarts number	R	Occupy 2 byte	unsigned short	
AA20H	Bmu09 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
AA21H	Bmu09 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AA22H	Bmu09 min cell voltage ID	R	Occupy 2 byte	unsigned short	
AA23H	Bmu09 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AA24H	Bmu09 max cell voltage ID	R	Occupy 2 byte	unsigned short	
AA25H	Bmu09 min cell temperature	R	Occupy 2 byte	short	
AA26H	Bmu09 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AA27H	Bmu09 max cell temperature	R	Occupy 2 byte	short	
AA28H	Bmu09 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AA29H~ AAFFH					Reserve
AB00H AB01H	Bmu10 SN	R	Occupy 4 byte	unsigned int	
AB02H	Bmu10 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
AB03H	Bmu10 hard version	R	Occupy 2 byte	unsigned short	0.01/bit

AB04H	Bmu10 state	R	Occupy 2 byte	unsigned short	Note13
AB05H	Bmu10 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
AB06H	Bmu10 cluster current	R	Occupy 2 byte	short	0.1 A/bit
AB07H	Bmu10 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
AB08H	Bmu10 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
AB09H	Bmu10 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
AB0AH AB0BH	Bmu10 LMU communication failure	R	Occupy 4 byte	unsigned int	
AB0CH AB0DH	Bmu10 temperature sensor failure	R	Occupy 4 byte	unsigned int	
AB0EH AB0FH	Bmu10 wireharness failure	R	Occupy 4 byte	unsigned int	
AB10H AB11H	Bmu10 equalization	R	Occupy 4 byte	unsigned int	
AB12H AB13H	Bmu10 equalization mos failure	R	Occupy 4 byte	unsigned int	
AB14H	Bmu10 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
AB15H	Bmu10 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
AB16H AB17H	Bmu10 Passive equalization	R	Occupy 4 byte	unsigned int	
AB18H AB19H	Bmu10 BOOST equalization	R	Occupy 4 byte	unsigned int	
AB1AH AB1BH	Bmu10 BUCK equalization	R	Occupy 4 byte	unsigned int	

AB1CH	Bmu10 LMU number	R	Occupy 2 byte	unsigned short	
AB1DH	Bmu10 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
AB1EH	Bmu10 reset log	R	Occupy 2 byte	unsigned short	Note15
AB1FH	Bmu10 restarts number	R	Occupy 2 byte	unsigned short	
AB20H	Bmu10 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
AB21H	Bmu10 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AB22H	Bmu10 min cell voltage ID	R	Occupy 2 byte	unsigned short	
AB23H	Bmu10 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AB24H	Bmu10 max cell voltage ID	R	Occupy 2 byte	unsigned short	
AB25H	Bmu10 min cell temperature	R	Occupy 2 byte	short	
AB26H	Bmu10 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AB27H	Bmu10 max cell temperature	R	Occupy 2 byte	short	
AB28H	Bmu10 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AB29H~ ABFFH					Reserve

AC00H AC01H	Bmu11 SN	R	Occupy 4 byte	unsigned int	
AC02H	Bmu11 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
AC03H	Bmu11 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
AC04H	Bmu11 state	R	Occupy 2 byte	unsigned short	Note13
AC05H	Bmu11 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
AC06H	Bmu11 cluster current	R	Occupy 2 byte	short	0.1 A/bit
AC07H	Bmu11 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
AC08H	Bmu11 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
AC09H	Bmu11 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
AC0AH AC0BH	Bmu11 LMU communication failure	R	Occupy 4 byte	unsigned int	
AC0CH AC0DH	Bmu11 temperature sensor failure	R	Occupy 4 byte	unsigned int	
AC0EH AC0FH	Bmu11 wireharness failure	R	Occupy 4 byte	unsigned int	
AC10H AC11H	Bmu11 equalization	R	Occupy 4 byte	unsigned int	
AC12H AC13H	Bmu11 equalization mos failure	R	Occupy 4 byte	unsigned int	
AC14H	Bmu11 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
AC15H	Bmu11 ISO hard version	R	Occupy 2 byte	unsigned short	0.01

AC16H AC17H	Bmu11 Passive equalization	R	Occupy 4 byte	unsigned int	
AC18H AC19H	Bmu11 BOOST equalization	R	Occupy 4 byte	unsigned int	
AC1AH AC1BH	Bmu11 BUCK equalization	R	Occupy 4 byte	unsigned int	
AC1CH	Bmu10 LMU number	R	Occupy 2 byte	unsigned short	
AC1DH	Bmu11 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
AC1EH	Bmu11 reset log	R	Occupy 2 byte	unsigned short	Note15
AC1FH	Bmu11 restarts number	R	Occupy 2 byte	unsigned short	
AC20H	Bmu11 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
AC21H	Bmu11 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AC22H	Bmu11 min cell voltage ID	R	Occupy 2 byte	unsigned short	
AC23H	Bmu11 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AC24H	Bmu11 max cell voltage ID	R	Occupy 2 byte	unsigned short	
AC25H	Bmu11 min cell temperature	R	Occupy 2 byte	short	
AC26H	Bmu11 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40

AC27H	Bmu11 max cell temperature	R	Occupy 2 byte	short	
AC28H	Bmu11 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AC29H~ ACFFH					Reserve
AD00H AD01H	Bmu12 SN	R	Occupy 4 byte	unsigned int	
AD02H	Bmu12 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
AD03H	Bmu12 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
AD04H	Bmu12 state	R	Occupy 2 byte	unsigned short	Note13
AD05H	Bmu12 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
AD06H	Bmu12 cluster current	R	Occupy 2 byte	short	0.1 A/bit
AD07H	Bmu12 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
AD08H	Bmu12 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
AD09H	Bmu12 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
AD0AH AD0BH	Bmu12 LMU communication failure	R	Occupy 4 byte	unsigned int	
AD0CH AD0DH	Bmu12 temperature sensor failure	R	Occupy 4 byte	unsigned int	
AD0EH AD0FH	Bmu12 wireharness failure	R	Occupy 4 byte	unsigned int	
AD10H AD11H	Bmu12 equalization	R	Occupy 4 byte	unsigned int	

AD12H AD13H	Bmu12 equalization mos failure	R	Occupy 4 byte	unsigned int	
AD14H	Bmu12 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
AD15H	Bmu12 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
AD16H AD17H	Bmu12 Passive equalization	R	Occupy 4 byte	unsigned int	
AD18H AD19H	Bmu12 BOOST equalization	R	Occupy 4 byte	unsigned int	
AD1AH AD1BH	Bmu12 BUCK equalization	R	Occupy 4 byte	unsigned int	
AD1CH	Bmu12 LMU number	R	Occupy 2 byte	unsigned short	
AD1DH	Bmu12 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
AD1EH	Bmu12 reset log	R	Occupy 2 byte	unsigned short	Note15
AD1FH	Bmu12 restarts number	R	Occupy 2 byte	unsigned short	
AD20H	Bmu12 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
AD21H	Bmu12 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AD22H	Bmu12 min cell voltage ID	R	Occupy 2 byte	unsigned short	
AD23H	Bmu12 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V

AD24H	Bmu12 max cell voltage ID	R	Occupy 2 byte	unsigned short	
AD25H	Bmu12 min cell temperature	R	Occupy 2 byte	short	
AD26H	Bmu12 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AD27H	Bmu12 max cell temperature	R	Occupy 2 byte	short	
AD28H	Bmu12 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AD29H~ ADFFH					Reserve
AE00H AE01H	Bmu13 SN	R	Occupy 4 byte	unsigned int	
AE02H	Bmu13 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
AE03H	Bmu13 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
AE04H	Bmu13 state	R	Occupy 2 byte	unsigned short	Note13
AE05H	Bmu13 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
AE06H	Bmu13 cluster current	R	Occupy 2 byte	short	0.1 A/bit
AE07H	Bmu13 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
AE08H	Bmu13 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
AE09H	Bmu13 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
AE0AH AE0BH	Bmu13 LMU communication failure	R	Occupy 4 byte	unsigned int	

AE0CH AE0DH	Bmu13 temperature sensor failure	R	Occupy 4 byte	unsigned int	
AE0EH AE0FH	Bmu13 wireharness failure	R	Occupy 4 byte	unsigned int	
AE10H AE11H	Bmu13 equalization	R	Occupy 4 byte	unsigned int	
AE12H AE13H	Bmu13 equalization mos failure	R	Occupy 4 byte	unsigned int	
AE14H	Bmu13 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
AE15H	Bmu13 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
AE16H AE17H	Bmu13 Passive equalization	R	Occupy 4 byte	unsigned int	
AE18H AE19H	Bmu13 BOOST equalization	R	Occupy 4 byte	unsigned int	
AE1AH AE1BH	Bmu13 BUCK equalization	R	Occupy 4 byte	unsigned int	
AE1CH	Bmu13 LMU number	R	Occupy 2 byte	unsigned short	
AE1DH	Bmu13 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
AE1EH	Bmu13reset log	R	Occupy 2 byte	unsigned short	Note15
AE1FH	Bmu13 restarts number	R	Occupy 2 byte	unsigned short	
AE20H	Bmu13 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086

AE21H	Bmu13 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AE22H	Bmu13 min cell voltage ID	R	Occupy 2 byte	unsigned short	
AE23H	Bmu13 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AE24H	Bmu13 max cell voltage ID	R	Occupy 2 byte	unsigned short	
AE25H	Bmu13 min cell temperature	R	Occupy 2 byte	short	
AE26H	Bmu13 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AE27H	Bmu13 max cell temperature	R	Occupy 2 byte	short	
AE28H	Bmu13 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AE29H~ AEFFH					Reserve
AF00H AF01H	Bmu14 SN	R	Occupy 4 byte	unsigned int	
AF02H	Bmu14 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
AF03H	Bmu14 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
AF04H	Bmu14 state	R	Occupy 2 byte	unsigned short	Note13
AF05H	Bmu14 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
AF06H	Bmu14 cluster current	R	Occupy 2 byte	short	0.1 A/bit
AF07H	Bmu14 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit

AF08H	Bmu14 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
AF09H	Bmu14 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
AF0AH AF0BH	Bmu14 LMU communication failure	R	Occupy 4 byte	unsigned int	
AF0CH AF0DH	Bmu14 temperature sensor failure	R	Occupy 4 byte	unsigned int	
AF0EH AF0FH	Bmu14 wireharness failure	R	Occupy 4 byte	unsigned int	
AF10H AF11H	Bmu14 equalization	R	Occupy 4 byte	unsigned int	
AF12H AF13H	Bmu14 equalization mos failure	R	Occupy 4 byte	unsigned int	
AF14H	Bmu14 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
AF15H	Bmu14 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
AF16H AF17H	Bmu14 Passive equalization	R	Occupy 4 byte	unsigned int	
AF18H AF19H	Bmu14 BOOST equalization	R	Occupy 4 byte	unsigned int	
AF1AH AF1BH	Bmu14 BUCK equalization	R	Occupy 4 byte	unsigned int	
AF1CH	Bmu14 LMU number	R	Occupy 2 byte	unsigned short	
AF1DH	Bmu14single cut fault code	R	Occupy 2 byte	unsigned short	Note14
AF1EH	Bmu14 reset log	R	Occupy 2 byte	unsigned short	Note15
AF1FH	Bmu14 restarts number	R	Occupy 2 byte	unsigned short	

AF20H	Bmu14 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
AF21H	Bmu14 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AF22H	Bmu14 min cell voltage ID	R	Occupy 2 byte	unsigned short	
AF23H	Bmu14 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
AF24H	Bmu14 max cell voltage ID	R	Occupy 2 byte	unsigned short	
AF25H	Bmu14 min cell temperature	R	Occupy 2 byte	short	
AF26H	Bmu14 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AF27H	Bmu14 max cell temperature	R	Occupy 2 byte	short	
AF28H	Bmu14 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
AF29H~ AFFFH					Reserve
B000H B001H	Bmu15 SN	R	Occupy 4 byte	unsigned int	
B002H	Bmu15 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
B003H	Bmu15 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
B004H	Bmu15 state	R	Occupy 2 byte	unsigned short	Note13

B005H	Bmu15 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
B006H	Bmu15 cluster current	R	Occupy 2 byte	short	0.1 A/bit
B007H	Bmu15 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
B008H	Bmu15 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
B009H	Bmu15 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
B00AH B00BH	Bmu15 LMU communication failure	R	Occupy 4 byte	unsigned int	
B00CH B00DH	Bmu15 temperature sensor failure	R	Occupy 4 byte	unsigned int	
B00EH B00FH	Bmu15 wireharness failure	R	Occupy 4 byte	unsigned int	
B010H B011H	Bmu15 equalization	R	Occupy 4 byte	unsigned int	
B012H B013H	Bmu15 equalization mos failure	R	Occupy 4 byte	unsigned int	
B014H	Bmu15 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
B015H	Bmu15 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
B016H B017H	Bmu15 Passive equalization	R	Occupy 4 byte	unsigned int	
B018H B019H	Bmu15 BOOST equalization	R	Occupy 4 byte	unsigned int	
B01AH B01BH	Bmu15 BUCK equalization	R	Occupy 4 byte	unsigned int	
B01CH	Bmu15 LMU number	R	Occupy 2 byte	unsigned short	

B01DH	Bmu15 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
B01EH	Bmu15 reset log	R	Occupy 2 byte	unsigned short	Note15
B01FH	Bmu15 restarts number	R	Occupy 2 byte	unsigned short	
B020H	Bmu15 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
B021H	Bmu15 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B022H	Bmu15 min cell voltage ID	R	Occupy 2 byte	unsigned short	
B023H	Bmu15 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B024H	Bmu15 max cell voltage ID	R	Occupy 2 byte	unsigned short	
B025H	Bmu15 min cell temperature	R	Occupy 2 byte	short	
B026H	Bmu15 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B027H	Bmu15 max cell temperature	R	Occupy 2 byte	short	
B028H	Bmu15 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B029H~ B0FFH					Reserve
B100H B101H	Bmu16 SN	R	Occupy 4 byte	unsigned int	

B102H	Bmu16 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
B103H	Bmu16 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
B104H	Bmu16 state	R	Occupy 2 byte	unsigned short	Note13
B105H	Bmu16 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
B106H	Bmu16 cluster current	R	Occupy 2 byte	short	0.1 A/bit
B107H	Bmu16 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
B108H	Bmu16 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
B109H	Bmu16 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
B10AH B10BH	Bmu16 LMU communication failure	R	Occupy 4 byte	unsigned int	
B10CH B10DH	Bmu16 temperature sensor failure	R	Occupy 4 byte	unsigned int	
B10EH B10FH	Bmu16 wireharness failure	R	Occupy 4 byte	unsigned int	
B110H B111H	Bmu16 equalization	R	Occupy 4 byte	unsigned int	
B112H B113H	Bmu16 equalization mos failure	R	Occupy 4 byte	unsigned int	
B114H	Bmu16 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
B115H	Bmu16 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
B116H B117H	Bmu16 Passive equalization	R	Occupy 4 byte	unsigned int	

B118H B119H	Bmu16 BOOST equalization	R	Occupy 4 byte	unsigned int	
B11AH B11BH	Bmu16 BUCK equalization	R	Occupy 4 byte	unsigned int	
B11CH	Bmu16 LMU number	R	Occupy 2 byte	unsigned short	
B11DH	Bmu16 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
B11EH	Bmu16 reset log	R	Occupy 2 byte	unsigned short	Note15
B11FH	Bmu16 restarts number	R	Occupy 2 byte	unsigned short	
B120H	Bmu16 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
B121H	Bmu16 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B122H	Bmu16 min cell voltage ID	R	Occupy 2 byte	unsigned short	
B123H	Bmu16 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B124H	Bmu16 max cell voltage ID	R	Occupy 2 byte	unsigned short	
B025H	Bmu16 min cell temperature	R	Occupy 2 byte	short	
B126H	Bmu16 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B127H	Bmu16 max cell temperature	R	Occupy 2 byte	short	

B128H	Bmu16 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B129H~ B1FFH					Reserve
B200H B201H	Bmu17 SN	R	Occupy 4 byte	unsigned int	
B202H	Bmu17 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
B203H	Bmu17 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
B204H	Bmu17 state	R	Occupy 2 byte	unsigned short	Note13
B205H	Bmu17 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
B206H	Bmu17 cluster current	R	Occupy 2 byte	short	0.1 A/bit
B207H	Bmu17 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
B208H	Bmu17 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
B209H	Bmu17 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
B20AH B20BH	Bmu17 LMU communication failure	R	Occupy 4 byte	unsigned int	
B20CH B20DH	Bmu17 temperature sensor failure	R	Occupy 4 byte	unsigned int	
B20EH B20FH	Bmu17 wireharness failure	R	Occupy 4 byte	unsigned int	
B210H B211H	Bmu17 equalization	R	Occupy 4 byte	unsigned int	
B212H B213H	Bmu17 equalization mos failure	R	Occupy 4 byte	unsigned int	

B214H	Bmu17 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
B215H	Bmu17 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
B216H B217H	Bmu17 Passive equalization	R	Occupy 4 byte	unsigned int	
B218H B219H	Bmu17 BOOST equalization	R	Occupy 4 byte	unsigned int	
B21AH B21BH	Bmu17 BUCK equalization	R	Occupy 4 byte	unsigned int	
B21CH	Bmu17 LMU number	R	Occupy 2 byte	unsigned short	
B21DH	Bmu17 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
B21EH	Bmu17 reset log	R	Occupy 2 byte	unsigned short	Note15
B21FH	Bmu17 restarts number	R	Occupy 2 byte	unsigned short	
B220H	Bmu17 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
B221H	Bmu17 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B222H	Bmu17 min cell voltage ID	R	Occupy 2 byte	unsigned short	
B223H	Bmu17 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B224H	Bmu17 max cell voltage ID	R	Occupy 2 byte	unsigned short	

B225H	Bmu17 min cell temperature	R	Occupy 2 byte	short	
B226H	Bmu17 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B227H	Bmu17 max cell temperature	R	Occupy 2 byte	short	
B228H	Bmu17 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B229H~ B2FFH					Reserve
B300H B301H	Bmu18 SN	R	Occupy 4 byte	unsigned int	
B302H	Bmu18 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
B303H	Bmu18 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
B304H	Bmu18 state	R	Occupy 2 byte	unsigned short	Note13
B305H	Bmu18 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
B306H	Bmu18 cluster current	R	Occupy 2 byte	short	0.1 A/bit
B307H	Bmu18 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
B308H	Bmu18 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
B309H	Bmu18 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
B30AH B30BH	Bmu18 LMU communication failure	R	Occupy 4 byte	unsigned int	
B30CH B30DH	Bmu18 temperature sensor failure	R	Occupy 4 byte	unsigned int	

B30EH B30FH	Bmu18 wireharness failure	R	Occupy 4 byte	unsigned int	
B310H B311H	Bmu18 equalization	R	Occupy 4 byte	unsigned int	
B312H B313H	Bmu18 equalization mos failure	R	Occupy 4 byte	unsigned int	
B314H	Bmu18 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
B315H	Bmu18 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
B316H B317H	Bmu18 Passive equalization	R	Occupy 4 byte	unsigned int	
B318H B319H	Bmu18 BOOST equalization	R	Occupy 4 byte	unsigned int	
B31AH B31BH	Bmu18 BUCK equalization	R	Occupy 4 byte	unsigned int	
B31CH	Bmu18 LMU number	R	Occupy 2 byte	unsigned short	
B31DH	Bmu18 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
B31EH	Bmu18 reset log	R	Occupy 2 byte	unsigned short	Note15
B31FH	Bmu18 restarts number	R	Occupy 2 byte	unsigned short	
B320H	Bmu18 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
B321H	Bmu18 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V

B322H	Bmu18 min cell voltage ID	R	Occupy 2 byte	unsigned short	
B323H	Bmu18 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B024H	Bmu18 max cell voltage ID	R	Occupy 2 byte	unsigned short	
B325H	Bmu18 min cell temperature	R	Occupy 2 byte	short	
B326H	Bmu18 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B327H	Bmu18 max cell temperature	R	Occupy 2 byte	short	
B328H	Bmu18 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B329H~ B3FFH					Reserve
B400H B401H	Bmu19 SN	R	Occupy 4 byte	unsigned int	
B402H	Bmu19 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
B403H	Bmu19 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
B404H	Bmu19 state	R	Occupy 2 byte	unsigned short	Note13
B405H	Bmu19 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit
B406H	Bmu19 cluster current	R	Occupy 2 byte	short	0.1 A/bit
B407H	Bmu19 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
B408H	Bmu19 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit

B409H	Bmu19 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
B40AH B40BH	Bmu19 LMU communication failure	R	Occupy 4 byte	unsigned int	
B40CH B40DH	Bmu19 temperature sensor failure	R	Occupy 4 byte	unsigned int	
B40EH B40FH	Bmu19 wireharness failure	R	Occupy 4 byte	unsigned int	
B410H B411H	Bmu19 equalization	R	Occupy 4 byte	unsigned int	
B412H B413H	Bmu19 equalization mos failure	R	Occupy 4 byte	unsigned int	
B414H	Bmu19 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
B415H	Bmu19 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
B416H B417H	Bmu19 Passive equalization	R	Occupy 4 byte	unsigned int	
B418H B419H	Bmu19 BOOST equalization	R	Occupy 4 byte	unsigned int	
B41AH B41BH	Bmu19 BUCK equalization	R	Occupy 4 byte	unsigned int	
B41CH	Bmu19 LMU number	R	Occupy 2 byte	unsigned short	
B41DH	Bmu19 single cut fault code	R	Occupy 2 byte	unsigned short	Note14
B41EH	Bmu19 reset log	R	Occupy 2 byte	unsigned short	Note15
B41FH	Bmu19 restarts number	R	Occupy 2 byte	unsigned short	
B420H	Bmu19 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-

					HV50056/38:BMU-HV900105/50:HV900120/41： BMU-HV90086
B421H	Bmu19 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B422H	Bmu19 min cell voltage ID	R	Occupy 2 byte	unsigned short	
B423H	Bmu19 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B424H	Bmu19 max cell voltage ID	R	Occupy 2 byte	unsigned short	
B425H	Bmu19 min cell temperature	R	Occupy 2 byte	short	
B426H	Bmu19 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B427H	Bmu19 max cell temperature	R	Occupy 2 byte	short	
B428H	Bmu19 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B429H~ B4FFH					Reserve
B500H B501H	Bmu20 SN	R	Occupy 4 byte	unsigned int	
B502H	Bmu20 soft version	R	Occupy 2 byte	unsigned short	0.01/bit
B503H	Bmu20 hard version	R	Occupy 2 byte	unsigned short	0.01/bit
B504H	Bmu20 state	R	Occupy 2 byte	unsigned short	Note13
B505H	Bmu20 cluster voltage	R	Occupy 2 byte	unsigned short	0.1 V/bit

B506H	Bmu20 cluster current	R	Occupy 2 byte	short	0.1 A/bit
B507H	Bmu20 insulated resistance	R	Occupy 2 byte	unsigned short	1 kΩ/bit
B508H	Bmu20 SOC	R	Occupy 2 byte	unsigned short	0.4 %/bit
B509H	Bmu20 SOH	R	Occupy 2 byte	unsigned short	0.4 %/bit
B50AH B50BH	Bmu20 LMU communication failure	R	Occupy 4 byte	unsigned int	
B50CH B50DH	Bmu20 temperature sensor failure	R	Occupy 4 byte	unsigned int	
B50EH B50FH	Bmu20 wireharness failure	R	Occupy 4 byte	unsigned int	
B510H B511H	Bmu20 equalization	R	Occupy 4 byte	unsigned int	
B512H B513H	Bmu20 equalization mos failure	R	Occupy 4 byte	unsigned int	
B514H	Bmu20 ISO soft version	R	Occupy 2 byte	unsigned short	0.01
B515H	Bmu20 ISO hard version	R	Occupy 2 byte	unsigned short	0.01
B516H B517H	Bmu20 Passive equalization	R	Occupy 4 byte	unsigned int	
B518H B519H	Bmu20 BOOST equalization	R	Occupy 4 byte	unsigned int	
B51AH B51BH	Bmu20BUCK equalization	R	Occupy 4 byte	unsigned int	
B51CH	Bmu20 LMU number	R	Occupy 2 byte	unsigned short	
B51DH	Bmu20 single cut fault code	R	Occupy 2 byte	unsigned short	Note14

B51EH	Bmu20 reset log	R	Occupy 2 byte	unsigned short	Note15
B51FH	Bmu20 restarts number	R	Occupy 2 byte	unsigned short	
B520H	Bmu20 version	R	Occupy 2 byte	unsigned short	15：BMU-HV900112/26：BMU-HV50056/38:BMU-HV900105/50:HV900120/41：BMU-HV90086
B521H	Bmu20 min cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B522H	Bmu20 min cell voltage ID	R	Occupy 2 byte	unsigned short	
B523H	Bmu20 max cell voltage	R	Occupy 2 byte	unsigned short	0.001V
B524H	Bmu20 max cell voltage ID	R	Occupy 2 byte	unsigned short	
B525H	Bmu20 min cell temperature	R	Occupy 2 byte	short	
B526H	Bmu20 min cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B527H	Bmu20 max cell temperature	R	Occupy 2 byte	short	
B528H	Bmu20 max cell temperature ID	R	Occupy 2 byte	unsigned short	0.1℃/bit -40
B529H~B5FFH					Reserve

5.Annex

Note1： Battery status

	Description	
Value	Charge	Discharge
0	0	0
1	0	1
256	1	0
257	1	1
512	2	0
513	2	1

Note2： Battery relay status

Value	Description
0	Charge discharge relays are disconnected
1	Only discharge relay is closed
2	Only charge relay is closed
3	Charge and discharge relays are closed

Note3： Battery type

Battery_ID	Battery product model
2	M4860
3	M48100
13	48112-P
16	Smile5-BAT
24	M4856-P
27	Smile-BAT-10.3P
30	Smile-BAT-10.1P
33	Smile-BAT-5.8P
34	Smile-BAT5-JP
35	Smile-BAT-13.7P

Note4： battery fault

Fault code	Description
Bit 0	
Bit 1	
Bit 2	Cell Temp Differ
Bit 3	Balancer Fault

Bit 4	Charge Over Current
Bit 5	Balancer Mos Fault
Bit 6	Dischage Over Current
Bit 7	Pole Over Temp
Bit 8	Cell Over Volt
Bit 9	Cell Volt Differ
Bit 10	Discharge Low Temp
Bit 11	
Bit 12	Cell Low Volt
Bit 13	ISO Comm Fault
Bit 14	LMU SN Repeat
Bit 15	
Bit 16	IR Fault
Bit 17	LMU Comm Fault
Bit 18	Cell Over Temp
Bit 19	BMU Comm Fault
Bit 20	
Bit 21	Charge Low Temp
Bit 22	
Bit 23	Volt Detect Fault
Bit 24	Wire Harness Fault
Bit 25	
Bit 26	Relay Fault
Bit 27	LMU ID Repeat
Bit 28	LMU ID Discontinuous
Bit 29	Current Sensor Fault
Bit 30	
Bit 31	Temp Sensor Fault

Note5: Inverter work mode

Value	Description
0	Wait Mode
1	Online Mode
2	UPS Mode
3	Bypass Mode
4	Fault Mode

Note6: System fault

Alarm code	Description		
	EMS SN byte1-2	AL	AE
Bit 0		Network Card_Fault	Inverter Disconnect
Bit 1		Rtc_Fault	Grid Meter Disconnect

Bit 2	E2prom_Fault	Battery Disconnect
Bit 3	INV_Comms_Error	System Not Set
Bit 4	Grid_Meter_Lost	PV Meter Disconnect
Bit 5	PV_Meter_Lost	Meter Not Set
Bit 6	BMS_Lost	Wrong direction of the pv_meter's connection
Bit 7	UPS_Battery_Volt_Low	SD not inserted or SD write error
Bit 8	Backup_Overload	RTC error
Bit 9	INV_Slave_Lost	SDRAM error
Bit 10	INV_Master_Lost	MMC error（CH376）
Bit 11	Parallel_Comm_Error	network card error
Bit 12	Parallel_Mode_Differ	Extension CAN error (MCP2515)
Bit 13		DRED error
Bit 14		Android LCD disconnect
Bit 15		STS_Lost
Bit 16		STS_Fault
Bit 17		PV_INV_Lost:n
Bit 18		DG_PV_Conflict
Bit 19		PV_INV_Fault:n
Bit 20		AirConFault
Bit 21		Fire_Fault
Bit 22		FireControllerErr
Bit 23		GC_Fault
Bit 24		AirConLost
Bit 25		OverCurr
Bit 26		PcsModeFault
Bit 27		BatEnergyLow
Bit 28		
Bit 29		
Bit 30		
Bit 31		

Note7： Dispatch Mode

Mode value	Description
1	Battery only charges from PV；
2	State of Charge control；
3	Load Following；
4	Maximise Output；
5	Normal Mode；
6	Optimise Consumption；
7	Maximise Consumption
8	ECO Mode
9	FCAS Mode

10	PV Power Setting

Note8： Grid_Regulation

Safety code	Grid_Regulation	
	AL	AE
0	VDE0126	
1	ARN4105/11.18	
2	AS4777.2	
3	G83_2	
4	C10/C11	
5	TOR D4	
6	EN50438_NL	
7	EN50438_DK	
8	CEB	
9	CEI-021	
10	NRS097-2-1	
11	VDE0126_GREECE	
12	UTE_C15_712	
13	IEC61727	
14	G59_3	
15	RD1699	
16	G99	
17	Philippines_60HZ	
18	Tahiti_60HZ	
19	AS4777.2-SA	
20	G98	
21	EN50549	
22	PEA	
23	MEA	
24	BISI	
25	JET-GR Series	
26	JET-GR Series	
27	Taiwan	
28	DEFAULT_50HZ	
29	DEFAULT_60HZ	

Note9： Safety Mode Enable

Bit NO	Name	Description
Bit0	Volt-WATT Mode	Volt-watt response mode
Bit1	Volt-VAR Mode	Volt-var response mode
Bit2	Power Factor Curve Mode	Fixed power factor mode

Bit3	Volt-WATT when Charging Mode	Characteristic power factor curve for cos ϕ (P)
Bit4	Reactive power mode	Reactive power control mode
Bit5		
Bit6		
Bit7		
Bit8		
Bit9		
Bit10		
Bit11		
Bit12		
Bit13		
Bit14		
Bit15		

Note10： Topbmu status flag

Bit NO	**Name**	**Description**		
Bit0	Charge flag	00: forbid	01:allow	10:force charge
Bit1				
Bit2	Discharge flag	0:forbid	1:allow	
Bit3	SOC calibration mode	0:exit	1: entry	
Bit4~7	reserve			

Note11： Topbmu reset log

Bit NO	**Name**	**Description**
Bit0	Error code	Power on reset
Bit1		Under voltage reset
Bit2		Main reset pin reset
Bit3		Soft reset
Bit4		Configuration mismatch reset
Bit5		Watchdog timer reset
Bit6~7	type	1:reset
Bit8~15	reset log	1~20

Note12： Toperror bmu warn and state cluster

Bit NO	**Name**	**Description**	
Bit0	Bmu SN repeat	0:normal	1:fault
Bit1	Bmu ID repeat	0:normal	1:fault
Bit2	Bmu ID discontinuity	0:normal	1:fault
Bit3	Lmu number inconsistent	0:normal	1:fault
Bit4	EMS communication lose	0:normal	1:fault
Bit5	total pressure anomaly detection	0:normal	1:fault
Bit6	Parallel failure detection	0:normal	1:fault
Bit7	No bmu warning	0:normal	1:fault

Bit8	Ems communication lose enable flag	0:disable	1:enable
Bit9	LMU Version inconsistency	0: consistent	1: inconsistent
Bit10	ISO Version inconsistency	0: consistent	1: inconsistent
Bit11	BMU Version inconsistency	0: consistent	1: inconsistent
Bit12~15	reserve		

Note13： Bmu-X state

Bit NO	Name	Description	
Bit0	Main relay status	0:off	1:on
Bit1	Precharge relay status	0:off	1:on
Bit2	Status of breaker	0:off	1:on
Bit3	Negative relay status	0:off	1:on
Bit4~7	reserve		

Note14： Bmu-X single cut fault code

Bit NO	Name	Description		
Bit0~1	Resection state	00:normal	10:single cut	11:three cut
Bit3~8	single cut fault code	0:normal	12:topbmu communicate fail	
		1: Pole over temperature	13:temp sensor fail	
		2: cell over temperature	14:relay fail	
		3: charge low temperature	15:pcs communicate fail	
		4: discharge low temperature	16: Under voltage shutdown failure	
		5: Temperature difference	17: total pressure anomaly detection	
		6: cell over voltage	18：ISO communicate lose	
		7: cell low voltage	19:LMU SN repeat	
		8: charge over current	20:LMU ID repeat	
		9: discharge over current	21:LMU ID discontinuity	
		10: Insulation fail	22:current sensor fail	
		11: LMU communicate fail	23:EMS communicate lose	

Note15： Bmu-X reset log

Bit NO	Name	Description
Bit0	Error code	Power on reset
Bit1		Under voltage reset
Bit2		Main reset pin reset

Bit3		Soft reset
Bit4		Configuration mismatch reset
Bit5		Watchdog timer reset
Bit6~7	type	1:reset