BMS 与 PCS/UPS 通信协议(RS485)

Protocol of BMS With PCS/UPS

编制 Write	审核 Check	批准 Approved

版本记录 Revision Log

版本号 Version	修订内容 Revision	修订日期 Date	修订人 Author
V1.0	第一版	2018-4-5	
V1.1	1.增加在线机柜数据 2.增加在线机柜最高单体电压 3.增加干接点状态 4.增加电压极值和温度极值 5.增加可充电机柜数和可放电机柜数 6.增加配置寄存器 7.增加对产品序列号信息的读取 8.调整电池数据寄存器为每簇 32 个模组 9.增加 SBMS 运行状态中的剩余放电时间寄存器	2023-4-3	Mars
V1.2	1.RBMS 运行状态增加充放电使能和充放电功率信息	2023-6-9	Mars

目 录 Catalogue

1. 文档说明 Document description

本文档为 RS485 通信协议，基于 Modbus RTU，适用于 RBMS/SBMS 与外部 PCS/UPS/其它数据采集设备进行通信。

This document is an RS485 communication protocol based on Modbus RTU. It is suitable for communication between RBMS/SBMS and external PCS/UPS/other data acquisition devices.

2. 通信参数 Communication parameter

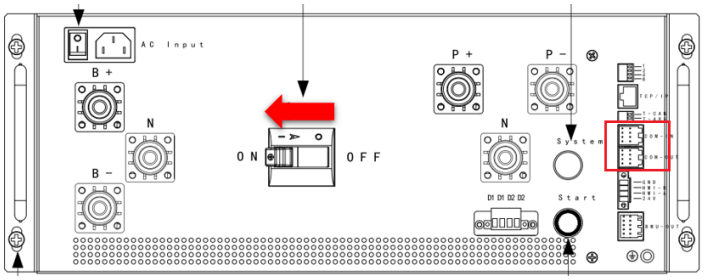
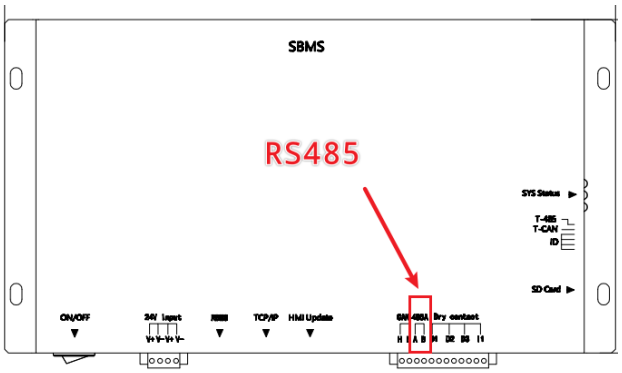
1 ．规定 RBMS/SBMS 作为从机，外部设备作为主机，通信由主机发起。

The RBMS/SBMS is specified as a slave, the external device is used as a host, and communication is initiated by the host.

2. PCS/UPS/数采设备通过将从机地址设置为 0x30 来读取 SBMS 数据。将从机地址设置为 1 来读取 1 号电池柜数据，设置为 2 来读取 2 号电池柜数据，依此类推

The PCS/UPS/data acquisition device reads the SBMS data by setting the slave address to 0x30. Set the slave address to 1 to read the No. 1 battery cabinet data, set to 2 to read the No. 2 battery cabinet data, and so on.

项 Item	参数 Parameter
通信链路 Communication link	RS485
通信配置 Communication arrangement	默认:9600 bps\8 位数据位\1 位停止位\无校验位,可通过上位机\HMI 修改波特率 Default:9600 bps\8-bit data bits\1 stop bit\no parity
通信接口 Communication Interface	RBMS:如下图红框处，COM-IN 和 COM-OUT，仅在单机模式下支持此协议 As shown below,COM-IN and COM-OUT port,only supported this protocol by working on single mode

项 Item	参数 Parameter
	  SBMS: 
字节序 Endian	Big Endian

PIN	1	2	3	4	5	6	7	8
Defintion	485-B	485-A	GND	CAN-L	CAN-H		GND	

3. 功能码定义 Function code definition

功能码 function code	描述 Description	
0x03	读多个寄存器 Read multiple registers	读取 BMS 系统的各项参数和状态信息 Read the parameters and status information of the BMS system
0x06	设置 Setting	

4. 帧定义 Frame definition

4.1 功能码=0x03 Function code=0x03

主机发送：The host sends

从机地址 Slave address (HEX,1Byte)	功能码 function code (HEX,1Byte)	寄存器起始地址 Register start address (HEX, 2Bytes)	寄存器数量 Number of registers (HEX,2Bytes)	CRC16 校验 CRC16 check (HEX,2Bytes)
1Byte	0x03	RegStart_H,RegStart_L	RegNum_H,RegNum_L	CRC_L,CRC_H

从机返回：The slave returns

从机地址 Slave address (HEX,1Byte)	功能码 function code (HEX,1Byte)	数据长度 Data length (HEX, 1Byte)	数据 Data (HEX,N Bytes)	CRC16 校验 CRC16 check (HEX,2Bytes)

从机地址 Slave address (HEX,1Byte)	功能码 function code (HEX,1Byte)	数据长度 Data length (HEX, 1Byte)	数据 Data (HEX,N Bytes)	CRC16 校验 CRC16 check (HEX,2Bytes)
1Byte	0x03	RegNum*2		CRC_L,CRC_H

5. 数据寄存器定义 Data register definition

5.1 SBMS 运行状态寄存器 Run status register（1000-1028）

寄存器地址 Register address (HEX)	含义 meaning	描述 description	备注 Remarks
1000	总电压 Total voltage	Unsinged	0.1 V
1001	充放电状态 Charge and discharge state	充电 charge：0x0011 放电 discharge：0x0022 静置 Stand still：0x0033	
1002	电流/正半簇电流(带中线应用) Current / positive half cluster current (with center-tap application)	Signed，放电为正，充电为负 The discharge is positive and the charge is negative	0.1A
1003	负半簇电流 Negative half cluster current	Signed，放电为正，充电为负 The discharge is positive and the charge is negative	0.1A
1004	正半簇电压 Positive half cluster voltage	Unsinged	0.1V
1005	负半簇电压 Negative half cluster voltage	Unsinged	0.1V
1006	电池组 SOC Battery pack SOC		1%
1007	电池组 SOH		1%

	Battery pack SOH		
1008	告警事件 Alarm event	See 5.2.1	
1009	一级保护事件 Primary protection event	See 5.2.2	
100A	二级保护事件 Secondary protection event	See 5.2.4	
100B	当前可用充电容量 Currently available charging capacity		kWh
100C	当前可用放电容量 Current available discharge capacity		kWh
100D	当前允许最大充电功率 Current maximum allowable charging power		kW
100E	当前允许最大放电功率 Current maximum allowable discharge power		kW
100F	系统状态 system status	正常运行 normal operation：0x0000 轻微异常 Minor abnormality：0x0001(Warning) 有一级保护 First level protection：0x0002(Alarm) 有二级保护 secondary protection: 0x0003 (Fault)	
1010	RBMS 通信状态 RBMS communication status	Bit0：1 号 RBMS 通信状态 Bit1：2 号 RBMS 通信状态 ... Bit11：12 号 RBMS 通信状态 Bit12~Bit~15：未使用	0：通信中断 Communication interruption 1：通信正常 Communication normal
1011	充电使能 Charging enable	0x0000: 禁止充电 No charging 0x0001: 允许充电 Allow charging	

1012	放电使能 Discharging enable	0x0000: 禁止放电 No discharging 0x0001: 允许放电 Allow discharging	
1013	在线机柜数目 Number of online cabinets		*在线是指自检通过并且主接触器或者放电接触器有一个闭合* Online means that the self-test passes and the main contactor or discharge contactor has a closed
1014	系统最高单体电压 System highest cell voltage		
1015	*系统最高单体电压所在机柜号* The cabinet number of the highest single cell voltage in the system		
1016	最高单体电压所在机柜内的模组号 The module number in the cabinet where the highest single voltage is located		
1017	最高单体电压所在模组内的编号 The number in the module where the highest cell voltage is located		
1018	系统最低单体电压 System minimum cell voltage		
1019	系统最低单体电压所在机柜号 The cabinet number of the lowest unit voltage of		

	the system		
101A	最低单体电压所在机柜内的模组号 The module number in the cabinet where the lowest cell voltage is located		
101B	最低单体电压所在模组内的编号 The number in the module where the lowest cell voltage is located		
101C	系统最高温度 System maximum temperature		
101D	系统最高温度所在机柜号 The cabinet number where the system maximum temperature is located		
101E	最高温度所在机柜内的模组号 The module number in the cabinet where the highest temperature is located		
101F	最高温度所在模组内的编号 The number in the module where the highest temperature is located		
1020	系统最低温度 System minimum temperature		
1021	系统最低温度所在机柜号 The cabinet temperature of the lowest system temperature		
1022	最低温度所在机柜内的模组号 The module number in the cabinet where the lowest temperature is located		
1023	最低温度所在模组内的编号		

	The number in the module where the lowest temperature is located		
1024	在线机柜最高单体电压 Maximum cabinet voltage in the online cabinet		
1025	干接点状态 Dry contact status	bit 0~bit 3 表示 4 路干接点输出状态，1 表示有效(闭合)，0 表示无效(断开) Bit 0~bit 3 indicates the output status of 4 dry contacts, 1 means valid (closed), 0 means invalid (disconnected) Bit 0:干接点 1 输出状态 Bit 0: dry contact 1 output status Bit 1:干接点 2 输出状态 Bit 1: dry contact 2 output status Bit 2:干接点 3 输出状态 *Bit 2: Dry contact 3 output status* Bit 3:干接点 4 输出状态 *Bit 3: Dry contact 4 output status* Bit 4~bit 7 保留 Bit 4~bit 7 reserved Bit 8~bit 11 表示 4 路干接点输入状态，1 表示有效，0 表示无效 Bit 8~bit 11 indicates the 4-way dry contact input status, 1 means valid, 0 means invalid. Bit 8:干接点 1 输入状态 *Bit 8: Dry contact 1 input status* Bit 9:干接点 2 输入状态 Bit 9: Dry contact 2 input	干接点 1 输出：充电器需关闭信号 Dry contact 1 output: the charger needs to turn off the signal 干接点 2 输出：锂电池系统异常信号 Dry contact 2 output: lithium battery system abnormal signal 干接点 3 输出：BCB 脱扣信号 Dry contact 3 output: BCB trip signal 干接点 1 输入：检测到此信号后 SBMS 下发指令通知各电池柜立即断开断路器 Dry contact 1 input: After detecting this signal, SBMS issues a command to notify each battery cabinet to immediately open the circuit breaker.

		status Bit 10:干接点 3 输入状态 Bit 10: Dry contact 3 input status Bit 11:干接点 4 输入状态 Bit 11: Dry contact 4 input status	
1026	可充电机柜数目 Number of rechargeable cabinets		
1027	可放电机柜数目 Number of dischargeable cabinets		
1028	剩余放电时间 Remaining backup time		mins

5.2 RBMS 单电池柜运行状态信息寄存器定义 Single battery cabinet operating status information register definition (1100~1123)

寄存器地址 Register address (HEX)	含义 Meaning	描述 Description
1100	总电压 Total Voltage	unsigned, 单位 Unit: 0.1V
1101	充放电状态 Charge and discharge status	充电 Charge: 0x0011 放电 Discharge: 0x0022 静置 Stand still: 0x0033
1102	BMS 自检状态 BMS Self-test status	自检成功 Self-test successful: 0xAAAA 自检失败 Self-test failed: 0xBBBB
1103~1104	BMU 工作状态 BMU working status	Bit0 表示 BMU 1,依次类推 Bit0 means BMU 1 and so on. 1: 对应 BMU 工作正常 1: The corresponding BMU works normally. 0: 对应 BMU 不存在或故障 0: Corresponding BMU does not exist or fails

1105	断路器/接触器状分合闸态 Circuit breaker/contactor-like switching state	bit 0~3: 断路器状态 Circuit breaker status bit 4~7: 正极主接触器状态 Positive main contactor status bit 8~11: 辅助放电接触器状态 Auxiliary discharge contactor status bit 12~15: 负极主接触器状态 Negative contactor state 状态定义: State definition 0000：断开 disconnect 0001：闭合 closed 0002：故障 Fault
1106	电流(带中线应用时为正半簇电流) Current (positive semi-clustered current with midline application)	signed, 单位 Unit: 0.1A，放电为正，充电为负 The discharge is positive and the charge is negative
1107	SOC	unsigned, 单位 Unit: 1%
1108	SOH	unsigned , 单位 Unit: 1%
1109	最高温度 Maximum temperature	signed, 单位 Unit: ℃
110A	最高温度所在模组编号 Module number of the highest temperature	unsigned, 取值 Value 1~32
110B	最高温度在模组内的编号 The highest temperature is the number in the module	unsigned, 取值 Value 1~8
110C	最低温度 lowest temperature	signed, 单位 Unit：℃
110D	最低温度所在模组编号 The lowest temperature is the module number	unsigned, 取值 Value 1~32
110E	最低温度在模组内的编号 The lowest temperature is the number in the module	unsigned, 取值 Value 1~8
110F	最高 Cell 电压 Maximum cell voltage	unsigned, 单位 Unit: mv
1110	最高 Cell 电压所在模组编号 Module number of the highest	unsigned, 取值 Value 1~32

	Cell voltage	
1111	最高 Cell 电压在模组内的编号 The number of the highest Cell voltage in the module	unsigned, 取值 Value 1~16
1112	最低 Cell 电压 Minimum cell voltage	unsigned, 单位 Unit: mv
1113	最低 Cell 电压所在模组编号 The module number of the lowest cell voltage	unsigned, 取值 Value 1~32
1114	最低 Cell 电压在模组内的编号 Minimum Cell voltage number in the module	unsigned, 取值 Value 1~16
1115	告警事件 Alarm event	定义见下 5.2.1 See 5.2.1 below for definition
1116	一级保护事件(断开接触器) Primary protection event (disconnect contactor)	定义见下 5.2.2 See 5.2.2 below for definition
1117	BMS 详细自检状态 BMS detailed self-test status	定义见下 5.2.3 See 5.2.3 below for definition
1118	BMU 1~16 通信状态 Communication status	每一位对应一个 BMU 的通信状态，为 1 表示通信正常，为 0 表示通信异常。Bit 0 对应 BMU 1，依此类推 The communication status of each bit corresponding to one BMU is 1 for communication and 0 for communication. Bit 0 corresponds to BMU 1, and so on.
1119	BMU 17~32 通信状态 Communication status	Bit 0 对应 BMU 17，依此类推 Bit 0 corresponds to BMU 17, and so on.
111A	BMU 1~16 电压状态 Voltage state	每一位对应一个 BMU 的电压状态，为 1 表示电压正常，为 0 表示电压异常。Bit 0 对应 BMU 1，依此类推 Each bit corresponds to a voltage state of a BMU, with 1 indicating that the voltage is normal and 0 indicating a voltage abnormality. Bit 0 corresponds to BMU 1, and so on.

111B	BMU 17~32 电压状态 Voltage state	Bit 0 对应 BMU 17，依此类推 Bit 0 corresponds to BMU 17, and so on.
111C	BMU 1~16 温度状态 Temperature state	每一位对应一个 BMU 的温度状态，为 1 表示温度正常，为 0 表示温度异常。Bit 0 对应 BMU 1，依此类推 Each bit corresponds to a BMU temperature state, with 1 indicating normal temperature and 0 indicating temperature anomaly. Bit 0 corresponds to BMU 1, and so on.
111D	BMU 17~32 温度状态 Temperature state	Bit 0 对应 BMU 17，依此类推 Bit 0 corresponds to BMU 17, and so on.
111E	二级保护事件(断开断路器) Secondary protection event (breaking circuit breaker)	定义见下 5.2.4 See 5.2.4 below for definition
111F	负半簇电流 Negative half cluster current	无中线应用时固定为 0. signed，单位：0.1A，放电为正，充电为负 When there is no centerline application, it is fixed to 0. signed, unit: 0.1A, discharge is positive, charging is negative
1120	充电使能控制 Charging enable	0xAAAA:允许充电(Charge enalbe) 0x5555:禁止充电(Charge disable)
1121	放电使能控制 Discharging enable	0xAAAA:允许放电(Discharge enalbe) 0x5555:禁止放电(Discharge disalbe)
1122	当前允许的最大充电功率 Current max charge power	单位(Unit):kW
1123	当前允许的最大放电功率 Current max discharge power	单位(Unit):kW

5.2.1 表 1：告警事件 Table 1: Warning events

1 有效，0 无效 1 is valid, 0 is invalid

位 bit	事件 event	描述 description
Bit0	整组过压 Total voltage high	总电压高于总电压过压告警值 The total voltage is higher than the total voltage overvoltage alarm value

Bit1	整组欠压 Total voltage low	总电压低于总电压欠压告警值 The total voltage is lower than the total voltage undervoltage alarm value
Bit2	充电过流 Charging overcurrent	充电时电流大于充电过流告警值 The current is greater than the charge overcurrent alarm value during charging
Bit3	放电过流 Discharge overcurrent	放电时电流大于放电过流告警值 The current is greater than the discharge overcurrent alarm value during discharge
Bit4	充电高温 Charging high temperature	电池温度高于高温告警值 Battery temperature is higher than high temperature alarm value
Bit5	充电低温 Charging low temperature	电池温度低于充电低温告警值 Battery temperature is lower than the charging low temperature alarm value
Bit6	BMU 通信故障 BMU communication failure	BMU 通信连续失败次数超过 BMU 通信故障告警值 The number of consecutive failures of BMU communication exceeds the BMU communication failure alarm value.
Bit7	RFU	RFU
Bit8	温度不均衡 Unbalanced temperature	串内最高温度和最低温度之差超过告警值 The difference between the highest temperature and the lowest temperature in the string exceeds the alarm value.
Bit9	电芯不均衡 Cell imbalance	电芯之间的压差大于告警值 The voltage difference between the cells is greater than the alarm value
Bit10	SOC 过低 SOC too low	SOC 低于告警值 SOC is lower than the alarm value
Bit11	绝缘等级低 Low insulation rating	绝缘电阻低于告警值 Insulation resistance is lower than the alarm value
Bit12	单体过压 Cell overpressure	单体电压高于过压告警值 The cell voltage is higher than the overvoltage alarm value
Bit13	单体欠压 Cell undervoltage	单体电压低于欠压告警值 The cell voltage is lower than the undervoltage alarm value

Bit 14	放电温度过高 The discharge temperature is too high	放电时温度高于告警值 The temperature at discharge is higher than the alarm value
Bit 15	放电温度过低 Discharge temperature is too low	放电时温度低于告警值 The temperature at discharge is lower than the alarm value

5.2.2 表 2: 一级保护事件 Table 2: Primary protection event

1 有效，0 无效 1 is valid, 0 is invalid

位 bit	事件 Event	描述 Description
Bit0	整组过压 Total voltage high	总电压高于总电压过压一级保护值 The total voltage is higher than the total voltage overvoltage first protection value
Bit1	整组欠压 Total voltage low	总电压低于总电压欠压一级保护值 The total voltage is lower than the total voltage undervoltage first protection value
Bit2	充电过流 Charging overcurrent	充电时电流大于充电过流一级保护值 The current when charging is greater than the protection level of the charging overcurrent
Bit3	放电过流 Discharge overcurrent	放电时电流大于放电过流一级保护值 The current at discharge is greater than the protection value of discharge overcurrent
Bit4	充电温度过高 Charging temperature is too high	电池温度高于高温一级保护值 Battery temperature is higher than the high temperature first protection value
Bit5	充电低温 Charging low temperature	电池温度低于充电低温一级保护值 The battery temperature is lower than the charging low temperature first protection value
Bit6	BMU 通信故障 BMU communication failure	BMU 通信连续失败超过 BMU 通信故障一级保护值 BMU communication continuous failure exceeds BMU communication failure level one protection value
Bit7	RFU	RFU

Bit8	温度不均衡 Unbalanced temperature	串内最高温度和最低温度之差超过一级保护值 The difference between the highest temperature and the lowest temperature in the string exceeds the primary protection value
Bit9	绝缘等级低 Low insulation rating	绝缘电阻低于一级保护值 Insulation resistance is lower than the primary protection value
Bit10	电芯不均衡 Cell imbalance	单体压差大于一级保护值 The cell pressure difference is greater than the primary protection value
Bit11	SOC 过低 SOC is too low	SOC 低于一级保护值 SOC is lower than the primary protection value
Bit12	单体过压 Cell voltage high	单体电压高于一级保护值 The cell voltage is higher than the primary protection value
Bit13	单体欠压 Cell voltage low	单体电压低于一级保护值 The cell voltage is lower than the primary protection value
Bit14	放电温度过高 The discharge temperature is too high	放电时温度高于一级保护值 The temperature at discharge is higher than the primary protection value
Bit15	放电温度过低 Discharge temperature is too low	放电时温度低于一级保护值 The temperature at discharge is lower than the primary protection value

5.2.3 表 3：BMS 详细自检状态 Table 3: BMS detailed self-test status

1 有效，0 无效 1 is valid, 0 is invalid

位 bit	描述 Description	定义 definition
Bit 0	霍尔传感器自检状态 Hall sensor self-test status	1：自检成功 0：自检失败 1: Self-test successful 0: Self-test failed
Bit 1	以太网自检状态 Ethernet self-test status	1：自检成功 0：自检失败 1: Self-test successful 0: Self-test failed

Bit 2	存储芯片自检状态 Memory chip self-test status	1：自检成功 0：自检失败 1: Self-test successful 0: Self-test failed
Bit 3	BMU 供电电压自检状态 BMU supply voltage self-test status	1：自检成功 0：自检失败 1: Self-test successful 0: Self-test failed
Bit 4~Bit 15	RFU	保留以备将来使用 Reserved for future use

5.2.4 表 4:二级保护事件 Table 4: Secondary Protection Events

1 有效，0 无效 1 is valid, 0 is invalid

位 Bit	事件 Event	描述 Decription
Bit0	整组过压 Total voltage high	总电压高于总电压过压二级保护值 The total voltage is higher than the total voltage overvoltage secondary protection value
Bit1	整组欠压 Total voltage low	总电压低于总电压欠压二级保护值 The total voltage is lower than the total voltage undervoltage secondary protection value
Bit2	充电过流 Charging overcurrent	充电时电流大于充电过流二级保护值 The current during charging is greater than the secondary protection value of the charging overcurrent
Bit3	放电过流 Discharge overcurrent	放电时电流大于放电过流二级保护值 The current during discharge is greater than the secondary protection value of discharge overcurrent
Bit5	充电低温 Charging low temperature	充电时电池温度低于充电低温二级保护值 The battery temperature during charging is lower than the charging low temperature secondary protection value
Bit4	充电温度过高 Charging temperature too high	充电时电池温度高于高温二级保护值 Battery temperature is higher than high temperature secondary protection value during charging
Bit6	RFU	RFU

Bit7	外部保护 External protection	断路器由外部人工断开或者短路断开 The circuit breaker is manually disconnected or shorted by external
Bit8	温度不均衡 Unbalanced temperature	串内最高温度和最低温度之差超过二级保护值 The difference between the highest temperature and the lowest temperature in the string exceeds the secondary protection value.
Bit9	绝缘等级低 Low insulation rating	绝缘电阻低于二级保护值 Insulation resistance is lower than the secondary protection value
Bit10	电芯不均衡 Cell imbalance	单体压差大于二级保护值 Cell pressure difference is greater than the secondary protection value
Bit11	SOC 过低 SOC is too low	SOC 低于二级保护值 SOC is lower than the secondary protection value
Bit12	单体过压 Cell voltage high	单体电压高于二级保护值 The cell voltage is higher than the secondary protection value
Bit13	单体欠压 Cell voltage low	单体电压低于二级保护值 The cell voltage is lower than the secondary protection value
Bit14	放电温度过高 discharge temperature is too high	放电时温度高于二级保护值 The temperature at discharge is higher than the secondary protection value
Bit15	放电温度过低 Discharge temperature is too low	放电时温度低于二级保护值 The temperature at discharge is lower than the secondary protection value

5.3 电池柜电池数据寄存器 Battery cabinet battery data register

电池数据按模组编号顺序排列，每个模组固定为 24+8=32 个寄存器，24 个寄存器存储 24 个电压，接下来的 8 个寄存器存储 8 个温度。如果实际模组内串数少于 24，则未使用的电池寄存器全为 0。一个电池柜内的电池数据寄存器定义如下表所示：

The battery data is arranged in the order of the module numbers. Each module is fixed at 24+8=32 registers, 24 registers store 24 voltages, and the next 8 registers store 8 temperatures. If the number of strings in the actual module is less than 24, the unused battery registers are all 0. The battery data registers in a battery cabinet are defined as shown in the following table:

寄存器地址(HEX) Register address	描述 Description	单位 Unit
2000	模组 1 Cell 1 电压 Module 1 Cell 1 voltage	mv
2001	模组 1 Cell 2 电压 Module 1 Cell 2 voltage	mv
2002	模组 1 Cell 3 电压 Module 1 Cell 3 voltage	mv
...	...	
2017	模组 1 Cell 24 电压 Module 1 Cell 24 voltage	mv
2018	模组 1 温度 1 Module 1 temperature 1	℃
2019	模组 1 温度 2 Module 1 temperature 2	℃
201A	模组 1 温度 3 Module 1 temperature 3	℃
201B	模组 1 温度 4 Module 1 temperature 4	℃
201C	模组 1 温度 5 Module 1 temperature 5	℃
201D	模组 1 温度 6	℃

	Module 1 temperature 6	
201E	模组 1 温度 7 Module 1 temperature 7	℃
201F	模组 1 温度 8 Module 1 temperature 8	℃
...	...	...
23FF	模组 32 温度 8 Module 32 temperature 8	℃

5.4 配置寄存器 Configuration Register(0x4000-0x4005)

寄存器地址 Register address (HEX)	含义 Meaning	备注 Remarks
4000	电池柜数目 Number of battery rack	仅 SBMS 有此项参数 SBMS support only
4001	电池柜内模组数目 Number of module inside single rack	范围(Range)1~20
4002	模组内电芯数目 Number of cell inside single module	范围(Range)1~24
4003	*模组内温度传感器数目* Number of temperature sensor inside single module	范围(Range)2~8
4004	*系统额定容量(Ah)* Rated capacity of system(Ah)	对 SBMS，额定容量为单簇容量乘以 RBMS 数目 For SBMS, the nominal capacity is the single cluster capacity multiplied by the number of RBMS
4005	*协议版本* Version of protocol	去掉 V 和.后的数字的 ASCII 码，如下所示 Ascii code after remove 'V' and '.', as follows

		V1.0=0x3130 V1.1=0x3131 V1.2=0x3232

注:与 SBMS 通信时，只能使用 30 作为站地址来读取配置信息

While communication with SBMS,only node id 0x30 is available for read configuration register

5.5 产品信息寄存器 Product Information Register(0x4010-0x4033)

寄存器地址 Register address (HEX)	含义 Meaning	备注 Remarks
4010~401B	产品型号 Product model	24 个字符 24 characters
401C~4021	产品序列号 Product ID	12 个字符 12 characters
4022~4024	Firmware 版本 Firmware version	6 个字符 6 characters
4025~4027	Hardware 版本 Hardware version	6 个字符 6 characters
4028~4033	Firmware 编译日期时间 Compile date&time of firmware	24 个字符 24 characters

6. 通信示例 Communication example

例:
Example

读取 SBMS 运行状态
Read running information register of SBMS
30 03 10 00 00 29 84 F5(HEX)

读取 RBMS 1 运行状态

Read running information register of RBMS1
01 03 11 00 00 20 41 2E(HEX)

读取 RBMS 2 运行状态
Read running information register of RBMS2
02 03 11 00 00 20 41 1D(HEX)

读取 RBMS 1 的 1 号模组的数据
Read module 1 cell data of RBMS 1
01 03 20 00 00 20 4F D2(HEX)

读取 RBMS 2 的 1 号模组的数据
Read module 1 cell data of RBMS 1
02 03 20 00 00 20 4F 1E(HEX)

读取 SBMS 的产品信息
Read product information register of SBMS
30 03 40 10 00 34 54 39(HEX)

读取 RBMS 1 的产品信息
Read product information register of RBMS 1
01 03 40 10 00 34 50 18(HEX)

读取 RBMS 2 的产品信息
Read product information register of RBMS 2
02 03 40 10 00 34 50 2B(HEX)