# MODBUS COMMUNICATION POINT TABLE OF BMS AND PCS

## 1. Communication specifications

1. This communication protocol is modified or expanded on the basis of Modbus/RTU protocolaccording to the actual requirement.
2. This protocol mainly involves analysis of register and read-write specifications. Other communication timing sequence, delay time and timeout shall refer to the Modbus/RTU protocol.
3. PCS is set as host, and BMS is set as slave
4. BMS default address is 0x1；
5. The interval time of two messages shall not less than 300ms；
6. Baud rate: 9600,Data bits:8,Stop bits:1,Parity:None,Flow control:None；

## 2. Register definition

### BMS control register：

|  |  |  |  |
| --- | --- | --- | --- |
| **Adds** | **Data name** | **Attribute** | **Description** |
| 0x2010 | BMSContactor  control | Read/Write | 0x0:cut-off（pre-charge control and main regenerative contactor disconnected）  0x1:connection initiating（pre-charge control connected and main regenerative contactor disconnected）  0x3:on-grid success(pre-charge control disconnectedand main regenerative contactor connected)  PCS only give order of 1 or 0, other value will be invalid |

### BMS status register

**Register adds = base adds（0x2000） + offset adds**

#### Single cluster battery total status register

|  |  |  |
| --- | --- | --- |
| **Offset adds** | **Data name** | **Description** |
| 0x0042 | System Over Voltage Protection | Unit: 0.1V |
| 0x0048 | System Under Voltage Protection | Unit: 0.1V |
| 0x0100 | Cluster1 Voltage | Unit:0.1V |
| 0x0101 | Cluster1 Current | Unit:0.1A.  Negative value indicates under charging. Positive value indicates under discharging. |
| 0x0102 | Charge and discharge indication | 0x0:Standing；0x1:Discharging；0x2:Charging |
| 0x0103 | Cluster1SOC | Range：0%～100% |
| 0x0104 | Cluster1SOH | Range：0%～100% |
| 0x0105 | Cluster1 Max Cell Voltage Id | Starts from 1 |
| 0x0106 | Cluster1 Max Cell Voltage | Unit: mv |
| 0x0107 | Cluster1 Min Cell Voltage Id | Starts from 1 |
| 0x0108 | Cluster1 Min Cell Voltage | Unit: mv |
| 0x0109 | Cluster1 Max Cell Temperature Id | Starts from 1 |
| 0x010A | Cluster1 Max Cell Temperature | Unit 0.1℃. |
| 0x010B | Cluster1 Min Cell Temperature Id | Starts from 1 |
| 0x010C | Cluster1 Min Cell Temperature | Unit: 0.1℃ |
| 0x010D-0x0115 | Reserve1 |  |
| 0x0116 | System Insulation | Unit：KΩ |
| 0x160 | System Accept Max Charge  Current | Unit: 0.1A |
| 0x161 | System Accept Max Discharge Current | Unit: 0.1A |

#### Alarm information and shut down info register

|  |  |  |
| --- | --- | --- |
| **Offset adds** | **Data name** | **Description** |
| 0x0140 | Alarm Level 2 | Bit15:Cluster 1 Cell Discharge Temperature Low Alarm Level 2  Bit14:Cluster 1 Cell Discharge Temperature High Alarm Level 2  Bit13: Reserve  Bit12: Cluster1Insulation Low Alarm Level 2  Bit11:Reserve  Bit10: Reserve  Bit9：Reserve  Bit8：Reserve  Bit7:Cluster1 Cell Charge Temperature Low Alarm Level 2  Bit6:Cluster1 Cell Charge Temperature High Alarm Level 2  Bit5:Cluster 1 Discharge Current High Alarm Level 2  Bit4:Cluster 1 Total Voltage Low Alarm Level 2  bit3:Cluster 1 Cell Voltage Low Alarm Level 2  bit2:Cluster 1 Charge Current High Alarm Level 2  bit1:Cluster 1 Total Voltage High Alarm Level 2  bit0: Cluster 1 Cell Voltage High Alarm Level 2  Value 0-Normal，1-Alarm |
| 0x0141 | Alarm Level 1 | Bit15:Cluster 1 Cell Discharge Temperature Low Alarm Level 1  Bit14:Cluster 1 Cell Discharge Temperature High Alarm Level 1  Bit13: Cluster1Total Voltage Diff High Alarm Level 1  Bit12: Cluster1Insulation Low Alarm Level1  Bit11: Cluster 1 Cell Voltage Diff High Alarm Level 1  Bit10: Reserve  Bit9: Cluster X Cell temperature Diff High Alarm Level 1  Bit8: Cluster1SOC Low Alarm Level 1  Bit7:Cluster 1 Cell Charge Temperature Low Alarm Level 1  Bit6: Cluster1CellChargeTemperature High Alarm Level 1  Bit5:Cluster 1 Discharge Current High Alarm Level 1  Bit4:Cluster 1 Total Voltage Low Alarm Level 1  bit3: Cluster 1 Cell Voltage Low Alarm Level 1  bit2: Cluster 1 Charge Current High Alarm Level 1  bit1: Cluster 1 Total Voltage High Alarm Level 1  bit0: Cluster 1 Cell Voltage High Alarm Level 1  Value 0-Normal，1-Alarm |
| 0x0142 | Cluster1 Run State | 0x0：Normal  0x1：Stop Charging  0x2：Stop Discharge  0x3：Standby |

#### BMS fault information:

|  |  |  |
| --- | --- | --- |
| 0x0185 | Failure of slave BMU alarm equipment | Bit12:Initialization failure  Bit11:EEPROM fault  Bit10:Intranet communication fault  Bit9: Temperature sampling line fault  Bit8: Balancing module fault  Bit7:Reserve  Bit6:Reserve  Bit5:Temperature sensor fault  Bit4: Temperature sampling fault  Bit3: Voltage sampling fault  Bit2: LTC6803 fault  Bit1: connector wire fault  Bit0: sampling wire fault  Value 0-Normal，1-Alarm effective |

#### Voltage Register

|  |  |  |
| --- | --- | --- |
| **Offset adds** | **Data name** | **Description** |
| 0x0800 | Cluster1 Battery 1stVoltage | Unit:mV |
| … | … |
| 0x08EF | ClusterX Battery 240thVoltage |

Maximum support: 512

#### Temperature register

|  |  |  |
| --- | --- | --- |
| **Offset adds** | **Data name** | **Description** |
| 0x0C00 | Cluster1 Battery 1stTemperature | 16-bit signed integer  Range：-40～150℃  Unit: 0.1℃ |
| … | … |
| 0x0C2F | Cluster1 Battery 48th Temperature |

Maximum support: 256

If there is no designated data type then all registers are unsigned int.