



# 达锂 Uart/485 通讯协议

## Daly UART/485

## Communications Protocol

版本 V1.2



1. 版本修订记录 (Version revision record)

序号 Serial Num	描述 Description	日期 Date	版本 Version	作者 Author
1	初始版本 Initial version	2019.06.11	V1.0	
2	修改地址分配 Modification of address allocation	2020.11.8	V1.1	
3	修正参考章节数 Number of sections amending references	2020.12.22	V1.2	



## 1. 物理层 (Physical layer)

### 1.1 UART

1. 物理接口 1. physical interface	UART	
2. 波特率 2. baud rate	9600 bps	
3. 通讯格式 3. Communication Format	9600 , N , 8 , 1	
4. 有效电平 4. active level	发送 TXD TXD sent	“0”: <0.5V “1”: OC (耐压 100V) (100V Voltage should lower than 100V withstand voltage)
	接收 RXD RXD received	“0”: <0.5V “1”: >3V(耐压 100V ) (withstand voltage 100V Voltage should lower than 100V)

## 2. 通讯格式 (Communication format)

### 2.1 基本时序 (Basic timing)

所有消息均由主机发送，所有从机收到消息后判断从机地址是否吻合，只有在从机地址吻合情况下才允许向主机返回数据。

(All messages are sent by the host, all slaves receive messages to determine whether the slave address matches, only in the case of slave address match allowed to return data to the host.)

### 2.2 地址分配 (Address assignment)

模块 Module	地址 Address
BMS 主控 BMS master	0x01
蓝牙手机 APP (Bluetooth APP)	0x80
GPRS	0x20
上位机 Upper computer	0x40



### 2.3 UART 通讯格式

#### 2.3.1 上位机发送

帧头 Start Flag	通信模块地址 PC address	数据 ID Data ID	数据长度 Data Length	数据内容 数据内容 Data	校验和 Checksum (1 Byte)
0xA5 (固定) 0xA5(fixed)	0x40(PC-Add)	参考第 3 节 See Section 3	8 字节 (固定) 8byte (fixed)		

#### 2.3.2 从机响应主机命令

帧头 Start Flag	通信模块地址 PC address	数据 ID Data ID	数据长度 Data Length	数据内容 Data	校验和 Checksum (1 Byte)
0xA5(固定) 0xA5(fixed)	0x01(BMS-Add)	参考第 3 节 See Section 3	8 字节 (固定) 8byte (fixed)		

说明

**Note:**

1. 对于每一个数据,都有固定的数据长度,一次不能读取两个数据。  
1. For each data,there is a fixed data length,can not read two data at a time.
2. 检验为之前所有数据之和(只取低字节)。  
2. The test is the sum of all previous data(only low byte).



### 3.通讯内容信息

数据 Data	数据 ID Data ID	接收/发送 Send/Received	说明 Note
总压电流 SOC SOC of total voltage & current	0x90	发送 Send	Byte0~Byte7:Reserved
		返回 Received	Byte0~byte1: 累计总压 (0.1V) Cumulative total voltage (0.1 V) Byte2~byte3: 采集总压 (0.1V) Gather total voltage (0.1 V) Byte4~byte5: 电流 (30000 Offset, 0.1A) Current (30000 Offset ,0.1A) Byte6-Byte7: SOC (0.1%) SOC (0.1%)
单体最高最低电 压 Maximum & Minimum voltage	0x91	发送 Send	Byte0~Byte7:Reserved
		返回 Received	Byte0~byte1: 最高单体电压值 (mV) Maximum cell voltage value (mV) Byte2: 最高单体电压cell号 No of cell with Maximum voltage Byte3~byte4: 最低单体电压值 (mV) Minimum cell voltage value (mV) Byte5: 最低单体电压cell号 No of cell with Minimum voltage
单体最高最低温 度 Maximum & Minimum temperature	0x92	发送 Send	Byte0~Byte7:Reserved
		返回 Received	Byte0: 最高单体温度值 (40 Offset, ° C) Maximum temperature value (40 Offset ,°C) Byte1: 最高单体温度cell号 Maximum temperature cell No Byte2: 最低单体温度值 (40 Offset, ° C) Minimum temperature value (40 Offset ,°C) Byte3: 最低单体温度cell号 Minimum temperature cell No
充放电、MOS 状 态 Charge & discharge MOS status	0x93	发送 Send	Byte0~Byte7:Reserved
		返回 Received	Byte0: 充放电状态 (0 静止, 1 充电, 2 放电) State (0 stationary 1 charge 2 discharge) Byte1: 充电MOS管状态Charge MOS state Byte2: 放电MOS管状态Discharge MOS status Byte3:BMS life (0~255循环) (0~255 cycles) Byte4~Byte7:剩余容量 (mAH) Remain capacity (mAH)
状态信息1	0x94	发送	Byte0~Byte7:Reserved



Status information		Send	
1		返回 Received	Byte0: 电池串数No of battery string Byte1: 温度个数No of Temperature Byte2:充电器状态 (0断开, 1接入) Charger status (0 disconnect 1 access) Byte3: 负载状态 (0断开, 1接入) Load status (0 disconnect 1 access)  Byte4: Bit 0: DI1 state Bit 1: DI2 state Bit 2: DI3 state Bit 3: DI4 state Bit 4: DO1 state Bit 5: DO2 state Bit 6: DO3 state Bit 7: DO4 state  Byte 5~Byte 7:Reserved
单体电压 1~48 Cell voltage 1~48	0x95	发送 Send	Byte0~Byte7:Reserved
		返回 Received	每个单体电压占2byte, 根据实际单体个数发送, 最大96byte, 分16帧发送 The voltage of each monomer is 2 byte, according to the actual number of cell, the maximum 96 byte, is sent in 16 frames Byte0: 帧序号, 从0开始, 0xFF为无效 frame number, starting from 0,0xFF invalid Byte1~byte6: 单体电压 (1mV) Cell voltage (1 mV) Byte7:Reserved
单体温度 1~16 Cell temperature 1~16	0x96	发送 Send	Byte0~Byte7:Reserved
		返回 Received	每个温度占1byte, 根据实际使用温度个数发送, 最大21byte, 分3帧发送 Each temperature accounts for 1 byte, according to the actual number of temperature send, the maximum 21 byte, send in 3 frames Byte0: 帧序号, 从0开始frame number, starting at 0 Byte1~byte7: 单体温度 (40 Offset, ° C) cell temperature(40 Offset, °C)
单体均衡状态 Cell balance State1~48	0x97	发送 Send	Byte0~Byte7:Reserved
		返回 Received	0: 关闭 1: 开启 0: Closed 1: Open Bit0: 单体1均衡状态Cell 1 balance state ...



			Bit47: 单体48均衡状态 Cell 48 balance state Bit48~Bit63: reserved
电池故障状态 Battery failure status	0x98	发送 Send	Byte0~Byte7:Reserved
		返回 Received	<p>0 -&gt; No error 1 -&gt; Error</p> <p>Byte 0 Bit 0: 单体电压过高一级告警 Cell volt high level 1 Bit 1: 单体电压过高二级告警 Cell volt high level 2 Bit 2: 单体电压过低一级告警 Cell volt low level 1 Bit 3: 单体电压过低二级告警 Cell volt low level 2 Bit 4: 总压过高一级告警 Sum volt high level 1 Bit 5: 总压过高二级告警 Sum volt high level 2 Bit 6: 总压过低一级告警 Sum volt low level 1 Bit 7: 总压过低二级告警 Sum volt low level 2</p> <p>Byte 1 Bit 0: 充电温度过高一级告警 Chg temp high level 1 Bit 1: 充电温度过高二级告警 Chg temp high level 2 Bit 2: 充电温度过低一级告警 Chg temp low level 1 Bit 3: 充电温度过低二级告警 Chg temp low level 2 Bit 4: 放电温度过高一级告警 Dischg temp high level 1 Bit 5: 放电温度过高二级告警 Dischg temp high level 2 Bit 6: 放电温度过低一级告警 Dischg temp low level 1 Bit 7: 放电温度过低二级告警 Dischg temp low level 2</p> <p>Byte 2 Bit 0: 充电过流一级告警 Chg overcurrent level 1 Bit 1: 充电过流二级告警 Chg overcurrent level 2 Bit 2: 放电过流一级告警 Dischg overcurrent level 1 Bit 3: 放电过流二级告警 Dischg overcurrent level 2 Bit 4: SOC过高一级告警 SOC high level 1 Bit 5: SOC过高二级告警 SOC high level 2 Bit 6: SOC过低一级告警 SOC Low level 1 Bit 7: SOC过低二级告警 SOC Low level 2</p>



			<p>Byte 3</p> <p>Bit 0: 压差过大一级告警 Diff volt level 1</p> <p>Bit 1: 压差过大二级告警 Diff volt level 2</p> <p>Bit 2: 温差过大一级告警 Diff temp level 1</p> <p>Bit 3: 温差过大二级告警 Diff temp level 2</p> <p>Bit 4~Bit7: Reserved</p> <p>Byte 4</p> <p>Bit 0: 充电MOS过温警告 Chg MOS temp high alarm</p> <p>Bit 1: 放电MOS过温警告 Dischg MOS temp high alarm</p> <p>Bit 2: 充电MOS温度检测传感器故障 Chg MOS temp sensor err</p> <p>Bit 3: 放电MOS温度检测传感器故障 Dischg MOS temp sensor err</p> <p>Bit 4: 充电MOS粘连故障 Chg MOS adhesion err</p> <p>Bit 5: 放电MOS粘连故障 Dischg MOS adhesion err</p> <p>Bit 6: 充电MOS断路故障 Chg MOS open circuit err</p> <p>Bit 7: 放电MOS断路故障 Dischg MOS open circuit err</p> <p>Byte 5</p> <p>Bit 0: AFE采集芯片故障 AFE collect chip err</p> <p>Bit 1: 单体采集掉线 Voltage collect dropped</p> <p>Bit 2: 单体温度传感器故障 Cell temp sensor err</p> <p>Bit 3: EEPROM存储故障 EEPROM err</p> <p>Bit 4: RTC时钟故障 RTC err</p> <p>Bit 5: 预充失败 Precharge failure</p> <p>Bit 6: 整车通信故障 Communication failure</p> <p>Bit 7: 内网通信模块故障 Internal communication failure</p> <p>Byte6</p> <p>Bit 0: 电流模块故障 Current module fault</p> <p>Bit 1: 内总压检测模块故障 Sum voltage detect fault</p> <p>Bit 2: 短路保护故障 Short circuit protect fault</p> <p>Bit 3: 低压禁止充电故障 Low volt forbidden chg fault</p> <p>Bit4-Bit7: Reserved</p> <p>Byte7: 故障码 Fault code</p>
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