
锦浪高压电池 CAN 通信协议 / Ginlong HV Battery CAN Protocol

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Revision History

版本号 Version	更改内容 Content	责任人 Write	更改日期 Date
V1.0	创建初稿。 Initial Version	蒋威 Jiang Wei	2020/09/28
V1.1	增加0x3030日期时间同步帧(仅支持部分电池); Add 0x3033 Date Time Synchronization (Only support some batteries)	蒋威 Jiang Wei	2021/03/25

1. 目的/Target

编写本文档为了使得软件程序更新受控，有利于以后的维护。
This document is prepared in order to get firmware upgrade under control. Benefit for future maintenance

2. 通信说明/ Communication Description

- 1、采用 29 位标识符的扩展帧格式传输，波特率 500kbps，数据格式 Little Endian；
Transmission in extended frame format with 29-bit identifier, baud rate 500kbps, data format Little Endian
- 2、上位机设备发送查询或控制指令后，电池组设备响应数据。
After the host computer device sends the query or control command, the battery pack device responds with the data.

3. 查询指令/ Query Command

3.1. 总体信息/ General Information

3.1.1. CAN ID: 0x4200 上位机设备发送数据/ The Upper Computer Device Sending Data
(为广播帧 / Broadcast Frame)

0x4200	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	0 General Information 总体信息							
Byte1-7	Reserve							

3.1.2. CAN ID: 0x4210+Addr 电池组设备响应数据 / Battery Pack Device Response Data
(设备地址 Addr = 0~F，最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4210+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Battery Pile Total Voltage 电池组总电压 (Data Type: 16bits, unsigned short; Unit: 0.1V, Offset: 0)							
Byte1								
Byte2	Battery Pile Current 电池组电流 (Data Type: 16bits, unsigned short; Unit: 0.1A, Offset: -3000A)							
Byte3								
Byte4	second level BMS Temperature 主控温度 (Data Type: 16bits, unsigned short; Unit: 0.1℃, Offset: -100 ℃)							
Byte5								
Byte6	SOC (Data Type: 8bits, unsigned short; Unit: 1%, Offset: 0)							
Byte7								
	SOH (Data Type: 8bits, unsigned short; Unit: 1%, Offset: 0)							

3.1.3. CAN ID: 0x4220+Addr 电池组设备响应数据 / Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4220+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Charge Cutoff Voltage 充电截止电压 (Data Type: 16bits, unsigned short; Unit: 0.1V, Offset: 0)							
Byte1								
Byte2	Discharge Cutoff Voltage 放电截止电压 (Data Type: 16bits, unsigned short; Unit: 0.1 V, Offset: 0)							
Byte3								
Byte4	MAX Charge Current 最大充电电流 (Data Type: 16bits, unsigned short; Unit: 0.1A, Offset: -3000A)							
Byte5								
Byte6	MAX Discharge Current 最大放电电流 (Data Type: 16bits, unsigned short; Unit: 0.1A, Offset: -3000A)							
Byte7								

3.1.4. CAN ID: 0x4230+Addr 电池组设备响应数据 / Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4230+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	MAX Single Battery Cell Voltage 最高单体电池电压 (Data Type: 16bits, unsigned short; Unit: 0.001V, Offset: 0)							
Byte1								
Byte2	MIN Single Battery Cell Voltage 最低单体电池电压 (Data Type: 16bits, unsigned short; Unit: 0.001 V, Offset: 0)							
Byte3								
Byte4	MAX Single Battery Cell Voltage Number 最高单体电池电压编号 (Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)							
Byte5								
Byte6	MIN Single Battery Cell Voltage Number 最低单体电池电压编号 (Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)							
Byte7								

3.1.5. CAN ID: 0x4240+Addr 电池组设备响应数据 / Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4240+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	MAX Single Battery Cell Temperature 最高单体电池温度 (Data Type: 16bits, unsigned short; Unit: 0.1°C Offset: -100)							
Byte1								
Byte2	MIN Single Battery Cell Temperature 最低单体电池温度 (Data Type: 16bits, unsigned short; Unit: 0.1°C Offset: -100)							
Byte3								
Byte4	MAX Single Battery Cell Temperature Number 最高单体电池温度编号 (Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)							
Byte5								
Byte6	MIN Single Battery Cell Temperature Number 最低单体电池温度编号 (Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)							
Byte7								

3.1.6. CAN ID: 0x4250+Addr 电池组设备响应数据 / Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4250+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Basic Status 基本状态 See Table 1 for details.							
Byte1	Cycle Period 循环周期							
Byte2								
Byte3	Error 故障 See Table 2 for details.							
Byte4	Alarm 告警 See Table 3 for details.							
Byte5								
Byte6	Protection 保护 See Table 4 for details.							
Byte7								

Table 1: Basic Status

Bit7	Reverse
Bit6	Reverse
Bit5	Reverse
Bit4	0: Null; 1: Balance charge request 均充请求
Bit3	0: Null; 1: Force charge request 强充请求
Bit2	0: Sleep, 1: Charge, 2: Discharge, 3: Idle, 4: Starting (Some batteries have this status), 5: fault, other: Reserve
Bit1	
Bit0	

Table 2: Fault

Bit7	Other error 其他故障 (For details, see Extended Fault)
Bit6	电池损坏故障 (电池过放等原因导致) / Battery cell error
Bit5	RELAY_ERR/ 继电器检测故障 Relay Check Error
Bit4	RV_ERR/ 输入反接故障 Input transposition Error
Bit3	DCOV_ERR/ 输入过压故障 Input Over Voltage Error
Bit2	IN_COMM_ERR/ 内部通信故障 Internal Communication Error
Bit1	TMPR_ERR/ 温度传感器故障 Temperature Sensor Error
Bit0	VOLT_ERR/ 电压传感器故障 Voltage Sensor Error

Table 3: Alarm

Bit15	Reverse
Bit14	Reverse
Bit13	Reverse
Bit12	Reverse
Bit11	MHV: 电池模块高压告警 Module High Voltage Alarm
Bit10	MLV: 电池模块低压告警 Module Low Voltage Alarm
Bit9	DOCA: 电池组放电过流告警 Discharge Over Current Alarm
Bit8	COCA: 电池组充电过流告警 Charge Over Current Alarm
Bit7	DHT: 放电高温告警 Discharge Cell High Temperature Alarm
Bit6	DLT: 放电低温告警 Discharge Cell Low Temperature Alarm

Bit5	CHT: 充电高温告警 Charge Cell High Temperature Alarm
Bit4	CLT: 充电低温告警 Charge Cell Low Temperature Alarm
Bit3	PHV: 电池组充电高压告警 Charge system High Voltage Alarm
Bit2	PLV: 电池组放电低压告警 Discharge system Low Voltage Alarm
Bit1	BHV: 电池单体高压告警 Single Cell High Voltage Alarm
Bit0	BLV: 电池单体低压告警 Single Cell Low Voltage Alarm

Table 4: Protection

Bit15	Reverse
Bit14	Reverse
Bit13	Reverse
Bit12	Reverse
Bit11	MOV: 电池模块过压保护 Module Over Voltage Protect
Bit10	MUV: 电池模块欠压保护 Module Under Voltage Protect
Bit9	DOC: 电池组放电过流保护 Discharge Over Current Protect
Bit8	COC: 电池组充电过流保护 Charge Over Current Protect
Bit7	DOT: 放电高温保护 Discharge Cell Over Temperature Protect
Bit6	DUT: 放电低温保护 Discharge Cell Under Temperature Protect
Bit5	COT: 充电高温保护 Charge Cell Over Temperature Protect
Bit4	CUT: 充电低温保护 Charge Cell Under Temperature Protect
Bit3	POV: 电池组充电高压保护 Charge system Over Voltage Protect
Bit2	PUV: 电池组放电低压保护 Discharge system Under Voltage Protect
Bit1	BOV: 电池单体高压保护 Single Cell Over Voltage Protect
Bit0	BUV: 电池单体低压保护 Single Cell Under Voltage Protect

3.1.7. CAN ID: 0x4260+Addr 电池组设备响应数据 / Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4260+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Module Max. Voltage 最高电池模块电压 (Data Type: 16bits, unsigned short; Unit: 0.001V, Offset: 0)							
Byte1								
Byte2	Module Min. Voltage 最低电池模块电压 (Data Type: 16bits, unsigned short; Unit: 0.001V, Offset: 0)							
Byte3								
Byte4	Module Max. Voltage Number 最高电池模块电压编号 (Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)							
Byte5								
Byte6	Module Min. Voltage Number 最低电池模块电压编号 (Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)							
Byte7								

3.1.8. CAN ID: 0x4270+Addr 电池组设备响应数据 / Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4270+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
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Byte0	Module Max. Temperature 最高电池模块温度
Byte1	(Data Type: 16bits, unsigned short; Unit: 0.1°C, Offset: -100)
Byte2	Module Min. Temperature 最低电池模块温度
Byte3	(Data Type: 16bits, unsigned short; Unit: 0.1°C, Offset: -100)
Byte4	Module Max. Temperature Number 最高电池模块温度编号
Byte5	(Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)
Byte6	Module Min. Temperature Number 最低电池模块温度编号
Byte7	(Data Type: 16bits, unsigned short; Unit: 1, Offset: 0)

3.1.9. CAN ID: 0x4280+Addr 电池组设备响应数据/ Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4280+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Charge forbidden mark 禁止充电标志 (0xAA 有效, 其它值无效)							
Byte1	Discharge forbidden mark 禁止放电标志 (0xAA 有效, 其它值无效)							
Byte2-7	Reserve							

3.1.10. CAN ID: 0x4290+Addr 电池组设备响应数据/ Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x4290+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Extended Fault 1 See Table 5 for details.							
Byte1-7	Reserve							

Table 5: Extended Fault 1

Bit7	Reserve
Bit6	Reserve
Bit5	Reserve
Bit4	Reserve
Bit3	开机自检异常/ Self - test error
Bit2	内部总线异常/ Internal bus error
Bit1	BMIC 异常/BMIC error
Bit0	关机电路异常/ Shutdown circuit error

3.1.11. CAN ID: 0x42F0+Addr 电池组设备响应数据/ Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x42F0+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
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Byte0-7	Manufacturer-Name-ASCII; 例如: DynessHV,Byte0=0x44,Byte1=0x79,Byte1=0x6E,Byte1=0x65, Byte1=0x73,Byte1=0x73,Byte1=0x48,Byte1=0x56;
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3.2. 系统装备信息 / System equipment information

3.2.1. CAN ID: 0x4200 上位机设备发送数据/ The Upper Computer Device Sending Data

(为广播帧) (Broadcast Frame)

0x4200	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	2 2 is system equipment information 系统装备信息							
Byte1-7	Reserve							

3.2.2. CAN ID: 0x7310+Addr 电池组设备响应数据/ Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x7310+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Hardware Version 硬件版本 0: Null; 1: ver. A; 2: ver. B; Others: Reserve.							
Byte1	Reserve							
Byte2	Hardware Version-V 硬件版本-V -0x02							
Byte3	Hardware Version-R 硬件版本-R 0x01							
Byte4	Software Version-V 软件版本-V (主版本 Major) -0x01							
Byte5	Software Version-V 软件版本-V (子版本 Minor) 0x02							
Byte6	Software Version 开发主版本							
Byte7	Software Version 开发子版本							

3.2.3. CAN ID: 0x7320+Addr 电池组设备响应数据/ Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x7310+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Battery Module Qty. 电池总数							
Byte1								
Byte2	Battery Module in series Qty. 串联电池模块个数							
Byte3	Cell Qty. in battery module 模块中电池个数							
Byte4	Voltage Level 电压平台							

Byte5	(Data Type: 16bits, unsigned short; Unit: 1V, Offset: 0)
Byte6	AH number AH 数
Byte7	(Data Type: 16bits, unsigned short; Unit: 1AH, Offset: 0)

4. 控制指令/Control Command

4.1. 休眠唤醒控制/ Sleep wake-up control

4.1.1. CAN ID: 0x8200+Addr 上位机设备发送数据/ The Upper Computer Device Sending Data

(不支持广播, 电池组无回复) (Does not support broadcast, no reply from battery pack)

(设备地址 Addr = 0~F, 最多 16 台设备并联通信)(Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x8200+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Sleep Awake Control 休眠唤醒控制 0x55: 控制设备进入休眠状态 0xAA: 控制设备退出休眠状态 其他: 无效							
Byte1-7	Reserve 0							

4.2. 充电放电命令 / Charge Discharge Command

4.2.1. CAN ID: 0x8210+Addr 上位机设备发送数据/ The Upper Computer Device Sending Data

(不支持广播, 电池组无回复) (Does not support broadcast, no reply from battery pack)

(设备地址 Addr = 0~F, 最多 16 台设备并联通信)(Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x8210+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Charge Command 充电命令 0xAA: effect; Others: Null (* Note 1)							
Byte1	Discharge Command 放电命令 0xAA: effect; Others: Null (* Note 2)							
Byte2-7	Reserve							

*Note:

1. 充电命令: 当电池处于欠压保护状态时, 继电器断开, 当 EMS 或 PCS 确定要对电池进行充电 时可以发送此命令, 电池会闭合主继电器。若电池已休眠, 则需先唤醒。

Charge command: When the battery is under voltage protection, the relay is disconnected. When the EMS or PCS determines that the battery needs to be charged, this command can be sent, and the battery will close the main relay. If the battery is sleeping, you need to wake up first

2. 放电命令: 当电池处于过压保护状态时, 继电器断开, 此时 EMS 或 PCS 确定要对

电池进行放电时，可发送此命令，电池会闭合主继电器。若电池已休眠，则需先唤醒。
Discharge command: When the battery is in the overvoltage protection state, the relay is disconnected. At this time, when the EMS or PCS determines to discharge the battery, this command can be sent, and the battery will close the main relay. If the battery is sleeping, it needs to be woken up first.

4.3. 临时屏蔽“通信故障”指令 / Temporarily shielding the "communication failure" command

4.3.1. CAN ID: 0x8240+Addr 上位机设备发送数据 / The Upper Computer Device Sending Data

(支持广播) (Support Broadcast)
(设备地址 Addr = 0~F, 最多 16 台设备并联通信 / Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x8240+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	BMS masking "external communication error" 下发“屏蔽外部通信故障”指令 0xAA: effect; Others: Null							
Byte1	屏蔽时长 (0~60 分钟可设)							
Byte2-7	Reserve 0							

4.3.2. CAN ID: 0x8250+Addr 电池组设备响应数据 / Battery Pack Device Response Data

(设备地址 Addr = 0~F, 最多 16 台设备并联通信) (Device address Addr = 0~F, up to 16 devices can communicate in parallel)

0x8250+Addr	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	System condition able to act this command or not 系统状态是否符合执行此命令条件 0xAA: 符合，立即执行; Others: 不执行此命令;							
Byte1-7	Reserve 0							

警示：不正当使用会造成系统严重安全风险。
Danger: High Safety Risk from improper use

当外部设备发起请求时，如电池系统允许执行此动作，则返回正常报文，并且系统将屏蔽 0~60 分钟“外部通讯故障”功能。在 0~60 分钟内，继电器将保持闭合。但当 0~60 分钟内发生保护时，系统将正常执行保护功能。
When the external device initiates a request, if the battery system allows this action, it will return a normal message, and the system will shield the "external communication failure" function for 0~60 minutes. During 0~60 minutes, the relay will remain closed. But when the protection occurs within 0~60 minutes, the system will perform the protection function normally.

4.3.3. CAN ID: 0x3030 日期时间同步/ Date time synchronization

(默认不发送；仅支持部分电池) (Not sent by default; only some batteries are supported)

0x3030	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Year							
Byte1	Month							
Byte2	Day							
Byte3	Hour							
Byte4	Minute							
Byte5	Second							
Byte6	Reserve							
Byte7								