Daly UART/485 Communications Protocol

V1.2

1. Version revision record

Serial Num	Description	Date	Version	Author
1.	Initial version	2019.06.11	V1.0	
2.	Modification of address allocation	2020.11.8	V1.1	
3	Number of sections amending references	2020.12.22	V1.2	

1.Physical layer

1.1 UART

1. physical interface	UART	
2. baud rate	bps 9600	
3. Communication Format	9600, N ,8,1	
4. active level	TXD send	"0":<0.5 V
		"1": OC (Withstand voltage should lower than 100V)
	RXD received	"0":<0.5 V
		"1":>3 V (Withstand voltage should lower than 100V)

2.Communication format

2.1 Basic timing

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 Address assignment

Module	Address
BMS master	0x01
Bluetooth APP	0x80
GPRS	0x20
Upper computer	0x40

2.3 UART Communication Format

2.3.1 PC send

Start Flag	PC address	Data ID	Data length	Data Content	Checksum (1 Byte)
0xA5(Fixed)	0x40(UPPER-ADD)	Refer to Section3	8 Bytes(fixed)		

2.3.2 The slave responds to the host command

Start Flag	PC address	Data ID	Data length	Data Content	Checksum (1 Byte)
0xA5(Fixed)	0x01(UPPER-ADD)	Refer to Section3	8 Bytes(fixed)		

Note:

1. For each data,there is a fixed data length,can not read two data at a time.
2. The test is the sum of all previous data(only low byte).

3.Communications content information

Data Message	Data ID	UPPER-BMS		Note Remark
SOC of total voltage current	0x90		Send	Byte0~Byte7：Reserved
			Received	Byte0~Byte1:Cumulative total voltage (0.1 V) Byte2~Byte3:Gather total voltage (0.1 V) Byte4~Byte5:Current (30000 Offset ,0.1A) Byte6~Byte7:SOC (0.1%)
Maximum & Minimum voltage	0x91		Send	Byte0~Byte7：Reserved
			Received	Byte0~Byte1:Maximum cell voltage value (mV) Byte2:No of cell with Maximum voltage Byte3~byte4: Minimum cell voltage value (mV) Byte5:No of cell with Minimum voltage
Maximum & Minimum temperature	0x92		Send	Byte0~Byte7：Reserved
			Received	Byte0: Maximum temperature value (40 Offset ,°C) Byte1: Maximum temperature cell No Byte2: Minimum temperature value (40 Offset ,°C) Byte3: Minimum temperature cell No
Charge & discharge MOS status	0x93		Send	Byte0~Byte7：Reserved
			Received	Byte0:State (0 stationary 1 charge 2 discharge) Byte1:Charge MOS state Byte2:Discharge MOS status Byte3:BMS life (0~255 cycles) Byte4~Byte7:Remain capacity (mAH)
Status information 1	0x94		Send	Byte0~Byte7：Reserved
			Received	Byte0:No of battery string Byte1: No of Temperature Byte2: Charger status (0 disconnect 1 access) Byte3: Load status (0 disconnect 1 access) Byte4: Bit 0:DI1state Bit 1:DI2state Bit 2:DI3state Bit 3:DI4state Bit 4:DO1state Bit 5:DO2state Bit 6:DO3state Bit 7:DO4state Byte 5~Byte 7：Reserved
Cell voltage 1~48	0x95		Send	Byte0~Byte7：Reserved

		Received	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:frame number, starting from 0,0xFF invalid Byte1~byte6:Cell voltage (1 mV) Byte7: Reserved	
Cell temperature 1~16	0x96	Send	Byte0~Byte7：Reserved	
		Received	Each temperature accounts for 1 byte, according to the actual number of temperature send, the maximum 21 byte, send in 3 frames Byte0:frame number, starting at 0 Byte1~byte7:cell temperature(40 Offset ,℃)	
Cell balance State 1~48	0x97	Send	Byte0~Byte7：Reserved	
		Received	0： Closed 1： Open Bit0: Cell 1 balance state ... Bit47:Cell 48 balance state Bit48~Bit63：reserved	
Battery failure status	0x98	Send	Byte0~Byte7：Reserved	
		Received	0->No error 1->Error Byte 0 Bit 0: Cell volt high level 1 Bit 1: Cell volt high level 2 Bit 2: Cell volt low level 1 Bit 3: Cell volt low level 2 Bit 4: Sum volt high level 1 Bit 5: Sum volt high level 2 Bit 6: Sum volt low level 1 Bit 7: Sum volt low level 2 Byte 1 Bit 0: Chg temp high level 1 Bit 1: Chg temp high level 2 Bit 2: Chg temp low level 1 Bit 3: Chg temp low level 2 Bit 4: Dischg temp high level 1 Bit 5: Dischg temp high level 2 Bit 6: Dischg temp low level 1 Bit 7: Dischg temp low level 2 Byte 2 Bit 0: Chg overcurrent level 1 Bit 1: Chg overcurrent level 2 Bit 2: Dischg overcurrent level 1 Bit 3: Dischg overcurrent level 2 Bit 4: SOC high level 1	

			Bit 5: SOC high level 2
			Bit 6: SOC Low level 1
			Bit 7: SOC Low level 2
			Byte 3
			Bit 0: Diff volt level 1
			Bit 1: Diff volt level 2
			Bit 2: Diff temp level 1
			Bit 3: Diff temp level 2
			Bit 4~Bit7:Reserved
			Byte 4
			Bit 0: Chg MOS temp high alarm
			Bit 1: Dischg MOS temp high alarm
			Bit 2: Chg MOS temp sensor err
			Bit 3: Dischg MOS temp sensor err
			Bit 4: Chg MOS adhesion err
			Bit 5: Dischg MOS adhesion err
			Bit 6: Chg MOS open circuit err
			Bit 7: Discrg MOS open circuit err
			Byte 5
			Bit 0: AFE collect chip err
			Bit 1: Voltage collect dropped
			Bit 2: Cell temp sensor err
			Bit 3: EEPROM err
			Bit 4: RTC err
			Bit 5: Precharge failure
			Bit 6: Communication failure
			Bit 7: Internal communication failure
			Byte6
			Bit 0: Current module fault
			Bit 1: Sum voltage detect fault
			Bit 2: Short circuit protect fault
			Bit 3: Low volt forbidden chg fault
			Bit4-Bit7：Reserved
			Byte7: Fault code