The protocol is used for BMS8T, BMS16T and BMS24T communicate with external device with RS232 by UART.

The open source code can be used as desired is on https://github.com/Tobi177/venus-chargerybms

1. Report cells voltage （main control board）

Packet header	command	Data length	voltage per Cell				SOC	Check sum
			No 1	No 2	….	No 24		
2bytes	1byte	1byte	2bytes	2byte	….	2byte	1byte	1byte
0x24 0x24	0X56		The high byte first Then low byte		….			

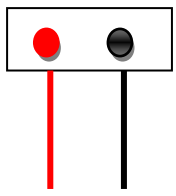
2. Report measure value （main control board）

Packet header	command	Data length	Charge End voltage of cell	Current mode	current	Battery packet temperature		SOC	Check sum
						T1	T2		
2bytes	1byte	1byte	2bytes	1 byte	2bytes	2bytes	2bytes	1byte	1byte
0x24 0x24	0X57		The high byte first Then low byte						

3. Note:

	Ture Value (float)		Deliver value (hex)
Current	200.5 A	200.5x10	0x07d5
Current mode	0 or 1 or 2		0x00 (discharge) 0x01 (charge) 0x02 (storage)
Charge End voltage of cell	4.356 V	4.356x1000	0x1104
Temperature	80.5 ℃	80.5x10	0x0325
SOC(0-100), Unit：%	20	20	0X14

- Data length: from The packet header to check sum(include check sum)
- Checksum calculation: Sum all packet bytes and calc the sum mod 256
- Command 0X56 is sent every 2 seconds
- Command 0X57 is sent every 1 second



4. Hardware configuration,
   - Notice that the TX signal from BMS is RE232 and is inverted
   - The TX signal voltage level is +5V and -5V.

There is a 2pin port named as COM3 on the BMS that can be connected to external device

5. Baud rate is 115200

Warning,

1. The communication protocol is applied for BMS8T, BMS16T and BMS24T.
2. The BMS only send out data, DON'T receive any data.
3. When send out all data to external device. After main unit is updated, please use correct communication protocol.

Update history,

Main unit version	Description
V1.21	Add current mode send out, otherwise only send out positive current value even in discharge.
V1.22	Add SOC send out.

For example,

The original hex data from BMS is as below

FF 21 FF 21 00 72 **24 24 57 0F** 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 56 26** 0F 5C 0F 6C 0F 66 00 00 00 06 00 09 00 12 00 09 00 19 00 0E 00 14 00 11 00 00 00 1B 00 00 00 13 00 C3 68 3A 3A 33 0D 0A 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 57 0F** 10 68 00 00 0C FF 21 FF 21 00 72 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 24 24 56 26 0F 5E 0F 6C 0F 64 00 00 00 06 00 09 00 12 00 06 00 19 00 0E 00 17 00 15 00 01 00 19 00 00 00 11 00 C4 **24 24 57 0F** 10 68 00 00 0C FF 21 FF 21 00 72 68 3A 3A 33 0D 0A 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 24 24 56 26 0F 5E 0F 6C 0F 64 00 00 00 06 00 0C 00 0D 00 09 00 17 00 0A 00 17 00 15 00 01 00 16 00 00 00 13 00 BE 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 68 3A 3A 33 0D 0A 24 24 57 0F 10 68 00 00 0A FF 21 FF 21 00 70 **24 24 57 0F** 10 68 00 00 0C FF 21 FF 21 00 72 24 24 56 26 0F 5C 0F 6C 0F 64 00 00 00 06 00 09 00 12 00 04 00 19 00 0E 00 17 00 15 00 01 00 1B 00 00 00 13 00 C4 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 57 0F** 10 68 00 00 0A FF 21 FF 21 00 70 68 3A 3A 33 0D 0A 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 57 0F** 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 56 26 0F** 5E 0F 6C 0F 64 00 00 00 06 00 0C 00 12 00 09 00 19 00 0E 00 17 00 15 00 01 00 1B 00 00 00 13 00 CE 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 24 24 57 0F 10 68 00 00 0A FF 21 FF 21 00 70 68 3A 3A 33 0D 0A 24 24 57 0F 10 68 00 00 0A FF 21 FF 21 00 70 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 56 26** 0F 5C 0F 6C 0F 64 00 00 00 06 00 0C 00 12 00 06 00 17 00 0E 00 14 00 15 00 01 00 19 00 00 00 13 00 C2 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 57 0F** 10 68 00 00 0C FF 21 FF 21 00 72 68 3A 3A 33 0D 0A 24 24 57 0F 10 68 00 00 0A FF 21 FF 21 00 70 24 24 56 26 0F 5C 0F 6E 0F 64 00 00 00 06 00 0C 00 0F 00 09 00 19 00 0E 00 14 00 15 00 00 00 1B 00 00 00 11 00 C5 **24 24 57 0F** 10 68 00 00 0A FF 21 FF 21 00 70 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 **24 24 57 0F** 10 68 00 00 0A FF 21 FF 21 00 70 68 3A 3A 33 0D 0A 24 24 57 0F 10 68 00 00 0A FF 21 FF 21 00 70 **24 24 56 26** 0F 5C 0F 6C 0F 64 00 00 00 06 00 09 00 12 00 09 00 19 00 0A 00 17 00 15 00 01 00 16 00 00 00 13 00 C0 24 24 57 0F 10 68 00 00 0C FF 21 FF 21 00 72 24 24 57 0F 10 68 00 00 0A FF 21 FF 21 00 70