Raw Extracted Data and Messages (BMS CAN Protocol 1 – 500 Kbps Baud Rate)

Raw BMS Message ID	Byte Index	Data Point	Resolution	Size	Range	Offset
0x00111100	Buf[0] and Buf[1]	Minimum Cell Voltage	1mV/bit	Uint16	0-6500mV	N/A
0x00111100	Buf[2] and Buf[3]	Maximum Cell Voltage	1mV/bit	Uint16	0-6500mV	N/A
0x00111100	Buf[4]	Minimum Cell Voltage Index	-	Uint8	0-255	N/A
0x00111200	Buf[0]	Minimum Cell Temp.	1®C/bit	Uint8	0-6500mV	40®C
0x00111200	Buf[1]	Maximum Cell Temp.	1®C/bit	Uint8	0-6500mV	40®C
0x00111200	Buf[3]	Maximum Cell Temp. Index	-	Uint8	0-255	N/A
0x00111500	Buf[2] and Buf[3]	Shunt Voltage	10mV/bit	Uint16	0-655.35V	N/A
0x00111500	Buf[4] and Buf[5] and Buf[6] and Buf[7]	Shunt Current	Reported in mA	Float (see below for conversion)	-365000 – 365000 mA	N/A
0x00140100	Buf[2]	Critical Flag Faults 1	1 flag/bit	Byte	0-255	N/A
0x00140100	Buf[3]	Critical Flag Faults 1	1 flag/bit	Byte	0-255	N/A

New Message Outputs from Teensy Conversion Board

Message 1 – Cell Voltages and Temperatures

Output	Receive	ID	Baud Rate	Period (ms)
Teensy Baud Translation Board	Teensy Datalogger Board	0x01111110	250Kbps	20

Byte	Data Point	Actual Data Conversion
0	Min Cell Voltage LSB	Actual Minimum Cell Voltage (mV) = MSB * 256 + LSB; 1mV/bit Range: 0-6500mV; Minimum cell Voltage as seen by BMS
1	Min Cell Voltage MSB	
2	Min Cell Voltage LSB	Actual Maximum Cell Voltage (mV) = MSB * 256 + LSB; 1mV/bit Range: 0-6500mV; Maximum Cell Voltage as seen by BMS
3	Min Cell Voltage MSB	
4	Min Cell Voltage Index	This is the TopMon number of the minimum cell voltage (No Conversion Required)
5	Min Cell Temperature	Actual Minimum Cell Temp = Min Cell Temp – 40; 1®C/bit Range = -40-155®C; Minimum Cell Temp. as seen by BMS
6	Max Cell Temperature	Actual Maximum Cell Temp = Max Cell Temp – 40; 1®C/bit Range = -40-155®C; Maximum Cell Temp. as seen by BMS
7	Max Cell Temp Index	This is the TopMon number of the maximum cell temperature (No Conversion Required)

Message 2 – Shunt Parameters and Critical Fault Flags

Output	Receive	ID	Baud Rate	Period (ms)
Teensy Baud Translation Board	Teensy Datalogger Board	0x01111120	250Kbps	20

Byte	Data Point	Actual Data Conversion							
0	Shunt Voltage LSB	Actual Shunt Voltage (mV) = (MSB * 256 + LSB)*10; 10mV/bit Resolution: 0-65000mV; Pack Voltage as seen by Shunt							
1	Shunt Voltage MSB								
2	Shunt Current Byte 1	Convert 4 bytes to a float using the following code where shunt_cur is a long variable. Returns a signed float variable between -365A and 365A measured in mA *for(int i = 2; i < 6; i++){ shunt_cur= (shunt_cur << 8) | inMsgR.buf[i];}*							
3	Shunt Current Byte 2								
4	Shunt Current Byte 3								
5	Shunt Current Byte 4								
6	LSB of Critical Flags	**BIT7**	**BIT6**	**BIT5**	**BIT4**	**BIT3**	**BIT2**	**BIT1**	**BIT0**
		ERR 7	ERR 6	ERR 5	ERR 4	ERR 3	ERR 2	ERR 1	ERR 0
7	MSB of Critical Flags	**BIT7**	**BIT6**	**BIT5**	**BIT4**	**BIT3**	**BIT2**	**BIT1**	**BIT0**
		NC	NC	NC	ERR12	ERR11	ERR10	ERR 9	ERR 8

Critical Flag Errors

Error Number	Name	Description
ERR 0	Low Cell Voltage	A cell has dropped below the specified Low Cell Voltage Point
ERR 1	High Cell Voltage	A cell has raised above the specified High Cell Voltage Point
ERR 2	Low Cell Temp.	A cell has dropped below the specified Low Cell Temp. Point
ERR 3	High Cell Temp.	A cell has raised above the specified High Cell Temp. Point
ERR 4	Low Supply Volt.	Batrium Watchmon's input Voltage is below Low Point
ERR 5	High Supply Volt.	Batrium Watchmon's input Voltage is above High Point
ERR 6	Low Amb. Temp.	Ambient Temperature seen by Watchmon is below specified Low Ambient Temperature set point
ERR 7	High Amb. Temp.	Ambient Temperature seen by Watchmon is above specified High Ambient Temperature set point
ERR 8	Low Shunt Volt.	Pack voltage as seen by the shunt has dropped below the specified Low Shunt Voltage Set Point
ERR 9	High Shunt Volt.	Pack voltage as seen by the shunt is above the specified High Shunt Voltage Set Point
ERR 10	Low Idle Volt.	Pack voltage has been below the specified Idle Voltage for a certain amount of time
ERR 11	Max Charge Cur.	Max current draw has been exceeded whilst charging
ERR 12	Max Discharge Cur.	Max current draw has been exceeded whilst discharging