CCGM – Centralized CAN Cell Group Module (CCGM023A)

INTRODUCTION

EMUS Centralized Cell Group Module (CCGM) is a battery cells communication adapter (or "Slave unit") equipped with two CAN connectors for easy BMS system assembly and integrated proprietary EMUS software that allows data transfer within 100ms frequency. CCGM performs all cell data measuring by itself, so the product allows saving space by reducing the need of having cell modules and three-way connectors. CCGM increases the speed of the cell data broadcasting and provides for each connected battery cell balancing functionality.

APPLICATIONS

- Any lithium chemistry, series-connected battery pack, or a pack of multiple parallel strings, of up to 512 cells total if using 32 EMUS Centralized CAN Cell Group Modules with connected 16 cells on each. (centralized cell monitoring)

FEATURES

- 2x CAN connectors. Enables communication with CAN equipped EMUS G1 Control Unit and EMUS Centralized Cell Group Modules.
- Supports from 6 up to 16 lithium cells.
- 5x external temperature sensors.
- Using Temperature Breakout (or Extender) board (TBB010A) possible to extend up to 16 temperature sensors.
- Balancing of cells, 400mA per each cell.
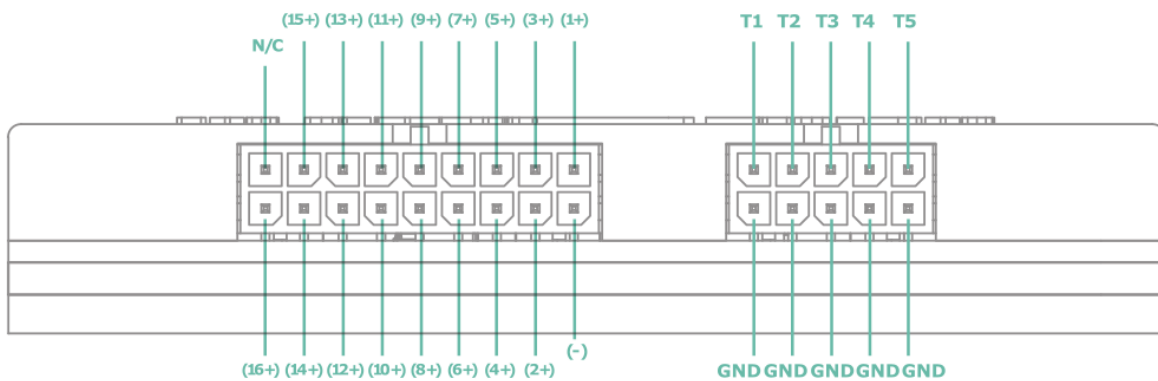- Supports 50, 125, 250, 500, 800 kbit/s and 1 Mbit/s CAN baud rates.
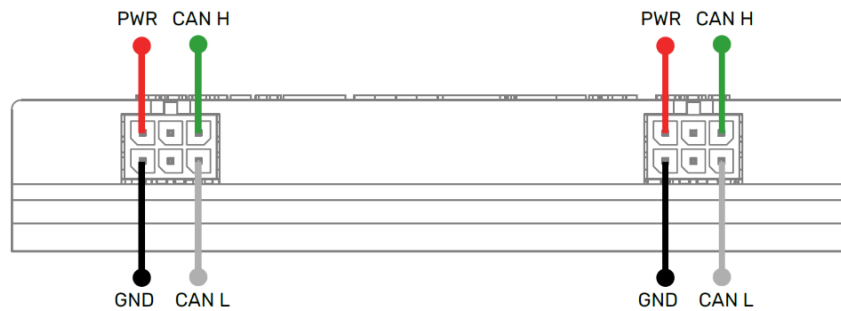
MECHANICAL INFORMATION
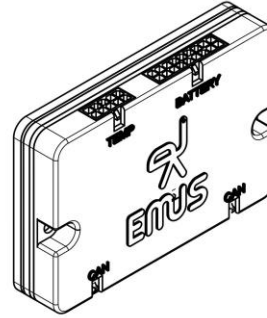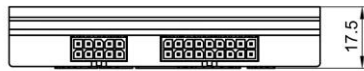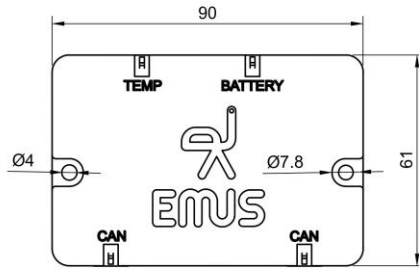
CONNECTION LAYOUT

Cells Layout: Ext. Temperature Sensors Layout:

Assignment	Mating Housing	Terminal
(–)	Microfit 43025-1800 cell connector	43030-0003Molex Micro-latch crimps (recommended crimp tool Molex Hand Crimp Tool P/N: 638190000)
1+		
2+		
3+		
4+		
5+		
6+		
7+		
8+		
9+		
10+		
11+		
12+		
13+		
14+		
15+		
16+		
N/C		
5XGND	Microfit 43025-1000 Temp connector	43030-0003 (recommended crimp tool Molex Hand Crimp Tool P/N: 638190000)
T1		
T2		
T3		
T4		
T5		

CAN Connection Layout:

Assignment	Mating Housing	Terminal
PWR		
GND	2x microfit 43025-0600	43030-0003 (recommended crimp tool Molex Hand Crimp Tool P/N: 638190000)
CAN_H		
CAN_L		

ELECTRICAL CHARACTERISTICS

Item	Value
Supply voltage	12-95V
Supply voltage battery	12.0 VDC to 79.2 VDC (firmware limited by 72.8VDC)
Power supply reverse protection	yes
Current consumption	5.6 mA @ 68V - 8.7 mA @ 15V
Isolation voltage	1000V
Transient/overvoltage protection between CAN H/CAN L and GND (and vice versa)	24V
Cell voltage limits	0-4.95V

OTHER SPECIFICATIONS

Item	Conditions	Value
Cell Count	Other Li chemistries	6–16
	LTO cell chemistry	8–16*
CAN Speed		50kbps, 125kbps, 250kbps, 500kbps, 800kbps, 1Mbps (by default 250kbps)
Reserved CAN IDs		0x1FFFFEE5, 0x1FFFFEE6, 0x1FFFE5E5, and 0x1FFFE5E6
Operating Temperature		-40 to +85 °C
IP rating		IP40
Weight	Without Quick Start Kit	105g
	With Quick Start Kit	145g
Cell communication wire length	In our Quick Start Kit	45cm
Temperature sensors wire length	In our Quick Start Kit	45cm
Cell Voltage	General Firmware	2.01 – 4.54V
	LTO Firmware	1.01 – 3.54V

INSTALLATION

* Minimum cell count depends on the cell chemistry used. The lowest supported battery pack voltage by internal CCGM parts is 12V, therefore if LTO cells are used then the minimum cell count should be calculated accordingly.
E.g. if LTO cell's expected lowest voltage is 1.5V then the minimum number of cells required would be 8 [12V / 1.5V = 8 cells].

$$V_{BatTotal} \div V_{CellMin} = MinimumNumOfCells$$

NOTE: the absolute minimum total battery pack voltage is 9V, however it is not guaranteed that the device will sense cell voltages correctly.

NOTE: Connection must start from the most negative cell to the most positive. In cases when cells number is less than 16, e.g. 8 cells, then free cells connection wires (dedicated for 9th-16th cells) must ALL be connected to the last 8th (most positive cell).

To setup the 16 cells and 5 external temperature sensors please refer to figure below.

Cells Layout: Ext. Temperature Sensors Layout:

(15+) (13+) (11+) (9+) (7+) (5+) (3+) (1+)   T1 T2 T3 T4 T5

N/C

(16+) (14+) (12+) (10+) (8+) (6+) (4+) (2+)   (-)
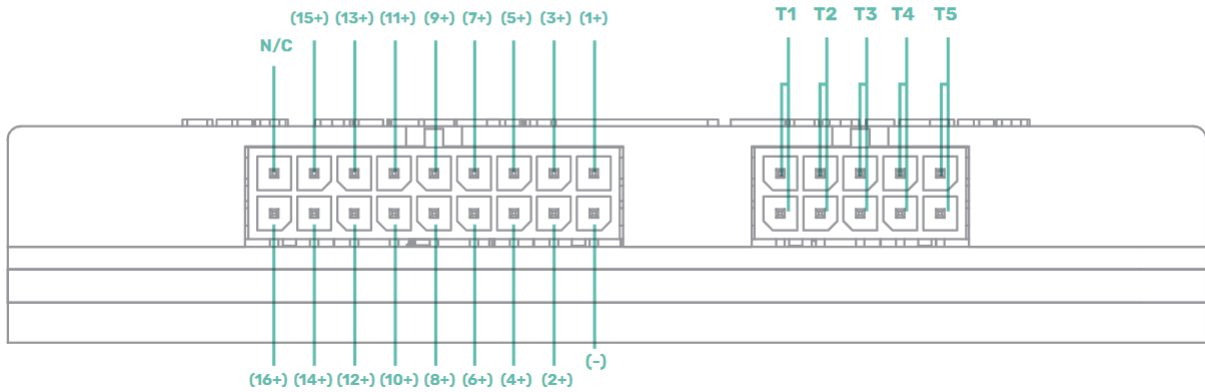
Cells Layout: (using other amount of cells)

(8+) (8+) (8+) (8+) (7+) (5+) (3+) (1+)

N/C

(8+) (8+) (8+) (8+) (8+) (6+) (4+) (2+)   (-)