A circuit board

Description automatically generated

Figure : Master board

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Description | |
| 1 | ExtPower | + | 12V DC power input |
| - | ISOGND |
| 2 | Discharge | + | 12V DC output for discharge contactor |
| - | ISOGND |
| 3 | Precharge | + | 12V DC output for precharge contactor |
| - | ISOGND |
| 4 | Charge | + | 12V DC output for charge contactor |
| - | ISOGND |
| 5 | - Discharge + | + | 0-400V DC input for load voltage measurement |
| - | BATGND |
| 6 | - BAT + | + | 0-400V DC input for battery voltage measurement |
| - | BATGND |
| 7 | - Charge + | + | 0-400V DC input for charger detection |
| - | BATGND |
| 8 | Current | 3.3V | +3.3V |
| I+ | Delta-sigma signal from current sensor |
| I- | Not connected |
| GND | ISOGND |
| 9 | Shunt1\* | 3.3V | +3.3V |
| I+ | Differential input + from differential current sensor |
| I- | Differential input - from differential current sensor |
| GND | ISOGND |
| 10 | Master | PA | Isolated ISOSPI communication 2 wire interfaces with slave boards |
| MA | Isolated ISOSPI communication 2 wire interfaces with slave boards |
| 11 | USB | Micro-USB interface with ENNOID-BMS-tool software on a computer | |
| 12 | CAN | EN | External enable signal |
| 5V | External 5V for CAN |
| H | CANH |
| L | CANL |
| GND | CANGND |
| 13 | OLED | 3.3V | +3.3V |
| RST | No connect |
| SDA | SDA signal output for OLED display |
| SCL | SCL signal output for OLED display |
| GND | ISOGND |
| 14 | Power Button | GND | ISOGND |
| N.O. | Normally open pin for power button |
| 3.3V | No connect +3.3V |
| LED | +3.3V for LED |
| GND | ISOGND |
| 15 | Debug | +3.3V | |
| SWCLK | |
| ISOGND | |
| SWDIO | |
| NRST | |

\* Current & shunt1 ports requires different components for operating. User must choose which one is appropriate.

A circuit board

Description automatically generated

Figure : Slave board

|  |  |  |  |
| --- | --- | --- | --- |
| # | Name | Description | |
| 1 | Master | Isolated ISOSPI communication 2 wire interfaces towards previous slave board or master board | |
| 2 | Slave | Isolated ISOSPI communication 2 wire interfaces towards next slave board | |
| 3 | LAST? | Leave pins unconnected for the last slave board in the battery pack. Otherwise, those pins must be shorted. | |
| 4 | Cells | BAT- | Connect to negative voltage of the battery module |
| 1 to 12 | Connect all pins to the next cells positive voltage levels. |
| 5 | Analog | Analog input that can be accessed & sampled if needed | |
| 6 | I2C | I2C communication channel for 8 temperature sensors through external ADC128 IC | |
| 7 | GPIO | GPIO for external signal if needed | |