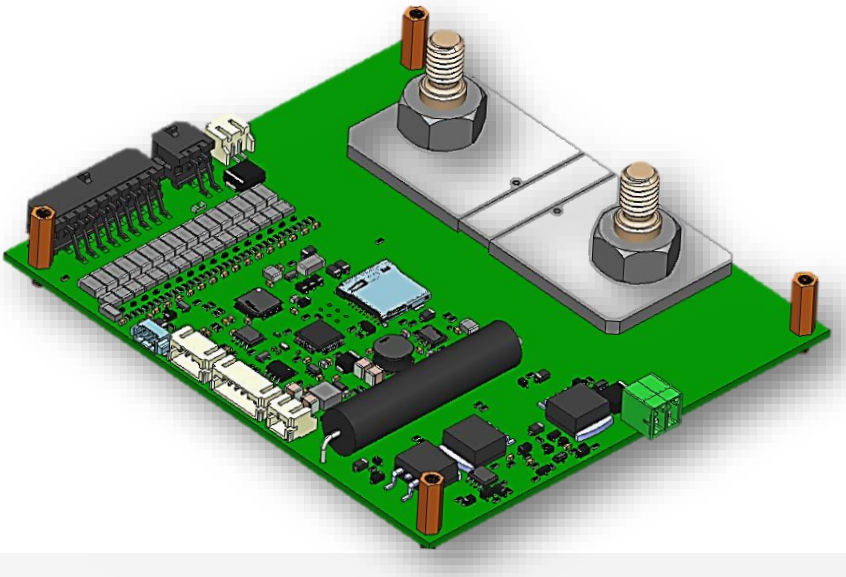
EF-ESS-400

Smart Battery Management System

The EF-ESS-400 BMS is a centralized BMS with battery monitoring and system management functions integrated into a single unit. Designed to monitor up to 16 cells individually, EF-ESS-400 can also be connected in a parallel architecture. This makes the EF-ESS-400 BMS an ideal choice for ESS applications. EF-ESS-400 is chemistry agnostic and compatible with all leading chemistries of lithium-ion batteries.



Design

- Compact design
- This BMS manages from 4 to 16 cells in series

Performance

- Accurate State of Charge (SOC) and State of Health (SOH) estimations based on advanced algorithms
- Smart passive balancing algorithm with a configurable balancing voltage
- Operational temperature range of -40°C to 85°C

Communication

- CAN bus 2.0 B interface for charger control and system interfacing
- Bluetooth BLE monitoring capabilities with companion mobile application Battrack BT
- Compatible with our Telematics Control Unit to track Battery deployments in real-time
- UART / RS232 / RS485 Communication.

Safety

- Status LEDs for error indication.
- Up to 2 onboard temperature sensors and 4 thermistors (NTC) inputs for external sensing
- Short circuit protection

Intelligence

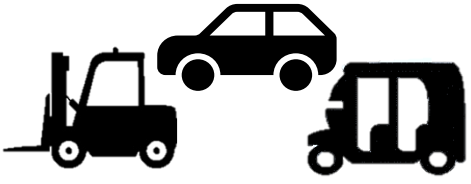
- Real-time monitoring and data logging
- Stores a lifetime of historical battery data

Application Software

- **Battrack-BT:** Companion smartphone app connects to the BMS via Bluetooth and displays live data of the battery's performance
- **BATBOT:** Desktop software to communicate with the BMS, get historical data and configure its parameters via the USB/CAN tool
- **Battrack web-** Cloud-connected battery analytics platform to manage a large fleet of batteries

Applications

L5, L7,e- Forklifts

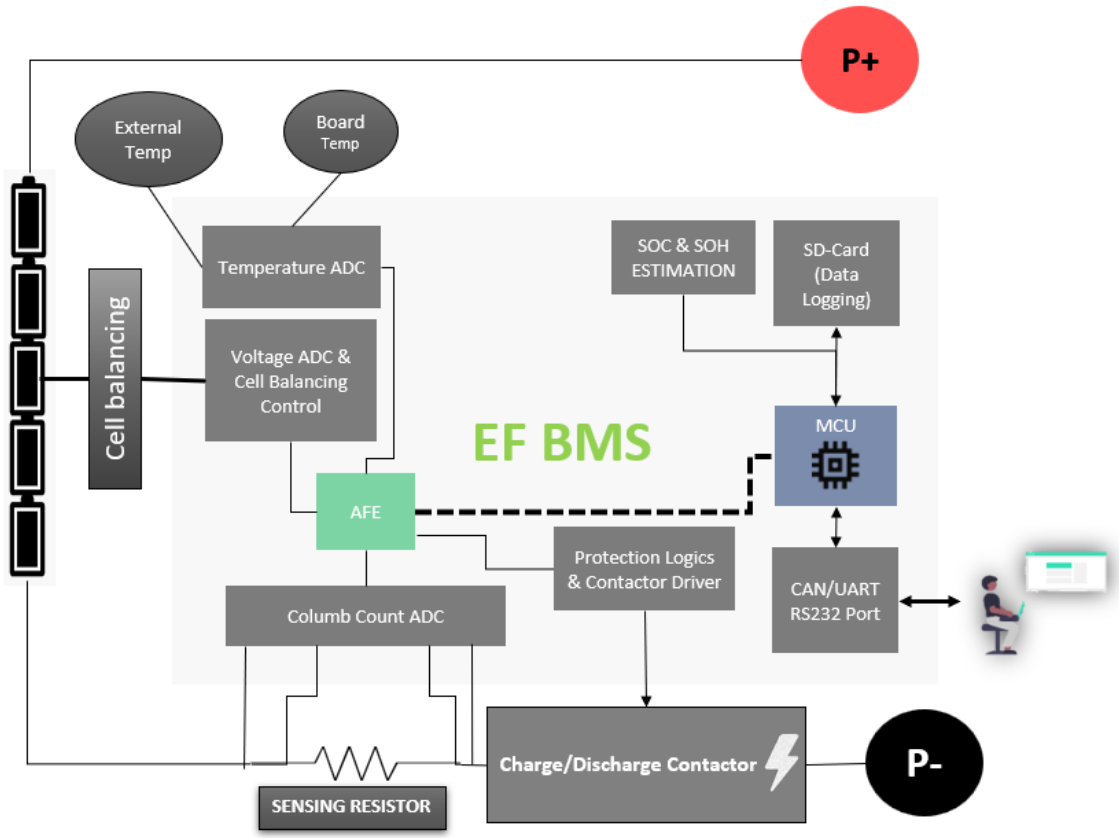


UPS/Backup Battery Systems

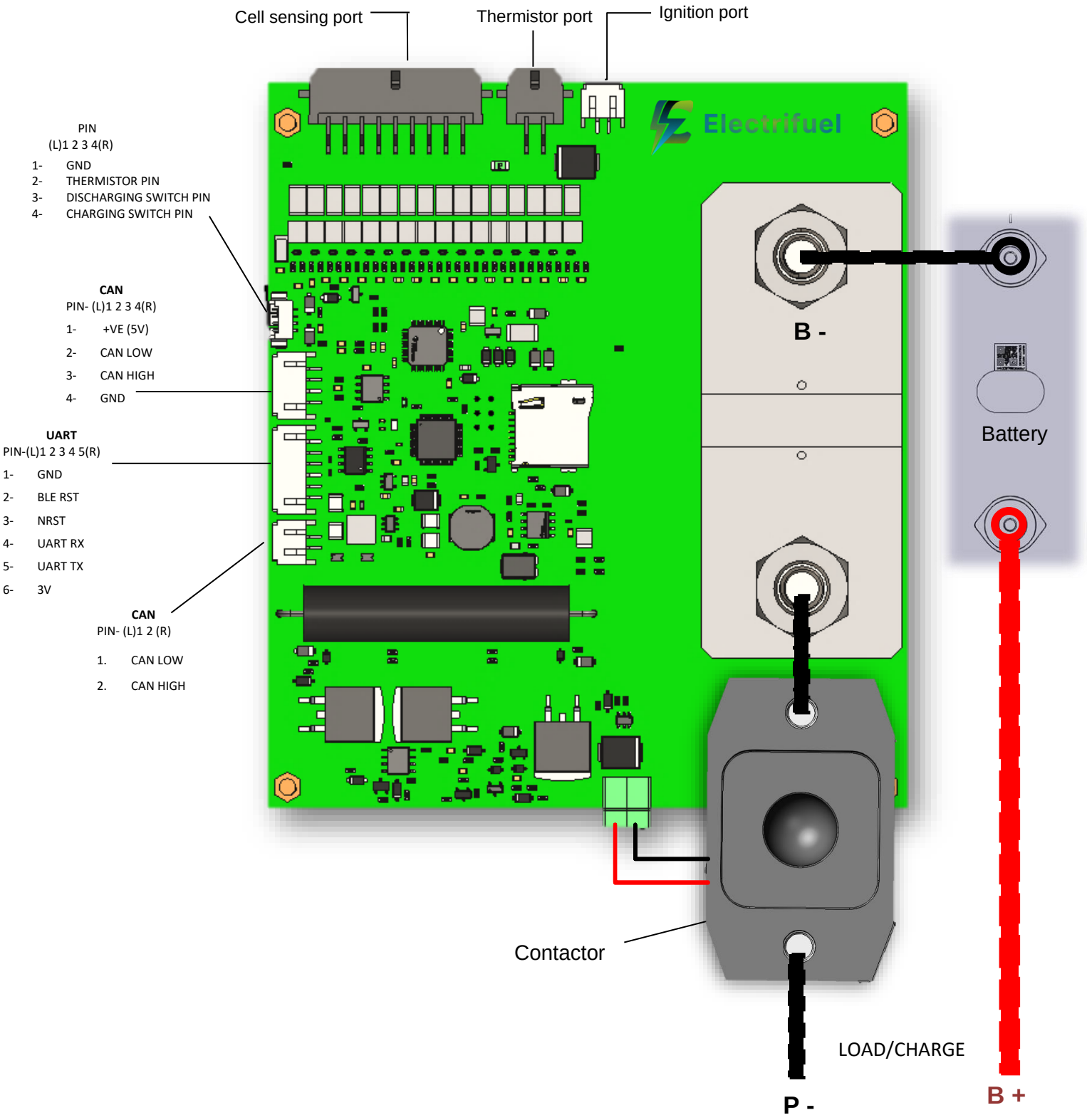
General Specifications-

Battery voltage	06– 85 VDC
Cell configuration	04 – 16
Capacity manageable	2000Ah
Balancing current per cell	210 mA @4.2V
Max cell voltage	5V
Discharging Current	400A
Max Charging Current	400A
Voltage measurement accuracy	±5.00 mV -40°C to 85°C
Active current consumption	10-20mA
Sleep current consumption	50µA
Temperature sensors	4 externals + 2 onboard
Temperature measurement accuracy	±1.00°C -40°C to 85°C
Control	Charge & Discharge switch control, ignition key, thermal management, status LED, buzzer control
Communication	CAN 2.0 B for system integration Bluetooth for Android dashboard, UART, RS232/RS485
Supported CAN speeds	125, 250, 500, 1k kbit/sec
Temperature	-40°C to 85°C
Dimensions	130*115*20 (without contactor)
Weight	180 g (Approx)

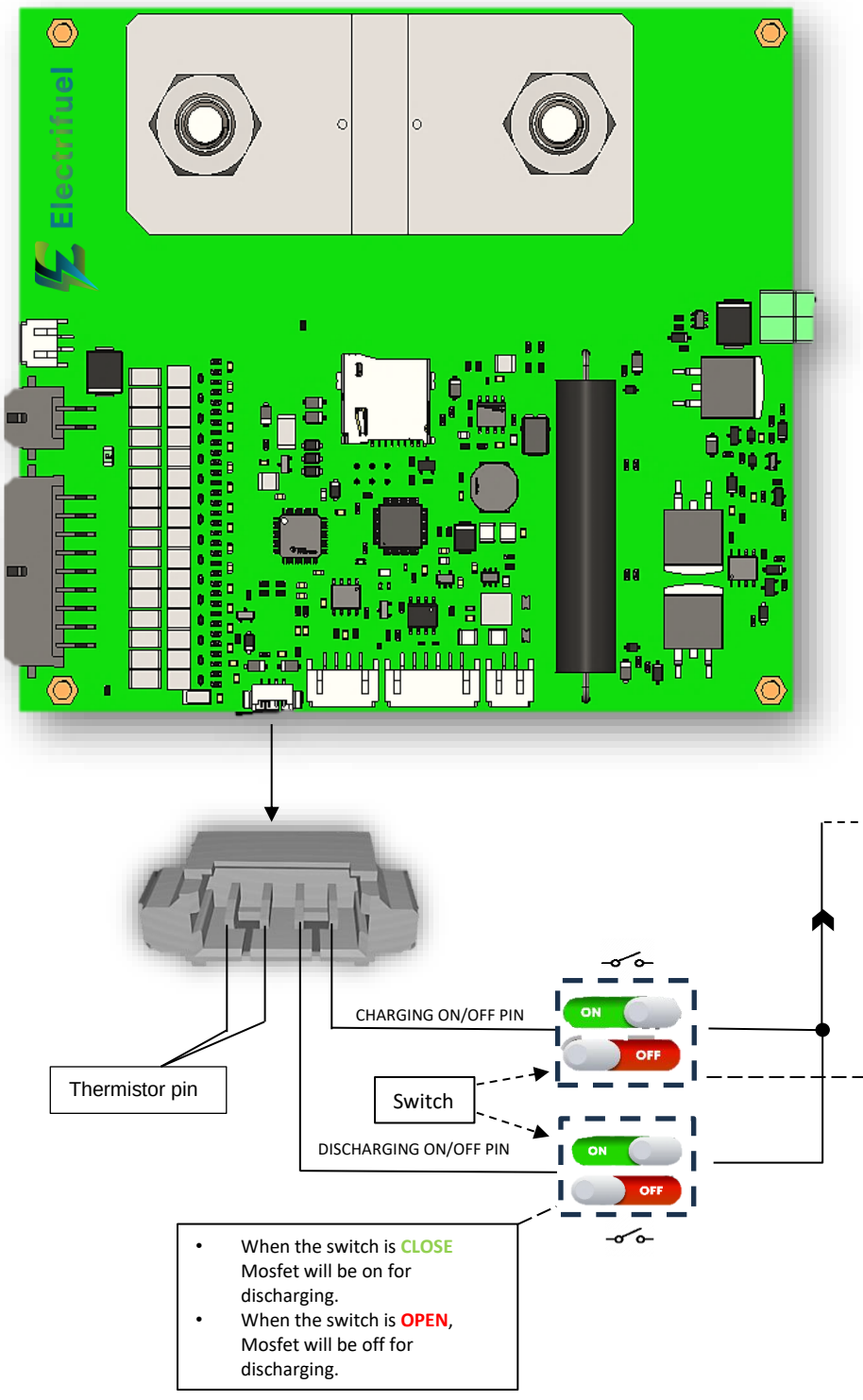
EF-ESS-400 Block diagram-



Mechanical Specifications-



Switch Control Mode-



Cell connections -

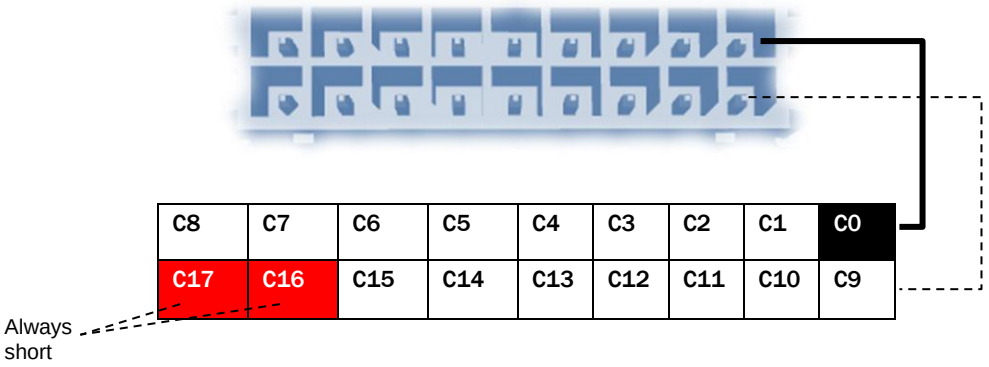


Table for cell connections- where C0 represents **B -VE** & here C Represents cells

String	3 Series Pack	4 Series Pack	5 Series Pack	6 Series Pack	7 Series Pack	8 Series Pack	9 Series Pack	10 Series Pack	11 Series Pack	12 Series Pack	13 Series Pack	14 Series Pack	15 Series Pack	16 Series Pack
C16-C15	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	C16
C15-C14	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	C15	C15
C14-C13	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	C14	C14	C14
C13-C12	Short	Short	Short	Short	Short	Short	Short	Short	Short	Short	C13	C13	C13	C13
C12-C11	Short	Short	Short	Short	Short	Short	Short	Short	Short	C12	C12	C12	C12	C12
C11-C10	Short	Short	Short	Short	Short	Short	Short	Short	C11	C11	C11	C11	C11	C11
C10-C9	Short	Short	Short	Short	Short	Short	Short	C10	C10	C10	C10	C10	C10	C10
C9-C8	Short	Short	Short	Short	Short	Short	C9	C9	C9	C9	C9	C9	C9	C9
C8-C7	Short	Short	Short	Short	Short	C8	C8	C8	C8	C8	C8	C8	C8	C8
C7-C6	Short	Short	Short	Short	C7	C7	C7	C7	C7	C7	C7	C7	C7	C7
C6-C5	Short	Short	Short	C6	C6	C6	C6	C6	C6	C6	C6	C6	C6	C6
C5-C4	Short	Short	C5	C5	C5	C5	C5	C5	C5	C5	C5	C5	C5	C5
C4-C3	Short	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
C3-C2	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3
C2-C1	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2	C2
C1-C0	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1

Document Revision History-

Revision	Date	Description
A	2023-05-01	Initial release
B	2023-06-15	Alignment changes with the connector images