

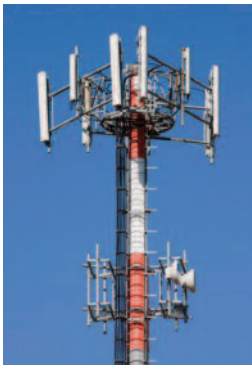
# FEATHERWEIGHT LITHIUM ION BATTERY

## LI TEL 48-160 C



Optimized for unstable electrical networks

Designed for Telecom back-up power high cycling applications



### Applications:

- Unstable networks
- Wireline
- Wireless
- Customer Premise/PBX
- Broadband
- Microwave Repeater
- Fiber Optic Regen Sites

### INDOOR/OUTDOOR INSTALLATIONS

- Sealed Cabinet Systems
- Rack Systems

### FEATURES AND BENEFITS

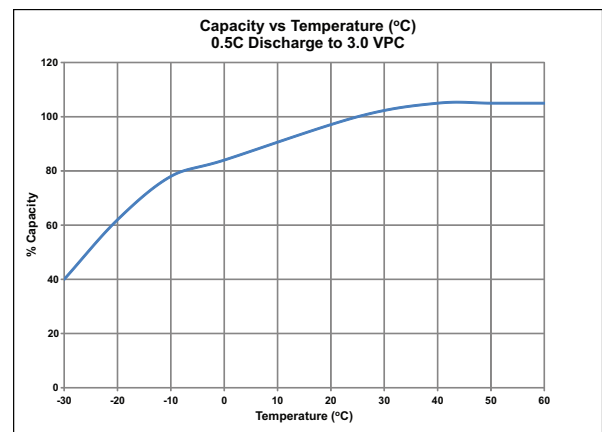
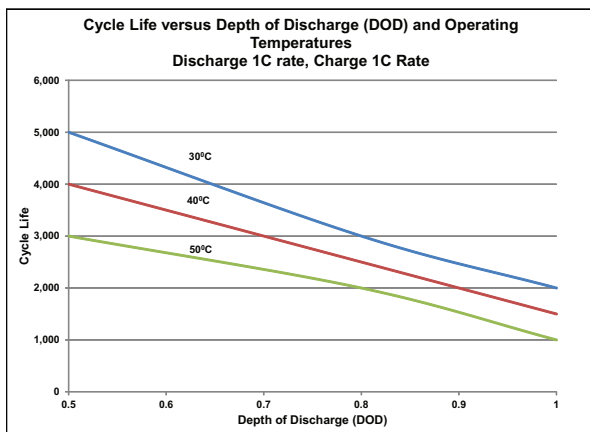
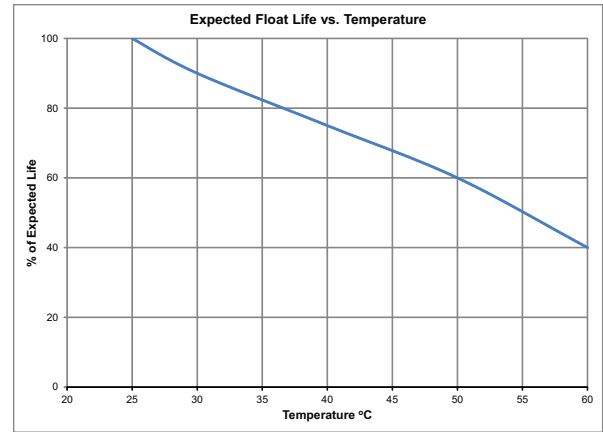
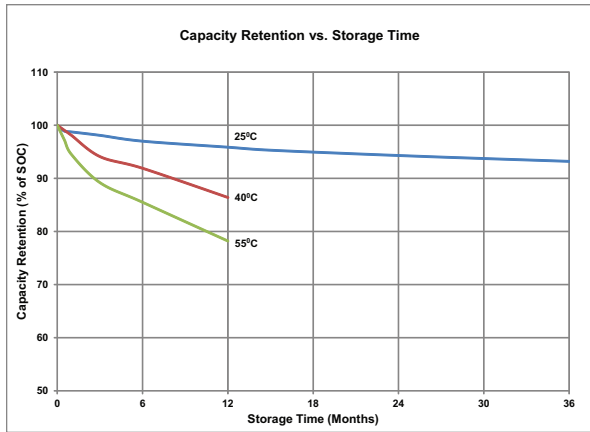
- 48V 160 Ah
- 7.6 kWh
- Optimized for Unstable Networks, float & cycling
- 23" Relay Rack Tray Mountable (10 per 7 ft rack)
- Reverse polarity and short circuit protected
- Battery Management System with Battery String Monitoring
- LED Alarm Indication
- Storage 'Sleep State' to maximize shelf life
- Designed for parallel and series operation
- Maintenance free

### Long Life Cycle Service

- Proven Lithium Ion chemistry
- Maximum cycle life for deep cycle and hybrid applications
- High charge acceptance for rapid recharge

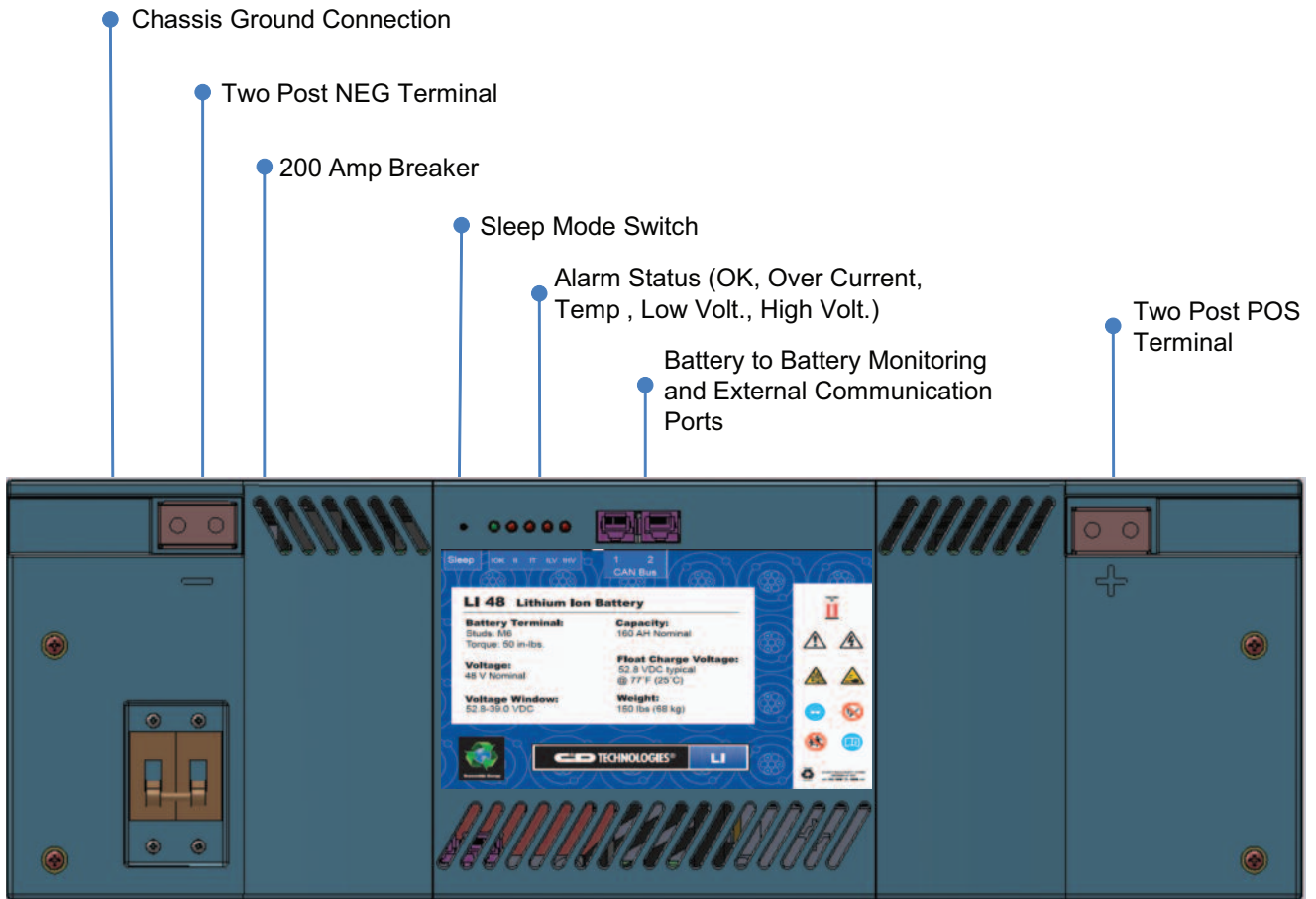
### High Level of Safety

- Multiple layers of safety features including a Battery Management System designed to operate and protect the battery autonomously

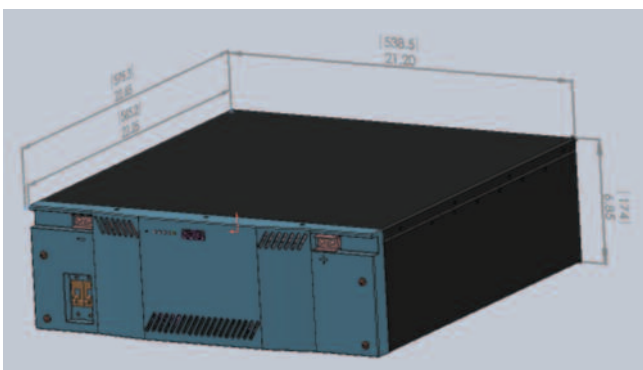


## Specifications

Voltage Per Unit	48 VDC
Nominal Capacity (Ah / kWh)	160 Ah / 7.63 kWh
Minimum operating voltage	39 VDC
Technology	Li Ion Polymer (NCM cathode, Graphite based anode)
Operating Temperature Range	Discharge: -30°C to 50°C Charge: 0°C to 50°C
Normal Operating Temperature Range	20°C to 27°C
Maximum Discharge Current	160 ADC
Recommended Charging Limit	80 ADC
Maximum Charging Limit	160 ADC
Charging Voltage	52.8 or 52.08 VDC / unit at 25°C
Cycle Life (1C chg / 1C dcg, 80% DoD)	3000
Remaining Ah Capacity at 46 VDC	~10% to 42 VDC at 25°C
Cycle Service Charging	53.95 VDC / unit at 25°C
Maximum AC Ripple (Charger)	0.5% RMS or 1.5% P-P of float charge voltage recommended for best results
Self Discharge	~1%/month Battery can be stored up to 12 months at 25°C before a freshening charge is required. Batteries stored at temperatures above 25°C will require charge sooner, than batteries stored at lower temperatures. Low voltage LED will indicate when charge is required.
Accessories	Inter unit connectors, racks and cabinet systems are available
Terminal	Two, 1/4" - 20 or M6, studs for two hole lugs



## Physical and Performance Specifications



Width	538mm / 21.2"
Height	174mm / 6.85" / 4RU
Depth	541mm / 21.3"
Weight	68kg / 150lbs

**Constant Current Discharge Table - Amps at 25°C (77°F), 53.95 VDC Charge**

Operating Time (hrs)

EOD (V)	1	2	3	8	10
46	120	68	46.6	17.5	14
42	159	81	55.3	20.7	16.6
39	160	82	56	21	16.8

**Constant Power Discharge Table - Watts at 25°C (77°F), 53.95 VDC Charge**

Operating Time (hrs)

EOD (V)	1	2	3	8	10
39	7675	3962	2704	1014	811

# Battery Management System (BMS) Key Features and Functions

## Monitor:

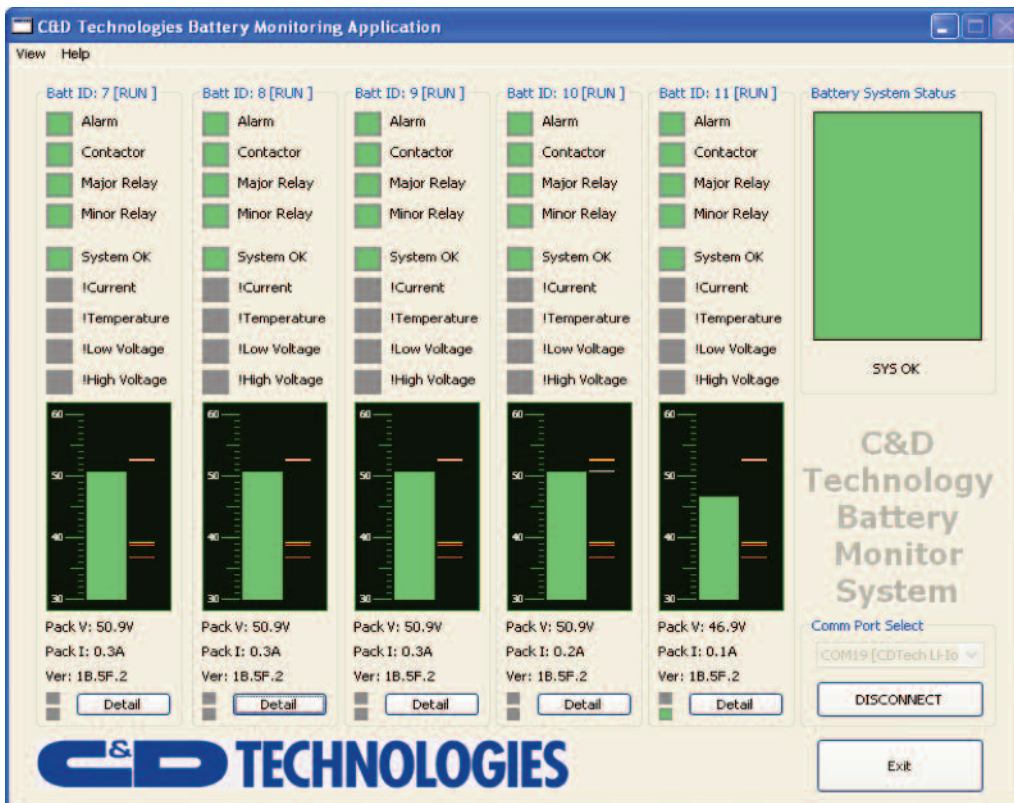
- Industry leading, +/- 1mV voltage measurement accuracy

## Balance:

- Industry leading high rate automatic active cell balancing
- Improved thermal management with high efficiency, active balancing (non-dissipative) used to minimize wasted energy (heat)
- Protects each cell from over-charge and over-discharge while increasing battery run time
- Extended run time, balances continuously during charge and discharge
- High current balancing reduces time to recharge from a discharged state

## Protect:

- Real Time Operating System (RTOS) on a high performance 32-bit microcontroller provides quick and deterministic response times to alarm conditions and time-critical events
- The BMS is designed to operate and protect the battery autonomously; no external controller is required
- Redundant cell voltage monitoring circuitry, temperature, and cell fault detection, provides an added layer of protection
- Integrated solid state battery switch which protects the battery from abusive battery currents, over-charge, over-discharge, and over/under temperature operation



## Battery Management System Graphical User Interface (GUI)

- PC or Mac based software for external monitoring
- Shows system status (from individual batteries down to individual cell groups)
- Alarm and event history with date and time stamp

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