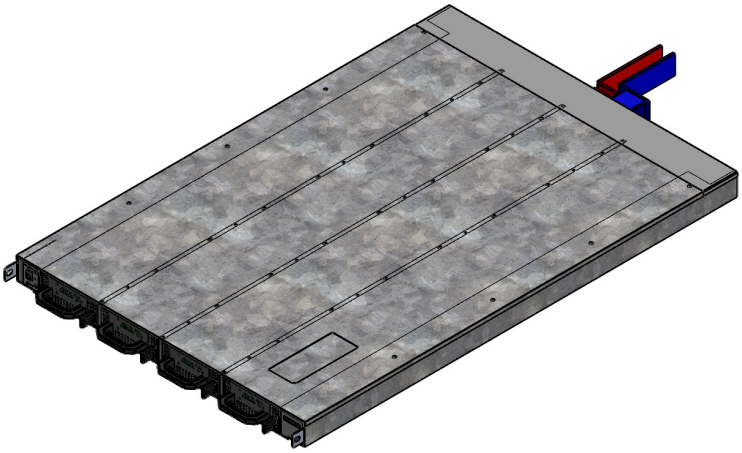
The Battery Backup System (BBS) is a rack-mounted backup power solution for servers, datacenters, and other critical-power environments. The BBS provides up to 7 kW of output power with only a height of 1U. It supports full load 12VDC bus backup for over 3 minutes during an AC loss. The BBS shelf contains four slots for Battery Backup Units (BBUs).

Key Features

- Four slots for hot-swappable, high performance Li-ion BBUs
- Provides up to 7 kW system backup power (1.75kW BBU x 4, 583.2A)
- Supports expansion for up to 3 BBSs for 21 kW output power
- Over 3 minutes run time at full load
- Monitors battery condition
- Active current sharing technology to optimize battery life
- 21-inch Battery Backup System with only 1 OU height
- PMBus 1.2 Communication



Specifications

Electrical	
Output Power (maximum)	7kW
Output Current (maximum)	583.2A
Input Voltage (normal)	12.5VDC
Input Voltage (minimum)	12.25VDC
Input Voltage (maximum)	12.725VDC
Input Current (maximum)	40A at 12.5VDC (battery charge condition)
Output Voltage (normal)	12.25VDC, 12.6VDC
Output Voltage (minimum)	11.5VDC, 12.25VDC
Output Voltage (maximum)	12.725VDC
Current Sharing Ability	Current error less than 5%
Communications	PMBus 1.2 via RJ45
EMI	Class A with minimum 4dB of margin
Physical	
Dimensions (H x W x D)	1.7” x 21.1” x 31.6” (43.3 mm x 535.8 mm x 802.2 mm)
Weight (empty)	29.98 lbs (13.6 kg) without BBUs 70.98 lbs (32.2 kg) with four BBUs
Form Factor	1 OU, 21” Rack Mount
Bus Bar Connection Type	Screw Lock

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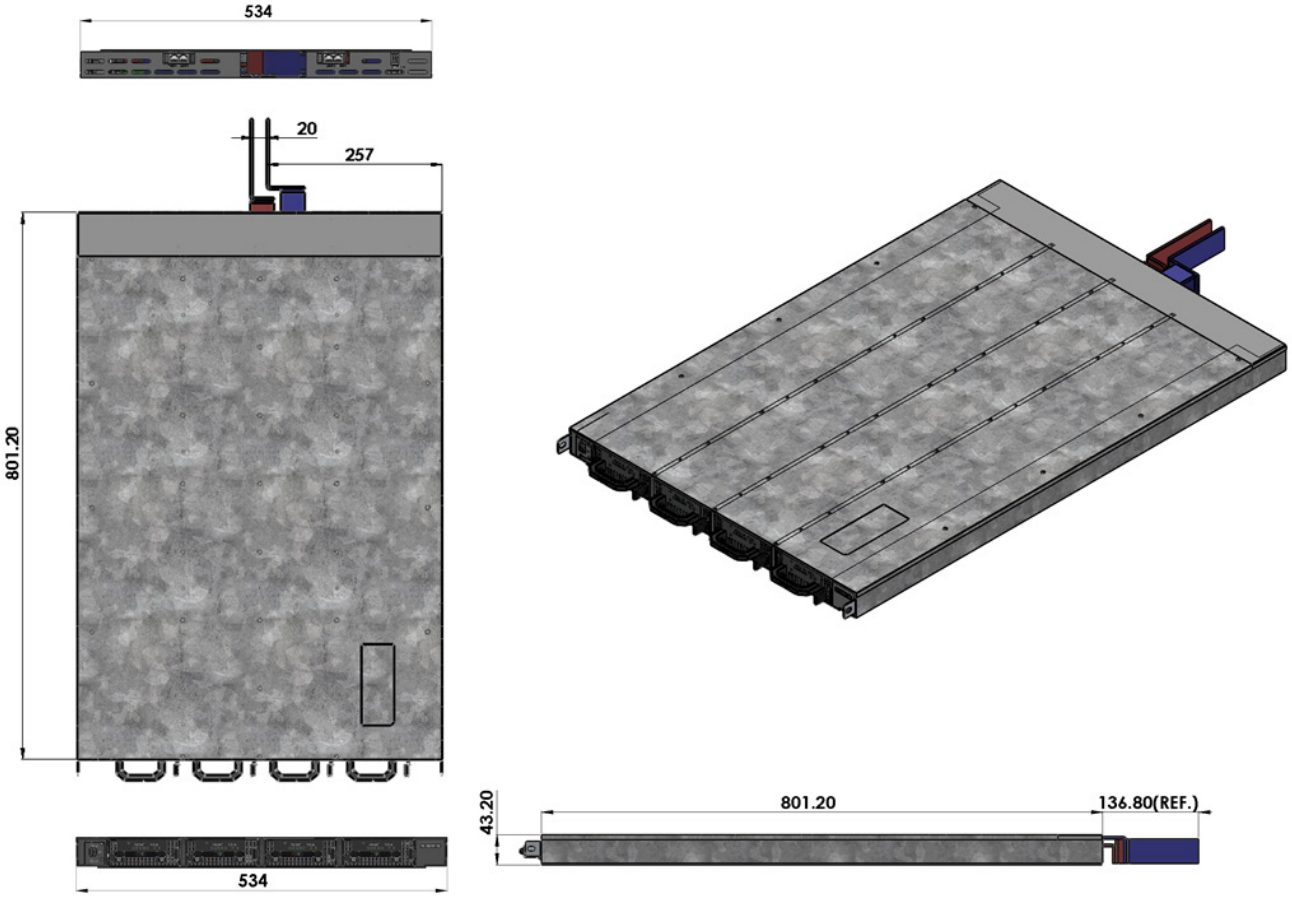
Specifications

Environment	
Temperature	Operating: 10°C – 45°C, Storage: -20°C – 70°C
Humidity	5% – 95% relative (non-condensing)
Altitude	Operating: 0 m – 1524 m, Storage: 0 m – 5000 m
Acoustic	30dB at 1 m
General	
Approvals	UL60950-1 (planned, approvals pending)
Mounting Hardware	2 mounting brackets with 12 screws included
Warranty	2 Years @ 35C

Mechanical



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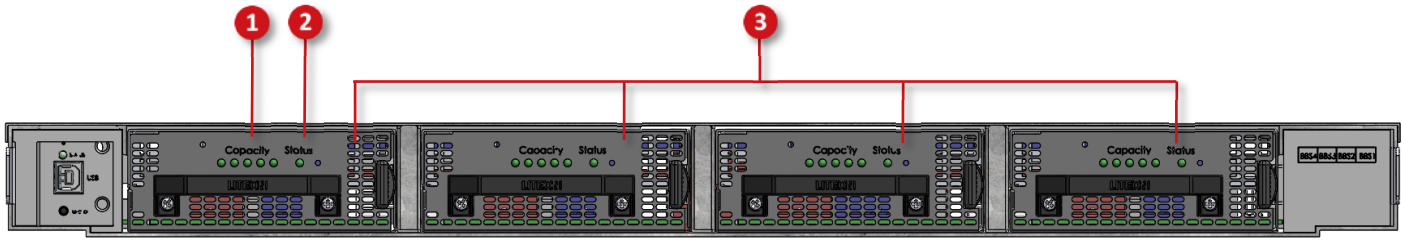
Front Panel



1	BBU Capacity Status LEDs	Five green status LEDs, LED 0 (left LED) to LED 4 (right LED), indicate battery capacity. Refer to the Capacity Status LED tables below for more details.	
2	BBU Status LED	Red	• Module Failure • BBU has entered protection mode
		Green	• Solid: BBU has input power and is charging • Blink: BBU has lost input power and is discharging (supplying 12.25V to bus)
3	Battery Backup Units (BBUs)	Output 12.25VDC	

The five green capacity status LEDs in the front of the BBU indicate the battery capacity as described in the tables below.

Capacity Status LEDs (Charge mode)					
	LED 0	LED 1	LED 2	LED 3	LED 4
0% – 20%	Blink	Off	Off	Off	Off
21% – 40%	Solid	Blink	Off	Off	Off
41% – 60%	Solid	Solid	Blink	Off	Off
61% – 80%	Solid	Solid	Solid	Blink	Off
81% – 99%	Solid	Solid	Solid	Solid	Blink
100%	Solid	Solid	Solid	Solid	Solid

Capacity Status LEDs (Discharge mode)					
	LED 0	LED 1	LED 2	LED 3	LED 4
0% – 20%	Off	Off	Off	Off	Off
21% – 40%	Solid	Off	Off	Off	Off
41% – 60%	Solid	Solid	Off	Off	Off
61% – 80%	Solid	Solid	Solid	Off	Off
81% – 94%	Solid	Solid	Solid	Solid	Off
95% – 100%	Solid	Solid	Solid	Solid	Solid

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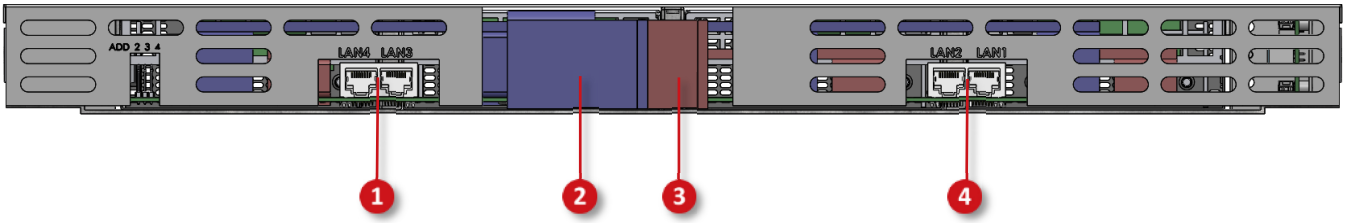
Rear Panel

Note: The DC input connector is the same as the DC output connector.



1	RJ45 Port for PSC/BBS Signal	PSC communication with BBS Signal
2	BUSBAR for GND	Negative Input/output voltage
3	BUSBAR for +12.6V	Positive Input/output voltage
4	RJ45 Port for BBS/BBU Signal	BBS communication with BBU Signal

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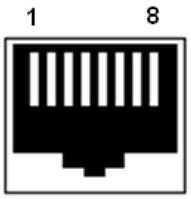
PSC/BBS Signal Connector

The Power shelf sends AC source and Bus voltage (12.5V) information to the Battery Backup System (BBS) through an RJ45 communication port. It also sends the On/Off command to the BBS.



Pin	Pin Define	PS I/O	Status		Description
1	PSC - I2C - SCL	Input	0V / 3.3V	L / H	I2C Clock Pin (Bit rates up to 100KHz)
2	BBS - SGND		0V	L	BBS signal GND pin
3	PSC - I2C - SDA	I/O	0V / 3.3V	L / H	I2C Data Pin (Bit rates up to 100KHz)
4	Reserved				
5	Reserved				
6	BBS - SGND		0V	L	BBS signal GND pin
7	BBS - DISCHARGE (Controlled by PSC)	Input	0V / 3.3V	L / H	AC Power status signal: Low = Power shelf AC loss High = Power shelf AC normal
8	Reserved				

Note: Low Level means voltage range is 0 to 0.8V; High Level means voltage range is 2.45 to 3.45V

Note: The power industry has adopted multiple names for a shelf controller including “RMC” for Rack Management Controller and “PSC” for Power Shelf Controller. This document uses the term PSC for a shelf controller.

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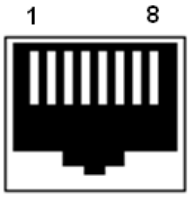
BBS/BBU Signal Connector

The Battery Backup System (BBS) communicates with BBUs through an RJ45 communication port. It also monitors BBUs status information via the I2C PMBus.



Pin	Pin Define	PS I/O	Status		Description
1	BBS - I2C - SCL	Input	0V / 3.3V	L / H	I2C Clock Pin (Bit rates up to 100KHz)
2	BBS - SGND		0V	L	BBS signal GND pin
3	BBS - I2C - SDA	I/O	0V / 3.3V	L / H	I2C Data Pin (Bit rates up to 100KHz)
4	BBS - CURRENT - SHARE	BI	0V / 8V		Active current sharing signal (Connects with next shelf)
5	Reserved				
6	BBS - SGND		0V	L	BBS signal GND pin
7	BBU - DISCHARGE (Controlled by the BBS)	Input	0V / 3.3V	L / H	High to Low = Normal state transfer to voltage boost state Low to High = Voltage boost state transfer to normal state
8	Reserved				

Note: Low Level means voltage range is 0 to 0.8V; High Level means voltage range is 2.45 to 3.45V

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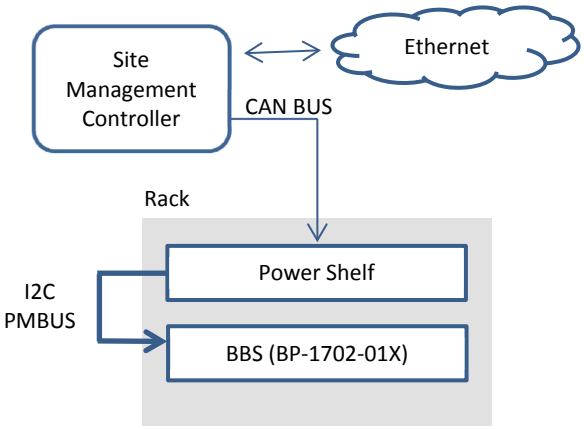
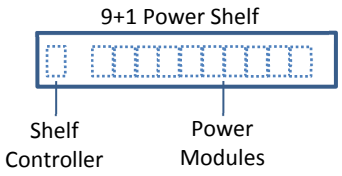
Three Phase Power Shelf System Components

The system provides a comprehensive power management and battery backup capability based on existing building block with configuration flexibility to suit specific power, size, and run-time requirements. The table below provides additional information on the building block available to create a customized power solution. Please visit our website for more in-depth information or contact your local Lite-On PSS representative for support.

Component	Model Number	Description
Power Shelf	PF-2123-1L1M	22.5KW (9+1) 3U Power Shelf with ten power module slots and one Shelf Controller slot: • Power Module slots (10) • Shelf Controller slot (1)
Power Module	PS-2252-6Q-LF	2.5kW Hot-Swappable Power Module
Battery Backup System	BP-1702-01X	7kW 1U Battery Backup System (BBS) with 4 slots
Battery Backup Unit	BM-1172-01X	1.75kW Battery Backup Unit (BBU)
Shelf Controller	CM-12CP-010U	Power shelf management and control
Site Management Controller	CP-13EC-010U	Rack management and control
21" OCP Rack	KT-2141-121	21-inch Open Frame Rack



System Block Diagram



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