Power Lite Lithium Battery System

SSLB1

USER GUIDE

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1. INTRODUCTION

Thank you for choosing Sunsynk's energy storage system.

The energy storage module includes lithium-ion rechargeable batteries with 5.12kWh capacity, and the controller enables a central of multiple modules.

This manual provides guidelines to use the product. Please read this manual carefully before use for safety and keep this manual handy for reference.

Some main features of this product are:

- **Long Life Span**

The battery can be expected to remain serviceable for more than 10 years, considering that it is charged and discharged once in a day at room temperature (25°C).

- **Stable**

Olivine-type lithium iron phosphate batteries with excellent thermal stability and storage characteristics are used in this product. The module also incorporates a self-monitoring function for the detection of any abnormalities in energy storage.

- **Compact Design**

The height is nicely designed in 3U, in favour of standard industrial applications.

- **High Scalability**

Multiple energy storage modules can be connected in parallel, and the capacity can be customized according to the intended use.

2. GENERAL SAFETY

Sunsynk's products are designed with full consideration of safety. However, all electrical appliances can be dangerous if used inappropriately; it can cause a fire or electric shock that leads to severe injury or death. For your protection, please read the safety precautions presented in the Installation Manual.

Below are symbols used in this manual and the unit.
Please read through the following definitions before reading the manual.

	**Warning**	If you ignore these instructions, it can lead to a fire or electric shock causing serious injury or death.
	**Caution**	If you ignore these instructions, it can lead to electric shock or other accidents causing injury or harm to nearby products.

3. SPECIFICATIONS AND FUNCTIONS

3.1. Dimensions and Weigh

SSLB1 dimensions are presented in Figure 1. It is well designed for 19-inch cabinet.

Power Lite Lithium Battery System SSLB1	
Depth	530mm
Width	440mm
Height	132mm
Weight	48kg

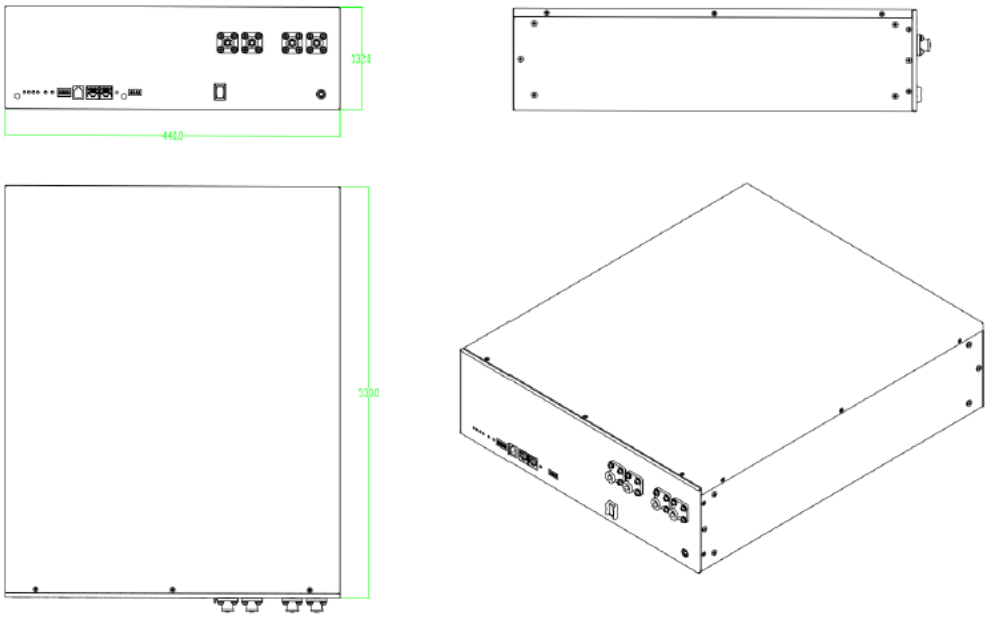


Figure 1 - SSLB1 dimensions

3.2. Specifications

Power Lite Lithium Battery System SSLB1	
Cell Type	Lithium Ferro Phosphate (LifePO4 or LFP)
Nominal Operating Voltage	51.2V
Nominal Capacity	100Ah / 5.12kWh
Depth of Discharge (DoD)	100%
Usable Capacity	5.12kWh
Packing	1P16S
IP Rating	IP40
Minimum Operating Voltage	44.8V
Maximum Operating Voltage	57.6V
Standard Charging Current	50A
Max. Continuous Charging Current	50A

Standard Discharging Current	50A
Max. Continuous Discharging Current	100A (1C, 25°C ± 2°C)
Max. Pulse Discharging Current	200A（2C, 30S, 25°C ± 2°C SOC≥40%）
Standard Charging Method	0.5C CC to 57.6V, CV at 57.6V till current is 0.05C
Min. Operating Temperature (no derating)	Charging: 0°C / Discharging: -20°C
Max. Operating Temperature (no derating)	Charging: 50°C / Discharging: 55°C
Operating ROH	20% ~ 80%
Storage Temperature	-20 ~ 50°C
Self-discharging rate	≤5% (25°C, 50% SoC)
SoC @ end of product line	40%
Insulation Resistance	>100MΩ
Voltage Difference in each module	≤20mV
Inner Resistance of single Cell	0.34 ± 0.05mΩ (fresh cell 30 ~ 40% SoC)
Altitude	Below 2000m
Weight	48kg
Dimensions	440 x 530 x 132mm (not include connector, MSD and other parts)
Expected Life @ 25°C	Greater than 10 years if used as per warranty terms

3.3. System Introduction

SSLB1 Energy Storage System is consisted of 2 sets of M025100-A modules manufactured by Sunsynk. In each M025100-A, there are 8 pcs of 100 Ah LFP cell originated from CATL. The overall system also provides standard communication port, i.e. CAN and RS485, to monitor the working status and communicate with upper machine as well as the Power Conversion System (PCS) in front. The system schematic drawing is presented in Figure 2.

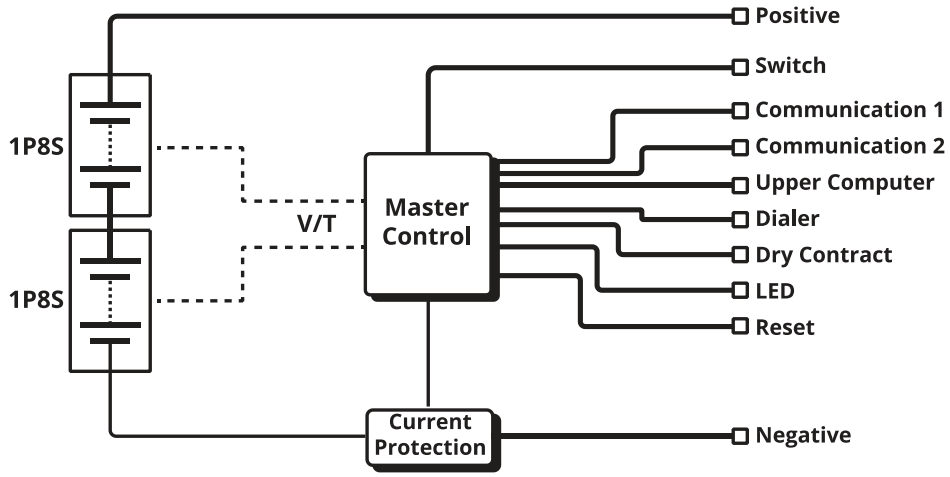


Figure 2 - System schematics

4. BATTERY OPERATION AND COMMISSIONING

Before turning on the batteries, please check the installation:

- Check the polarities of the batteries.
- Check if there are no damaged cables.
- Check for local installation compliance.
- Check if appropriate air flow is provided to the set.

4.1. System Power ON

- Installation (including DC cable, communication wire connection and dialer switch) is properly down.
- Press Power Switch button, green LED should be twinkling and then turn into function mode. (system status can be red from LED signal, as shown below)

4.2. System Power OFF

Attention: It must be confirmed that the system is off before taking off DC cables.
Press Power Switch button
Green LED should be twinkling and then turn into stop mode

4.3. Sleep and wake up function

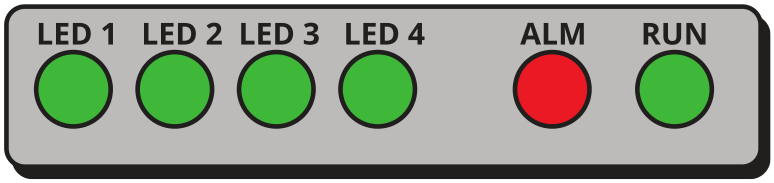
Number	Sleep Condition	Wake up Condition	Mark
1	Forced sleep by upper computer	Reset button	
2	Forced sleep by soft switch	Soft switch,	Only those equipped with soft switch can pass the call Wake up
3	Total Voltage is lower than 48V or monomer is lower than 2.8V, and continuous No charge and discharge current for 4 hours, no communication goes to sleep	Reset button, Soft switch, Communication, Charging	Only those equipped with soft switch can pass the call Wake up

4.4. Buzzer function

- 0.25s per 1s in case of fault
- 0.25s per 2S during protection

4.5. System Status Instruction

There are 6 LED indicator, 4 green LED gives status of SoC, 1 red Alarm LED and 1 green Running Status LED (indicating charging, discharging etc.)



Status	Normal/Warning/Protection	RUN	ALM	SoC				Remarks
		●	●	●	●	●	●	
Power Off	Hibernate	no	no	no	no	no	no	ALL No
Standby	Normal	Twinkle 1	no	Real SoC				Standby
	Warning	Twinkle 1	no					
Charging	Normal	Twinkle 2	no					
	Warning	Twinkle 2	no					
	Overcharging	Twinkle 1	no					Overcharing ALM no
	Overheat, Over-current, Low Temp.	Twinkle 1	Twinkle 2					
Discharging	Normal	Continuous	no					
	Warning	Continuous	no					Over-current, ALM no
	Over-discharging	Twinkle 1	no					
	Overheat, Low Temp., Over-current, Shortcut	Twinkle 1	Twinkle 2					
Charging/ Discharging/ Standby	Abnormal	Twinkle at current state	Twinkle 3					If the slave is disconnected or disconnected, the slave ALM light Twinkle;
	Fault	no	Continuous	no	no	no	no	Fault refers to the hardware fault of BMS voltage cai'yang device, charging MOS damage, temperature sensor disconnection, etc

4.6. LED Twinkle Status

Status	On	Off
Twinkle 1	0.25S	3.75S
Twinkle 2	0.5S	0.5S
Twinkle 3	0.5S	1.5S

4.7. SoC indicator

SoC	LED			
	●	●	●	●
	LED1	LED2	LED3	LED4
0~25%	On	OFF	OFF	OFF
25%~50%	On	On	OFF	OFF
50%~75%	On	On	On	OFF
75%~100%	On	On	On	On

5. TROUBLESHOOTING

The Power Lite SSLB1 battery set is designed as a lead-acid replacement energy storage solution to run with most systems. Lithium batteries have a much higher density related to lead-acid batteries, and they utilise the settings and protections built into the ancillary equipment, the BMS.

When the operation of the battery is outside limits, the BMS activates in order to provide safe operation.

During normal operation, there will be a voltage across the terminals of the batteries. If the BMS activates its protection circuit, the battery should restart without external assistance once the fault is cleared. The scenario where this may not occur is on low volt disconnect. In this case, the battery circuit breaker will need to be turned off and on again to restart the BMS.

In rare cases in which the voltage does not recover, it is necessary to apply an external power source to the battery output terminal, which will allow the battery to charge up above the BMS low voltage cut off. Once the voltage rises above this point, the BMS will make the battery operate normally.

6. MAINTENANCE

The Power Lite SSLB1 does not require maintenance itself, however as part of your overall system maintenance, some verifications can be conducted.

- Check LED indicators.
- Check for any obstruction placed around the battery.
- Check battery connections and cables for secure fitting or damage.
- Check circuit breakers by turning them off and on again.