LA-SB5100

PoE Solar Power System Smart Box (4G IoT version)

Description

LA-SB5100 series PoE solar power supply integration system serves the digital network, new energy and weak current system. In Solar power supply industry, LA-SB5100 combines multiple functions in one, easy operation, perfect hardware protection and high capability of application.

The system provide reliable guarantee with great features:

● Combined solar power generation control with network data exchange, 48V / 24V PoE power supply with different protocol and DC5V-48V synchronous power supply

● Applied 4G / 5G technology achieves LAN + WAN data information transmission and control, integrating terminal control equipment of different industries in this system, widely apply in the environment without network and power

● Multi-functional PSE technology patent, easily solve the power supply problem of high-power equipment like standard 48V PoE or 24V non-standard PoE devices

● High efficiency MPPT charging up to 20A / 40A, improve the power generation efficiency of solar panel.

● Outstanding design, neat circuit layout, simple and generous bracket, farewell to trivial and complicated assembling

Highlights

● LA-SB5100 series is a full-function PoE solar power supply system with most advanced PoE power supply mode (IEEE802.3af /at) meet the needs of different voltage devices using at the same time.

● Built in OLED LCD easy for checking the status information (charging, discharging, current, voltage and load); external LED indicator light shows using status any time.

● Simple debugging, low maintenance cost, no need for professional construction and maintenance, plug and play easy-operation. Unique optical fiber port, RJ45 network port with “Network Watchdog” function: Automatic restart for the fault port, solving the problems of MAC address loss, network feign death, protocol mismatch and other network transmission problems.

● 12 items of safety protection functions: prevent overcharge, over discharge, over discharge activation, low power repeated restart, reverse circuit, short circuit, over-current, over-voltage, overload, surge, lightning, over temperature

● Modular hardware structure can be freely extended to 4G, IoT, AI recognition, HD storage and other different types of models.

● Providing efficient and stable power supply mode for projects. It is suitable for forest fire prevention, geological disaster resistance, environmental monitoring, security system, agricultural system, water conservancy system, oil system, power system, communication system and other fields.

Specification

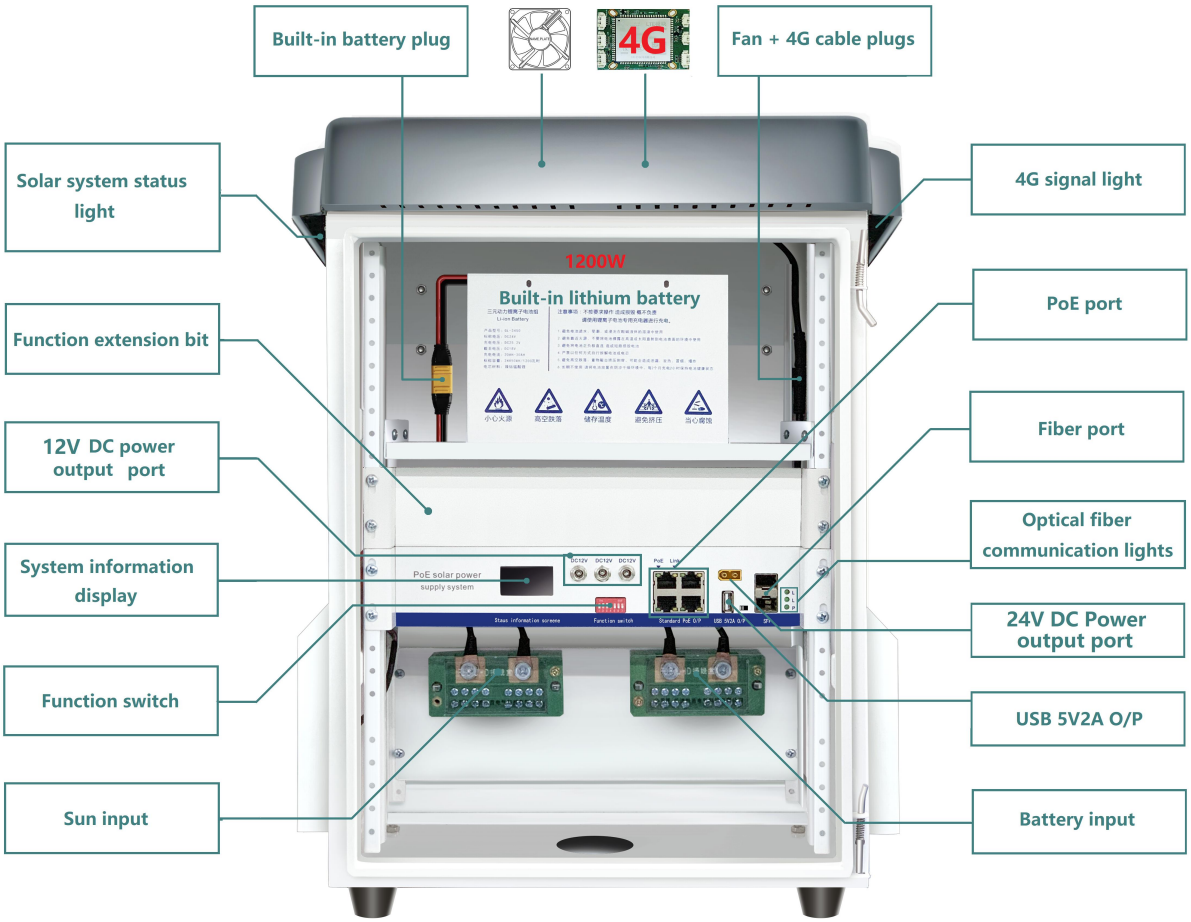
Port performance

- 2 x 100/1000M auto PoE power supply ports, each port maximum output 30W, 24V/48V switchable
- 2 x 100/1000m 802.3bt HiPoE ports, each port maximum output 90W
- 3 x 100m network ports (15 EDGW -3.81 external fixed port)
- 2 x 1000Mpbs SFP ports
- 1 x 5V2A USB power supply output port
- 1 x 24V 30A output port
- 3 x DC12V (DC5525) and 2 x 12V (15EDGW-3.81 external fixed port) ports, maximum current 20A in total.
- 4 x solar panel charging input ports (total input power 45A), support collecting solar energy for multiple solar panels at the same time.
- 1 x 30A battery input TX60 port (built-in battery). If large capacity external battery is needed, special docking port shall be customized.

Smart PoE Power Supply

- 2 x 100/1000Base-TX RJ45 ports support HiPoE with 90W power supply, and support 3-9 inch infrared night vision dome camera, public broadcasting and other high-power devices.
- 2 x 100/1000Base-TX RJ45 ports, support full-automatic power supply for 48V/24V PoE equipment, never burn equipment. Meet the requirements to various security products.
- Work with splitter (PD end), support output 5V, 12V, 24V, 48V, provide comprehensive solution to the problem of outdoor equipment transmission and power supply.
- PoE power supply 250 meters is not restricted by the power transmission distance. The load equipment can be installed in the weak light environment, and the solar system can be installed in the sunny place.

Structure View



Protection Functions

- Meet IEEE 802.3af/at PoE power supply standard, support hierarchical voltage detection class0, Class1, class2, class3, class4, automatically identify PoE equipment for power supply.
- Automatically identify the battery and device, plug and play.
- The output cable of the solar panel battery prevent equipment burning caused by positive and negative reverse connection.
- PoE power supply port prevent short circuit, surge, over-current, over-voltage, overload.
- Over-charge / over-discharge protection: 2-levels PCM battery protection.
- Delayed charging & discharging function avoid frequent restart caused by wrong switching of working mode in the early morning or evening, which protect PD devices.
- Battery self-activation: unique low-voltage EMD automatic activation technology automatically matches various types of battery for activation, makes battery normal working.
- High temperature protection: Auto cut off power to protect the whole system when high temperature caused by the failure of battery or solar panel.
- Lightning protection: built in 6kV lightning protection circuit, safe and reliable.
- Power calibration function: Start power supply when reach load power consumption, avoid repeated start causing equipment damage.
- Automatic unattended charging, with overload protection, overheating and reverse current protection (to prevent the battery loosing on cloudy days or at night when there is no sunshine).
  Built in automatic fan to keep the internal temperature of the system balanced and stable.

Quick Network Management & Self-maintenance

- RJ45 network port with “Network watchdog” function: automatic detection, automatic restart, solve the problems caused by MAC address loss, network feign death, protocol mismatch, PoE without power output and etc., reduce the system maintenance cost and improve equipment operation efficiency.
- Support the hardware watchdog of the SFP port: Restart connecting for network data congestion, equipment downtime.
- Support the SFP optical fiber ring ring
- Support VLAN one key isolation.
- 10M / 100M / 1000M switchable.

OLED+LED OLED + LED indicator accurate display

- External LED indicator display the status of solar panel, host system, battery failure, charge and discharge percentage, easily viewing equipment working state without climbing and unpacking.
- Built in OLED Industrial LCD screen, display discharge current, voltage and load status in real time.
- Real time display total discharge power.

High Efficiency Charge & Discharge Performance

- Unique MPPT fast charging function, achieve faster charging speed in the same light environment.
- With online charging and discharging management technology, achieve hybrid output power of solar panel and battery, efficient use of electricity.
- Adopt MPPT charging technology, three-stage charging mode, constant current charging → constant voltage charging → floating charging, increase 10-30% charging efficiency & extending battery life.
- Support multiple solar panel power input, the maximum input charging current is 45A

4G Internet

- Built in zx297520 V3 4G industrial customized module, the transmission rate up to 150Mbps.
- Support different telecom operator. (Customized)
- Support the insert nano SIM card
- Support reset
- Built in dual 4G hidden antenna, WIF antenna, WIF distance 10-15m
- Support WIFI connection (conform to IEEE802.11 B / g / N wireless network protocol).
- Support automatic restart.
- Operating temperature: - 25 ℃ to 50 ℃;
- Working humidity: 10% to 90% RH, non-condensing
- Design specifications: comply with 3C, FCC and CE design specifications

Flexible Expansion Mode

- Highly integrated network, power supply and power control module, which is a standard platform for networking & power supply hardware. According to the project requirements, it can embedded 4G router, NVR + hard disk storage, LTE wireless networking, IoT, AI recognition algorithm and agricultural data acquisition module.
- Different types of sensors can be connected according to the embedded equipment: like detector of temperature, humidity, height, water level, wind speed, vibration, radar, etc.
- The video, audio, controller and switching data of products uploaded online in real time for unified management.
- Built in multiple battery packs, external multiple solar panels and other customized functions.

High Efficiency Solar Panels

- High efficiency 1.56 x1.56 monocrystalline silicon cell, conversion efficiency up to 20%
- Power tolerance range: within the range of - 5 ~ + 5%
- 93% high transmittance tempered glass, ultra-white and low iron
- Anodized aluminum alloy frame: corrosion resistance, wear resistance, high surface hardness
- Solar panels withstand: wind load (2400 Pascal); snow load (5400 Pascal)
- Service life: 25 years, more than 90% output power in 10 years, more than 80% output power in 25 years
- IEC, TUV and other international authoritative certification

Excellent Energy Storage Materials

- Light and small in size: vehicle specification grade ternary power lithium battery pack. Comparing with the same industry, the volume and weight is 1/4 of is 1/4 of Lead-acid battery.
- CATL battery cell, support repeatedly charge and discharge for 1200 times and keep more than 80% of the energy storage space, service life is 5-7 years, which is 4 times of lead-acid battery.
- DC24 V lithium battery pack to solve the huge heat generated by charging and discharging, avoid battery explosion and damage.
- Stable use within the range of 0 ℃ ~ + 55 ℃(external battery pack is required for low temperature environment and use underground).
- 304 stainless steel military grade IP67 waterproof battery pack can be customized and work well for 7-30 days, which solve the problem of battery damage caused by flood disaster.

Customization

- IIC / 485 docking protocol can be provided for secondary development according to the needs of customer.

Stable and Reliable

- Low power consumption, galvanized steel metal shell, strong exhaust heat dissipation, ensure the stable operation of the product.
- The solar panels meet ISO9001 system certification and CE/TUV
- The battery meets UN38.3 MDS international shipping certification.
- The equipment is in full compliance with 3C, CE, FCC and ROHS.

Application Environment

- Security monitoring, forest fire prevention, intelligent agriculture, environmental protection monitoring, oil, electric power, water conservancy, geological disaster resistance, campus, factory, scenic spot, all kinds of unattended environment.

Technical Indicators

Name		PoE Solar Power System Smart Box
Model		LA-SB5100
PoE Port	HiPoE	2x1000M HiPoE Max output 90W
	AUTO PoE	2x1000M 48V(standard) /24V(non-standard) Automatic identification of power supply

Network Communication Port	SFP Port	2xGigabit SFP optical fiber interface (supporting optical fiber ring network)
	Ethernet Port	3x100M Ethernet ports (15EDGW-3.81 external fixed port)
Conventional Power Supply Port	DC 24V	1set DC 24V max output 30A in total
	DC12V	3sets DC12V(DC5525 Male plug) Max output 10A in total
	DC12V	Two sets of DC12V (15EDGW-3.81 external fixed port) maximum output total current 10A
	DC5V	1set USB 5V2A
Energy Storage Port	Solar Panel Input	Four input ports available for connect 4 solar panels
	Battery Pack Input	4 different capacity batteries can be connected at the same time
4G port	SIM	1 Micro SIM slot
OLED	Size	1.3 inch OLED; Working temperature: - 40 ℃ to 70 ℃
	Status Display	Charge & discharge current, voltage;battery voltage' solar panel current and voltage; load equipment current and voltage.
	Statistics Dispaly	Total discharge power; cumulative power consumption
External LED indicator	Status of Solar Panels	SPU
	Battery Status	BAT
	Charge	CHG
	Discharge	EDC
	Battery percentage	PTC 25%-100%
Host Panel Indicator	Optical Fiber Uplink Indicator	L: Optical fiber data transmission status
	Power Status Indicator	P: System startup
4G Indicator	Power Supply	PWR: Red light on
	4G Network	Yellow light on
	LAN	Green light flashing
Charge & Discharge Performance	Max Charging Current	25.2V 45A
	Max Discharge Current	40A
	MPPT Intelligent Tracking	The first stage of battery power loss state: trickle charging (small current rising uniformly)
		The second stage is the main stage: the maximum efficiency of MPPT charging within the rated charging current
		The third stage of constant voltage charging: when the capacity reaches the predetermined value, stop charging
Network Transmission Performance	Network Protocol	IEEE802.3, IEEE802.3i, IEEE802.3u, IEEE802.3z, IEEE802.3x
	Backplane Bandwidth	56G
	Packet Forwarding Rate	40.32Mbps
	MAC Address	8K
	Port Rate	Automatic state :10m / 100M / 1000m adaptive; Manual state:adjustable setting
	Optical Fiber	Double SFP ports support ring network connection, transmission

	Ring Network	distance 120km (external optical fiber module)
PoE Performance	PoE Standard	IEEE802.3 AF(15.4W)/AT(65W)/BT(90W)
		AUTO POE 802.3AF/AT DC48/DC24 ; Automatic identification at (30W)
		Standard 1EEE802.3 AF (15.4 w) / at (30 W)
	PoE Distance	Over class 5 cable 180M / over class 6 cable 250M Extend OF:100M/ON:250M
	PoE Protection	High frequency/short circuit surge /overvoltage /overload
	PoE Start-up	Ports are powered one by one with an interval of 50 milliseconds
4G Communication Performance	Mode	4G/3G
	Operators	Customizable foreign operators
	Internal storage	8M Flash 64M cache
	Operating Power Consumption	5W
	Network Protocol	IEEE802.11 b/g/n
	Transmission Speed	300Mbps
	Serial Port	RS232, RS458
	Antenna	Built in dual 4G antenna and dual WIFI antenna
Charge & Discharge Protection	Delay Charging	Detect illumination accurately control the charge and discharge
	Reverse Current Protection	Prevent the battery pouring back into the solar panel on cloudy days or at night
	Power on detection	Avoid equipment damage caused by repeated start-up when turn on in low power statue
	Wire Connect Protection	Reverse connection will not burn the device
	PCM	Dual PCM protects the battery from overcharge and over-discharge
	Charging Protection	Using MPPT efficient charge tracking algorithm to extend battery life
	High Temperature Protection	Detect the main board temperature, automatically shut down the system to protect the host
	High Temperature Heat Dissipation	When the internal temperature of the system exceeds +45 ℃, start ventilation and heat dissipation to balance the internal environment temperature of the system
Physical Connection Security	Reverse Connection Protection	Solar panels and battery packs: prevent burning when positive and negative reverse connection
	Automatic Identification Start	No need to connect batteries, solar panels in sequence automatic recognition, plug and play
	PoE Safe Power Supply	Meet the international power supply standard IEEE802.3, never burned devices, automatic identification of power receiving equipment protocol
Network Connection Security	RJ45 Watchdog	Support network auto restart and maintenance free
	SFP Watchdog	Support optical fiber auto restart

PoE Power Supply Security	Power Supply Watchdog	Support power supply detection, automatic restart and maintenance free
Battery Characteristics	Battery Capacity	DC24V 50AH 1200 Watt (factory standard)
	Battery Cell	CATL
	Charge & Discharge Times	1. Support repeatedly charge and discharge for 1200-3000 times; 2. keep more than 80% of the charging capacity, 3. Service life is 5-7 years.
	Switching Loss/ Protection Capacity	10% conversion loss + 20% protection capacity 1200 × 30% = 840w (actual available capacity)
	Volume / Weight	235(L)×155(W)×115(H)，7.2Kg (standard built in battery pack))
	Extend	The internal system can be expanded to 2 battery packs × 1200 watts = 2400 watts (unlimited external battery capacity)
	Working Temperature	-25℃~+55℃ (low temperature environment requires set the external battery underground)
	Customized External Battery Pack	Support customized capacity and design cycle time according to Power consumption of load equipment
Characteristics of Solar Panels	Material Science	Monocrystalline silicon
	Power	Peak power 200W
	Peak Voltage	DC 30.23V
	Open Circuit Voltage	DC36.2V
	Peak Current	6.67A
	Short-circuit current	7.34A
	Maximum System Voltage	1000 V DC (IEC) / 600 V DC (UL)
	Conversion Efficiency	20.00%
Switch	Switch On and Off	Support
	PoE Control	48V/24V/ Turn off (port 1, port 2 support 3 levels selection)
	SFP Port Watchdog	ON/OFF
	RJ45 Port Watchdog	ON/OFF
	VLAN Control	When turn it on, port 2-4 will not communicate data with each other, port 1 and optical port can communicate data with port 2-4
	Network Extension	On / off: 10M / 100M switching
Others	Installation Method	Wall mounted; Derrick installation
	Sunshine Angle	30-85 degrees adjusted (according to different areas)
	Case	All galvanized steel plate sprayed with outdoor paint
	Shell Material	Protection grade IP30; Iron shell
	Product Size	500(L)×400(W)×210(H)
	Package Size	600(L)×490(W)×300(H)
	Overall Weight	≤ 20kg, including packaging (bare machine 12.5kg) (battery 7.15kg)

Host Working Environment	Working Temperature	-40℃～+55℃(-40～+131F)
	Storage Temperature	-40℃～+75℃(-68～+199F)
	Relative Humidity	5%～95% (no condensation)
Industry Standard	Certification	Meet UN38.3 MDS 3C, CE, FCC, RoHS standard

Dimension

Optional Accessories - Battery

Optional Accessories - Solar Panel

High-Performance Monocrystalline Silicon Solar Panels
Specifications Can Be Customized

300W	250W	200W
180W	150W	120W
100W	80W	60W

Packing List

	Product Name	QTY	Unit
Packing list	Solar power supply system smart box	1	pc
	Hose clamp	2	pair
	Stainless steel ipe strap	2	pc
	Lock and key	1	pc
	Quick use guide	1	pc
	System manual and quick installation guide	1	pc
	Warranty card and certificate	1	pc

Order Information

Product Model	Information
LA-SB5100	PoE solar power supply system: equipped with 24V/1200 W battery + 200W/30V single crystal solar panel