Photovoltaic MPPT Controller

Overview

The LMSC series photovoltaic MPPT controller converts solar energy into DC power through the photoelectric effect of solar panels and stores it in batteries. It is a programmable boost/buck IGBT-based switching power supply device.

The photovoltaic MPPT controller adopts a classic BUCK/BOOST step-up/step-down chopper circuit topology, allowing selection of boost or buck type devices based on photovoltaic and battery configurations. It features a highly efficient MPPT control algorithm with an efficiency of no less than 99%, and utilizes advanced interleaved control technology for low ripple current and extended battery life. DC voltage (photovoltaic or battery): DC ≤ 1200V, using a two-level circuit topology; DC voltage (photovoltaic or battery): 1200V < DC ≤ 1500V, using a three-level circuit topology.

The photovoltaic MPPT controller offers multiple charging modes, including constant voltage, constant current, and constant power, and supports parallel operation of multiple units. A touchscreen serves as the human-machine interface, providing integrated display and control. Operating data, status information, and fault information are displayed in real-time, and a historical fault information query function is available (capable of storing 200,000 entries). An optional DC energy meter provides accurate DC energy statistics (0.2 accuracy class).

The photovoltaic MPPT controller is compatible with various energy storage systems, including lead-acid batteries, lithium batteries, flow batteries (supporting 0V pre-charging), and supercapacitors. Multiple communication interfaces are available, including RS485, TCP/IP, and CAN, using the standard Modbus communication protocol for remote monitoring. Optional WIFI and GPRS communication modules allow users to download a smart terminal APP for mobile phones or computers, enabling 24/7 real-time monitoring of device operating data and alarm information from anywhere.

Typical applications include: photovoltaic energy storage systems, photovoltaic energy storage with a common DC bus, and photovoltaic hydrogen production.

Technical Features

1. High-efficiency MPPT control algorithm, with MPPT efficiency of no less than 99%.

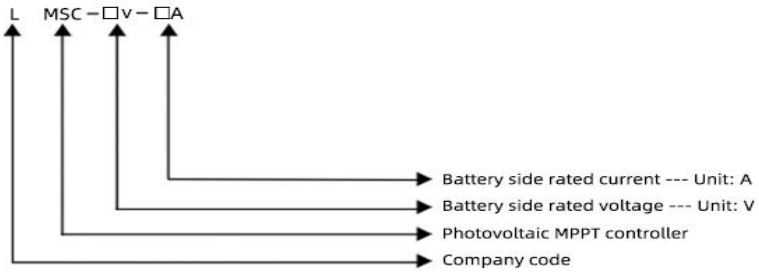
2. Supports constant voltage, constant current, and constant power charging, and allows for parallel operation of multiple units.

3. Advanced interleaved control technology, resulting in low ripple current and extended battery life.

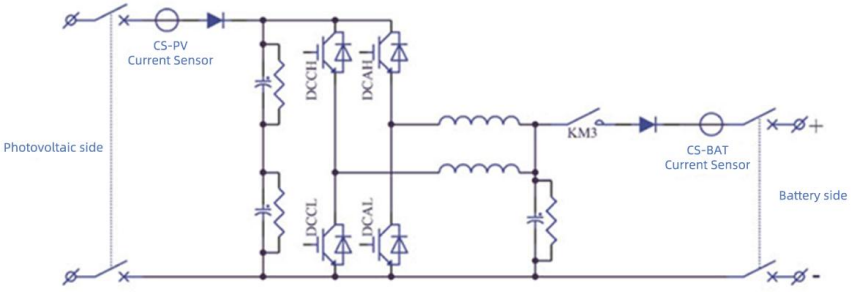
4. Features protection against reverse connection, over/under voltage, overcurrent, and overheating.

5. Color touchscreen display with Chinese and English language options, integrating display and control functions for clear and intuitive operation data.

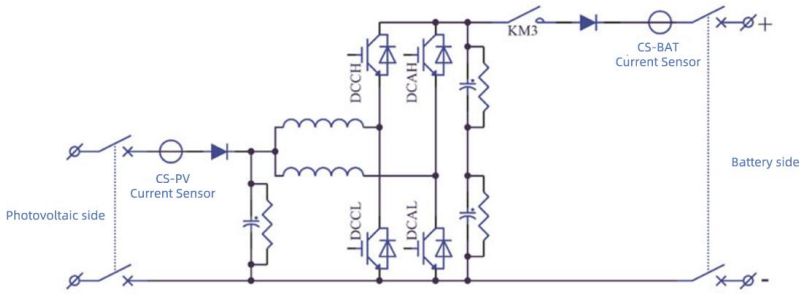
Model and meaning



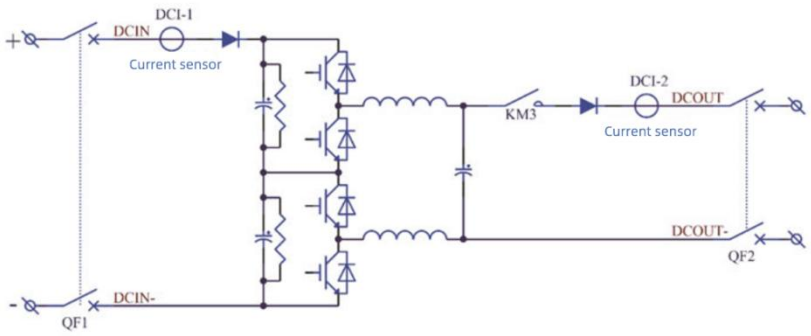
Electrical schematic diagram



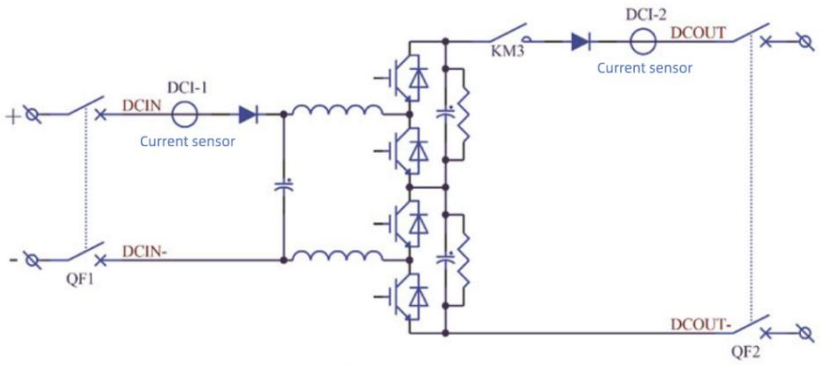
▲ Two-level buck converter topology



▲ Two-level boost converter topology



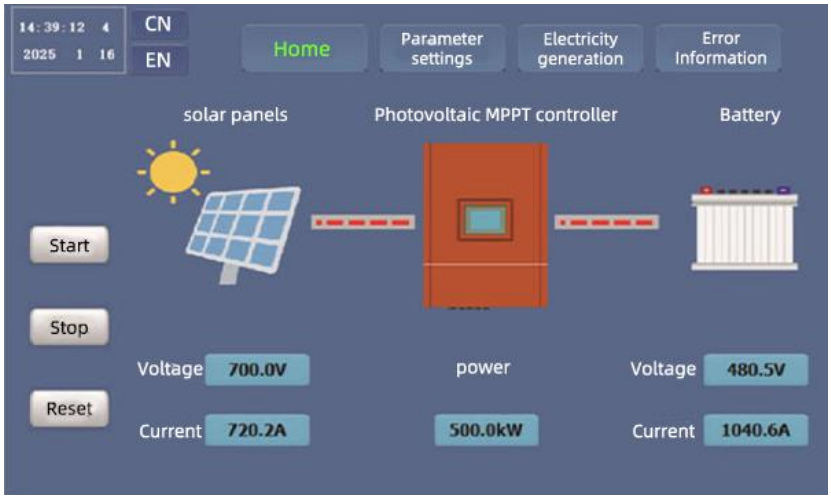
▲ Three-level buck converter topology

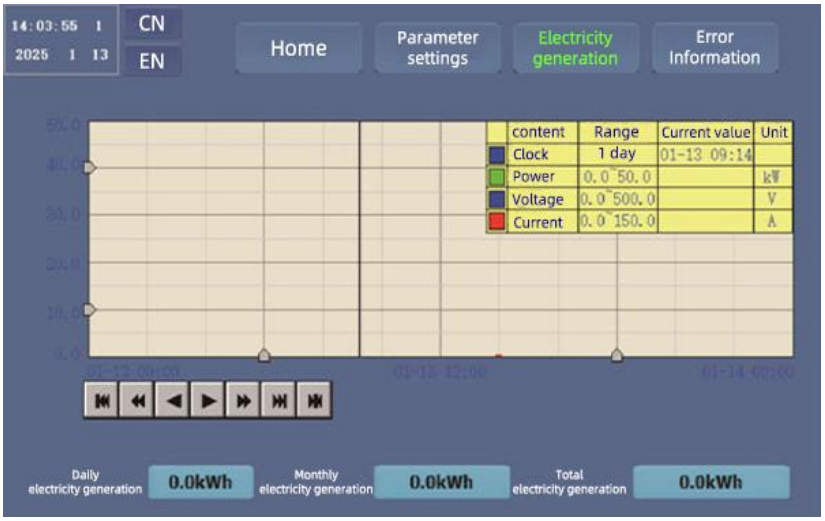


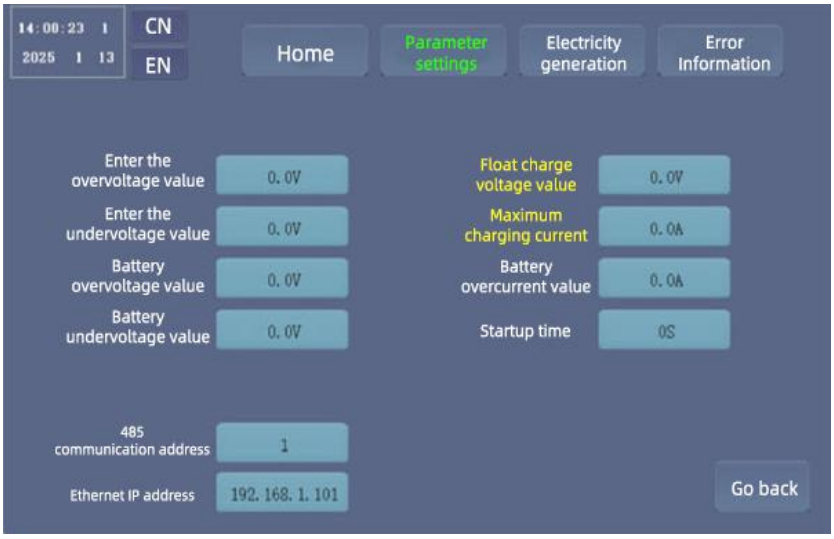
▲ Three-level boost converter topology

Operating Interface

Color touchscreen display, integrated control and display unit, supports switching between Chinese and English.







Technical parameters and selection criteria

Photovoltaic MPPT Controller - Buck Type					
Rated equipment power	30KW	100KW	250KW	500KW	1000KW
Maximum equipment power	33KW	110KW	275KW	550KW	1100KW
Battery-side parameters					
Battery voltage range	160-240VDC	200-300VDC	320-480VDC	400-600VDC	400-600VDC
Rated battery voltage	192V	240V	384V	480V	480V
Maximum battery current	156.3A	416.7A	651.1A	1041.7A	2083.4A
Voltage/current regulation accuracy	+1%FS				
DC voltage ripple	<3%Irms				
Photovoltaic side parameters					
DC voltage range	350-550VDC	400-600VDC	550-750VDC	650-850VDC	650-850VDC
Maximum DC current	66.7A	200A	384.7A	666.7A	1333.4A
	In practical projects, the actual photovoltaic short-circuit current should be used.				
Voltage/current regulation accuracy	± 1%FS				
DC voltage ripple	<3%Irms				
System Parameters					
Operating modes	Constant current, constant power				
Charging Mode	Constant current and constant voltage modes, constant power and constant voltage modes, 0V charging function (only supported in constant current mode).				
Protection Functions	Reverse polarity, short circuit, overheating, over/undervoltage, overcurrent protection, etc.				
Maximum Conversion Efficiency	99%				

Noise Level	<65dB
Protection Class	IP20 (Customizable to IP54)
Allowable Ambient Temperature	-15℃-50℃ (Other temperatures customizable)
Allowable Relative Humidity	0-95% (non-condensing)
Allowable Altitude	Derating required above 2000 meters (1% derating for every 100 meters increase) ≤6000m
Cooling Method	Intelligent air cooling
Emergency shutdown	Emergency stop button
Display	Touch screen
Insulation Monitoring	☆Insulation tester
Temperature Monitoring	Temperature monitoring device
Communication Interface	RS485, Ethernet, WIFI, GPRS, CAN
Communication Protocol	Modbus RTU/ Modbus TCP
This indicates optional features. The above technical parameters are standard parameters and are for reference only; they can be customized according to the user's actual needs.	

Photovoltaic MPPT Controller - Boost Type					
Rated equipment power	30KW	100KW	250KW	500KW	1000KW
Maximum equipment power	33KW	110KW	275KW	550KW	1100KW
Battery-side parameters					
Battery voltage range	320-480VDC	320-480VDC	400-600VDC	400-600VDC	600-900VDC
Rated battery voltage	384V	384V	480V	480V	720V
Maximum battery current	78.2A	260.5A	520.9A	1041.7A	1388.9A
Voltage/current regulation accuracy	+1%FS				
DC voltage ripple	<3%Irms				
Photovoltaic side parameters					
DC voltage range	150-250VDC	190-290VDC	250-350VDC	250-350VDC	350-550VDC
Maximum DC current	200A	526.4A	100A	2000A	2857.2A
	In practical projects, the actual photovoltaic short-circuit current should be used.				
Voltage/current regulation accuracy	± 1%FS				
DC voltage ripple	<3%Irms				

System Parameters	
Operating modes	Constant current, constant power
Charging Mode	Constant current - constant voltage, constant power - constant voltage, OV charging not supported
Protection Functions	Reverse polarity, short circuit, overheating, over/undervoltage, overcurrent protection, etc.
Maximum Conversion Efficiency	99%
Noise Level	<65dB
Protection Class	IP20 (Customizable to IP54)
Allowable Ambient Temperature	-15℃-50℃ (Other temperatures customizable)
Allowable Relative Humidity	0-95% (non-condensing)
Allowable Altitude	Derating required above 2000 meters (1% derating for every 100 meters increase) ≤6000m
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Optional features

Input dry contacts: Start/stop dry contact, BMS fault dry contact, reset control dry contact, etc.

Output dry contacts: Running status dry contact, fault status dry contact, power-on status dry contact, etc.

Dry contact definitions:

a) Start/stop dry contact: Input type, dry contact closed, equipment runs; dry contact open, equipment stops.

b) BMS fault dry contact: Input type, dry contact closed, equipment is allowed to run; dry contact open, equipment stops and alarms.

c) Reset control dry contact: Input type, dry contact changes from open to closed (rising edge of the signal), the equipment performs fault reset, the dry contact remains closed for at least 1 second.

d) Running status dry contact: Output type, dry contact operates when the equipment is running or stopped, 1NO+1NC

e) Fault status dry contact: Output type, dry contact operates when the equipment malfunctions, 1NO+1NC

f) Power-on status dry contact: Output type, dry contact operates when the equipment is powered on and the screen is lit, 1NO+1NC

Note: For the selection of the number of dry contacts and definitions of other functional dry contacts, please contact our company's technical department.

Standard dimensions and net weight

● W --- Width, L --- Depth, H --- Height

Due to continuous equipment upgrades and adjustments, the dimensions and weight are for reference only; the actual product shall prevail.

Ordering Information

Users need to provide parameters such as the product's AC/DC voltage and capacity.

Users also need to provide information about the specific characteristics of the usage environment. For locations with special requirements (specific technical parameters, dimensions, appearance, mounting method, etc.), customized solutions are available.

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