

# Spartan Power SP-TS4500PLUS

## User Manual

### **I. Application:**

This power transfer controller allows for trouble-free operation of an inverter and AC mains on the same circuit. The SP-TS4500PLUS switches automatically between inverter power and AC mains while protecting the inverter against external voltage. In addition, it offers the possibility to choose the battery power prior between the two power sources.

### **II. Safety Instructions:**

The following safety notes and hazard warnings serve not only for the protection of the SP-TS4500PLUS but also for the protection of your health.

In case of property damage or personal injuries caused by improper handling or non-observance of these operating instructions or the safety notes stated herein, the warranty will expire. We assume no liability for any consequential damages.

1. For safety and technical approval reasons, the unauthorized conversion and/or modification of the product is not permitted.
2. This power transfer controller is not a toy and must not be used by children! Please ensure childproof operation and storage of the power transfer controller at any time. Don't leave packaging material heedlessly. It could become a hazardous toy for children!
3. Check the power transfer controller and connection cables before starting operation. If you detect any damages (e.g. transport damages) on the power transfer controller, do not start operation. Damaged connection cables must be replaced immediately.
4. The power transfer controller may only be operated in a dry environment to avoid getting humid or wet, otherwise there is a risk of life-threatening electrical shocks.
5. The use of the product under unfavorable environmental conditions must be avoided under all circumstances.

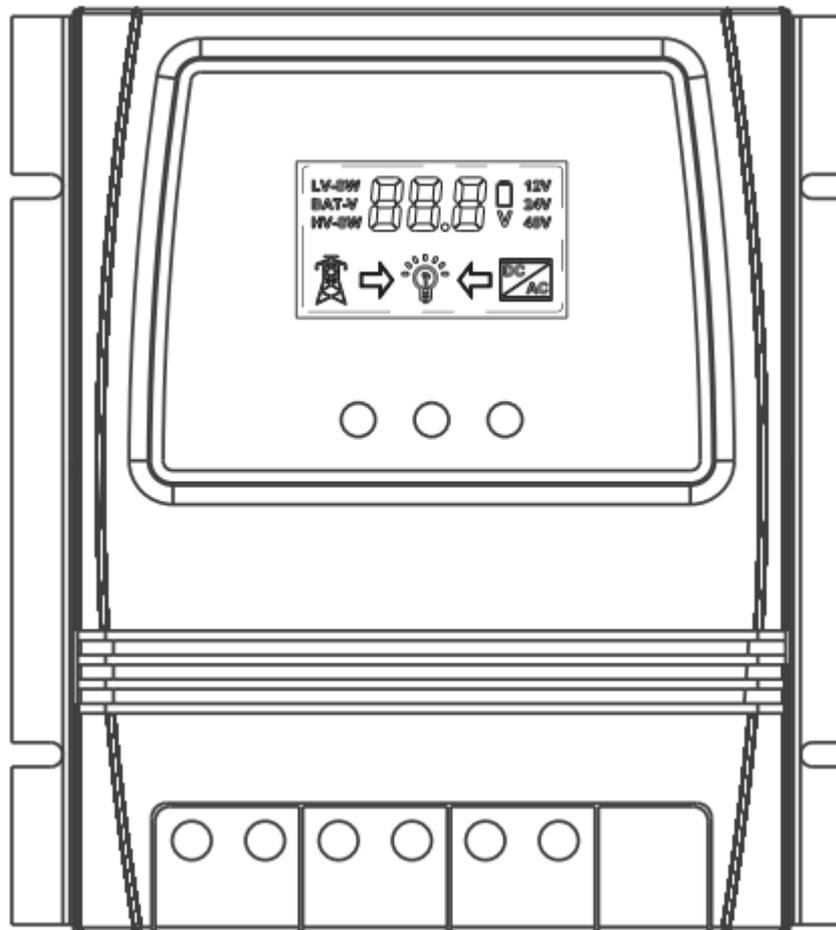
Unfavorable environmental conditions include: ambient temperatures above 50°C, flammable gases, solvents, vapors, dust, relative humidity in excess of 80%, and moisture.

6. Do not use the switching station near ignition sources, open fire or other heat sources (heating, gas stoves or strong solar radiation).
7. Service and repairs may only be carried out by authorized and qualified personnel. Use only original spare parts for repair work. The use of any other spare parts may lead to serious damage to property and personal injury!

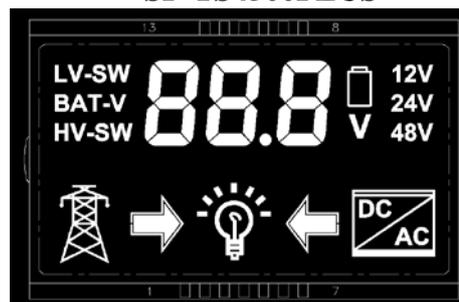
### **III. Product Introduction:**

This dual power transfer controller is used between an off-grid system and public power. The controller is separately connected with public power, inverter, battery and load. On the top of the controller, there is an on/off switch, please turn on the controller after ensuring all cables are well connected.

#### IV. Product Display:



SP-TS4500PLUS



LCD interface:

1. LV-SW interface: setting the switching voltage function.
2. BAT-V interface: normal displaying battery voltage.
3. HV-SW interface: setting the recovery voltage.
4. 12V, 24V, 48V interface: displaying after the system identification.
5. LCD digital:
  - a. Battery voltage
  - b. Low voltage setting switching voltage

- c. Low voltage recovery to set switching voltage
- 6.  Right arrow shows low voltage switch to mains status.
- 7.  Left arrow shows the low pressure is restored to the inverter state
- 8. LCD turns red when no function control display, fixed display after power on.

- 9.  The battery icon is low voltage status.

- 10.  Case buttons are: Add button, Function button, Minus button.

- a. The *add button* is only valid in setting voltage (0.1V per trigger).
- b. The *minus button* is only valid in setting voltage (0.1V per trigger).
- c. The *function button* has 3 kinds of independent display interface types: BAT-V LV-SW, HV-SW. Pressing the button will cycle types. Default interface is BAT-V. Without trigger signal in 10 seconds, it will restore to BAT-V interface.
- d. When function setting display BAT-V interface, LCD digital displays actual tracking battery voltage.
- e. When function setting display LV-SW interface, LCD digital displays low-voltage cut-off voltage (default value). You can press the add/minus buttons to modify the default value. Press and hold the function button for 3 seconds to save the value. Then the interface will restore to BAT-V interface.
- f. When function setting display HV-SW interface, LCD digital displays low-voltage recovery voltage (default value). You can press the add/minus buttons to modify the default value. Press and hold the function button for 3 seconds to save the value. Then the interface will restore to BAT-V interface.
- g. LCD backlight. Without a pressed button within 60 seconds, the interface will go dark.

## V. Installation:

- 1. The installation should only be carried out by persons having relevant professional skills. If there is any doubt, always contact an authorized expert.
- 2. Before installation, ensure that the inverter output as well as AC mains supply are voltage free and equipped with a safety lock system to prevent unintentional start of the power transfer controller.
- 3. The cross sections of the used cables must be selected and secured in compliance within applicable law.
- 4. Ensure that the connection cables are connected properly and have good contact, as loose contacts may cause smoldering fire.
- 5. Use the supplied cage clamps to connect the protective earth conductor on the inverter.
- 6. If the inverter has no earth connection, the negative battery terminal must be connected to the earth.

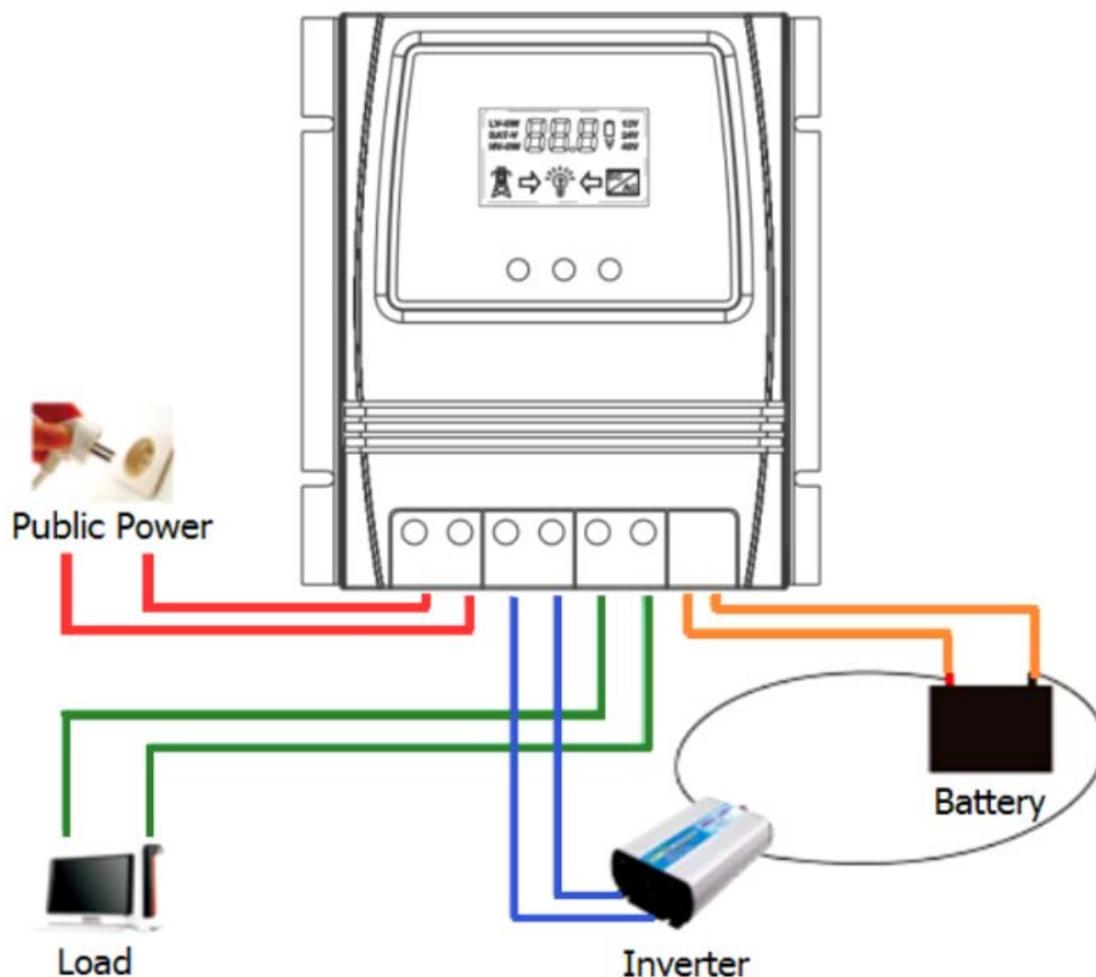
7. Do not connect the neutral conductor on the consumer side to earth or protective earth conductor; as the consumer sockets in particular have no protective multiple earthing (i.e. connection of PE-grounding wire with the neutral connector).
8. It is not permissible to use the power transfer controller for three-phase current.
9. After ensuring all the steps above, connect the controller separately with public power, inverter, load and battery.
10. Turn on the switch after all the cables are well connected.

**Attention:**

1. The dual power transfer controller is simply a switch between off-grid power system and public power, it can't replace the charge controller in the off-grid system.

**Connection Types:**

This device can work with both a solar or wind system.



**VI. System Working Specifications:**

### **12V System:**

1. Battery level- LCD display
2. Detection cut off and recovery point voltage
  - a. When it is detected that the battery voltage is lower than 10.5V for 2 seconds (system default value is 10.5V), it is the low-voltage switching voltage, and the switching action is:  
LCD -  Right arrow blinks, LCD-  Left arrow turns off, battery icon blinks.
  - b. When it is detected that the battery voltage recovers to 12.5V for 2 seconds (system default value is 12.5V), it is the low-voltage recovery voltage, and the switching action is:  
LCD -  Right arrow turns off, LCD -  Left arrow blinks, battery icon stops blink.

### **24V System:**

1. Battery level - LCD display
2. Detection cut off and recovery point voltage
  - a. When it is detected that the battery voltage is lower than 21V for 2 seconds (system default value is 21V), it is the low-voltage switching voltage, and the switching action is:  
LCD -  The right arrow blinks, the LCD -  Left arrow turns off, and the battery icon blinks.
  - b. When it is detected that the battery voltage recovers to 25V for 2 seconds (system default value is 25V), it is the low-voltage recovery voltage, and the switching action is:  
LCD -  The right arrow turns off, the LCD -  Left arrow blinks, and the battery icon stops blink.

### **48V System:**

1. Battery level- LCD display
2. Detection cut off and recovery point voltage
  - a. When it is detected that the battery voltage is lower than 42V for 2 seconds (system default 42V), it is the low-voltage switching voltage, and the switching action is :  
LCD -  The right arrow blinks, the LCD-  Left arrow turns off, and the battery icon blinks.
  - b. When it is detected that the battery voltage recovers to 50V for 2 seconds (system default 50V), it is the low-voltage recovery voltage, and the switching action is:  
LCD  The right arrow turns off, the LCD  Left arrow blinks, and the battery icon stops blink.

## **VII. Technical Specifications:**

Model	SP-TS4500PLUS
Rated Power	4500W
Input Voltage	AC110V or AC220-240V
Output Voltage	AC110V or AC220-240V
Transfer Time	≤ 10ms
LED Indicator	Working Status of Public Power, Inverter and Battery.
System Voltage	12V or 24V or 48V
BAT. Low Cut-Off	Default 10.5V/22V/42V
BAT. Low Recovery	Default 13.5V/27V/54V
Application	Off-grid Solar or Wind System
Product Size	7.4" X 6.7" X 2.8"
Weight:	

### **VIII. Environmental Protection Notes:**

At the end of its useful life, this product must not be disposed of together with normal household waste, but has to be dropped off at a collection center for the recycling of electrical and devices.

The materials of this product are recyclable. With recycling, you are making an important contribution to protect the environment.

## **Warranty**

1. Quality assurance should be carried out according to the following rules:
  - This product is guaranteed of replacement within 30 days after sale.
  - This product is guaranteed of repairing within 12 months after sale.
  
2. The product can be repaired for the whole life beyond warranty period at customer's own expense.
  
3. If the product is damaged by the following conditions, we need to charge even if it is in the guarantee period:
  - User did not operate according to the user's manual.
  - Use the product under conditions which is beyond using standard and technical requirements.
  - Repaired by yourself or reformed by yourself.
  - Used during inappropriate environmental condition which can cause breakdown and aging of the product.
  - Improper carrying or storage.
  - For all warranty claims, please call Spartan Power at 775-800-1725 or visit [spartanpower.com](http://spartanpower.com)

**All stipulations are subject to our final resolution.**