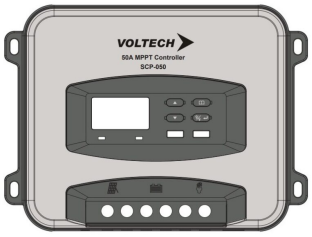

VOLTECH SCP050 Solar Charge Controller Instruction Manual

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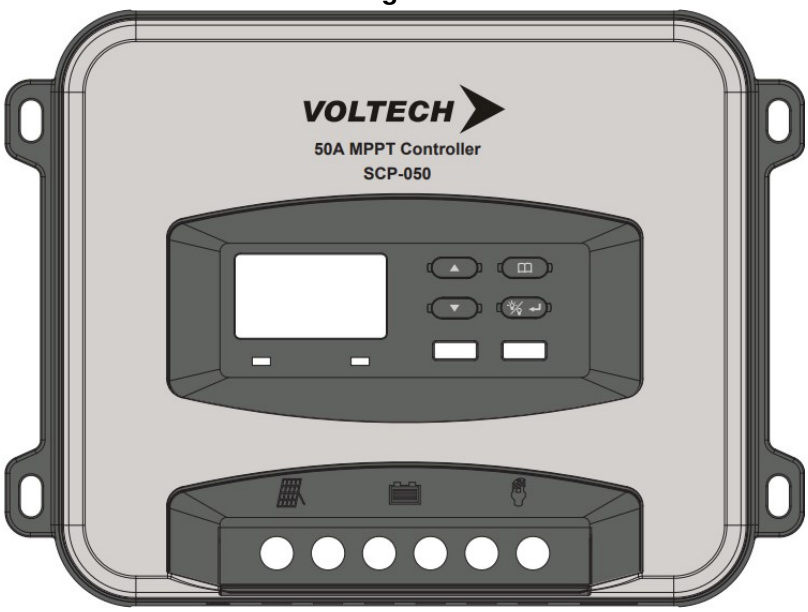


These operating instructions come with the product and should be kept with it as a reference to all user's of the product.

- Read these operating instructions carefully before use,
- Keep them over the entire life of the product,
- And pass then on to any future owner or user of this product.

This manual describes the installation, function, operation and maintenance of the solar system controller SCP050.

These operating instructions are intended for end customers. A technical expert must be consulted in cases of uncertainty.

Contents

SAFETY

1. The solar controller may only be used in PV systems for charging STD, AGM, LiFePO4 battery. Note; User's should always refer to battery manufacturer/supplier's recommended values for battery charging settings and float voltage setting.
2. No energy source other than a solar panel (PV) may be connected to the solar charge controller.
3. Do not connect any defective or damaged measuring equipment.
4. Follow the general and national safety and accident prevention regulation.
5. Never alter or remove the factory plates and identification labels.
6. Keep children away from PV & Battery systems.
7. Never open the device. (No user serviceable parts inside)
8. One set solar module can connect with one controller only.
9. Never touch bare cables.

OTHER RISKS

- **Danger of fire and explosion**
- Do not use the solar charge controller in dusty environments, in the vicinity of solvents or where inflammable gases and vapors can occur.
- No open fires, flames or sparks in the vicinity of the batteries.
- Ensure that the room is adequately ventilated.
- Check the charging process regularly.
- Follow the charging instructions of the battery manufacturer.

Battery acid

- Acid splashes on skin or clothing should be immediately treated with soap water and rinsed with plenty of water.
- If acid splashes into the eyes, immediately rinse with plenty of water. Seek medical advice

Fault behavior

Operating the solar charge controller is dangerous in the following situations:

- The solar charge controller does not appear to function at all.
- The solar charge controller or connected cables are visibly damaged.
- Emission of smoke or fluid penetration.
- When parts are loose.

If any of these occur, immediately disconnect the solar charge controller from the solar panels and battery.

Function

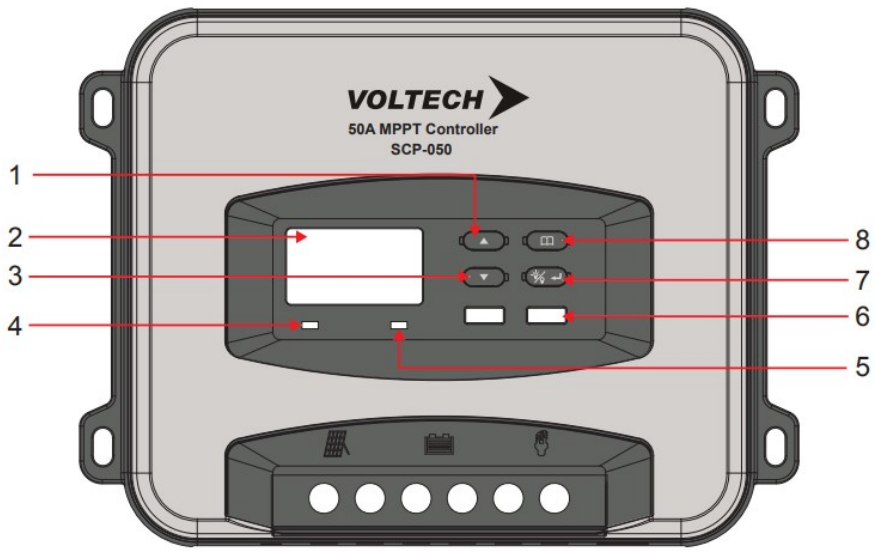
This solar system controller is designed to

- Monitor the state of charge of the battery;
- Controls the charging process,
- Make sure Solar system works at proper condition.
- Charging Voltage is user programmable

OPERATING THE CONTROLLER

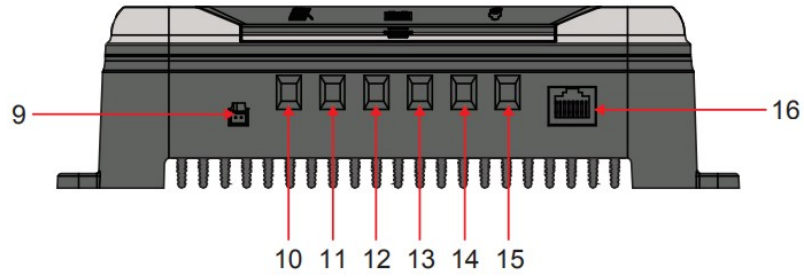
The display shows a variety of system data by symbols and digits. Both buttons control all settings and display windows.

Display and operation elements:



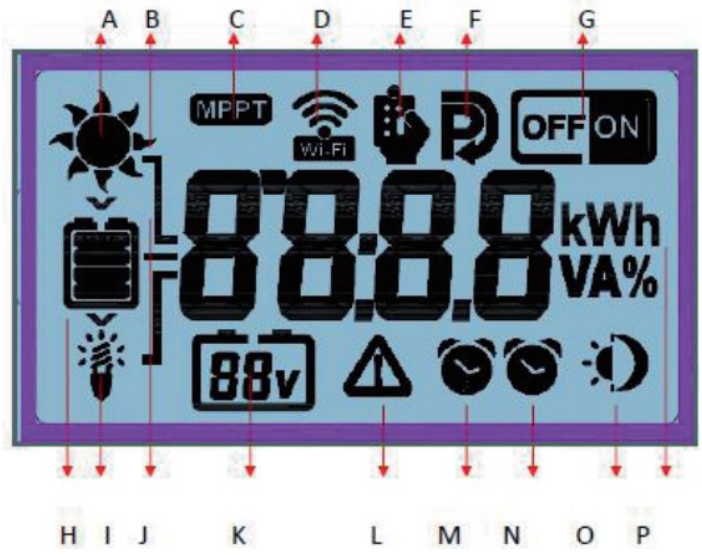
1. Up for toggling through the menus
2. LCD screen
3. Down for toggling through the menus
4. Green LED light (off when not charging,flashing during charging, on when fully charged)
5. Red LED light (off when no error,on when error/alarms)
6. USB output 2 x 3.4A
7. Enter/OK button

8. MENU



9. Temperature Sensor connecting point
10. PV+
11. PV
12. Battery+
13. Battery
14. Load+
15. Load
16. RJ45 port. Connected to remote control board through the network cable (This port is reserved. Do no use)

Display window:



A. Sun icon, displayed when solar panel is connected.
B. Sunlight icon, 8 in total, display according to the charging current
C. MPPT/PWM indication.
D. WIFI icon; turn on WIFI through button settings, read product data and control load output through APP.
E. Remote control icon; displayed when the remote control is connected (remote control optional).
F. Settings icon; turn on when entering the setting parameters, and turn off when exit.
G. Load function ON/OFF icon; Load ON/OFF optional, default ON.
H. Battery level icon; display the corresponding icon according to the battery voltage.
I. Load icon; turn on when the load is turned on, synchronized with the load switch ON.
J. Connections: Three segments. Top corresponding to PV, middle corresponding to battery, down corresponding to load.
K. Currently identified battery type (12V/24V/36V/48V).
L. Protection icon. When this icon appears, it indicates that the machine has some protection, such as load overcurrent, short circuit protection, under-voltage protection, etc. (Refer to the fault code).
M. Load timing clock 2.
N. Load timing clock 1.
O.Daytime and Night Icons. When PV > 12V it show half sun icon. When PV<12V it show half moon icon.

P. Numerical Display (8888 characters). Can be switched by the mode button to display Battery Voltage/Load Voltage/PV voltage/time

Menu Setting:

Menu

Enter

Press the MENU button once, and press again to hold the Menu button for 2 seconds to enter the setting interface. Press the Menu button again to toggle the mode selection. Press the Enter button to confirm the setting.

Battery Type Selection: There are 3 battery types to select from. S = Standard lead Acid. L=LiFePO4. A = AGM battery. Us MENU button to toggle and use the ENTER button to confirm

Wifi On/Off: Default setting is Wifi On. Please use the MENU button to toggle and press ENTER to confirm

Low voltage protection cut off: When your battery goes down to this voltage level, the output load will be cut off. Use the UP/DOWN button to toggle through the voltages and press ENTER to confirm. Setting range of 12V batteries: 10-11.5V, default 10V; setting range of 24V batteries: 20-23V,default 20V;Setting range of 36V batteries: 30-34.5V,default 30V;setting range of 48V batteries: 40-46V,default 40V.

Low Voltage recovery re-engage: When your battery voltage charged up to this level, the output load will be re-activate. Setting range of 12V batteries: 12-13V, default 12.5V; setting range of 24V batteries: 24-26V,default 25V;setting range of 36V batteries: 36-39V,default 37.5V;setting range of 48V batteries: 48-52V,default 50V.

Time setting: This is the time setting in 24 hour format Use UP/DOWN button to set and press ENTER to confirm.

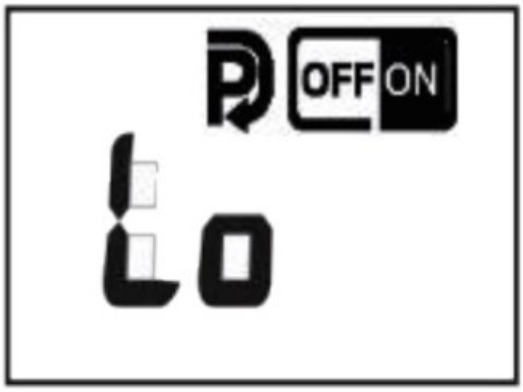
Factory Reset:

1. Remove the battery positive cable that connects the regulator to the battery. Screen should be turned off
2. Press and hold the MENU button whilst reconnecting the positive battery cable, the screen shall be lighted up.
3. Then, you will see from the display “FFFF”
4. Now, all settings should be restored to default

Load Timing Setting:

Lo Mode: Load On/Off based on the PV input voltage (Day and Night)

When the PV input voltage drops below 10V (during the night time/bad weather) you can set the regulator to activate the load output automatically. Set the Off/On bar to ON by using the UP/DOWN and ENTER button

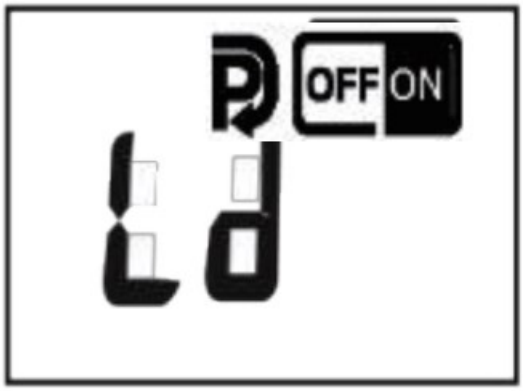


Clock 1 symbol on. The default is 60 minutes. This means when the PV input voltage drops below 10V, after 60 minutes and load output will be activated. Clock 1 is a power on timer, ranged from 0 – 120 minutes. Press ENTER to confirm

Next screen you will see the Clock 2 symbol on. The default is 30 minutes. When the PV input voltage rise up to 10.5V (Morning time), after 30 minutes the output load will be cut off. It is a power off timer, ranged from 0-120 minutes

Ld Mode: Load On/Off based on a set length of time

It can allow you to set the load output to be activate for a set length of time



Clock 1 symbol on. The default is 3 hours. When the PV input voltage drops to 10V, the output load will be activate for 3 hours, ranged from 0 – 12 hours

Clock 2 symbol on. The timer will begin after the Clock 1 counting finished. In this case, after the PV input voltage drop to 10V (night time), the output load will power on for 3 hours, and then switch off for 4 hours, then it will on again until the PV input voltage rise to 10.5V, the load will be cut off.

To mode: Load On/Off based on the real time

It can allow you to set the load on/off based on the real time

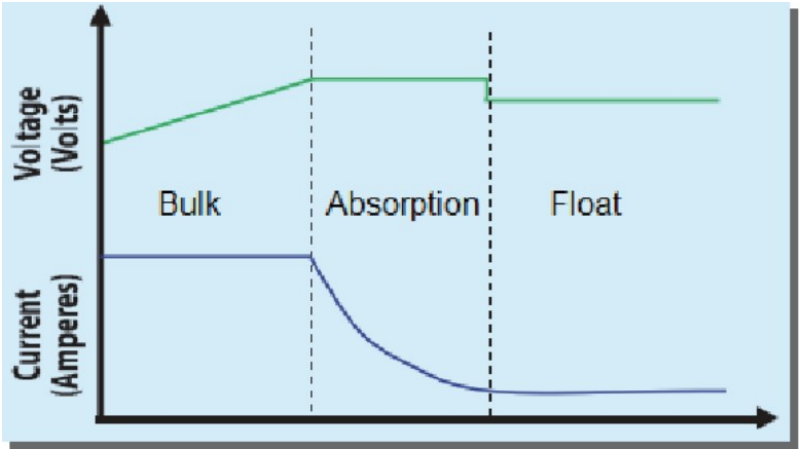
Clock 1 symbol on. It is a power on timer, the output load will be activated at 18:00. Press ENTER to confirm. It is a 24 hour format.

Clock 2 symbol on. It is a power off timer, the output load will cut off at 6:00. Press ENTER to confirm. It is a 24 hour format.

TECHNICAL INFORMATION

PV Input	Max. PV Array Power@12V	700W
	Max. PV Array Power @24V/36V/48V	1400W
	PV Array Voc max.	135VDC
	PV Array MPPT Voltage range	16~108VDC
	PV Array open circuit Voltage Range @12V	16~80VDC
	PV Array open circuit Voltage Range @24V	32~80VDC
	PV Array open circuit Voltage Range @36V	48~108VDC
	PV Array open circuit Voltage Range @48V	64~108VDC
	MPPT efficiency	≥99%
	Suggested PV cable	8AWG~10AWG
Battery	Battery Rated Voltage	12V STD/AGM/ LiFePO424V/36V/48V STD/AGM/-
	Max. Charging Current	50A
	Max. Charging Voltage	STD:14.4V/28.8V/43.2V/57.6V LiFePO4:14.5V/-AGM:14.6V/29.2V/43.8V/58.4V
	Suggested battery cable	6AWG min , length <2metre
	Max. Load Burrent	50A
		12V Battery: 10V~11.5V
	Low Battery Protection Voltage Range	24V Battery: 20V~23V
	(programmable)	36V Battery: 30V~34.5V 48V Battery: 40V~46V
DCload & Output	Low Battery Recover Voltage (programmable)	12V Battery: 12V~13V 24V Battery: 24V~26V 36V Battery: 36V~39V 48V Battery: 48V~52V
	USB Output Voltage	5V
	Single USB Port Output Current	3A
	Total Output Current for 2 USB	3.4A
	USB Low Battery Protection Voltage	10.5V
	USB Low Battery Recover Voltage	11.0V
Standy Current (Wifi off mode)		≤60mA
Standy Current (Wifi on mode)		≤160mA
Operation Temperature Range		-10°C/+50°C
Other Function		WIFI/Cloud
Product Dimension		238x177x73mm
Net Weight		2.3kg

CHARGING CURVE



Bulk: This is the first stage (MPPT) where the battery is in a low charge state. During this stage the controller delivers all of the available solar power to the Battery system.
Absorption: In this stage (Constant Voltage) the controller charges at a constant voltage as the amount of current required to charge the battery is decreasing. The constant voltage regulation prevents overheating and excessive battery out-gassing; this stage will end when the battery charge current reduces to below 4 Amps OR after 4 hours of entering absorption mode.
Float (Maintenance): After the battery is fully charged, the controller reduces to a lower Constant Voltage setting to maintain the Battery (also called trickle charge).

PROTECTION FUNCTIONS

- Overcharge protection
- Battery under-voltage protection
- Solar panel reverse current protection

  The following installation faults do not destroy the controller. After correcting the fault, the device will continue to operate correctly:
- Overcharge protection
- Reverse polarity protection of panel and battery
- Automatic electronic fuse
- Open circuit protection without battery
- Reverse current protection at night

MAINTANANCE
The controller is maintenance-free. We strong suggest that all components of the PV system must be checked at least annually,

- Ensure adequate ventilation of the cooling element
- Check the cable strain relief
- Check that all cable connections are secure
- Tighten screws if necessary
- Terminal corrosion

ERROR MESSAGES
Caution! Please do not open the controller or attempt to replace components when troubleshooting. Improper maintenance can be hazardous to the user and the system. If the controller detects errors or unauthorized operating states, it shows error codes on the display. Error codes can generally be differentiated, whether there is a temporary malfunction, e.g. regulator overload or a more serious system error that can be remedied by

appropriate external measures. Since not all errors can be simultaneously displayed, the error with the highest error number (priority) is displayed. If several errors are present, the second error code is displayed after remedying the more significant error.

The following meaning is assigned to the different error codes:

Fault Codes:

E1 Battery reverse connection / reverse polarity (please correct).
E2 Battery open circuit protection / low DC voltage (battery not connected / or battery voltage <8V/18V) too low,
E3 Battery over current protection (circuit has constant current function; the machine may be damaged if there is a problem).
E4 Load over current / short circuit protection (error 10S, turn on the load after eliminating the error).
E5 Battery over voltage (battery damaged or battery voltage too high,>15V/31V/45V/60V).
E6 PV (solar) input over voltage protection. (PV voltage exceed the limit)
E7 Over temperature protection, automatically stop charging when heat sink temperature ≥ 90°C; resume when temperature ≤ 60°C.
E8 PV reverse connection (please check voltage and fix) – please ensure polarity is correct.

Temperature Compensation/Temp sensor:

(Only for STD/Lead Acid battery)

1. The system will automatically adjust the float voltage according to the ambient temperature. If the external temperature probe is not connected (or the external temperature is <40°C), use (temperature ≥ 20°C – 5°C) by default.
2. The voltage may vary when the input energy is insufficient to stabilize the energy required for the float charging.
    1. For 12V/24V/36V/48V 12V/24V/36V/48V 12V/24V/36V/48V batteries, when the external probe temperature ≤ 0°C, the float charging voltage is 14.1V/28.2V/42.3V/56.4V
    2. For batteries, when the external probe temperature is 0°C~20°C, the float charging voltage is 13.8V/27.6V/41.4V/55.2V
    3. For batteries, when the external probe temperature ≥ 20°C, the float charging voltage is 13.5V/27V/40.5V/54V

Remark: If internal head sink temperature exceeds 75 Deg C, the device shall go into approximately half power mode. Shall resume normal operation when internal head sink drops below 70 Deg C.
If internal head sink exceeds 90 Deg C, the device shall turn off. Shall resume charging again when temperature drops below 60 Deg C.

FOR TECHNICAL ADVICE OR HELP PLEASE CONTACT:
Electro Parts Australia Pty Ltd PH: 07 3219 6655 FAX: 07 3219 6644
EMAIL: support@electroparts.com.au
WEB: www.electroparts.com.au

Documents / Resources

VOLTECH  Installation and Operating Instructions Solar System Controller SCP050	VOLTECH SCP050 Solar Charge Controller [pdf] Instruction Manual SCP050 Solar Charge Controller, SCP050, Solar Charge Controller, Charge Controller, Controller