

VOLTECH 



SCM030

MPPT Solar System Controller
With
DC to DC Booster Input

Installation & Operating Instructions

ABOUT THIS MANUAL

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 them on to any future owner or user of this product.

This manual describes the installation & operation of the solar system controller SCM030.

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

SAFETY

1. The solar controller may only be used in PV systems for charging Lead-Acid type batteries. This includes: SLA, VRLA, Lead-Calcium, AGM and GEL.

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 *PV Input*.
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 the location is adequately ventilated at all times.
- ◆ 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 suds and rinsed with plenty of water.
- ◆ If acid splashes into the eyes, immediately rinse with plenty of water. Seek medical advice.

Caution

Users should seek advice if any of the following situations occur:

- ◆ 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.

In the event of such an occurrence, if possible and safe to do so immediately disconnect the solar charge controller from the solar panels and battery and insulate cable conductors.

Features

- ◆ Dual Charge Input source for PV and DC
- ◆ PV input range from 10V –50V (40Amp MAX, 500Watt MAX)
- ◆ DC input range from 10V-50V (recommend > 30A) *with* User programmable Low Voltage Disconnect and Reconnect (DC Source Input)
- ◆ Automatically selects between PV and DC Inputs
- ◆ User Programmable Bulk charge voltage
- ◆ User Programmable Float charge voltage
- ◆ Multi Stage Charging *with* Timer Protection
- ◆ Temperature Compensated Float charge
- ◆ MPPT charging algorithm to achieve maximum power draw from PV
- ◆ Suitable for numerous Battery types (12V systems)
- ◆ LCD display for Battery Voltage, Charging Current, Input Voltage (PV/DC), Input Current (PV/DC)
- ◆ Reverse Polarity Protection (Electronic)
- ◆ Over Current Protection

MPPT means "Maximum Power Point Tracking". This refers to the type of advanced electronic circuits used to harvest Maximum Power from your solar panel(s). The *Maximum Power Point* of PV systems can vary depending on the prevalent conditions, such as the temperature and solar irradiation levels. This controller establishes and *Tracks* the most efficient operating point of the solar panel enabling it to deliver the maximum available power to the battery.

Mounting

Mount in a cool dry place away from excessive dust & moisture

Allow space on each side for ventilation

Attach to a solid surface using screw holes provided

(Note; Surface of the Unit may become hot when in use)

All cables must be anchored securely using appropriate cable mounting/clamps/etc.

I.E: Cables should not be allowed to hang off the connection terminals

Failure to do this will result in loose connections which may cause premature failure of the unit &

In extreme cases possible risk of fire.

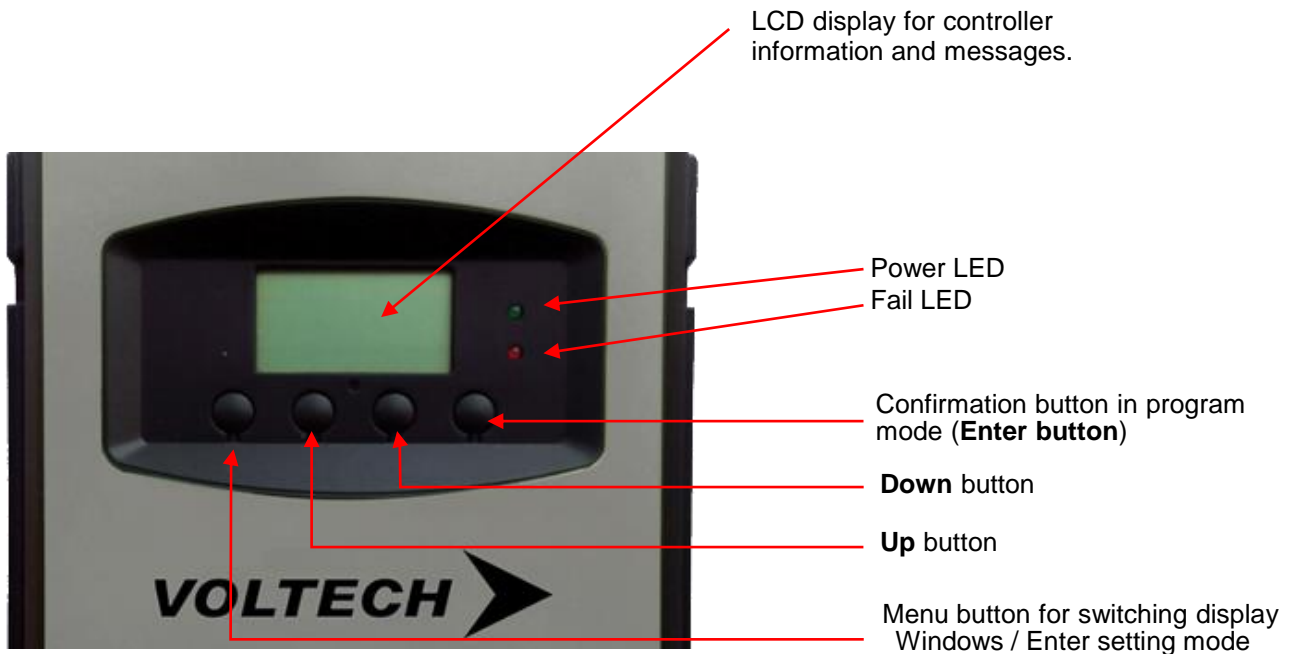
The Installer should determine & use appropriate sized cable and fusing for the particular installation

It is recommended to install circuit protection (Fuse or Circuit Breakers) to all DC power sources & Battery Connections.

Operating the controller

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

Display and operation



Connection



Connect PV Panel Input to; PV + and PV –
Connect DC Input source to; DC + and DC –
Connect your 12V battery to; B + and B –

The system will only turn on when 12V battery is connected.

Temp Sensor

An External Temperature Sensor is included.

If required; Insert the 2-Pin connector into the socket labelled 'Temp Sensor'

Connect the Lug (sensor) to the Battery Negative Post to sense Temperature at the Battery.



Status Led's

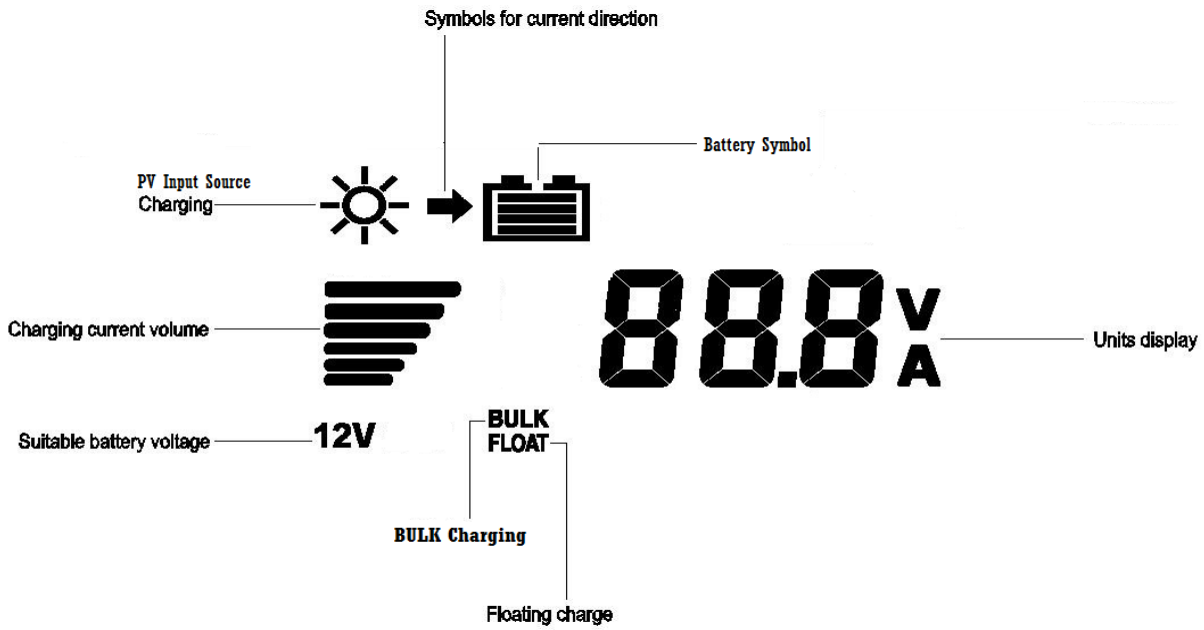
When battery is connected to B+ and B-

Power LED will turn Green to indicate the system is operating.

Fault LED will turn on/off depending on system status.

If no voltage is present on PV or DC inputs Led will Indicate RED to show NO input hence no charging.

LCD Display Symbols



Default Home Screen (No Input)

1. The default window will show like below;



Displays just the battery voltage, with battery level.

Charging with PV Input as source

When PV input is available (>10V) Charging will begin. The default window will now show **Sun Icon** like below;



Displays Sun Icon with arrow indicating Current flow into the Battery. Displays Charging Current Bar Graph (Each bar = 5amps approx') Either Bulk or Float Mode is indicated.

Charging with DC input as source

When sufficient DC input is available charging will begin.

The default window will now show **Arrow Icon** like below;



Displays Arrow Icon indicating Current flow into the Battery.
Displays Charging Current Bar Graph (Each bar = 5amps approx')
Either Bulk or Float Mode is indicated.

Changing Display Windows

Users can change what information is displayed on the LCD as below;

- From the Home screen, Press "menu" button once to display Output charging current.



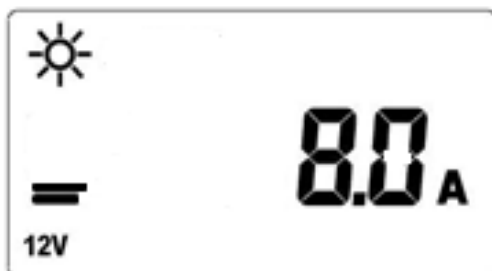
Note;
Sun icon will display only if PV is source.

- Press 'menu' button again to display Input voltage (PV/DC)



Note;
Sun icon will display only if PV is source.

- Press 'menu' button again to display the Input current (PV/DC)



Note;
Sun icon will display only if PV is source.

- Press 'menu' button again to return to default home screen.

Check/Adjust Charging Voltage settings

Note; Charging will be paused while in Settings Windows. If NO buttons have been pushed for a period of approx' 30 sec then display will revert to the Home screen & no changes will be saved.

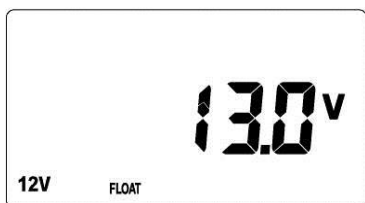
BULK charge voltage setup;

Press and hold "menu" button for 2 sec. Window will switch to show BULK voltage setting. To change this setting; Press "enter" button once, you can program charge voltage via Pageup/Pagedown buttons: Press "enter" or "menu" button to save setting. **Factory Default= 14.2V**



Float charge voltage setup;

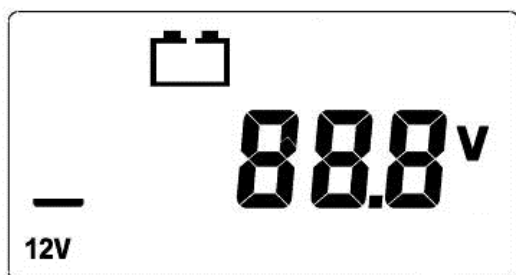
Press and hold "menu" button for 2 sec. Window will display the BULK voltage setting, press "down" key to switch to FLOAT voltage setting. To change this setting; Press "enter" button once; you can program Float voltage via Pageup/Pagedown buttons: Press "enter" or "menu" button to save setting. **Default =13.5V**



Note; The Float charge voltage is based on 25 degree C. The actual charging voltage will automatically be trimmed when Temp increases above 25.C (-20mV/C)

DC Input Low voltage Shut-off setup

Press and hold "menu" button for 2 sec. window will display the BULK voltage setting, press 'down" key twice to switch to DC input shutoff voltage setting To change this setting; Press "enter" button once; you can program DC input low DC/battery shut off voltage via up/down button: Press "enter" or "menu" button to save setting. **Default= 10.0V**

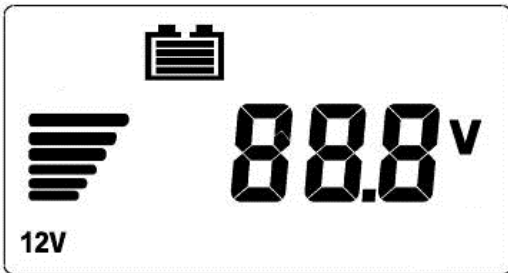


Displays 'Empty Battery' Icon

Remark: This DC input low shut off voltage setting is only for the DC input

DC Input recover voltage setup

Press and hold “menu” button for 2 sec. Window will display the BULK voltage setting, press ‘down” key three times to display DC input recover voltage setting. To change this setting; Press “enter” button once; you can program DC input recover voltage via up/down button: Press “enter” or “menu” button to save setting.
Default = 12.5V



Displays ‘Full Battery’ Icon

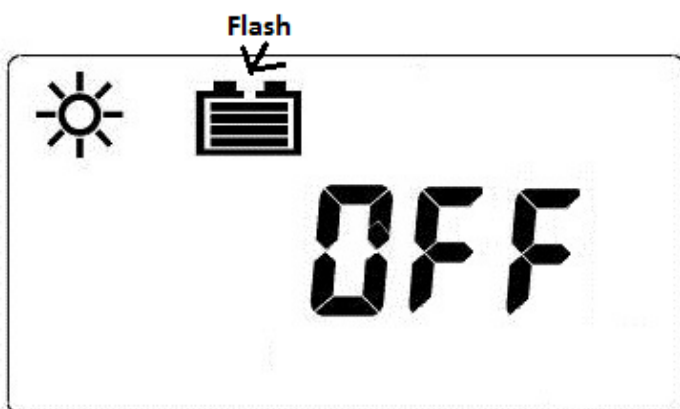
Remark: This DC input low shut off voltage setting is only for the DC input

Charging Source Priority

The User can select which Input has priority to provide power for charging.
E.g.; If DC has priority it will provide power when available (providing there is sufficient voltage to meet the min’ requirements).

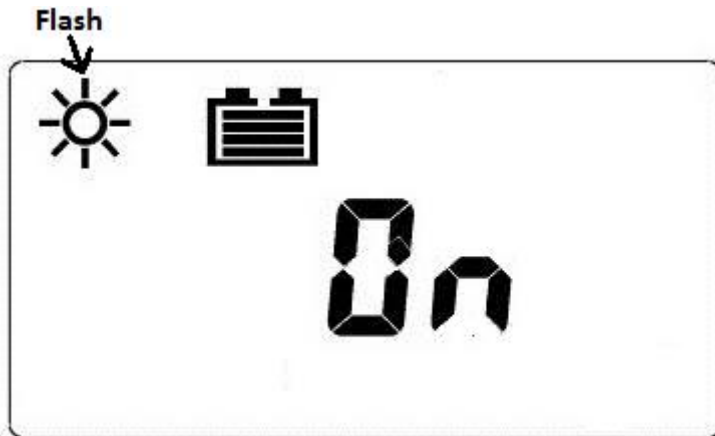
Changing Charging Source Priority Setup

Press and hold “menu” button for 2 sec. Window will display the BULK voltage setting, press ‘down” key four times to display Input priority window. To change this setting; Press “enter” button once; you can program and set which Input Source has priority. **Default = DC Input**



DC as Priority Source;
Displays a flashing Battery Icon
& OFF

Changing Charging Source Priority Setup (Cont'd)



PV as Priority Source;
Displays a Sun Icon Flashing
& ON

To change the currently programmed setting, Press the “enter” button;
OFF or On will now flash. Press the “down” button to change setting.
Then Press “enter” or “menu” buttons to save setting.

Sleep Mode

If NO input power is available from either source then the LCD will briefly display “E0”
If Input remains un-available for 5 Mins the SCM030 will enter Sleep mode to conserve power,
And the LCD will display **5LP**. Pressing any button will temporarily display the Main screen.
Approx. every 2 Mins the unit will wake-up for 10 Secs to scan Inputs for available Power.

Warranty

24 Months Product Warranty

If problems arise please read through this Manual before contacting your place of Purchase or Installation for advice specific to your application.
If your issue is un-resolved please contact us via the details below or website.

For your records;






<i>Part #</i>	<i>Serial #</i>	<i>Date of Purchase</i>

<i>Purchased from</i>	<i>Contact Details</i>
<i>Installer</i>	<i>Contact Details</i>

ERROR MESSAGES

All below error messages display with 'Fault' (RED LED) on.

The following meaning is assigned to the different error codes:

1.  Meaning: PV/DC voltage too low.
Remedy: Check for PV/DC input.
2.  Meaning: Module current too high.
Remedy: Reduce the input current (module power)
3.  Meaning: Battery voltage above 16V in charging process
Remedy: Please disconnect the solar panel and stop the charging.
4.  Meaning: PV/DC voltage too high.
Remedy: Change the module with input open circuit voltage (Voc) < 55Vdc.
5.  Meaning: Temperature is too high for the unit.
Remedy: Stop charging for a while to cool down the unit.

The Leading Edge in Solar

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Waste electrical products should not be disposed of with household waste
Please recycle where facilities exist. Check with your local authority or retailer for
recycling advice

Specifications are subject to change without prior notice
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SCM030 INSTALLATION NOTE

NO OUTPUT: Check that the start/stop charge voltage is set to the voltage that the unit is receiving from the vehicle. (REFER TO MANUAL WITH UNIT OR DOWNLOAD FROM WEBSITE FOR ADJUSTMENT)

This is start: 12.5V and stop 10V factory preset. You can adjust this to suit what voltage your vehicle is supplying the unit at the DC+ and DC- terminals.

1. You must make sure that the settings are correct for the unit to operate.
2. You must check if there is a high voltage drop from the front battery to the unit, in this case the unit will not be receiving the correct voltage. (thin cables from front battery to the unit will cause voltage drop)
3. You must check the voltage to the unit at the DC+ and DC- terminals with a multimeter.
4. You must make sure that the unit is receiving a high enough voltage for it to operate.
5. If the vehicle cannot supply enough Voltage for the start charge, the setting should be adjusted lower or higher to suit.

START CHARGE VOLTAGE: (Screen with full battery, 6 bars and 12V under bar)

Unit will look for this Voltage to start charging. **THE UNIT WILL NOT CHARGE UNLESS THE VOLTAGE FROM THE VEHICLE IS AT THIS SETTING OR HIGHER FOR MORE THAN 15 SECONDS.**

STOP CHARGE VOLTAGE: (Screen with empty battery, 1 bar and 12V under bar)

If the DC+ and DC- terminals see a voltage lower than the stop charge voltage setting for more than 15 seconds, **THE UNIT WILL SHUT OFF FROM THAT SOURCE AND TRY THE OTHER OR NOT OUTPUT AT ALL IF NO OTHER SOURCE AVAILABLE.**

PRIORITY: THE UNIT WILL LOOK FOR EITHER DC INPUT (CHARGE FROM CAR) OR SOLAR INPUT. CHECK THAT THE UNIT HAS THE CORRECT PRIORITY SETTING FOR THE SOURCE AVAILABLE.

UNIT CONSTANTLY SWAPPING SOURCE:

The SCM030 will change from priority input to the other input if there is not enough voltage being received at the unit (DC+ DC- and PV+ PV- terminals).

Once the unit starts to charge the input Voltage will drop under load. This is an undetermined value. The voltage will slowly rise as there is less load (lights, pump, fridge or low battery)

If the voltage stays below the stop charge voltage for more than 15 seconds it will disconnect from the priority source and try the other source. If by this time the Voltage rises on the priority source, the unit will try it again. The unit will continue to do this until the condition of start charge is met.

EXTERNAL FACTORS BEYOND THE UNIT ARE NOT DIAGNOSABLE BY ELECTRO PARTS.