



Installation and Operating Instructions
MPPT Solar System Controller
ISC3040

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, function, operation and maintenance of the solar system controller ISC3040.

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, 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.
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 flammable 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 suds and rinsed with plenty of water.
- ◆ If acid splashes into the eyes, immediately rinse with plenty of water. Seek medical advice.

Fault behaviour

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.

In these cases immediately dis-connect the solar charge controller from the solar panels and battery.

Function

The solar system controller is designed to:

- ◆ Monitor the state of charge of the battery;
- ◆ Control the charging process,
- ◆ Control the connection/disconnection of loads,
- ◆ Make sure solar system works at max' possible power.

Features

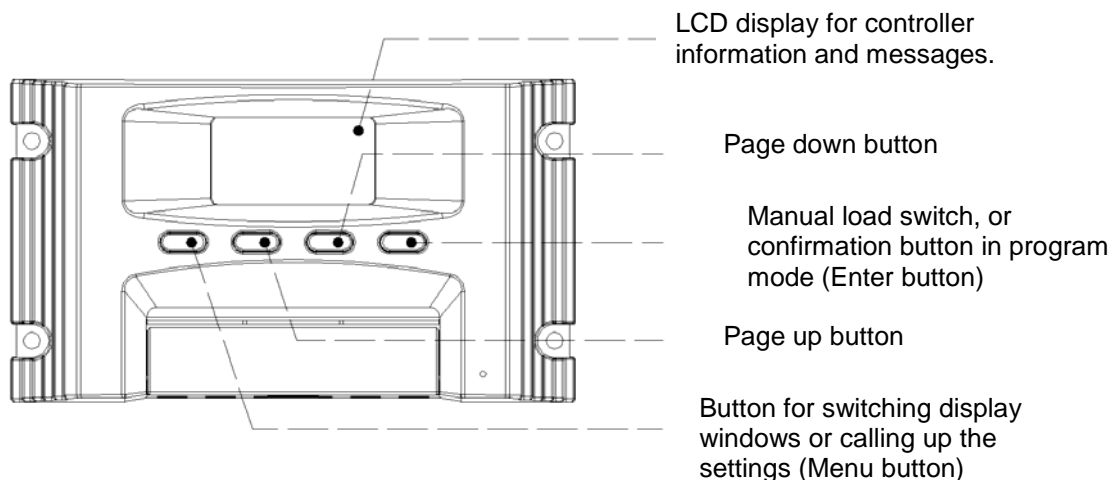
- ◆ Charging Voltage is user programmable.
- ◆ Load Terminal switches Positive side.
- ◆ Manual load switch with automatic re-start.
- ◆ Night-Light Functions
- ◆ Set the two timer schedule programmable for street light application
- ◆ Perform the MPPT algorithm to harvest the maximum power available from the solar panel.

MPPT means "Maximum Power Point Tracking" and it is an electronic system that operates the solar panel to produce maximum power. Maximum power point can vary depending on the operating mode and the local conditions, such as the temperature and solar irradiation. The controller varies the electrical operating point of the solar panel and enables it to deliver maximum available power; this allows to increase the current available for battery charging.

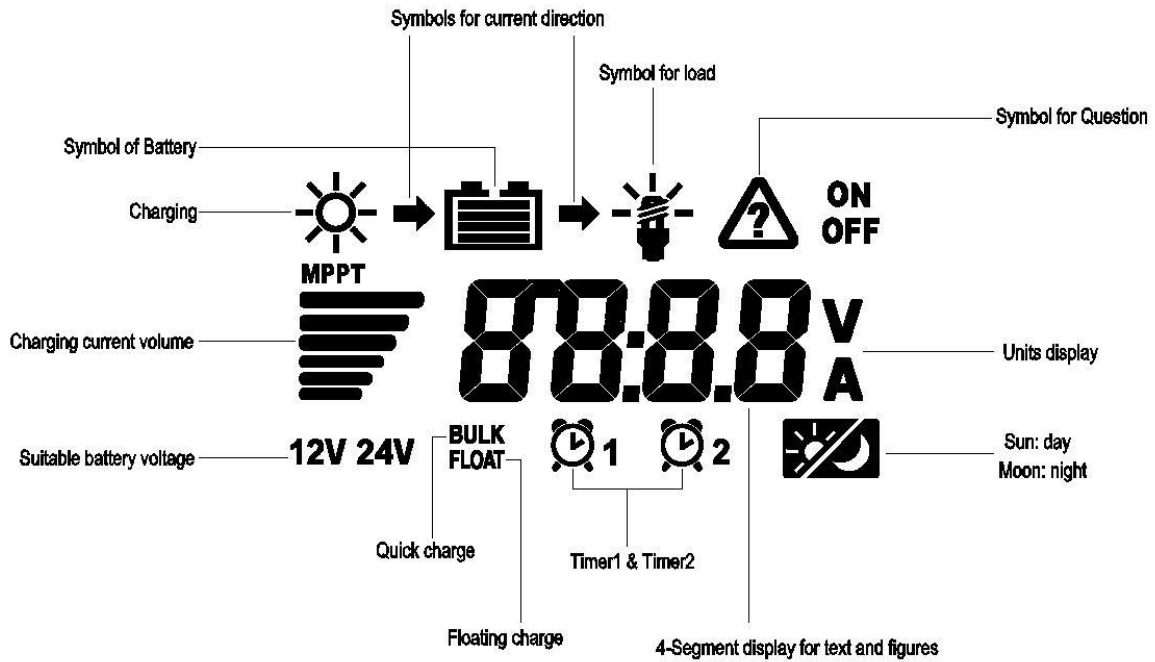
Operating the controller

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

1. Display and operation elements

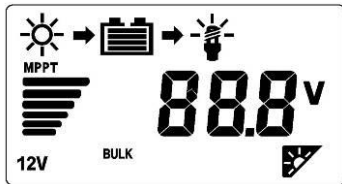


2. Display window

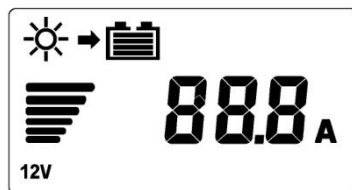


Change the display windows with the “Menu” button; (e.g. for 12V battery)

1. The default window will show like below, battery voltage/capacity volume of the battery.



2. Press “menu” button once to check charging current.



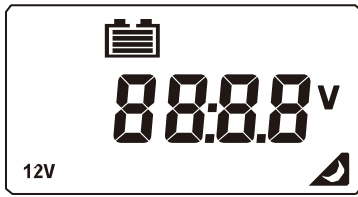
3. Press” menu” button again to display the load current.



4. ONLY When in Default display mode, Press “enter” button to turn the load On or Off.



5. If solar module cannot provide current or the current is less than 1Amp for 5 minutes, the controller will switch to Night mode.



6. At default display mode, press “menu” button 3 times to show controller’s system time to you.

How to setup system time?

In this mode, press “enter” button once, the hour will flash. You can adjust the hour via Pageup / Pagedown button. Press “enter” button one more time to confirm the setup for ‘Hour’ and switch to ‘Minute’ setup mode. You can adjust the minute via Pageup/Pagedown button. Once it’s done, press “enter” button for final confirmation.

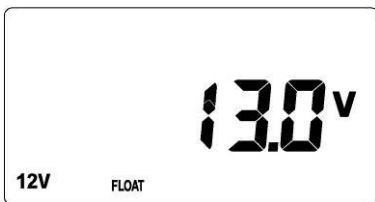


7. Charging Voltage Check & Program

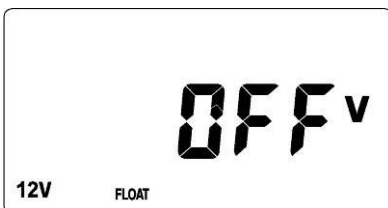
Press “menu” button 4 times. Window will switch to show BULK voltage setting. To change this setting; Press “enter” button once, you can program charge voltage.via Pageup/Pagedown button:
12V Battery (13.8V-14.8V); 24V Battery(27.6V-29.6V)



Press “menu” button 5 times.Window will switch to show FLOAT voltage setting. To change this setting; Press “enter” button once, you can program Float voltage.via Pageup/Pagedown button:
12V Battery (13.0V-14.2V); 24V Battery(26.0V-28.4V)



ATTENTION: Under FLOAT setup interface at 13.0V, press “enter” button once, and Pagedown button, LCD will show OFF, which means that the FLOAT voltage is up to ambient temperature.



8. Night-Light Function

Press "menu" button 6 times. Window will switch to NLF setup interface. Press "enter" button once, through Pageup/Pagedown button, choose "ON" or "OFF" and then confirm by "enter" button.



After NLF on, press "menu" button, window switch to Timer1 setup interface. Press "enter" button once, you can adjust the "Hour"(1-12hours) via "Pageup/Pagedown" button, and then confirm by "enter".



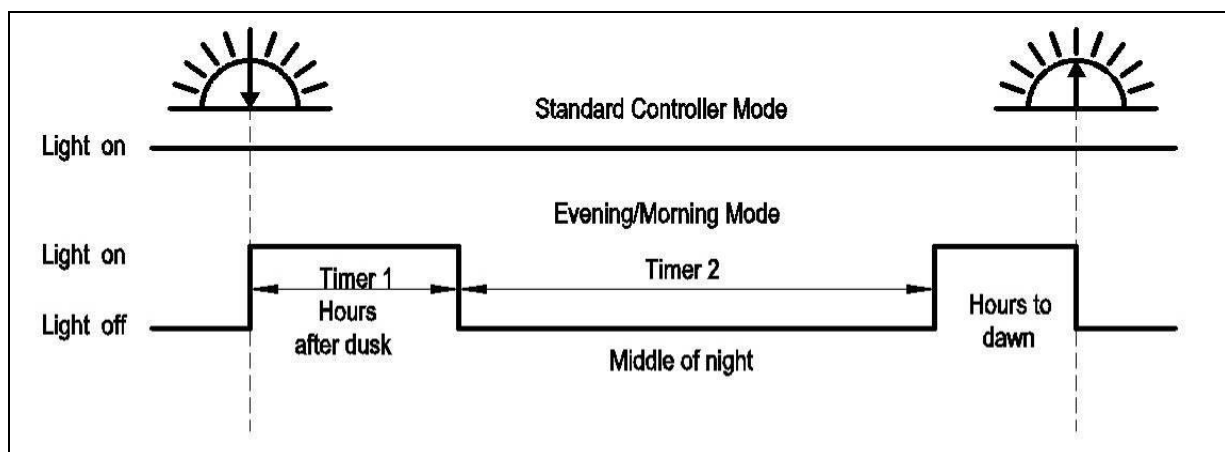
Press "menu" button again, window switch to Timer2 setup interface. Press "enter" button once, you can adjust the "Hour"(1-12hours) via "Pageup/Pagedown" button, and then confirm by "enter".



ATTENTION: Timer1 hours stands for the time the load being ON; Timer2 hours stands for the time the load being OFF after Timer1 hours finished. The load will turn ON automatically till the dawn when Timer2 hours finished.(See below diagram)

The ISC3040 comes with night-light function. It controls the load output at night and is widely programmable.

There are 2 modes available: Standard Controller Mode and Evening/Morning Mode.



The ISC3040 recognizes days and night based on the solar array voltage. NLF will start when the PV(Voltage) < 10V.

Attention: Under Standard Controller Mode, please set NFL OFF.

9. Timer1 & Timer2 setup

To change Timer settings you must first clear(reset) Timer by starting from 'NLF OFF'.

Press "menu" button 6 times. Window will switch to NLF setup interface. Press "enter" button once, choose NFL OFF via 'Pageup/Pagedown' button, and then confirm by "enter".



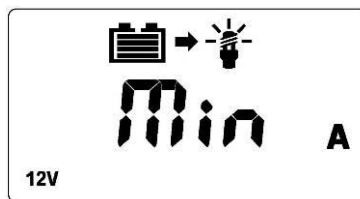
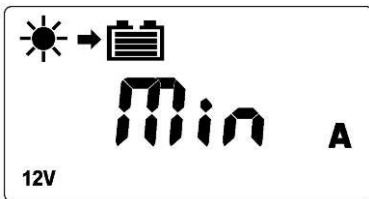
Press "menu" button; Window will switch to Timer1 setup interface. Press "enter" button once. Then adjust 'Hour' via 'Pageup/Pagedown' button. Press 'enter' button to confirm Hour setting and switch to 'Minute' adjustment. Use 'Pageup/Pagedown' button to adjust Minute. Press 'enter' button to confirm minute setting. Now using 'Pageup/Pagedown' button; Choose 'ON' or 'OFF' or 'ON/OFF' and then confirm by 'enter' button.

Press 'menu' button again, window will switch to Timer2 setup interface. Similar operation for time and ON/OFF setup as mentioned above.

Remark: ON stands for the time when you want to turn the load on. OFF stand for the time when you want to turn the load off. Once ON/OFF is set, which means the Timer is disable, the load will turn on or off automatically,



10. When the charging current or output current is less than 0.5Amp, the LCD will always show Min A.



Remark: When there is no currentt, it will show 0 Amp.

Function / Features info:

1. PWM Charge control

Depending on the actual battery charge level, various charging procedures, float charging, boost charging and equalization charging are automatically performed. The final charging voltage (Float) is also temperature compensated.

2. Deep discharging protection

If the battery falls below a specified voltage, the load output is disconnected preventing excessive discharge of the battery. Once the voltage increases the load will be automatically re-connected. The set points of the deep discharging protection are predefined and cannot be reset.

3. MPPT function

Implementing the latest MPPT technology the controller is able to harness the panels maximum available output at all times.

4. 5V USB output provides 5Vdc/ 500mA power supplier

5. 2 timers can be set to turn the loads on and off automatically.

6. Temperature Compensation

[Temperature compensation of charge voltage can help to increase battery life and decrease battery maintenance. ISC3040 has an internal ambient temperature sensor.]

Installation

- Install the controller in a ventilated area away from flammable materials and gases.
- The surface should be solid, even, dry and nonflammable.
- The battery to controller cable should be as short as possible (1-2m) and be of a suitable diameter to minimize voltage loss.
- Do not assemble outdoor, the unit should be installed in the way to be protected against humidity, dripping, rainwater as well as direct and indirect heat (sunlight).
- To ensure the air circulation for cooling an area of 15cm on each side of the unit must be kept free.
- The LCD display should be protected against UV rays (e.g. sunlight). Long time exposure to UV rays can permanently discolor the LCD.
- The solar charge controller may only be connected to the local loads and the battery by trained personnel and in accordance with any applicable regulations.
- Follow the installation and operating instructions for all components of the PV system.
- Ensure that no cables are damaged.
- Ensure that polarity of Solar panel/battery/load is correct and use only insulated tools.

Warning

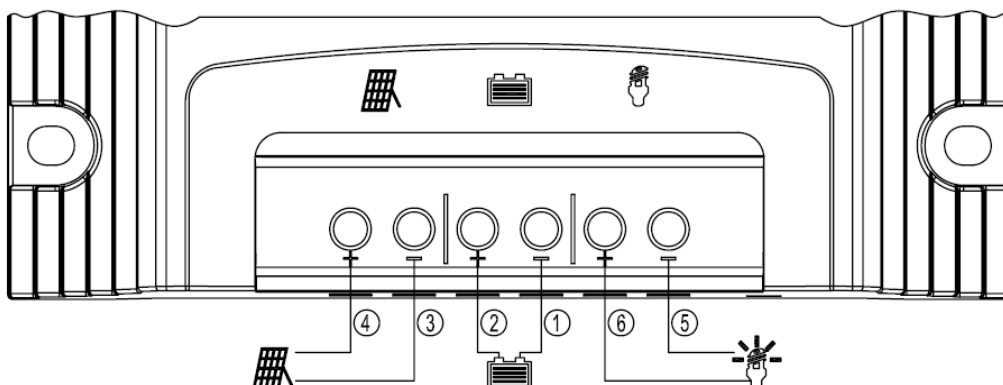
ISC 3040 can work with input voltage up to 65 Vdc maximum; When installing at this voltage, particularly with regard to module open circuit voltage(Voc), the entire solar energy system must be installed with protection class II. Cover solar modules during installation and use only insulated tools.

Grounding

Grounding ISC3040 is not technically required when installing a stand alone solar system. However, if required, Common grounding of the negative Battery and Load control output is OK (for negative earth electrical systems such as a caravan or motor-home).

Caution: ISC3040 can ground the negative only.

Connecting/dis-connecting system sequence



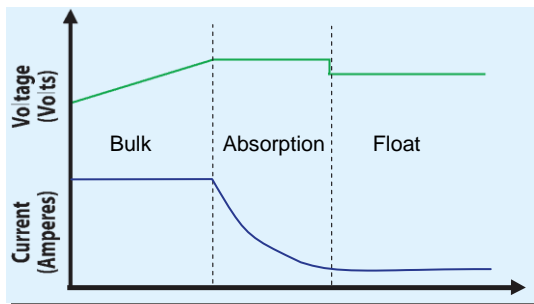
- Connect the wires in the sequence from 1 to 6 according to the above diagram. Disconnect the wires in the REVERSE sequence from 6 to 1 according to the above diagram.
- Use with 12V or 24V battery bank, (controller will detect voltage of battery automatically).
- Never exceed the nominal ratings: 360 Watts at 12 Volt battery/ 720 Watts at 24 Volt battery for solar panel (see below technical data for reference).
- Suggested cable length, 10m solar panel connection cable/2m battery connection cable/5m load connection cable.

TECHNICAL INFORMATION

Max. Input Current	30Adc
Max. Input Open Circuit Voltage (Voc)	65Vdc
Max. Load Current	30A dc
Charge Voltage(Bulk)	13.8V-14.8V/27.6V-29.6V
Charge Voltage(Float)	13.0V-14.2V/26.0V-28.4V
Deep Discharge Protection Voltage	11.5/23.0V dc \pm 2%
Output Voltage	12/24V dc
Typical Idle Consumption	<50mA dc
Operating temperature	-20°C/+50°C

Remark: ISC3040 is suitable for 12V or 24V system, you can use a 24V solar panel to charge a 12V battery, but 12V solar panel cannot be used to charge a 24V battery.

Charging Curve



Bulk: This is the first stage where the battery is in a low charge state, (typically 10%), & receives the majority of its charge. During this stage the battery is brought to about 95% of its charge by getting 100% of the available solar power.

Absorption: In this stage 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 3 Amps OR after 3 hours of entering absorption mode.

Float (Maintenance): After the battery is fully charged, the controller reduces the battery voltage to a float charge, also called trickle charge.

Protection functions

- ◆ Overcharge protection
- ◆ Deep discharge protection
- ◆ Battery under-voltage protection
- ◆ Solar panel reverse current protection

The following installation faults do not destroy the controller. After correcting fault, the device will continue to operate correctly:

- ◆ Overcharge protection
- ◆ Deep discharge protection
- ◆ Reverse polarity protection of load, panel and battery
- ◆ Automatic electronic fuse
- ◆ Short circuit protection of load and panel
- ◆ Over voltage protection at panel input
- ◆ Open circuit protection without battery
- ◆ Reverse current protection at night
- ◆ Overload protection
- ◆ Battery over voltage shutdown

Maintenance

The controller is maintenance-free. We strongly suggest that all components of the PV system are checked at least annually,

- ◆ Ensure adequate ventilation of the cooling element or body of the controller.
- ◆ Check cable's are *held* securely.
- ◆ Check that all cable *connections* are tight..
- ◆ Tighten screws if necessary
- ◆ Check and remove any 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:

1.



Meaning: Battery reverse polarity warning

Remedy: Reconnect battery correctly.

2.



Meaning: Battery Voltage (Too high or too low)

Remedy: Check battery voltage it might be too low or too high. Recharge battery manually if necessary. If battery can't be recharged, it might be deeply discharged. Replace battery if necessary.

3.



Meaning: Module current too high.

Remedy: Reduce the input current(module power) to <30Amps).

4.



Meaning: Over current at the load output.

Remedy: Reduce load current to <30Amps.

If reducing load current does not work, one of the two situations occurred:

- 1) No load connected, press "Enter" button, LCD showing E4.
- 2) If the load is over 50W, press "Enter" button, load current showing 0.00A.

Reset: Remove all connections in Reverse sequence from 6 to 1(see Page 6), then follow the reset procedure:

- i. While holding down the "Menu" button, connect the Battery terminals
- ii. Release the "Menu" button, this will prompt the LCD to show "FFFF"
- iii. First connect the PV then the Load terminals

NOTE: Always connect the Negative first, then the Positive for all connections

The Leading Edge in Solar Technology



For Indoor Use



IP32

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

FOR TECHNICAL
ADVICE OR HELP
PLEASE CONTACT :

VOLTECH 

Specifications are subject to change without prior notice
Copyright reserved by ProVista Technology Limited
Version of Instruction manual 1.0

Tel: 07 – 3219 6655
Fax: 07 – 3219 6644
Email: infoqld@electroparts.com.au
Website: www.electroparts.com.au