



SOL-30-NC/SOL-40-NC

# USER MANUAL



## IMPORTANT:

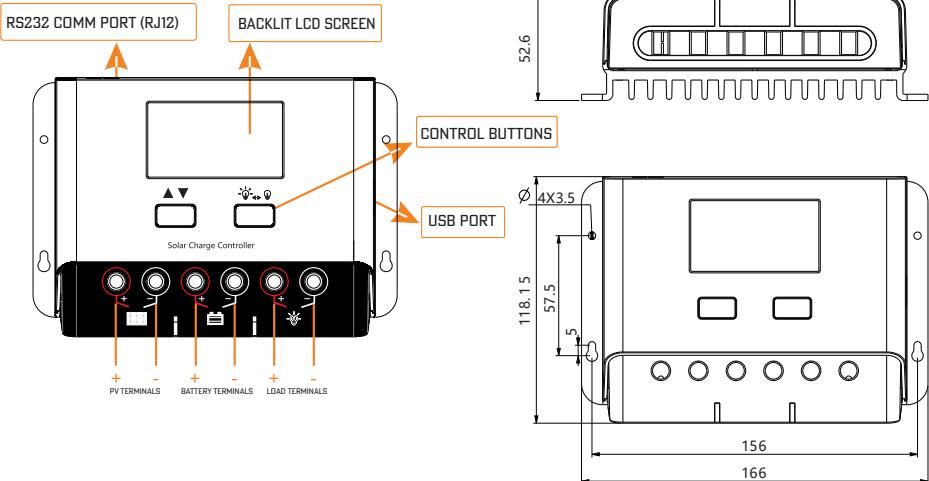
This charge controller ships in Lighting Control Mode. To operate a normal load, you must change the operation mode to Mode 17 to ensure normal operation.

Thank you for your purchase of the Solisto SOL Series charge controllers. Please read this manual carefully as damage to system components is possible if settings are misconfigured or if installation is performed improperly.

Version 1.01\_SW

Information included in this manual is subject to change without notice.

# CHARGE CONTROLLER PHYSICAL LAYOUT



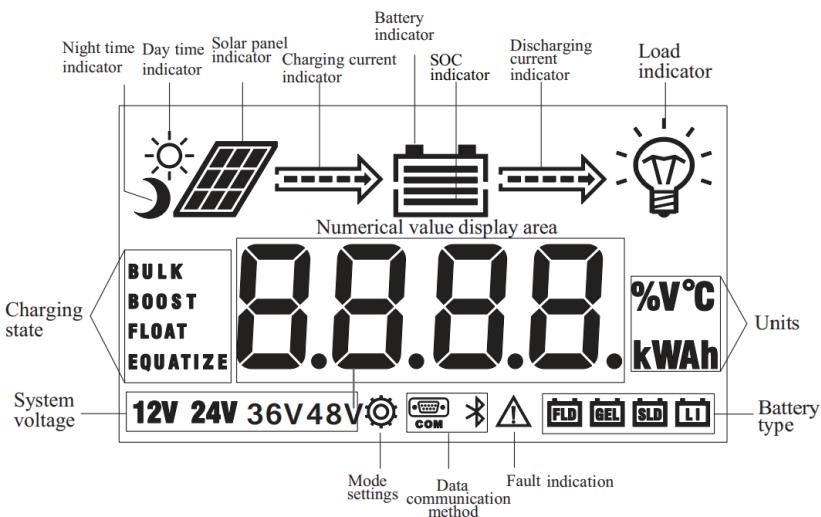
## MECHANICAL DETAILS

External dimensions: 166.0×118.2×52.6 (mm)  
6.5" x 4.65" x 2.1"

Weight: 1.54 Pounds

Hole dimensions: 156×57.5 (mm)  
6.14" x 2.26"

## LCD SCREEN INDICATORS



## STATUS INDICATORS

LCD ICON	CAUSE	STATUS	DEFINITION
	Day recognition	Steady on	Day time
	Night Recognition	Steady on	Night time
	Solar panel	Steady on	Solar panel indication
BULK	Charging state	Steady on	Battery Bulk Charging Stage
BOOST		Steady on	Battery Boost/Absorption Stage
FLOAT		Steady on	Floating Charging Stage
EQUATIZE		Steady on	Flooded Battery Equalization
	Battery	Quick Flashing	Battery overcharge
		Slow Flashing	Battery over discharge
	Battery SOC	4 Lines	100%
		3 Lines	75%
		2 Lines	50%
		1 Line	25%
		0 Line	0%
	Load	Steady on	Load turned on
		Steady on	Load turned off
		Quick Flashing	Overload or short-circuit protection

## PRODUCT FEATURES

1. Autodetect of 12V/24V system voltage. Manual selection is also supported.
2. Built-In charging programs for Sealed, Gel, Flooded, and Lithium batteries.  
(it is recommended that users program the charging set-points for their specific battery)
3. Temperature Compensation more accurately charges batteries, is disabled for Lithium.
4. Lighting Control Mode with wide variety of run-times.
5. RS232 Communication port using RJ12 socket with Modbus protocol.

## LOAD CONTROL MODES

1. Dusk to Dawn lighting mode (Mode 0) (10 min adjustable delay)
2. Timed Lighting control (Modes 1 - 14)  
Light turns on at dusk and runs for set amount of time (see table)
3. Manual mode (15): In this mode, the load is toggled with buttons on the controller,
4. Debugging mode (16): When the solar panel voltage is higher than the "light control off" voltage, switch off the load immediately; when the solar panel voltage is lower than the "light control on" voltage, switch on the load immediately.
5. Normal on (17): The energized load keeps in output state.

LED Display	Mode	LED Display	Mode
0	D2D control mode	9	Light control + time control (9 hours)
1	Light control + time control (1 hour)	10	Light control + time control (10 hours)
2	Light control + time control (2 hour)	11	Light control + time control (11 hours)
3	Light control + time control (3 hours)	12	Light control + time control (12 hours)
4	Light control + time control (4 hours)	13	Light control + time control (13 hours)
5	Light control + time control (5 hours)	14	Light control + time control (14 hours)
6	Light control + time control (6 hours)	15	Manual mode
7	Light control + time control (7 hours)	16	Debugging mode(default)
8	Light control + time control (8 hours)	17	Normal on mode

## LOAD MODE SETTING ADJUSTMENT

**IMPORTANT:** The charge controller ships in Lighting Control mode- if it is desired to operate a normal load, the load mode must be switched to Mode 17!

- 1) Scroll through the main menu screens with the  key, stop on the load mode screen, indicated by the light bulb in the top right corner, followed by a number in the middle of the screen.
- 2) Hold the  key until the number flashes.
- 3) Once flashing, tap the  key to cycle through the load modes until the desired selection is indicated.
- 4) After the desired mode is indicated, hold down the  until the flashing stops.
- 5) The load mode has been changed.

## SAFTY PRECAUTIONS

- 1) When connected to a 24 V system, the solar panel terminal voltage may exceed the limit for human safety. If operation is to be performed, be sure to use insulation tools and keep your hands dry.
- 2) Check and Verify polarity of solar and battery wires before installation. Reverse polarity may lead to damage of components and personal injury.
- 3) Installation of this controller as part of a remote solar power system is to be performed by qualified technicians in accordance with the National Electric Code.

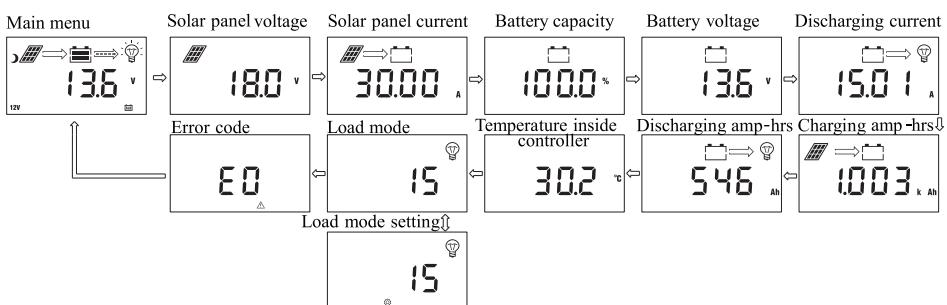
Wear proper PPE when installing or servicing the system.

Use insulated tools, voltages present with solar and battery can be harmful to people!  
4) Overcurrent protection devices (circuit breakers, in-line fuses, etc.) must be used in appropriately sized for the conductor. Consult NEC if needed.

- 5) Batteries may produce explosive gas when charging. Install the batteries in a well ventilated and secure location.
- 6) Install the controller in an indoor location. Prevent exposure to elements and water.
- 7) Follow the safety and programming advice provided by the battery manufacturer.
- 8) Do not dismantle the controller. There are no user serviceable components inside.

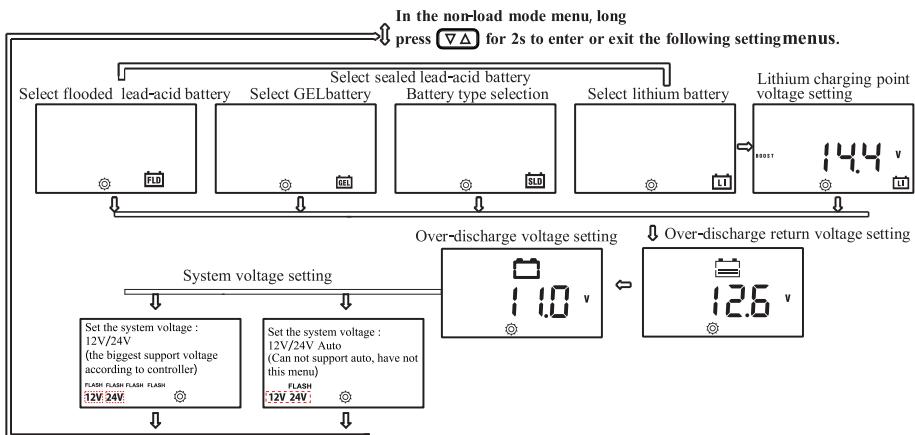
## LCD SCREEN MENU NAVIGATION

- 1). Continuously press  , the screen will display the following in order: "main menu"---"solar panel voltage"---" solar panel current"---"battery capacity"---"battery voltage"---"discharging current"---"charging amp-hrs"---" discharging amp-hrs"---" temperature inside controller"---" load mode"---" load mode settings"---"error code", and then back to "main menu". If the keys are not operated for 12s, the system will automatically return to display the "main menu".



## SETTINGS MENU MAP

- 2). When "load mode" is displayed, long press  $\nabla\Delta$  to enter into the load mode setting. Press  $\nabla\Delta$  to adjust the mode, and long press  $\nabla\Delta$  for 2s to save and exit; or else, the system



## BATTERY VOLTAGE SET POINTS MENU

In the non-load mode menu:

- When  $\nabla\Delta$  is long pressed, the first menu entered is for battery type selection. the selection flashing will be the current battery type. Press  $\nabla\Delta$  to select among FLD/GEL/SLD/LI.
- After selection, short press  $\nabla\Delta$  to enter into LVD-Recovery and LVD set points Or if using Lithium battery type, to enter charge voltage set points menu for lithium battery.
- After parameters have been set, long press  $\nabla\Delta$  for 2 s to save and exit.

Parameters shall be set according to the following rule: over-discharge voltage < over-discharge return voltage ≤ under-voltage warning < float charging voltage < boost charging return ≤ equalizing charging voltage < overcharge voltage; and two adjacent values shall have a difference greater than 0.5 V.

## OVERLOAD PROTECTION AND RECOVERY TIME

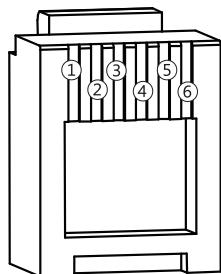
The overload function allows for a short surge to start loads before triggering. The controller can surge to 1.25x rated load for 30 Seconds, 1.5x for 5 seconds, or 2x for 1 second. Automatic recovery will be attempted after 1 min.



## COMMUNICATION PORT PINOUT

Controller communication port RJ12 (6-pin)

RS232



No.	Definition
①	Transmitting terminal TX
②	Receiving terminal RX
③	Power supply grounding /Signal grounding
④	Power supply grounding /Signal grounding
⑤	Power supply positive
⑥	Power supply positive

## ERROR CODE LIST

Code on LCD screen	Corresponding error
E0	Normal Operation
E1	Battery LVD
E2	Battery Overcharge
E3	Battery LVD Warning
E4	Load Short Circuit
E5	Load Overcurrent
E6	Controller Overheat
E8	Solar Overcurrent
E10	Solar input voltage too high

## COMMON PROBLEMS AND SOLUTIONS

### IMPORTANT:

This charge controller ships in Lighting Control Mode. To operate a normal load, you must change the operation mode to Mode 17 to ensure normal operation.

Symptoms	Causes and Solutions
LCD screen does not light up	Verify connection to batteries is solid.
LCD screen is garbled or incomplete.	Temperature may be too low for LCD. Batt. connection absent when solar is pres.
No charging with sunlight present	Check ALL solar wiring is correct polarity. Check that ALL solar connections are solid. Check that solar voltage exceeds battery volt.
The load does not come online after the sun has gone down with the load working mode in lighting	The load will be switched on automatically after 10 minutes (set by the user).
The battery icon flashes quickly, and there is no output.	System overvoltage. Check whether the battery voltage is too high.
The battery icon flashes slowly, and there is no output.	Battery LVD. The Battery is empty.
The load icon flashes quickly, and there is no output.	The load's power exceeds the current rating or it's short-circuited. After checking for faults, long press the key or wait until it recovers automatically.
The load and the encircling light ring stays lit, and there is no output.	Verify load connections are solid.
Other issues?	Check whether wiring is sound and reliable, and system voltage is correctly recognized.
The charging and discharging amp -hrs displays: 9999.K Ah	The decimal point flashes indicating that the displayed value has reached its upper limit. Long press  to reset it.

## PARAMETER DETAILS

	<b>SOL-30-NC</b>	<b>SOL-40-NC</b>		
Rated Current	30A	40A		
System Voltage	12V / 24V Nominal Auto-detect			
Rated Power @ 12V	450W	600W		
Rated Power @ 24V	900W	1200W		
Standby Power Draw	22mA @ 12VDC / 16mA @ 24VDC			
Max Open Circuit Voltage	27.5VOC / 55VOC			
Max Battery Voltage	<34V			
	<b>Default Charging Set Points</b>			
	Flooded	Sealed	Gel	Lithium
High Voltage Disconnect	16V / 32V			
Equalization	14.8	14.6	-	-
Boost	14.6	14.4	14.2	14.4
Float	13.8	13.8	13.8	-
Low Battery Recovery	13.2V			
LVD Recovery	12.6V (Settable with Keys)			
Low Voltage Disconnect	11V (Settable with Keys)			
Equalization Interval	30 days			-
Equalization Duration	1 hours			-
Boost Charge Duration	2 Hours			-
Temp Comp	-3mV / *C / 2V			-
Light Control Voltage	On 5V, Off 6V			
Light Control Delay	10 Min			
Operating Temperature	-25*C to 55*C			
IP Protection Rating	IP30			
RS232 Communication	Yes			

