



Solar Charge Controller

Owner's Manual



SC1210LD **SCD1230**
SC1220LD

For safe and optimum performance, the Solar Charge Controller must be used properly. Carefully read and follow all instructions and guidelines in this manual and give special attention to the **CAUTION** and **WARNING** statements.

Disclaimer

While every precaution has been taken to ensure the accuracy of the contents of this guide, **KISAE Technology** assumes no responsibility for errors or omissions. Note as well that specifications and product functionality may change without notice.

Important

Please be sure to read and save the entire manual before using or installing your Solar Charge Controller. Misuse may result in damage to the unit and/or cause harm or serious injury. Read manual in its entirety before using the unit and save manual for future reference.

Service Contact Information

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Document Part Number

MU SC1210LD Rev 3.0

Important Safety Instructions

This section contains important safety information. Before installing or using the unit, READ ALL instructions and cautionary markings on or provided. The unit contains no user-serviceable parts. See Warranty section for how to handle product issues.

Warning: Fire and/or Chemical Burn Hazard

- Do not cover or obstruct any air vent openings and/or install in a zero-clearance compartment.

Warning: Failure to follow these instructions can result in death or serious injury

- When working with electrical equipment or lead acid batteries, have someone nearby in case of an emergency.
- Wear eye protection and gloves.
- Avoid touching your eyes while using this unit.
- Keep fresh water and soap on hand in the event battery acid comes in contact with eyes. If this occurs, cleanse right away with soap and water for a minimum of 15 minutes and seek medical attention.
- Batteries produce explosive gases. **DO NOT** smoke or have an open spark or fire near the system.
- Keep unit away from moist or damp areas.
- Avoid dropping any metal tool or object on the battery. Doing so could create a spark or

short circuit which goes through the battery or another electrical tool and may create an explosion.

Warning: Explosion hazard!

- DO NOT use the unit in the vicinity of flammable fumes or gases (such as propane tanks or large engines).
- Prolonged exposure to high heat or freezing temperatures will decrease the working life of the unit.
- For SC1210LD and SC1220LD unit, use only with 12V battery systems.
- For SCD1230 unit, use only with 12V or 24V battery systems.
- Do not exceed the voltage and current ratings of the unit.
- For SC1210LD and SC1220LD, use only with solar array rated for 12V batteries (25V VOC max.).
- For SCD1230, use only with solar array with 25V VOC max for 12V battery systems and solar array with 50V VOC max for 24V battery systems.
- Do not short circuit the solar array and/or the load while connected to the unit. This will permanently damage the unit.
- Protect the unit from direct sunlight.
- Unit should be properly grounded. Grounding should comply with local codes.
- Do not connect and disconnect the unit when the circuit is live.

1. Introduction

Thank you for purchasing the KISAE PWM type Solar Charge Controller. With our state of the art, easy to use design, this product will offer you a reliable service to convert your solar energy to charge your low voltage battery system in an effective and efficient way. It also protects your battery from overcharge by the solar panel or over-discharge through the DC load connected.

2. Product Description

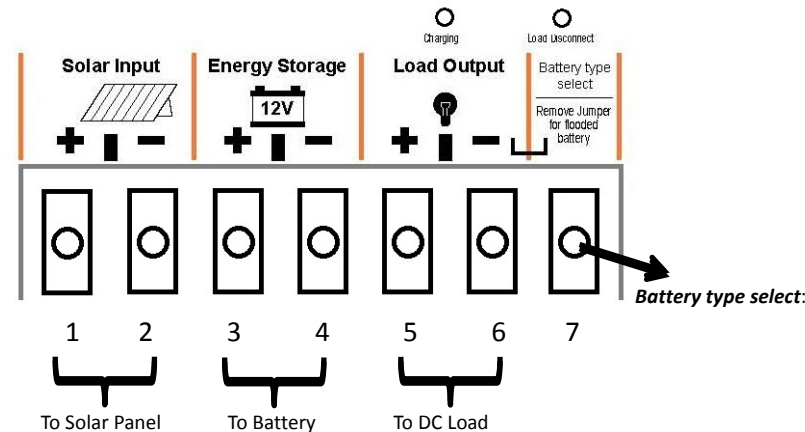
The KISAE Solar Charge Controller package includes the items listed below.

- Solar Charger controller
- Owner's manual

3. Understanding the unit

For SC1210LD and SC1220LD model:

Caution: The SC1210LD and SC1220LD are designed for use with 12V Battery Systems only



- Terminal 1, 2 are the input terminals for solar panel connection.
- Terminal 3, 4 are the terminals used for battery connection. That acts as output terminals for battery charging from the solar panel and act as an input terminal for battery discharging to DC load through the controller.
- Terminal 5, 6 are the output terminals for small DC load connection (if any).

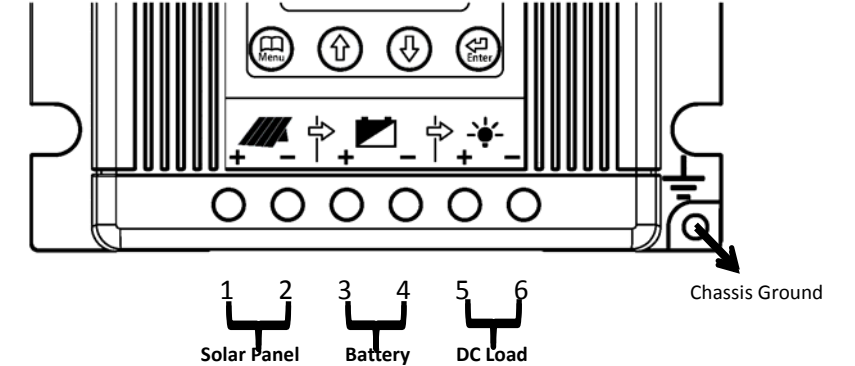
Caution: Unit Damage!

- Terminal 5 and 6 are designed for DC loads with current draw less than the rated current of the unit like DC light bulbs and small DC appliances. Connecting loads with high surge current or loads with current higher than the rated current of the unit, will permanently damage the unit and will not be covered by the warranty. Heavy duty loads like Inverters or DC Vacuum Cleaners should be connected directly to the battery terminals.
- To select battery type, use the jumper provided to connect Terminal 6 and 7 for charging 'Sealed' type of battery and do not use the jumper for 'Flooded' types of battery. 'Charging' green indicator starts to turn ON when it senses the solar panel provides more than approximately 3.5V to let you know the solar panel works. With low Solar panel voltage, it may not have sufficient energy to charge the battery. The Solar panel has to have at least 0.2 to 0.3V above the battery voltage in order to charge the battery.

'Load Disconnect' indicator turns ON when battery charge is low and the Load Output is disconnected from the battery. The Load Output will automatically reconnect when the battery voltage is charged to above 12.6V.

For SCD123 model:

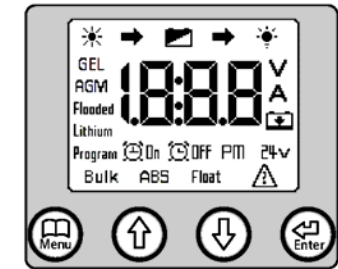
Caution: This unit is designed for use with 12V or 24V Battery Systems only



- Terminal 1, 2 are the input terminals for solar panel connection.
- Terminal 3, 4 are the terminals used for battery connection. They act as an output terminal for battery charging from the solar panel and act as an input terminal for battery discharging to DC load through the controller.
- Terminal 5, 6 are the output terminals for small DC load connection (if any).

Caution: Unit Damage!

Terminal 5 and 6 are designed for DC loads with current draw less than the rated current of the unit like DC light bulbs and small DC appliances. Connecting loads with high surge current or loads with current higher than the rated current of the unit, will permanently damage the unit and will not be covered by the warranty. Heavy duty loads like Inverters or DC Vacuum Cleaners should be connected directly to the battery terminals.



	<ul style="list-style-type: none"> Press once to temporary trigger ON the display to show unit status. You can then use the arrows to scroll the unit setting. The display will automatically turn OFF after 60 seconds Press and hold for 3 seconds to enter unit setting mode
	<ul style="list-style-type: none"> During normal operation, press once to turn DC load ON or OFF Under unit setting mode, press once to proceed to the next setting
	<ul style="list-style-type: none"> Under normal operation with display ON by pressing once, press 'up' or 'down' arrows to scroll unit setting: (Time, Battery Type, Bulk Voltage, Under voltage protection, under voltage recovery, Clock setting) Under unit setting mode, press 'up' or 'down' arrows to adjust unit settings

4. Installation Instructions

Caution: Please verify the rating of the solar panel size, battery voltage type and the total power consumption of the DC load before installing the unit.

Model	Max. Current	Battery Voltage	Battery Type	Maximum Solar Panel Size	Maximum Cable Size
SC1210LD	10A	12V	Sealed Lead Acid or Flooded (Note 1)	160W (12V)	#10 AWG
SC1220LD	20A			320W (12V)	
SCD1230	30A	12V or 24V	Gel, AGM, Flooded, Lithium Programmable (See Appendix)	480W-12V (12V system) 960W-24V (24V system)	#6 AWG

Step 1: Select Battery type

For **SC1210LD, SC1220LD**: use provided jumper to select battery type.

- Connect between pin 6 and 7 to charge **Sealed Lead Acid** batteries
- Disconnect the jumper connected between pin 6 and 7 to charge **Flooded** batteries

For **SCD1230**: Use Appendix and following instructions to select battery type.

Step 2: Connecting a battery

- Connect '-' terminal pin 4 on unit to battery negative terminal
- Connect '+' terminal pin 3 on unit to battery positive terminal

Step 3: Connecting a solar panel

- Connect '-' terminal of solar Input (pin 2) on unit to solar panel negative terminal
- Connect '+' terminal of solar Input (pin 1) on unit to solar panel positive terminal

Step 4: Connecting a DC load

- Connect '-' terminal of Load Output (pin 6) on unit to solar panel negative terminal
- Connect '+' terminal of Load Output (pin 5) on unit to solar panel positive terminal

5. Understanding the Unit Setting

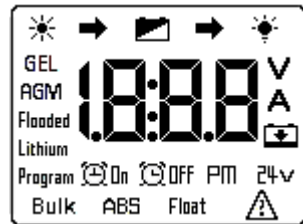
SC1210LD and SC1220LD:

The unit is fully automatic; no other unit setting is required once the battery type (**Sealed Lead Acid or Flooded**) is set and it is installed properly. It is recommended to verify the state of charge of the battery regularly and to verify that the load connected to the unit is not over rated for the unit. It is also recommended to verify that the power consumption on the load is less than the solar panel can produce.

SCD1230:

The unit has a built-in clock and the DC Load is programmable to be turned ON and OFF automatically each day through the unit setting (see Appendix for more details). The DC Load can also be switched to ON or OFF manually using the 'Enter' button. The Digital display shows charging status, solar panel voltage, battery charging current, DC Load current and error/warning code.

6. Understanding the Display on SCD1230



Symbol	Descriptions
	Solar is connected and is charging the battery
	DC Load is ON and current is drawing from the battery
	The related icon indicates the battery type is set
	The related icon shows the charging status.
	Automatic Load ON/OFF function is set and Load is ON
	Automatic Load ON/OFF function is set and Load is OFF
	24V battery system is detected
	The battery is discharging. Charging current is < Load current
	The display shows time (e.g.'12:00'), Charging current, Load current (e.g.'20.0'), battery voltage (e.g.'12.8'), Timer setting (e.g. 'C01' and Error code (e.g.'E02')
	The display is showing the afternoon time
	The display is showing current in Amps
	The display is showing voltage in Volts
	Error is detected and the display is showing the error code

7. Operation and Maintenance

The unit is fully automatic and no unit setting is required once it is installed properly. It is recommended to verify the state of charge of the battery regularly and to verify that the load connected to the unit is not over rated for the unit. It is also recommended to verify that the power consumption on the load is less than the solar panel can produce.

The following periodic inspections and maintenance tasks are highly recommended for best performance.

- Check for any rusting or corrosion around the battery terminals
- Verify the solar panels and loads connected do not exceed the unit rating
- Tighten all the terminal screws and inspect for any loose, broken or burnt wire connections.
- Ensure solar panel is mounted properly and is placed in the right position. Check for any dirt, debris and corrosion on the panel.
- Periodically clean solar panels with water and do not use chemicals

8. Troubleshooting

No Output at DC Load:

- Check DC load terminal connection. Connection may be loose or disconnected. For SCD1230, check the 'Clock OFF' icon. The DC load may be turned OFF automatically by the unit setting.
- Check connection polarity. Reverse polarity on any terminals will damage unit and is not covered by warranty.
- Check the battery voltage:
 - For SC1210LD and SC1220LD models, check that the 'Load disconnect' LED is ON. Verify battery voltage is above 12.6V.
 - For SCD1230, check for any error code on the display. Verify battery voltage. Check if the time and the automatic ON/OFF function is active.

Battery did not charge:

- Verify the solar panel is functioning properly. Check for poor connection on the solar panel
- Verify solar panel is not blocked by any surrounding tall objects. Check the solar panel surrounding area.
- Check solar panel and battery connections. Loose connection will reduce unit performance.
- Check connection polarity. Reverse polarity on any terminals will damage unit and is not covered by warranty.
- Verify the DC load consumption. The power consumed by the DC load should be less than the solar panel generates.

9. Specifications

	SC1210LD	SC1220LD	SCD1230
Battery Voltage System	12 VDC		12 / 24VDC
Solar Open Circuit Voltage (max.)	26 VDC		12V: 26VDC *
Charge Current (Max.)	10 A	20A	30A
Load Current (max.)	10 A	20A	30A
Load Surge Current (max.)	35A-1 min	40A-1 min	50A?
Operation Current	< 10mA	< 10 mA	< 20mA?
Charge Controller Type	PWM (Pulse Width Modulation)		
Charge Controller Grounding System	Negative Grounding		
Regulated Voltage			
Sealed Battery	Bulk:14.2 V Float:13.5V	Not Applicable	
Flooded Battery	Bulk:14.4 V Float:13.3V	Bulk:14.4V* Float:13.3V*	
GEL	Not Applicable		Bulk:14.4V* Float:13.7V*
AGM			Bulk:14.6V* Float:13.6V*
Lithium			Bulk:13.9-14.6V* Float:13.0-14.0V*
Program			Bulk:13.9-15.0V* Float:13.0-14.0V*
Load Disconnect Voltage	11.5 V	11.5V*	
Load Disconnect Voltage Range	Not applicable	10-11.8V*	
Load Reconnect Voltage	12.6 V	12.6V*	
Load Reconnect Voltage Range	Not applicable	10-12.3V*	
Recommended Wire Size	# 10-12 AWG		# 6 AWG
Operating Temperature	- 40 to 60 °C (-40 to 140 °F)		
Dimensions (L x W x H)	4.1x4.1x1.3 inches (104x104x33mm)	6.7x4.7x1.7 inches (170x120x43mm)	
Weight	0.7lb (320g)	0.77lb (350g)	1.25lb (570g)

*voltage is double when unit is use on 24V battery system.

10.Unit Mounting

- Select an appropriate mounting location and orientation. The unit can be oriented in any direction.
- Hold the solar charge controller against the mounting surface and mark the positions using the mounting flanges as guide.
- Pilot-drill the four mounting holes.

11.Warranty

Two Years Limited Warranty

The limited warranty program is the only one that applies to this unit, and it sets forth all the responsibilities of KISAE. There is no other warranty, other than those described herein. Any implied warranty of merchantability of fitness for a particular purpose on this unit is limited in duration to the duration of this warranty. This unit is warranted, to the original purchaser only, to be free of defects in materials and workmanship for one year from the date of purchase without additional charge. The warranty does not extend to subsequent purchasers or users. Manufacturer will not be responsible for any amount of damage in excess of the retail purchase price of the unit under any circumstances. Incidental and consequential damages are specifically excluded from coverage under this warranty. This unit is not intended for commercial use. This warranty does not apply to damage to units from misuse or incorrect installation/ connection. Misuse includes wiring or connecting to improper polarity power sources.

Return/Repair Policy:

If you are experiencing any problems with your unit, please contact our customer service department at info@kisaetechnology.com or Phone 1-877-897-5778 before returning product to retail store. After speaking to a customer service representative, if products are deemed non-working or malfunctioning, the product may be returned to the purchasing store within 30 days of original purchase. Any defective unit that is returned to manufacturer within 30 days of the date of purchase will be replaced free of charge. If such a unit is returned more than 30 days but less than one year from the purchase date, manufacturer will repair the unit or, at its option, replace it, free of charge. If the unit is repaired, new or reconditioned replacement parts may be used, at manufacturer's option. A unit may be replaced with a new or reconditioned unit of the same or comparable design. The repaired or replaced unit will then be warranted under these terms for the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items.

LIMITATIONS:

This warranty does not cover accessories, such as adapters and batteries, damage or defects result from normal wear and tear (including chips, scratches, abrasions, discoloration or fading due to usage or exposure to sunlight), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to follow instructions for care and maintenance, fire and flood. If your problem is not covered by his warranty, call our Customer Service Department at info@kisaetechnology.com or 1-877-897-5778 for general information if applicable.