

SOLAR CHARGE CONTROLLER MANUAL

ST-S1210

ST-S1220

ST-S1230

PRODUCT FEATURES

1. Three battery charging settings have been preset (B01 Lead acid battery, B02 Lithium ion battery, B03 Lithium iron phosphate battery), according to the types of batteries, with power-off memory function, which can remember the settings when users power on next time.
2. Large-screen LCD display, charging and discharging parameters can be fully customized.
3. Adopt complete three phase PWM charge management (Constant current mode, constant voltage mode, floating charge mode).
4. Built-in overcurrent/short circuit/open circuit and battery reverse protection.
5. Double MOS tube anti-reverse circuit protection, which prevents battery current from being caused power loss transferring to the solar cell at night.

SAFETY INSTRUCTIONS

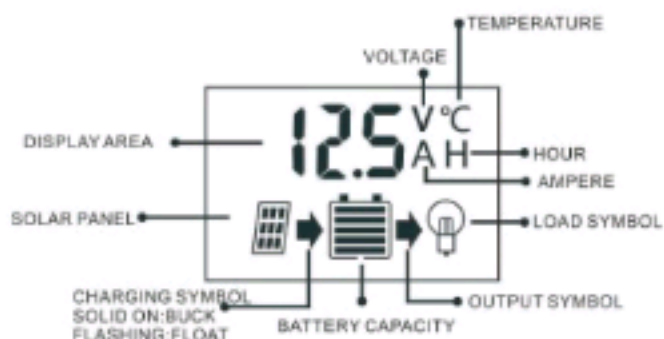
1. Make sure your battery has enough voltage for the controller to recognize the battery type before first installation.
 2. The battery cable should be as possible to minimize loss.
 3. The regulator is only suitable for lead-acid, lithium ions and LiFePO4 batteries.
 4. The charge regulator is only suitable for regulating solar modules.
- Never connect another charging source to the charge regulator.

CONTROLLER SYSTEM CONNECTION

1. Connect the battery to the charge regulator-plus and minus.
2. Connect the solar module to the regulator-plus and minus.
3. Connect the consumer to the charge regulator-plus and minus.



LCD SCREEN ICON DEFINITION/THE KEY EXPLANATORY AND FUNCTION



Menu: Used to switch the parameter display interface, tap to switch to the next setting of display parameter, long press for 5 seconds number flashes, enter the parameter adjustment, when settings are finished, press and hold until the number does not flash, and the corresponding parameter setting is completed.



UP: press to increase value



DOWN: press to decrease value

CONTROLLER ELECTRICAL PARAMETER TABLE

Model	ST-S1210	ST-S1220	ST-S1230
System voltage	12V/24V		
Maximum input voltage	< 50V		
Rated current	10A	20A	30A
External 12V battery recommended Solar panel specifications	100W/18V	200W/18V	300W/18V
External 24V battery recommended Solar panel specifications	100W/36V	200W/36V	300W/36V
External battery	12V 100-150Ah	12V 100-150Ah	12V 100-150Ah
	24V 100-150Ah	24V 100-150Ah	24V 100-150Ah
Battery Type	B01=Lead Acid Battery 12V		
	B02=Lithium-ion battery 3 series 3.7V=11.1V		
	B03=Lithium iron phosphate battery 4 series 3.2V=12.8V		
Charging voltage	*14.3V(B01)	*12.6V(B02)	*14.6V(B03)
Low-voltage cut-off voltage	*10.7V(B01)	*9V(B02)	*10V(B03)
Low power recovery voltage	*12.6V(B01)	*10.5V(B02)	*12V(B03)
USB output	5V/2A		
Standby current	<10mA		
Working temperature	-35~+60°C		
Size / Weight	125*86*34mm/200g		

Mark: * tagged voltage only corresponds to 12V solar system, if users use 24 system, please multiply by 2

LCD DISPLAY INTERFACE/PARAMETER SETTINGS



Main display, it shows battery voltage, battery capacity, charging and discharging status, press [MENU] to enter next display tab.

25 °C

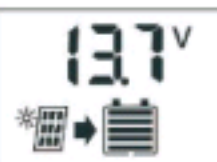
controller's body temperature display, if the controller gets hot during running, it will automatic shut down and wait for the temperature to drop to normal level, and then it will work again.



The controller can display the charging current from solar panel



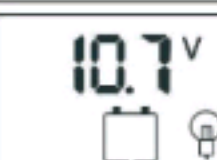
Display the discharge current value of load output.



Charging voltage display, when battery is charged to this voltage, it will maintain and keep float charging, long press the [MENU] key until the numbers flash, use [UP]/[DOWN] to select the voltage desired, then long press the [MENU] again to exit setting.



Low voltage re-connect display. When a low voltage disconnect happens, the controller will wait until the voltage raise more than this voltage, then it will re-connect the load again, the setting is the same as above.



Low voltage disconnect display. When battery voltage is lower than this voltage, the controller will cut off the output automatically, the setting is the same as above.



Load working mode. For 24H means the controller will continuously supply power to your load. For OH means dusk to dawn. For 1-23H means enable output after sun goes down and run a +1-12H then close output, the setting is the same as above.



Battery type setting, B01=Lead acid battery, constant charging voltage is 14.3V, B02=3*3.7V lithium ion battery pack, constant charging voltage is 12.7V, B03=4*3.2V lithium iron phosphate battery pack (LiFePO4), constant charging voltage is 14.6V. (The setting method is the same above.)



D2D trigger value (solar panel voltage) When the work mode is D2D or Timer, the controller will detect the solar panel voltage to decide whether its day or night, so to decide to enable load output or not, the higher this value is, the earlier it enables the load output, the setting is the same as above.



D2D trigger delay value (Second) When the work controller detect the solar panel voltage is lower than trigger value, it will delay for 10s and detect again to make sure night falls, then enable the load output, some car light or thunder lighting will confuse the controller and make it think its daytime, using this delay can prevent interference, default value is recommended, the setting is the same as above.

SC.F

Short-circuit protection setting. Some inductive or capacitive consumer will trigger the short-circuit protection during start up, therefore, you can disable the SC-protection manually. SC.F=OFF, SC.N=ON, the default is OFF, the setting is the same as above.

CONTROLLER FAULT INTERFACE

80 °C

High temperature anomaly interface, when the controller's body temperature is too high, it will enter stand-by mode and stop charging or discharging, when temperature drop down to a safe level, it will work again, press any key to ignore for one time and force to work again.



Low voltage protection interface. Empty battery symbol flashing means the battery is discharged lower than the LVD voltage, the controller has disabled the output, user should charge the battery until it raise up to LVR voltage and then controller will recover the output status, press any key to ignore for one time and force to work again.



Overload protection interface: Over-current or short-circuit protection. The load symbol flashing means a output over-current or short-circuit protection occurs. The controller now will disable the output and wait for 30s delay then try to recover again. User should check and remove the trouble in time.

POSSIBLY APPEARS QUESTIONS DURING INSTALLATION AND USE

The load will not light up?	it could be wrong working mode, like setting the work mode to D2D, but you are asking why my consumer is off during the daytime, or battery is not enough and a low-voltage disconnect has happened, or your consumer is broken, to check that, you can directly connect your consumer to the battery to see if it is working, please carefully check the wires and so.
The photovoltaic panel is connected but do not display charging current.	please carefully check the solar panel wires are connected correctly, and there is no reverse, the PV voltage should be higher than the voltage of the battery, any sewage or shadow on the PV will cause the voltage drop, please use a 18V PV to charge a 12V battery under normal circumstances.
Lower charging current?	use more solar panel and stronger sun light will increase the charging current, otherwise, using the wrong PV voltage or sewage and shadow on the PV will reduce the charging current. In addition, when the battery voltage is high it will enter float charging mode, also the charging current will become smaller.
Why does the battery run out so quickly even after it is fully charged?	your battery could have been used for a very long time, and after few hundred of cycling, its dying, a dying battery will not have the capacity to keep the electricity, run a simplest like this, when your charge your battery, the voltage raise very quickly, and when you discharge it again, it drops very quickly, this means you should change your battery.
What's the solution if the discharge time is not long enough?	If the power generated by the solar panel is less than the consumer used, the consumer will have to get the power from the battery storage, and day by day, it will cause a LVD finally at some moment, please use more solar panel and add more battery capacity to prevent cloudy or rainy day, or you can reduce the wait of the consumer or working time to balance the system.

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