

Thank you very much for choosing our product. This product manual provides important information and advices for product installation, use and troubleshooting. Before using this product, please read carefully and thoroughly.

Our product has a number of safety and display functions.

Clear readable LED display of the state of charge.

Acoustic signal when the state of charge changes.

Low voltage disconnect regulated by state of charge or voltage.

The controller adjusts itself automatically to 12V or 24V system voltage.

Max .16 mm<sup>2</sup> connector binding posts. Max safety current can reach 91A.

The charging characteristics include automatic adoption to the ambient temperature.

Complete electronic protection.

### Wiring and grounding:

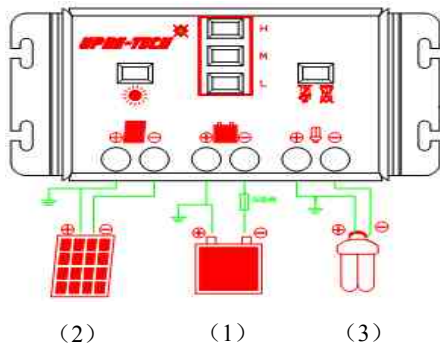
The controller is intended for indoor use only or installed in distribution box. Protect it from direct sunlight and rain. If installed in distribution box, should avoid the position of condensed water drip. The controller measures the ambient temperature to adapt the charging voltage. To ensure the start-up of controller, battery voltage should exceed 10V if the system voltage is 12V, and battery voltage should exceed 20V if the system voltage is 24V.

If the battery voltage is not within the normal operation range at start-up, a status display according to the section ERROR DESCRIPTION occurs.

Connect the controller by following steps to avoid installation faults.

1. Connect the wire to the controller, then to the battery.
2. Connect the wire to the controller, then to the photovoltaic modules.
3. Connect the wire to the load, then to the controller.

Follow the reverse procedure when uninstalling to avoid any damage.



All positive connections of SLAC-H controller are common and therefore have the same electrical potential. If any grounding is required, always do this on the positive wire. Special grounding terminal can be used for controller shell grounding.

If the controller is used in a vehicle which has the battery negative on the chassis, loads connected to the controller must not have an electric connection to the car body. Otherwise the Low Voltage Disconnect function and the electronic fuse function of the controller are short circuited.

**REMARK:** Mind the recommendations of your battery manufacturer. We strongly recommend connect a fuse directly to the battery to protect any short circuit at the battery wiring. The fuse must correspond to 1.5 times the nominal current of the controller.

### Starting up the controller:

#### Self Test

As soon as the controller is supplied with power from the battery, it starts a self test routine. Then the display changes to normal operation.

The controller adjusts itself automatically to 12V or 24V system. As soon as the voltage at the time of start-up exceeds 20V, the controller assumes a 24V system.

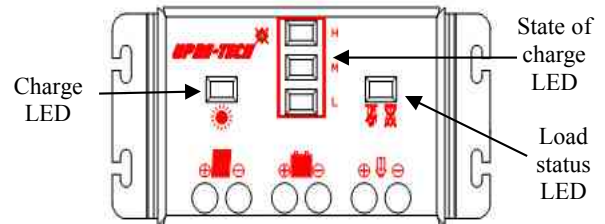
If the battery voltage is not within the normal operation range at start-up, a status display according to the section ERROR DESCRIPTION occurs.

### Battery Type

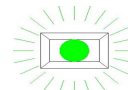
Factory Settings of the controller is to operate with lead-acid batteries with liquid electrolyte. If you intend to use a lead-acid battery with solid electrolyte (Gel type or AGM type), you can adjust the charging characteristics (see "Settings"). The equalization charge mode is canceled then. In case of any doubts or questions, please consult your dealer.

### Display Functions

The controller is equipped with 5 LEDs and an acoustic warning signal.



### Charge display



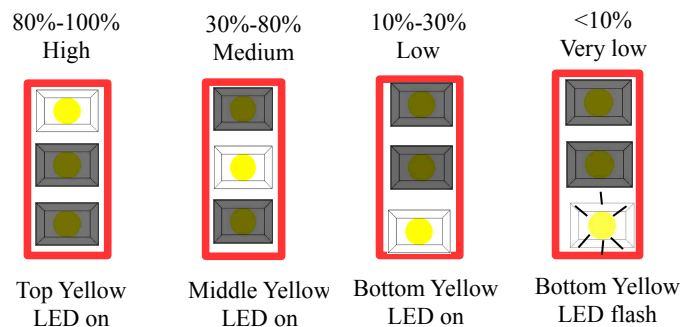
Solar array supplies electricity  
Green LED on



Solar array does not supply electricity  
Green LED off

### State of charge display

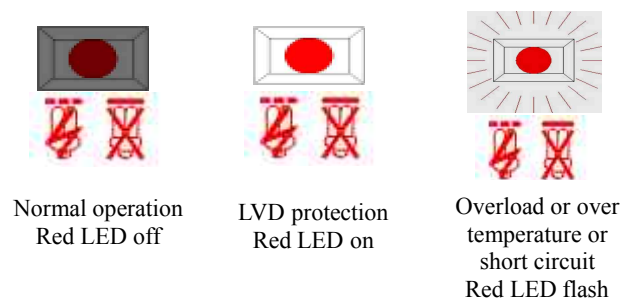
A change of the state of charge (SOC) to a lower status is indicated by an acoustic signal.



The loads are disconnected approx. 1 minute after a series of 25 tones.

### Load status display

In case of deep discharge or overload/short-circuit of load, the load output is switched off. This is indicated by followings:



### Low Voltage Disconnect Function

To protect the battery from being deeply discharged, the controller has following 2 protection modes:

1. State of charge controlled (SOC) : Disconnect at 11.4V/22.8V (at rated load current) up to 11.9V/23.8 V (At no load current). Factory default mode for better safe battery protection.
2. The battery voltage controlled (LVD): Disconnect at 11.0V/22.0 V - fixed voltage settings.

### Setting

After opened the case of controller, there are three jumpers can be seen on circuit board: GEL LVD BUZ. The factory setting is Jumper OFF.

## Jumper ON Jumper OFF



With these jumpers, the following settings can be configured:

Jumper	GEL	LVD	BUZ
Function	Battery type	Function of low voltage disconnect	Acoustic alarm signal
Jumper OFF	Flooded battery	State of charge controlled	Alarm off
Jumper ON	GEL (VRLA battery)	Voltage controlled	Alarm on
Factory setting	Flooded battery	State of charge controlled	Alarm on

### Safety features:

SLAC – H safety features can protect the controller to avoid damage to products due to incorrect installation or use.

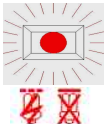


	PV terminals	Battery terminals	Load terminals
Reverse polarity	Protected(Not at 24V system voltage.)	Protected (buzzer alarm warning)	Protected (1)
Short circuit	Protected (2)	Protected(3) (with fuse on battery)	Switches off immediately(2)
Over current	Controller will limit the current.	Protected	Switches off with a delay (4)
Reverse charge	Protected	No effect	No effect
Over voltage	Max. 55V	Max. 55V	Switches off above 15.5V/31.0 V
Under voltage	No effect	Switches off load	Switches off
Over temperature	When over temperature occurs, the controller will limit the charging current. If the temperature of controller reaches a high level, the load will automatically be switched off.		

- (1) Controller can protect itself, but load might be damaged.  
 (2) Short circuit current:  $>4x-6x$  nominal current,  $<300\text{ A}$ .  
 (3) We strongly recommend that add a fuse between battery and controller. The battery may be permanently damaged when short circuit occurs.  
 (4)  $> 200\%$  rated current: Load will be switched off with 3s delay.

**Warning:** Two or more error conditions at the same time may cause damage to the controller. Always remove the present fault condition before next operation.

### Troubleshooting

Error	Indication	Cause	Corrective action
Loads are not supplied		Battery is low (Red LED on)	Load will reconnect as soon as battery is recharged.
		Over current or short circuit (Red LED flashing)	Switch off all loads. Remove all errors. Controller will switch on load automatically after max 1 minute.

	 flashing	Over temperature protect	Cool down the controller. Load will be switched on automatically.
		Battery voltage too high	Check if other sources overcharge the battery. If not, controller is damaged.
		Battery wire or the fuse is damaged, battery has high resistance.	Check the battery, the fuse and the wire. Remove faults.
Battery power is low after a short time.		Battery capacity becomes very low.	Replace the battery.
Battery is not being charged during daytime.		Solar panels faulty or reverse polarity (green LED off)	Check the solar panel and wire. Remove faults.
Battery wrong polarity.	All LEDs off. Buzzer alarm warning.	Battery is connected with reverse polarity.	Change polarity.

### SLAC-H Technical Characteristics

Model	SLAC-H 10A/20A/30A/40A
Rated system voltage	12V/24V auto recognition
Rated battery charging current	10A 20A 30A 40A
Boost charge	14.5V / 29V(25 °C) 2 h Activation: battery voltage $< 12.3/24.6\text{ V}$
Equalization	14.8V/29.6(25 °C) 2 h Activation: battery voltage $< 12.1/24.2\text{ V}$ (at least one time every 30 days)
Float charge	13.8V / 27.6V(25 °C)
Deep discharge protection, cut-off voltage.	11.4-11.9V/22.8-23.8 V by SOC 11.0/22.0 V by voltage
Reconnect level	12.8V/25.6V
Under voltage protection.	10.8V/21.6V
Over voltage protection.	15.5V/31.0 V
Max. Charge current.	10A 20A 30A 40A
Max. Load current.	10A 20A 30A 40A
Self consumption	4mA-5mA (12V) 5mA-6mA (24V)
Max. Panel/ Battery voltage	55V
Temperature compensation (Charge voltage)	-25 mV/K (12 V system) -50 mV/K (24 V system)
Grounding	Positive grounding
Battery type	Lead acid (GEL, AGM, flooded)
Dimensions (WxHxD)	140mm*72mm *40mm
Installation dimensions	130mm*66mm
Max. wire size	Max 16mm <sup>2</sup>
Ambient temperature	-40°C--60°C
IP grade	IP22
Altitude	$\leq 4000\text{m}$
Net weight	280g

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 Version: 20140530  
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