HX-VWG2008WSSL

Hybrid charge controller

—for wind and solar Hybrid Street light

User manual

Please read carefully before use it for your correct operation

Contents

A. Security

This equipment should be installed, adjusted by qualified electrical maintenance personnel which familiar with the construction and operation of the equipment and the hazards involved. Please read this manual very carefully. Failure to do so may result in bodily injury and permanent damage to the hybrid charge controller and attached wind turbine.

Please find the professional people guide to install the charge controller or contact with the local distributor.

Prevent any liquid from the spattering on charge controller. Do not clean the controller with wet cloth.

Keep the controller always from the children and incapacity person.

Keep controller away from electrical heater, warmer and some other source of heat; avoid the controller under sun.

Please check the rated battery of wind generator, solar panel, battery, and load before connection. Make sure their rated voltage is 12V (or 24V).

Pay attention to connect the positive ("+") and negative pole ("-") among Solar, battery, and loads correctly.

Select suitably wire sizes for the currents being generated.

The current of the wind generator, solar panel, and load are kept lower than the controller's rated current.

Make sure all connection are firmly tightened.

Connecting wired battery positive and negative poles directly is prohibited.

B. Features

HX-VWG2008 hybrid charge controller is a smart controller controlled by CPU. The controller will adjust the charge current and decide if charge to the battery based on the battery voltage. The product also has following features:

- ü Generally keep the battery on full voltage condition.
- ü Prevent the battery from overcharge and over discharge
- ü Prevent supplying electricity from the battery to solar panels during nights.

- ü Reverse polarity protection for battery.

- ü Load-off automatically when the battery is over charged.

- ü Brake the wind turbines automatically when the wind generator output voltage is too high.

- ü The controller will turn into protection state and brake the wind turbine automatically when the current is too large.

- ü Manual brake protection for Wind Turbine

- ü When load current exceed the controller's rated current, controller will disconnect load turn into the self-protection state and is automatically.

- ü Lightning protection，and can prevent the light　并可防止闪电干扰光控开关动作。

- ü Small size(diameter<12cm), Can be installed inside the street light pole.

- ü The display with USD connection can be removed easily. It can save power.

- ü Backlight display can be seen clear even in darkness.

- ü Display is in common use with other HX-VWG series controller

- ü The charge controller is always counting the charge or discharge AH of the battery, And the total KWH which is generated by wind turbine and solar panel.

- ü When the controller starts up, according to the voltage level of battery (12V/24V). Controller will self-setup the charging-off voltage, the load-off voltage, the load-on voltage, brake current, brake time etc.

- ü ser can setup the charging-off voltage, the load-off voltage, the load-on voltage, brake current, brake time according to their requirement.

- ü There are five groups independent switches, each switch can set light control and time control.

- ü Show current time. It can continue work 3 months even outage

- ü It can calculate the local sunrise and sunset time automatically after input the longitude and latitude. The load switch can be set self-adjust based on sunrise and sunset time.

C. System connection

Refer to the picture:

1. Connect the "+"、"-" of battery with the charge controller Battery "+"、"-" correctly and tightly.
2. Connect the "+"、"-" of solar panel with the charge controller Solar "+"、"-" correctly and tightly.

3. Connect the wind turbine with the controller wind "~"

4. Connect the Loads "+"、"-" with the Charge Controller Load "+"、"-" correctly and tightly. (There are two "+" load connecting terminal in the controller)

Attention:

Do connect the poles "+"、"-" of solar panel, battery, loads correctly

Choose the suitable cable, Suggestion cable: ≥6m ㎡

Connection Diagram
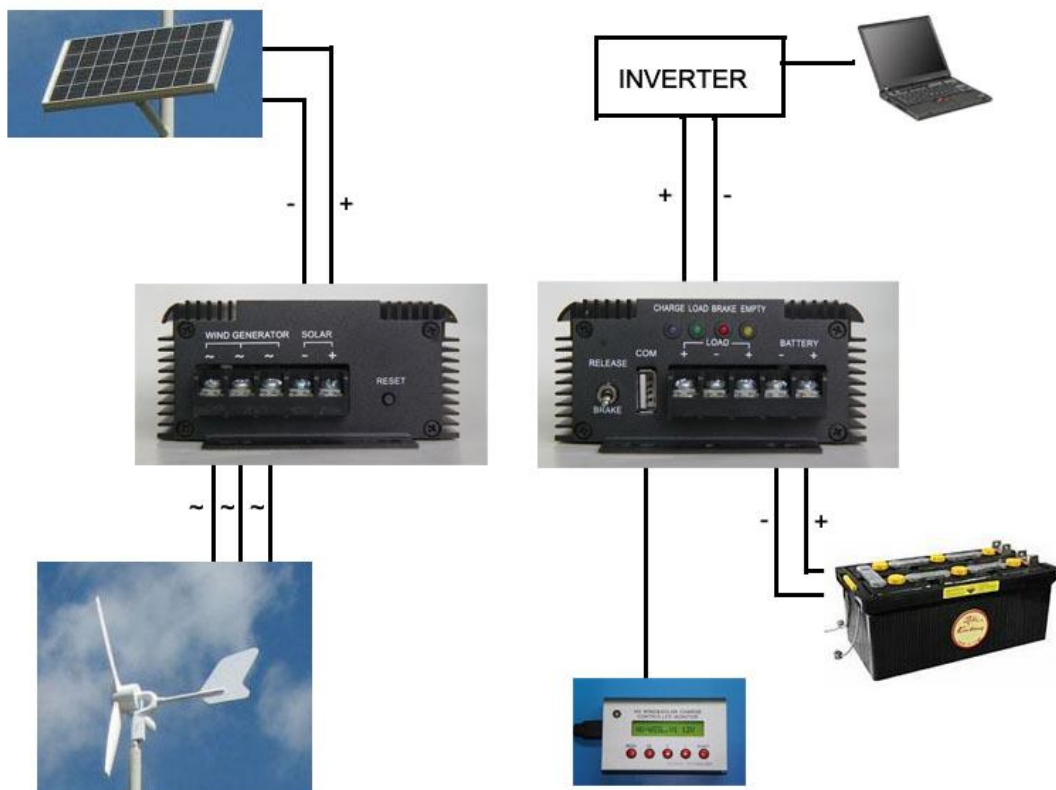
D. Operation method

HX WSSL V1.0 XX V ---- LCD display   MENU ----Press button

n **Menu**

Menu screen	Press Menu	Press OK	Remarks
HX WSSL. V1 **V			
U***V I***A	↓	↑	Charge voltage and current
Charge off ***V	↓	↑	Full charge voltage
Charge ***Ah	↓	↑	Total charge AH
Charge ***kwh	↓	↑	Total charge KWH
Power ***W	↓	↑	Instantaneous power
User ***Ah	↓	↑	Total discharge AH
User off ***V	↓	↑	Load off voltage
User on ***V	↓	↑	Load recovery voltage
Brake on ***A	↓	↑	Max current
Braketime *** Sec	↓	↑	Recovery time after brake
G ***V P ***V	↓	↑	Wind turbine, PV Voltage
User *** A	↓	↑	Instantaneous current
Max load ***A	↓	↑	Max load current
SET LOAD OUTPUT?		light control and time control Menu	

Main Menu instruction:

HX WSSL V1.0 xxV ：Product type: WSSL (street light controller). It show 12V or 24V based on different battery system.

U xx.xxV I xx.xx A ：Check the battery voltage or charge current. U(battery voltage, Unit: V) I(charge current, Unit: A)

Charge off xx.xx V ：Battery charge-off voltage. Press "**+**"Or"**-**" set battery's full charge voltage. Float charge when the battery voltage reaches to the 95% of full charge voltage.

Charge xxxAh ：charging AH，Unit: AH

Charge xxxkwh ：power generated，Unit: KWH

Power xx W ：Instantaneous power of wind generator and PV Unit : Watts

User xxx Ah ：discharge AH，Unit: AH

User off xx.xx V ：Off-load voltage. When battery voltage lower than this voltage, load will be cut off automatically to protect the battery from over discharge. Press" **+** or "**-**" set this voltage. Load off voltage can't be higher than the load on voltage.

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User on xx.xx V ：On-load voltage. When battery voltage is higher than this voltage, will supply the load automatically. Press" **+** or "**-**" set this voltage. Load on voltage can't lower than the load off voltage.

Brake on xx.xx A ： Brake current. It will brake wind turbine when the charging current higher than this set current. Press" **+** or "**-**" set this parameter.

Brake time xxx Sec ： Brake time. In order to protect the wind turbine, it will continue a period after the wind turbine is braked. Press" **+** or"**-**" set this parameter.

Range: ：1－60Sec

G xx.xxV P xx.xx V ： G－wind turbine voltage，P－solar panel voltage

User xxx A ： discharge current，unit：Ampere

Max load　xxx A ：Max discharge current. When the battery discharge current higher than this current; load will be cut off automatically to protect the battery from over discharge.

Press" + or"-" set this parameter.　Unit: A

Light control and time control setup

Note: Press "OK" to move cursor to the setting parameters. Press "**+**"or"**-**"set suitable value.

Menu	MENU	Remarks
****.**.**.**.**	↩	OK "**+**"or"**-**"
Light **(**)	↓	Current PV voltage
glong: ** ' ** W	↓	W: West longitude 西经,E: East Longitude
glat: ** ' ** N	↓	N: North Latitude S: South Latitude
time zone:　　**	↓	Time zone
R:**:** D:**:**	↓	sunrise(R) and sunset(D) time of each day
1:T**:**-T**:** E	↓	The 1st switch time
2:T**:**-T**:** E	↓	The 2nd switch time
3:T**:**-T**:** E	↓	The 3rd switch time
4:T**:**-T**:** E	↓	The 4th switch time
5:T**:**-T**:** E	↓	The 5th switch time
On off: ********	↓	Switch state　0:Off，1:On
GO TO MAINMENU?	↪	Press "OK" back to main menu

The correct date and time must be set before set the light control and time control. Press "OK" button at this interface **SETLOAD OUTPUT?** ， find the time control interface **YYYY-MM-DD HH:MM** ，Press "**OK**" move cursor to the setting parameters. Press" **+**"

or "-" set the suitable value. Then press" MENU" to switch to next group parameters.

It need set the light on brightness or light off brightness if use the light control. Light control brightness is based on the current PV voltage. In this menu ┌ **LIGHT   xx(XX)** ┐ The **XX** in parentheses() is current PV voltage, it means the current brightness, for setting reference. The **xx** is the setting brightness voltage. Press "**+**" or "**-**" to set the suitable brightness value. （Refer to the following introduction of the light control setup）

If it need to set the "switch on time" or "switch off time" based on the sunrise or sunset，It need to set the longitude and latitude of the place which you located, then the controller will calculate the sunrise time and sunset time based on the date. Please set the longitude and latitude through these two interface ┌ **glong: xx ' xx W** ┐ and ┌ **glat: xx'xx N** ┐ Press " **OK**' button to move the cursor. Press "+" and "-" to adjust. The last letter W,E mean west longitude and East longitude. N,S mean North latitude and South latitude. It can be switched to the other state when the cursor moves to this place.

┌ **timezone: + xx** ┐ means the current time zone, please press "+""-" to set it.

After the date, time, longitude, attitude and time zone are adjusted correctly. The controller can calculate the sunrise time and sunset time automatically. The interface ┌ **R: xx:xx   D: xx:xx** ┐ show that day's SUNRISE TIME(R) and SUNSET TIME(D)

There are1-5 five groups load switching time. Format as bellows


```
      ⌐ :E/F
      ⌐ ,HH:MM
      ⌐ :T/L/R/D
      ⌐ ,HH:MM
      ⌐ :T/L/R/D
      ⌐ 1□□□□□
```
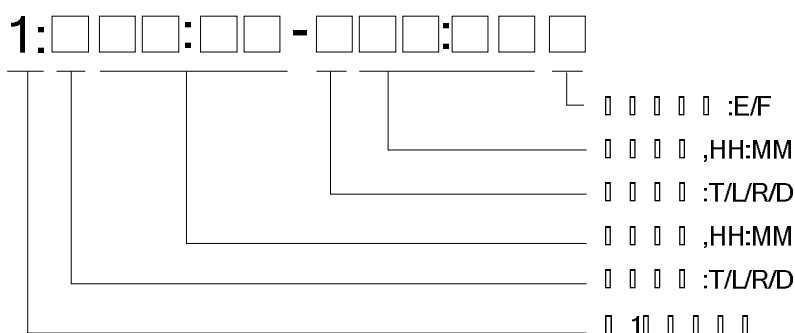
Press "(**MENU**)" will circularly between 1－5 groups date. Each group can be adjusted independently. Press"**OK**" to move, then press **"+"** or **"-"** to set it.

There are five optional modes for each switch:

T: time control mode;

R: Sunrise control

D: Sunset control.

L: Light control mode.

When select T mode: Switch on/off at the set time.

When select R mode: It will calculate the right time to switch on or switch off based on the sunrise latitude correction. When set certain time, it will calculate the D-value between the current sunrise time and set time. Then it will adjust the switch off time based on the changing sunrise time.

When select D mode: It will calculate the right time to switch on or switch off based on the sunset latitude correction. When set certain time, it will calculate the D-value between the current sunset time and set time. Then it will adjust the switch on time based on the changing sunset time.

T, R, D mode's time setting range: 00:00-23:59

When select L mode: Light on/off is controlled by brightness. If set light control switch on,

Refer to $\boxed{\text{1:L}-\square\square\square:\square\square \quad \text{E}}$ It will switch on if the current brightness is under the set brightness. If set light control switch off, refer to $\boxed{\text{1:}\square\square\square:\square\square-\text{L E}}$ It will Switch off if the current brightness is higher than set brightness. If the switch on and switch are all light control. Refer to $\boxed{\text{1:L} \quad - \quad \text{L} \quad \text{E}}$ It will switch on if the current brightness is lower than set brightness and switch off if the current brightness is higher than set brightness.

The last letter is significant digits. **E:** valid, **F:** invalid. Press "**OK**" to move the place, then press **"+"** or **"-"** to switch it.

Menu item $\boxed{\text{onoff: ********}}$ Show the current switch status of each group. **0**:OFF, **1**:ON

Menu item $\boxed{\text{GOTO MAINMENU?}}$ Press"OK" back to main Menu. Press "MENU" back to time date setting menu.

E. Trouble shooting

1. Phenomenon: Green light off

  Reason: Battery voltage is too low

          Load is trun off

  Solution: Charge the battery or change battery

          check the load's switch status

2. Phenomenon: Green light off, load cut off, LCD display shows: Over Load

  Reason：Load over loading or load short circuit

  Solution: Down load or solve the short circuit problem, Press RESET again

·**3. Phenomenon:** Green light is on

   Normal, charge to load

4. Phenomenon: Red light is on

  Normal, battery fast charge

5. Phenomenon: Red light off

  Reason: No charge

  Solution: Its normal if at night. Checking it if it not has been charged for a long

     time. And Check whether the wind turbine or solar panel connects correctly or

     tightly with the charge controller.

F: Technical parameters

Item Model	HX-VWG2008 WSSL
Rated voltage	12V、24V Detect the voltage automatically
Wind rated power	300W
PV rated power	150W
Charge mode	constant voltage with current-limiting,，PWM
Over charge protective voltage	14.4V/28.8V(Default, adjust range: 12~15V/24~30V)
Over discharge protective voltage	10.5V/21V(Default, adjust range: 10~12.5,20~25.1)
Over discharge voltage recovery	12.6V/25.2V(Default, adjust range:10.6~14.4,21.1~28.8)
Max charge current	50A/25A（Default, adjust range: 30~60A/15-30A）
Brake time	6 Sec（Default, adjust range: 1~60 Sec）
Max load current	50A/25A
No-load loss	≤60mA

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