High Performance 1KW Wind MPPT Charge Controller (MAX-1000)Instruction

One Overview

High performance 1KW Wind MPPT charge controller is one kind of generating equipment which is suitable for DS700(Darrieus and Suvoneus mixed blades of vertical axis wind turbine generator). Wind power is withdrawn accordance with MPPT look up table. Make full use of the wind turbine power generating, improve generating efficiency. By using of the power conversion parts, the wind turbine can do charge to the battery with low level voltage (it can charge 48V) even when its voltage is between 0 and 450V. The inside wind turbine unloading control unit ensures the safe running of wind turbine. This instruction mainly describes the composition and using method of charge controller. Single equipment can be used in the off-grid type Wind generating system with the power under 1KW, and several equipments can be used in parallel, which makes the customers' configuration free and flexible.

Please read the instruction carefully before using.

Two Controller structure

The controller includes MPPT wind turbine charge unit and unloading control unit.

MPPT charge unit:

Through this parts can do maximum power tracking output to the wind turbine, and finish the charge to battery with low level voltage

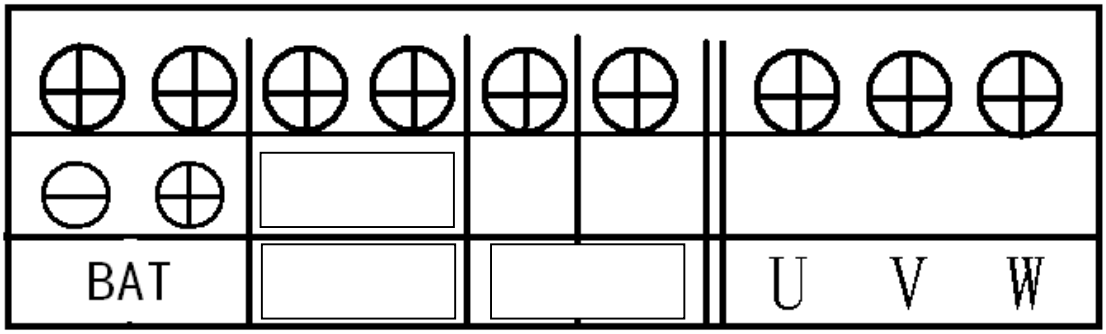
The controller is as below shows：

Controller

Controller size (L*W*H)：415mm *350mm *150mm

Three Definition and parameter of terminals

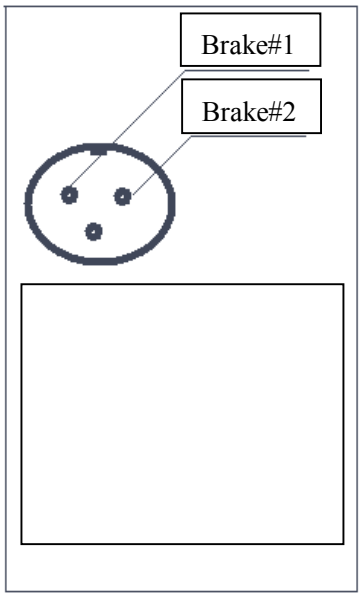
Terminals at the back of controller are defined as below



[BAT(一) BAT(十)] Battery input terminal of controller, battery voltage <=96V

Reverse connection is not allowed, otherwise, controller may be damaged.

[U V W]---------- Three phase voltage input terminals of generator.



brake terminals are defined

Passive control input---passive input signal,
input must be passive (closed after input)

Brake contact：

Output mode---passive contact output
(Close is effective, no polarity)

Capacity： ----------5A

Passive control input:

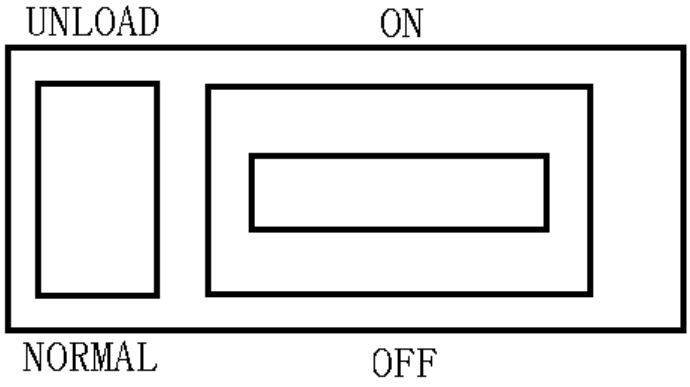
Input mode--- passive contact input
Close is effective (no polarity)

Attention: do not do reverse or wrong connection, otherwise, controller may be damaged.

Specifications of controller

Model	Rated battery voltage	Input voltage of wind turbine	Rated output current of wind turbine charge unit	Adaptive wind turbine	Solar current	Solar power	Communication interface
MAX-A4-WI-10	48V	0-450V	25A	1KW	x	x	485
Protection mode	Battery overcharge, reverse connection of battery, current limiting of wind turbine, power limiting, unloading brake, input lightening						
Display mode	128*64 128*64 liquid crystal display						
Working performance	Wind turbine maximum power point tracking						
Unloading mode	Wind turbine						
Working condition	-20~60℃/ 35~85%RH (non-condensing)						

Air switch terminal



UNLOAD :Manual brake switch, when switch to UNLOAD state,

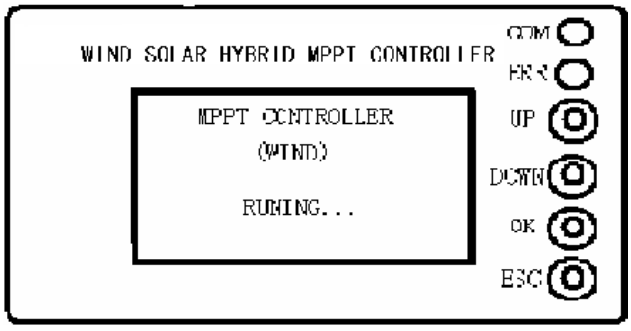
output line of three phase machine is short circuited (used when install the wind turbine), do not switch to ON state when the rotate speed is too high, otherwise, the wind turbine maybe damaged due to excessive current; switch to OFF state, the wind turbine works normally, not short circuit.

[ON OFF] ------- Power supply switch of controller, ON connect power, OFF close power.

The controller equips with wind turbine electronic unloading device inside, if the voltage of wind turbine is too high, the unloading device works immediately, which to ensure the output voltage is under the set value.

Four Function description

1. controller operation:



The controller uses 128*64 liquid crystal operation displayer. A part of control information and setting parameters can be seen on this displayer. Below interface will be shown after the controller connects with electric

power.

Yellow light---yellow light is bright means abnormal conditions happen, for example, power device over current, short circuit; the temperature is too high; and so on. After the abnormality happens, the internal buzzer continues to ring; not bright means OK.

Green light--indicator light of working power, flicker normally

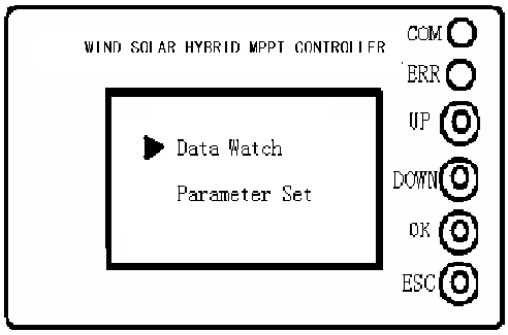
There are 4 operation buttons, functions are as following:

UP ---------- page up

DOWN ------- page down

OK ---------- confirm / switch

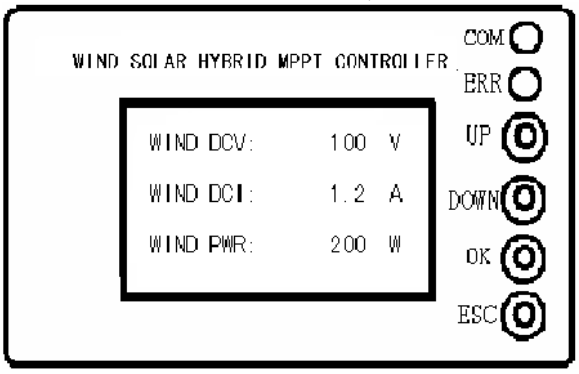
ESC ---------- escape



Under the standby interface, press [OK], enter into function menu select interface, as below shows:

Through [UP] and [DOWN] buttons to choose current operation, the front triangle arrow indicates the current choose, press [OK], enter into next chosen operation interface.

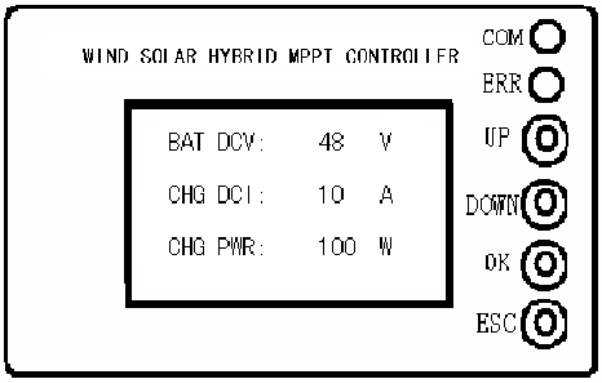
1. data query, shows some working information of current wind turbine; press [OK] to enter into this interface, as below shows:



[WIND DCV]----- Shows direct voltage of current wind turbine Unit V

[WIND DCI]----- Shows input current of current wind turbine Unit A

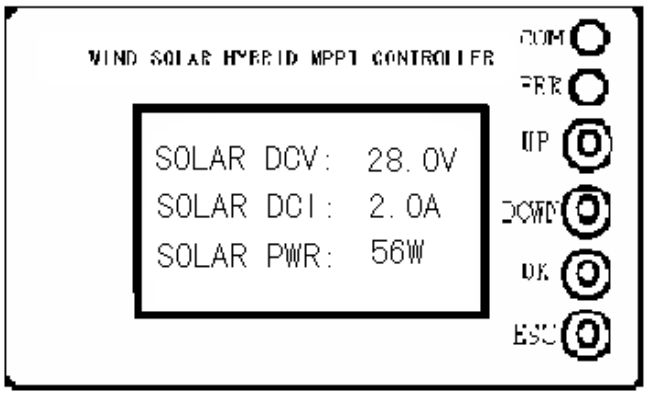
[WIND PWR]----- Shows current charge power Unit W



[BAT DCV]----- Shows current battery voltage Unit V

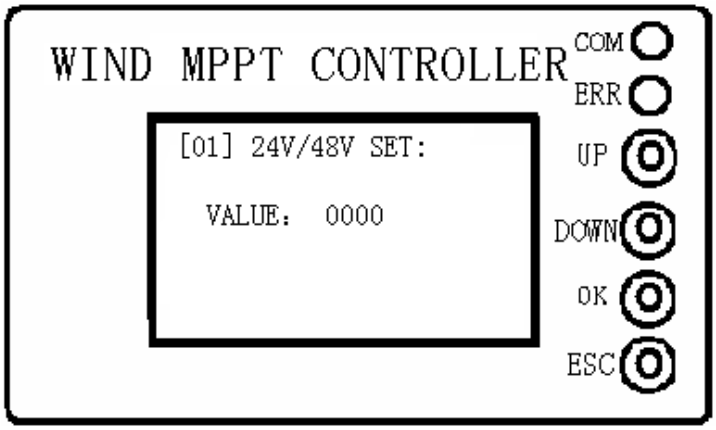
[CHG DCI]----- Shows current charge current Unit A

[CHG PWR]----- Shows current charge power Unit W



2. [Parameter Set]-----parameter setting, make the controller match

up with the normal working of wind turbine through internally setting of a part of parameters, press [OK] to enter into this interface, as below shows:



[24V/48V SET]----- Used for choosing the voltage level of battery. Range 0000-0005

0000 corresponds to 12V

0001 corresponds to 24V

0002 corresponds to 36V

0003 corresponds to 48V

0004 corresponds to 96V

There are 22 parameter settings under such setting:

[MAX CHG DCI SET]---- Setting of maximum battery charge current, according to this current parameter, the controller makes the charge current rise steadily when it reaches to this value, instead of power curve charge. It's used for limiting the

charge current. Range is 0-1000.

For example: 0800 corresponds to 80.0A current.

[WIND POWER SET]------Setting of maximum wind turbine input power, this parameter ensures wind turbine does not charge battery by the power which is over this set value, avoid over load working of wind turbine or battery. Range is 0-9999.

Foe example, 0900 corresponds to 900W.

[Clear All Err]----------If over current and over temperature happens, sets to 1 to remove all errors, range 0-1.

[WIND OUT V/P 01-15]--------Voltage and power curve configuration parameters of wind turbine. Every wind turbine has its best working power curve; this controller maximally provides 15 points to fit the wind turbine's power curve. There are two parameter settings, voltage and its

corresponding maximum output power. The controller will do MPPT according to this parameter, and make best power output according to this configuration curve. The parameters must set from small to big orderly, for example, 15 parameters, voltage increases from V/P01 to V/P15, as well as its corresponding power. The range of voltage is 0-450V; power corresponds to 0-9999W.

[MAX BAT DCV]---------- Limitation of highest battery voltage, after this parameter be set, if the battery voltage is higher than this value, the controller will automatically and dynamically reduce the charge current, ensure the battery not over charge.

[MAX Wind DCI]----------Setting of maximum wind turbine input current. If the wind turbine's

input currents is higher than this value, 5sec later, output control signal of wind turbine brake, setting range is 0000-9999, for example, 1000 corresponds to 10.00A current.

[Break ON Time]----------Braking time setting of wind turbine brake, unit second. After wind turbine braking due to over current, after this time delay, brake action will be re-released, and makes the wind turbine working (except the manual force braking)

Setting range is 0000-9999 seconds.

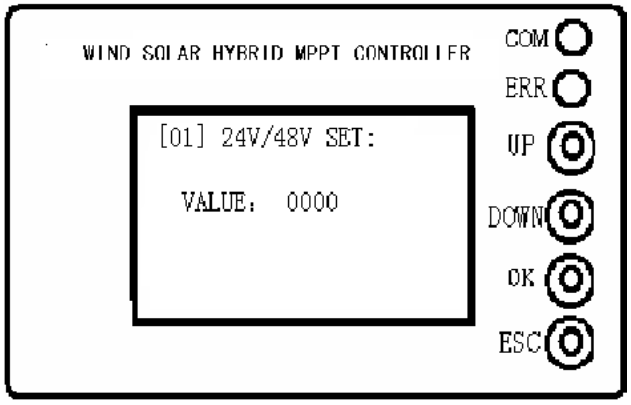
[ULOAD V SET]----------Wind turbine unloading protection input voltage setting. When the wind turbine input voltage reaches to this set value, unloading starts, which to ensure the wind turbine input voltage is under this parameter value.

Setting range is 0000-4500

For example, 3500 corresponds to 350.0V

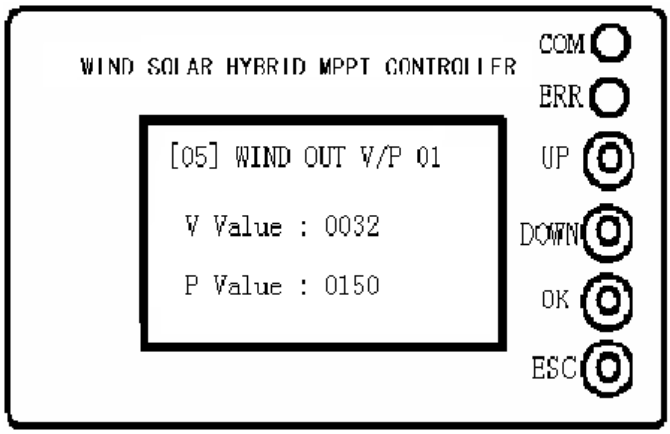
Parameter setting method is as below shows:

For example, when enter into this setting interface:



Then press [OK], the corresponding modify position of current set value is flickering. Now, press [UP] can change the current value; through [DOWN] button to change the modify position which needs to be set. After the setting finishes, press [OK] to save data. Press [ESC] to escape setting anytime, the current data will not flicker.

The parameters settings method of power curve on the below interface is as follow:



On this interface, press [OK], the corresponding values of [V Value] or [P Value] show reversely, through [UP], [DOWN] to select the parameter of

current operation, the corresponding selection shows reversely. Press [OK] again, the corresponding modify position will be flickering, press [UP] to change current value; through [DOWN] button to change the modify position which needs to be set. Press [ESC] to escape setting menu gradually.

Attention:

All the above parameters must be set according to reality so that the work can be controlled availably.

Five Attentions in the application

Configure the controller as possible as below recommendations

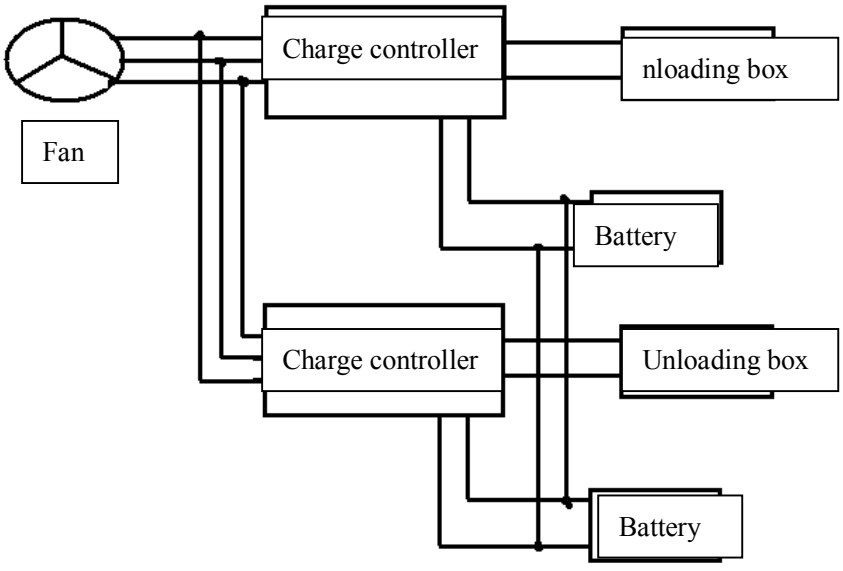
When installation, especially during the installation of wind turbine, the corresponding manual unloading switch of controller should be switched to [UNLOAD] state, to avoid wind turbine idling. During normal working, unloading switch must be switched to [NORMAL] state.

First connect the battery wire, choose the cable according to the current density capacity. connect the cable with battery by reliable connection (the current is very big), virtual connection may damage the controller.

After wiring, open the power switch, the controller starts work.

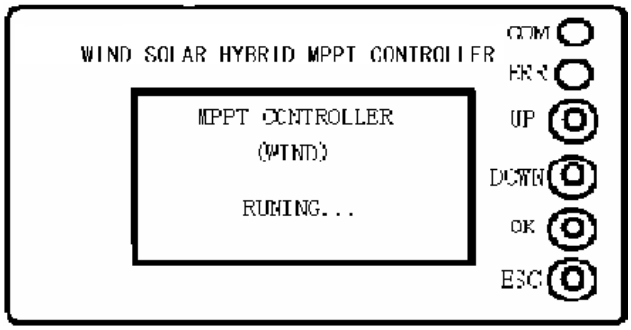
Attention: the charge unit of wind turbine is belong to buck power conversation structure, only when the wind turbine voltage is over battery voltage, there is current to charge battery. So it's suitable for the buck (wind turbine voltage > battery voltage) wind turbine charge.

In order increase the wind turbine charge capacity, several charge controllers can be connected in parallel. When charge the battery by several charge controllers (same type and mode) connected in parallel with single wind turbine, the input ports of wind turbine and battery connected on parallel. The controller will balance the absorption of power from wind turbine to do charge. The set parameters of controller must be the same. As below picture:



Six Operation instruction

After correct wiring of controller, switch the air switch to [ON], power up the controller, work normally, the LCD shows the working interface:



ERR indicator light on the board is not bright, means the controller works normally, and tracks the output according to configuration automatically. Following describes several abnormal situations

1. When the battery is not full, the wind turbine is not over power, over current working, does MPPT track output according to power curve automatically.

2. When the battery is almost full, the controller ignores power tracking automatically, forced reduce charge current, does low current dynamic charge to battery. When the battery is completely full, charge power becomes less, till to stop charging, to ensure the battery is not over charge.

3. When the charge current reaches to maximum limiting value, the controller ignores power tracking, forced reduce current from the direction of limiting charge current (the current may over the limit value, and rise steadily) automatically, which ensures the safe

working of controller, on the other hand, avoid over power working of wind turbine.

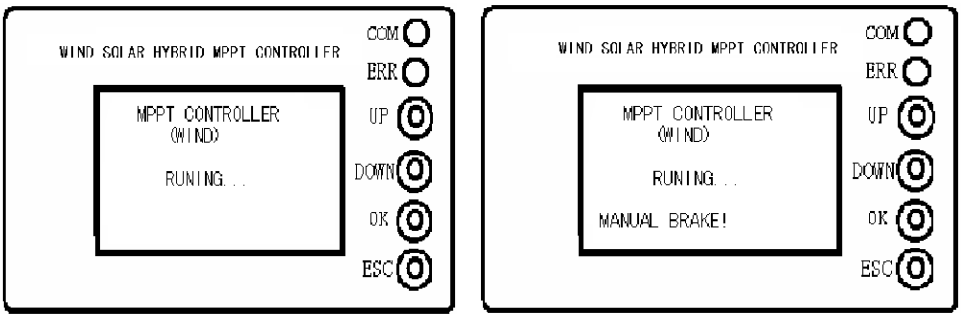
4. Input current of wind turbine divides into charge current and unloading current. When the total input current of wind turbine is over set limiting value, the controller outputs control signal of brake automatically, stops the wind turbine working through external braking.

5. When abnormal situations happen, for example, inside temperature is too high; over current (the yellow indicator light is bright). Forced to suspend controller's working temporally, after return to normal, re-start work automatically. Users can also remove abnormalities through menu. If it returns to normal, the yellow indicator light is not bright.

6. When the wind turbine is no-load working or output voltage of wind turbine is too high due to all kinds of reasons, the controller automatically control the input voltage within the internal setting range, unload extra energy, which avoids rapid running of wind turbine, as well as damage of controller due to high voltage.

7. On the standby interface, long press [ESC] button for 3 seconds, and the controller will output control signal of brake automatically, brake wind turbine manually. This signal is always available, till

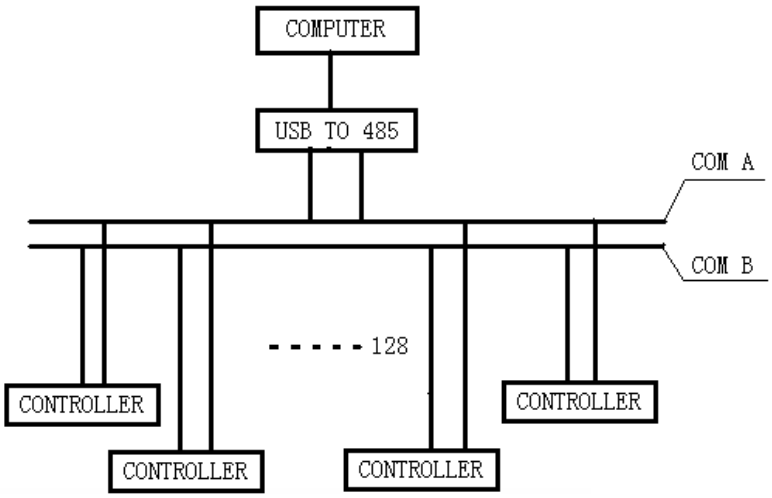
long press [ESC] button for 3 seconds again, cancel the output of brake control signal,



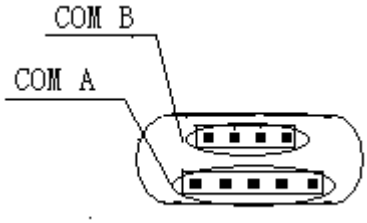
Seven Using of monitoring software

Instruction of Monitoring Software

This controller can be remotely connected with computer through 485 communication terminal (use USB interface). When several controllers monitoring exist, centralized monitoring can be achieved through one cable. Maximally support on the monitoring of 128 controllers. Topological structure as below shows:



Communication terminal, definition of terminal signal (right picture):



belong to 485 communication structure

Before using monitoring, connect all the controllers with twisted pair cable, and energinzing; the monitoring software should be installed with USB switch to 485 driver, monitor the software.

1． using environment:

Monitoring software can work in the WINDOWS 2000/2003/XP/WIN7 system.

2． Debugger drive installation

Accompany with a USB cable, adaptor and software CD.

Install driver when first use it.

First connect the adaptor with USB cable, and then insert the cable to computer's USB interface, the system will prompt finding new hardware, then pop-up the driver installation window:

Connect computer as the right picture shows

prompting of finding new hardware

)

Choose install form the list or designated position (senior)
Click next step:

Check the option "include this position in searching", click "browse" button, choose the "DRIVE" folder in CD.

click next step:

Begin to install driver. When installation finishes, the system will restart hardware.
Then operate again according to the above process. Till now, the driver installation finished. Your computer will have a COM interface

3． Installation of monitoring software

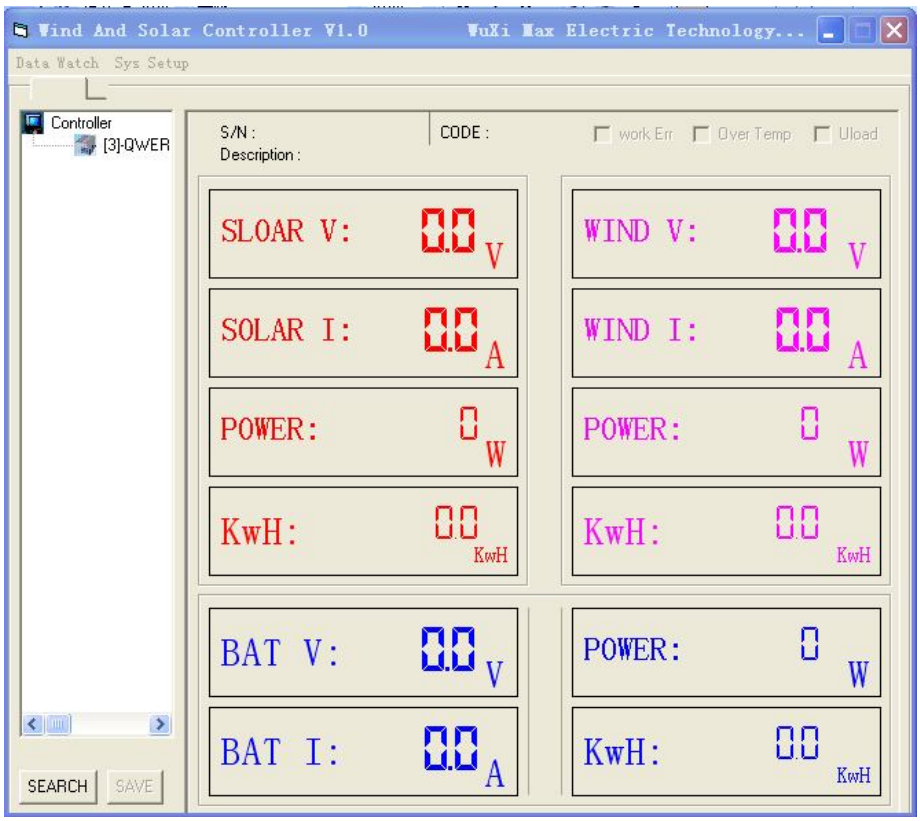
Open the CD, click SETUP.EXE, and install software according to prompts.

After installation, the software can be used for setting and observation of controller's working.

Click the software in program, working.

Monitoring interface as follows

1st page



On the left of the 1st page shows the controller's name and code which is connected to computer at present.

1.

for example

【5】---RIGHT （computer number is '1'）

【5】--- corresponding controller's number

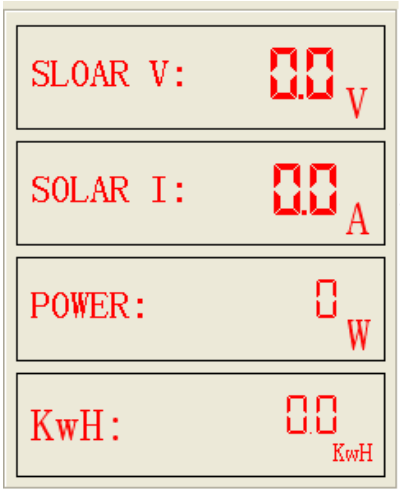
"RIGHT"----- corresponding to the descript STOP controller's installation(e.g. explanation of installation location, and so on, SAVE y for customers' management)

Normally, here does not connect and show any controller. Users should use the below SEARCH click , shows if you want to search connected controller, click done, begin searching from number 2 to number 128, the list will show the controller's information after searching every one controller. During the searching process, click STOP, stop searching. When searching finishes, all the linked controllers will show out, and then users can use SAVE to save controllers' information. So that every time opens the software, controllers' information will in the list. Do searching after newly install controller to make the information show in the list.

Click the relevant controller's name can update and check its information, only the information is updated, the operation in the 2nd page will be available, the parameter settings of the 2nd page are corresponding to current chosen controller.

2.

In the middle shows the basic parameters after controller working, explanations as below:

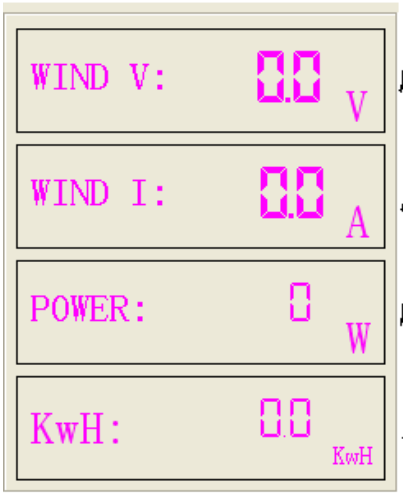


Solar input voltage Unit: V

Solar input current Unit: A

Solar input power Unit: W

Solar input degree Unit: KwH

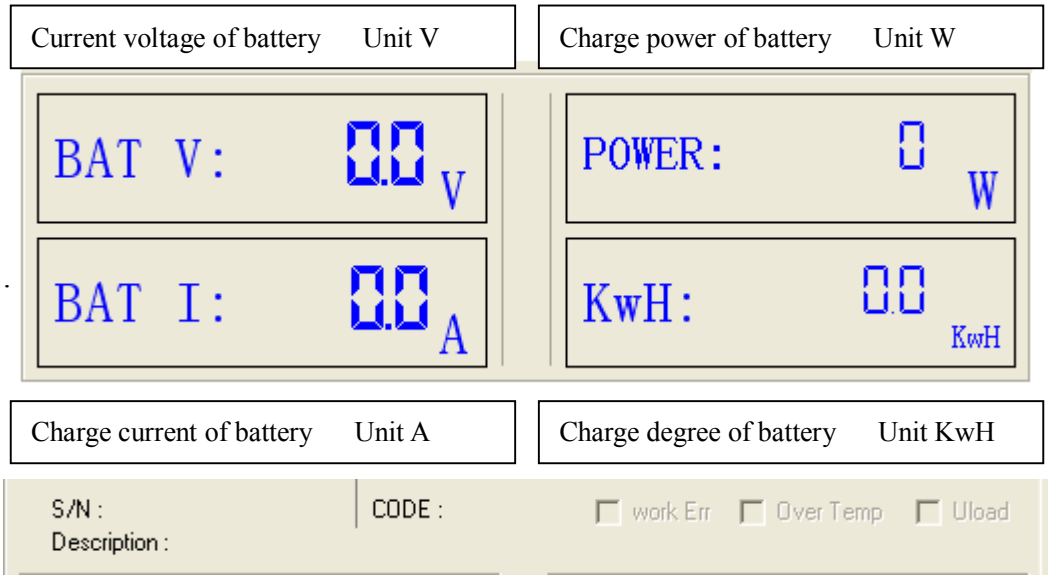


Fan input voltage Unit: V

Fan input current Unit: A

风机输入功率 单位 瓦（W）

风机输入电度数 单位 度（KwH）



[S/N]---------- Shows serial number of product, it's unique for every controller, users can not change it.

[CODE]----------Show controller's code. Codes are needed when does centralize monitoring by several controllers, and the codes must be different, the code range is [2-128], set through the 2nd interface

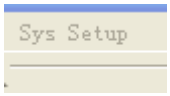
[Description]---------- Controller installation description, specify the install location of controller, or other explanation which is easy for users' checking, set through the 2nd interface.

[Work Err]----------Error indication of controller's inverter unit (fail can be removed through reset button), red means action.

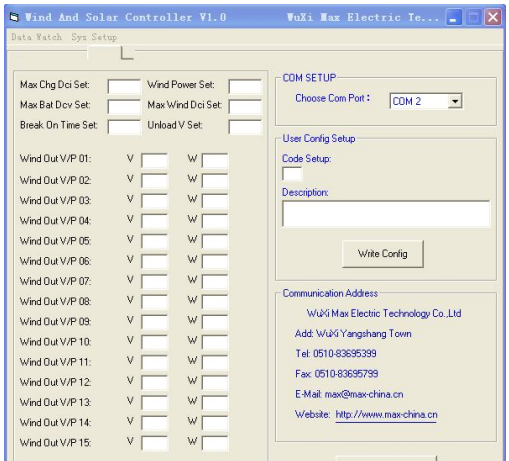
[Over Temp]----------

Indication of over temperature, stop working when the inside temperature of controller is too high, till the temperature restores to normal, returns to service automatically, red means action.

[Uload]---------- Unloading indication of controller, red means action.

Click 

switch to the 2nd page



Set working parameters of system at the left, the parameters are the same as that of LCD, please refer to the instruction of LCD setting parameters.

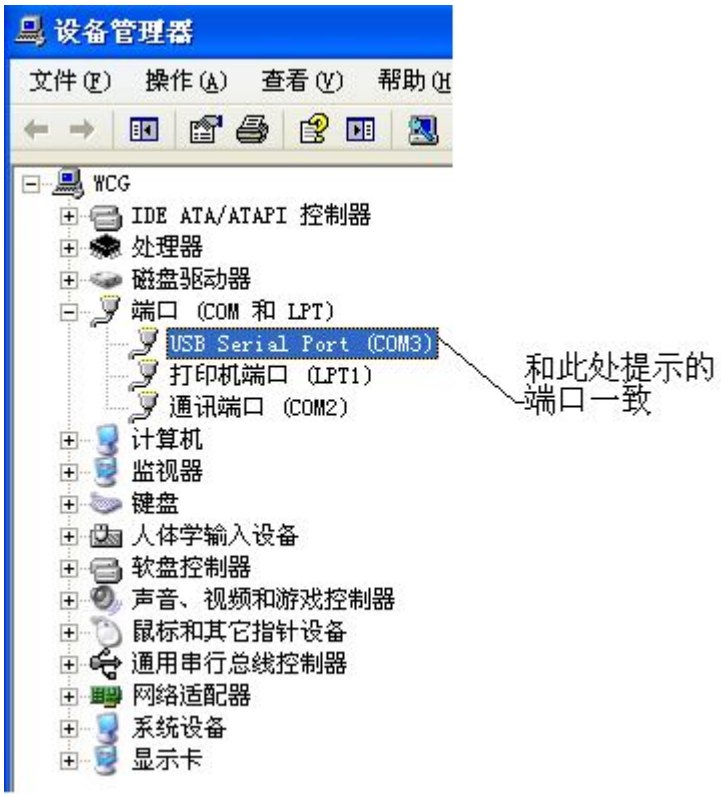
Used for reading all parameters of controller

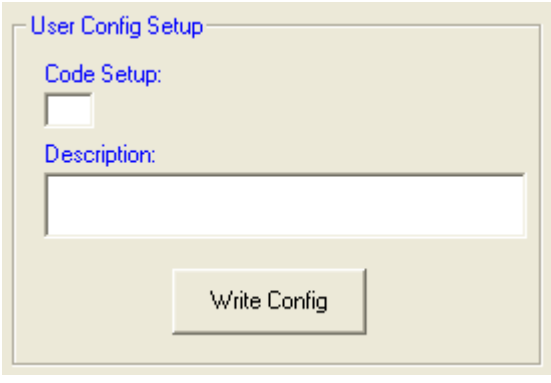
Used for write all to be set parameters

Recommendation: before setting the parameters, first read all inside parameters of controller then make corresponding changes.

choose communication terminal

Communication terminal must be the same as the one prompted by USB device, otherwise, not work. Use the following operations (in the XP system) can check communication terminal:





Setting of user information

[Code Setup]-----Controller code setting, every controller has one code in the centralize monitoring, the range is [2-128], and must be different.

[Description]----- Description of controller installation information, describe installation location of controller, and so on, which are easy for users' identification, no more than 50 English characters.

After writing, click 

the write configuration button, current controller will be updated.

Attention: when the current controller code changed, the current controller list information is not updated, needs to research controller, so that list can be updated and saved. Otherwise, current display information can not be updated when code changed.

Show the company contact information.

Note: The instruction may be revised according to the product. When using, please refer to the enclosed instruction. The information is subject to changes without prior notice!