ASTRO-D Solar tracker controller

Specification

Version：10

Jimmy-technology Copyright

Catalogue

Summary

Since the 21st century, in order to cope with global ecological changes, mankind's demand for clean energy has increased day by day. Among them, photovoltaic solar energy is the clean energy that mankind relies on most. In recent years, as the cost of photovoltaic power generation has been greatly reduced, the penetration rate of photovoltaic power has become higher and higher.

At the same time, people have been looking for ways to improve the conversion efficiency of solar energy. In addition to improving the power generation efficiency of the photovoltaic panels themselves, the use of solar tracking brackets is the most effective means of improvement. In recent years, the installation of tracking brackets has been growing at an annual rate of more than 40%, and market demand has also blown out, but the relevant control technology is still in the hands of a few large companies.

With the concept of a community with a shared future for mankind and the purpose of improving the global environment, Jimmy Technology strives to promote the popularization of solar-related technologies. Under this vision, Jimmy Technology has developed ASTRO photovoltaic support tracking controller series, hoping to allow new photovoltaic technology to enter the mass market.

The ASTRO series are divided into two categories: single-axis tracking series and dual-axis tracking series. Its own chip has an automatic satellite search and positioning function, which can update coordinates and time in real time. Through the patented algorithm independently developed by the company, supplemented by a variety of sensors, the function of accurately tracking the angle of the sun's rays is achieved. Compared with light-sensitive trackers and other trackers, ASTRO trackers have higher automatic control methods, simpler installation and operation methods, more precise control effects, and are not affected by weather changes.

This tracker is ASTRO-S2 dual axis tracking controller, suitable for the construction and use of medium and large photovoltaic power plant projects. It can be used to design a more wind-resistant structure.

Technology Parameters

Supplier voltage：24V

Max load current：10A or customized

No load current：0.1A

Control mode：ASTRO

Location and time setting：Auto

Wind speed protection：Yes

Limited position protection：Yes

Max, Min angle setting：Manual

Angle sensor：Yes

Construction and components
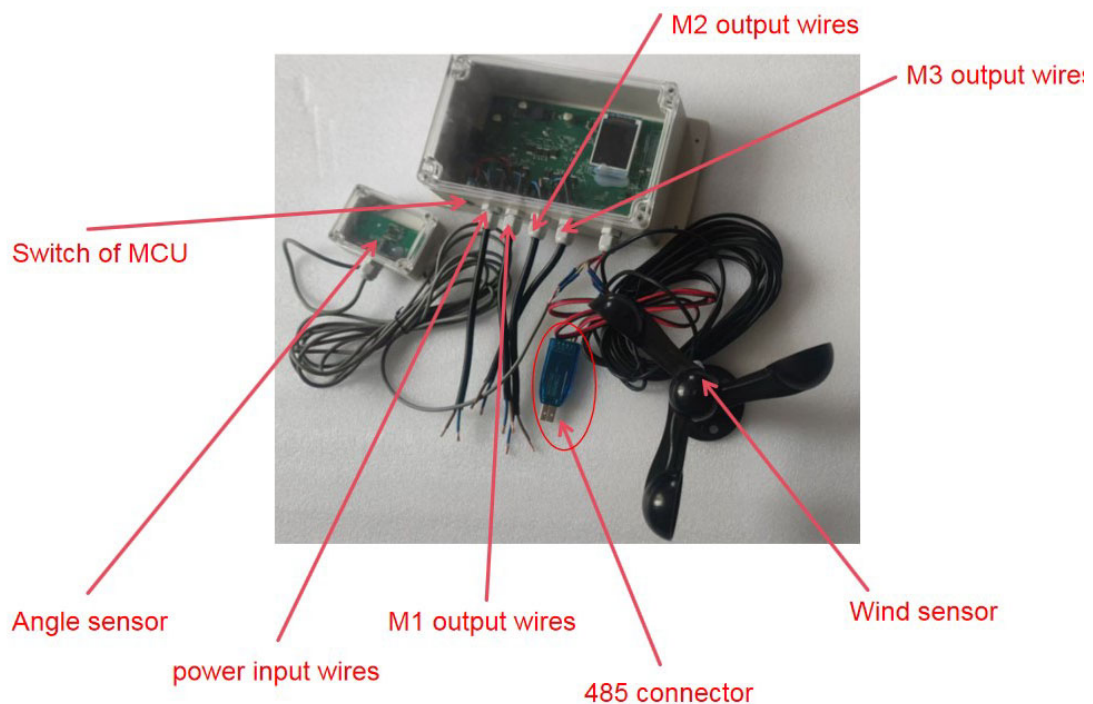
Switch: to turn on/off the power;   Power input wires: the input power sourcing;

M1 and M2 cable connect to linear actuator(for elevating angle, pitch up and down);

M3 cable connect to slewing drive(for azimuth, Yaw left and right);

Wind sensor: to check the win speed;   Angle sensor: 9 axis angle sensor;
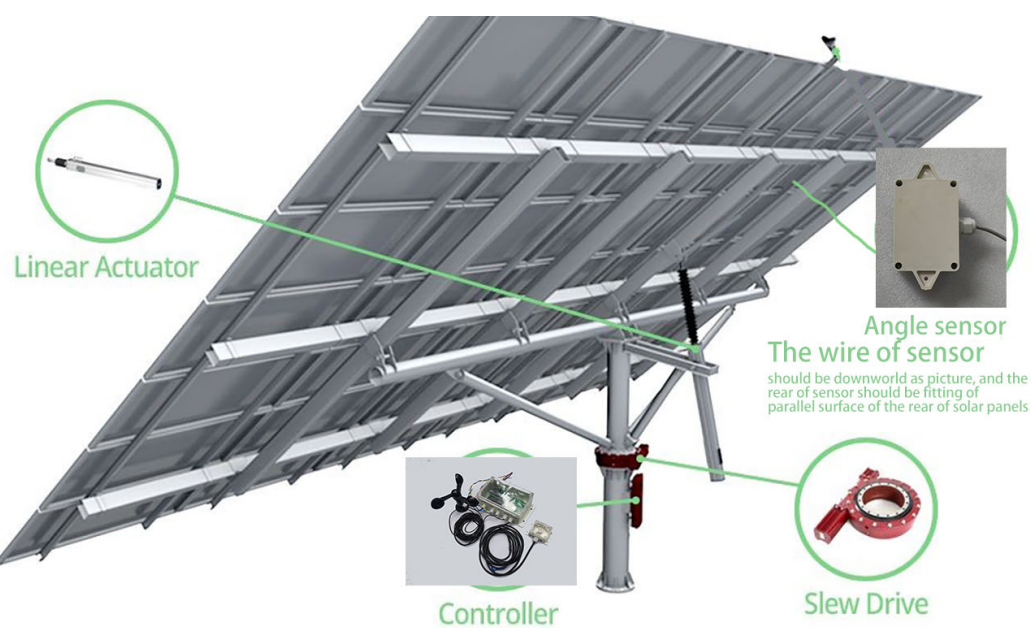
485 connector: connect to computer to run the APP;

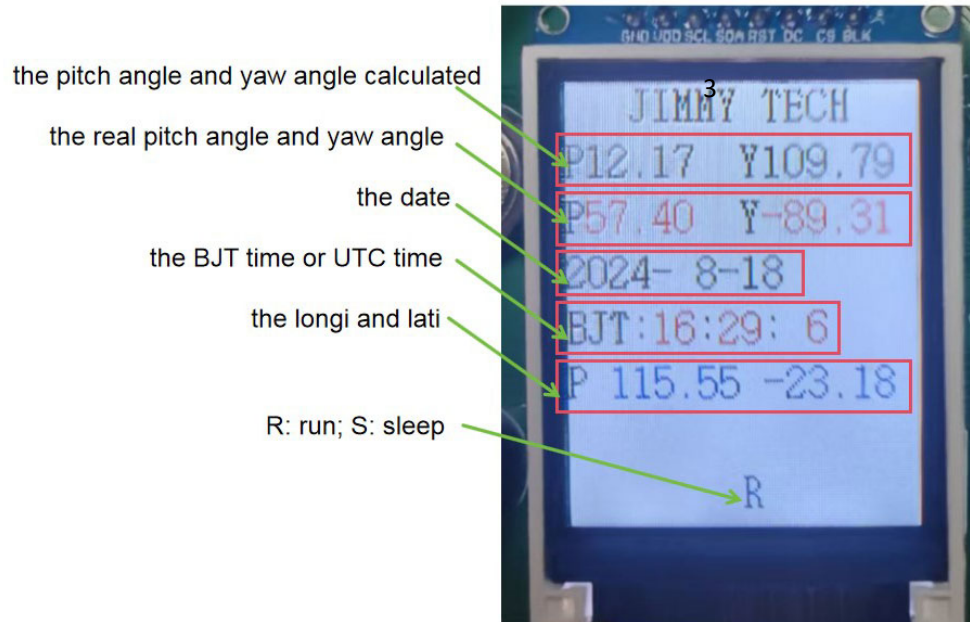# Solar tracker controller system
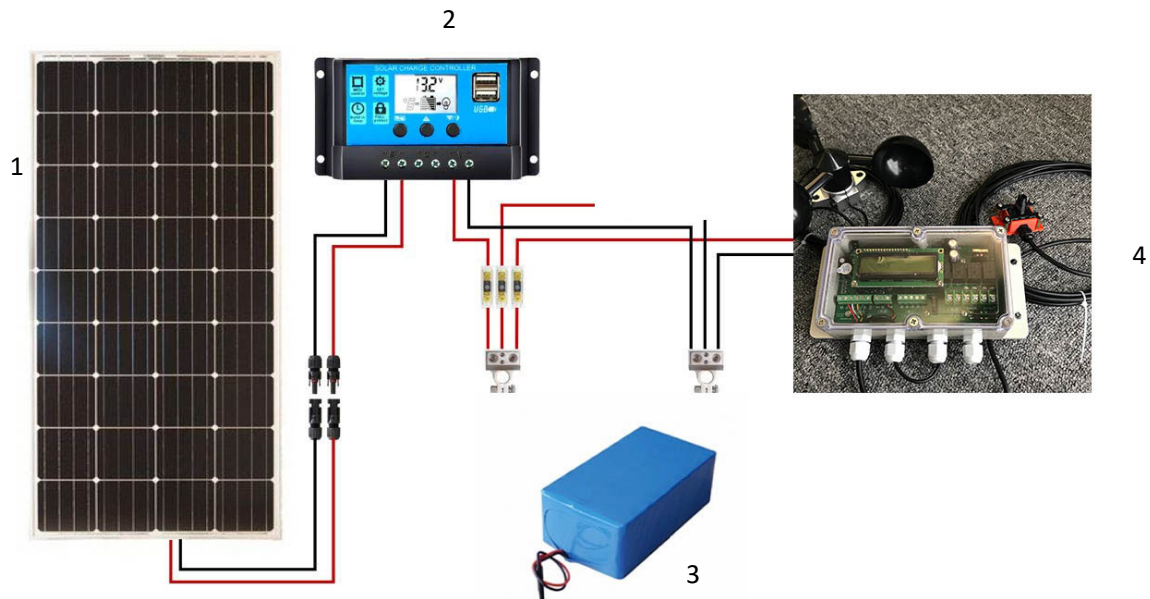
Our solar tracker controller system can use portable power sourcing.

1. Solar panel for battery pack charging, and recommend you use around 10-20W panels for saving cost.

2. Charger. For battery pack charging.

3. Batter pack, power sourcing of solar tracker controller and motors.

4. Solar tracker controller.

For controller about motors system, please see below(the angle sensor wires must be point to right :


Linear Actuator

Angle sensor
The wire of sensor
should be downworld as picture, and the rear of sensor should be fitting of parallel surface of the rear of solar panels

Controller

Slew Drive

Display details on auto-working

the pitch angle and yaw angle calculated

the real pitch angle and yaw angle

the date

the BJT time or UTC time
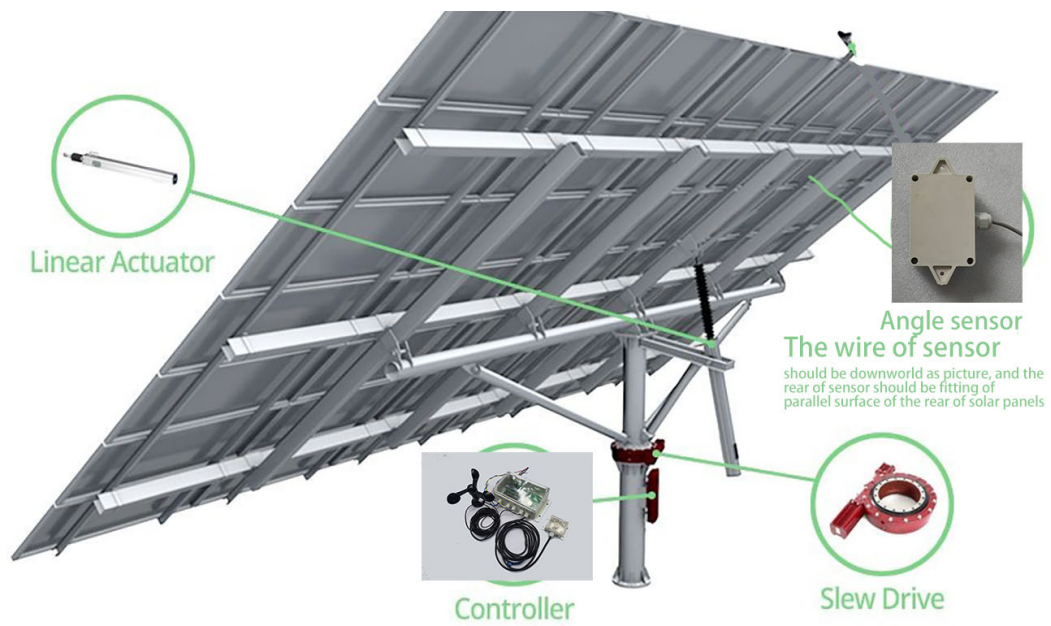
the longi and lati

R: run; S: sleep

1. Pitch, show up and down angle(elevating angle)
2. Yaw, show left and right angle(azimuth angle)
3. UTC time or BJ time;
4. R: run; S: sleep;
5. Lati: Latitude date;   longi: Longitude date;

Setting up on APP

1. Use the compass to determine the N-S-W-E direction;

2. **Put button cell into controller as below picture,** and Connect all wires according to the construction details picture above
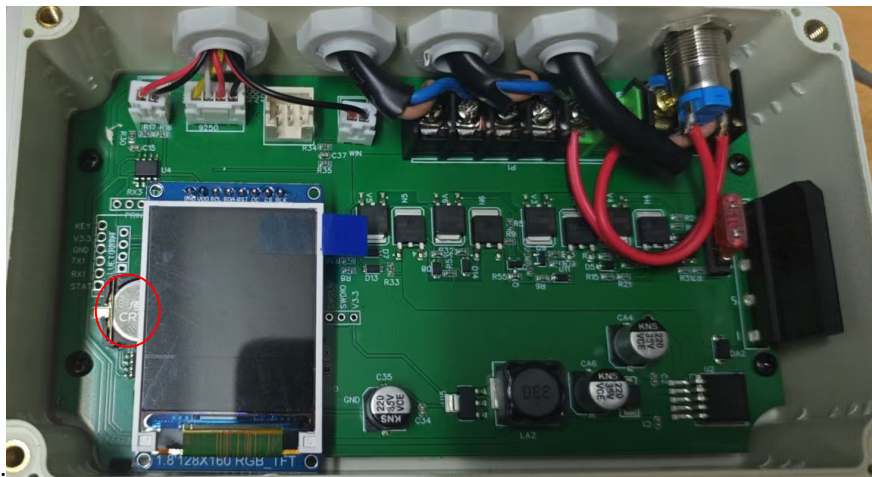
3. Fixed angle sensor should be downward as picture, the wire of sensor must be point to the right direction. **Very important: the angle sensor must be far away form motors(50cm at least), and be far away from metal parts (20cm at least), because the motors and metals will effect the geomagnetic signal.**

Linear Actuator

Angle sensor
The wire of sensor
should be downworld as picture, and the
rear of sensor should be fitting of
parallel surface of the rear of solar panels

Controller

Slew Drive

4. Fix the main device controller in a suitable place (when the bracket rotates, there is no interference)

5. Fix the wind sensor at a suitable place where can test the wind level well.
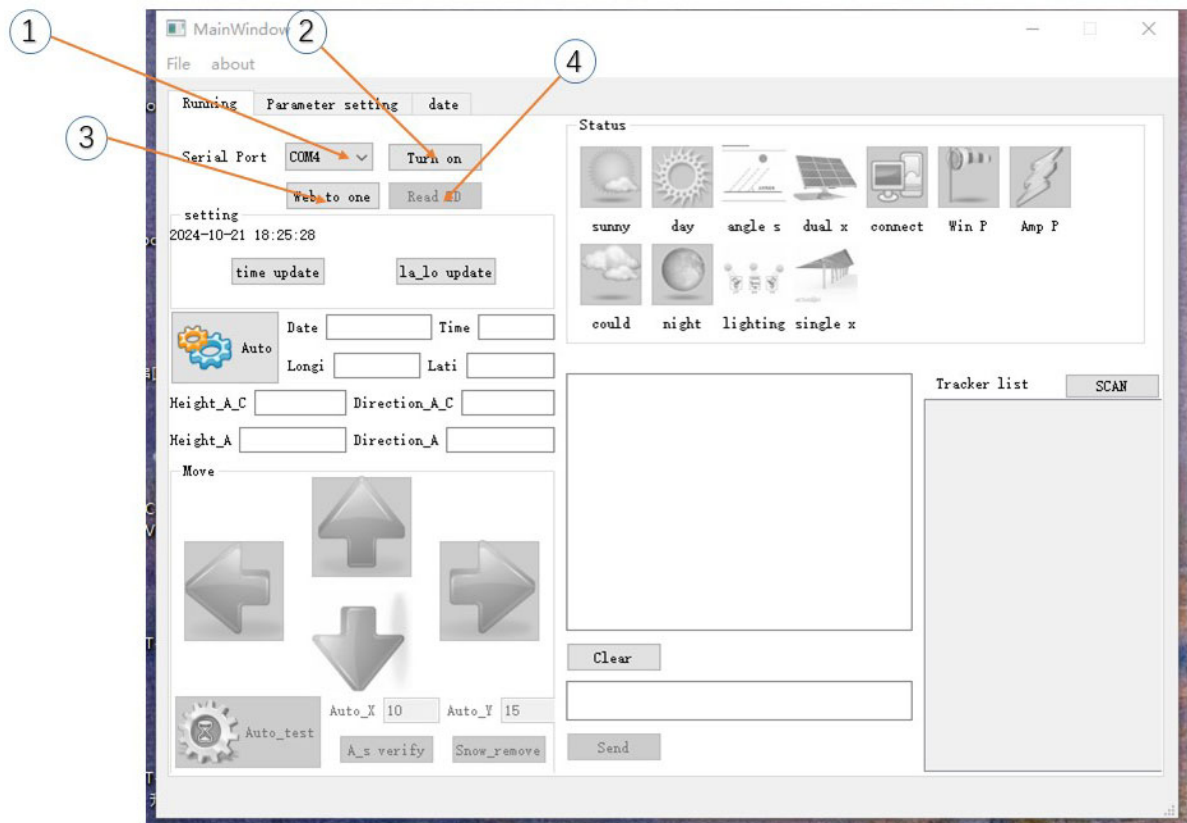
6. Press the power button of the controller

7. Connect the connector to your computer and run the APP.
   The preparing steps can watch this video : https://youtu.be/NiQxNht_lkY
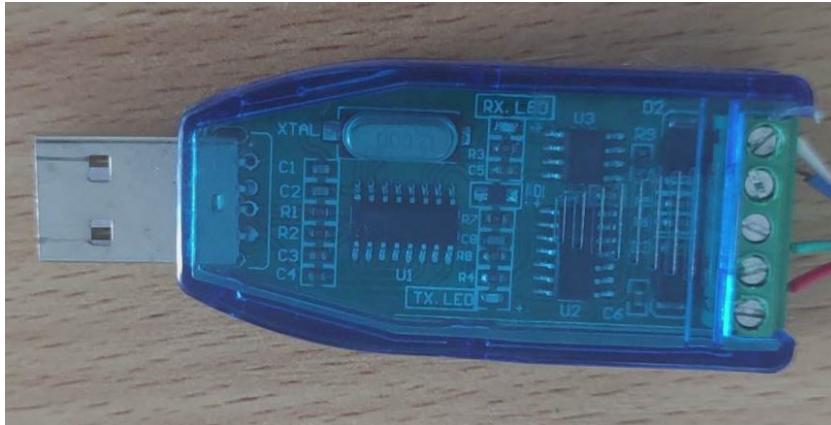
8. Operate the APP according to the next nine steps(marking on below pictures);
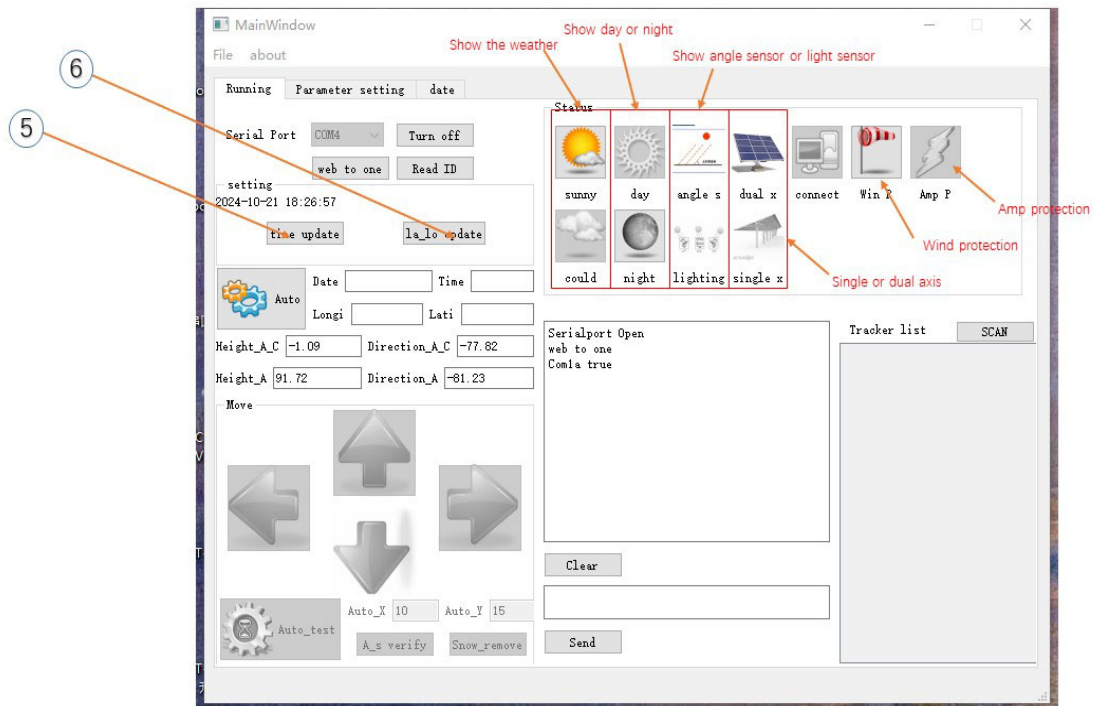

First step: choose the COM number according to yourself.
Second step: click to turn on the serial port.

As usual, we needn't do the third and fourth steps.
(Third step: click to Change the model to can read the ID of the controller.
Fourth step; click to read the ID of the controller. You need to wait for few time for it gets successfully.)

Fifth step: get the system time updated to controller.

Sixth step: get the local GPS location updated to the controller(you must make sure that your computer keeps online of internet)
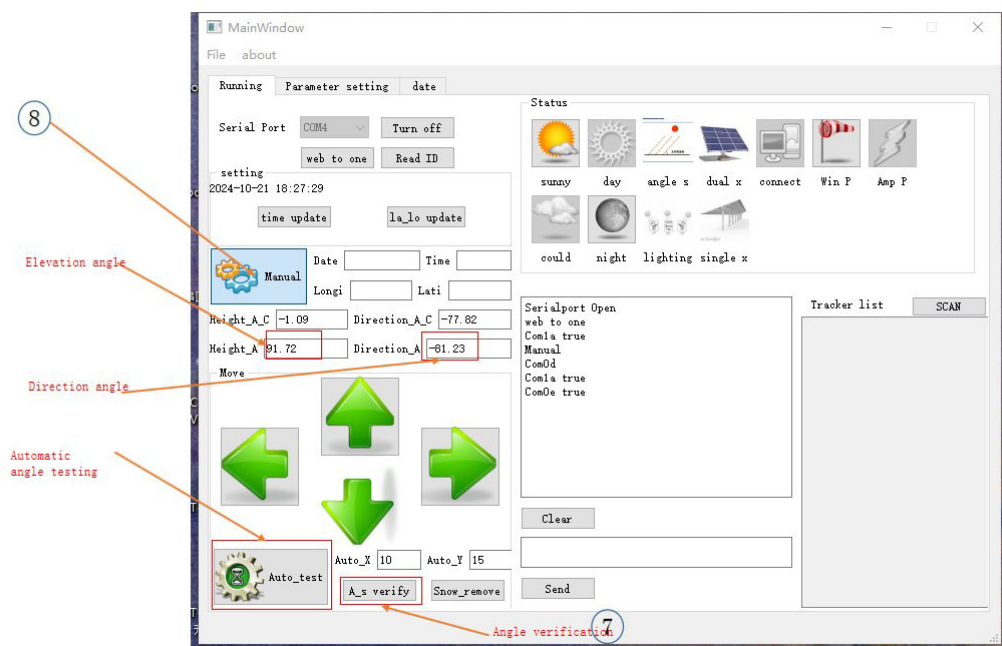

Seventh step: you need click manual button to turn to manual model, click the A_s verify button one time, and start the angle verify. You need rotate the sensor of more than 3 circles at x,y,z axis directions. After you rotated the sensor, you need click the button again to stop angle verify. (you can check that the LED lighting will be changed to red on verify process)

For this step, please check this video: https://youtu.be/Nq-5orUVFLw
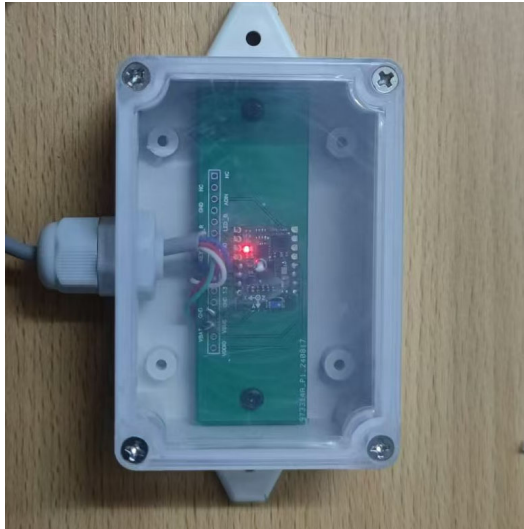
Eighth step:

1). you need click it to turn to manual model, and you have to check the direction and the angle sensor are corrected.

2). At first, you need use compass to know the current direction of the solar panels should be faced to.
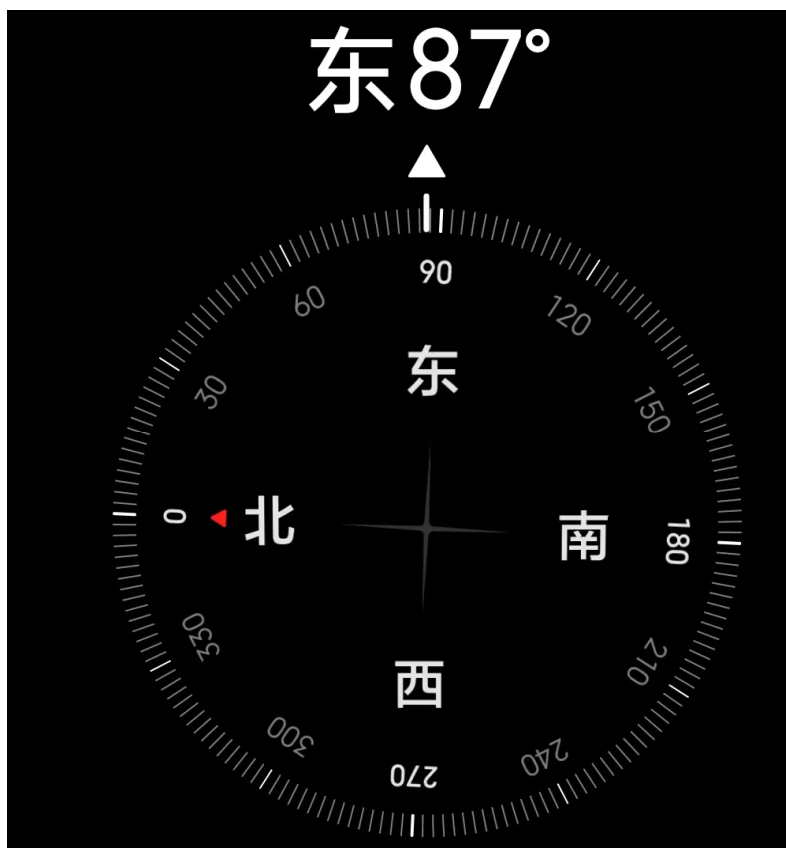
The panels should be faced to east on the morning, to south on the noon, to east on the evening. According to angle sensor date(not compass angle date,please pay attention), East

direction is on the -90 degree, and south direction is on the 0 degree, and east direction is on the 90 degree.

3) . run the solar tracker to move to the current direction by manual operation.

4) Put the angle senor on correct way. The transparent cover should be face to yourself, and the wire should point to your left hand. It looks like the picture below:

5) Start to run and check the solar tracker.**(this step is very important)**

Height_A_C angle means the target elevating angle. Height_A angle means the real elevating angle.

Direction_A_C angle means the target direction angle. Direction_A_C angle means the real direction angle.

When you click the up button, the real elevation angle(Height_A) need be changed to greater than before.

When you click the down button, the real elevation angle(Height_A) need be changed to less than before.

When you click the left button, the solar tracker need run left and the direction angle(Direction_A) need be changed to less than before.

When you click the right button, the solar tracker need run right and the direction angle(Direction_A) need be changed to greater than before

Make sure that all directions have been checked, then you finish this step.

6) Start to Auto_run. Click the manual button again to enter into the Auto_run model.

For this step, please check this video : https://youtu.be/w_mpIc286kM

Very important: after you finished all the step of set up, you must restart the controller one time.

Ninth step:

Adjust the min angle of elevating. Default is 60 degree.If you want another suitable elevating angle, you need set up the elevating min angle date as below steps.

1) Set the below page of APP all parameters to zero and just set the Min angle date according to your solar tracker construction(the angle marked on the second picture below).

2) Click the send button.

Min Angle is the angle as below red marked angle(elevating angle) of your solar trackers.
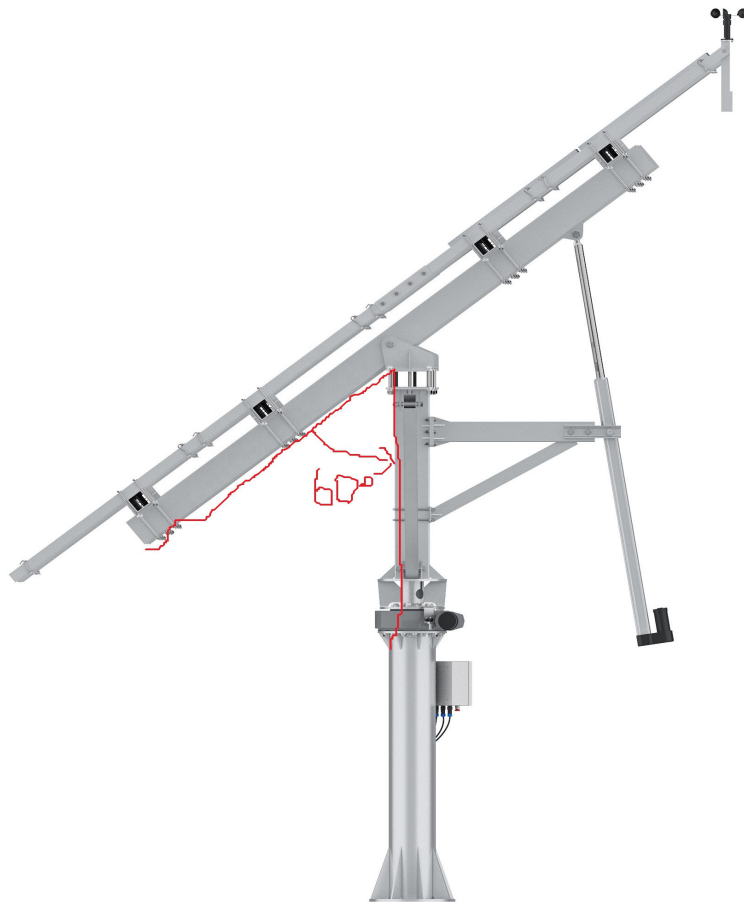
Common troubleshooting methods

1. After entering the automatic mode, the device automatically runs to the maximum angle instead of the real-time angle.   Cause analysis: the angle sensor is not installed correctly

2. When debugging the motor, the direction of motor rotation is opposite to the direction on the hand controller. Reason: The controller interface and the positive and negative poles of the motor are connected reversely

Spare parts selection program

1. Linear actuators options: www.servolinearactuator.com   www.jimiactuators.com

2. Slewing drives optional www.jimiactuators.com   www.solartrackersystem.com

3. Optional fixing parts www.solartrackersystem.com

4. Energy storage and power supply www.jimiactuators.com www.solartrackersystem.com

5. Optional power charging kit www.solartrackersystem.com

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Websites:

www.jimiactuators.com

www.servolinearactuator.com

www.solartrackersystem.com