

EXC[®] 爱 克 深圳爱克莱特科技股份有限公司

Shenzhen EXC-LED Technology CO.,Ltd

[Installation Instruction]

[Lighting and controller mounting connection]

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一、 Before installation

1.1 Matching product Selection

1.1.1 Requirement Of Network Cable

1、 Control system between the network requires for the use of ultra-five and above eight-core pure copper unshielded wire(CAT5e 4RP UTP),The bare copper wire diameter of 0.51mm (gauge 24AWG), insulated wire diameter of 0.92mm

2、 It is suggested that the single net wire should not be more than 10 ohms per 100 meters, and the single net wire should not be more than 30 ohm per 300 meters. The resistance value of each 300m single net wire is 25 Euro >;

3、 Suggest buy branded Network cable Recommend ANPU/TCL/HENGTONG/TIANCHENG OFFICIAL BRAND) Resistance Requirement 300M[25Ω-40Ω];

4、 EXC won't responsible for (Customer buy the net cable from third party which cause controller work problem)

5、 The multimeter can be used for measure the resistance value of whole box of 300meters,(better cable should within 30ohms in resistance value),To ensure steady signal transmission on lamps.

6、 Please take RJ45 for priority ,Better RJ45 with golden color on the port of cooper area,Inferior RJ45, surface easily become dark after oxidization due to using different material.

7、 Use a good quality Network cable pliers

1.1.2 Requirement Of Power Supply

- 1、 Suggest use Meanwell or superior brand;
- 2、 EXC will ask professional testing organization to test the quality of power supply,For(customer purchase the power supply itself),EXC wont' bear the related maintenance cost.
- 3、 We will calculate the wire loss at advance, And will indicate the selected wire diameter and the length of the switch power supply to the first lamp in the drawing. Please select the cable length and diameter of the switch power supply to the first lamp according to the construction drawings , Avoiding the problems caused by the insufficient power supply of the lamps and lanterns; If the actual site can not match with the construction drawings we provided, please communicate with our technical staff solution;
- 4、 The positive pole must be disconnected between the different power supply in the same signal circuit of the same signal port on the spot. Using EXC'S standard positive pole disconnection wire to connect the two power supply circuits.
- 5、 It is suggest to use YJV-3*4mm²cable for single circuit with electric box,The maximum power shall not large than 2.2KW,Power supply shall not more than 10pcs,If use“350W” power supply.Should less than 8 pcs.

1.2 Product Storage

- 1、 Be caution about waterproof and sleet,Especially for light fixture connector,All wet connectors shall not be used until it fully dry.
- 2、 Pay attention to not to super high stacking(we have limited height on packaging) so as not to cause extrusion damage.
- 3、 Be caution about rat bite or product miss,insufficient product on site.It will have delay time for make replacement of product.

二、 installation process

2.1 Product Protection

2.1.1. Protection of Light Connectors

① All connector is waterproof with IP66 grade,Keep tight between light connectors(Without seeing the screw thread (Pictures))

② During installation, Be caution about rain and sleet,Specially for light connector,keep connectors in tight condition,keep unconnected connector in right direction.



③ Each light should use exc's exclusive end cap, The end cap should be fixed on the end port of light fixture.Or use structural glue/silica to cover the female hole.Remember wrap insulating tape(in case structural glue flows out before solidification).

It is not allowed for construction company cut off the joint of light without

EXC's agree.If cut off the joint,Then need re-soldering the wire and do waterproof insulation,remember do waterproof insulation if not going to connect next light.Do as below:

A、 Separate each wire one by one.

B 、 Use insulation adhesive to wrap each wire separately,this is first step.

C 、 Use waterproof adhesive wrap each wire separately,this is second step.

D、 Lastly,Use insulation adhesive wrap each wire again. Finished.



④ EXC won't burden the loss caused by improper waterproof insulation on construction site.

⑤ Length of adhesive on end of connectors should no less than 5CM

2.1.2 Protection Of Products

1. Indoor equipment such as controllers , switches ,It must be water - proof treated with rain - proof boxes if for outdoor use,EXC won't burden the loss caused by improper waterproof problem(Only burden the cost for right operation),EXC will provide waterproof controller shell and power supply for the replacement.

2. Outdoor installation must be vertical to the wall 50 cm above the ground (special environment should be appropriately elevated, such as lake, riverbank, reservoir, bridge, etc., to avoid damage to equipment caused by stagnant water on the ground.



3. Waterproof on Network cable, please make sure adhesive length on cable end port more than 5 CM, (This is suggested standard, Technically, It can guarantee the cable work for 3 years without fault), This can keep cable internal part short circuit from outside sleet.

4. All the installation must compatible with IP grade indicated on light, It must keep sales under informed if installed environment is underwater.

5. Product With Vent Plug: such as high power wall washer light, flood light, Please keep the air vent plug in down direction, EXC won't burden loss caused by improper installation .



2.2 Wire Connection During Installation

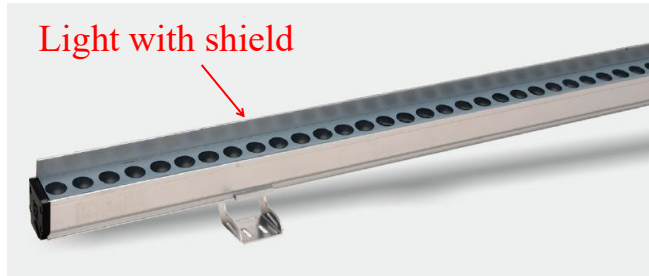
2.2.1 Installation Of Product

- ① Installation: It is forbidden to use installation way not provided by

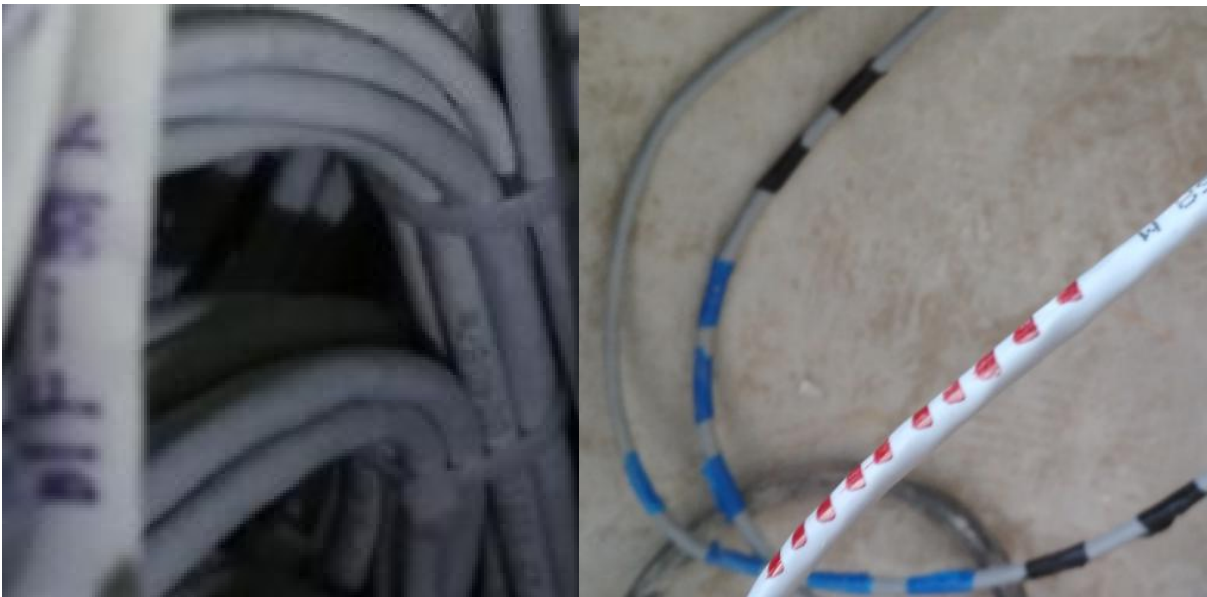
EXC, Please contact factory if need change installation method, With permission of factory can start construction.

② Connection between lights please abide male in-female out principal. (Special project, please follow our company's customize standard)

③ Light with shield should be informed advance of installation direction (To avoid inconsistent direction between pre-buried network wires and assembled lights)



④ During installation phase, Please mark the network cables, By use numbers (1.2.3.4...9,) or tape which can clearly present the positions of light fixture, Keep the network cable to first light in certain order, For future maintain purpose, Never connect the controller port by random sequence.



⑤ **It is forbidden that strong and weak electricity go through the same line slot or use one wire tube.** The bridge frame of strong electricity and weak electricity must be more than 35 cm apart. The signal line and AC power line must be placed separately and strictly prohibited in parallel. Also not bound together. if must need in parallel method, Please use metal casing, casing spacing greater than 10 cm.

⑥ For fixed part,Use reliable fix method,Do not use power cord,network cable,woolen straps to fixed equipment.

2.2.2 Wire Connection

The control system(including main controller,sub-controller,switches,fiber converter all the transmission device),

A circuit with load must be separated from the power supply. It is forbidden to connect the same circuit with the lamp power supply or other electrical equipment.

1. On-site strong electricity equipment such as: switching power supply, main controller, controller, switcher and so on must do grounding-connection

2. Wiring arrangement(signal cord,power cord),See below:

A.first,wear heat shrink pipe

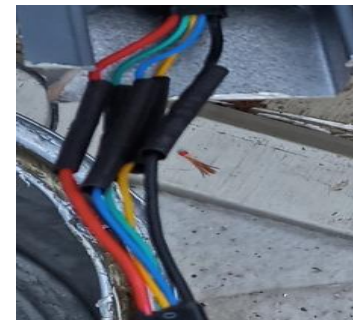
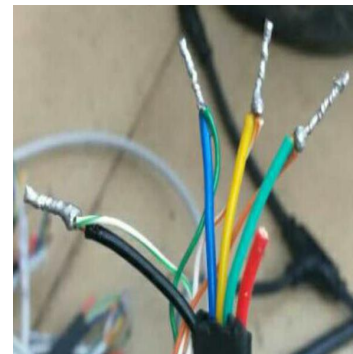
B.welding

C.after welding process,use heat shrink pipe cover it,then Use electric blower blow the area until it shrink completely.

D.Single cord wrap with waterproof tape

E.Then wrap it with insulation tape

F.Finally use insulation tape wrap all the cords.See right pictures,If do not have heat shrink pipe,You can cover one more circles with waterproof tape.



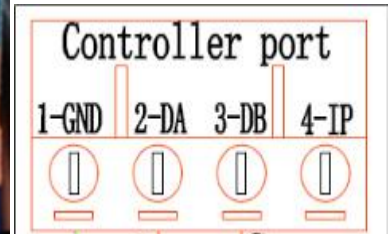
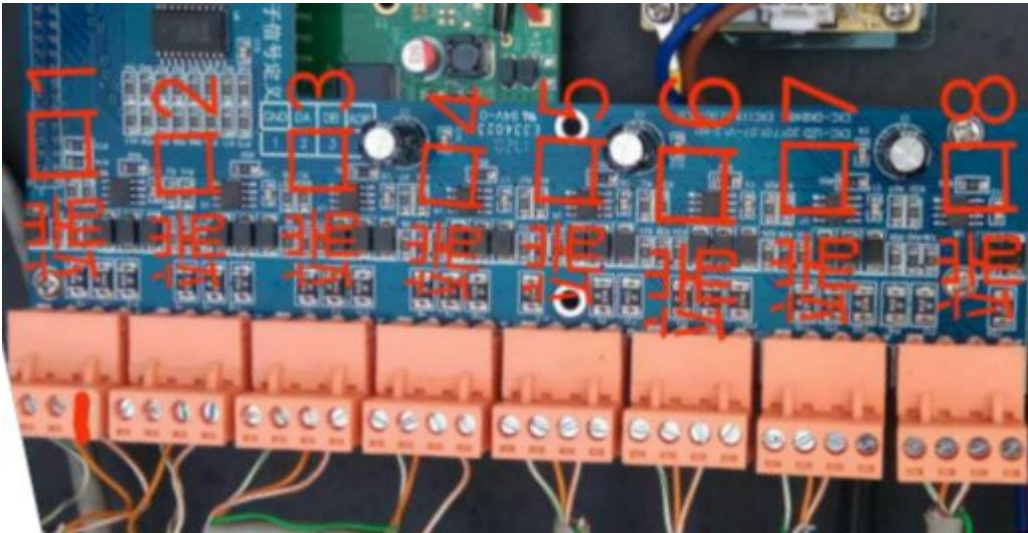
3. Controller.Switch,routers ,all the network device adopt 568B Benchmark.

Wire Sequence	1	2	3	4	5	6	7	8
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568B	Orange white	orange	Green white	Blue	Blue white	Green	Brown white	Brown
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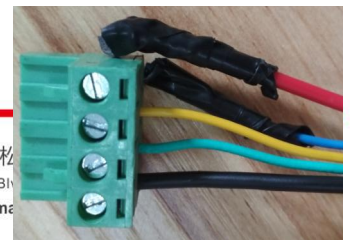
4. Female connector between controller and data adapter(signal amplify) need follow EXC's criterion to connect,from left to right: GND,Signal A,Signal B,Addressing IP.



5. Keep male and female connectors tightly fixed between lamps and lamps,Don't reverse connect the signal input and output,Lamp wire core definition is as below:

Controllable light fixture 5 core wire and Four core wire signal definition					
Definition	GND	DA	DB	IP	Positive
A type 5 core wire	Black	Green	Yellow	Blue	Red
B type 5 core wire	Blue	White	Yellow	Black	Brown
A type 4 core wire	Black	Green	—	Blue	Red

Controllable light fixture 3 core wire signal definition			
Definition	GND	DI/DO	Positive
A type 3 core wire	Black	Yellow	Red
B type 3 core wire	Blue	Yellow	Brown



6. When connect first lamp with sub-controller,remember connect signal female connector with lamp's male connector.

A、 If signal female connector is near sub-controller,then can connect the wire with controller's port directly.(without connecting IP,Positive wire) See pictures.(It is A type five core wire)

If signal female connector is far from sub-controller,Then use network cable to transfer,definition as below:

Definition	GND	DA	DB	IP
Network cable color	Green White	Orange	Orange and white	Green

Please check below picture shows,(A type five core wire)



Only connect needed cable when connect female with controller port(No need connect positive wire,Well wrapped with insulation tape), Only connect needed cable when connect network cable with controller port(No need connect green wire,Well wrapped with insulation tape),

7. If distances between light and light is too far, Then should use extension cable provided by EXC,If met cable shortage at on-site ,Please contact our exc for purchasing.

8. If do not buy extension cable from EXC,Also can use 2X2.5m m² for

replacement, Connection method: 2X2.5m m² cable connect with positive and negative of lamps, orange and orange white cable connect with DA-signal wire, Green and green white connect with DB-signal wire. Blue and blue white connect with IP-addressing, Brown and brown white connect with GND, with well wrapped with insulation tape, For only signal transmission, As per below form, No need use 2X2.5m m² cables. Also without connecting with positive side, remember wrap it well by insulation tape.

Lamp five core wire	+	GND-	DA-	DB-	IP-
Network cable		Brown+Brown White	Orange+Orange White	Green+Green White	Blue+Blue White
2X2.5m m ²	Brown/Red	Blue/Black			

9. The length from sub-controller to the last led light no more than 150M. The length from first led light to the sub-controller no more than 80M. Multi-segment network cable is not allowed to stitching together, the junction will increase the resistance, which will cause unstable signal transmission.

2.2.3 Cautious During Installation

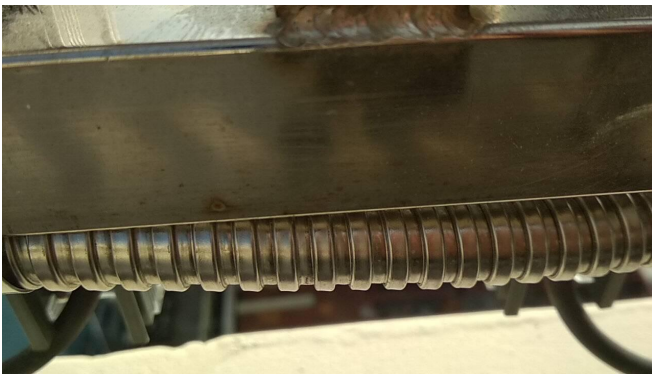
1. The installer must be trained first. After the completion of the training, a sample section should be installed in a small batch. And then the batch installation can be conducted after the sample section passing lighting debugging.

2. The members of the construction team shall read the installation instruction and other relevant product information before installation. The lamp should be handled gently in the installation process.

3. During the construction process, it is strictly necessary to prevent the damage of the cable outer skin, to avoid internal signals or power supply have short circuit with external environment, or to expose it to the external static environment. **Ensure all connections will not have short-circuiting with the building facade or installation**

profile.

Please ensure that the signal lines and power lines are not soaked by rain and sun exposure ,you can use plastic ,metal hose or hard pipe for protection when it is necessary,to avoid the problems caused by aging phenomenon of cables.For signal line, power line, you can use waterproof tape for for waterproof protection, and then wrap with insulating tape.



4. In the process of installing lamps and controllers, it is necessary to prevent the wires from being damaged by screws and fittings, so as to avoid problems such as short circuit, circuit breaking and leakage.This problem will seriously affect the operation stability and service life of the lamps, which may cause the failure of the whole project.

5. If the installation operation fail to be performed according to our requirements, the screws and other bolts damage the internal PCBA or internal wiring, or cut the wires without our permission.If any problems that caused by improper installation, our company does not bear the maintenance costs.

6. When installing the lamps, please carefully inspect whether the fixing parts are firmly fixed with the building facade.It should be kept the lights in vertical status, so as to easily adjust the angle of the lamp .Screws that fix the lights and its bracket must be reliably installed.Please do not install lights roughly, to avoid any damage to lights or fixed parts.

No fierce force,No hard plug during work on suspended platform.

7. It is recommended that before the connection,use the magneto-ohmmeter and

universal electric meter test insulation resistance between the signal line,power cord ,other wires and outside world.



8. When the luminaire signal lines and power lines do not have waterproof joints (bare wire) , the connection way must be “Solder”,not just “Tinned”.

Also, it is forbidden screw together the wires like the right side picture.

Solid solder joint is a must,please avoid false welding and lack of weld.



It is request to do a good job of insulation and reliable waterproofing for the solder joints.Please refer to steps 2.2.2 - 3

9. It is strictly forbidden to carry out the wiring operation and maintenance on the lamps with charged. During the installation, we should pay attention to the protection so as to avoid unnecessary damage to the lamps caused by non-standard construction.

10. Before the first time power-on and test the lights, be sure to confirm the following:

- a. Whether you use correct voltage power supply for the lights(Like, 15v pixel lights you should use 15V power supply.)

b. Whether the “+”“-”“signal port”are connected in correct way.

c. Please test the power lines and signal lines to check whether it short circuit or have other issues.

Please double check the connection and ensure all are correct before power on.

三、COMMON PROBLEMS AND FAULT ANALYSIS

3.1 Common Problems

- 1、Poor contact or lights are damaged due to pull hard.
- 2、The lights are damaged due to the outdoor installation condition or other external causes.
- 3、The installers damage the lights during the installation process.
- 4、The connectors、Ethernet cable are scratched when you install the lights.
- 5、The appliances haven't been earth grounded.
- 6、The connector has been waterred;
- 7、The joint is not tightened, and the contact is bad.

3.2 Fault Analysis

3.2.1 Light Fault

(一) The whole string lights of the controller port do not light up or flashing.

1.First check the connection of each sub controller port, whether the crystal plug is poor contact and connect in correct way. (Re-insert the crystal plug or change a new plug).And if the join connection from female connector to network cable is correct?

2.Check whether the network cable is in good condition

3.Check the power distribution box to power supply, whether it is 220 v and normal working . Whether the dc positive (+) and negative (-) is short circuit?

From the power supply to led lights should be rated voltage.The connection between the power supply and the lamps is oxidized and the contact is not reliable.

4. When the whole string led lights can not light up. Usually it is the problem of power supply, or the connection problem with power supply. Please test the voltage of light's first terminal ,if voltage is normal, (the voltage is in accordance with the

product's nominal working voltage) , which means the female connector is damaged or poor connect/disconnect from the lights to controller ,check the connection or replace the female connector will be OK.

If voltage is not normal (external pressure or voltage is zero),please disconnect the power and led lights,then test power supply voltage,if voltage is normal, (the voltage is in accordance with the product's nominal working voltage).Then you need to check whether there is open circuit or short circuit of power supply .If the voltage is not normal ,then check whether there is open circuit or short circuit of the led lights.

When confirm the problems then can be directly replace the power supply.

5. Check whether the output port of the controller is damaged (Try to connect the not working led light string to the normal working controller port)

6.Whether the T shape connector is damaged or the connector is watered

7.Check whether the lights position wiring and lighting effect conversion are normal.

8.If all above mention are normal,then please replace the not working led lights and do waterproof protection.

(二) No light or no signal or only light from the middle (the front part of the lamp is normal but the end part is abnormal)

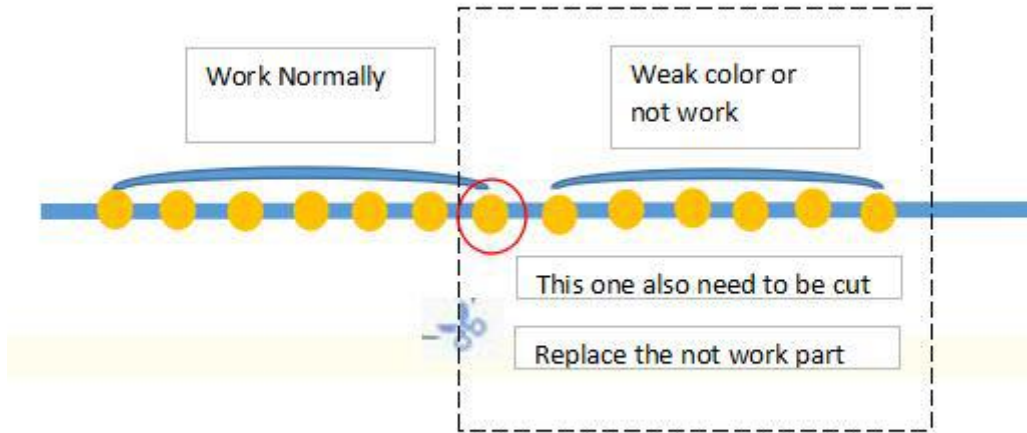
1.Please check whether the voltage of the power supply is in accordance with the led lights .Whether the direct current (+), negative (-) is short circuit.

2.Check whether the lights position wiring and lighting effect conversion are normal.

3. When the light show the same color, if the color of the end part lights are more and more weak, generally it is the output port board of sub controller broken ,power supply is damaged,poor contact (or Oxidation at junction) of power supply with led lights.Please confirm what problem it is, then change the sub-controller/power supply/re-connect the power supply and led lights.

4.If all above mention are normal,then please replace the not working led lights

and do waterproof protection, write IP address again.(The correct replace way please refer to picture as below)



(三) The entire string is not controllable (The screen blurred)

Please firstly check the connection of network cable, whether it is connect correctly. Touch the first light that connect the network cable , if it is hot, that means one or both of the power cord (“+”“-”wire)of the lamp is damaged,short circuit caused by “+”“-” connect the GND,it is suggest find the damaged part and wrap it with tap again.

(四) All the lights are not shine.

- 1.Check if the power is tripped or whether the power is turn on(not powered).
- 2.Check the main controller, switcher,sub-controller,whether it is broken or connect in wrong way.

(五) Most lights are not bright or a small part is not bright

- 1.Check if the power is tripped or whether the power is turn on(not powered).
- 2.Check the whether the power supply is broken ;
- 3.Check the corresponding sub-controller,switcher, whether they are work normally.(Which led lights are not work, then check its sub-controller,switcher ,connection etc.)

4. Check whether the lights position wiring and lighting effect conversion are normal.

3.2.2 Controller Fault

(一) All the lights are not shine

1. Check whether the main controller and the sub-controller are working normally

2. Loose connection of network cable (Re-insert the crystal plug or change a new plug)

3. Check indicator light "STATE" of the controller, whether it is flash normally.

(二) Some lights shine but some are not

1. Check the connection of sub controller with sub controller, whether it is connect in correct way.

2. Loose connection of network cable or poor/wrong connection order of crystal head (Re-insert the crystal plug or change a new plug)

3. Due to some reasons that the controller does not work (such as AC power supply is not normal)

4. Check indicator light "STATE" of the controller, whether it is flash normally.

(三) The lights flashing not normally

The lights flashing not normally, but the indicator light of sub-controller show it work normally, it may have damage of female connector, port of sub controller, connection cable. Or the connection cable exceed the prescribed length. Please try to work out the answer by process of elimination.

3.2.3 Power Supply Fault

(一) No output voltage of the power supply (It will cause the lamp not bright, the

switch power indicator does not light).General power wire of lights with a short circuit or the power supply itself is damaged

(二) Output voltage is unstable (will cause the lamp flashing or blinking, the switch power indicator will blink)

1. The input cable connection is not reliable

2. The input voltage is not stable, AC input wire diameter is too small, or the load exceeds the power rated wattage

3. The power supply itself is broken

(三) The output voltage is too high or too low(High voltage will cause the lamp overheat or even burn out the lamp leds, the low voltage will cause the lamp to shine dark,have weak color)

Generally,it is because the total wattage of led lights exceed the rated wattage of power supply, or you need to adjust the voltage bottom to corresponding voltage of led lights.It also have the possibility that the power supply is broken.

(四) Power supply does not work after thunderstorms

1. Poor waterproof protection for the junction of power supply , which leads short circuit ; 2. Do not have GND protection for the power supply。

Note: The above failure analysis and troubleshooting methods are mainly used for construction site maintenance. The operator and the operation process must have the following requirements:

一: It is required that construction workers at the construction site must have a certain basis of electronics, electrical, and on-line, off-line controller system and the sub-controller, the signal amplify etc.。

二: When replacing or repairing unit components on site, please refer to the wiring /installation diagram to understand the signal direction of the lamp point and

the connection way of the lights and controllers. Familiar with the maintenance and replacement joint processing(waterproof processing) requirements; At the same time, please ensure the system is powered off when replacing the components, to avoid further damage, improve the maintenance efficiency.

三： If any problems caused by improper installation, such as failed waterproof treatment; screws or other things direct damage through the lamp inside, lamp PCBA, internal wiring; Wrong or unstable connection etc. We can help you solve it, but will not be responsible for any maintenance cost.

If any other questions please ask us for help!