# T8-1000AC Controller instructionsV3.0

Software download: https://langweiled.com/download/setupen.exe



## 一、Features and advantages

- ✓ 8-channel output, each channel carries 1024 points, and the maximum load of a single controller is 8192 points.

- ✓ Support high-voltage, cascade and two hybrid synchronization modes.

- ✓ Play built-in effects without SD card. There are 99 Kinds of built-in effects, and support full broadcast, unicast and anycast functions.

- ✓ When inserting the SD card, play the effect files in the SD card. The SD card can store up to 32 effect files. Each effect file can contain up to 100 programs, and the total number of programs does not exceed 100. The programs support full broadcast and unicast functions, and the SD card capacity supports 128mb-8gb.

- ✓ It can be equipped with our "gps-sync synchronization controller" for cluster synchronization.

✓ The LED digital tube is used to display the controller information, which is resistant to low temperature and is not affected by ambient temperature.

✓ The controller provides 5 entity keys for setting various parameters, which is simple and reliable.

✓ The design of pull-out rainproof shell is especially suitable for outdoor engineering construction.

✓ AC 220V power supply, with a 2-pin plug, makes the test and construction extremely convenient.

✓ Each controller is presented with a 2-inch slotted screwdriver, which completely solves the trouble of finding suitable tools during wiring.

# 二、 Controller parameters
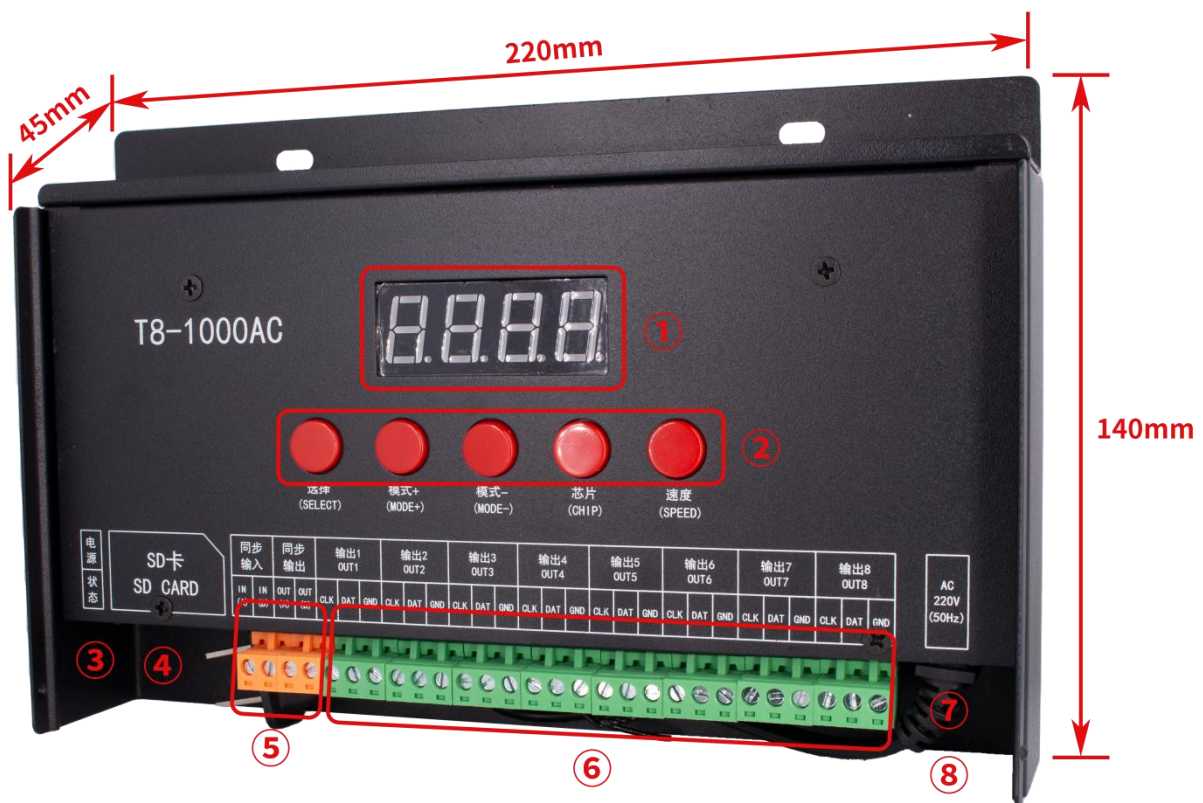


## 2.1、 Component description

① Led nixie tube

② Entity key

③ The upper green is the operation indicator light, which flashes when the controller works; The lower red is the power indicator, which is constant after power on.

④ SD card slot

⑤    The left two bits are synchronous input ports; The two bits on the right are synchronous output ports.

⑥    8-channel output port

⑦    AC 220V power line, 50cm long, with a 2-pin plug.

⑧    Power switch

## 2.2、Controller parameters

Working voltage：AC220V 50Hz

Rated power：<1W

Weight：1.1KG

Product size：220mm x 140mm x 45mm

Enclosure type：Pull type rainproof iron shell

Output port：8-way TTL output port (does not support

DMX512 lamps)Number of loaded lamps：1024 lamps / channel, 8 channels, 8192 lamps in total

SD card type：SDHC

SD card capacity：128MB-8GB

Effect file format：FAT32

Effect file type：*.LED

# 三、Wiring diagram

The controller can be used by a single machine or multiple machines. When a single machine is used, it only needs to supply power to the controller and connect lamps.

The use of multiple machines means that two or more controllers work synchronously, and the controllers are required to work in step. T8-1000ac supports three synchronization modes: simple high-voltage synchronization, highly reliable cascade synchronization, and GPS / BD distributed synchronization. It also supports the mixed use of three synchronization modes. The installation and connection of the controller are different due to different synchronization modes, which are introduced below.

The controller comes with built-in effect. When the card is not inserted, the effect file in the SD card will be played automatically when the SD card is inserted and then turned on. When a single machine is used, you can freely choose which effect to play, but when multiple machines are used, all controllers involved in synchronization must choose the same, either all the built-in effects or all the SD card effects. When playing SD card effect, the effect file in SD card must be exported from the same project. Failure to do so will result in synchronization failure.

T8-1000ac supports lamps with various TTL signals such as through-hole lamps, point light sources, line lamps and lamp strips, but does not support DMX512 lamps. Whether to support specific lamps, please ask the lamp manufacturer for lamp parameters and ask our business personnel or agents.

## 3.1、**Stand alone use**
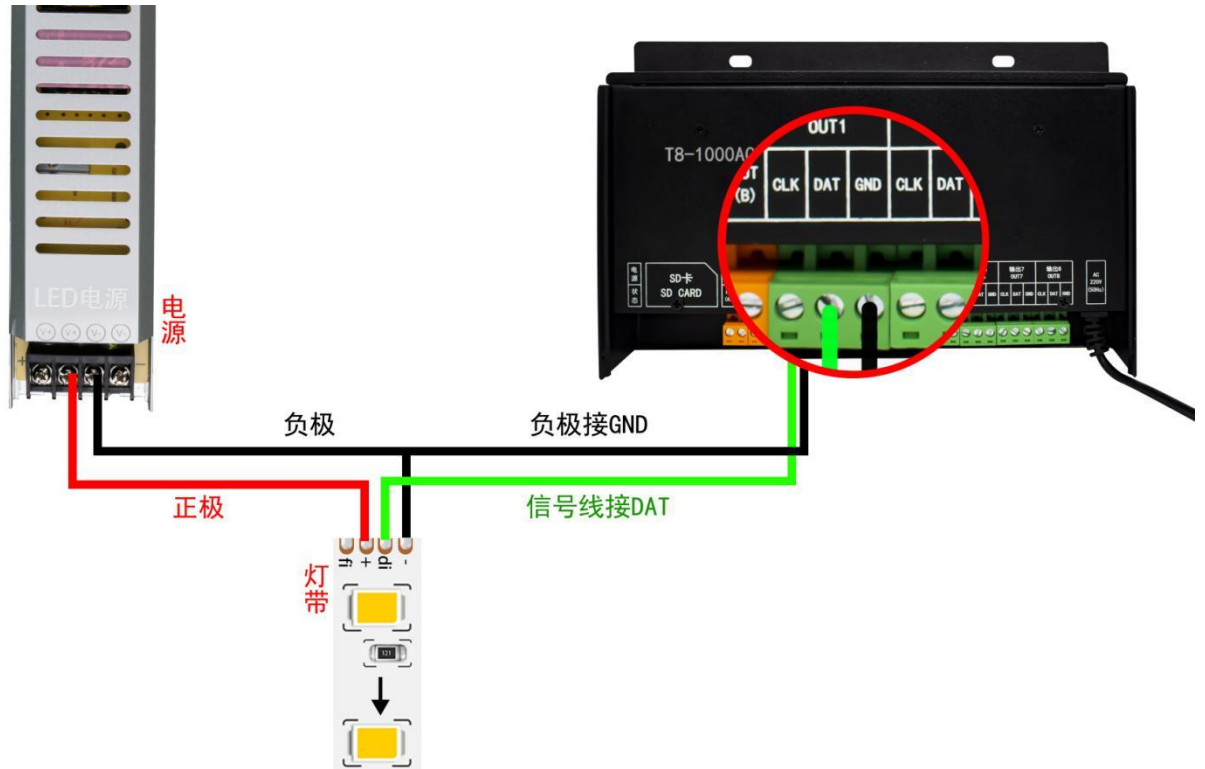


## 3.1、**High voltage synchronization**

When all high-voltage synchronization is adopted, all controllers must be connected to the same pair of 220V AC lines, or ensure that all controllers are powered on at the same time. High voltage synchronous construction is convenient and easy to operate, but limited by the synchronization principle, it is easy to be disturbed, resulting in synchronization failure. The following figure is the schematic diagram of high voltage synchronous wiring.
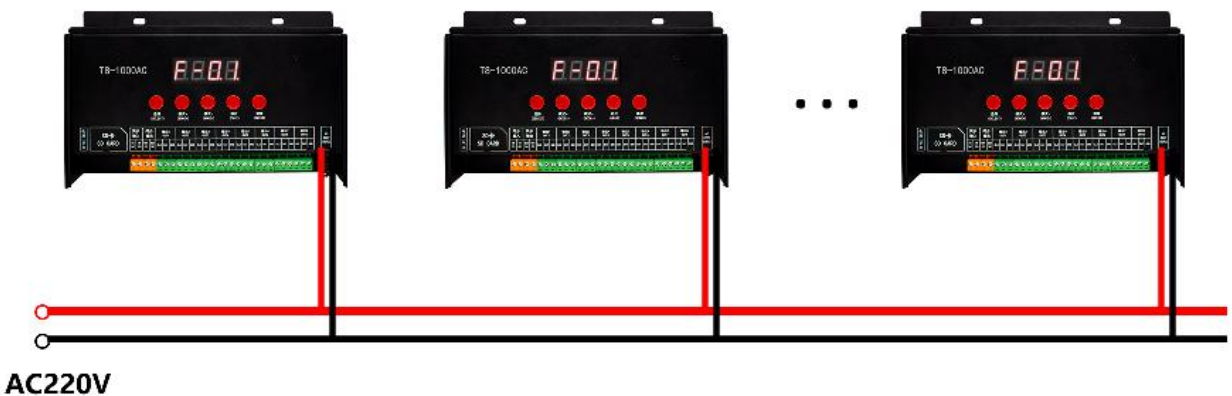


## 3.2、**Cascade synchronization**

When cascade synchronization is adopted, the controller power supply does not need to be connected together or powered on at the same time, but the synchronization line needs to be connected. It is recommended to use shielded pure copper twisted pair (such as network cable) for the synchronization line. The connection mode of the synchronization line

is: connect the synchronization output port of the controller 1 to the synchronization input port of the controller 2, and the synchronization output port of the controller 2 to the synchronization output port of the controller 3, Connect to the synchronization input port of the last controller in turn, and a is connected to a and B is connected to B, as shown in the figure below.
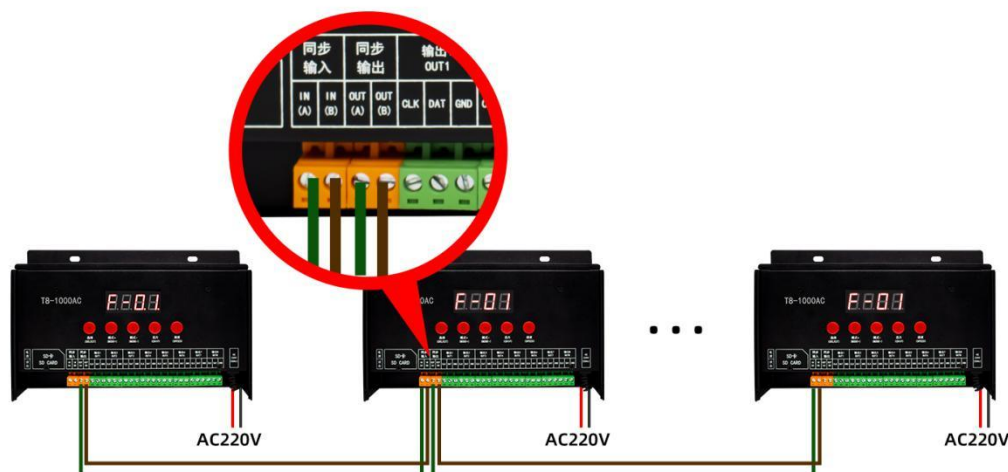


After the synchronization line is correctly connected, the nixie tube of controller 1 displays p-0.0 (display f-0.0 when playing the built-in effect.), The decimal point is displayed after the number, indicating that it is the host. The nixie tube of all other controllers displays p-00 (f-00 is displayed when playing the built-in effect). The decimal point is not displayed after the number, indicating that it is the slave. If there is a decimal point displayed on two or more controllers, it indicates that the synchronization line is not connected correctly. At this time, it is necessary to check the synchronization line connected to the synchronization input port of the current controller.

## 3.3、GPS / BD synchronization and cascade synchronization are mixed

When GPS / BD synchronization is used, cascade synchronization must be adopted between controllers. After each GPS / BD synchronization controller, multiple controllers can be cascaded to form a synchronization unit. Multiple synchronization units do not need any connection and are not limited by geographical distance, so large-scale synchronous playback can be realized. The wiring mode is shown in the figure below:
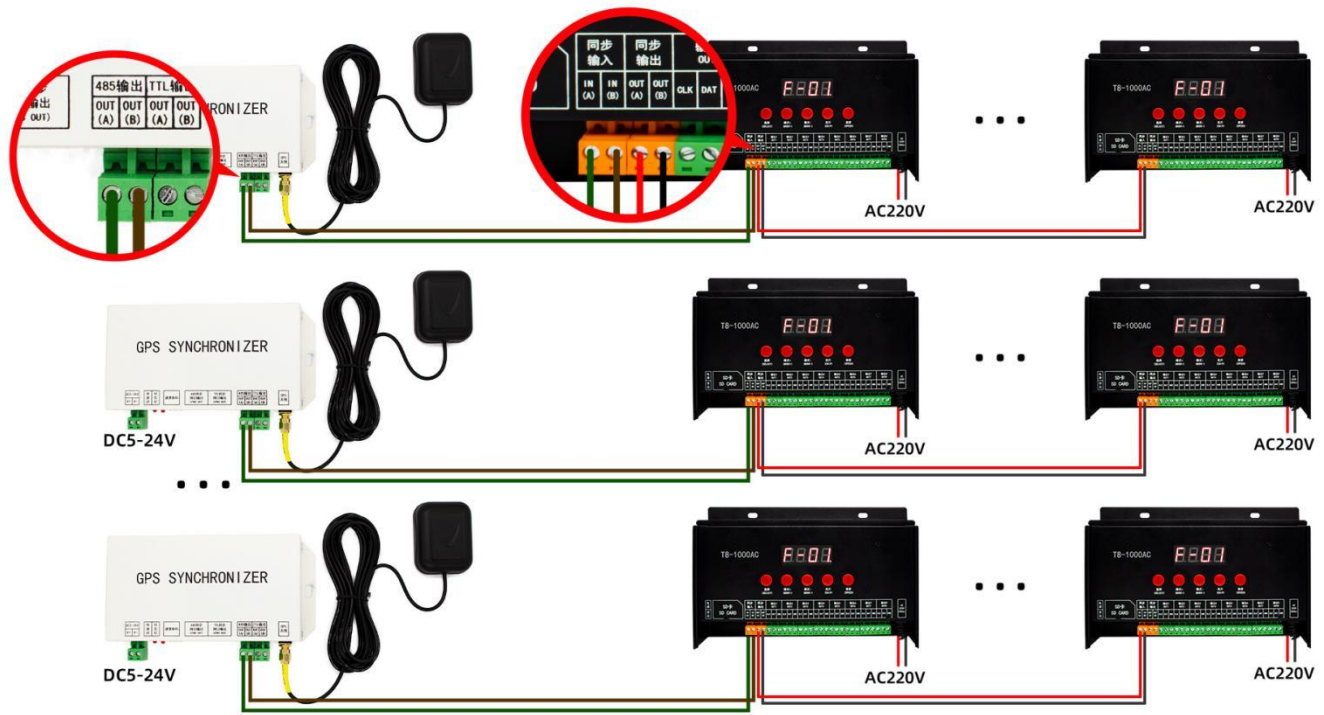
## 四、 Nixie tube display meaning

| Display content | Meaning |
| --- | --- |
| P-00 | SD card effect |
| F-00 | Built in effect |
| 1903 | Chip model |
| L-00 | Playback speed |
| AH.00 | Extension address |
| A.001 | Address at the beginning of code writing: indicates the number of lights to write code from |
| AL.01 | Write address offset |
| AP.01 | Field mode: AP01 = 1 field; AP02 = 2 field; AP03 = 3 field; AP04 = 4 field |
| AE.00 | RGBW order |
| AF.01 | Test effect |
| - - - - | Select key operation type |
| V3.0 | Controller firmware version |
| E-01 | Error message |

# 五、**Operating instructions**

## 5.1、**Power on status**

After the controller is powered on, it displays: version number - > chip type - > playback speed - > playback content, as shown in the following figure:

1、  Controller version number: the version will be upgraded if the controller changes the problem or updates the function. Users can query the function and status of the controller according to the version number.

2、  Chip type: refers to the chip model used for the effect to be played, which must be consistent with the lamp.

3、  Playback speed: refers to the speed to be played. The higher the value, the faster the speed.

4、  or    Playback content: f-0.0 Indicates the built-in effect of playback; P-0.0. Indicates playing SD effect.

## 5.2、**Play SD card effect**

To play the SD card effect, you must first insert the SD card and then power on to make the controller enter the card reading mode. Inserting or pulling out the SD card halfway will cause card reading failure, and then the SD card effect cannot be played.

When playing the SD card effect, the controller first sorts all programs contained in all files in the SD card, and then plays them in order. The sorting rule is based on the copy order of files and program serial number.

The key functions when playing SD card effect are as follows:

1、The "select" key is used to test the function. After pressing, the nixie tube displays af.01 and the value part flashes, and the controller starts playing the first test effect. After that, press once to switch one test effect. After switching to af.08, press again to return to af.01. If there is no new key operation, the controller will always play the current test effect. If you need to exit the test state, you can press any other key or restart the controller. There are 8 kinds of test effects, as shown in the table below:

| Sequencing effect table | | | |
|---|---|---|---|
| Display content | Effect description | Display content | Effect description |
| AF.01 | All black | AF.02 | All white |

| AF.03 | Black and white gradient | AF.04 | All red |
|---|---|---|---|
| AF.05 | All green | AF.06 | All blue |
| AF.07 | Red, Green and Blue jump | AF.08 | Brush red, green, blue, white and black |

2、"Mode +" and "mode -" keys are used to switch programs. After pressing, the nixie tube displays p-00 (the specific value is determined by the last set value) and the value part twinkle. The numerical value represents the program serial number. Each time you click to switch a program, the "mode +" key switches forward and returns to the first one after switching to the last one. The "mode -" key switches backward and jumps to the last one after switching to the first one.

P-00 means to play all programs in a loop, and others mean to play only the current program. The software can set the number of program playback. For example, the number of program 1 playback is set to 5. During full broadcast, program 1 is played 5 times and then program 2 is played. When the controller is in the program setting state, if there is no key operation within 30s, it will automatically return to the normal playing state.

3、The "chip" key can only view the chip type and cannot be set. After pressing, the nixie tube displays the chip type, which is shown in the following table:

| Chip type table | | | |
|---|---|---|---|
| Display content | Chip name | Display content | Chip name |
| 6703 | SM16703 | 1914 | TM1914 |
| 1903 | UCS1903 | 8206 | GS8206 |
| 9883 | P9883 | 2811 | WS2811 |
| 2818 | WS2818 | 1814 | TM1814 |
| 6704 | SM16704 | 1916 | 1916 |
| 512H | DMX512-500K | 512L | DMX512-250K |
| 512A | DMX512-750K | | |

4、The "speed" key is used to adjust the playback speed. After pressing, the nixie tube displays l-00 (the specific value is determined by the last set value) and the value part flashes. The value indicates the speed level. The higher the value, the faster the speed. Switch to a speed level with each click, and return to l-00 after switching to L-16. When playing SD card effect, l-00 indicates to use the speed set in SD card. The relationship between speed and frame rate is as follows:

| Speed and frame rate correspondence table | | | |
|---|---|---|---|
| Display content | Frame rate | Display content | Frame rate |
| L-00 | SD card frame rate or 25 frames / sec | L-01 | 5 fps |
| L-02 | 6 fps | L-03 | 7 fps |
| L-04 | 8 fps | L-05 | 9 fps |
| L-06 | 10 fps | L-07 | 12 fps |
| L-08 | 14 fps | L-09 | 16 fps |
| L-10 | 18 fps | L-11 | 20 fps |

| L-12 | 21 fps | L-13 | 22 fps |
|------|--------|------|--------|
| L-14 | 23 fps | L-15 | 24 fps |
| L-16 | 25 fps |      |        |

## 5.3、Play built-in effects

To play the built-in effect, you must not insert the SD card, and then power on. Inserting an SD card halfway does not affect the built-in playback effect.

The controller has 98 built-in effects, and each effect is no less than 360 frames. The playback duration is calculated according to the set frame rate (playback speed). The calculation formula is: playback duration (unit: Second) = number of frames / frame rate. The built-in effect supports the functions of full broadcast, unicast and anycast: the nixie tube displays f-00 for full broadcast, which is played circularly in the order of F-01 to F-98; The nixie tube displays F-01 to F-98, indicating unicast, cyclic playback and single effect; The nixie tube displays f-99, indicating anycast. The built-in effect is suitable for line application scenarios, such as building outline and so on.

The key functions when playing SD card effect are as follows:

1、"Select" key is used for Anycast setting: when the nixie tube displays any value from F-01 to F-98 and the value part flashes, press this key, and the two points behind the value are not displayed, indicating that the current effect is not selected; Press the button again, and the two points behind the value will resume to display, indicating that the current effect is selected. When the nixie tube displays f-99, only the effect with points after the value is played.

2、he "mode +" and "mode -" keys are used to switch built-in effects. After pressing, the nixie tube displays f-00 (the specific value is determined by the last set value) and the value part flashes. The numerical value represents the serial number of built-in effects. Each click switches one built-in effect. The "mode +" key switches forward and returns to the first one after switching to the last one. The "mode -" key switches backward and jumps to the last one after switching to the first one. The built-in effect is shown in the following table:

| ID | Effect | ID | Effect |
|------|--------|------|--------|
| F-00 | Loop play | F-50 | Two way 6 color trailing |
| F-01 | All red | F-51 | Backward wave interval 2 white dot running |
| F-02 | All green | F-52 | Run at two o'clock on purple, yellow and green |
| F-03 | All blue | F-53 | Two way 7-color gradient running |
| F-04 | All yellow | F-54 | Backward 6-color line segment interval running |
| F-05 | Quan Qing | F-55 | 7 color jump |
| F-06 | All purple | F-56 | Back to the coloring, run at 1 points. |
| F-07 | All white | F-57 | Backward combination of line segments and white line running |

| F-08 | Two way 6 color gradual trailing | F-58 | Red wave running |
|------|----------------------------------|------|------------------|
| F-09 | First 6 colors black interval running | F-59 | Green wave |
| F-10 | 7 color gradient | F-60 | Blue wave |
| F-11 | Forward 3 colors running at 1 points. | F-61 | Yellow wave |
| F-12 | Forward combination color line segment interval white line segment running | F-62 | Cyan wave |
| F-13 | Red tail | F-63 | Purple wave |
| F-14 | Green tail | F-64 | White wave |
| F-15 | Blue tail | F-65 | Brush back in 7 colors |
| F-16 | Yellow tail | F-66 | Run back at 1:00 in 6 colors |
| F-17 | Cyan tail | F-67 | Forward 6 color line segment white interval running |
| F-18 | Purple tail | F-68 | Trailing white interval 2 |
| F-19 | White tail | F-69 | Forward red and green tail |
| F-20 | Brush 7 colors forward | F-70 | Forward green blue 2 color trailing |
| F-21 | Backward 3 colors running at 1 points. | F-71 | Forward red and blue tail |
| F-22 | Backward 3 colors running at 1 points. | F-72 | Two way 6 color interval 2 white dot trailing |
| F-23 | Forward coloring interval 2 white dot trailing | F-73 | Forward yellow and purple, running 2 points each. |
| F-24 | Run forward in red and green waves | F-74 | Forward 3-color wave run |
| F-25 | Run forward in green and blue waves | F-75 | Backward 3-color wave run |
| F-26 | Run forward in red and blue waves | F-76 | Backward 6 color gradual trailing |
| F-27 | Bidirectional 6-color interval 2 white dot trailing | F-77 | Forward color combination tail |
| F-28 | Forward red, green and blue, running 2 points each. | F-78 | Backward composite color trailing |
| F-29 | Forward red, green and blue 3-color tail | F-79 | Forward 7-color wave run |
| F-30 | Forward red, green and blue 3-color tail | F-80 | Backward 7-color wave run |
| F-31 | Forward 6-color gradient trailing | F-81 | Backward 3 color interval 2 white dot trailing |
| F-32 | Forward combo wave run | F-82 | Run forward at 2 o'clock on blue, red and green |
| F-33 | Backward combination color wave | F-83 | Forward blue wave interval 2 Green Point running |
| F-34 | Forward 7 color tail | F-84 | Backward 6-color white tail |
| F-35 | Backward 7-color tail | F-85 | Forward 3 colors wave interval 2 white spots running |
| F-36 | Forward 3-color interval 2 white dot trailing | F-86 | Run forward with 2 blue dots between the red waves |
| F-37 | Forward 6 colors running at 1 points. | F-87 | Run forward with blue waves and 2 green dots apart |

| F-38 | Run forward with green waves and 2 red dots apart | F-88 | Run forward by 1 point in each combination color |
|------|------|------|------|
| F-39 | Forward 6-color white tail | F-89 | Forward 3 color line segment interval white line running |
| F-40 | Backward 3 color wave interval 2 white spots running | F-90 | 7 color gradient running forward |
| F-41 | Run forward with 2 green dots between the red waves | F-91 | Backward 6-color white head tail |
| F-42 | Run forward with blue waves and 2 red dots apart | F-92 | Forward 6 color line segment without gap running |
| F-43 | Run forward with blue waves and 2 yellow dots apart | F-93 | Backward white line interval running |
| F-44 | Run forward at 2 o'clock on green, red and blue | F-94 | Two way 6-color wave running |
| F-45 | Backward 7-color gradient running | F-95 | Forward combined color wave interval 2 white spots running |
| F-46 | Backward 3 color interval white line running | F-96 | 2 points running forward, yellow and purple. |
| F-47 | Forward 6-color white head tail | F-97 | Purple green wave interval 2 |
| F-48 | Backward 6-color segment running without interval | F-98 | Forward red wave interval 2 Green Point running |
| F-49 | Run forward at intervals of white line segments | F-99 | Play the selected effect |

3、The "chip" key is used to set the chip type. Each click switches a chip type, and the controller plays according to the newly set value. See chip type table in Section 5.2 for chip type.

4、The "speed" key is used to adjust the playback speed. The operation mode is the same as when playing SD card effect, except that l-00 represents 25 frames / second when playing built-in effect.

## 5.4、Advanced settings

How to enter the advanced setting: the controller is turned on → unplug the SD card → press and hold the "select" key and don't release it → the nixie tube displays "-" (4 horizontal lines) → press the "speed" key again → the nixie tube displays "ae.00". At this time, the controller enters the advanced setting state.

The advanced setting has four setting items: RGB sequence, extension address, test function and high-voltage synchronous switch. The following are introduced respectively.

1、Enter the advanced setting state for the first time or press the "select" key, and the nixie tube displays AE 00 indicates that RGBW order is being set. After that, each time you press the "select" key to switch one RGBW sequence value, long press the "select" key to switch directly to the last one. The RGBW sequence set here is only applicable to the built-in effect, and the RGBW sequence of SD card effect is set in the upper computer software. The meaning of setting RGBW order is to sort the four colors of red, green, blue and white. By default, the controller is in the order of red, green, blue and white.

However, the order in which different chips and lamps receive the four colors is inconsistent, so they must be adjusted to be consistent in order to display the colors correctly. The RGBW sequence values are shown in the following table (the last value represents the RGB sequence, and the penultimate value represents the position of W):

| RGBW sequence table | | | |
|---|---|---|---|
| Display content | RGBW order | Display content | RGBW order |
| AE.00 | RGBW | AE.10 | RGWB |
| AE.01 | GRBW | AE.11 | GRWB |
| AE.02 | RBGW | AE.12 | RBWG |
| AE.03 | GBRW | AE.13 | GBWR |
| AE.04 | BRGW | AE.14 | BRWG |
| AE.05 | BGRW | AE.15 | BGWR |
| AE.20 | RWGB | AE.30 | WRGB |
| AE.21 | GWRB | AE.31 | WGRB |
| AE.22 | RWBG | AE.32 | WRBG |
| AE.23 | GWBR | AE.33 | WGBR |
| AE.24 | BWRG | AE.34 | WBRG |
| AE.25 | BWGR | AE.35 | WBGR |

2、Press the "mode +" key, and the nixie tube displays ah 01 indicates that the controller extension address is being set. Extension address value range ah 01-AH. 99, up to 99 extensions. T2-1000ac extension address is mainly used to communicate with the third party. The host selects which controller to send data to. Each time you press the "mode +" key, the extension address will be + 1. Long press the "mode +" key, and the extension address will be set to the maximum value ah 99。

3、Press the "mode -" key, and the nixie tube displays af.01, indicating that the test function is being executed. The test function is the same as that described in the "select" key of playing SD card effect in Section 5.2.

4、Press the "chip" key, and the nixie tube displays A0 00 indicates that high voltage synchronization is enabled, and then press the "chip" key, and the nixie tube displays A0 01 indicates that high voltage synchronization is disabled. After the high-voltage synchronization is enabled, the controller will play a frame effect only after receiving the high-voltage synchronization signal. If the signal is not received, the controller will constantly detect the signal without playing any effect. In order to avoid the phenomenon that the signal cannot be received due to the failure of the signal detection circuit or other reasons, resulting in the false crash of the controller, the high-voltage synchronization function can

be turned off here.

5、Press the "speed" key to exit the advanced setting.

## 5.5、Third party control interface

The third-party equipment can be connected with the synchronous input port of the controller, and RS-485 communication is used to control the controller. The third party communication protocol is as follows:

1、Communication baud rate: 115200, data bit: 8, stop bit: 1, no parity.

2、Communication protocol format:

0x55：Frame header, fixed value

LEN：Data length, the sum of all bytes after the frame header and before the frame footer

SRC：source address

DES：Destination address

CMD：Command value

DATA：Data domain

CS：Checksum: all bytes after the frame header and before the checksum participate in the calculation

0xAA：End of frame, fixed value, optional

3、SCR and des cannot be the same. The controller will process data only when it detects that DES is consistent with its own extension number.

4、If the controller can return data, the SRC and des will be exchanged and remain unchanged when returning data.

5、CMD command table:

0x02：Play the specified program, data field 1 byte, d0 = program serial number

0x06：Play built-in effect, data field 1 byte, d0 = serial number of built-in effect

0x04：Play test effect, data field 1 byte, d0 = test effect serial number

0x05：Set chip, data field 1 byte, d0 = chip name

0x03：Set speed, data field 1 byte, d0 = speed level

0x1F：Playback pause, data field 1 byte, d0 = 0 playback, d0 = 1 pause

0x20：System restart, data field 1 byte, d0 = 1

0x1B：Circularly play the specified frame, 7 bytes in the data field, d0 = program sequence number, d1|d2 < < 8|d3 < < 16 start frame, d4|d5 < < 8|d6 < < 16 end frame

0x1C：Light the light within the specified range, 8 bytes in the data field, d0 = program serial number, d1|d2 < < 8|d3 < < 16 start light signal, d4|d5 < < 8|d6 < < 16 end light signal, D7 = channel number

0x1E：Turn on the light within the specified range (the next white measuring), the data field is 8 bytes, d0 = test

effect serial number, d1|d2 < < 8|d3 < < 16 start light number, d4|d5 < < 8|d6 < < 16 end light number, D7 = channel number

6、If the end light signal is equal to the start light signal, clear the setting range of this channel. If the end light signal is less than the start light signal, clear the specified range of all channels.

7、The light number and program serial number start from 0.

# 六、**Points for attention**

1、Before copying the file to the SD card, the SD card must be formatted. It needs to be formatted before each copy. Format parameters: file system = FAT32, allocation unit size = default configuration size, or directly click "restore device default value (d)".

2、The SD card cannot be hot unplugged. You must first disconnect the power supply of the controller and then unplug the SD card.

3、The controller is rainproof and not waterproof. Please install it vertically.