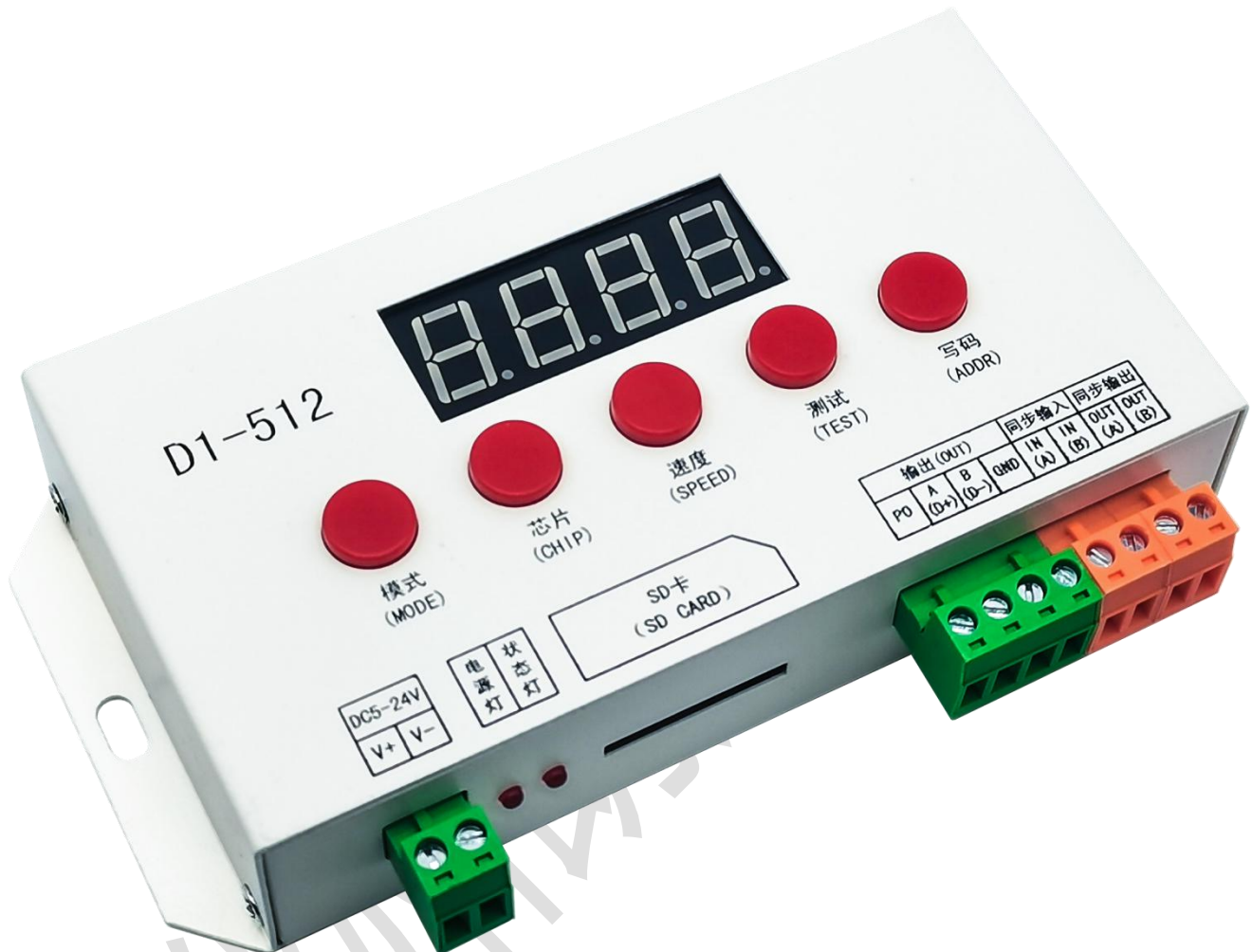


D1-512

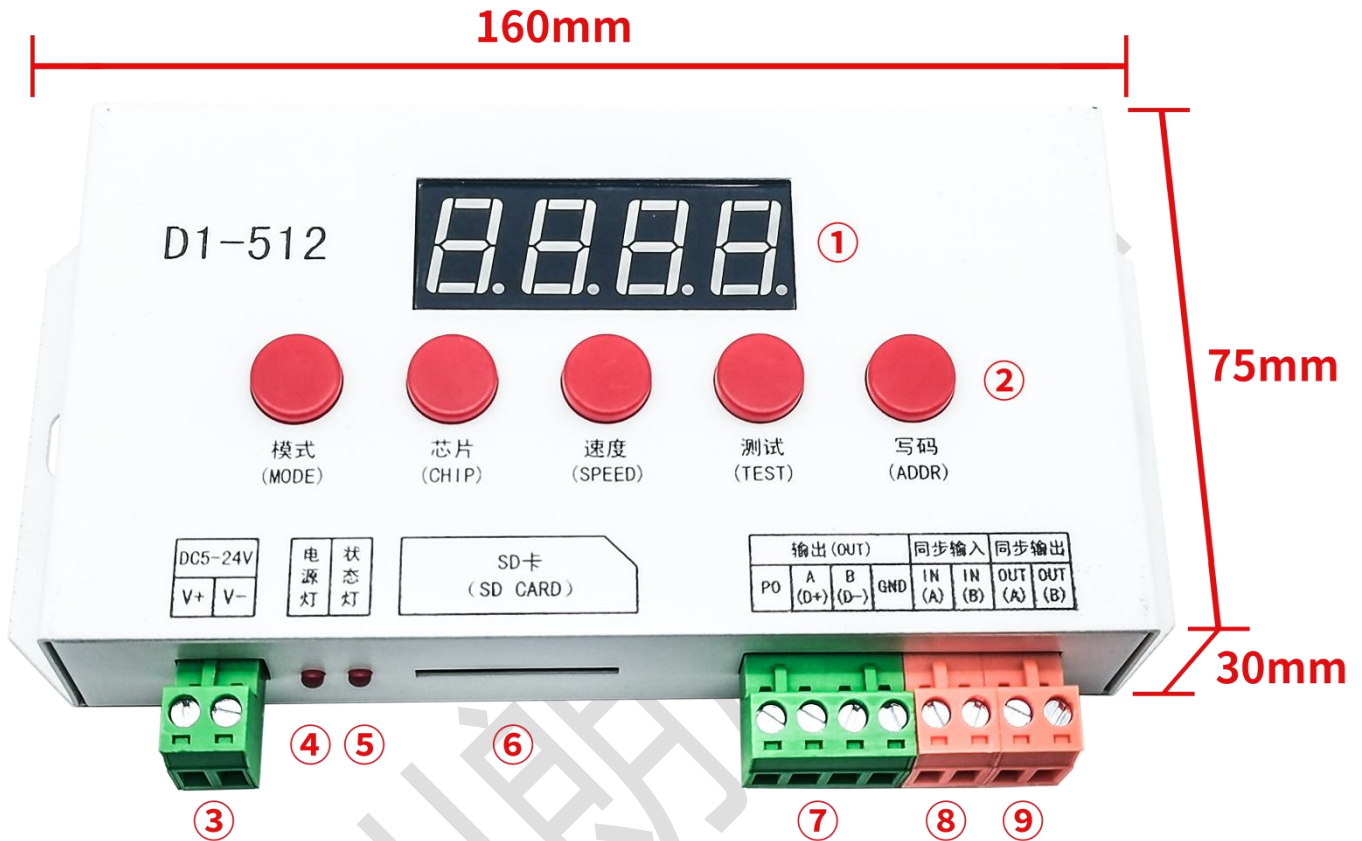


一、Controller features and advantages

- ✓ Single channel output, the maximum load of DMX512 chip is 512 points, and the maximum load of other ICs is 2048 points.
- ✓ 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 supports cascade synchronization and can be configured 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.

- ✓ DC 5-24v power supply, wide voltage, suitable for more application scenarios.
- ✓ 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 digital tube | ⑤ Status indicator |
| ② Entity key (Name: mode, chip, speed, test, code writing) | ⑥ SD card port |
| ③ Dc5-24v power port | ⑦ Output port |
| ④ Power indicator | ⑧ Synchronous input port |
| | ⑨ Synchronous output port |

2.2、Controller parameters

Working voltage: DC5-24V

Rated power: <1W

Weight: 320G

Product size: 160mm x 75mm x 30mm

Output port: 1 Way

Number of loaded lamps: 2048 points TTL lamps or 512 points DMX lamps

SD card type: SDHC

SD card capacity: 128MB-8GB

Effect file format: FAT32

Effect file type: *.LED

二、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.

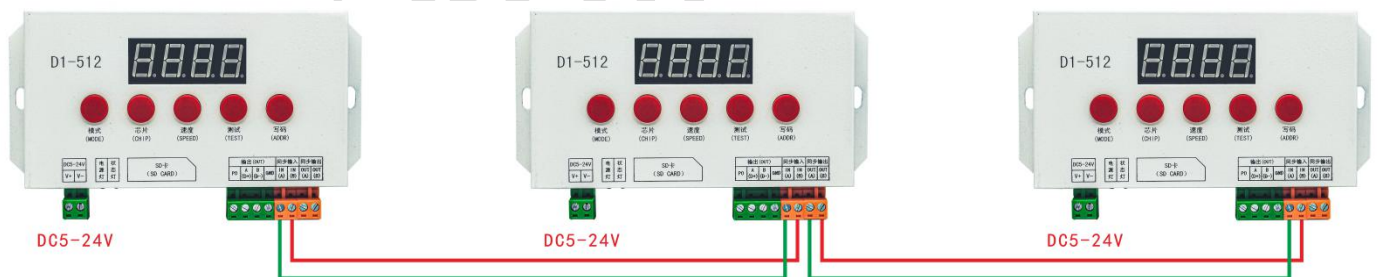
The use of multiple machines means that two or more controllers work synchronously, and the controllers are required to work in step. D1-512 supports cascade synchronization and can be used with GPS / BD synchronization controller.

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.

D1-512 supports various lamps such as through-hole lamp, point light source, line lamp and lamp strip (both TTL signal and DMX512 signal). Whether to support specific lamps, please ask the lamp manufacturer for lamp parameters and ask our business personnel or agents.

3.1、Cascade synchronization

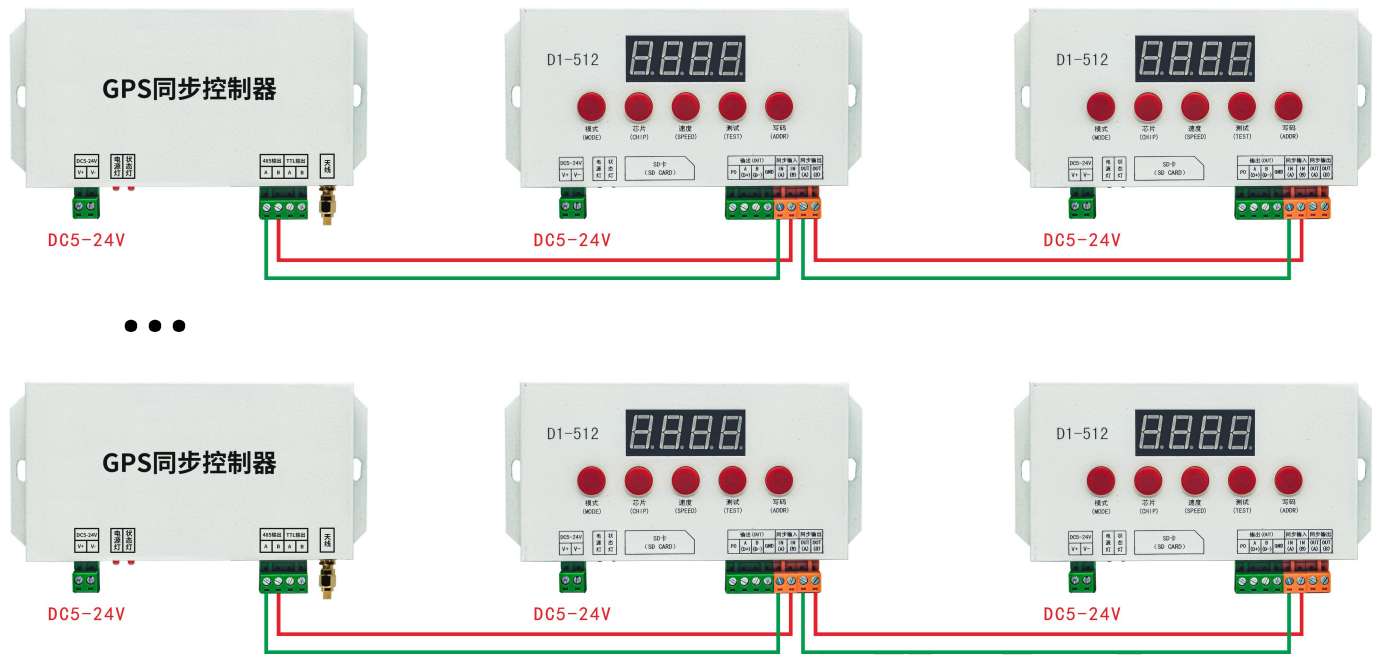
When cascade synchronization is adopted, the controller power supply does not need to be connected together or powered on at the same time, but the synchronization line needs to be connected. It is recommended to use shielded pure copper twisted pair (such as network cable) for the synchronization line.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

3.2、Used with GPS synchronization controller

When using GPS synchronization, after each GPS synchronization controller, multiple controllers can be cascaded to form a synchronization unit. Without any connection between multiple synchronization units, large-scale synchronous playback can be realized without being limited by geographical distance. The wiring mode is shown in the figure below:



四、Display meaning of digital tube

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、Boot state

After the controller is powered on, the nixie tube displays: version number → chip type → playback speed → playback content, as shown in the following figure:



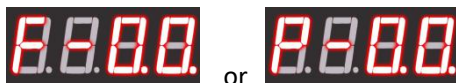
1、 Controller version number: the version will be upgraded if the controller changes the problem or updates the function. Users can query the function and status of the controller according to the version number.



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、 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

First insert the SD card, and then power on. The controller enters the card reading mode and starts playing the SD card effect. If the SD card is inserted or pulled out halfway, the card reading will fail, and then the SD card effect cannot be played.

The SD card can store up to 32 effect files. Each file can contain up to 100 programs, but the total number of programs cannot exceed 256. Before playing, first arrange the files according to the copy order of the files, and then arrange the programs according to the program serial number in the file, so as to arrange a serial number for each program, and the controller plays according to the program serial number.

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

1、 The "test" key is used to test the function. After the first press, the nixie tube displays af.01 and the value part flashes, indicating that the controller enters the test state, and the controller starts playing the first test effect. In the future, press the "test" key every time to switch a test effect. After switching to af.08, press the "test" key again to return to af.01. If there is no key operation, the controller will always play the current test effect. If you want 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、 The "mode" key is used to switch programs. After the first press, the nixie tube displays p-00 and the digital part flashes, indicating that the controller enters the program setting state. After that, each time you press the "mode" key to switch a program, switch to the last program and return to the first one. If there is no key operation within 30s, it will automatically return to the normal playing state, and the last two digital tubes will not flash during normal playing.

The nixie tube display p-00 indicates that all programs are played circularly, the display of others indicates that only the current program is played, and the number represents the program serial number. Users can set the number of program playback in the company's full color controller software editing system software. For example, the number of program 1 playback is set to 5. During full broadcast, program 1 plays 5 times before playing program 2.

3、 When playing SD card effect, the "chip" key can only view the chip type and cannot be set. The chip type is shown in the table below:

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 the first press, the nixie tube displays l-00 and the digital part flashes, indicating that the controller enters the speed setting state. The number indicates the speed level. The larger the number, the faster the speed. Every time you press the "speed" key to switch to a speed level, switch to L-16 and return to l-00. When playing the SD card effect, l-00 means to use the speed set in the SD card, and other values mean to force it to a certain speed. The corresponding 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、The "write code" key is used for DMX512 code writing operation, which is built-in and detailed in summary 5.5 and 5.6.

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 length of playback time is calculated according to the playback speed. The calculation formula is: playback time (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, only playing the current effect, and the number indicates the serial number of the built-in effect; The nixie tube display f-99 indicates anycast, and the anycast setting is explained in the function of "test" key.

The built-in effect is suitable for line application scenarios, such as building outline and so on.

The key functions for playing built-in effects are as follows:

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

2、The mode key is used to switch built-in effects. After the first press, the nixie tube displays f-00 and the digital part flashes, indicating that the controller enters the built-in effect setting state. After that, press the "mode" key every time to switch a built-in effect. After switching to the last effect, press the "mode" key to return to the first one. If there is no key operation within 30s, it will automatically return to the normal playing state, and the last two digital tubes will not flash during normal playing.

The names of 98 built-in effects are shown in the table below:

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、When playing the built-in effect, the "chip" key is used to set the chip type. Each click switches a chip type, and the controller sends the timing according to the newly set chip type. Refer to Section 5.2 "chip type table" 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, but when I-00 is displayed, it means 25 frames / second.

5、The "write code" key is used for DMX512 code writing operation, which is built-in and detailed in summary 5.5 and 5.6.

5.4、Advanced settings

How to enter the advanced setting: the controller is in the shutdown state → unplug the SD card → press and hold the "test" key without loosening → then power on → nixie tube display (4 horizontal lines) → press the "speed" key again → nixie tube display "ae.00". At this time, the controller enters the advanced setting state.

Advanced settings have two settings: RGB sequence and test function. The following are introduced respectively.

1、Enter the advanced setting state for the first time or press the "mode" key, and the nixie tube displays AE 00 indicates that RGBW order is being set. After that, press the "mode" key to switch one RGBW sequence value, and press and hold the "mode" key to switch to the last one.

Tip: the RGBW sequence set through the controller is only applicable to the built-in effect, and the RGBW sequence of SD card effect is set in the software of full color controller software editing system.

Setting RGBW order is actually to sort the data of red, green, blue and white. By default, the controller is in the order of red, green, blue and white. However, the order of RGBW is different for different chips and lamps, which must be adjusted to be consistent in order to display the color correctly. The controller will automatically judge whether the W-bit is used according to the set chip type.

The RGBW sequence values are shown in the following table (the last number represents the RGB sequence, and the penultimate number 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	WB RG
AE. 25	BWGR	AE. 35	WBGR

2、Press the "test" key, the nixie tube displays af.01, and the controller starts playing the test effect. The operation is the same as the "test" key in Section 5.2.

3、Press the "write code" key to exit the advanced setting.

5.5、Write code using controller

Enter the method of using the controller to write code: the controller is turned off → unplug the SD card → press and hold the "test" key without loosening → then power on → the nixie tube displays (4 horizontal lines) → press the "chip" key again → the nixie tube displays the DMX512 chip model. At this time, the controller enters the DMX512 write code state.

The controller can only write equidistant addresses. There are four setting parameters: field mode (AP. 01), address offset (al. 01), write header address (a000) and DMX512 chip class. If you need to write chip parameters or more flexible and complex addresses, please edit the code writing file in the software of full color controller software editing system for code writing operation.

1、When entering the DMX512 code writing state for the first time or pressing the "chip" key, the nixie tube displays the DMX512 chip model and flashes, indicating that the chip type is being set. After that, press the "chip" key every time to switch a chip model, and long press the "chip" key to switch to the last one. The DMX512 chip models supported by the controller are shown in the table below:

DMX512 chip type table

Display content	Chip name	Display content	Chip name
512b	UCS512A、UCS512B	512C	UCS512CN、TM512AC
12C4	UCS512C4	512d	UCS512D、TM512AD
512E	UCS512E	6512	SM16512、SM16511
6522	SM16522	7500	SM17500
7512	SM17512	8522	SM18522
8512	GS8512		

2、Press the "mode" key, and the nixie tube displays AP 01 and the digital part flashes, and the controller enters the setting field mode state. After that, press the "mode" key once to switch to one field mode, and long press the "mode" key to switch to the last one. A lamp needs several bytes of data, which is several fields. For example, only one color needs one byte of data, which is 1 field, and two colors need two bytes of data, which is 2 field. The nixie tube displays ap01 for 1 field, ap02 for 2 field, ap03 for 3 field and ap04 for 4 field.

3、Press the "speed" key, the nixie tube displays al.01 and the digital part flashes, and the controller enters the state of setting address offset. After that, each time you press the "speed" key, the address offset + 1, and long press the "speed" key to set the maximum address offset al.99. Address offset refers to the difference of several fields between two adjacent lamps. For example, in the 3-field mode, the address offset is set to 5. If the address of the first lamp is 0, the address of the second lamp is

15.

4、Press the "test" key, the nixie tube displays a.000 and the digital part flashes, and the controller enters the state of setting the first address of the code. In the future, each time you press the "test" key to write the first address + 1, long press the "test" key to write the first address, and set the maximum value of a.999. The first address of code writing refers to the address of the first chip connected to the controller. The default is 0, and the maximum is 999. If the address exceeds 999, you need to edit the code writing file and write the code with software. You can write the single lamp address by writing the first address of the code, or continue to write the code from the place where the code fails.

5、When the nixie tube displays the DMX512 chip model and flashes, press the "write code" key, and the controller starts to write the code according to the set parameters. During the code writing process, the nixie tube displays the rotating screen. After the code writing, the nixie tube displays the DMX512 chip model and is always on (not flashing). At this time, press the "chip" key again. When the nixie tube displays the chip type and flashes, you can write the code again.

5.6、Using software to write code

1、Software operation: open the full color controller software → select the "edit (E)" menu → select the "DMX code writing file production" menu item → open the "DMX512 code writing file generation tool", as shown below.



The left side of the "DMX512 code writing file generation tool" window is the node information, and a node represents a DMX512 chip. The number of nodes can be set through the input box after "total number of nodes". After setting, the "node list" will be refreshed automatically, and "[]" is the address of each node. The number of nodes shall be consistent with the number of DMX512 chips actually used.

The right side of the window is the parameter setting area. Select the chip through the "chip type" drop-down box.

Different chips support different functions. See the following table for details:

Functions supported by DMX512 chip				
Chip name	Conventional coding	Self channel	Write parameters	Write current
UCS512A、UCS512B	√			
UCS512CN、TM512AC	√		√	
UCS512C4	√		√	
UCS512D、TM512AD	√	√		
UCS512E	√	√	√	√
SM16511、SM16512	√			
SM16522	√			
SM17500	√	√	√	√
SM17512	√	√	√	√
SM18522	√	√	√	√
GS8512	√	√	√	√

(1)、Conventional code writing is to write the address of each DMX512 chip in turn, which is the basic function of DMX512 chip.

2、One click code writing operation: copy the "dmxset. Led" code writing file into the SD card, and insert the SD card into the SD card slot of the controller. Power on the controller again, and the nixie tube displays in turn: version number → DMX512 chip type → playback speed → DMX512 chip type. The chip type displayed by the nixie tube is the chip type set in the "dmxset. Led" code writing file, indicating that this type of chip is written.

When the nixie tube displays the DMX512 chip type and flashes, press the "write code" key, the controller starts the code writing operation, and the nixie tube displays the rotation effect. During code writing, the nixie tube always displays rotation until the end of code writing. The nixie tube displays the chip type and constant (not flashing).

When the nixie tube displays the DMX512 chip type and constant (without flashing), press any key other than the "write code" key, and the nixie tube displays the chip type and flashes. At this time, press the "write code" key to write the code again.

六、matters needing 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.

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