TC809 Art-Net Controller User Manual

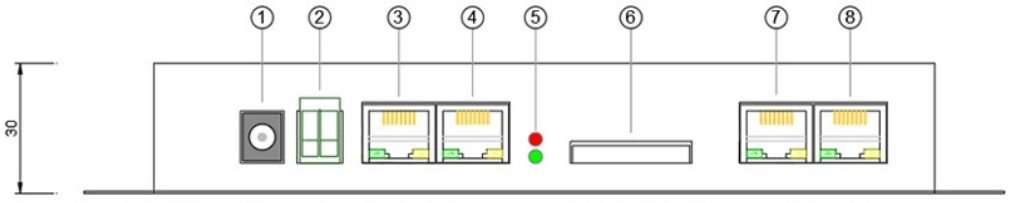
★ Please read this manual carefully before installing and using this product★

1. Product introduction

This TC-809 controller is a controller with LCD digital interface display, which converts Art-Net signals into various pixel lamp chip signals. It adopts standard Ethernet transmission and additionally accepts DMX512 signal control. Eight output ports, can control a variety of LED driver chips, support automatic addressing function, convenient for users to access different types of lamps, and realize unified control of different lamps in the project. The input network port can be directly connected to the computer network card, and can also be connected to the computer network card via a switch or photoelectric converter. Widely used in buildings, municipal lighting, stage scenery, entertainment venue decoration, etc.; it can achieve various running changes such as horse racing, running water, trailing, coloring, scanning, raindrops, etc., and has the advantages of convenient wiring and simple use; Single unit can be used in cascade connection.

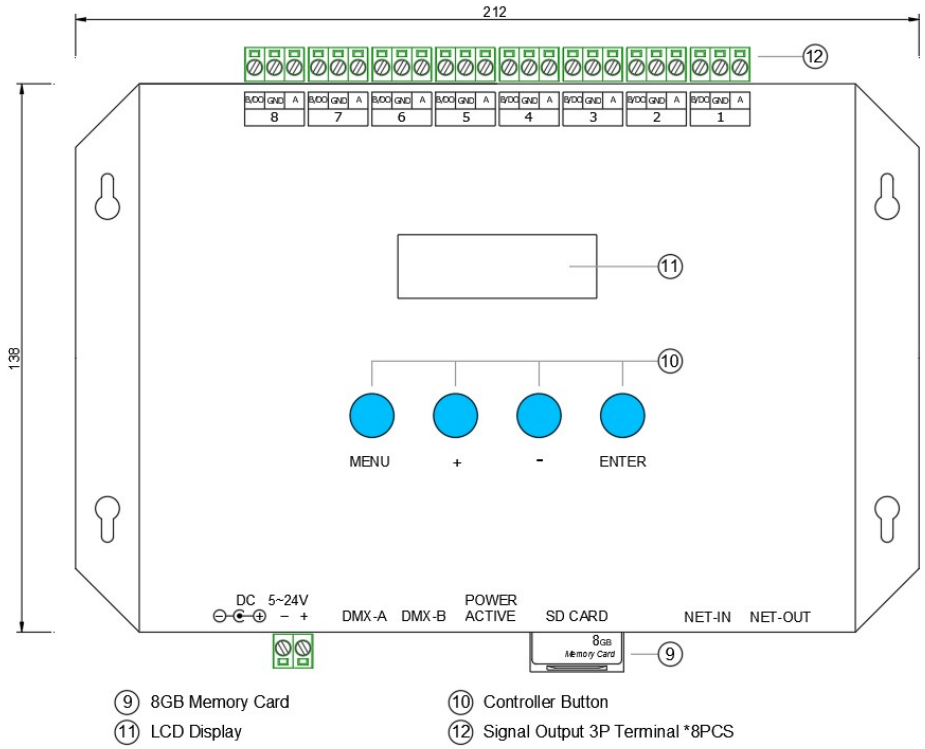
2. Dimensions & Technical Parameters

TC809 Art-Net Controller Dimensions



① DC12~24V Power Converter Socket
② 5~24V DC Power Supply Terminal
③ DMX-A: DMX Signal Input (DMX console)
④ DMX-B: DMX Signal Output (To Next Controller / DMX Device)
⑤ Power & Active Indicator Light
⑥ SD Card Socket
⑦ NET-IN: Art-Net Signal Input
⑧ NET-OUT: Art-Net Signal Output
③&④ Interface Definition 1:D+ 2:D- 3-6:NC 7-8:GND
⑦&⑧ Interface Definition T568B

TC809 Art-Net Controller Front View



Technical Parameters

Name	Description & Parameters
Operating Voltage	DC5-24V
Input Signal	Art-Net / DMX512
Output Signal	DMX512 / SPI (TTL)
Refresh Rate	30(ms)
Control Pixels	RGB 1020pixels*8Ports / RGBW 765pixels*8Ports （MAX）
Cascades QTY	170pixels*8Port / 128pcs 340pixels*8Port / 64pcs 510pixels*8Port / 42pcs 680pixels*8Port / 32pcs 850pixels*8Port / 25pcs 1020pixels*8Port / 21pcs
Operating temperature	-20℃ ~55℃
Protection level	IP20
Accessories	8G Memory Card * 1 / 3P terminal * 8 / 2P terminal * 1
Dimensions	L212 x W138 x H30 mm
Packing Size	25 x16.5 x4 cm
Product weight	0.73 kg

3. Functions and features

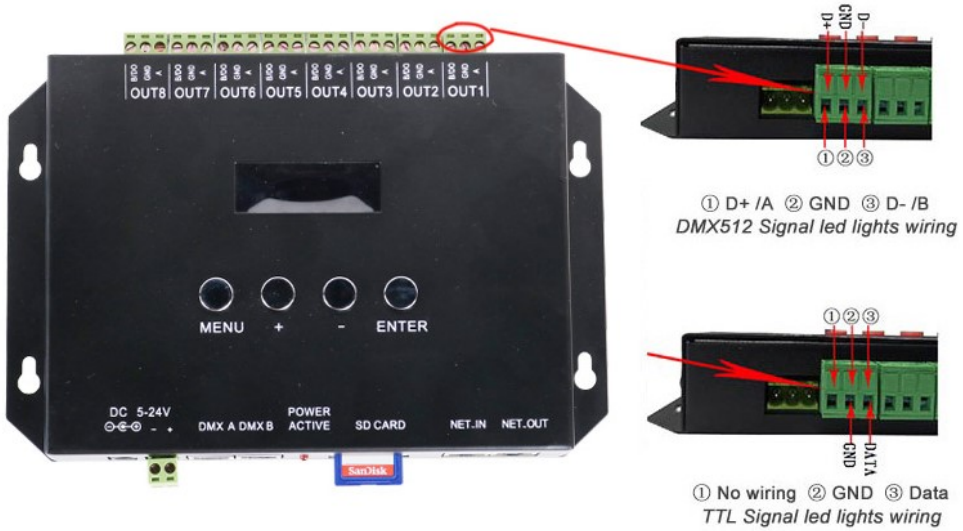
3.1 Provide LCD screen display, which can display the model, ID, and working status of the controller.

3.2 Have 8 ports output, each port can Control to 170/340/510/680/850/1020 pixels (depending on the number of different loaded chips).

3.3 The port outputs two signal protocols: ①DMX512/1990 international standard protocol and DMX512 extended protocol (RS-485 differential signal); ②TTL serial protocol (level signal).

3.4 Support a variety of pixel control ICs, flexible control methods.
3.5 Controller network IP online/manual setting function.
3.6 With DMX512 write address function, single port or all ports load DMX512 IC write address.
3.7 It can be directly connected to the computer network card when online, or it can be connected to the computer network card via a switch or photoelectric converter.
3.8 It can be used as a single unit, or multiple units can be cascaded to use, supporting multiple connections of switches.
3.9 Support DMX512, online and offline integrated control, online priority is the highest, automatically switch to offline playback when there is no 2 online and DMX51 signal, online can be connected to MADRIX, offline can be connected to DMX512 console.
3.10 The SD card stores offline effect files and supports the download of effect files through Art-Net network, no need to insert or pull out the SD card.
3.11 It can be used as **the main control (with SD card inserted)** or **as a sub-controller (without SD card)** when it is online.
3.12 The sub-control cascade can be interchanged at will, and it has strong adaptability to lighting engineering.
3.13 The communication adopts the international standard TCP/IP network protocol, the optional transmission rate supports 100M/Gigabit adaptive, the transmission speed is more stable and fast, and the nominal transmission distance between each two controllers can reach 100 meters.
3.14 The network interface with indicator light is adopted, and the T568B line sequence protocol is adopted.
3.15 Port ESD protection design.
3.16 Power input interface reverse connection protection design.

4. LED Lights Wiring Instructions



When outputting DMX512/HDMX/TM512/UCS512/SM16512 control signals (differential), 3-wires are required.
When outputting control signals (TTL) such as WS2811/UCS1912/UCS1903/GS8206, 2-wires are required.

LED Lights Wiring Definition

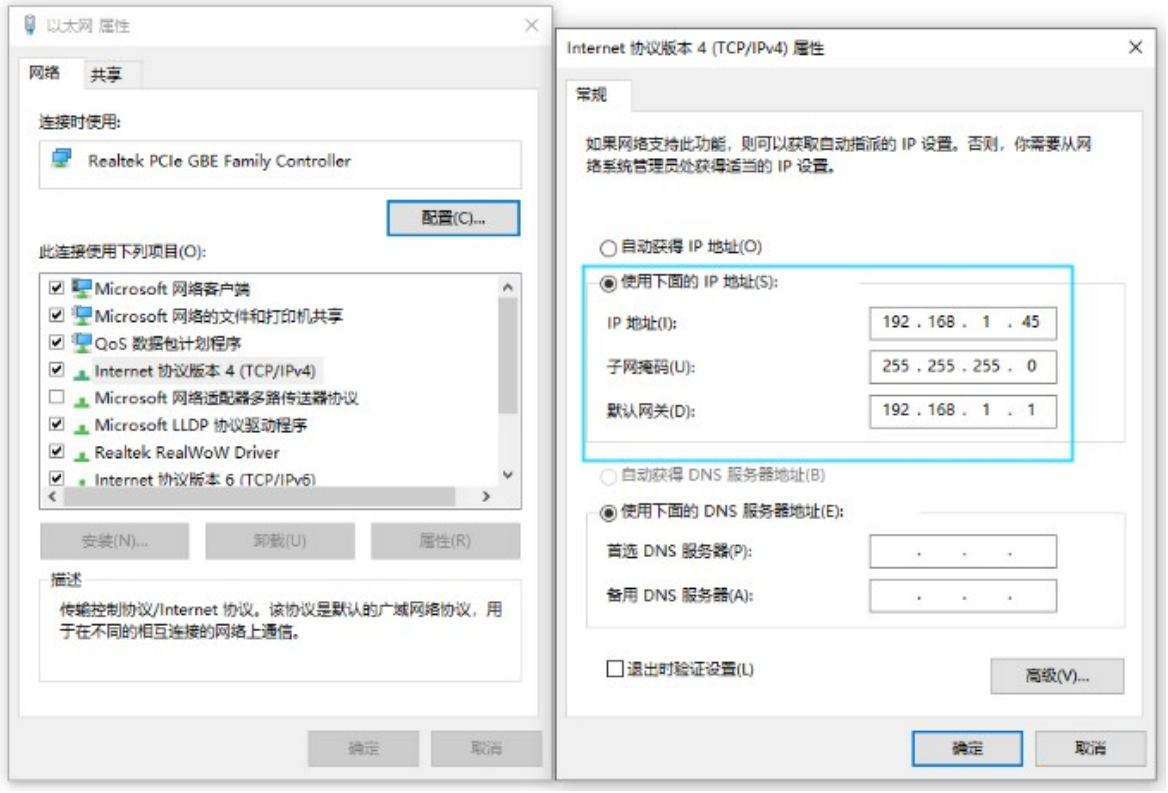
3P Terminal	DMX512 Signal	TTL Signal
A	*D+*	*(NULL)*
GND	*GND*	*GND*
B/DO	*D-*	*DATA*

5. Control IC Type

IC Type	IC Model NO.	Color
2811	TM1804, TM1809, TM1812, UCS1903, UCS1909, UCS1912, UCS2903, UCS2909, UCS2912, UCS2919, WS2811, WS2812, GS8206, SM16703 ……	RGB
1914	TM1914……	RGB
5603	UCS5603…..	RGB
512	DMX512, HDMX, TM512, UCS512, SM16512……	RGB
2904	UCS2904B……	RGBW

6. Set the IP address of the computer network card

Correctly select the network card connected to the controller and set the corresponding IP address for it.



Selection (TPC/IPv4)-Properties- Manually set the IP address information

IP address: 192.168.1.X (Unoccupied IP address)

Subnet mask: 255.255.255.0

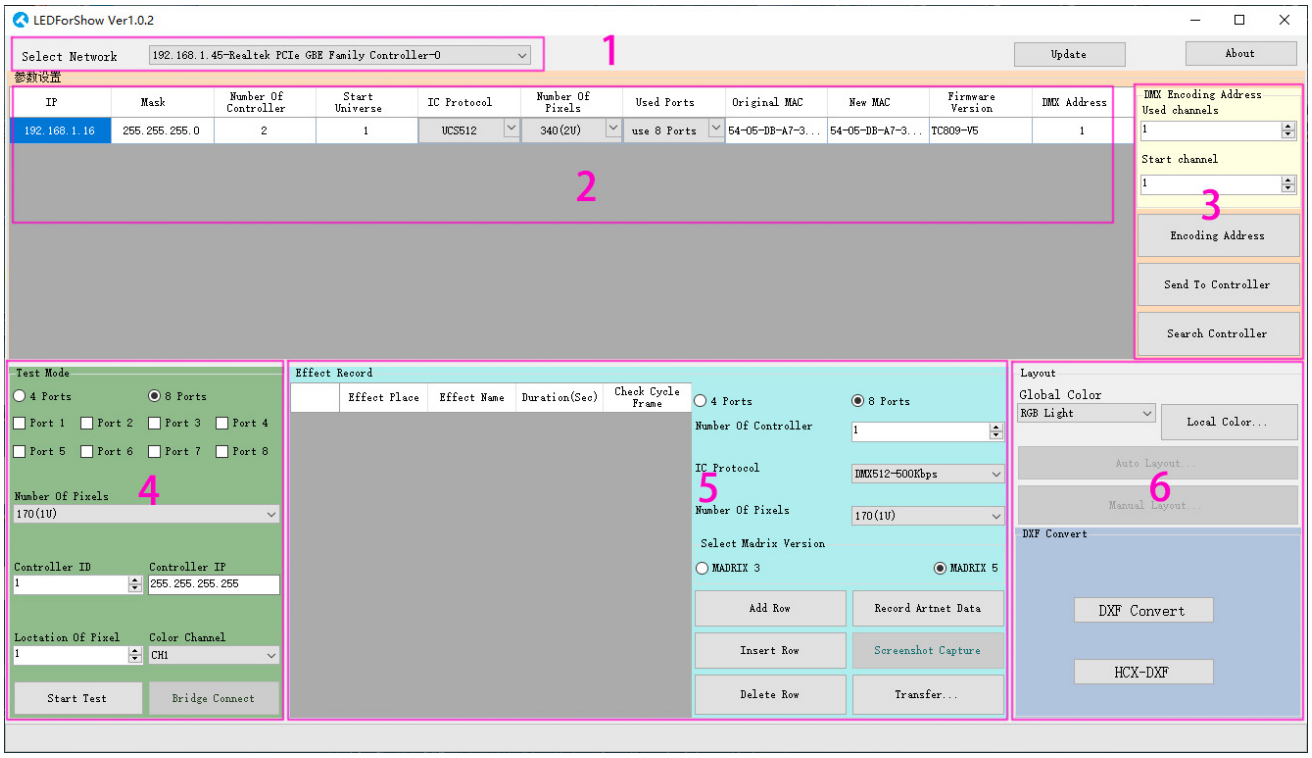
Default gateway: 192.168.1.1

This step is very important !!!

It may cause the software to fail to search the controller correctly.

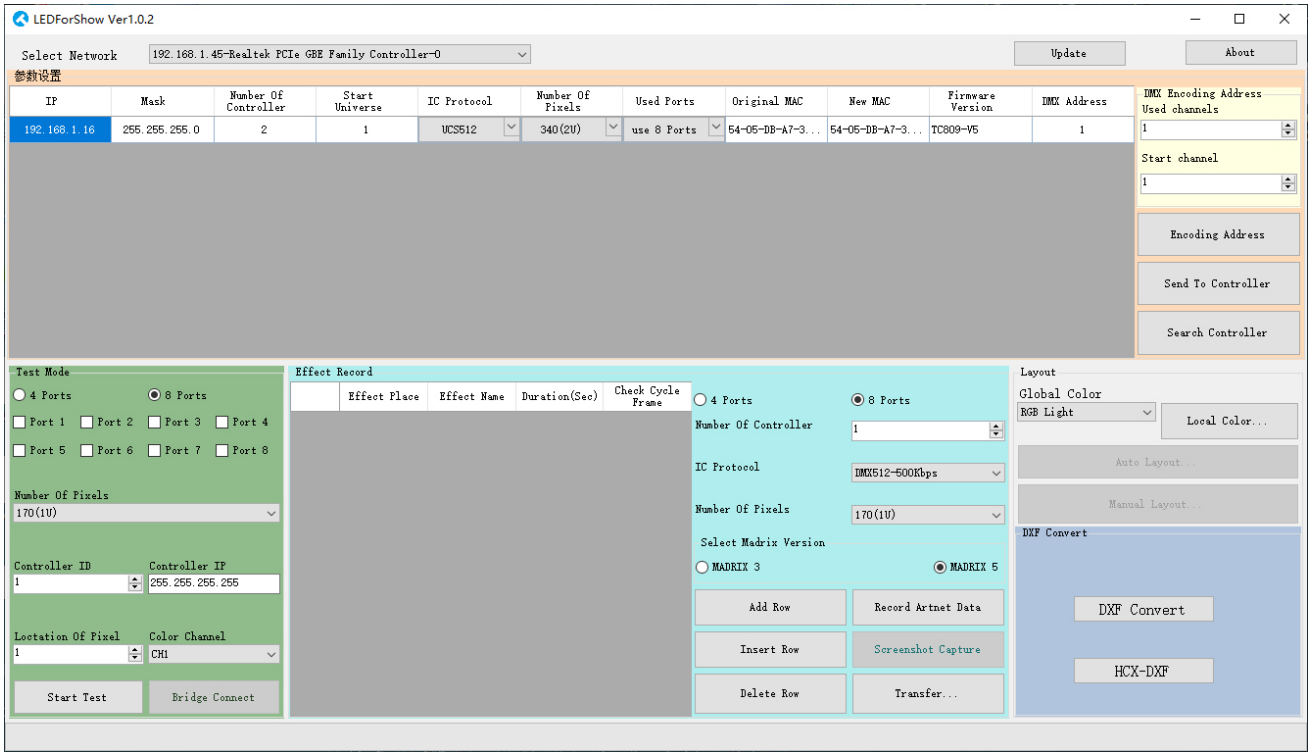
7. Art-Net Setting Software- LEDForShow

7.1 LEDForShow Software interface introduction



1- Select Network Card
2- Controller parameter setting module
3- DMX512 online address code, controller parameter sending, controller search
4- Controller port test module
5- MADRIX effect recording module
6- Lighting layout conversion module

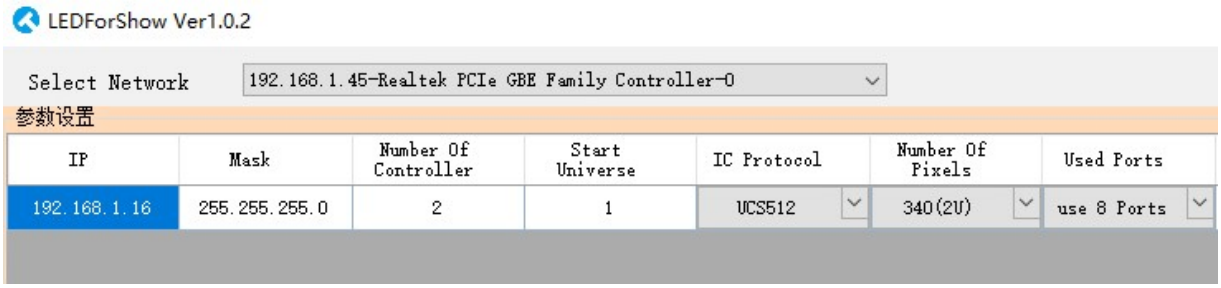
7.2 Open the controller setting software



7.2.1 Select Network > Select the network card connected to the controller

7.2.2 Click the "Search Controller" button on the right, and when the controller is searched, you can set the parameters of the controller.

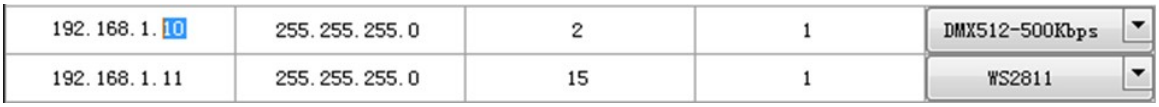
7.3 Controller parameter setting



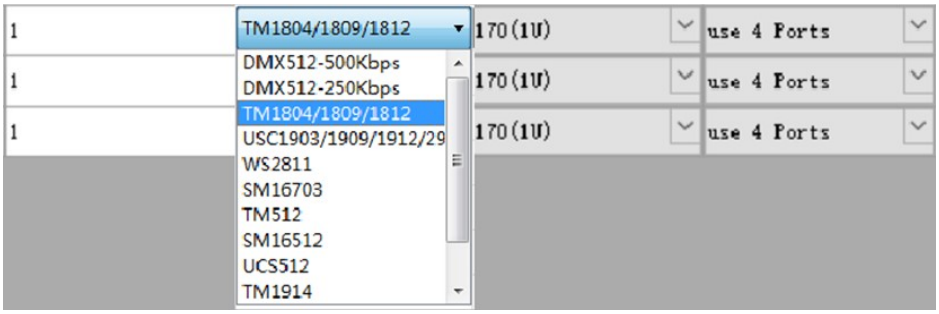
Name	Description	Remark
IP	Set a fixed IP address for the controller, Set to 192.168.1.X (Unoccupied IP address)	On the same network segment as the computer
Mask	Set to 255.255.255.0	The same as the computer settings
Number of Controller	Number of connectable sub-controllers	Set according to project usage
Start Universe	Virtual space in the first output port MADRIX software	
IP Protocol	Loaded IC model for port output	The same as the loaded IC signal protocol on the connected Lights
Number of Pixels	Set the MAX loading pixels of the controller port ; 170pixels/1U Max 1020pixels/U	DMX512 MAX 510pixels/3U SPI/TTL MAX 1020pixels/6U
Used Ports	Use 4 Ports / Use 8 Ports	When set to "Use 4 Ports", there is no signal output from the "5-8" ports of each controller

Double-click the corresponding number box, after the number is selected, you can change it as needed, and set the controller's IP address, sub-control number, starting space, etc.

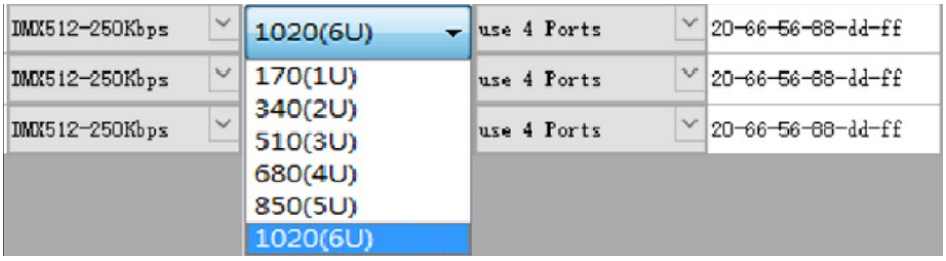
The controller connected to the network card in the cascade mode will only display the IP address of the first controller, and only need to set the corresponding number of sub-control cascades.



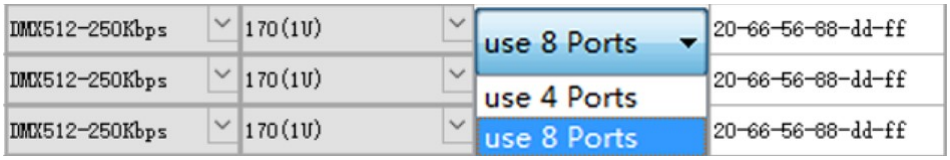
Note: The above is the grouping of the controller to the switch. When the controller is directly connected to the computer, only one IP address will appear.



Click the " IP Protocol " box arrow to pop up a drop-down menu to select the LED lights chip.



Click the " Number of Pixels " box arrow to pop up a drop-down menu to select port loading.



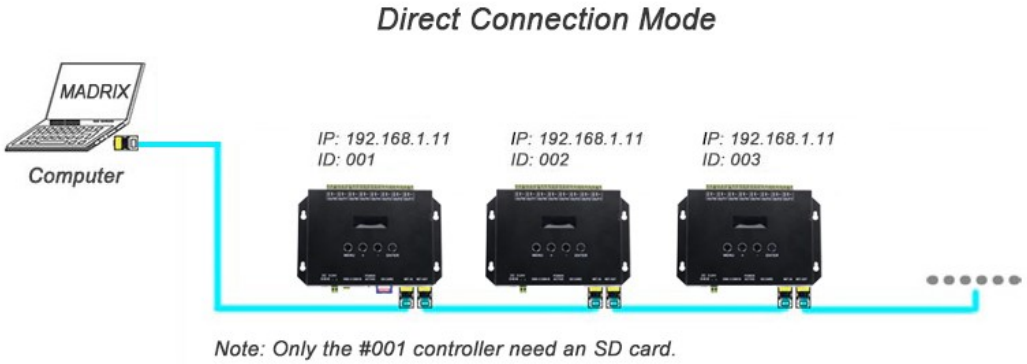
Click the " Used Ports " box arrow to pop up a drop-down menu to select the port mode, and you can choose "4" or "8" output.

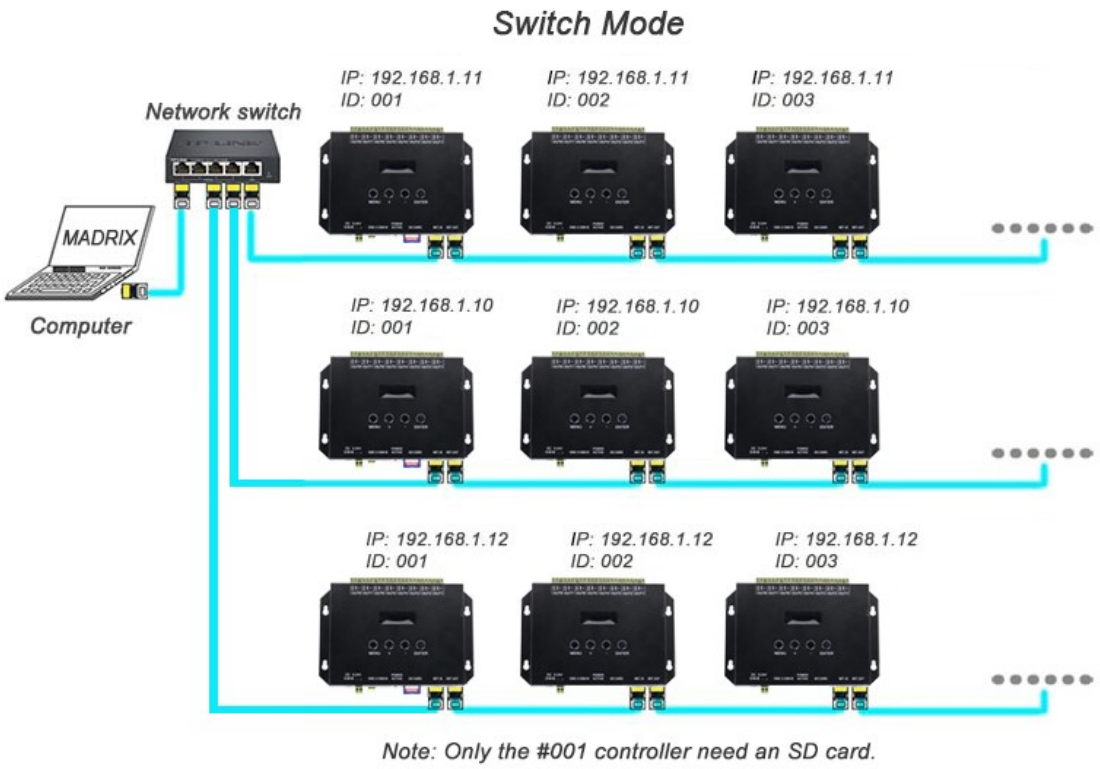
Original MAC	New MAC	Firmware Version	DMX Address
54-05-DB-A7-3...	54-05-DB-A7-3...	TC809-V5	1

When the controller is connected to the LAN and conflicts with the MAC address of other devices in the LAN, click the number in the "New MAC" box. After the number is selected, you can change it as needed.

After setting each parameter, click "*Send to Controller*" to save the parameters to the controller.

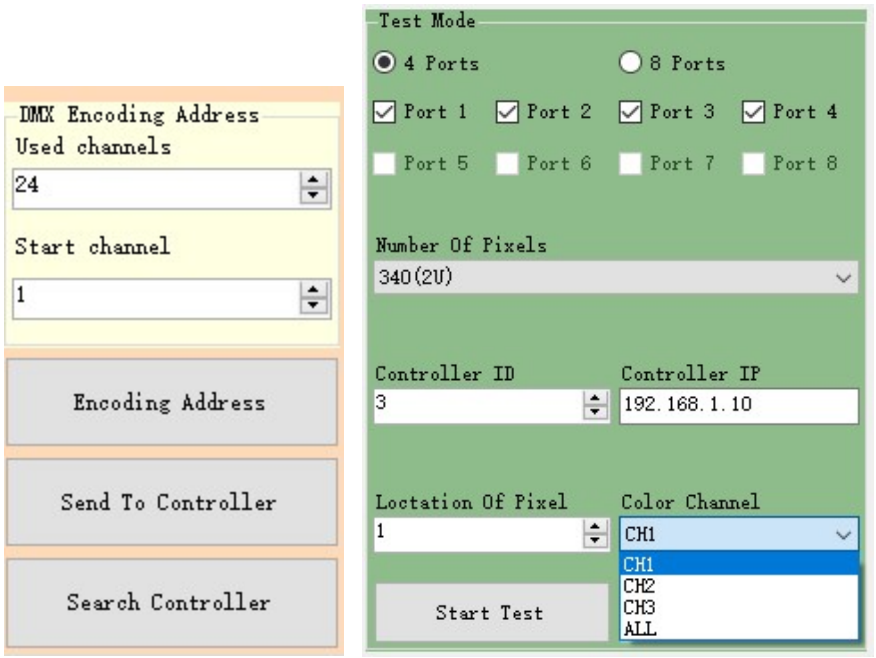
7.4 IP address and controller arrangement





Note: When using multiple controllers in series, after setting the IP address using LEDForShow software, the controller identification method is: IP+ID, such as 192.168.1.10: ID001, and the following controllers are automatically arranged as 192.168.1.10: ID002, 192.168 .1.10: ID003.....

8. DMX Address Code Online & Controller Test



8.1 Set and store the controller parameters, and then correctly connect the DMX512 lamp signal to the controller. Fill in the value of "Used Channels" and "Start Channels" in the LEDforShow software, and click "Encoding Address" to write the address code for DMX512 Lights.

8.2 Controller test method:

1> Fill in the IP address of the corresponding controller

2>Fill in the ID number of the corresponding controller

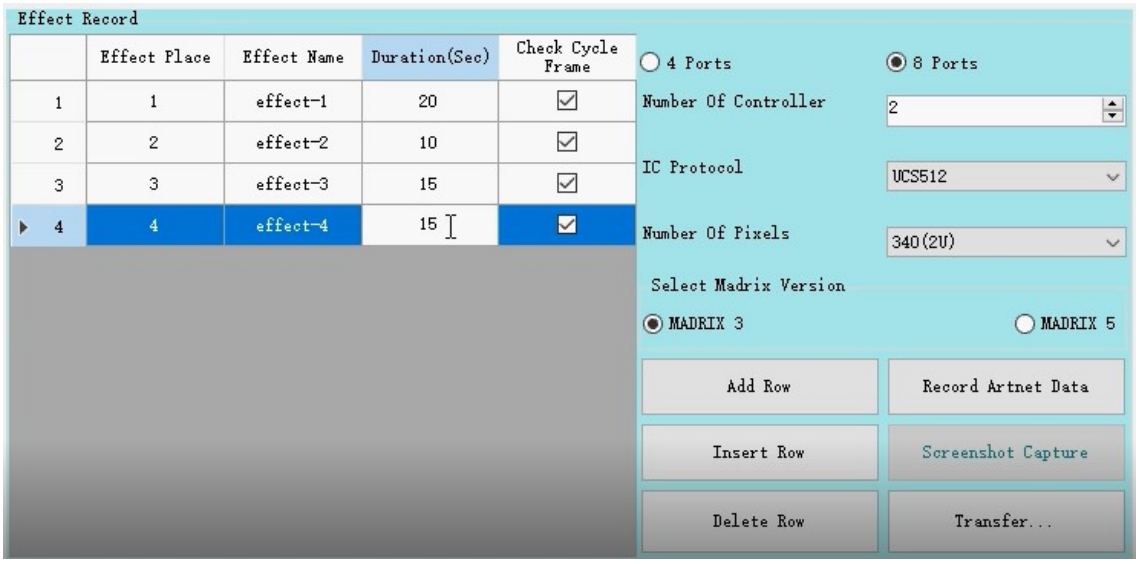
3>Fill in the port of the corresponding controller to control the number of pixels.

4>Select the test port of the corresponding controller

5>Select test channel

6>Select the corresponding pixel to test directly.

9. MADRIX Effect Record Module

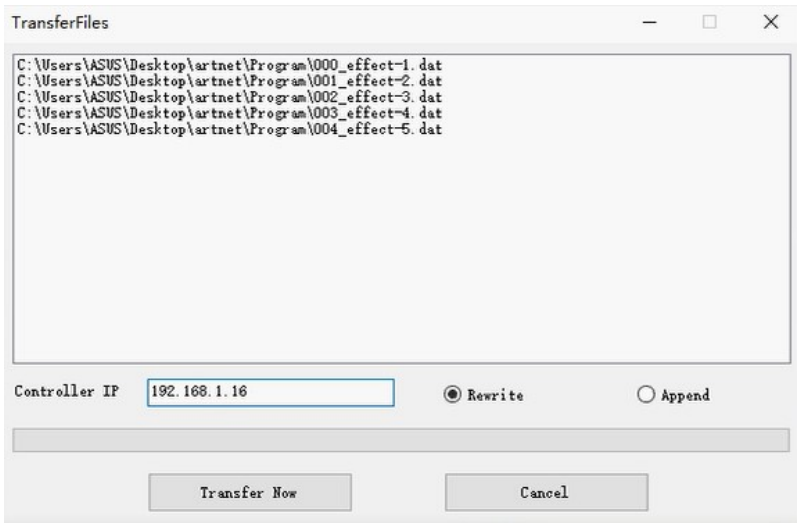


This module is to record the set lighting effects from MADRIX software, the steps are as follows:

1> Set the parameters of the corresponding controller, including the number of ports, the number of controllers, the IC protocol, the number of pixels to be controlled, and the version of MADRIX.

2> Make MADRIX lighting effects, return to the LEDForShow software, add a Row or more, and set the recording duration(Sec) for the effect, then click the “Record Artnet Data” button to finish and save the file.(Note: “Check Cycle Frame” is to automatically detect the Madrix effect loop. If this is selected, the manual setting of the duration is invalid.)

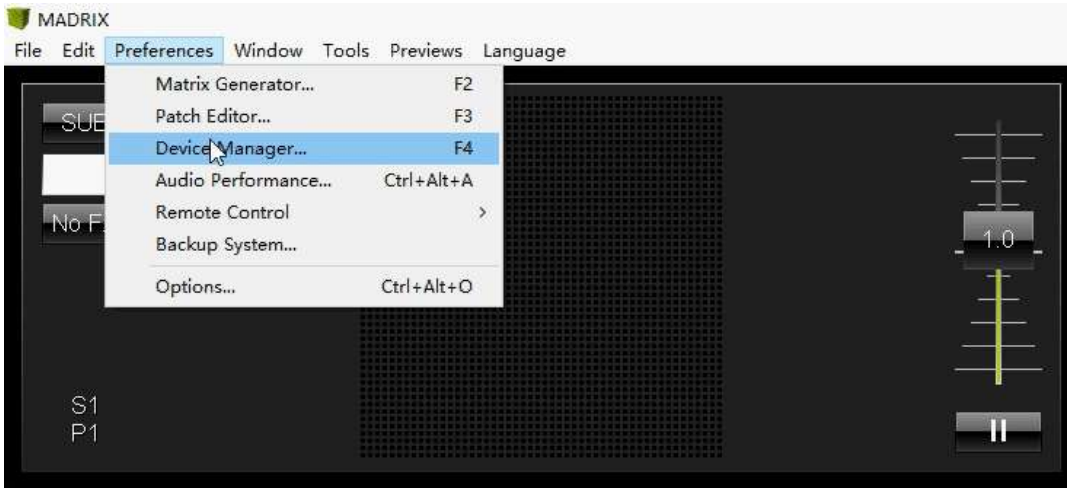
3> The "Transfer" button is to send the program to the controller.



10. Online Application-MADRIX

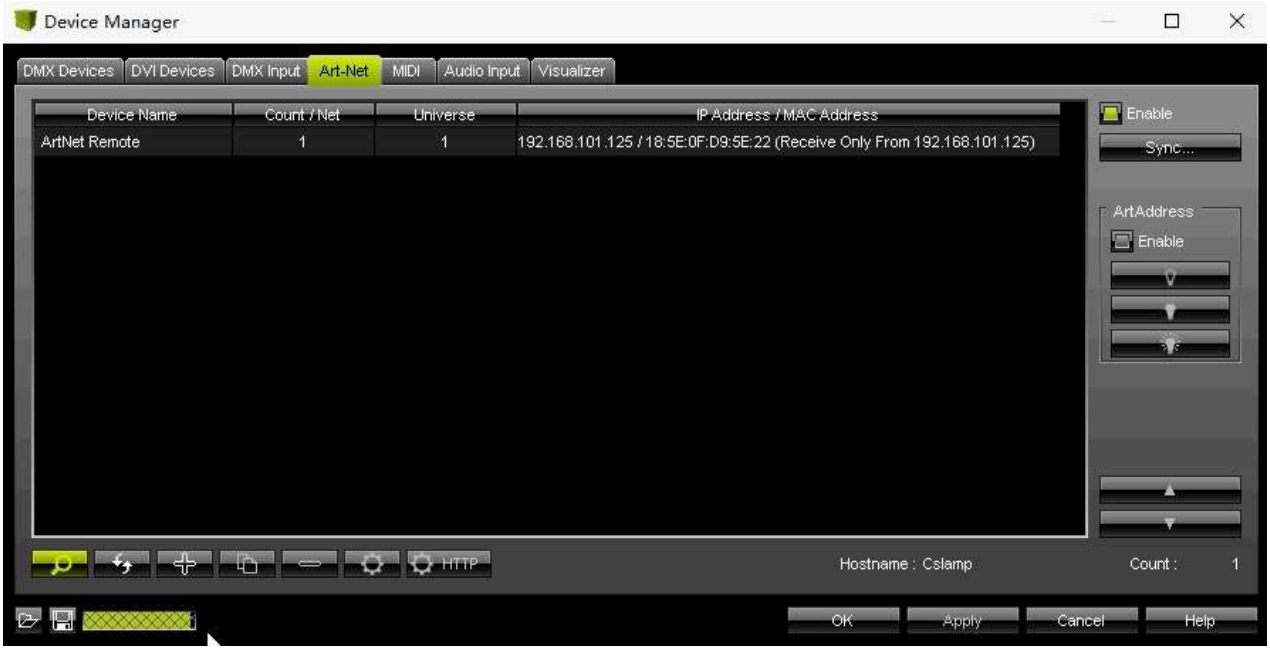
10.1. MADRIX connection settings

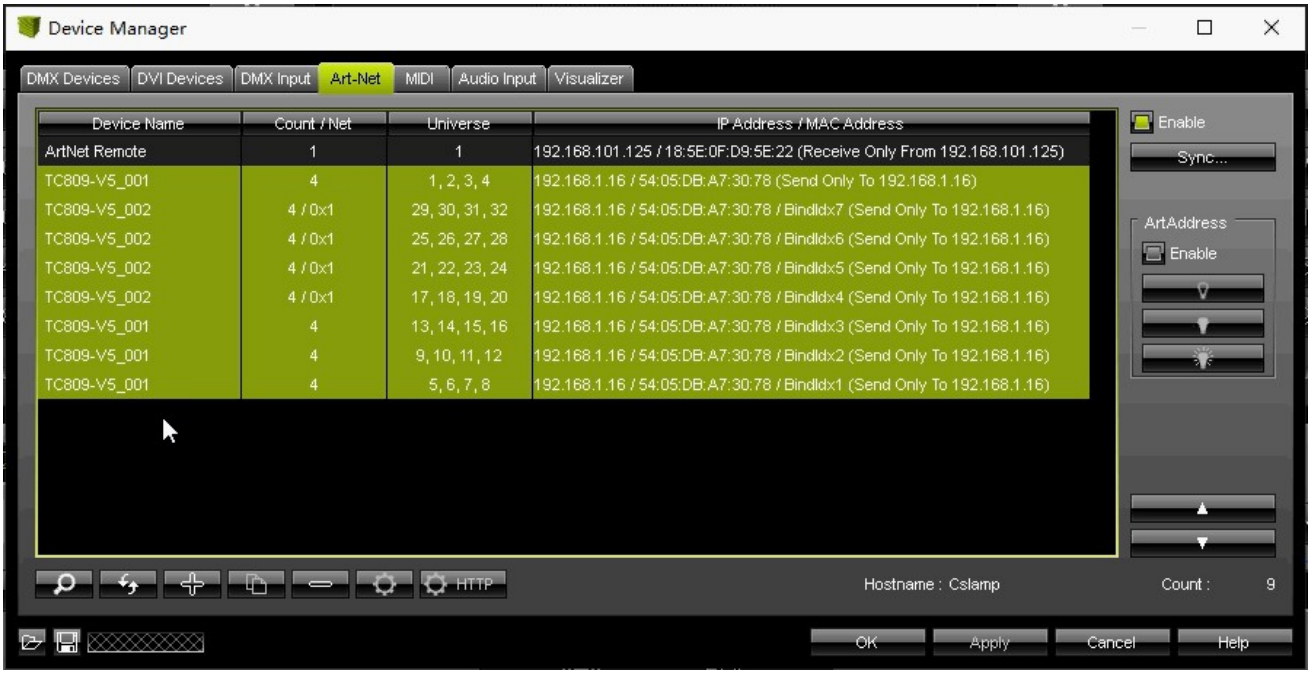
Run the MADRIX software, click **"Preferences" menu,** select **"Device Manager"** from the drop-down menu or press the "F4" key to pop up the Device Manager menu, and select the **"Art-Net" tab**.



10.2. Art-Net Settings

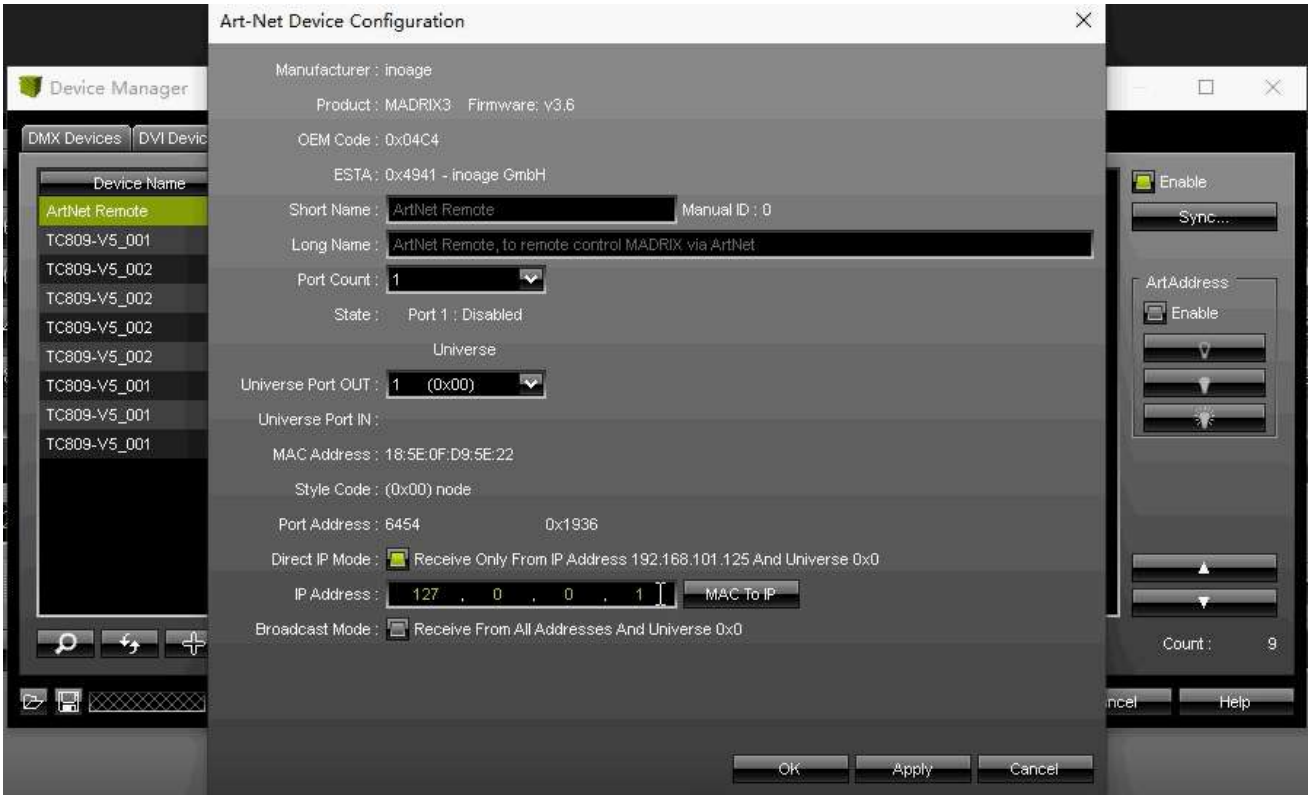
10.2.1. Select the "Art-Net" tab, check the "Enable" checkbox in the upper right corner, click the search button to search for the port of the controller, and click "Apply" below to enable Ethernet output.





10.2.2 Select "ArtNET Remote", click "Sync" in the upper right corner, and in the pop-up "Sync Mode" dialog box, double-click the IP option of the same network segment as the controller to open the synchronization, and set the "Pre-Sync" and " Post-Sync", click on the two checkboxes;
Click "OK" below to activate "Sync". And return to the device management interface.

10.2.3. Double-click "ArtNET Remote" to change **the IP address to "127.0.0.1"** in the pop-up "Sync Mode" dialog box.



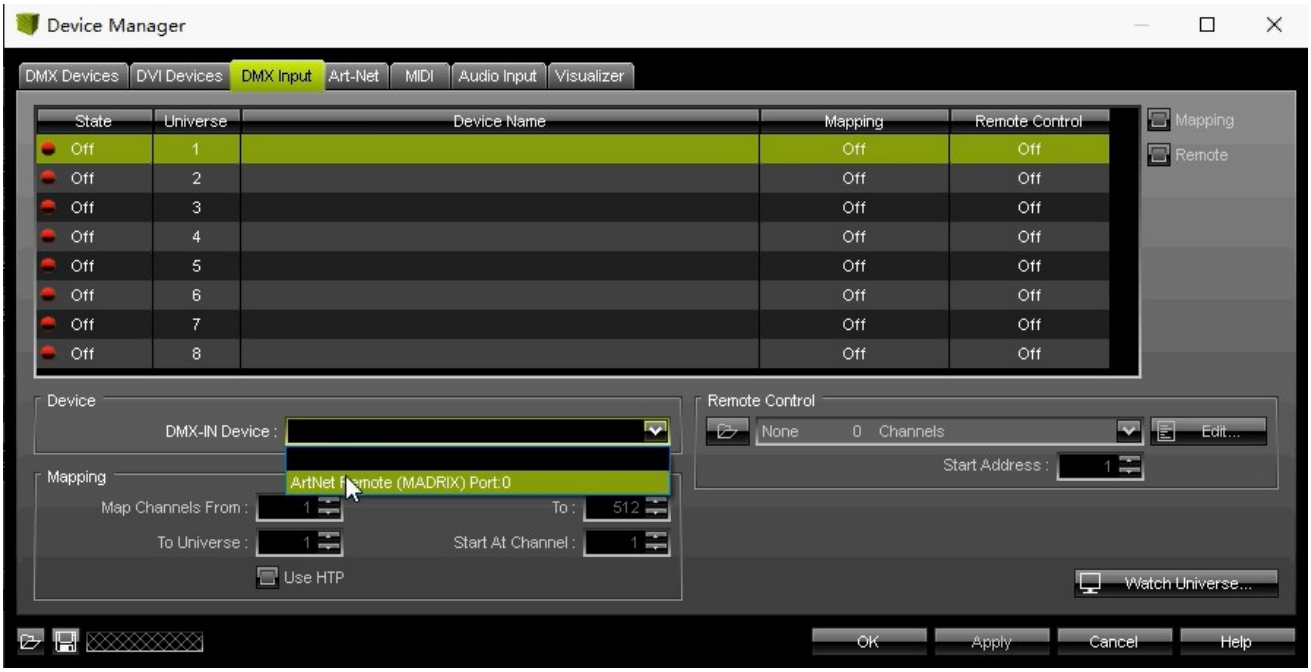
Click "OK" below to complete the settings and return to the device management interface.

10.3. DMX device settings

Select the "DMX Devices" tab, select all devices, activate the "Enable" check box on the right, and click "Apply" below to enable DMX output.

10.4. DMX input settings

1> Select the "DMX Input" tab, select the list item whose space is "1", and select the "ArtNet Remote (MADRIX) Port:0" option in the "DMX-IN device" option box.



2> Activate the "Remote" checkbox in the upper right corner, and select the "Simple 4 Channels" option in the "Remote Control" option box.

Click "OK" below to complete the settings and return to the main interface.

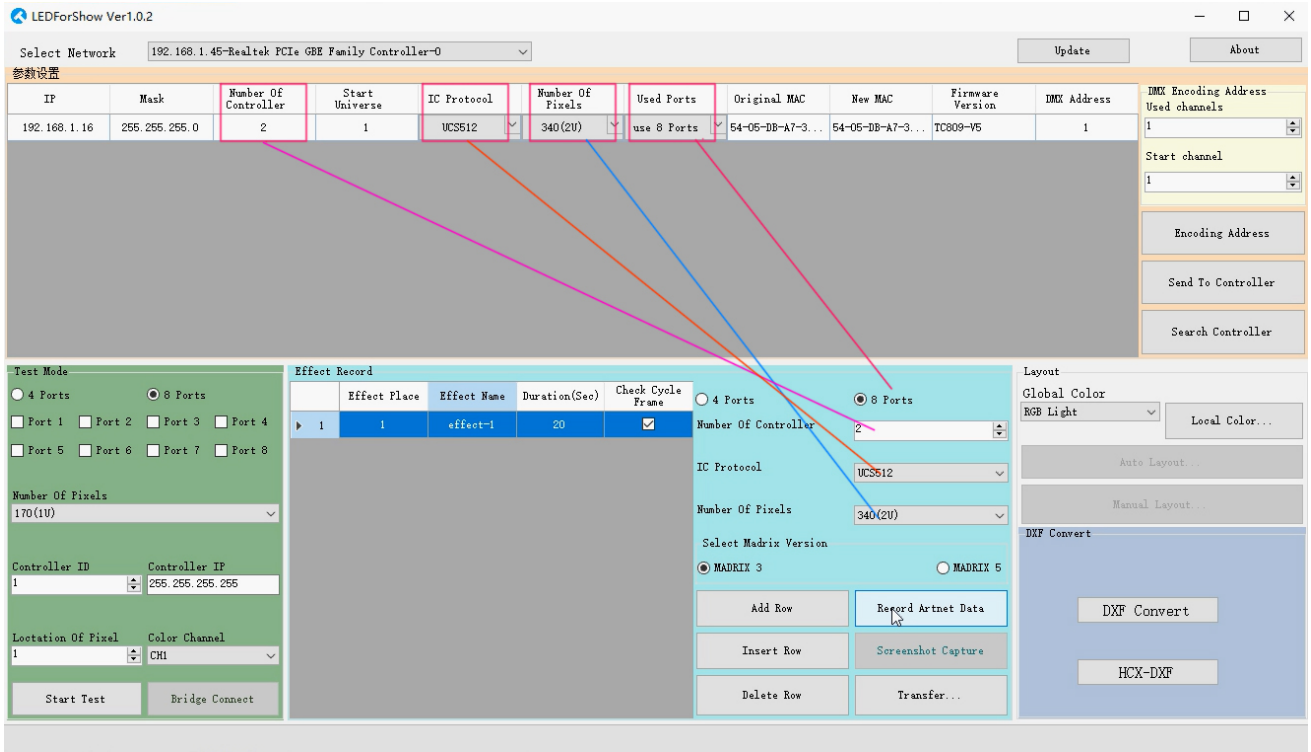
Note: The "Mapping" checkbox in the upper right corner should be kept in a dormant state.

Tips: The 10.2.2, 10.2.3 and 10.4 settings in MADRIX above are mainly for "MADRIX effect recording" service.

10.5. MADRIX effect recording

10.5.1. Debug the lighting effect program on MADRIX.

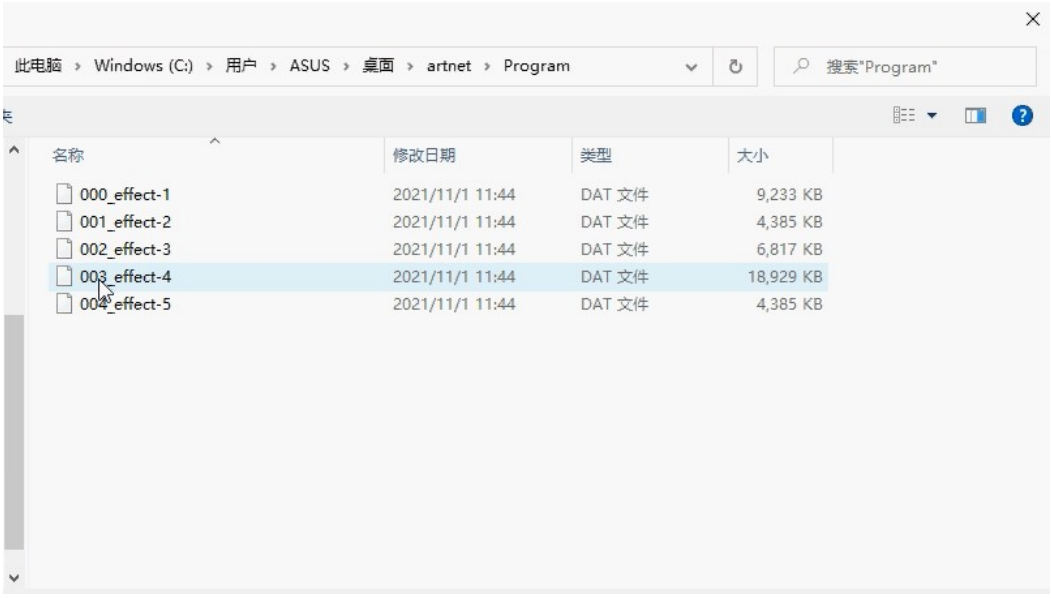
10.5.2. Controller setting software "Effect Recording" setting box port mode, number of controllers, chip type and port loaded pixels are set to be consistent with the parameters of the main controller (the first controller connected to the computer)



10.5.3. The number of rows in the effect list under the effect recording is added according to the lighting effect program debugged by MADRIX. Click "Add a row" or "Insert a row" once, and the effect list will increase by one row accordingly. Click "Data Recording", MADRIX automatically jumps to the first effect program to play, and the software also records in the first line at the same time.

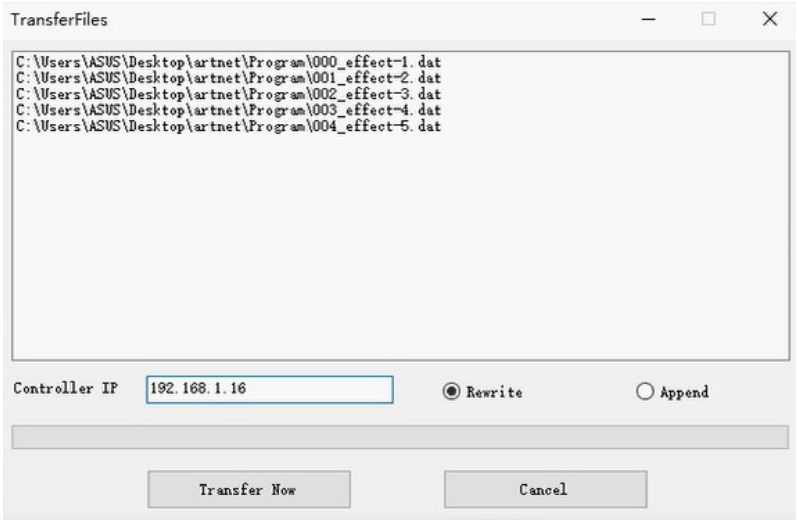
After the effect is recorded, the file save window pops up, select the save path, and click "OK" to save.

10.5.5. The function of downloading to the controller can download the recorded effect program to the SD card of the controller through the Art-Net network without plugging or unplugging the SD.



When multiple effect program files are stored in the SD card, the naming of each file must start from "000" and be named in an increasing manner of "001, 002, 003...010, 011...". There must be no missing in the middle.

Click "Transfer" to pop up a file browsing window, find the save path of the effect file, select all the effect files (.dat), click "Open", and a download window will pop up.



Keep the controller IP address input box as the default or enter the file you want to download to Click "Rewrite" or "Append" to set the IP address of the controller, click "Transfer Now" to download the effect file.

Note: Rewrite: The controller formats the SD card first, and then downloads the effect file.
Append: The controller does not format the SD card first, and directly downloads the effect file.
When there are the same files, the new effect file will overwrite the old one.
And you can also use a card reader to copy the effect file directly to the SD card.

Please watch the detailed video tutorial for specific operation
https://www.youtube.com/watch?v=dLiyfutyoq4

11. DMX512 Application

11.1. DMX channel table

Each controller occupies 8 DMX channels, the channel description is as follows:

CHANNEL	DMX Value	Function	illustrate
Channel 1	0-255	Effect switching	SD card effect file switching
Channel 2	0-255	Speed adjustment	Effect playback speed adjustment, from slow to fast
Channel 3	0-255	R dimming	R dimming, linear dimming, from dark to bright
Channel 4	0-255	G dimming	G dimming, linear dimming, from dark to bright
Channel 5	0-255	B dimming	B dimming, linear dimming, from dark to bright
Channel 6	0-255	Total dimming	R, G, B, total dimming, linear dimming, from dark to bright
Channel 7	0-255	Effect reversal	Change direction switch
Channel 8	0-255	Total strobe	R, G, B, total strobe, from slow to fast

11.2. Master-Slave System

11.2.1. Synchronous playback of multiple controllers

In practical applications where multiple controllers are required to play simultaneously, one of the controllers is set as the master (with SD card inserted), and the others are set as slaves (without SD card).

11.2.2. Cascade mode

Through Art-Net signal cascade, that is, the NET-OUT of the master is connected to the NET-IN of the No. 1 slave, the NET-OUT of the No. 1 slave is connected to the NET-IN of the No. 2 slave, and so on.

11.2.3. Slave arrangement

The sub-controller connected to the master is the No. 1 slave, the sub-controller connected to the No. 1 slave is the No. 2 slave, and the sub-controller connected to the No. 2 slave is the No. 3 slave, and so on. When the position of the slave is changed, the sequence will also change automatically. For example, the No. 2 slave and the No. 4 slave are interchanged. After accessing the network, the original No. 4 slave will be automatically recognized as the No. 2 slave, and the original No. 2 slave will be recognized. It is the No. 4 slave and does not need to be reset.

———————OVER———————