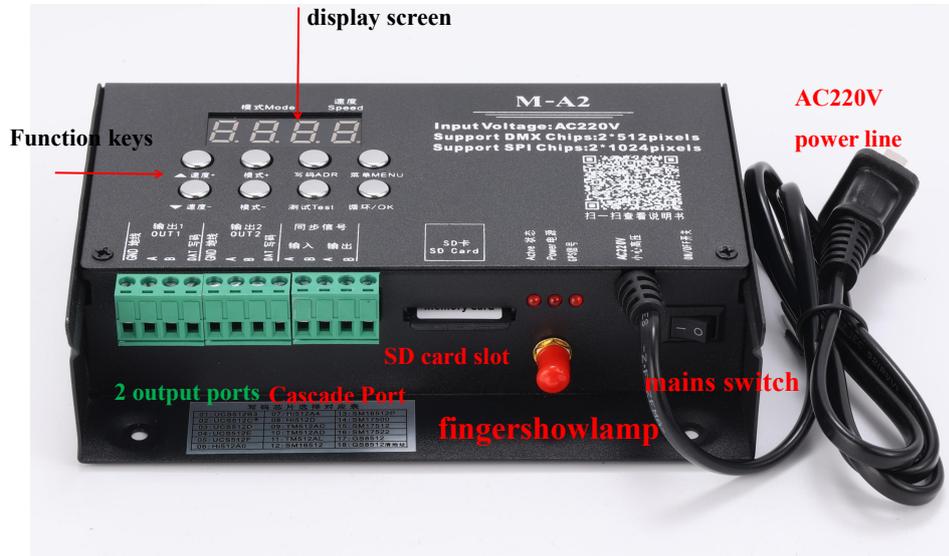# M-A2 Controller Manual

Image (Description):

1. Specific parameters:

1. Power supply voltage: AC220V

2. Load quantity: DMX 2*512; TTL 2*1024 points   Note: Format the SD card before using it.

3.Synchronization methods: offline, GPS synchronization; Installation methods: outdoor rainproof

4. Load mode: SD card program;

5. SD card format: FAT326. SD card capacity: 4G

7. Dimensions: 163*130*45 mm

8. Weight: 0.85kg

II. Features of the M-A2 System

1. Grayscale control from level 32 to 65536 with software Gamma correction.

2、   Supports various point, line, and surface light sources, as well as regular and irregular shapes.

3. The controller port supports DMX 2×512pixels and SPI 2×1024 lights.

4. Utilize AC220V alternating current power supply. Configure corresponding controller ID numbers for multi-unit cascaded synchronization. During synchronization, only the first controller

operates while subsequent units function as sub-controllers. Employ Simple LED programming software to export multiple program files during multi-unit synchronization. The sequence number at the end of each file name is copied to the corresponding controller, which identifies the program content based on the ID sequence.

5、 The M-A2 supports unlimited file storage, but the total capacity must not exceed the SD card's limit. To optimize performance, compress program files to their smallest size. The dual ports operate independently without interference.

6、 For GPS satellite signal synchronization, whether used individually or in multi-unit systems, the controller must be equipped with an SD card. The program must be copied to the SD card, and the controller's corresponding ID number must be set. The controller automatically reads the program content from the designated section.

7、 Supports standard RGB (serial, DMX512) and RGBW (UCS2904, SK6812, DMX512) lighting.

8、 **The controller now features a one-touch reset function. To activate it, press and hold the** **cycle/OK** **button and the** **speed +/-****buttons simultaneously on the main interface.**

3. Digital display and button meaning:

Menu Display	Digital display	liquid-crystal display	Chinese translation
①	1-c P	Set Chip x x x x	Set chip
②	2-b r、g-22	Set Bright 100%	Set brightness and gamma values
③	3-r F	Set RF Mode	Set RF band
④	4-r g b	Set RGB Mode	Set up light channel
⑤	5-R T C	RTC :1970-00-00	Timer
⑥	6:d-0 1	ID :01	Set ID number
⑦	7：c 150	AC Delay：150MS	a-c cycle
⑧	8:50 HZ	WorkMode:50HZ	service frequency
⑨	9：A024	Led：1024	Load point settings
⑩	10：ch-0	Ch：RGB	Built-in Insertion W channel
⑪	11：V 685	VER 6.85	Version sequence

4. Main interface display instructions:

F: represents single built-in mode run; press the **cycle/OK** key to switch to E: represents all built-in cycles.

d: represents running a single SD card file; press the **cycle/OK** button to switch to A: represents cycling all SD cards

Key name	meaning
velocity +/-	Switch speed directly on the main interface, and use up/down buttons in other states.
pattern +/-	Switch directly between controller built-in programs and SD card programs on the main interface.
coding (ADR)	Light fixture address to make the light fixture sequence normal.
test (Test)	There are five test effects in total, which detect whether the signal is smooth, whether the power supply is sufficient, and whether the code is correct.
recurrence (OK)	After completing the above items, press OK to confirm, save, return, or exit.
Menu (MENU)	Settings: Chip, brightness, RF band, channel, time, ID number, synchronization frequency, operating frequency, point settings, built-in insertion_W, version number

5. Operation Steps

1. Set the chip (CHIP):

The chip is the model of the lamp used. The commonly used chip models in the market are as follows:

UCS1903、UCS1904、UCS2909、UCS2903、UCS1912、TM1803、TM1804、TM1809, TM1914

(resuming from breakpoint), WS2811, WS2812, WS2818 (resuming from breakpoint)、SM16703,

SK6812, SK6814, GS8206 (Resume from Breakpoint), GS8205 (Resume from Breakpoint)

For UCS5603 (Resume from Breakpoint) and P9883 (Resume from Breakpoint), select the appropriate chip model for each controller.、UCS512C series, B series, D series; SM16512, TM512AC

Full-color lamps are controlled by chips. No matter what kind of full-color lamps are used, there are models, so it is necessary to clarify the specific chip model of the lamps before using them, and know the model before operating the controller.

The specific steps are as follows:

Step 1: Press the **MENU** button to enter

Step 2: Press the **cycle/OK** button to enter the chip selection interface

Step 3: Press **Speed +/Speed-** to switch the chip model and select the corresponding model for the lamp.

Chip selection correspondence table			
1:512-7	**2:512H**	**3:512L**	**4:1903**
4:2904	**5:6503**	**6:1804**	**7:1914**
8:8206	**9:9883**	**10:6703**	**11:6812-RGB**
12:6812-RGBW	**13:2811**	**14:2812**	**15:1923**
16:1814	**17:8603**	**18:2603**	**19:6813**

Step 4: Press the **cycle/OK** button to save to the controller, and the lamp will start to work.

1.2. Switch Mode (MODE):

The system features two modes: SD card program mode and built-in effect mode, with seamless switching between them. Press and hold the **cycle/OK** button for 3 seconds to toggle modes. For users who prefer custom programming over the controller's built-in effects, developers can design programs and copy them to the SD card. For basic outline effects requiring minimal

variations, the built-in effects library (86 options in total) provides sufficient flexibility.

SD card program mode: it is designed by program software, according to customer requirements, or designed by the designer.

The specific operation steps are as follows:

Step 1: Press the **cycle/OK** button for 3 seconds to switch between the SD card program and the built-in program. The interface will display as follows

d: SD card program mode; 01: First program; 5: Speed 5

Step 2: Press the **Speed +/-** key to switch between mode files.

Step 3: Press the **speed +/-** button to adjust the controller speed.

Press the **cycle/OK** key once to toggle between single-program loop and all-program loop.

d: represents a single loop of the SD card program; A: represents all loops of the SD card program.

F: represents a single loop in the built-in program; E: represents all loops in the built-in program

Built-in effect mode: (Built-in effects can be activated with or without the controller card. In short, it is independent of the SD card.)

The controller comes with built-in effect programs, which are relatively basic and mainly used to test whether the lamp is working properly and whether the controller is working normally. If you want more gorgeous effects, you need to write a program file and place it on the SD card. Some simple contours can be used with the built-in effects.

The specific operation steps are as follows:

Step 1: Press and hold the **cycle (OK)** button for 3 seconds until the interface appears

```
F.0.1.5
```

F: Controller built-in program mode; 01: First program; 5: Speed 5

Step 2: Press the**Speed +/-**button to switch between programs. There are 86 modes in total.

```
F.0.2.5
```

Step 3: Press the **speed +/-**button to switch the program speed.

```
F.0.2.4
```

Press the **cycle/OK** key once to toggle between single-program loop and all-program loop.

```
E.0.1.5
```

d: represents a single loop of the SD card program; A: represents all loops of the SD card program.

F: represents a single loop of built-in programs; E: represents all built-in program loops.

2. Adjust brightness (Bright):

When the brightness of the actual lamp is too bright or too low, the brightness value can be adjusted appropriately. Only the overall brightness can be adjusted, 5% -100% grade. The higher the 100%, the higher the brightness.

Step 1: Press the **MENU** button twice. The interface will display as follows

```
2.0.b.r
```

Step 2: Press the **cycle/OK** button to enter the brightness adjustment interface.

```
1.0.0.0
```

Step 3: Press the **Speed+/-**key to switch the digital level and select the appropriate lamp brightness

(005-100). The higher the number, the brighter the light.

Step 4: Press the **cycle/OK** button to save to the controller, and the lamp will adjust to the selected brightness.

2.1 Set gamma value:

Step 1: Press the **MENU** button twice. The interface will display

Step 2: Press the **cycle/OK** button twice to access the gamma value adjustment interface.

Step 4: Press the **Speed+/-**key to adjust the gamma value. Save the setting by pressing the **cycle/OK** key to return to the main interface.

3. Communication synchronization delay: (not enabled)

4. Channel switching:

The channel refers to the sequence of R, G, and B in a light fixture, with a total of 7 possible sequences. When there's a discrepancy between the designed color profile and the actual color output of the light fixture, it indicates a misalignment in the RGB sequence. Therefore, the controller must adjust the RGB sequence accordingly.

The specific operation steps are as follows:

Step 1: Press the **MENU** button four times. The interface will display as follows

Step 2: Press the **cycle/OK** button again to confirm entering the channel selection interface.

Step 3: Press the **Speed+/-**key to switch channels (RGB, RGB, GBR, GRB, BGR, BRG, RGBW) and select the channel for the light fixture.

Step 4: Press the **cycle/OK** button to save and return to the main interface.

5. Time setting: (add battery, start the timer function, and the timer starts to work)

6. ID Configuration: When multiple controllers operate in parallel, users can assign unique ID numbers to each controller or develop separate programs for each unit. If ID assignment is required, configure them in sequential order. The default ID for standalone operation is 0001. Note that during programming, the drawing port number will be assigned automatically. For example, ports numbered 1-2 will be designated as the primary controller.

Step 1: Press the **MENU** button 6 times. The interface will display as follows

Step 2: Press the **cycle/OK** button to enter the ID setting interface.

Step 3: Press the **speed +/-**button to switch the number and select the corresponding number for the controller.

Step 4: Press the **cycle/OK** button to return to the main interface.

7. Set AC frequency:

Step 1: Press the **Menu** button 7 times. The interface will display

Step 2: Press the **cycle/OK** button to enter the AC frequency setting interface.   flashes 150 times.

Step 3: Press the speed +/-key to switch the number (0-999) and select the corresponding number for the controller.

8. WorkMode: Normal (Feature not enabled)

9. Load quantity setting:

Step 1: Press the menu key 9 times. The interface will display

Step 2: Press the **cycle/OK** button to enter the load quantity setting. The A 0 2 4 indicator flashes.

Step 3: Press the **speed +/-**key to switch the number (24--1024) and select the corresponding number for the controller.

10. Insert _W effect, supports RGBW lighting display:

Step 1: Press the **MENU** button 10 times. The interface displays

Default RGB, no W channel

Step 2: Press the **cycle/OK** button to enter the switching interface

Default W is first, WRGB

Default W is in the second position, RWGB

Default W is in the third position, RGWB

Default W is in the fourth position, RGBW

Step 3: Press the **cycle/OK** button to save and return.

11. VER: 6.85 Controller version number, upgrade according to manufacturer requirements

12. Addressing Code Assignment: (For DMX512 lighting fixtures, manufacturers may assign individual addresses during production testing. However, on-site installation with varying methods and sequences may cause address code duplication or offset. Therefore, a controller is required to uniformly assign codes to all installed fixtures.)

Before the operation, it is necessary to determine the chip model of the lamp, the chip writing channel, and check whether the wiring of the controller is correct and whether the direction of the

lamp is correct. After determining these, the operation of writing code can be started.

The specific coding steps are as follows:

Step 1: Press the ADR key to enter the chip selection mode.

Step 2: Press the **speed +/-**key to switch the chip

Write code chip selection table		
01：UCS512B3	07：Hi512A4	13：SM16512P
02：UCS512C*	08：Hi512D	14：SM17500
03：UCS512D	09：TM512AC	15：SM17512
04：UCS512E	10：TM512AD	16：SM17522
05：UCS512F	11：TM512AL	17：GS8512*
06：Hi512A0	12：SM16512	18: Clear address GS8512
19：UCS512KH	20：UCS512KL	21：UCS512K-
22：UCS512K0	23：UCS512KF	24：GS852*
25：GS852*--		

Step 3: Press **Cycle/OK** to enter the channel selection interface

Step 4: Press the **speed +/-**key to switch channel count, press the **ADR** key to the previous layer.

Step 5: After confirming, press the **Cycle/OK** button to enter the port selection interface

Write code for all ports together

Step 6: Press the **speed +/-**key to select the port for writing the address code

Write code for the first port

This pattern repeats, resulting in a total of 2 ports.

In cascade synchronization, all subsequent controllers follow the selection of the first controller.

Step 7: After confirming, press the **Cycle/OK** button to enter the start channel selection interface

Start channel: Note that channels are counted from RGB has 3 channels, RGBW has 4 channels.

For example, for a point light source like an RGB light, how many channels should you select when writing code starting from the sixth point?

For the sixth point, the starting channel is calculated as 3 channels multiplied by 5 plus 1, totaling 16. To skip the first 5 points, select 16 as the starting point.

Summary formula: S=3/4*N+1, where S is the starting channel and N is the skipped light fixture

Press the ADR key to return to the previous operation.

Step 8: After the channel, port, and starting channel are confirmed:

Press the **cycle/OK** key to start writing code

Display content: IC: 0X, Channel: CH0X, Port: POAL/PO-X

The representative is writing code

Code completion

During the coding process, check if the lamp's status changes during coding. Once completed, it automatically switches to the measurement point interface.

This interface is consistent

with the measurement point operation below

Step 9: After completing the code writing operation, if there's no need to replace the lamp or reconfigure the chip channel post-repair, the controller introduces a one-touch code writing feature: Press and hold the Write Code (ADR) button for 3 seconds. The controller interface will automatically display all previous code writing data and initiate the writing process.

Note: Check if the lighting fixtures are programmed to operate sequentially or manually switched to add them one by one. A normal sequence indicates success; an abnormal sequence requires further programming or troubleshooting to identify the cause of failure.

Common reasons for unsuccessful coding:

①、The lamp's signal direction is incorrect. Although DMX512 uses parallel bidirectional signal transmission, the code writing direction is unidirectional.

②、The wiring problem of the lamp is not correct. Check the controller port and the wiring sequence of the lamp.

③、The power supply of the lamp is insufficient, so the chip cannot be driven to write code.

④、The signal line of the lamp is too long to exceed the effective distance range of the chip.

13. Set up the test (Test):

The following scenarios require the test function: ① Unclear number of lights ② Unidentified channel sequence (RGB, RGB, GRB, GBR, BRG, BGR) ③ Presence of faulty pixels ④ Insufficient power supply ⑤ Normal DMX512 address encoding (including code corruption). All these issues can be effectively diagnosed using the test function.

Step 1: Press the **Test** key to enter the test interface

Step 2: Press the **speed +/-**button to switch the 3/4 channel lights. For example, use 3 channels.

Step 3: Press the **cycle/OK** button. The interface displays

Step 4: Press the **speed +/-**key to switch the digital selection to the corresponding port test.

Step 5: Press the **cycle/OK** button to enter the manual measurement interface.

Step 6: Press the **speed +/-**key to manually test each individual unit sequentially, from1 to 1024.

Step 7: Press the **MENU** button to automatically measure the point, then press it again to return to

the manual measurement interface.

To test the RGB channel sequence of the light, press the **Test** button in the manual measurement

interface.
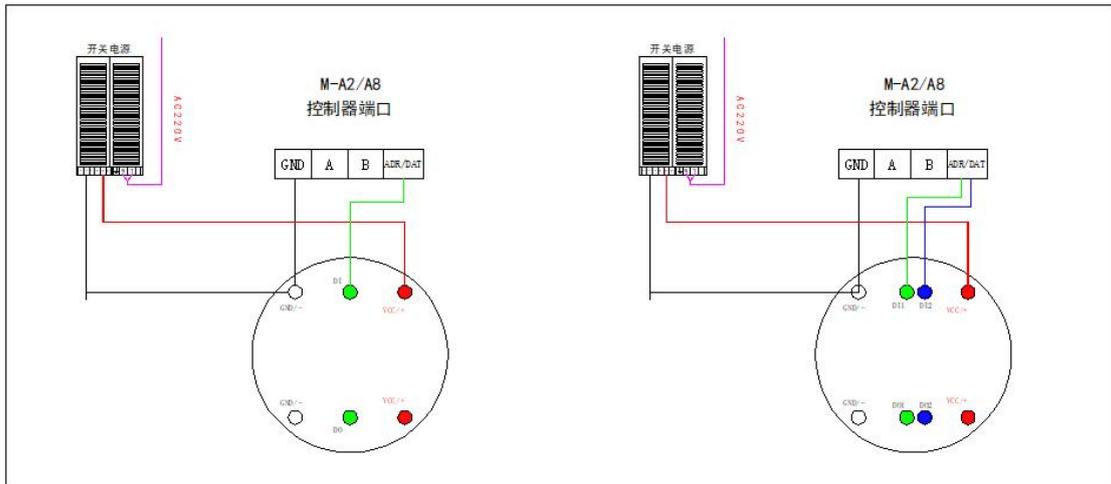

Press the Test key again to switch to the next color.

| **- 2 - -** | **- 3 - -** | **- 4 - -** | **- 5 - -** |

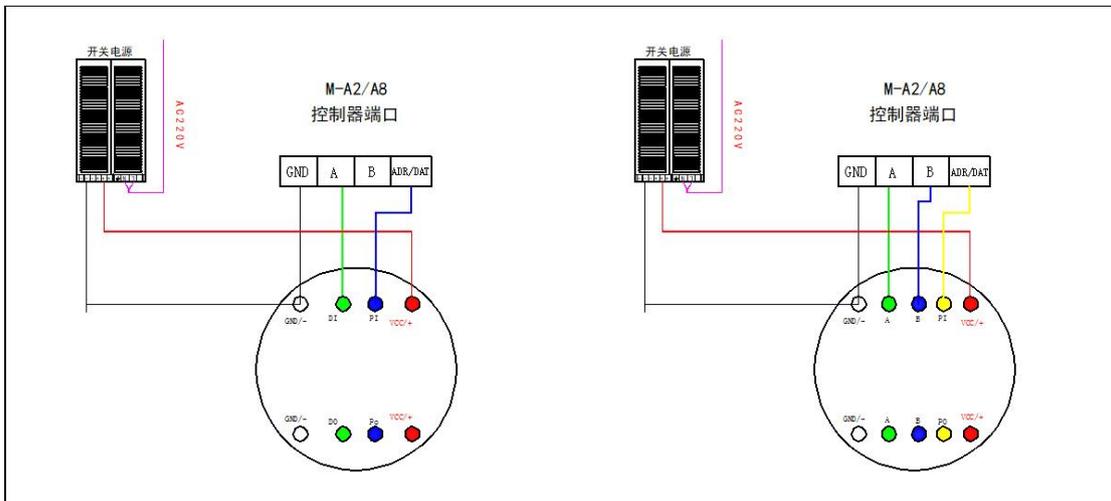Always red Always green Always blue Always white

The color sequence of the lamps is the channel sequence of the lamps

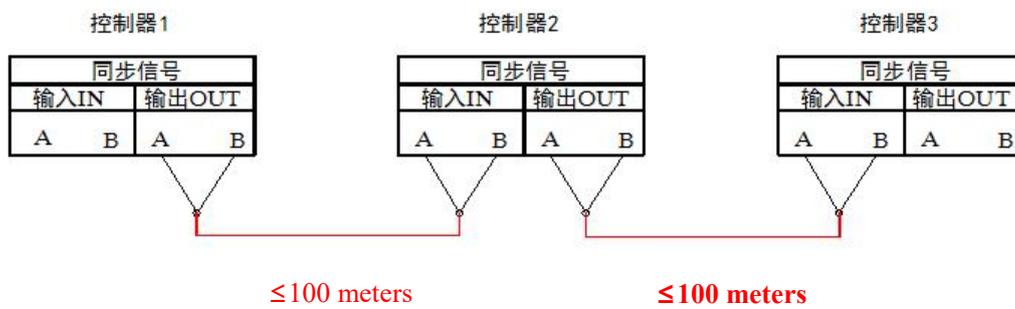Step 2: After completing the T**est**, press the **cycle/OK** button to return to the main interface.

6. Wiring Diagram: SPI Series

DMX Series:

7. The cascade diagram is as follows:

≤100 meters   **≤100 meters**

Line Notes:

①、Do not operate the lamp under power during the actual wiring process. Cut off the power supply before wiring, changing the wire or changing the lamp.

②、SPI signal lights are directional, so determine the direction of the lights before operating.

The PI input of the controller port connects to the PO output of the controller, which then connects to the next light fixture. ⟶ **PI lamp ends PO---PI** **The PI input of the controller port connects to the PO output of the controller, which then connects to the next light fixture.**

③、The controller is powered by AC220V high-voltage electricity. Please pay attention to safety during use.

④、The controller's SD card has limited capacity. Keep file sizes under 5000 frames when creating programs.

⑤、The controller is vertically suspended to prevent rainwater from falling into the interior.

⑥、The M-A2 controller integrates DMX512 and differential signals, with two independent output ports that operate without interference. The transmission distance of the lamp varies depending on the chip used in the market.

⑦、The controller is GPS synchronized, and the packaging box is equipped with a GPS antenna. Please keep it properly.

⑧、As GPS is the BeiDou satellite positioning system, the GPS antenna must be placed outdoors in an open area during testing, free from solid obstructions.