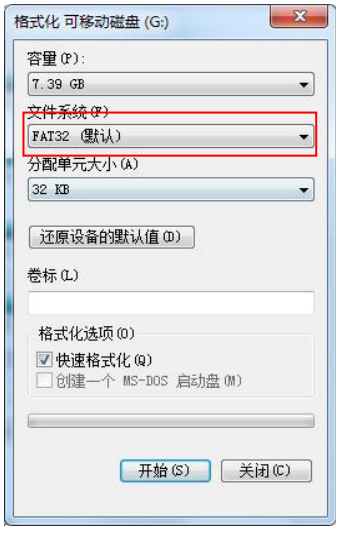
H2-AC GPS Controller Manual

I. Introduction to the controller:

Note: Format the SD card before using it.



2. Detailed parameters:

1. Power supply voltage: AC220V

2. Control mode: TTL serial

3. Synchronization method: Satellite synchronization

4. Dimensions: 162×127×42 mm

5. Weight: 0.85kg

6. SD format: FAT32

7、SD capacity ： 256M

2. Features of (H2-AC) + GPS products:

1. Solve the problem that controllers cannot be synchronized between buildings because cable lines cannot be installed.

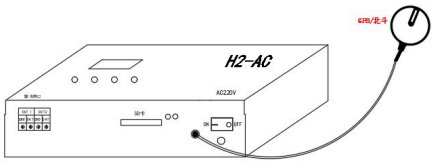
2. The GPS synchronization method enables controller synchronization anywhere with satellite signal reception, ensuring global availability.

3、The external antenna, which separates the antenna from the GPS synchronization module, can receive satellite signals better, faster and more reliably.

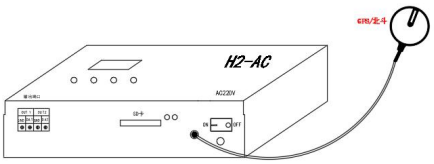
Note: The GPS global synchronization module antenna must be placed outdoors, not in indoor enclosed spaces.

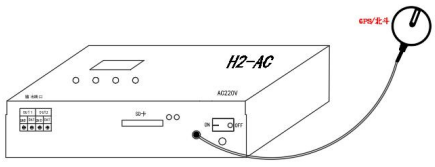
3. Working principle:

The GPS+H2-AC offline control system, or GPS+H2-GPS configurations, features independent offline master controllers with synchronized operation. It employs software-driven automatic image segmentation, where each controller operates independently while maintaining unified performance. By implementing time synchronization between controllers to achieve frame synchronization, the entire display is realized, providing a reliable theoretical foundation for H2-AC-GPS's GPS synchronization. The H2-AC-GPS offline controller continuously receives world time data from GPS satellites via its module, ensuring seamless frame synchronization between controllers.



Speed and mode consistent





Problem 1: Two or more GPS devices fail to sync after power-on

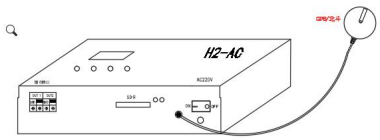
Answer: 1) The GPS global synchronization module's antenna is not deployed outdoors, preventing it from receiving satellite synchronization signals.

2) The controller's excessive pixel count prevents it from matching the frame rate synchronization capability of the GPS global synchronization module.

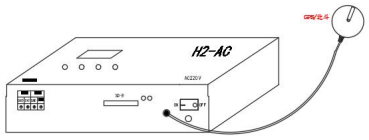
4、Operation mode (GPS synchronization has two options)

Option 1: Copy files with different ID numbers to the SD card without distinction using the same effect file

ID：001



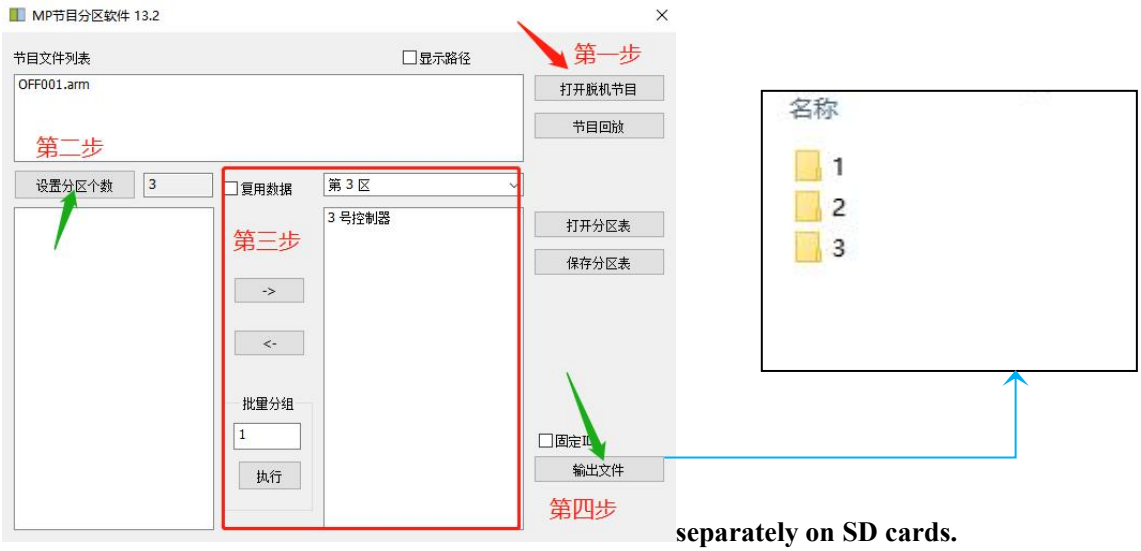
ID：002



Speed and mode consistent

For setting the specific ID number, refer to the controller operation steps below.

Option 2: Same ID number, different effect files (program sections). Copy files



separately on SD cards.

The controller SD card copies the corresponding files:

Controller 1------Folder 1-----OFF001.arm

Controller 2------Folder 2---OFF001.arm

Controller 3------Folder 3-----OFF001.arm

III. Features of H2-AC 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 supports TTL signal-controlled lamps, with each port providing independent output and supporting up to 1024 lamps per port.

4. Operate with AC220V alternating current, each unit runs independently with its own program,

eliminating the need for ID number configuration.

5. The controller utilizes Simple LED program software to generate partition files, which can be directly copied to the corresponding controller.

6. The controller must be equipped with an SD card for both single-unit and multi-unit operation.

7. Supports standard RGB and RGBW lighting (UCS2904, SK6812, TM1814).

8. Add a selection loop feature to allow multiple effect loops.

9. New one-click reset feature: Press and hold the **Cycle/OK** key and the **Speed+**up button simultaneously to power off and restart.

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: runs a single SD card file; press the **Cycle/OK** button to switch to A: runs all SD cards in sequence.

Press and hold the **Cycle/OK** button to switch between built-in mode and SD card mode.

V. Meaning of digital display:

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 g b	Set RGB Mode	Set up light channel
④	4-A024	THE Points	Set points
⑤	5-S100	Set the refresh rate	Set refresh rate
⑥	6-C000	AC Delay：150MS	a-c cycle

6. Button meanings:

Key name	meaning
Speed +/Speed-	Up and down keys for selection, up and down for switching, up and down for channel selection
Mode+/Mode-	Switching between programs
slug （CHIP）	Press the chip key to display the model number on the digital screen. Press up or down to switch to the corresponding lamp model.
test （Test）	There are three test modes in total to check whether the signal is smooth and the power supply is sufficient. Press this button to switch.
Menu (MENU)	Settings: Chip, brightness, channel, points, refresh rate, AC frequency
recurrence （OK）	After completing the above items, press the cycle/OK button to save and switch to cycle mode.

7. The detailed operation steps are as follows:

1. Chip Configuration (CHIP): The chip identifies the lamp model. All standard chips available on the market can be controlled，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 once to enter

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

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

Chip selection correspondence table			
01：1903	**02：6812**	**03：6703**	**04：1804**
05：2904	**06：2811**	**07：2812**	**08：1914**
09：9883	**10：8206**	**11：8205**	**12：5603**

13：1923	14：1814	15:2603	

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

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

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

Step 3: Switch the digital level by pressing the **Speed +/-**key (1-digit) or **MODE+/-**key (10-digit). Select the appropriate lamp brightness (005-100), where higher numbers indicate brighter lighting.

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 3: Switch gamma values using the **Speed +/-**key (1-digit) or **MODE +/-**key (10-digit). Adjust the value to 1.0-5.0.

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

3. 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's definitely due to a misalignment in the RGB sequence. Therefore, the controller should be used to adjust the RGB sequence.

The specific operation steps are as follows:

Step 1: Press the **MENU** button three 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.

4. Set points:

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

Step 2: Press the **Cycle/OK** button to confirm and enter the point setting interface.

Step 3: Press the **Speed +/-**key to switch up to 1024 points and select the desired number.

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

5. Set refresh rate:

Step 1: Press the **MENU** button 5 times. The interface will display as follows

Step 2: Press the **Cycle/OK** button to confirm and enter the refresh rate setting interface.

Step 3: Press the **Speed +/-**button to switch between 50-300 and select the desired refresh rate.

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

6. Sync delay settings:

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

Step 2: Press the **Cycle/OK** button to confirm entering the synchronization delay setting interface.

Step 3: Press the **Speed +/-**key to switch the number (0-999) and select the desired value.

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

7. 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 (130 options in total) provides sufficient flexibility.

7.1. SD card program mode: The program is designed through software, either according to customer requirements or 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 (1-8). The higher the number, the faster the 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

7.2. Built-in effect mode: (Built-in effects can be activated with or without the controller card, which means it's 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: 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.

Step 3: Press the **Speed +/-**button to switch the program speed (1-8).

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 of built-in programs; E: represents all built-in program loops.

8. Set up 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 value (1-1024).

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 8: Press the **Cycle/OK** button to return to the main interface after testing is complete.

9. New feature: Selective loop, allowing you to choose any effect file for looping

For example, select Mode 2 and Mode 5 to loop through the files. The operation is as follows

Step 1: Press the **Speed +/-**key to select the corresponding file mode (d02 mode 2).

Step 2: Press the Select Loop button to confirm the add mode loop. A dot will appear on the screen,

as shown below:Re-select the loop and deselect

Step 3: Press the **Speed +/-**key to select the corresponding file mode (d05 mode 5).

Step 4: Press the Select Loop button to confirm adding this pattern loop. A dot will appear on the screen, as shown below

. Press the Select Loop button again to deselect.

Step 4: Press the Select Loop button to confirm adding this pattern loop. A dot will appear on the screen, as shown below. Press the Select Loop button again to deselect.

Step 5: Press and hold the **Cycle/OK** button to select the cycle mode

Step 6: Press the **Speed +/-**button to cancel the loop.

The built-in effect works the same as the SD card: Fxxx single mode, C.xxx built-in effect selective loop

dxxx Single SD Card Mode A.xxx Selective SD Card Effect Loop

8. Synchronization diagram:

Synchronization conditions: 1. Power on simultaneously (all controllers on the same bus to ensure simultaneous startup)

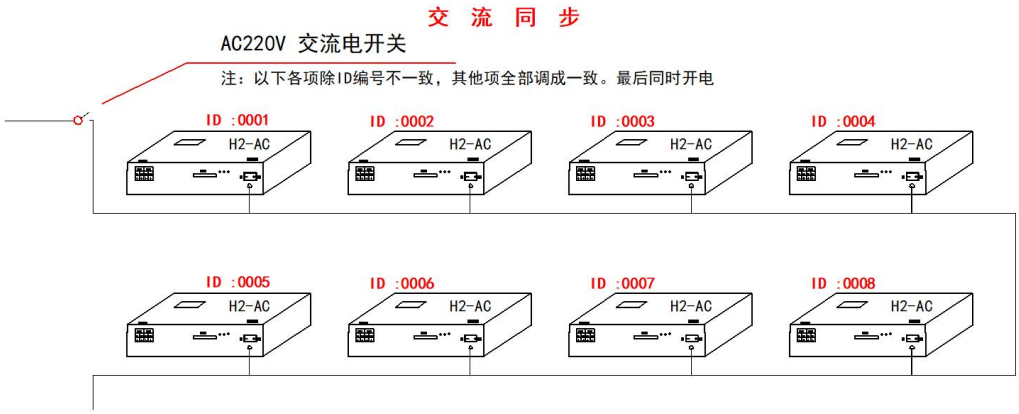
2. All controllers maintain consistent speed values.

3. Set all controllers to the same mode: numerical, single, or loop.

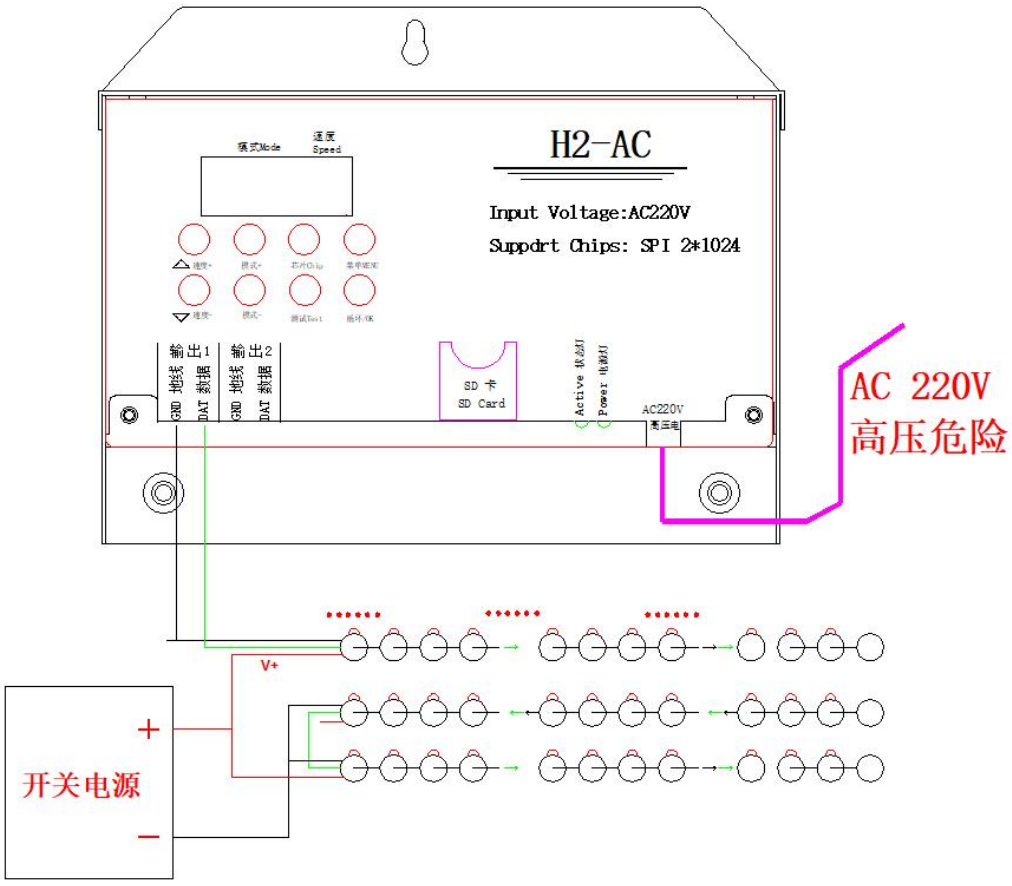
4. All controllers must have SD cards with identical capacities.

5. Brightness values, channel order consistent.

diagrammatic sketch ：



9. H2-AC wiring diagram:



Requirements: 1. The GND must be properly connected to ensure identical grounding.

2. Distinguish data lines: Different chips have different data lines. For conventional chips, one data line is used, while two data lines are used for breakpoint continuation.

3. The positive and negative poles of the power supply and the positive and negative directions of the signal should be clearly marked.