

HX-SPI03

Category: SPI / Pixel Controllers
Source model: HX-SPI03
Internal reference: HOION-CTRL-089

Product Overview

HX-SPI03 controller is designed for controlling digital LED strips, and single color/CCT/RGB/RGBW 4 in 1. It is widely used in buildings, municipal lighting, stage scenery, entertainment venue decoration, etc.; it can realize horse racing, running water, trailing, color painting, scanning, raindrops Various running change effects; convenient wiring, simple to use; with memory storage function; with digital tube display, which can be controlled by the built-in buttons or RF remote control, with mu

Technical Details

Features

This product is a low-voltage SPI controller, the standard product supply voltage is 12-24V;

With 4 in 1 function, compatible with single color/CCT/RGB/RGBW digital LED strips.

- 3. Four groups of SPI signal output ports which can control up to 2048 pixels each port;
- 4. With digital tube and control buttons, it can also be used with RF remote control for mode selection, speed and IC point adjustment;
- 5. With power-off memory storage function;
- 6. There has 29 effect modes for single color, the 28 th mode is automatic loop mode and the 29 th mode is custom combination mode;
- 7. There has 54 effect modes for CCT, the 53 rd mode is automatic loop mode and the 54 th mode is custom combination mode;
- 8. There has 136 effect modes for RGB/RGBW, the 135 th mode is automatic loop mode and the 136 th mode is custom combination mode;
- 9. The controllers can realize multiple synchronous changes through shielded wire connection;
- 10. 3 years warranty, excluding man-made damage, improper operation, overload short circuit or force majeure factors.

Technical Parameters:

- | Working temperature | 0-45℃ | Working voltage | DC12-24V
- | Static consumption | <1W | RF frequency | 2.4GHz
- | Gray level | 256 | Speed level | 99
- | N. weight | 100g | G. weight | 130g
- | Dimension | L160*W46*H25 mm | Packing size | L170*W50*H29 mm
- | Output signal | 4 groups | Max. IC points | 2048
- | RF distance | ≤20m | Modes | Single color: 29; CCT: 54; RGB/RGBW:136
- | Memory function | Yes | Wired-Sync | Yes
- | Compatible ICs |
 - Single color/CCT/RGB: UCS1903
 - ã□□
 - WS2811
 - ã□□
 - WS2812
 - ã□□
 - WS2813
 - ã□□
 - WS2815
 - ã□□
 - WS2818
 - ã□□
 - TM1804
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HX-SPI03

TM1809

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TM1812

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SM16703

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ICP943

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17822

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SK6812

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SK6813.

Single color/CCT/RGBW: UCS2904B

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SM16704

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SK6812

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FW1834.

Remote control:

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LED type |

Remote control

|

Single color/CCT

(2 in 1 remote control) | |

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RFBT03B (1-zone) |

RFBK-DIMCCT-2.4G (4-zone)

|

RGB/RGBW

(2 in 1 remote control) | |

|

RFBT03A (1-zone) |

RFBK-RGB-2.4G (4-zone)

Dimension

Connection ports

Instructions for use

Determine the controller is the master or the sub-controller, and set the DIP switch at the right position, master-ON, sub-controller- OFF;

Connecting the load led strip at first, then connect the power input wires; and make sure that there is no short circuit between the connecting wires before powering on;

The functions of the 4 buttons on the controller are as follows:

| Button | Function description

|

ON/OFF | Turn on/off

|

HX-SPI03

M/S | Switch Mode/speed/brightness adjustment functions

Mode adjustment : digital tube display H*** (***) is 000-029/000-054/000-136, 000 is displayed when controlled by the touch ring on the remote control)

Speed adjustment : the digital tube displays S-** (***) is 01-99), the speed adjustment function is only valid for dynamic mode

Brightness adjustment : the digital tube displays d*** (***) is 001-100), the brightness adjustment function is only valid for static mode

|
UP | Mode+/Speed+/Brightness+, adjust the object according to the setting result of M/S.

|
DOWN | Mode-/Speed-/Brightness-, adjust the object according to the setting result of M/S.

Control IC number setting

In the off state (the controller needs to be powered on), long-press the "UP" and "DOWN" keys at the same time for two seconds, the digital tube displays **** (0010-2048, the current IC point number), means enter the IC number setting interface, Press "UP"/ "DOWN" to increase/reduce the control IC number.

After the setting is completed, press the "ON/OFF" key to save and exit.

Load LED type and LED colors sequence setting

There are a wide variety of digital LED strips in current. This item not only supports the setting of output LED types but also allows for the setting of the color sequence of different LEDs.

Output LED types setting

In the OFF state (need be powered on), press the "UP" and "DOWN" buttons simultaneously for two seconds. After the controller enters the IC number setting interface;

Then press the "M/S" button once to enter the setting of output modes for single color ---1 / CCT --- 2 / RGB --- 3 / RGBW --- 4. You can switch the output modes by using the "UP" and "DOWN" buttons.

LED colors sequence setting

After selecting the output LED type, press the "M/S" key again to enter the setting for LED colors sequence. You can switch by using the "UP" and "DOWN" keys.

|
Output LED type |
LED colors sequence setting

| LED type | Display | Channels and sequence | digital tube display | Marks

| Single color | ---1 | 1 CH | dl | | | | |

| Correct setting indication: The load LED strip will be in a fully lit state.

| CCT | ---2 | 2 CHs | ct | tc | | | | |

| 3 CHs | ct- | tc- | c-t | t-c | -ct | -tc | "-" stands for blank

| Correct setting indication: The CCT LED strip will light up in sequence according to the order of "cool white - warm white - off" as a whole.

| RGB | ---3 | 3 CHs | rgb | rbg | brg | bgr | grb | gbr |

| Correct setting indication: The RGB LED strip will light up in sequence according to the order of "red - green - blue - off" as a whole.

| RGBW | ---4 | 4 CHs | rgb- | rbg- | brg- | bgr- | grb- | gbr- | "-" stands for W

| -rgb | -rbg | -brg | -bgr | -grb | -gbr

| Correct setting indication: The RGBW LED strip will light up in sequence according to the order of "red - green - blue - off" as a whole.

Tips:

For some models of CCT LED strips, one channel has no function and is only used for occupying a position. The "-" in CCT-3CHs means that this channel is blank (no function).

The "-" in "RGBW" stands for "W".

The factory-default colors sequence for RGB/RGBW mode is rgb.

There are various types of digital LED strips. When setting up, the "correct setting indication" appears on the load light strip, means that the setting has been matched, and there is no need to check out the specific of the light strip in advance.

When using the multi-device online synchronization function, please confirm that the load output type and the color sequence settings of all devices are consistent. Otherwise, synchronization abnormalities may occur.

After the setting is completed, press the "ON/OFF" key to save and exit.

Custom combination mode setting

This mode is a free combination mode. Choosing 2-20 modes combine them into a cyclic mode, and each mode can set an independent change speed.

|
LED type |
Total modes |
DIY mode |
Selection range |
Function

| Single color | 29 | The 29 th | 2 nd -27 th | Select 2-20 modes to combine into a custom loop mode, the speed of each selected mode can be adjusted independently.

| CCT | 54 | The 54 th | 4 th -52 nd

| RGB/RGBW | 136 | The 136 th | 8 th -134 th

Step 1 : In the off state, long-press the "M/S" and "Up" buttons at the same time for 2 seconds to enter Custom combination mode settings, the digital tube will light up and display "-**-", "-**-" represents the currently edited scene number. Please use the "UP" / "DOWN" keys to select the scene number to be edited.

For example, we will set a custom combination mode with 5 modes.

Step 2 : Setting the mode for -01-. Press "M/S" after Step 1 "-01-", the digital tube will display "H****". Please use the "UP" / "DOWN" keys to select the needed mode from "Selection range" for "-01-". If the digital tube displays "H000", mean there is no effect was set to current scene.

Step 3 : Setting the speed for -01-. Press "M/S" after Step 2, the digital tube will display "S-***". Please use the "UP" / "DOWN" keys to select the needed speed from 01-99 for "-01-" mode. The status of loading led strips will be changed accordingly.

Press "M/S" after Step 3, the digital tube will display back to "-01-". Please press "UP" / "DOWN" keys to select the next edited scene number and repeat the operation like step2 and step 3 to finish the all other 5 scenes from 2 nd to 6 th . And press the "ON/OFF" key to save and exit in the end.

Important notes: When there are less than 20 scenes set, the scene should start from -01- the first number (because the 136th mode runs from scene "01"), and the scenes without effect need to be set to "H000". Like example that we set 5 scenes to combine the 136th mode, enter the edit menu and edit the respective modes and speeds of scenes "-01-" to "-05-" (can be not in order during the editing operation). After editing, please check the mode of scene "-06-" should be "H000", if not, please correct it by the "UP"/"DOWN" keys.

Synchronization function

The synchronization control function can be formed by connecting up to 32 controllers, all controllers follow the first master control to achieve synchronous changes without delay.

After all the controllers are connected according to the wiring diagram (please make sure the position of the DIP switch of the master and the sub-controller is correct), just turn on the master, and the sub-controllers will change according to the speed and mode of the master. The green signal light on the sub-controller will flash in normal working statues.

Remote control

1/4□

RFBT03A/RFBT03B

| Button | Function description

| | ON/OFF

| Color ring |

Single color 1/4□ Static white light, digital tube displays d***, brightness is adjustable by B+/B-.

CCT: Static CW-WW light, digital tube displays C***, brightness is adjustable by B+/B-.

RGB/RGBW: Static color light, digital tube displays H000, brightness is adjustable by B+/B-.

| W |

Single color: Static white light hot key, digital tube displays d***, 3 brightness 25%/50%/100% hotkeys.

CCT: Static CW-WW light hotkey, digital tube displays H001-H003 (cool white, warm white, pure white).

RGB/RGBW: Static white light hot key, digital tube displays H007, brightness is adjustable by B+/B-.

| M+ | Mode + (Single color: up to 29; CCT: up to 54; RGB/RGBW: up to 136.)

| M- | Mode -

| B- | Brightness- for static light, long-pressing can get fast adjustment.

| B+ | Brightness+ for static light, long-pressing can get fast adjustment.

| S- | Speed- for dynamic light, long-pressing can get fast adjustment.

| S+ | Speed+ for dynamic light, long-pressing can get fast adjustment.

RFBT03A/RFBT03B pairing and clearing setting

| Button | Function | Operation instruction | Marks

|| Pairing

(ON/OFF key) | Connect the receiver to the load and power it on. Press and hold the pairing button for 5 seconds. The indicator light on the remote control will flash rapidly. Then you see the load light blink 3 times and return to its initial state, means the code-pairing is successful. | If the receiver has been paired with other remote controls, please do the clearing operation firstly before pairing.

|| Clearing

(W key) | Within 1 minute after the receiver is powered off and then powered on again, press and hold the clearing key for 5 seconds. The indicator light on the remote control will flash rapidly. Then you see the load light blink 3 times and return to its initial state, means the code-clearing is successful. | The code-clearing operation is only valid within 1 minute after the receiver is powered on.

Remote control

1/4

RFBK-DIMCCT-2.4G/RFBK-RGB-2.4G

| Button | Function description

|| Non-function

|| ON

|| OFF

| Color ring |

Single color 1/4 Static white light, digital tube displays d***, brightness is adjustable by B+/B-.

CCT: Static CW-WW light, digital tube displays C***, brightness is adjustable by B+/B-.

RGB/RGBW: Static color light, digital tube displays H000, brightness is adjustable by B+/B-.

||

Single color: Static white light hot key, digital tube displays H001, 3 brightness 25%/50%/100% hotkeys.

CCT: Static CW-WW light hotkey, digital tube displays H001-H003 (cool white, warm white, pure white).

RGB/RGBW: Static white light hot key, digital tube displays H007, brightness is adjustable by B+/B-.

|| Automatic loop hotkey, digital tube will display H028(Single color)/H053(CCT)/H135(RGB/RGBW).

|| Mode down. Long-press can get fast adjusting.

|| Mode up. Long-press can get fast adjusting.

| | Brightness – for static colors by 100 levels. Long-press can get fast adjusting.

| | Brightness + for static colors by 100 levels. Long-press can get fast adjusting.

| | Speed down for dynamic mode (100 levels). Long-press can get fast adjusting.

| | Speed up for dynamic mode (100 levels). Long-press can get fast adjusting.

| | Zone selection, 2 seconds long-press get “all-control”.

RFBK-DIMCCT-2.4G/RFBK-RGB-2.4G pairing and clearing setting

| Button | Function | Operation instruction | Marks

| | Pairing

(ON key) | Connect the receiver to the load and power it on. Select the right zone, then press and hold the pairing button for 5 seconds. The indicator light on the remote control will flash rapidly. Then you see the load light blink 3 times and return to its initial state, means the code-pairing is successful. | If the receiver has been paired with other remote controls, please do the clearing operation firstly before paring.

| | Clearing

(OFF key) | Powered off the receiver and then powered on again, within 1-minute press and hold the clearing key for 5 seconds. The indicator light on the remote control will flash rapidly. Then you see the load light blink 3 times and return to its initial state, means the code-clearing is successful. | The code-clearing operation is only valid within 1 minute after the receiver is powered on.

Mode table

Single color Modes

|
No |
Mode description |
No |
Mode description

| 1 | Static Mode | 2 | Flashing

| 3 | Flashing 5 times with an interval of 2 seconds | 4 | Fade

| 5 | Horse race to left | 6 | Horse race to right

| 7 | Horse race to right with spacing | 8 | 1-pixel horse race-right

| 9 | Single long-trailing to right | 10 | Single trailing to left

| 11 | Single short-trailing to right | 12 | Double trailing to left

| 13 | Running water to turn on and running back to turn off | 14 | Running water to right and off

| 15 | Running water to left and off | 16 | Running water to right, close and running back

| 17 | Running water and running back | 18 | Trails water to right

| 19 | Horse race 2 directions on low brightness | 20 | High brightness closing

| 21 | High brightness opening | 22 | High brightness opening and closing

| 23 | Stacking to right | 24 | Opening stacking

| 25 | Closing stacking | 26 | Segmented moving come and go

| 27 | Segmented brushing | 28 | Auto loop playback (1-27th)

| 29 | User-defined combination mode | |

CCT Modes

|
No |

HX-SPI03

Mode description |

No. |

Mode description

| 1 | Static Cool white (WW) | 2 | Static Warm white (CW)

| 3 | Static Pure white | 4 | WW, CW jumping

| 5 | 3 colors (WW, CW, Pure white) jumping | 6 | CW and WW fade alternately

| 7 | CW and WW fade in turn | 8 | 1-pixel cool white horse race-right

| 9 | 1-pixel cool warm horse race-right | 10 | 1-pixel Pure white horse race-right

| 11 | 3 colors 1-pixel horse race-right | 12 | 3 colors 3-pixel horse race-right

| 13 | CW running water to turn on and running back to turn off | 14 | WW running water to turn on and running back to turn off

| 15 | Pure white running water to turn on and running back to turn off | 16 | CW running water to end and running back

| 17 | WW running water to end and running back | 18 | Pure white running water to end and running back

| 19 | WW running water and CW running back | 20 | CW running water to right and off

| 21 | WW running water to right and off | 22 | Pure white running water to right and off

| 23 | CW running water and running back | 24 | WW running water and running back

| 25 | Pure white running water and running back | 26 | CW trailing-water to right

| 27 | WW trailing-water to right | 28 | Pure white trailing-water to right

| 29 | CW double trailing to left | 30 | WW double trailing to left

| 31 | Pure white double trailing to left | 32 | CW single trailing to right

| 33 | WW single trailing to right | 34 | Pure white single trailing to right

| 35 | 3-color single trailing to right | 36 | WW trailing on CW

| 37 | CW trailing on WW | 38 | CW horse race 2 directions on WW

| 39 | WW horse race 2 directions on CW | 40 | CW WW opening and closing

| 41 | CW WW closing | 42 | CW closing

| 43 | WW closing | 44 | CW stacking to right

| 45 | CW stacking to right and left | 46 | WW stacking to right

| 47 | WW stacking to right and left | 48 | CW WW stacking to open

| 49 | CW WW stacking to close | 50 | CW WW segmented moving come and go I

| 51 | CW WW segmented moving come and go II | 52 | CW WW segmented brushing

| 53 | Auto loop playback(1-52th) | 54 | User-defined combination mode

RGB/RGBW Modes

|

No. |

Mode description |

No. |

Mode description

| 1 | Static Red | 2 | Static Green

| 3 | Static Blue | 4 | Static Yellow

| 5 | Static Purple | 6 | Static Cyan

| 7 | Static White | 8 | 3 color jumping

| 9 | 7 color jumping | 10 | 7 color flashing

| 11 | Red horse race-right | 12 | Blue horse race-right

| 13 | Purple horse race-right | 14 | Orange horse race-right

| 15 | White horse race-right | 16 | Cyan horse race-right

| 17 | Cyan horse race-left | 18 | 7 color horse race-right

| 19 | 7 color horse race 2 direction | 20 | 7 color jumping horse race right direction

| 21 | White 1-pixel horse race-right I | 22 | Red 1-pixel horse race-right I

| 23 | Green 1-pixel horse race-right I | 24 | Blue 1-pixel horse race-right I

| 25 | White 1-pixel horse race-right II | 26 | Red 1-pixel horse race-right II

| 27 | Green 1-pixel horse race-right II | 28 | Blue 1-pixel horse race-right II

| 29 | White 3-pixel horse race-right | 30 | Red 3-pixel horse race-right

| 31 | Green 3-pixel horse race-right | 32 | Blue 3-pixel horse race-right

| 33 | White 5-pixel horse race-right | 34 | Red 5-pixel horse race-right

| 35 | Green 5pixel horse race-right | 36 | Blue 5-pixel horse race-right

| 37 | Red and white chasing(right) | 38 | Red, white, blue chasing(right)

| 39 | Orange and purple chasing(right) | 40 | Orange and blank chasing(right)

| 41 | Green and white chasing(right) | 42 | Blue and white chasing(right)

| 43 | Red and yellow chasing(right) | 44 | Orange and blue chasing(right)

| 45 | Red and blue chasing(right) | 46 | Blue, purple, yellow chasing(right)

| 47 | Red and green chasing(right) | 48 | Blue and green chasing(right)

| 49 | Pink and purple chasing(right) | 50 | Yellow and green chasing(right)

| 51 | Red, yellow, green chasing(right) | 52 | Yellow chasing(right)

| 53 | Cyan and white chasing(right) | 54 | Cyan and purple chasing(right)

| 55 | Blue, purple, yellow floating | 56 | Red, green, white floating

| 57 | Orange, yellow, red floating | 58 | Red, pink floating

| 59 | Red, white floating | 60 | Blue, white floating

| 61 | Green, white floating | 62 | All color floating

| 63 | White random twinkle strobe | 64 | Red running water I

| 65 | Green running water I | 66 | Blue running water I

| 67 | Yellow running water I | 68 | Purple running water I

| 69 | Cyan running water I | 70 | White running water I

| 71 | Orange running water I | 72 | Cyan trailing right I

| 73 | Cyan trailing right II | 74 | Cyan trailing left

| 75 | Running back and forth with Cyan | 76 | Running back and forth with Purple

| 77 | Red running water II | 78 | Green running water II

| 79 | Blue running water II | 80 | Yellow running water II
| 81 | Purple running water II | 82 | Cyan running water II
| 83 | White running water II | 84 | 7-color running water II
| 85 | Cyan trails water to the right I | 86 | Cyan trails water to the right II
| 87 | 7-color trails water to the right | 88 | Red single trailing right
| 89 | Purple single trailing right I | 90 | Blue single trailing right
| 91 | Cyan single trailing right | 92 | White single trailing right
| 93 | Green single trailing right | 94 | Yellow single trailing right
| 95 | 7-color jumping single trailing right | 96 | 7-color queue single trailing right
| 97 | 7-color in turn single trailing right | 98 | Cyan double trailing left
| 99 | Red double trailing right | 100 | Purple double trailing right
| 101 | Blue double trailing right | 102 | Cyan double trailing right
| 103 | White double trailing right | 104 | Green double trailing right
| 105 | Yellow double trailing right | 106 | 7-color jumping double trailing right
| 107 | 7-color queue double trailing right | 108 | 7-color in turn double trailing right
| 109 | 7-color running water III | 110 | Blue double trailing on Red
| 111 | Red double trailing on Blue | 112 | Green double trailing on Blue
| 113 | Blue double trailing on Green | 114 | Red double trailing on Green
| 115 | Green double trailing on Red | 116 | White double trailing on Blue
| 117 | Double trailing on 7-color | 118 | 7-color opening brushing
| 119 | 7-color closing brushing | 120 | 7-color open-closing
| 121 | 7-color closing | 122 | Red closing
| 123 | Green closing | 124 | Blue closing
| 125 | Yellow closing | 126 | Purple closing
| 127 | Cyan closing | 128 | White closing
| 129 | 7-color stacking right | 130 | 7-color stacking
| 131 | 6-color opening stacking | 132 | 6- color closing stacking
| 133 | 7-color moving | 134 | 7-color brushing
| 135 | Auto loop playback (8-134) | 136 | User-defined combination mode

Connection diagram

Stand-alone Circuit1:

Synchronization Circuit 2:

Note: The first one will be the master, please set the DIP switch to ON position; others from the second one will be the sub-control, please keep the DIP switch in the factory default setting -OFF.

Malfunctions analysis & troubleshooting

|
Malfunctions |

HX-SPI03

Causes |

Troubleshooting

| No light | 1. No power.

2. Wrong connection or insecure.

3. Wrong setting. | 1. Check the power.

2. Check the connection.

3. Check the setting.

| Out of sync when using the sync function | 1. Wrong DIP switch setting.

2. Wrong connection or insecure. | 1. Check the DIP switch setting.

2. Check the connection.

| No response from the remote | 1. The battery has no power.

2. Beyond controllable distance.

3. The controller did not match the remote. | 1. Replace battery.

2. Reduce remote distance.

3. Re-match the remote.

Product information for placing order

| Product name | Item number

| 4 in 1 LED Controller for digital LED strips | HX-SPI03

| 1 zone RGB/RGBW 2 in 1 remote control | HX-RFBT03A

| 1 zone Single color/CCT 2 in 1 remote control | HX-RFBT03B

| 4 zones RGB/RGBW 2 in 1 remote control | HX-RFBK-RGB-2.4G

| 4 zones Single color/CCT 2 in 1 remote control | HX-RFBK-DIMCCT-2.4G

Source reference: <https://www.hoionlighting.com/products/LEDdiaoguangqi/LEDhuancaikongzhiqi/2025/1010/422.html>