HX-SPI01-RFBT03

SPI controller with RF remote control for digital LED strip

HX-SPI01-RFBT03 controller is suitable for controlling LED lamps driven by a variety of different types of chips. 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 with a RF remote control; with multiple online synchronization functions.

Features

1. This product is a low-voltage SPI controller, the standard product supply voltage is 12-24V;
2. Four groups of SPI signal output ports (three-wire digital led strip), which can control up to 2048 pixels;
3. With digital tube and control buttons, it can also be used with RF remote control for mode selection, speed and IC point adjustment;
4. With power-off memory storage function;
5. Contains 136 effect modes, including horse racing, running water, trailing, color brushing, scanning, raindrops and other effects. The 135th mode is the 8-134th automatic cycle mode, and the 136th is the custom combination mode;
6. The controllers can realize multiple synchronous changes through shielded wire connection;
7. This product is guaranteed for three years, excluding man-made damage, improper operation, overload short circuit or force majeure factors.

Technical Parameters:

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Controller:

Working temperature	-20-60℃	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 SPI	Max. control points	2048
RF distance	≤20m	Modes	136
Memory function	Yes	Sync-work function	Yes
Compatible ICs	UCS1903、WS2811、TM1804、SM16703、17822、ICP943		

Remote control:

Working temperature	0-40℃	Working voltage	3V （AAA*2)
Standby current	20uA	Working current	20mA
Standby power	60uW	Working consumption	60mW
N. weight	30g	Dimension	L108*W36*H22 (mm)
RF distance	≤20m	RF frequency	2.4GHz

Dimension

Connection ports

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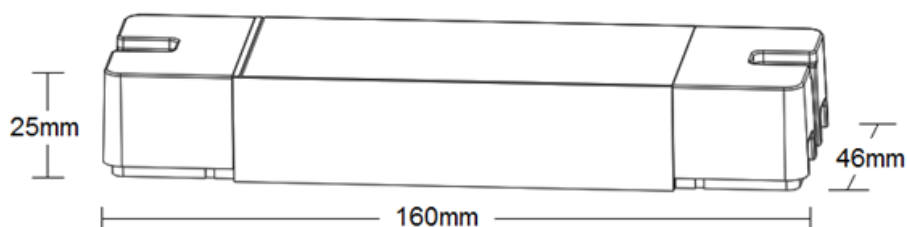
Synchronization signal ports
Power input

Master/sub setting switch
LED output
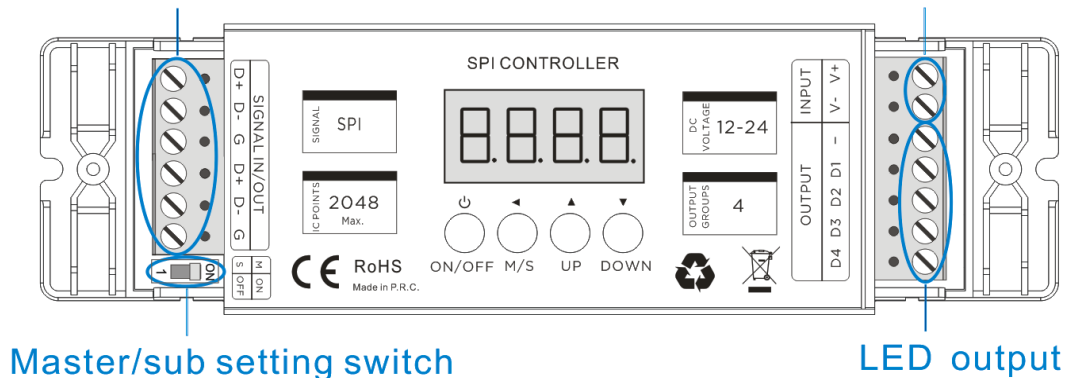
ON: Master

OFF: Sub-controller (factory default)

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
M/S	Switch Mode/speed/brightness adjustment functions **Mode adjustment**: digital tube display H*** (*** is 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) and then enters the control 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.

- ## Custom combination mode settings

This mode is a free combination mode. Choosing 2-20 modes from the 1-134th mode and combine them into a cyclic mode, and each mode can set an independent change speed.

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 1-134th 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 finished the all other 5 scenes from 2nd to 6th. And press the "ON/OFF" key to save and exit in the end.
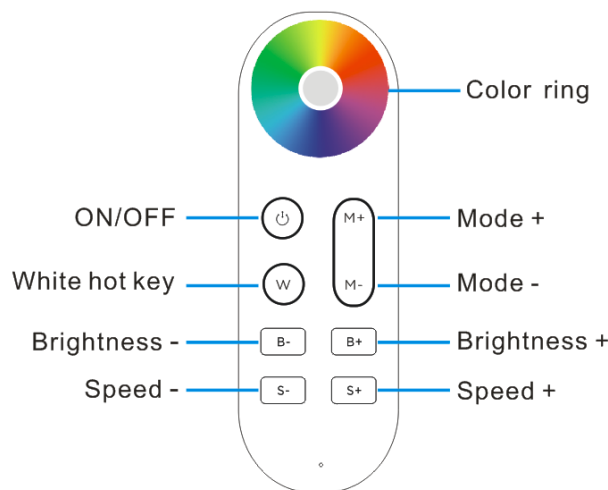
Important notes: When there are less than 20 scenes set, the scene should start from -01- the first number (because the 136th mode runs from scene "01"), and the scenes without effect need to be set to "H000". Like example that we set 5 scenes to combinate the 136th mode, enter the edit menu and edit 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 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 : RFBT03-2.4G

Button	Function description
⏻	ON/OFF in any time

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|		
🎨	Static color options, 64 colors in total, digital tube will display "H000", brightness is adjustable by B+/B-.
W	Static white color hotkey, digital tube will display "H007"
M+	Mode up (136 modes in total). Long-press can get fast adjusting.
M-	Mode down (136 modes in total). Long-press can get fast adjusting.
B-	Brightness – for static colors by 100 levels. Long-press can get fast adjusting.
B+	Brightness + for static colors by 100 levels. Long-press can get fast adjusting.
S-	Speed down for dynamic mode (100 levels). Long-press can get fast adjusting.
S+	Speed up for dynamic mode (100 levels). Long-press can get fast adjusting.

Mode table

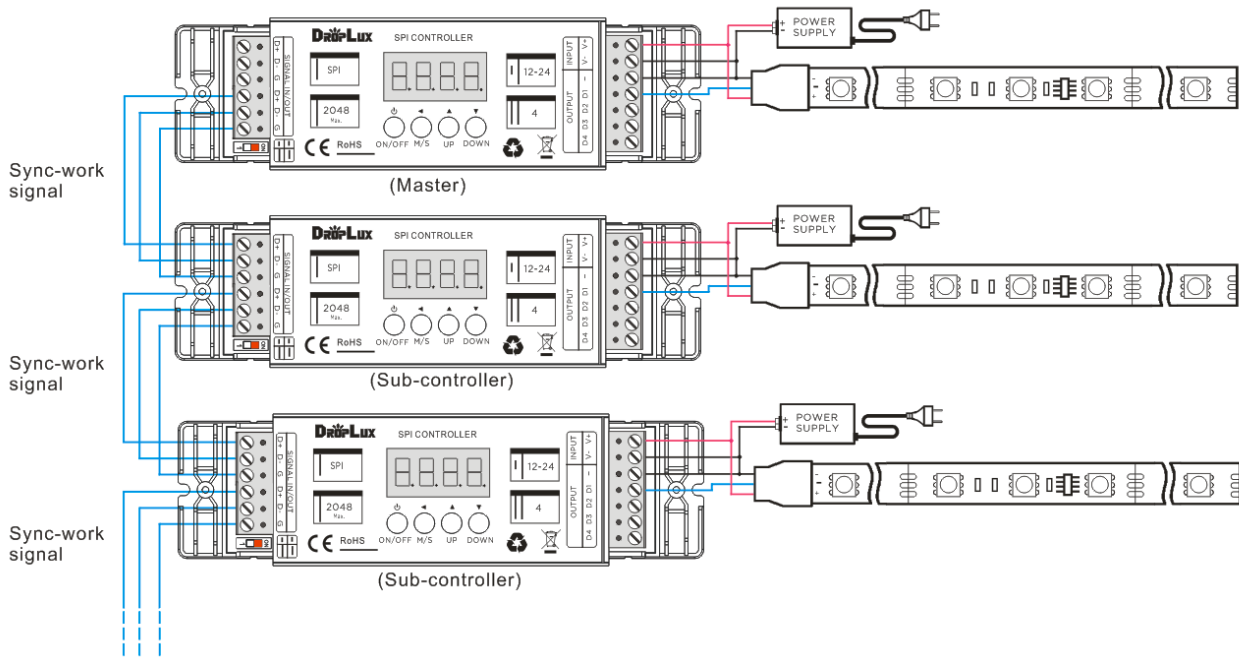| No.	Mode description	No.	Mode description
1	Static Red	2	Static Green
3	Static Blue	4	Static Yellow
5	Static Purple	6	Static Cyan
7	Static White	8	3 color jumping
9	7 color jumping	10	7 color flashing
11	7 color fading	12	Red horse race-right
13	Blue horse race-right	14	Purple horse race-right
15	Orange horse race-right	16	White horse race-right
17	Cyan horse race-right	18	Cyan horse race-left
19	7 color horse race-right	20	7 color horse race 2 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

No.	Mode description	No.	Mode description
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:
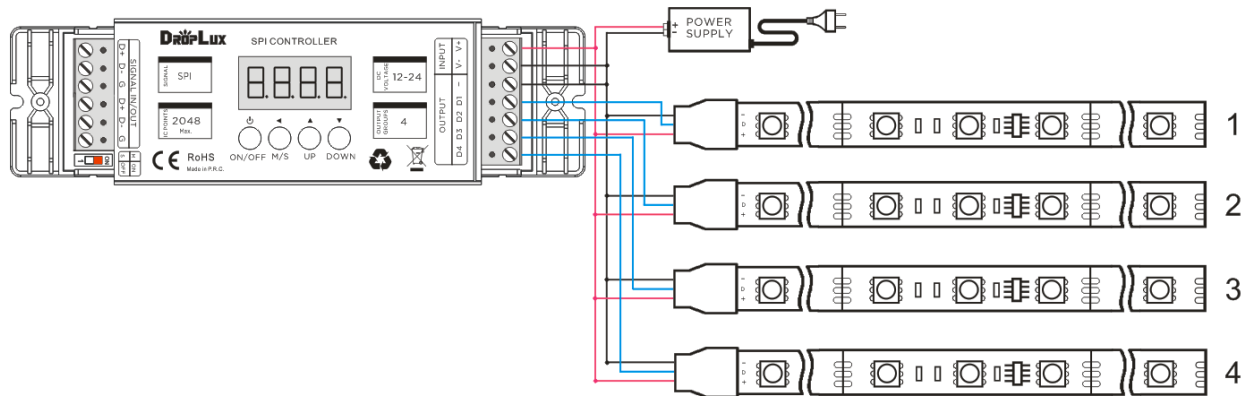
Synchronization Circuit 2: take the single-signal-wire digital led strip as an example

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(Master)

(Sub-controller)

(Sub-controller)

Sync-work signal

Sync-work signal

Sync-work signal

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.

Wireless remote control code value setting method

The number of controllers and remote controls in one system is unlimited. 2.4G Smart system has one unique RF code for communication. Each controller and each remote control can remember only one RF code, recorded in the first programing. New RF code can be recorded after delete the old one.

Code matching operation: the receiver will only be controlled by the value code remote control.

Step	Operation	Instructions
1	Connecting the load to the receiver and power on it.	1.It is necessary to clear the code first, if the receiver was coded before. 2.Batch operation can be performed within the remote control range. 3. Please remember to cut off other un-code zones power, or will be paired together.
2	Press and hold ⊙ (RGB ON/OFF key) on the remote control for 5 seconds	The RF indicator on the remote control will flash quickly, see the load light flashes 3 times and return to the initial state, means matching coding is finished successfully
3	Press any key to exit and end the operation	Also will automatically exit code transmission status after 60 seconds

Code clearing operation: that the original code value of the receiver will be cleared and returned to the factory state. Then it can be controlled by any compatible remote control, also can be paired to a new code.

Step	Operation	Instructions
1	Connecting the load to the receiver and power on it.	1. The clearing operation should be finished within 1 minute after the receiver is powered on. 2. Batch operation can be performed within the remote control range.
2	Press and hold "W" on the remote control for 5 seconds	1. The indicator of the remote control will flash quickly, see the load light flashes 3 times and return to the initial state, means clearing coding is finished successfully. 2. If the original remote control is lost, the new remote control

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		can be used for clearing operations.
3	Press any key to exit and end the operation	Also will automatically exit code transmission status after 60 seconds.

Malfunctions analysis & troubleshooting

Malfunctions	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
LED digital Controller with remote control	HX-SPI01-RFBT03