# SC-P

RF SPI LED Controller

SPI

Features

- RGB/RGBW or white light SPI LED controller, support RF remote control and push switch control, output two group SPI signals, digital display, 3-button operation.
- Output SPI(TTL) signal, compatible with RGB or white LED strips with 48 kinds chip, the chip type and R/G/B color sequence can be set.
  Compatible chip: TM1809(default), TM1804, TM1812, UCS1903, UCS1909, UCS1912, SK6813,UCS2903, UCS2909, UCS2912, WS2811, WS2812, WS2813, WS2815, SM16703P ,TM1803, TM1829, TLS3001, TLS3002, GW6205, MBI6120, TM1814B(RGBW), SK6812(RGBW), WS2813(RGBW), WS2814(RGBW), UCS8904B(RGBW), LPD6803, LPD1101, D705, UCS6909, UCS6912, LPD8803, LPD8806, WS2801,WS2803, P9813, SK9822, TM1914A, GS8206, GS8208, UCS2904, SM16804, SM16825, SM16714(RGBW), UCS2603, UCS5603, SM16714D, UCS7604(RGBW), UCS7804(RGBW).
- Three push switch can be connected for up direction switching, down direction switching, all switching function.
- Connect the up direction and down direction push switch to control the staircase light on/off.
- 16 kinds color light, 10 kinds dynamic mode and 6 kinds move direction are selectable, speed and brightness adjustable.
- Match with RF 2.4G remote control optional, to realize up direction switching, down direction switching or all switching control.
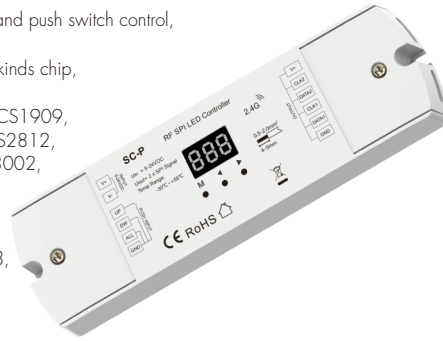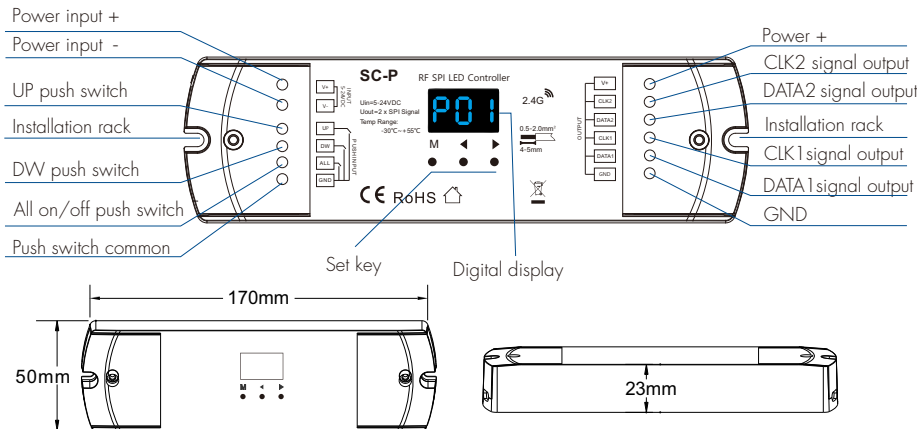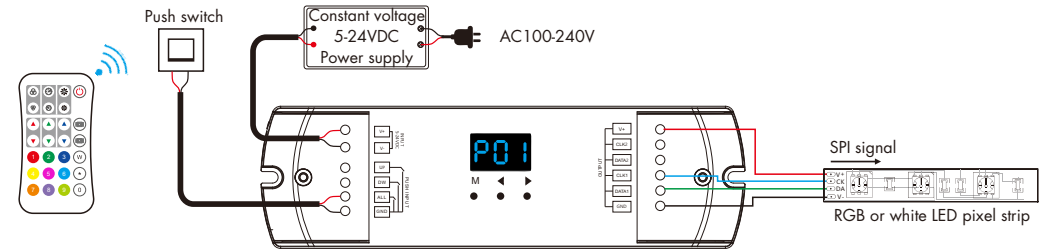
CE RoHS

Technical Parameters

Input and Output

Input voltage	5-24VDC
Input current	10A
Output signal	2 X SPI(TTL)
Pixel Dots	Max.900
Input signal	RF 2.4GHz + Push switch

Environment

Operation temperature	Ta: -30℃ ~ +55℃
Case temperature (Max.)	Tc: +65 ℃
IP rating	IP20

Package

Size	L175 x W120 x H35mm
Gross weight	0.27kg

Safety and EMC

EMC standard	EN IEC 55015/ EN IEC 61547 ETSI EN 301 489-1/-3
Safety standard	EN 61347-1/-2
Radio equipment	ETSI EN 300 440
Certification	CE RoHS

Warranty

Warranty	5 years

Mechanical Structures and Installations

- Power input +
- Power input -
- UP push switch
- Installation rack
- DW push switch
- All on/off push switch
- Push switch common
- Set key
- Digital display
- Power +
- CLK2 signal output
- DATA2 signal output
- Installation rack
- CLK1 signal output
- DATA1 signal output
- GND

170mm
50mm
23mm

Wiring Diagram

1. SC-P controller connected to one push switch, match with RF remote control

Push switch — Constant voltage 5-24VDC Power supply — AC100-240V
SPI signal
RGB or white LED pixel strip

- Short press the push switch to turn on the light, display the current light mode; short press the push switch again, turn off the light, display "OFF".
- Double click the push switch to sequentially switch 16 kinds color type.
- Long press the push switch for 2s, sequentially switch the 10 kinds dynamic mode.

2. SC-P controller connected to two push switch for stair light manual switch control

UP Push switch — Constant voltage 5-24VDC Power supply — AC100-240V
DW Push switch
SPI signal
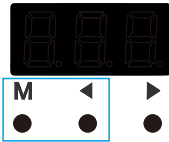RGB or white LED pixel strip
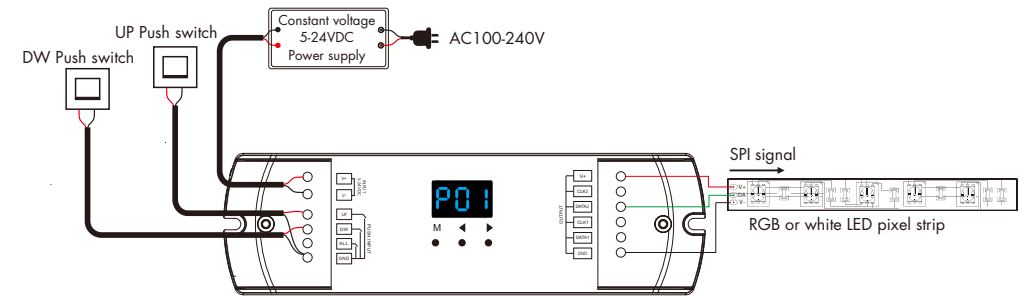
- The UP push switch is installed at the bottom of the stairs; the DW push switch is installed at the top of the stairs.
- Short press the push switch to turn on the light, display the current light mode; short press the push switch again, turn off the light, display "OFF".
- Long press the UP push switch for 2s, adjust 5 levels brightness (20%, 40%, 60%, 80%, 100%), digital display "b20" - "bFF".
  Long press the DW push switch for 2s, adjust 5 levels speed (2,4,6,8,10), digital display "S-2" - "S-F".

Installation Precautions:

1. If the SPI LED strip is a single-wire control method, the DATA and CLK signal line outputs of the controller are same, and one controller can connect four LED strips.
2. If the SPI LED strip is a dual wire control method, one controller can connect two LED strips.
3. When the SPI LED strip load does not exceed 10A, the same power supply can simultaneously power the SC-P controller and the SPI LED strip at the same time.
   When the load on the SPI LED strip exceeds 10A, separate power supplies are required for the SC-P controller and the SPI LED strip. Only DATA and GND signal lines are connected between SC-P controller and SPI LED strip.
4. The output power of the constant voltage power supply is at least 1.2 times of the output load (LED strip), otherwise the full power output of the load is likely to cause the lights to automatically flicker or shake phenomenon.

Parameters Setting
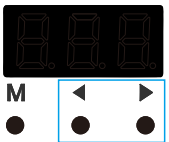
1. Light parameter setting

Long press the M and ◄ key for 2s simultaneously, enter the light parameter setting state, set the light type, pixel length, up or down light off mode.
Short press the M key to switch the setting of each parameter in sequence.
Long press the M key for 2s or wait for 15s to exit and save the setting of the light parameters.

(1) Light type setting

Short press ◄ or ► key to switch three light type.
3-bead white light: 1 pixel with 3 same data, control 3-bead white LED, display "L-1".
1-bead white light: 1 pixel with 1 data, control 1-bead white LED, display "L-2".
RGB color light: 1 pixel with 3 data, control one R/G/B LED, display "L-3".

Short press M key

(2) Pixel length setting

Short press ◄ or ► key to set the pixel length.
the range is 008-900, display "008"-"900".

Short press M key

(3) light off mode setting

Short press ◄ or ► key to switch three light off mode.
Sequential light off: Light turn off sequentially from the beginning to the end, display "oFS" .
Sequential light off in reverse: Light turn off sequentially from end to beginning, display "oFb".
Synchronized light off: Light turn off synchronously, display "oFC" .
Note: Light off mode setting is only valid for up or down switching operation.

2. LED strip parameter setting

Long press the ◄ and ► key for 2s simultaneously,
enter the LED strip parameter setting state: set the chip type, RGB color order.
Short press the M key to switch the setting of each parameter in sequence.
Long press the M key for 2s or wait for 15s to exit and save the setting of the LED strip parameters.

(1) Chip type setting

Short press ◄ or ► key to switch chip type (Table 1).

Short press M key

(2) RGB order setting

Short press ◄ or ► key to switch R/G/B order (Table 2).

LED strip chip types list:

No.	IC type	Compatible chip type	Output signal
C11	TM1803		DATA
C12	TM1809	TM1804, TM1812, UCS1903, UCS1909, UCS1912, SK6813,UCS2903, UCS2909, UCS2912, WS2811, WS2812, WS2813, WS2815, SM16703P	DATA
C13	TM1829		DATA
C14	TLS3001	TLS3002	DATA
C15	GW6205		DATA
C17	TM1814B(RGBW)		DATA
C18	SK6812(RGBW)	WS2813(RGBW), WS2814(RGBW)	DATA
C19	UCS8904B(RGBW)		DATA
C21	LPD6803	LPD1101, D705, UCS6909, UCS6912	DATA,CLK
C22	LPD8803	LPD8806	DATA,CLK
C23	WS2801	WS2803	DATA,CLK
C24	P9813		DATA,CLK
C25	SK9822		DATA,CLK
C26	MBI6020		DATA
C31	TM1914A		DATA
C32	GS8206	GS8208	DATA
C33	UCS2904		DATA
C34	SM16804		DATA
C36	SM16714(RGBW)		DATA
C37	UCS5603		DATA
C38	UCS2603		DATA
C39	SM16714D		DATA
C41	UCS7604(RGBW)		DATA
C42	UCS7804(RGBW)		DATA

(Table 1)

LED strip RGB order:

R/G/B order	RGB	RBG	GRB	GBR	BRG	BGR
Digital display	0-1	0-2	0-3	0-4	0-5	0-6

(Table 2)

3. Factory default parameter setting

Long press ◄ and ► key for 5s simultaneously, restore factory default parameters, display "RES".
Factory default parameters: RGB color light output, 300 pixels, sequential light off, chip type TM1809,
RGB order, brightness 100%, 8th speed level, 7 colors, flow change type, forward move direction.

Light Effect Settings by Key

(1) Turn on/off light

Short press M key, turn on/off light.

Light on
(Color light mode)
display P00~PF9

Light on
(White light mode)
display P-0~P-9

Light off

(2) Light color setting

Short press ◀ key to switch 16 kinds of color type in sequence (Table 3).

Color type (2nd digit):

NO.	Name	NO.	Name
0	White (custom R/G/B colors)	8	R/G/B 3 color
1	Red	9	7 color
2	Orange	A	Red + yellow
3	Yellow	b	Red + purple
4	Green	c	Green + yellow
5	Cyan	d	Green + cyan
6	Blue	E	Blue + cyan
7	Purple	F	Blue + purple

(Table 3)

Light color type
(White / custom)

(3) Light change type setting

Short press ▶ key to switch 10 kinds of light change type (Table 4).

Light change type (3rd digit):

NO.	Name	Move direction selectable
0	Static	/
1	Flow	Forward, reverse, round trip, center split, close, center split and close.
2	Chase	Forward, reverse, round trip, center split, close, center split and close.
3	Building blocks	Forward, reverse, round trip, center split, close, center split and close.
4	Float	Forward, reverse, round trip, center split, close, center split and close.
5	Trail	Forward, reverse, round trip, center split, close, center split and close.
6	Trail+black section	Forward, reverse, round trip, center split, close, center split and close.
7	Jump	/
8	Fade	/
9	Random flash	/

(Table 4)
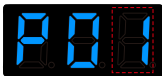
Light change type
(Flow)

(4) Speed setting

Long press the ◀ key for 2s to enter speed setting interface.
Short press ◀ or ▶ key to switch the speed level, 1-10 levels adjustable, display "S-1"-"S-F".
Long press the M key for 2s or wait for 15s to exit speed setting interface.

8th speed level

(5) Move direction setting

Long press the ▶ button for 2s to enter the move direction setting interface.
Short press ◀ or ▶ key to switch 6 kinds of move direction,
display "d-1"-"d-6" (Table 5).
Long press the M key for 2s or wait for 15s to exit move direction setting interface.

Move direction type:

NO.	Name
d-1	Forward
d-2	Reverse
d-3	Round trip (forward + reverse)
d-4	Center split (center to sides)
d-5	Close (sides coming together in the center)
d-6	Center split and close (center split + close)

(Table 5)

Move direction
(Forward)

(6) Light brightness setting (including custom R/G/B colors)

Long press M key for 2s to enter the brightness setting interface.
Short press M key to switch 4 parameter items: brightness, custom R/G/B color.
Short press ◀ or ▶ key to adjust the parameter value of each parameter item.
Long press the M key for 2s or wait for 15s to exit brightness setting interface.

Brightness: 10-100% levels adjustable, display "b10"-"bFF",
b10 means 10% brightness, bFF means 100% brightness.

Custom R/G/B color: 0-255 adjustable, display 00-FF.
R channel display "100" - "1FF".
G channel display "200" - "2FF".
B channel display "300" - "3FF".

Brightness(100%)

R channel brightness(100%)

Note:
1. White light type does not support set the color type.
2. For color light type, 16 light colors and 10 light change types are combined to form more than one hundred kinds of lighting effects, and static change types are not supported when the light color is multi-color.
3. Static, jump, fade, random flash lighting change type, move direction setting is not supported.

Push Switch Function

Three push switch are used for light on/off, light brightness, speed, color light type and light change type switching operations.

1. UP push switch:
   Short press to turn on/off the up direction light.
   long press for 2s to switch 5 levels of brightness (20%, 40%, 60%,80%,100%) in sequence.

2. DW push switch:
   Short press to turn on/off the down direction light.
   long press for 2s to switch 5 levels of speed in sequence.

3. All on/off push switch:
   Short press to turn on/off the light.
   Double click to switch 16 kinds of color type in sequence (Table 3).
   long press for 2s to switch 10 kinds of light change types (Table 4) in sequence.

Match RF Remote Control

Different RF remotes can be matched to realize up direction switching, down direction switching or all switching control independently.
There are two ways to match RF remotes.

Match by M and ▶ key of the controller

1. Match all switch remote control:
Long press M and ▶ key simultaneously for 2s, digital display "RLS", enter RF remote control matching state.
Immediately short press the on/off key on the remote control, "RLO" is displayed to indicate the matching is successful.

2. Match UP switch remote control:
Long press M and ▶ key simultaneously for 5s, digital display "Rlu", enter UP switch RF remote control matching state.
Immediately short press the on/off key on the remote control, "RLO" is displayed to indicate the matching is successful.

3. Match DW switch remote control:
Long press M and ▶ key simultaneously for 8s, digital display "RLd", enter DW switch RF remote control matching state.
Immediately short press the on/off key on the remote control, "RLO" is displayed to indicate the matching is successful.

Match by push switch

1. Match all switch remote control:
When the controller is power up, long press all push switch for 5s, the output LED strip flash slowly and the digital display "RLS",
enter RF remote control matching state.
Immediately short press the on/off key on the remote control, the output LED strip flash 3 times and the digital display "RLO",
the matching is successful.

2. Match UP switch remote control:
When the controller is power up, long press UP push switch for 5s, the output LED strip flash slowly and the digital display "RLu",
enter UP switch RF remote control matching state.
Immediately short press the on/off key on the remote control, the output LED strip flash 3 times and the digital display "RLO",
the matching is successful.

3. Match DW switch remote control:
When the controller is power up, long press DW push switch for 5s, the output LED strip flash slowly and the digital display "Rld",
enter DW switch RF remote control matching state.
Immediately short press the on/off key on the remote control, the output LED strip flash 3 times and the digital display "RLO",
the matching is successful.

Delete Remote Controller:

Long press M and ▶ key for 10s simultaneously to delete all matched RF remote controllers, and the digital will display "RLE".