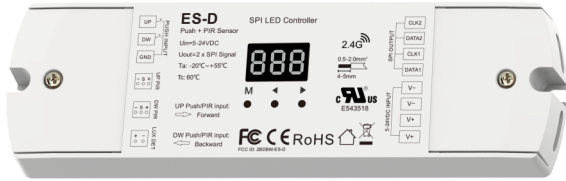


Stair Light Controller

ES-D

Dual PIR Sensor + Dual Push Button SPI Controller



Notice:
Please use in a dry environment
This control circuit is not isolated-see installation instructions
Remarque: Ce circuit de commande n'est pas isolé - voir les instructions d'installation



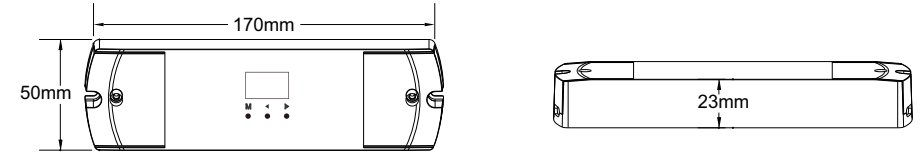
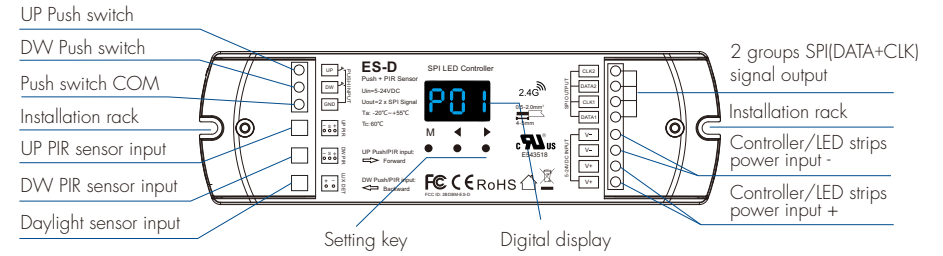
Features

- Dual PIR sensor + dual push button input RGB or white light SPI controller features daylight sensor.
- Two groups same SPI(TTL) signal output, drive 36 kinds IC digital RGB/RGBW/white LED strip, IC type and R/G/B/W order can be set.
- Compatible Ics: TM1803, TM1809, TM1804, TM1812, UCS1903, UCS1909, UCS1912, SK6813, UCS2903, UCS2909, UCS2912, WS2811, WS2812, WS2813, WS2815, SM16703P, TM1829, TM1914A, GW6205, GS8206, TM1814B, SK6812, UCS8904B, LPD6803, LPD8806, WS2801, P9813, SK9822, UCS2904, SM16804, SM16714, UCS7604, UCS7804 (RGBW), UCS5603, UCS2603, SM16714D.
- When applied to stair light, supports four output modes: color flow, white flow, color step, white step.
- Sequential switching control is realized when multiple SPI controllers are connected to a single self-resetting push switch button.
- Multiple light colors and change types are selectable with adjustable speed and brightness.
- Match with RF 2.4G remote control optional.

Technical Parameters

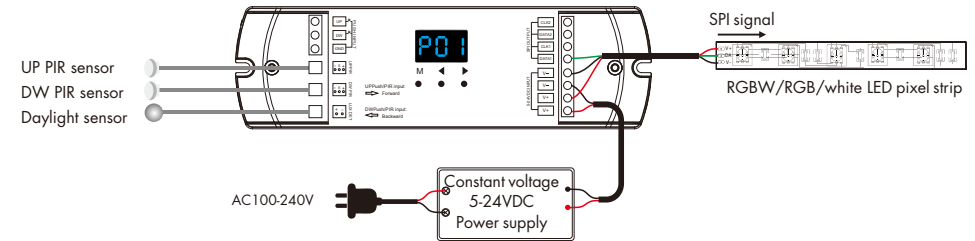
Input and Output	Sensor Data	Safety and EMC
Input voltage: 5-24VDC	Sensitive field: ≤3m	EN IEC 55015/EN IEC 61547
Input current: 10A	Sensitivity angle: 30°(±10°)	EMC standard: EN IEC 61000-3-2/ EN IEC 61000-3-3 ETSI EN 301 489-1/-3/-17
Output signal: 2 X SPI(TTL)		Safety standard: EN 61347-1/-2
Pixel number: Max 960		Radio equipment: ETSI EN 300 328 ETSI EN 300 440
Input signal: PIR sensor + Push button + RF 2.4GHz	Environment	Certification: CE RoHS FCC UL
	Operation temperature: Ta: -20°C ~ +55°C	Package
	Case temperature (Max.): Tc: +60°C	Size: L175 x W120 x H35mm
Warranty	IP rating: IP20	Gross weight: 0.27kg
Warranty: 5 years		

Mechanical Structures and Installations

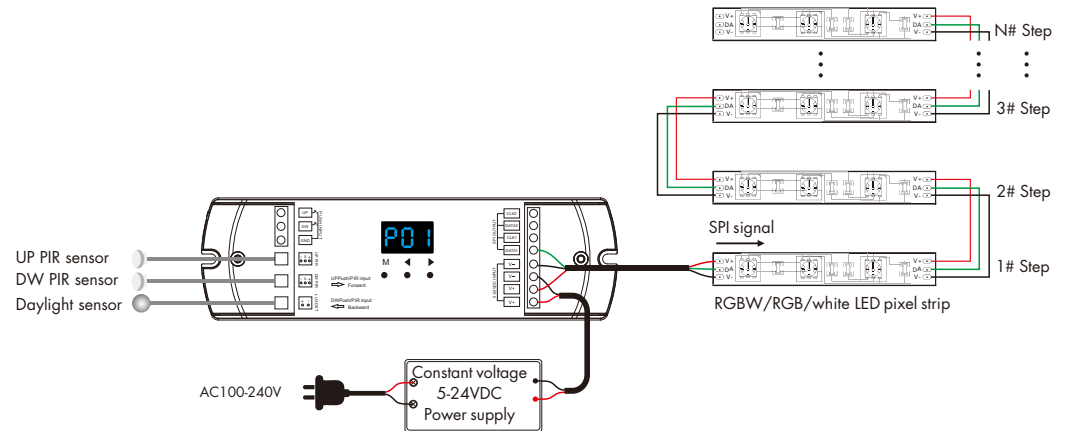


Wiring Diagram

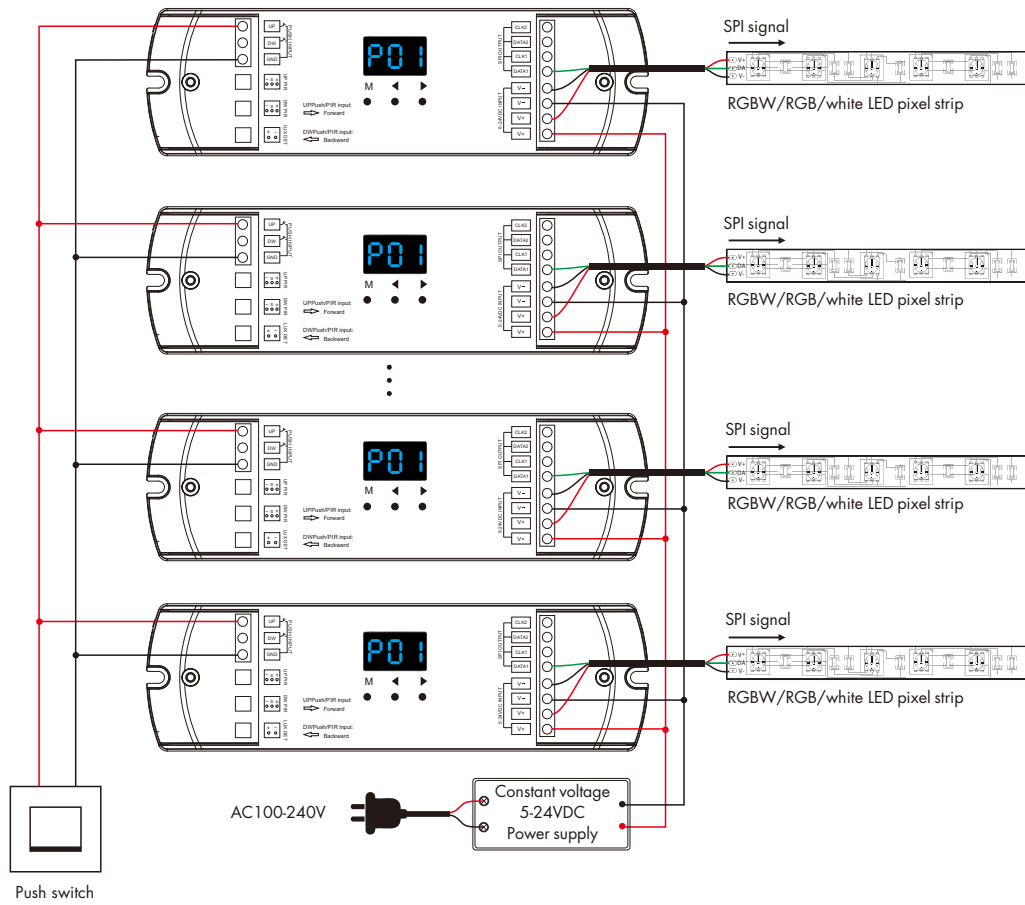
1. Stair light application, connect with PIR sensor, color or white light flow control



2. Stair light application, connect with PIR sensor, color or white light step control



3. One push switch connect with multiple controllers for sequential switching control

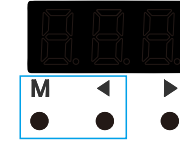


Note:

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 strip load does not exceed 10A, the same power supply can simultaneously power the ES-D controller and the SPI strip at the same time. When the load on the SPI strip exceeds 10A, separate power supplies are required for the ES-D controller and the SPI strip. Only DATA and GND signal lines are connected between ES-D controller and SPI strip.
4. The PIR sensor can be replaced with a stair infrared reflection sensor(ES-T) or other sensors that output 5V level signals.
5. The color or white light flow model can control up to 960 pixel points of SPI strip.
6. The color or white light step model defaults to 30 steps with 10 pixels per step. the step number x pixel length per step must ≤ 960 .

Parameters Setting

1. Light parameter setting



Long press the M and ◀ key for 2s simultaneously, enter the light parameters setting state: set the light type, LED strip connection mode (flow or step) pixel length, step number, light on/off mode, sensor turn off light delay time, daylight detection, self-reset push switch turn on or off light delay time. Short press the M key to switch between parameter settings. Long press the M key for 2s or wait for 15s, quit the parameter setting state.

(1) Light type setting



Short press ◀ or ▶ key to switch 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) LED strip connection mode setting



Short press ◀ or ▶ key to switch LED strip connection mode.

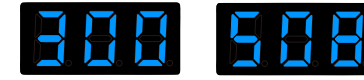
Flow mode: Straight line digital pixel LED strip connection mode, display "o-L".

Step mode: Z-shape digital pixel LED strip connection mode, display "o-S".

Short press M key

Short press M key

(3) Pixel length, step number and step pixel lengths setting



For color or white flow mode, short press ◀ or ▶ key to set the pixel length. The range is 032-960, display "032"-"960".

Short press M key

Short press M key

For color or white step mode, short press ◀ or ▶ key to set the step number. The range is 8-99, display "S08"-"S99".

For color or white step mode, short press ◀ or ▶ key to set the pixel length of each step. The range is 2-99, display "L02"-"L99".

Note: The step number x pixel length of each step number must ≤ 960 .

Short press M key

Short press M key

(4) Light on/off mode setting



i.e., set the sensor activated and self-reset button to turn on or off the light mode (Table 1)

Short press ◀ or ▶ key to switch two light on mode:

Sequential light on: Light turn on sequentially from the beginning to the end, display "o-n".

Synchronized light on: Light turn on synchronously, display "o-nC".

Short press M key



Short press ◀ or ▶ key to switch three light off mode:

Sequential light off: Light turn off sequentially from the beginning to the end, display "o-f".

Sequence light off in reverse: Light turn off sequentially from end to beginning, display "o-fB".

Synchronized light off: Light turn off synchronously, display "o-fC".

Short press M key

List of ways to turn on/off light combinations:

Display	Name
onS + ofS	Sequential light on, sequential light off
onS + ofb	Sequential light on, sequential reverse light off
onS + ofC	Sequential light on, synchronized light off
onC + ofS	Synchronized light on, sequential light off
onC + ofb	Synchronized light on, sequential reverse light off
onC + ofC	Synchronized light on, synchronized light off

(Table 1)

(5) Sensor delay off time setting



Short press ◀ or ▶ key to switch 10 levels delay time.
5sec (d05), 10sec (d10), 30sec (d30), 1min (01d), 3min (03d),
5min (05d), 10min (10d), 30min (30d), 60min (60d), cancel (d00),
set cancel means not turn off the light.

Short press M key

(6) Daylight detection setting



Short press ◀ or ▶ key to switch 6 levels daylight detection.
Set the light sensing detection threshold (6 levels):
10Lux (Lu1), 30Lux (Lu2), 50Lux (Lu3), 100Lux (Lu4), 150Lux (Lu5), 200Lux (Lu6), Off (LoF).
Factory default light sensing detection is Off (LoF).
When light sense detection is on, PIR sense turns on the light only
when the ambient light is lower than threshold value.

Short press M key

(7) Self-reset push switch turn on or off light delay time setting



Short press ◀ or ▶ key to set the self-reset push switch turn on light delay time.
Setting range 0-15.5s, the smallest unit 0.5s,
display "o00"~"o95"~"oF5", A-F indicates that 10-15s. Setting 0s means turn on light immediately.

Short press M key



Short press ◀ or ▶ key to set the self-reset push switch turn off light delay time.
Setting range 0-15.5s, the smallest unit 0.5s,
display "c00"~"c95"~"cF5", A-F indicates that 10-15s. Setting 0s means turn off light immediately.

2. LED strip parameter setting



Long press the M and ▶ key for 2s simultaneously,
enter the LED strip parameters setting state: set the chip type, R/G/B/W color order.
Short press the M key to switch between parameter settings.
Long press the M key for 2s or wait for 15s, quit the parameter setting state.

(1) Chip type setting



Short press ◀ or ▶ key to switch chip type (Table 2).

Short press M key

(2) RGB color order setting



Short press ◀ or ▶ key to switch R/G/B order (Table 3).

Short press M key

(3) W color order setting



Short press ◀ or ▶ key to switch RGBW/WRGB order.
"RGBW" order displays "0c4", "WRGB" order displays "04c".

LED strip IC types list:

No.	IC 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	TM1914A	DATA
C15	GW6205	DATA
C16	GS8206	DATA
C17	TM1814B(RGBW)	DATA
C18	SK6812(RGBW)	DATA
C19	UCS8904B	DATA
C21	LPD6803	DATA, CLK
C22	LPD8806	DATA, CLK
C23	WS2801	DATA, CLK
C24	P9813	DATA, CLK
C25	SK9822	DATA, CLK
C33	UCS2904	DATA
C34	SM16804	DATA
C36	SM16714(RGBW)	DATA
C37	UCS5603	DATA
C38	UCS2603	DATA
C39	SM16714D	DATA
C41	UCS7604	DATA
C42	UCS7804(RGBW)	DATA

(Table 2)

LED strip RGB color 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 3)

Light Effect Settings by Key

(1) Light color setting

Short press ◀ key to switch 16 color light in sequence (Table 4).



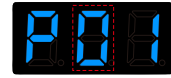
Color Flow/Color Step mode, the digit shows P01~P95.

White Flow/White Step mode, the digit shows P-1~P-5.

Color light type (2nd digit):

NO.	Name	NO.	Name
0	Rxxx Gxxx Bxxx Wxxx (User define)	8	R/G/B/W 4 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 4)



Light color type
(RGBW / custom)

(2) Light change type setting

Short press ▶ key to switch 5 light change types in sequence (Table 5).

Color/white light change type (3rd digit):

NO.	Name
1	Flow
2	Chase
3	Float
4	Trail
5	Trail+black section

(Table 5)



Light change type
(Flow)



Speed(8 level)



Brightness(100%)



R channel brightness(100%)

(3) Speed, brightness, self-defined color setting

Short press M key to switch three parameter items;

Short press ◀ or ▶ key to adjust the value of each parameter item.

Speed, brightness, and self-defined R/G/B/W color parameter value description:

Speed: 1-8 levels adjustable, display "S-1"-"S-8", S-8 is the maximum speed.

Brightness: 1-10 level adjustable, display "b10"-"bFF",

bFF means maximum brightness 100%.

Self-defined R/G/B/W color: 0-255 (00-FF) adjustable.

R channel displays "100"-"1FF"; G channel displays "200"-"2FF";

B channel displays "300"-"3FF", W channel displays "400"-"4FF".

Long press the M key for 2s or wait for 15s,

quit the light effect parameter setting state.

Note:

1. White flow / white step mode does not support self-defined R/G/B/W color function.
2. For color flow / color step mode, the light color and light change type are combined to form 50 kinds of light effects.
3. For color flow / color step / white flow / white step mode, can be adjusted in speed and brightness.

Match RF Remote Control

Long press M, ◀ and ▶ key for 2s simultaneously, the digital display "RLS", enter remote control matching status, immediately press on/off key (single zone remote) or zone key (multiple zone remote) of the remote, display "RLO" means successful match.

When the light is turned off using the remote control, digital display "OFF".

Factory Default Parameter Setting

- Long press ◀ and ▶ key for 2s simultaneously, restore factory default parameters, display "RES".
- Factory default parameters: Clear all matched remote control, RGB color light flow output, 300 pixels, sequential light on, sequential light off, 30s delay off time, disable daylight detection, push switch turn on delay and turn off delay is 0s, chip type TM1809, RGB order.

Typical Application

1. Dual PIR sensing

Connect two PIR sensors to realize automatic staircase light control.

- The UP PIR sensor is installed at the bottom of the staircase, when sensing a person, the digital tube instantly displays "u-", the light is automatically turned on, and the light is turned off with a delay.
- The DV PIR sensor is installed at the top of the staircase, when sensing a person, the digital tube instantly displays "d-", the light is automatically turned on, and the light is turned off with a delay.
- If you set the daylight sensor detection on, the light will be turned on only in darker environment or at night.

2. Dual self-reset push switch control

Connect two push switches for manual control of stair lights.

The UP push switch is installed at the bottom of the stairs; the DV push switch is installed at the top of the stairs.

Set the self-reset push switch to 0s for both light on delay and light off delay.

Short press the self-reset push switch to turn on the light, display the current light effect mode;

short press the self-reset push switch again, turn off the light, display "OFF".

Long press the UP self-reset push switch to adjust the brightness, range 10-100%, digital tube display "b10"-"bFF".

Note: The DW self-reset push switch does not have the function of adjusting the brightness.

Using self-reset push switch control will ignore the daylight sense detection.

3. Self-reset switch connects multiple controllers for sequential switching control

Multiple controllers are connected to one or two push switches at the same time to realize sequential switching control.

Set the self-reset push switch light on/off delay time of multiple controllers to incremental or decremental values, for example: set 1-4# controllers' push switch light on delay time to 0s, 1s, 2s, 3s respectively, and push switch light off delay time to 3s, 2s, 1s, 0s respectively.

In this way, 1-4# controllers will turn on the lights in the same order, and turn off the lights in the reverse order.

Short press the self-reset push switch to turn on the lights sequentially. during the delayed light on time, digital display "don".

When the light on, display the current light dynamic mode.

Short press the self-reset push switch again to turn off the lights sequentially. during the delayed light off time, digital display "doF".

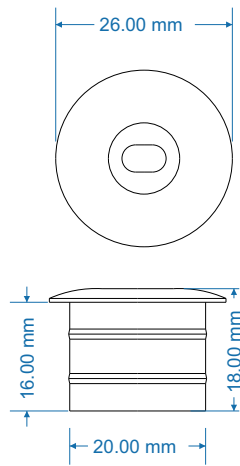
When the lights off, digital display "OFF".

Note:

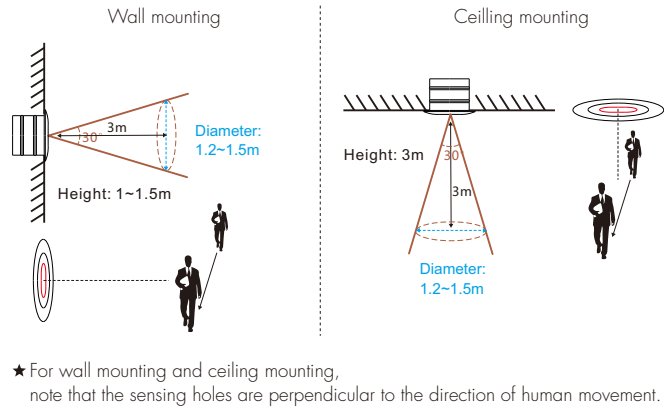
- When the lighting effects of multiple controllers are confused, it can be quickly restored by double-click the self-reset push switch.
- Using the self-reset switch to control multiple controllers will ignore the sensor delay off time and daylight detection settings.

Installation of PIR Sensor

Size of detector:



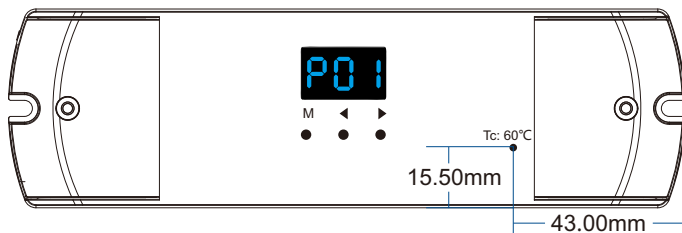
PIR sensor detection scope ($\pm 10^\circ$ Error):



Notice for installation of PIR sensor

1. Recommended for wall mounting.
2. If the sensor is exposed to direct sunlight, interference signal will be introduced.
3. The sensor should be installed in a dry environment and keep away from windows, air conditioner and fans.
4. Make sure that the sensor stays away from heat source, such as countertops, kitchen appliances which generate hot steam, walls and windows in direct sunlight, air conditioner, heating, refrigerators, stoves and so on.
5. We recommended the wall-mounted installation height is 1-1.5 meters and the ceiling mounting height is no more than 3 meters.
6. There should not be shelter(screen, furniture, large bonsai) within the range of detection.

Tc Point Location



The Tc point is located on the front of the controller.

Statement

FCC ID Statement:

Mobile

RF Exposure Information

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Packing List

