

Specification

Product Name: 24GHz Low-mounting microwave motion sensor (868 RF version)

Product Model: MSA054 RF

Product Version: V1.0

Versions	Release/ change Date	Publishing
V1.0	2023.02.02	Jacky

【Product Description】

MSA054 RF is a 24GHz microwave sensor with high antenna gain and wide sensing range. Combined with the unique software algorithm of Merrytek, it can accurately detect human movements and apply 868 RF to wirelessly connection to group control lighting or other electrical appliance.

【Product Feature】

- Max mounting height:6m
- Flush mounting installation available
- 868MHz RF wireless communication applied
- Group divide and group control function available
- 1-10V / PUSH dimming available
- 868 RF wireless transmit max range indoor: 30m
- Motion detection and daylight sensor detection available
- 24Ghz ISM Band Microwave Radar technology
- Max motion detection range: 8-10m in diameter
- Circle radar radiation to eliminate blind sense angle
- Total 32 hopping channel for group definition
- Narrow-frequency and hopping- frequency technology applied to solve same-frequency-crash problem
- Low RF power output. No harm to human health
- Not affected by temperature, humidity, noise, airflow, dust, light and other environments
- Motion detection can be disable by fast switch-on-off within 2S for urgent maintenance

【Product dimension】

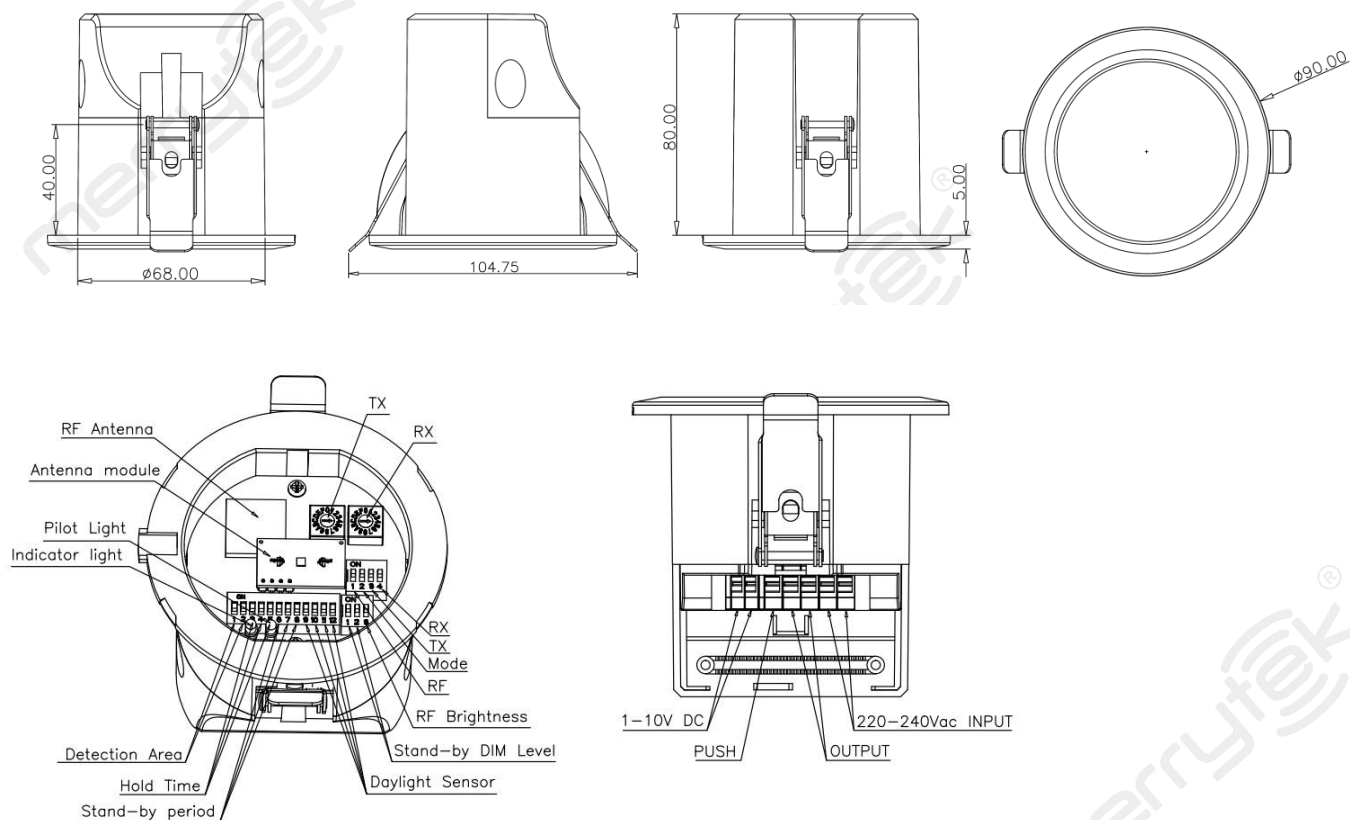
- Dimension:φ105x85mm
- Terminal:7 pin terminal



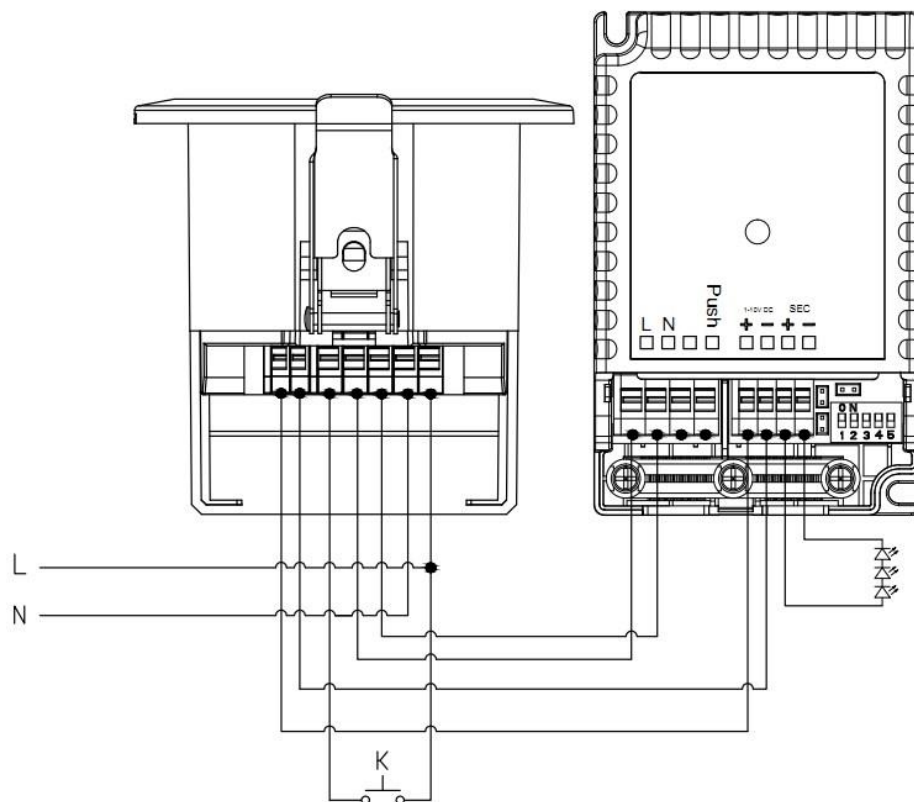
【Parameter】

Input	Input voltage	100-240Vac 50Hz/60Hz
	Rated voltage	220V AC
	Working Power	≤2W 230V AC
Output	Output signal	ON/OFF; 0-10V; PUSH dimming
	Load capacity	800w resistive loading or 400w inductive loading
	Loading instant peak current	30A
	0-10V terminal	< 50mA 10%(1-2V) 20%(1.9-2.1V) 30%(2.9-3.1V) 40% (3.9-4.1V)
Wireless module	Wireless frequency	868MHz RF transmitting power:20dBm
	Transmit range	30m indoor
	Modulation	FSK
	Group coding	32
Sensor Parameter	Radar Frequency	24GHz-24.25GHz ISM 频段
	Radar transmit power	5mW Max.
	Detection Sensitivity	25% 50% 75% 100%
	Hold Time	5s/30s/90s/3min/20min/30min/+∞
	Standby Time	0s/5s/5min/10min/30min/60min/+∞
	Daylight threshold	5lux/15Lux/30Lux/50Lux/100lux/150lux/Disable
	Standby brightness	10%/20%/30%/50%
	Radius detection range(based on 100% sensitivity and 3m mounting)	3-5m
	Mounting height	2.5-6.0m typical value:3m
	3db beam angle	80° (horizontal)
		96° (vertical)
Application Environment	Drill hole	Φ75mm
	Working Temperature	-20℃...+50℃
	Storage Temperature	-30℃~+80℃
Certificate Standard	Certificate	CE/FCC/RED
	Environmental Requirement	Compliant to RoHS
	IP Rating	IP20
Note: "N/A" means not available.		

【Dimension and Function diagram】

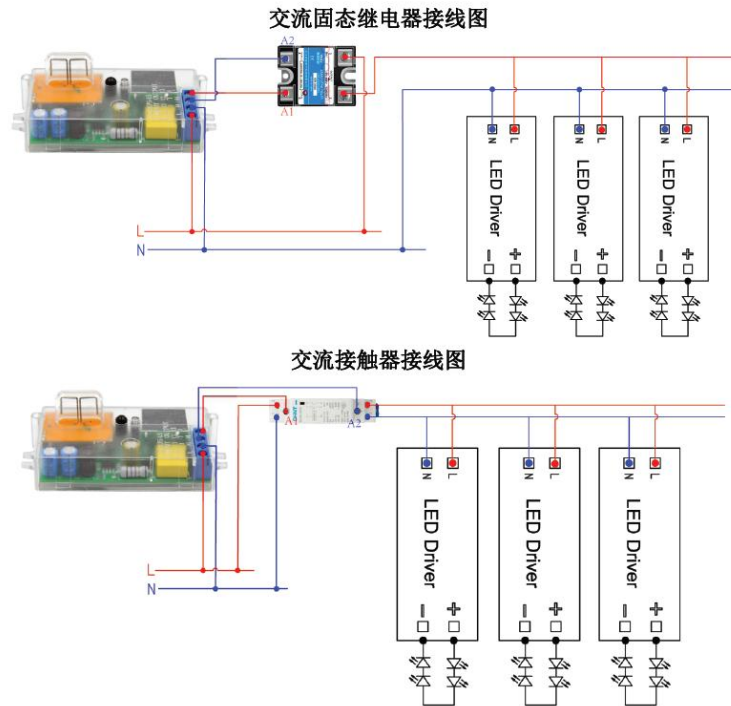


【Wiring instruction】



Wiring layout suggestion: ④

1. LN terminal stands for AC input, L'N' stands for AC output, please wiring correctly
2. One sensor's max loading capacity is 800w resistive loading and 400w inductive loading for one single load. if you want connect more load in one loop, we recommend to add an AC contactor in our output LN terminal to avoid momentary surge overload.



注：负载能力由交流固态继电器/交流接触器性能决定。

3. if 0-10V terminal is used, please guarantee all load total current <50mA

【Initialization】

When powered on, sensor indicator will turn off after flashing for 10S and will not detect moving signal during this time. After 10S, you can use DIP Switch to adjust detection area, hold time, group ID and daylight sensor etc parameter.

【Factory setting】

Detection Area :100%

Hold Time :5S

Daylight Threshold :Disable

Standby DIM level :10%

RF Brightness : 10%

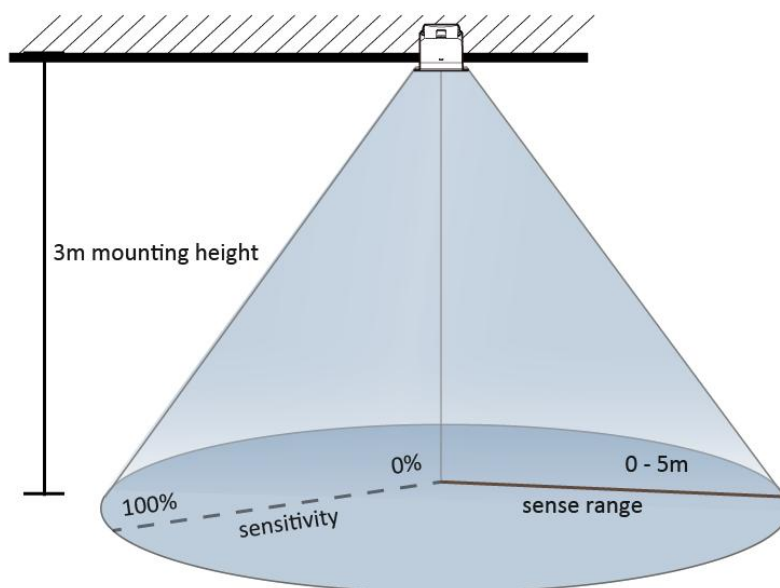
RF Communication Function : open

RF Mode :broadcast

TX: A RX: A

【Detection radiation】

MSA054 RF is highly recommended flush mounting and its detection radiation is as below shows:



【Function description】

MSA054 RF can control electrical load like lighting independently or do master-slave group control, below is its detailed function instruction:

Single sensor function

1. Switch on/off (Stand-by period at "0s"), Please set other sensor data according to practical applications.



- ① With sufficient ambient light, the light will not be switched on even if with motion signal.

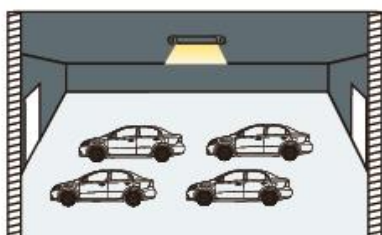


- ② With insufficient ambient light, the sensor switches on the light when motion is detected.

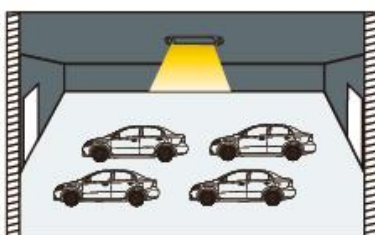


- ③ After elapse of hold time, the sensor switches off the light when no motion is detected.

2. 2 step dimming (stand-by period at "+∞"), Please set other sensor data according to practical applications.



- ① If there is no motion detected, the light will be remained at a low light level all the time.

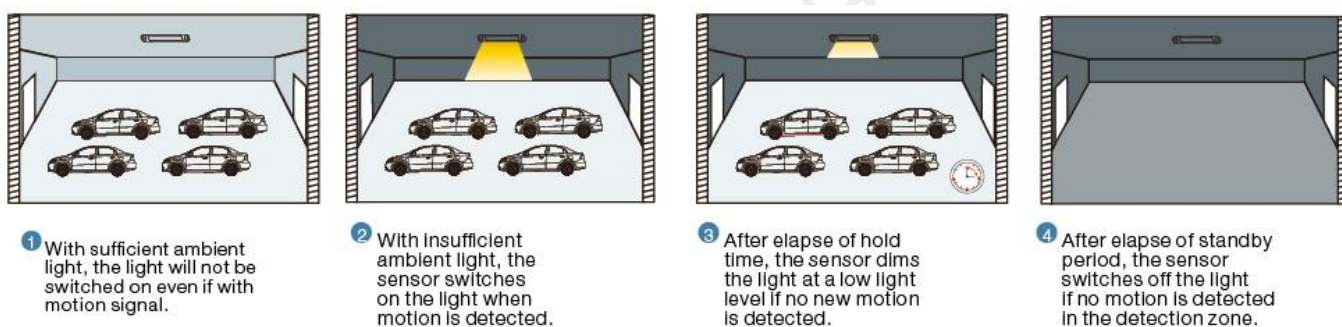


- ② When motion is detected, the sensor will switch on the light to 100% brightness



- ③ After elapse of hold time, the sensor dims the light at the present low light level if no motion is detected.

3. 3 step dimming (stand-by period at “5s/5min/10min/30min/60min”) , Please set other sensor data according to practical applications.



RF wireless networking :

1) Broadcast:

All sensors set the same channel.

See below picture ,there Are several exits /entrances to the corridor ,Any Master sensor is triggered ,all lamps in the corridor will light up .

Settings :

Master	TX	RX		Satellite	RX
1	A0	A0		1	A0
2	A0	A0		2	A0
...				...	
Any	A0	A0		Any	A0



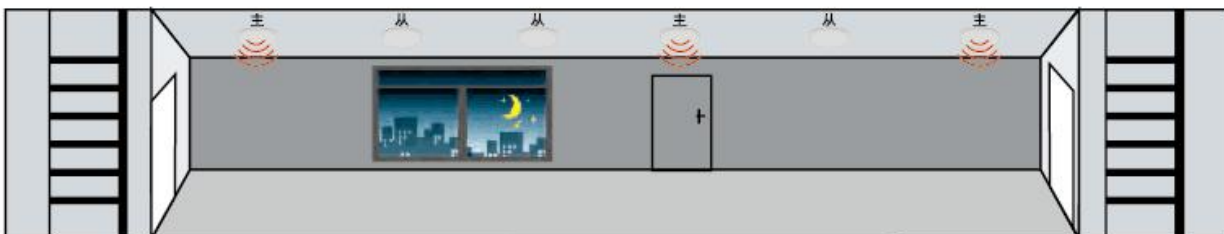
1 If no motion is detected, all lamps will be switched off.



2 If any movement is detected from any direction, all lamps will be synchronously switched on.



3 If no motion is detected in the detection zone, all lamps will be synchronously dimmed to a low light level after hold time.



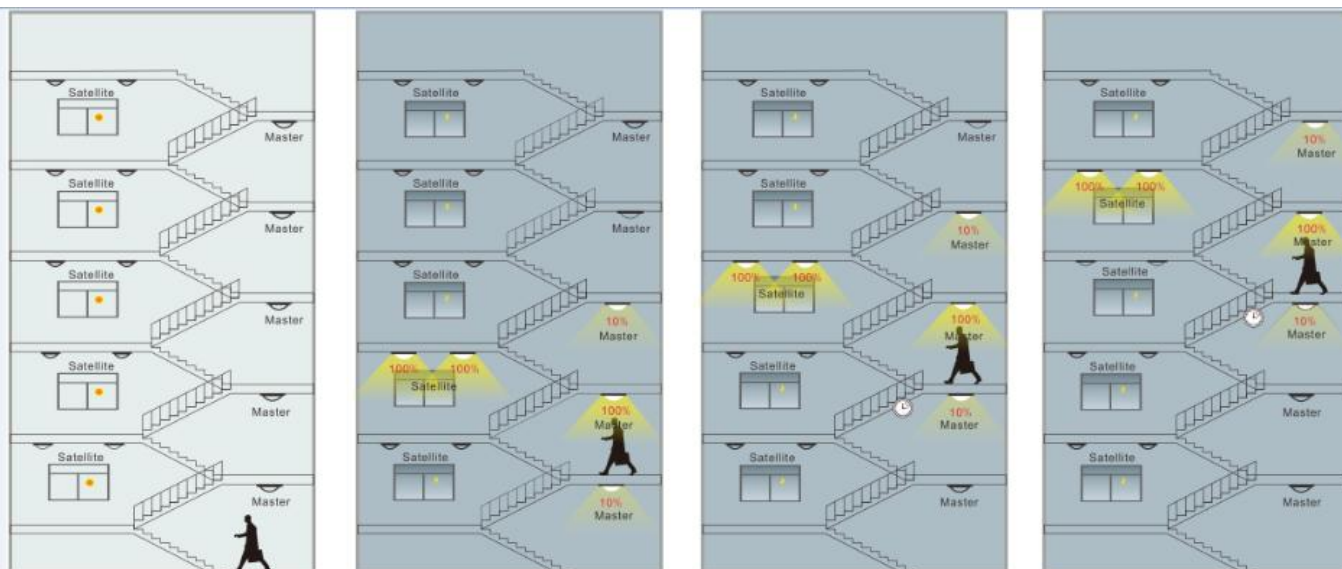
4 After stand-by period, the lamps will be switched off if no movement is detected in the detection zone.

2.) Broadcast + Hopping:

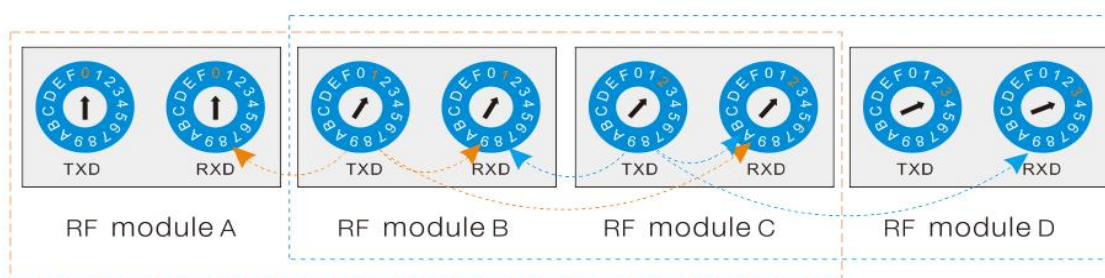
Once any Master motion is detected, the motion signal will be transmitted to other grouped sensors through RF transceiver. See the pic below, when the person walks to one of the floors, the lamps in adjacent floors will switch on at a preset low light level synchronously.

Settings:

Master	TX	RX		Satellite	RX
1 st floor	A0	A0		1 st floor	A0
2 nd floor	A1	A1		2 nd floor	A1
...				...	
16 th floor	AF	AF		16 th floor	AF
17 th floor	B0	B0		17 th floor	B0
18 th floor	B1	B1		18 th floor	B1



- ① With sufficient ambient light , all lamps switch off even if there is motion.
- ② With insufficient ambient light and the person walks to the 2nd floor ,all the 2nd lamp switch on at 100%,and the 1st and 3rd floor lamps switch on at a preset light.
- ③ The person walks to the 3rd floor ,all the 3rd floor lamps light up to 100% , and the 4th lamp switch on at a preset light ,the 2nd floor lamp dim to low light level after hold time.
- ④ The person walks to the 4th floor ,all the 4th floor lamp light up at 100% ,and the 5th floor lamp switch on at a low light level ,the 3rd floor lamp dims to a low light level after hold time ,the 2nd floor lamp switches off after a standby period .



Group 1

Group 2

Group 1: Module B TXD ,send signal to Module A RXD and Module C RXD and itself

Group 2: Module C TXD ,send signal to Module B RXD and Module D RXD and itself

AO—A1—A2—A3—A4—A5—A6—A7—A8—A9—AA—AB—AC—AD—AE—AF

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BF—BE—BD—BC—BB—BA—B9—B8—B7—B6—B5—B4—B3—B2—B1—B0

【DIP setting】

Detection Sensitivity

	1	2	
I	ON	ON	100%

II	ON	☹	75%
III	-	ON	50%
IV	-	-	25%

Hold Time

	3	4	5	
I	ON	ON	ON	5S
II	ON	ON	-	30S
III	ON	-	ON	90S
IV	ON	-	-	3Min
V	-	ON	ON	20min
VI	-	ON	-	30min
VII	-	-	-	+∞

Stand-by Period

	6	7	8	
I	ON	ON	ON	0S
II	ON	ON	-	5S
III	ON	-	ON	5Min
IV	ON	-	-	10Min
V	-	ON	ON	30min
VI	-	ON	-	60min
VII	-	-	-	+∞

Daylight Sensor

9	10	11	12	
ON	ON	ON	ON	5LUX
-	ON	ON	ON	15LUX
ON	-	ON	ON	30LUX

-	-	ON	ON	50LUX
ON	ON	-	ON	100LUX
ON	ON	ON	-	150LUX
-	-	-	-	Disable

Stand-by DIM Level

	1	2	
I	ON	ON	10%
II	ON	-	20%
III	-	ON	30%
IV	-	-	50%

RF Brightness

	3	
I	ON	100%
II	-	10%-50%

TX/RX mode

1	RF	2	Mode	3	TX(A/B)	4	RX(A/B)
ON	Open	ON	Broadcast	ON	A	ON	A
-	Close	-	Hopping	-	B	-	B

*When set RF to close , now the sensor only can receive signal ,cannot transmit signal ,but it still have sensor function.

Slave model MW05 DIP setting:**Stand-by Period**

	1	2	
I	O N	ON	5S
II	-	ON	10min
III	O N	-	30min
IV	-	-	+∞

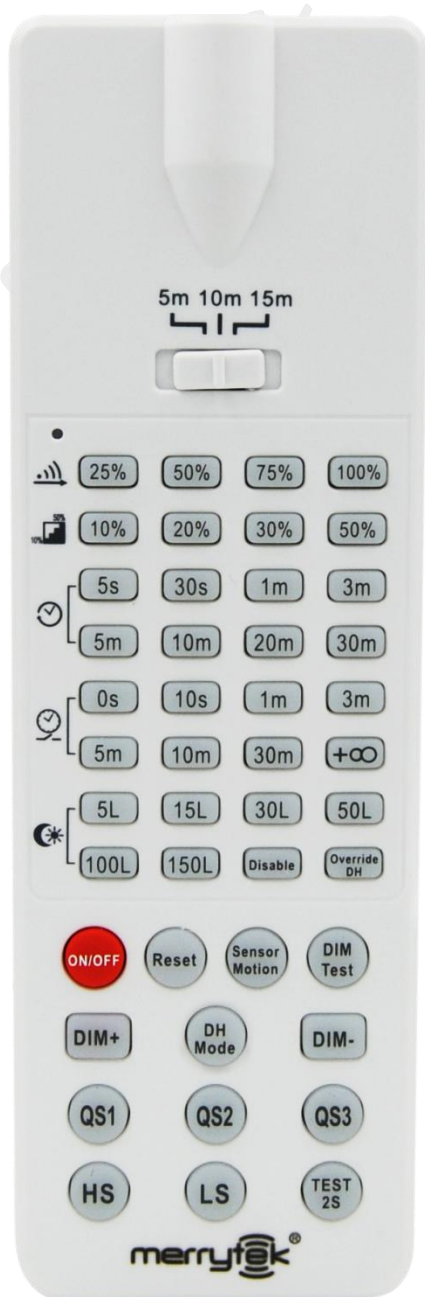
RX

	3	RX
I	ON	A
II	-	B

Stand-by DIM level

	1	2	3	
I	O N	-	-	50%
II	-	ON	-	30%
III	-	-	ON	20%
IV	-	-	-	10%

【Remote manual】



Detection range: 25%/50%/75%/100%

Hold time: 5s/30s/1min/3min/5min/10min/20min/30min

Daylightthreshold: 5lux/15lux/30lux/50lux/100lux/150lux/Disable

ON/OFF: disable sense function

Sensor motion: enable sense function

Reset: all parameter back as factory setting

QS1/QS2/QS3: High/Medium/Low sensitivity setting

HS: turn on indicator

LS: turn off indicator

【Disclaimer】

Due to the complexity of product technology and differences in application environment, it is difficult to guarantee a completely accurate or complete description, so this specification is only for user reference.

We will reserve the right to make changes to the product specifications without notifying the user, and do not make any commitments and guarantees in the legal sense.

At the same time, our company encourages users to supplement or modify the contents of our specifications after using our products.