



IoT Edge Light User Manual

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IoT-EDGE-LIGHT-R2

Server containing 13 sensors (Dust sensor, Temperature · Humidity sensor, Air quality sensor, CO₂ sensor, Illuminance sensor, MOS sensor, Formaldehyde sensor, ozone sensor, CDS optical sensor, SISONIC microphone, Microphone, Flame detection sensor, Motion detection sensor) We manage space by transmitting data and querying sensor data on the server.





IoT Edge Light User Manual

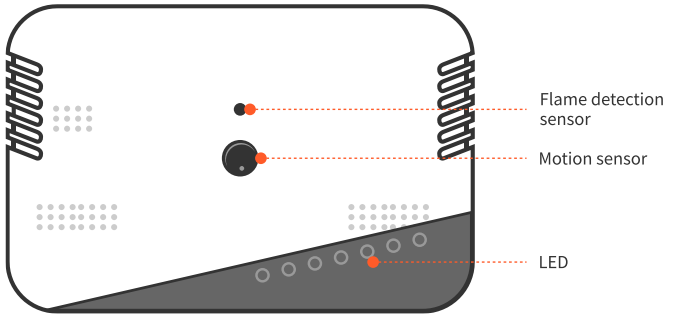
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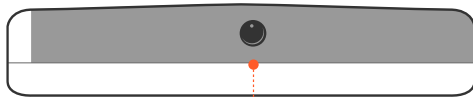
Name of each part

IoT Edge Light is configured as follows.

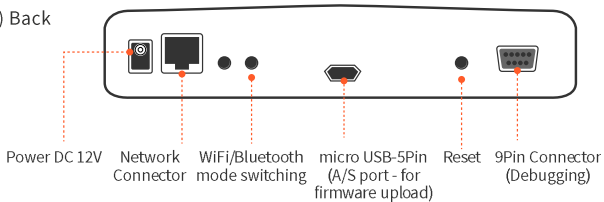
1) Top



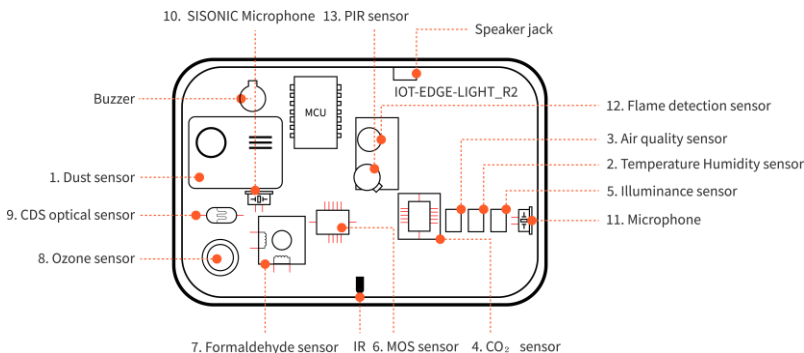
2) Front



3) Back



4) Sensor configuration



IoT Edge Light Sensors for Detecting Harmful Substances

- The MOS sensor is a hazardous gas sensor that detects air quality.
- The dust sensor detects fine dust to improve indoor air quality.
- The air quality sensor is a sensor that detects volatile organic compounds in the air quality inside a building.
- The CO₂ sensor is a sensor that detects when the indoor CO₂ concentration increases.
- The formaldehyde sensor is a sensor that detects the concentration of formaldehyde inside a building.
- The ozone sensor is a sensor that detects the ozone concentration inside a building.

8 types of harmful gases detected by MOS sensor

- ① Carbon monoxide
- ② Nitrogen dioxide
- ③ Ethanol
- ④ Hydrogen
- ⑤ Ammonia
- ⑥ Methane
- ⑦ Propane
- ⑧ Iso-butane

5) Sensor list

No.	Type
1	Dust sensor
2	Temperature · humidity sensor
3	Air quality sensor
4	Air quality sensor
5	Illuminance sensor
6	MOS sensor
7	CH ₂ O (formaldehyde) sensor

No.	Type
8	O ₃ (Ozone) sensor
9	CDS sensor, Optical sensor
10	SISONIC Microphone
11	Microphone
12	Flame detection sensor
13	PIR sensor
	Microwave Radar Motion Sensor

MCU specifications

Category	Specifications
Sensitivity	-98dBm
Type of mount technology	Surface Mount Technology
Frequency Range	2.4GHz ~ 2.5GHz
Memory size	16MB flash, 8MB SRAM
Temperature Range	-40°C ~ 85°C
Power	2.3V ~ 3.6V
Power-Output	20.5dBm

Category	Specifications
Data Transfer Rate	150Mbps
Current	- Reception: 80mA, - Transfer: 80mA
Antenna Type	PCB Trace
Used IC/Parts	ESP32-D0WD-V3
Modulation	CCK, DSSS, OFDM
RF Standard	Bluetooth, WiFi
Series	ESP32

Sensor specifications

1) Dust sensor

Category	Specifications
Interface	I2C
Voltage	DC 5V
Rated Current	≤100mA
Principle of operation	Laser Scattering
Measurement particle range	0.3µm ~ 10µm
Measuring range	0 ~ 1,000µg/m ³
Resolution	1µg/m ³
Working Condition	-10°C~60°C, 0~99%RH (No condensation)
Operating Standard	GRIMM

2) Temperature · Humidity sensor

Category	Specifications
Interface	I2C
Voltage	DC 3.3V
Rated Current	≤400mA
Rated Current	-40°C ~ 125°C
Operating Temp.	-40°C ~ 125°C
Operating Humidity	0 ~ 100 % RH

3) Air quality sensor

Category	Specifications
Interface	I2C
Voltage	DC 3.3V
Rated Current	2.6mA
Measuring range (raw)	0 ~ 65535 ticks
Measuring range (processed)	0 ~ 500 VOC Index points
Measuring duration	<60s

4) CO₂ sensor

Category	Specifications
Interface	I2C
Voltage	DC 3.3V, 5V
Rated Current	115mA, 175mA
Operating Temp.	-10°C ~ 60°C
Sensor type	Carbon Dioxide (CO ₂)
Measuring range	400 - 2000 ppm

5) Illuminance sensor

Category	Specifications
Interface	I2C
Voltage	DC 3.3V
Rated Current	7mA
Operating Temp.	-40°C ~ 85°C
Measuring Range	0 ~ 65535 lx照도

6) MOS sensor

Category	Specifications
Interface	Analog
Voltage	DC 5V
Operating Temp	-30°C ~ 85°C
Operating Humidity	5 ~ 95%RH
Measuring Range	<ul style="list-style-type: none"> • Carbon monoxide CO : 1 ~ 1000ppm • Nitrogen dioxide NO₂ : 0.05 ~ 10ppm • Ethanol C₂H₅OH : 10 ~ 500ppm • Hydrogen H₂ : 1 ~ 1000ppm • Ammonia NH₃ : 1 ~ 500ppm • Methane CH₄ : >1000ppm • Propane C₃H₈ : >1000ppm • Iso-butane C₄H₁₀ : >1000ppm

7) Formaldehyde sensor

Category	Specifications
Interface	Analog
Voltage	DC 5V
Gas type of detection	CH ₂ O
Measuring Range	0ppm ~ 5ppm
Maximum detection concentration	20ppm
sensitivity	(0.25 ± 0.60)μA/ppm
resolution	0.02ppm
Operating Humidity	15% ~ 90% RH
Operating Temp.	-20°C ~ 50°C
Input Range	1atm ± 10%

8) Ozone sensor

Category	Specifications
Interface	Analog
Voltage	DC 5V
Preheating time	>=48hours
High concentration measuring range	10ppm ~ 1000ppm
Measuring environment	20°C±2°C, 55%±5%RH

9) CDS optical sensor

Category	Specifications
Interface	Analog
Max Voltage	DC 150V
Max Current	100mW
Operating Temp.	-30°C ~ 70°C
Spectral Peak	540nm
Photo Resistance R10	20 ~ 50KΩ
Photo Resistance R100	4 ~ 10KΩ
Dark Resistance	2.0MΩ

10) SISONIC Microphone

Category	Specifications
Interface	Analog
Operating Voltage	2.3V ~ 3.6V
Operating Current	250μA
Operating Temp.	-40°C ~ 85°C
Frequency Range	7Hz ~ 36kHz
S/N Ratio	67dB

11) Microphone

Category	Specifications
Interface	I2S
Operating Voltage	1.65V ~ 3.63V
Operating Current	490μA
Operating Temp.	-40°C ~ 85°C
Frequency range	60Hz ~ 20kHz
S/N Ratio	64dB

12) Flame detection sensor

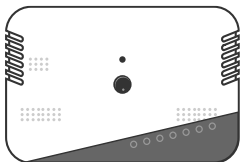
Category	Specifications
Interface	Analog
Operating Voltage	3V ~ 5V
Operating Current	2.5mA
Operating Temp.	-25°C ~ 85°C

13) PIR sensor

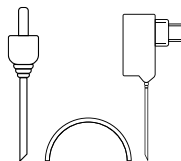
Category	Specifications
Interface	GPIO
Voltage	DC 5V
Operating Current	< 60μA
Operating Temp.	-20°C ~ 80°C
Sensing duration	2s
Sensing distance	500cm

Product composition

IoT Edge Light sensor body 1ea , Power cable DC 12V 1ea, User manual 1ea



IoT Edge Light sensor body

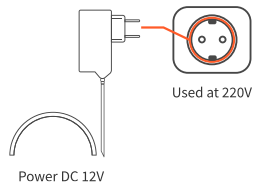
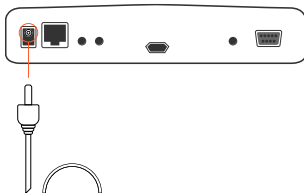


Power cable DC 12V

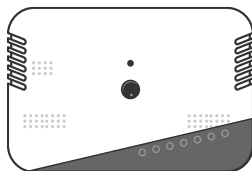
Device connection

The power unit is located on the back. Connect power through the power input terminal.

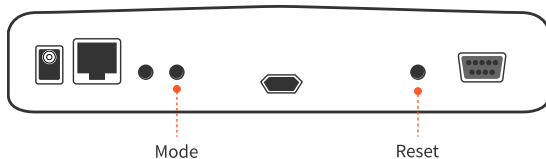
- 1) Connect the jack to the IoT Edge Light rear cable.
- 2) Connect power.



- 3) Install the IoT Edge Light app on your smartphone and connect via Bluetooth or Wi-Fi.



Action Description



1) Mode selection (Wi-Fi mode, Bluetooth mode)

- When you first turn on the power, the LED blinks quickly for 10 seconds.
- If you press “Mode” on the back within 10 seconds, it will operate in Bluetooth mode.
- If 10 seconds elapse without pressing “Mode”, it operates in Wi-Fi mode.

2) Wifi mode

It attempts to connect to the configured router, and when the connection is complete, the sensor data is transmitted to the server.

- Router connection stage: The operation LED blinks at 0.5 second intervals.
- Data transmission phase: The operation LED blinks at 1 second intervals.

3) Bluetooth mode

- Use the smartphone app to set the router information for Wi-Fi connection.
- Bluetooth operation: The operation LED quickly blinks twice at 1 second intervals.

4) System reboot

If you press “Reset” at any time while operating in Wi-Fi mode or Bluetooth mode, the system will reboot.

App description

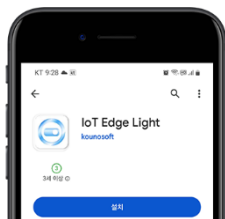
• Android

1) App Installation

Just access the Google Play Store, search for "IoT Edge Light" and install it.

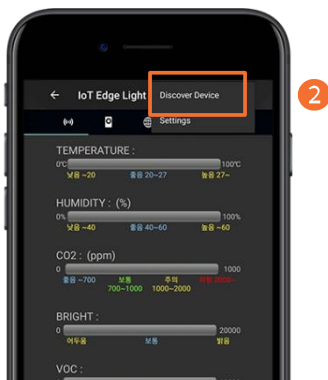
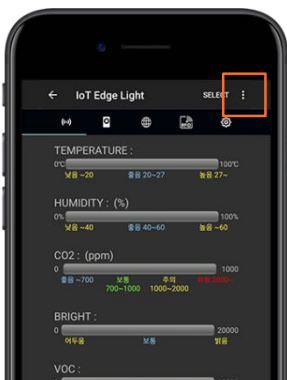


Download IoT Edge Light
QR code



2) Start the app

After running the app, to connect to IoT Edge Light via Bluetooth, ① touch the menu icon and then ② search for the device.



3) Find IoT Edge Light device



- When the Bluetooth device search screen is displayed, Bluetooth is automatically searched and displayed.
- If the ③ "KOUNO_Light" device is found among the searched devices, touch the device to connect.

4) Connect IoT Edge Light (KOUNO_Light)



- When properly connected to the IoT Edge Light device, sensor data from IoT Edge Light is received and displayed on the screen.
- The time displayed on the screen may take several seconds depending on the sensor data collection state of the IoT Edge Light.

5) IoT Edge Light remote control function



- IoT Edge Light used the infrared transmission function to turn external devices on and off. This function is optional.
- In order to turn on and off an external device, the remote control protocol of the external device must be implemented in the IoT Edge Light's firmware. However, the remote control protocol different for each device, so the firmware must be updated for each device you want to control.

6) IoT Edge Light Settings



- The setting screen is where you set up IoT Edge Light's Wi-Fi settings. Set and save the SSID and access key of the router you want to connect to.
- Saved settings will not be applied until the device is rebooted.
- IoT Edge Light supports WiFi 2.4Ghz only. WiFi 5Ghz can't be searched or connected.
- SSID and access key can be set up to 13 digits.

7) Disconnect IoT Edge Light



- The marked part of the picture is a connection button, which displays the connection and connection status of the IoT Edge Light device.
- ※ When connected, displayed as DISCONNECT
- While connected, touching this button will disconnect IoT Edge Light and display the name of the disconnected device.
- ※ Here, KOUNO_Light
- If the device's name is displayed, touch it again to reconnect.
- When the app is first launched, it is displayed as "SELECT" because there is no IoT Edge Light connection information.

8) RFID screen



- If RFID devices are attached, they can be used for asset management and theft prevention.

App description

- IOS

1) App Installation

You can access the App Store, search "IoT Edge Light" and install it



Download IoT Edge Light
QR code



2) Start App / Search IoT Edge Light Equipment

To connect to IoT Edge Light through Bluetooth after executing the app, ① After touching the Bluetooth icon

② When the Bluetooth equipment search screen is displayed, it automatically searches and displays Bluetooth.

Touch and connect the equipment you want to connect to among the searched equipment.



3) IoT Edge Light (KOUNO_Light) connect



- if connected normally to the IoT Edge Light equipment, sensor data of the IoT Edge Light is received and displayed on the screen.
- The time on the screen may take a few seconds depending on the state of the IoT Edge Light's sensor data collection.

4) IoT Edge Light remote control function



- This feature is optional with the ability to turn external equipment on and off using the infrared transmission function in IoT Edge Light.
- To turn the external equipment on and off, the remote control protocol of the external equipment must be implemented in the firmware of the IoT Edge Light, but the remote control protocol varies from equipment to equipment, so the firmware must be updated for each equipment to be controlled.

5) IoT Edge Light setting



- The setting screen is a screen that sets the Wi-Fi setting of the IoT Edge Light, and sets and saves the SSID and access key of the router you want to access.
- Saved settings are applied only after the equipment is rebooted.
- IoT Edge Light only supports WiFi 2.4Ghz. WiFi 5Ghz can't be retrieved and connected.
- SSID and connection keys can be set up to 13 digits.

6) IoT Edge Light disconnect



- The displayed part of the figure is the disconnect button used to disconnect the IoT Edge Light equipment.
- Touching this button while connected will prompt you to disconnect the IoT Edge Light, and press OK to disconnect the equipment.

7) RFID screen



- If RFID devices are attached, they can be used for asset management and theft prevention.

Caution



Do not spray or immerse the product in water. It may cause product damage.



Do not expose the product to high temperatures for an extended period of time. It may cause product damage.



Do not damage the power plug. It may cause product damage.



Do not clean the product with volatile solvents or organic solvents such as alcohol.



Please plug it into a dedicated 220V outlet with a rated current of at least 15A.



Do not place it on top of electric appliances such as heaters and televisions. It may cause fire, electric shock, or malfunctions.



Please locate it out of reach of children.



Do not place containers of water, chemicals, food, small metal objects, or flammable materials on top of the product.



Do not modify, disassemble, or repair the product on your own. Reassembling it will void the manufacturer's warranty, and service may be refused.



Do not apply excessive force or shock to the product. There is a risk of damaging the product.

Product Warranty

- The warranty period for this product is 1 year from the date of purchase. If a malfunction occurs within the warranty period, you can receive free service.
- After the warranty period, service may be provided for a fee.
- However, if the service falls under the consumer damage compensation regulations for a fee (product damage due to user negligence, etc.), the service will be provided for a fee even during the warranty period.
- Transportation costs during service processing are borne by both parties in the case of free services, and are borne by the consumer in the case of paid services.
- This warranty will not be reissued.

Device name	IoT EdgeLight		
Model name	S2K-LT-001	Product cereal	Marked separately
Purchase date	년 월 일	Manufacturer	Kunosoft Co., Ltd.
Warranty	1 year from date of purchase	Address	Korea University Industry Academic Building, 145 Anam-ro, Seongbuk-gu, Seoul
Country of manufacture	Korea, Republic of	Service center	+82-2-3291-2200



Labeling information based on conformity assessment



Company name: Kunosoft Co., Ltd.
Device name: IoT Edge Light
Model name: S2K-LT-001
Country of manufacture: Korea
Certification Number: R-R-KnG-S2K-LT-001
Wireless module authentication number:
R-C-es5-ESP32WROVERE

※ This product can be exchanged or compensated for in accordance with consumer dispute resolution standards.

The user manual may change depending on company circumstances.



Customer service center 02-3291-2200

Website <http://www.kounosoft.com>

