Indoor Ambience
Featuring LoRaWAN
Monitoring Sensor
KL107 Series

◆ Introduction

KL107 series is a compact indoor ambience monitoring sensor for measurement of temperature, humidity, light, CO_2 concentration, $HCHO/O_3$ level, TVOC, barometric pressure, PM2.5, PM10 and motion. The data will be shown on the E-ink screen in real-time, which helps to measure the indoor environment and comfort. KL107 series is widely used for offices, stores, classrooms, hospitals, etc.

Sensor data is transmitted using LoRaWAN® technology. Combining KLED LoRaWAN ® gateway and KLED IoT Cloud, users can manage all sensor data remotely and visually.

◆ Features

➢ Integrated with multiple sensors like humidity, temperature, CO_2, light, barometric pressure, PM2.5, PM10, etc.

➢ Multiple display modes and clear emoticon to easily understand the comfort levels via screen

➢ Support batteries or DC power supply

➢ Equipped with traffic light indicator and buzzer to indicate device status and threshold alarms

➢ Store locally 18, 000 historical records and support retransmission to prevent data loss

➢ Compliant with standard LoRaWAN® gateways and network servers

➢ Quick and easy management with KLED IoT Cloud

◆ Specifications

Model	KL107	KL108	KL109
Wireless Transmission			
Technology	LoRaWAN®		
Frequency	CN470/RU864/IN865/EU868/US915/AU915/KR920/AS923-1&2&3&4		
Tx Power	16dBm(868MHz)/22dBm(915MHz)/19dBm(470MHz)		
Sensitivity	-137dBm @300bps		
Work Mode	OTAA/ABP Class A	OTAA/ABP Class A	OTAA/ABP Class C
Sensors			
Temperature			
Operating Principle	Digital CMOSens® technology (MEMS)		
Range	-20°C - 60°C		
Accuracy[1]	± 0.2°C		
Resolution	0.1°C		
Humidity			
Operating Principle	Digital CMOSens® technology (MEMS)		
Range	0% - 100% RH		
Accuracy	± 2% RH		
Resolution	0.5% RH		
Motion			
Operating Principle	Passive infrared (PIR)		
Detection Range	80 ° Horizontal, 55 ° Vertical, 5m		
Status	Vacant/Occupied		
Light			
Operating Principle	Photodiode		
Range	0-60000 Lux (Determine as 6 levels, 0-5)		
TVOC			
Operating Principle	MOX (MEMS)		
Range[1]	1.00 - 5.00 (IAQ Rating)		
Accuracy	±1		
Resolution	0.01		
Barometric Pressure			
Operating Principle	Piezoresistive absolute pressure sensor (MEMS)		
Range	260 - 1260 hPa		

Accuracy	±0.5 hPa
Resolution	0.1 hPa

Carbon Dioxide (CO_2)

Operating Principle	Nondispersive Infrared (NDIR)	Photoacoustic
Range	400 - 5000 ppm	400 - 2000 ppm
Accuracy	± (30 ppm + 3 % of reading) (0°C to +50°C)	± (50 ppm + 5 % of reading) (-10°C to +60°C)
Resolution	1 ppm	1 ppm

PM2.5 & PM10

Operating Principle	—	Laser Scattering	
Range	—	0 - 1000 µg/m^3	
Accuracy	—	0-100(±10µg/m^3), 100-1000(±10 %) (-10°C to +60°C)	
Resolution	—	1 µg/m^3	

Formaldehyde (HCHO)[2]

Operating Principle	—	—	Electrochemical
Range[3]	—	—	0 - 1.25 mg/m^3
Accuracy	—	—	±10 %
Resolution	—	—	0.01 mg/m^3
Working Life			6 Years

Ozone (O_3)[2]

Operating Principle	—	—	Electrochemical
Range	—	—	0 - 10 ppm
Accuracy	—	—	±5 % FS
Resolution	—	—	0.01 ppm
Working Life			2 Years

Display & Configuration

Display	4.2-inch Black & White E-Ink Screen
Button	1 × Power Button + 1 × Reset Button
LED & Buzzer	1 × Traffic Light Status Indicator + 1 × Buzzer
Configuration	1. Mobile App via NFC 2. PC software via NFC or USB Type-C port

Physical Characteristics

Power Supply	1. 4 × 2700 mAh ER14505 Li-SOCl$_2$ Replaceable Batteries	5V/1A by Type-C Port

	2. 5V/1A by Type-C Port		
Battery Life[4] (10 min interval)	Around 3 Years	Over 1 Year	—
Operating Temperature	-20°C - 60°C (E-Ink Screen: 0°C - 40°C)		
Relative Humidity	10% - 90% (non-condensing)		
Ingress Protection	IP30		
Dimension	100.8 × 114 × 22 mm (3.97 × 4.49 × 0.87 in)		
Installation	3M Tape Mounting, Wall Screw Mounting, 86 Box Mounting		
Approvals			
Regulatory	CE, FCC		
Environmental	RoHS		

Note:

1. Reference to IAQ rating guideline (conversion from mg/m3 to ppm by the factor is about 0.5):

IAQ Rating	TVOC (mg/m³)	Air Quality
≤1.99	<0.3	Very Good
2.00 to 2.99	0.3 to 1.0	Good
3.00 to 3.99	1.0 to 3.0	Medium (not recommended for exposure > 12 months)
4.00 to 4.99	3.0 to 10.0	Poor (not recommended for exposure > 1 months)
≥5.00	>10.0	Bad (not recommended)

2. HCHO or O_3 sensor is alternative option and both support replacement.

3. For HCHO at 760 mmHg and 20°C, 1 ppm = 1.25 mg/m³.

4. The battery life is tested under laboratory conditions and for guideline purposes only.

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