

Air Lab & PM2.5 Particle Sensor

Description

The air lab & PM2.5 particle sensors are specifically designed to monitor and air pollution in offices and other indoor spaces. The sensors complement applications for a healthy indoor climate. ModBus RTU&TCP/IP, BACnet MSTP&IP for direct digital reading on all models.



Highlights

- Accurate : Laser scatter method, particles are sized with a resolution of 0.3 μm .
- User defined sampling period prolongs sensor life.
- Fast Response : response time less than 10 seconds.
- Real-time display monitoring data on LCD .
- Supports ModBus TCP/IP & BACnet IP protocol over WIFI.
- Supports ModBus RTU & BACnet MSTP protocol over RS485.
- TVOC sensor can detect Glycerin (Vaping smoke).

Specifications

General			
Power	15-24V +/- 10%, AC or DC,3VA@24VAC		
Display Resolution	130x80 dot matrix, backlit		
Temperature Limt	-20~+50°C, 0~95% RH(Non condensing)		
Plastic Housing	Flammability rating UL 94 file E56070		
Particulate Matter Sensor Life time	8 years continuous, adjustable to decades intermittent		
Communications	ModBus TCP/IP & BACnet IP protocol over WIFI ModBus RTU & BACnet MSTP protocol over RS485		
	Range	Accuracy	Response time
Relative Humidity	0-100% non condensing	5%RH(25°C,20~80%RH	<10s(25°C,in slow air)
Temperature	-30-70°C (-22~158°F)	< $\pm 0.5^\circ\text{C}$ @25°C	<10s
PM0.5	0.3-0.5um	$\pm 10\text{ug}/\text{m}^3$ @0 to 100 ug/m^3 $\pm 10\%$ @100 to 1000 ug/m^3	<8s
PM1.0	0.3-1.0um	$\pm 10\text{ug}/\text{m}^3$ @0 to 100 ug/m^3 $\pm 10\%$ @100 to 1000 ug/m^3	<8s
PM2.5	0-1000 ug/m^3	$\pm 10\text{ug}/\text{m}^3$ @0 to 100 ug/m^3 $\pm 10\%$ @100 to 1000 ug/m^3	<8s
PM4	0.3-0.4um	$\pm 10\text{ug}/\text{m}^3$ @0 to 100 ug/m^3 $\pm 10\%$ @100 to 1000 ug/m^3	<8s
PM10	0.3-10.0um	$\pm 10\text{ug}/\text{m}^3$ @0 to 100 ug/m^3 $\pm 10\%$ @100 to 1000 ug/m^3	<8s
CO2	3000ppm	$\pm 70\text{ppm}$ or $\pm 5\%$ of reading	20s
TVOC	0-1000ppm	0-30ppm	2s-30s
Light Sensor	0-1000Lux	$\pm 15\%$	/
Sound Sensor	0-100Db	$\pm 5\%$	/

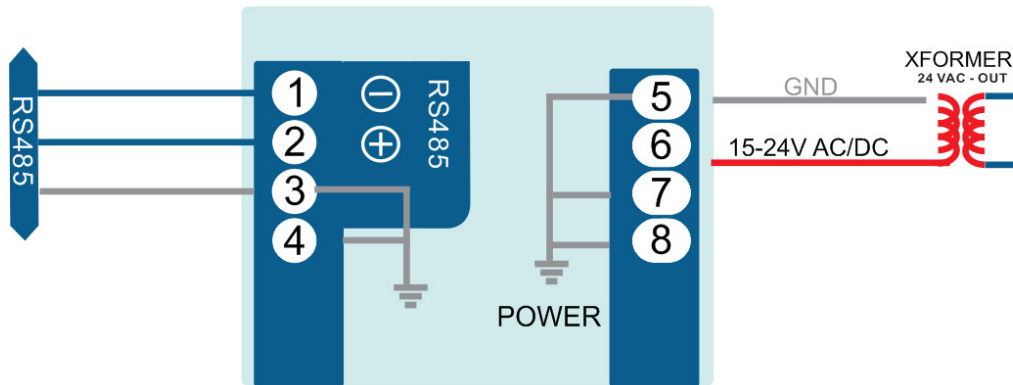
AQI levels as defined by the China Ministry of Environmental Protection

Air Quality Index	Air Pollution Level	PM2.5 24hr avg (ug/m ³)	PM10 24hr avg (ug/m ³)
0-50	Good	0-35	0-50
50-100	Moderate	35-75	50-150
100-150	Unhealthy for Sensitive Groups	75-115	150-250
150-200	Unhealthy	115-150	250-350
200-300	Very Unhealthy	150-250	350-420
> 300	Hazardous	> 250	> 420

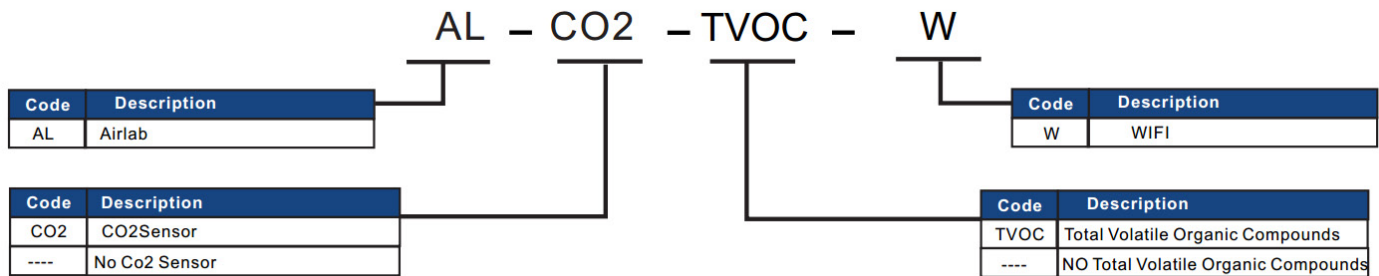
AQI levels as defined by the US Environmental Protection Agency

Air Quality Index	Air Pollution Level	PM2.5 24hr avg (ug/m ³)	PM10 24hr avg (ug/m ³)
0-50	Good	0-12	0-54
51-100	Moderate	12.1-35.4	55-154
101-150	Unhealthy for Sensitive Groups	35.5-55.4	155-254
151-200	Unhealthy	65.5-150.4	255-354
201-300	Very Unhealthy	150.5-250.4	355-424
301-500	Hazardous	250.5-500.4	425-604

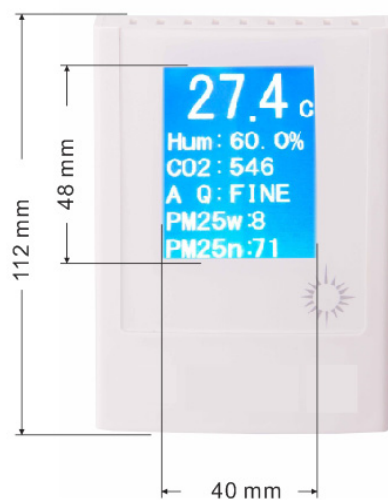
Wiring Diagram



Part Number Scheme



Dimensions



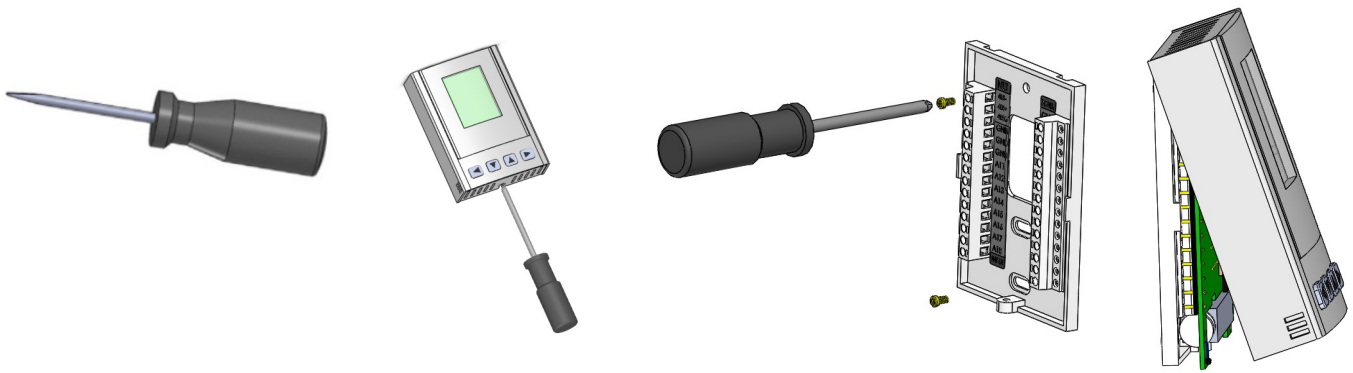
Mounting Installation

1. Slotted Screwdriver

2. Unfasten screw at cover

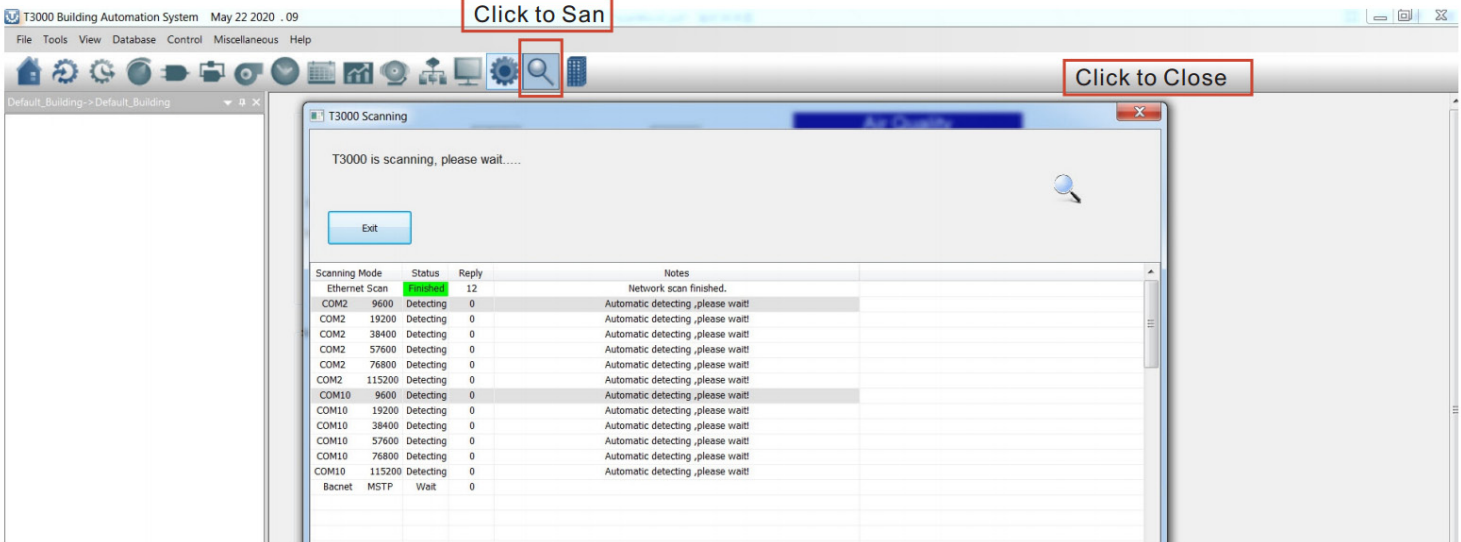
3. Install screws as shown

4. Installing the rear panel

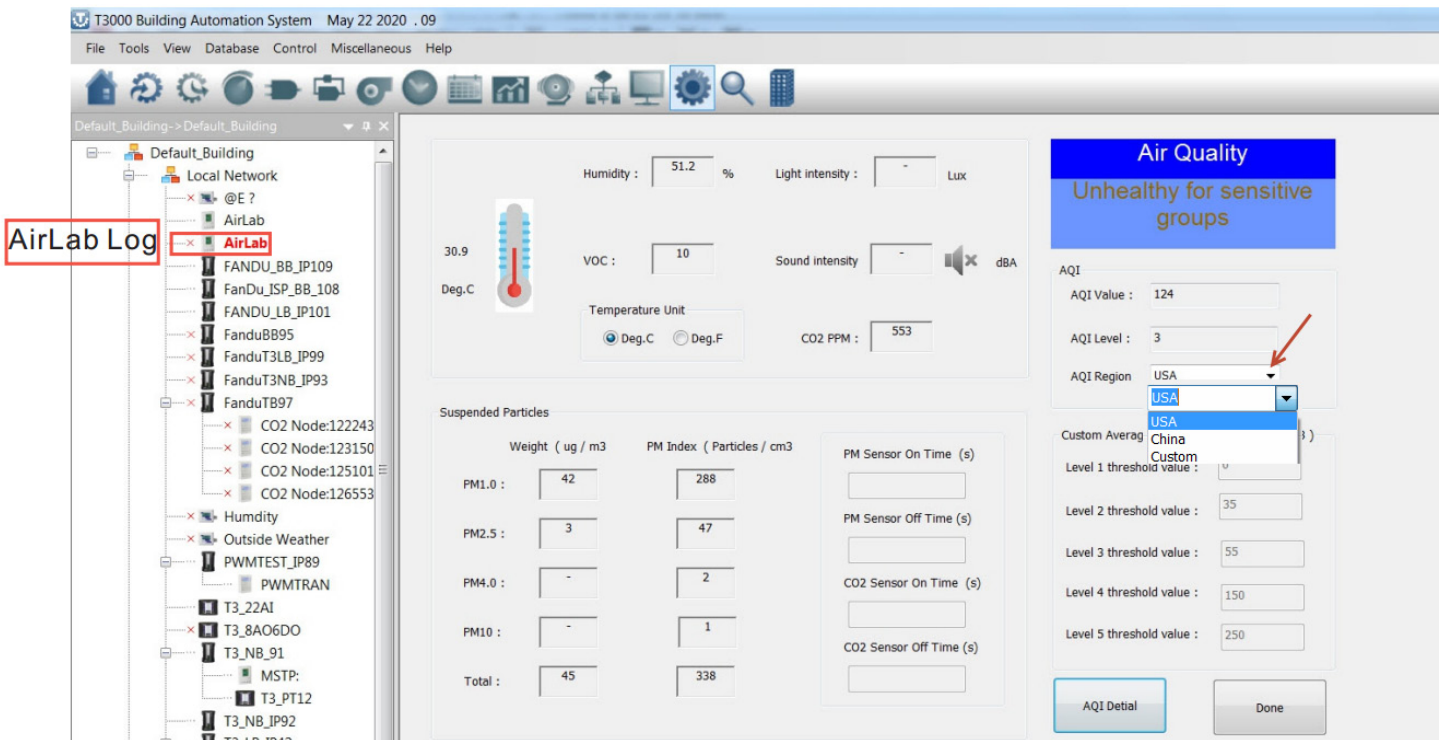


T3000 Building system

1. Connect AirLab to PC by RS485, start T3000 software




2. Click AirLab log, then you can see a tab below about AQI Region and AQI detail.



AQI Detial

The PM2.5 index grade corresponding to the average daily concentration

Average daily concentration(ug/m ³)			Air quality rating	
Custom	China	USA	China	USA
0-0	0-35	0-12	Level 1	Good
0-35	35-75	12-35	Level 2	Medium
35-55	75-115	35-55	Level 3	Unhealthy for Sensitive groups
55-150	115-150	55-150	Level 4	Unhealthy
150-250	150-250	150-250	Level 5	Very Unhealthy
250-500	250-500	250-500	Level 6	Poisonous

3. Click  to do settings, you can see a tab below about parameter.

T3000 Building Automation System May 22 2020 .09

File Tools View Database Control Miscellaneous Help

Default_Building->Default_Building

Default_Building

- Local Network
 - @E ?
 - AirLab
 - AirLab
 - AirLab
 - AirLab
 - FANDU_BB_IP109
 - FanDu_JSP_BB_108
 - FANDU_LB_IP101
 - FanduBB95

Input	Pa...	Full Label	Auto/Man...	Value	Units	Range	Calibrati...	Sign	Filter	Status	Signal Type	Label	Type
IN1	1	Temperature		30.20			0.0	+	5		TEM	Internal	
IN2	1	Humidity		52.70	%		0.0	+	5		HUM	Internal	
IN3	1	CO2		536.00	PPM		0.0	+	5		CO2	Internal	
IN4	1	VOC minipid2		7524.00			0.0	+	5		VOC_m	Internal	
IN5	1	VOC sensiron		4.00			0.0	+	5		VOC_s	Internal	
IN6	1	PM2.5 in ug/m3		43.00			0.0	+	5		PM2.5_w	Internal	
IN7	1	PM10 in ug/m3		0.00			0.0	+	5		PM10_w	Internal	
IN8	1	PM2.5 particle		328.00			0.0	+	5		PM2.5_n	Internal	
IN9	1	PM10 particle		0.00			0.0	+	5		PM10_n	Internal	
IN10	1	Sound Level		0.00			0.0	+	5		SOUND	Internal	
IN11	1	Light Strength		0.00			0.0	+	5		LIGHT	Internal	
IN12	1			0.00					0			Internal	

Wifi Set Up

First install this app in a android phone And connect your phone with your wifi router, power on Air Particle & Quality Sensor

The app will get the SSID from your phone and you need enter the wifi password, click confirm button then app will send a broadcast message through wifi router to Air Particle & Quality Sensor

Visit <https://temcocontrols.com/ftp/software/24esptouch.zip>, download Androidwifisetup software and install it;

EspTouch

SSID: TEMCO_TEST_2.4G

BSSID: 40:a5:ef:5d:32:ca

Password: enter password here

Device count: 1

Broadcast Multicast

CONFIRM

v0.3.7.0

After about less than 20 seconds, Air Particle & Quality Sensor will get the IP, and can see the message from phone

EspTouch

SSID: TEMCO_TEST_2.4G

BSSID: 40:a5:ef:5d:32:ca

Password: password

Device count: 1

Esptouch success, bssid =
cc50e35ceef5, inetAddress =
192.168.10.240

确定

CONFIRM

v0.3.7.0

Modbus Object List

Sensor	Description
0	Serial Number-4 byte value,Read-only
4	Software version-2 byte value,Read-only
6	Address,Modbus device address
7	Product Model.This is a read-only register that is used by the microcontroller to determine the product
8	[INVALID_DATA]
9	PIC firmware version
10	PIC version of humidity module
11	[INVALID_DATA]
15	
16	Firmware update register ,used to show the status of firmware updates.Writing 143 sets the config back to out of the box except for modbus ID and baud rate. Write 159 to fix the current config as the user defaults,this is done automatically by T3000 any.
20	Hardware options register,starting with LSB: Bit 0=Clock present or not ,Bit1=humidity present or not,Bit2=CO2 Sensor,Bit3=COsensor,Bit4=Motion Sensor.
104	DEGC_OR_F,engineering units,Deg C=0,Deg F=1
121	Temperature reading in Deg C or F from the sensor used in the control loop PI 1which is configured in register 111.This can be internal sensor,external,or an average of the two. writing a temperature value to this register will calibrate the curren.
139	CO2 ppm
140	humidity %
142	Temperature sensor filter,Fil,weighted average of stored value to new raw value
151	CO2 filer
152	hum filer
382	Sensor to be used for the PID calculations, 1=external sensor analog input 1,2=internal thermistor,3=average the internal thermistor and analog input 1
612	CO2 sensor calibration data
628	value of light sensor,unit lux
629	PIR sensor select 1=PIR sensor enable 0=PIR sensor disable
630	PIR sensor real value
631	PIR sensor ZERO value
640	Sound sensor real value,unit dbm
760	PM1.0 real value,unit ug/m3
761	PM2.5 real value,unit ug/m3
762	PM4.0 real value,unit ug/m3
763	PM10 real value,unit ug/m3
764	PM0.5 real value,unit number
765	PM1.0 real value,unit number
766	PM2.5 real value,unit number
767	PM4.0 real value,unit number

768	PM10 real value,unit number
769	Humidity sensor calibration data
805	Tvoc sensor real value,unit ppb
988	Tvoc sensor real value,unit ppb

Bacnet Object List

AI	Description
AI1	TEM
AI2	HUM
AI3	CO2
AI4	VOC_m
AI5	VOC_s
AI6	PM2.5 ug/m3
AI7	PM10 ug/m3
AI8	PM2.5 number
AI9	PM10 number
AI10	Sound level
AI11	Light strength

AV	Description
1	baud rate
2	station number
3	protocol select 0:MODBUS 1:BACKED
4	Instance
5	Temperature unit 0:C 1: F