

PMX 2.5/10 - Duct



PMX 2.5/10 - Wall



Features

- **Accuracy** : 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
- **LCD display with backlight** for keypad setup and troubleshooting
- **High resolution**: Particle diameter resolution of 2.5 μm
- **BACnet MS/TP and Modbus RTU protocols** with an Ethernet port over RS485 at up to 115.2k baud
- **Transducer outputs** with 0-10Vdc, 0-5Vdc and 4-20mA signals
- **IoT ready**

Technical Data

Measurement parameters	PM2.5, PM10
Range	0.0-999.9 $\mu\text{g}/\text{m}^3$
Power supply voltage	12-24Vac/dc +/- 10%, 2 watt typical
Output Signal Type	Jumper select: 4-20mA, 10V, 5V
Output Signal Drive	> 500 Ω for mA mode, 75mA max output drive for voltage mode
Operating Temp	-20 to +50°C, 0-95% non-condensing
Plastic Housing	Flammability rating, UL 94V0 file E194560, halogen free
Air pressure	86KPa to 110KPa
Response time	1s
Minimum resolution of particle	< 2.5 μm
Counting yield	70% @0.3 μm 98% @0.5 μm
Relative error	Maximum of $\pm 15\%$ and $\pm 10\mu\text{g}/\text{m}^3$
Display	130x80 dot matrix, backlit
Protection class	IP65
Mounting height	1.5 m above floor
Coverage area	35 m ² - 100 m ² based on application demands
Approvals	The product meets the demands
Life span	8000 hrs

Description

The PM2.5/10 Particle Counter is designed for environmental monitoring in industrial, commercial and institutional buildings.

The unit provides accurate readings of particle counts in two important sizes, 2.5 μm and 10 μm .

The sensor uses the laser light scattering method which is not subject to drift or sensor contamination.

A fixed volume of air is pumped through the sensor and suspended particulate matter in a given unit volume of air, is totalized into two bins, one for particles of 2.5 μm and another for larger 10 micron sizes.

The results are reported in $\mu\text{g}/\text{m}^3$ of air with all data available over the RS485 port for integration into large systems using either the BACnet MS/TP or the Modbus RTU protocols, with an ethernet port.

Two analog outputs, one for each of the two particle size bins.

The fan can be disabled between readings to extend the life of the sensor by adjusting a Modbus register/ bacnet variable.

The fan runs for one minute, takes a reading and then goes off for the user defined period which is adjustable from one minute to as long as 250 minutes between readings.

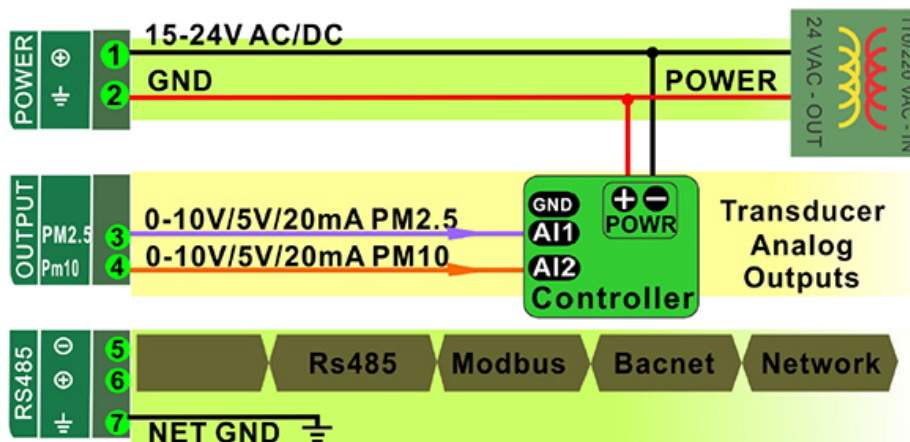
The laser diode within the PM sensor head has an operating life of up to 8000 hrs. This means an unexpectedly long life span of two years for typical applications.

The sensor head may be returned to Automatikprodukter for factory servicing and calibration as required.

Ordering Codes - Particle Counters

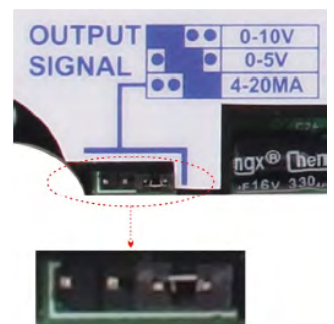
PMX Wall	Particle Counter
PMX Duct 150	Particle Counter, 150mm probe
PMX Duct 200	Particle Counter, 200mm probe
PMX Duct 250	Particle Counter, 250mm probe
PMX Duct 300	Particle Counter, 300mm probe
PMX Duct 1000	Particle Counter, 1000mm probe

Wiring Diagram

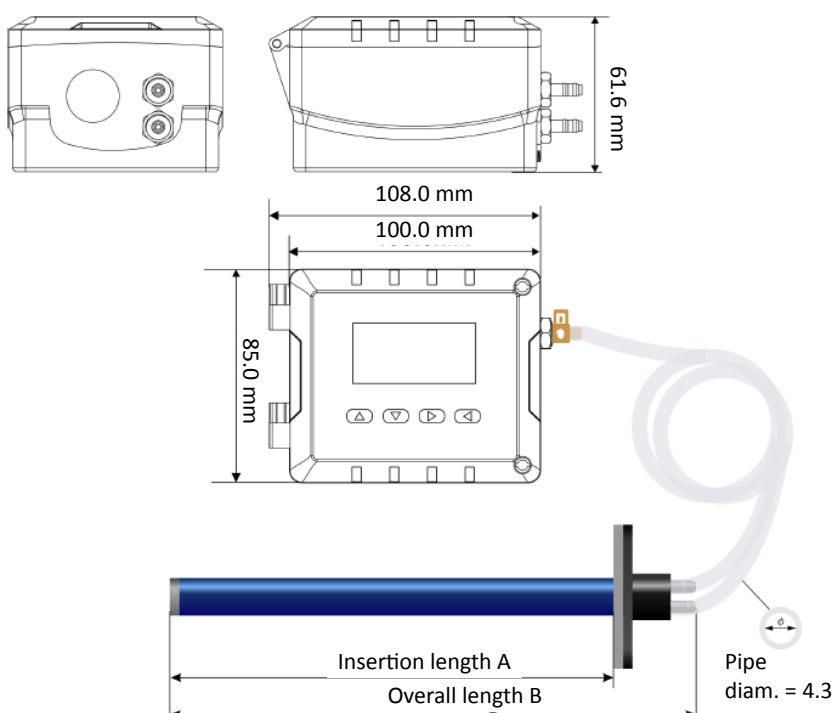


Output Jumper Settings

In this mode the device acts as a traditional transducer where it sends out three analog signals, all you need to do is to set this one single jumper to the appropriate signal type: 4-20mA, 0-10Vdc, or 0-5Vdc.



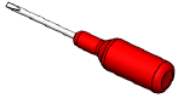
Dimensions



Insertion length A (mm)	Overall length B (mm)
150	193
200	243
250	293
300	343
1000	1043

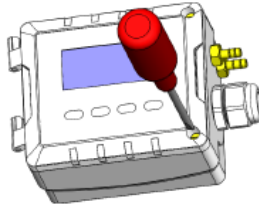
Mounting Installation

1. Slotted screw driver.

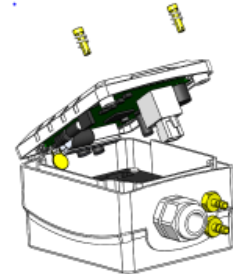


Captive screw (slotted screw)

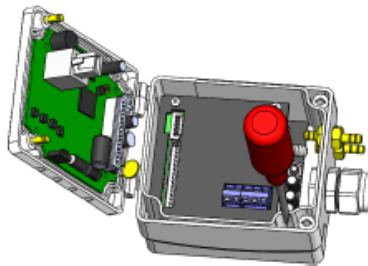
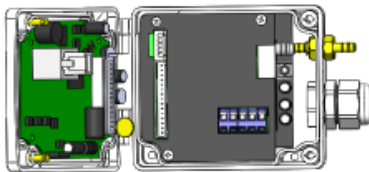
2. Unfasten screw at cover, turn the captive screw 1/2 turn till it pops out.



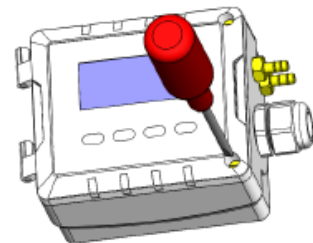
3. Open the cover.



4. There are three small holes inside the box for fastening self-tapping screws in the duct with a template.

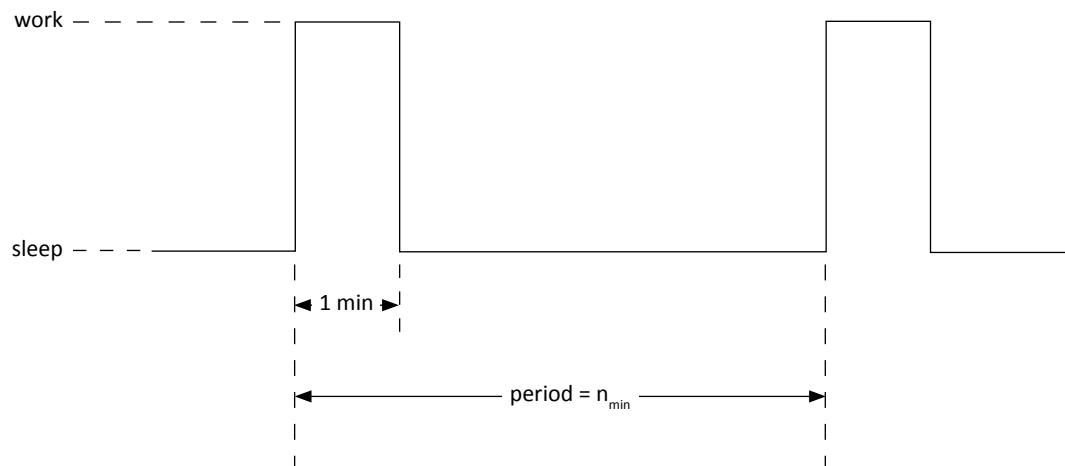


5. Re-fasten screw at cover.



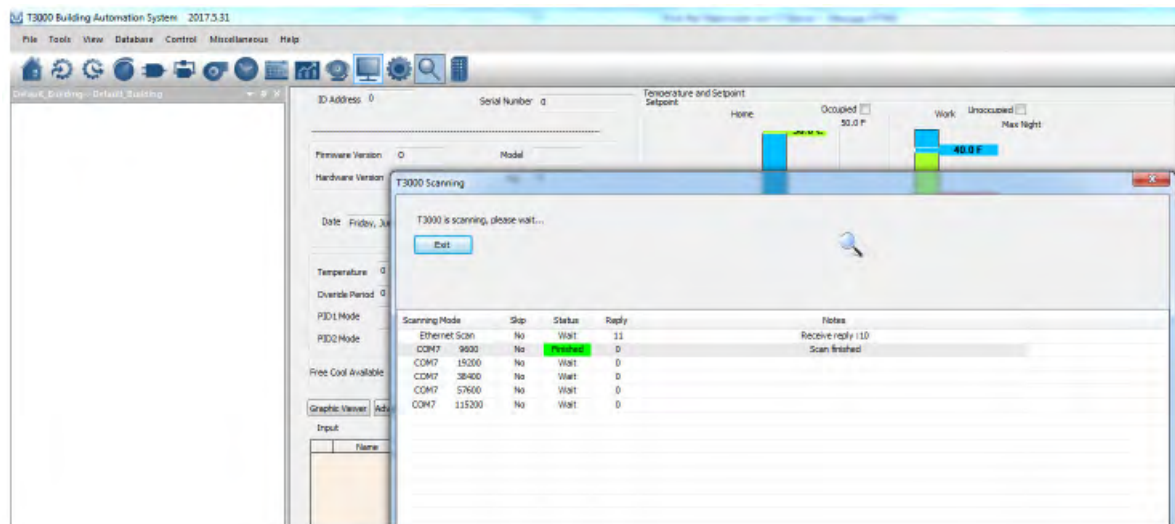
Work Period Setting

Available range of PM2.5 work period setting is 0 to 30min, default 0 (Modbus Register list 104).
When the setting value is n, PM2.5 works for 1 minute, the sleep time is (n-1) min.

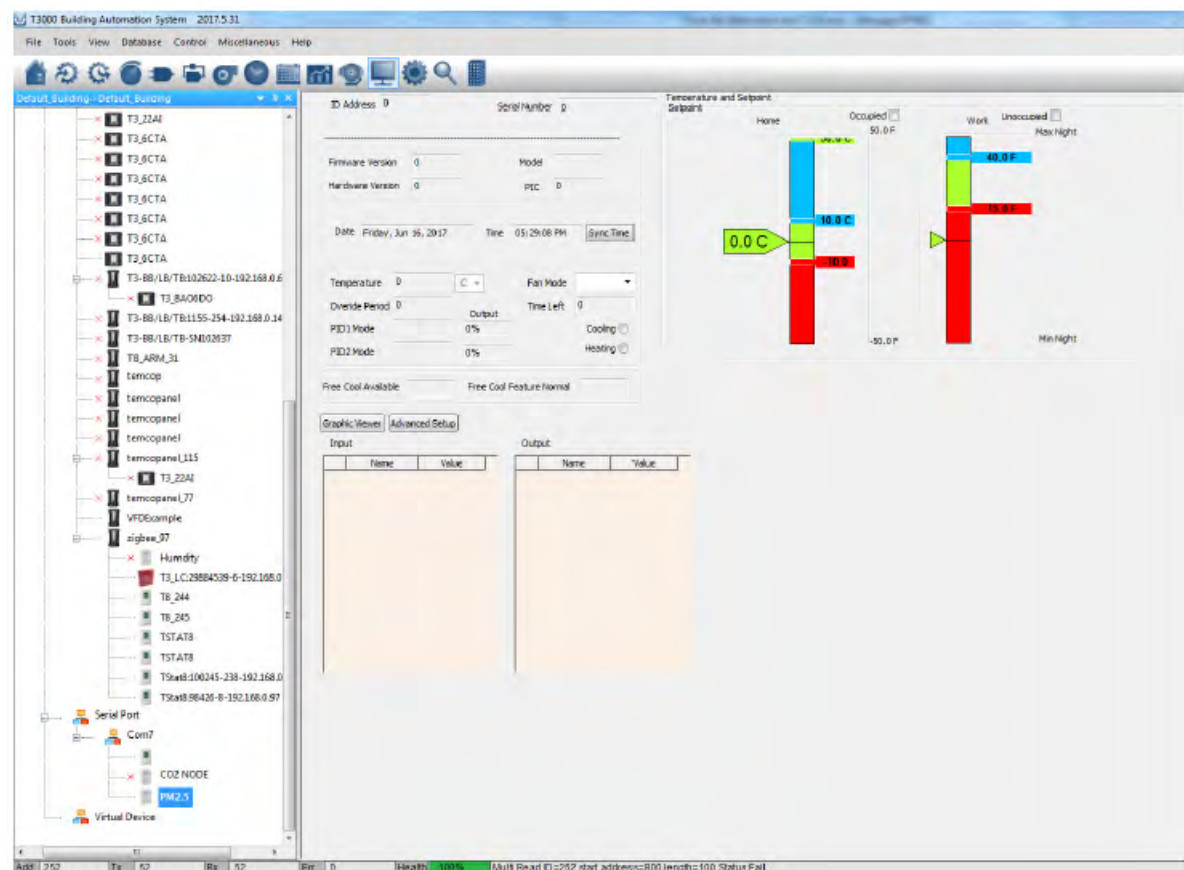


Software Operation

1. Request latest software from "ewert@automatikprodukter.se" and install it;
2. Plug PM2.5 in power and connect it to PC via RS485;
3. Start the software and click to scan. Then you can find PM2.5 as below.



4. Click  to see status. This window will display setpoints, temperature, inputs and outputs.





Address	Modbus Register and Description
0 to 3	Serial Number -4 byte value. Read-only
4 to 5	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	Hardware Revision. This is a read-only register that is used by the microcontroller to determine the hardware Rev
9	PIC firmware version
10	'Plug n Play' address, used by the network master to resolve address conflicts. See VC code for algorithms
15	Bau - Baudrate, 0=9.6kbaud, 1=19.2kbaud 2=38.4kbaud 3=57.6kbaud 4=115.2kbaud
16	Firmware Update Register, used to show the status of firmware updates
21	Protocol switch. 3 = MODBUS,0=MSTP.
17-39	Blank, for future use
40 to 45	reg40, MAC address, read only normally
46	reg46, IP mode. 0=static IP; 1= DHCP
47 to 48	reg47, upper two bytes of IP address
49 to 50	reg49, lower two bytes of IP address
51 to 52	reg51, right two bytes of SUBNET MASK address
53 to 54	reg53, left two bytes of SUBNET MASK address
55 to 56	reg55, right two bytes of GATEWAY address
57 to 58	reg57, left two bytes of GATEWAY address
59	reg59, 0, TCP server, (NO USE)
60	reg60, listen port at TCP server mode
61~75	buffer mirror for changing to a new IP address, copy of reg 46 to 60
76	write 1 to set the ghost settings to the system and start new settings, then clear the ghost registers.
93	Enable for MAC setting. It should be set as 1 before write the new MAC to the MAC registers(100-105), and it will be cleared automatically after setting the MAC address.
94~99	Spare
100	pm2.5 value. ug/m3
101	pm10 value. ug/m3
102	AQI
103	AQI LEVEL. 0 = Good,1=Moderate,2=pool for some,3=unhealthy,4=more unhealthy,5=hazardous.
104	the work period. 0 = work all the time. 1~30 minutes.
105	the pm2.5 sensor id
106	Spare
107	the pm2.5 sensor status. 0 = offline,1=online
108	Spare
109	the main display set . bit0:PM25,bit1:pm10,bit2:AQI,
110	the scroll display set. bit0:sensor status,bit1:rx/tx,bit2:baudrate,bit3:aqi level.
111	main display switch time.1~254 seconds.
112	the pm2.5 offset
113	the pm10 offset
114	the pm2.5 filter
115	the pm10 filter



Variable	Bacnet Variable and Description
0	Spare
1	SerialNumber LowByte
2	SerialNumberHighByte
3	SoftWare Version
4	ID Address
5	Product Model
6	Instance
7	Station number
8	Uart BaudRate.0=9.6kbaud, 1=19.2kbaud 2=38.4kbaud 3=57.6kbaud 4=115.2kbaud
9	Update
10	Protocol. 0=MSTP,3= MODBUS
11~19	Spare
20	OffSet_P25
21	OffSet_P10
22~25	Spare
26	Filter_Pm25
27	Filter_Pm10
28~35	Spare
36	Air Quality Index

Input	Input and Description
0~4	Spare
5	PM2.5
6	PM10

Health effects at different pollution levels

Air Quality Levels		PM2.5 24h Average concentration	Effects on Health
Level	Air Type	$\mu\text{g}/\text{m}^3$	
I	Very good	0 - 35	Good air quality, almost no air pollution
II	Good	36 - 75	Acceptable air quality, but some pollutants may have a small effect on health on a handful of sensitive persons.
III	Light pollution	76 - 115	Vulnerable people will experience some degree of discomfort.
IV	Medium pollution	116 - 150	Vulnerable people will suffer even further from discomfort. Many people will suffer severe symptoms.
V	Heavy pollution	151 - 250	Symtomen på utsatta grupper förvärras ytterligare. Människor i allmänhet får sjukdomssymptom.
VI	Serious pollution	> 251	Healthy people will suffer severe symptoms.

Air Quality Levels		PM10 24h Average concentration	Effects on Health
Level	Air Type	$\mu\text{g}/\text{m}^3$	
I	Very good	0 - 50	Good air quality, almost no air pollution
II	Good	51 - 150	Acceptable air quality, but some pollutants may have a small effect on health on a handful of sensitive persons.
III	Light pollution	151 - 250	Vulnerable people will experience some degree of discomfort.
IV	Medium pollution	251 - 350	Vulnerable people will suffer even further from discomfort. Many people will suffer severe symptoms.
V	Heavy pollution	351 - 420	Symtomen på utsatta grupper förvärras ytterligare. Människor i allmänhet får sjukdomssymptom.
VI	Serious pollution	> 421	Healthy people will suffer severe symptoms.