

Aerosol Monitor AES-1000-05N

Simplified Measurement of Particulates

Operating Manual



IMD11002Rev1. 2011.9

For Your Safety



Mis-use of this product may cause fatal accident or machine failure. Please operate the product after read this manual carefully and fully understand it. Defects caused by negligence, misuse, improper installation, accident or unauthorized repair or alteration by the buyer, or any modification, shall void this warranty. We shall in no way be liable for damages consequential or incidental to defects for any of our products, or failure to deliver in whole or partial, for injuries resulting from its use, or any other causes.

WARNING

When these instructions are not followed, loss of life or serious injury could occur.

CAUTION

When these instruction are not followed, injury to persons, or damage to building or contents could occur.



WARNING

Carefully check the following items before using the product.

- Do not use the product with other than 100V-240VAC to avoid electric shock or fire.
- Do not use the cable if you find any defects such as breaking or exposure of wire to avoid electric shock or fire.
- Do not place any heavy material or the product itself on the power cable.
- Do not fix the cable by tapes or nails.
- Do not install wiring the way getting something hung up on the cables.
- Do not use this product where flammable or explosive gases exist.
(* The product and the sensor are not constructed to protect from explosion.)
- Stop the usage of the product if moisture or foreign materials have gotten into the product to avoid fire or electric shock. Turn off the power and unplug the product immediately and ask for check-up and repair.
- Stop the usage of the product if you notice any smoke, abnormal odor or noise to avoid fire or electric shock. Turn off the power and unplug the product immediately and ask for check-up and repair.
- Do not open the cover or modify the product. Consult authorized repair shop for check-up and repair.



CAUTION

Please do not use or store the product in the following environment.

- Where the ambient temperature could exceed a range between 0 and +40 .
- Where the ambient humidity could exceed 90%rh.
- Where the temperature and the humidity could change suddenly and dew-condensation could occur easily.
- Where corrosive gas or combustible gas is contained in the atmosphere.
(* The product and the sensor are not intrinsically safe.)
- Where vibration or impacts are transmitted directly to the main unit.
- Where the product could be exposed to water, oil, chemicals, steam or vapor.
- Where the atmosphere is heavily loaded with dust, salt or iron powder.
- Where there might be larger inductive interferences and it is likely to generate static electricity, magnetism or noise.
- Where the product is exposed to direct exhaust air from air conditioner.
- Where the product is exposed to direct sunlight.
- Where heat could accumulate as a result of heat radiation, etc.
- Any other environment that could cause adverse effects on the instruments.

Maintenance

When cleaning the external area of the product, make sure to wipe it with dry, clean cloth.

It is prohibited to use such liquid as water, benzene or chemical.

This product is laser product that fits the requirement of Class 1 in category of JIS C 6802 (2005) regulations. Laser is used in internal particle sensing system, however, the laser beam won't leak out of the case.

This product uses the laser, that fits the requirement of Class 3B in category of JIS C 6802 (2005) regulations, in internal particle sensing system. Do not look at the laser because looking directly at the laser could cause blindness, also exposing skin to the laser could cause serious injury. Do not disassemble or modify the product. (Caution: Usage of the product other than the way stating in this manual could cause fatal laser exposure.)

Laser diode is used for internal particle sensing system of the product. Laser diode has relatively shorter life than other semiconductor device and is considered that its each life length depends highly on piece-to-piece variations. The life could be relatively short because of the condition of usage and the piece-to-piece variations.

Instruction Manual

This manual will become necessary from time to time during operation. Keep it always at a safe place where you can consult whenever you may need it.

Aerosol Monitor: Model AES-1000-05N

Feature

Easy-to-read display

AES-1000-05N has an easy-to-read display, which shows current air cleanliness level (equivalent of Class 100 - Class 100,000) by using a scale of one to ten.

3 types of Alarm

AES-1000-05N carries 3 types of alarms: TTL Open collector output in sync with alarm display, Alarm LED light, and Buzz sound alarm. All of the alarms come on when reaching to setting level.

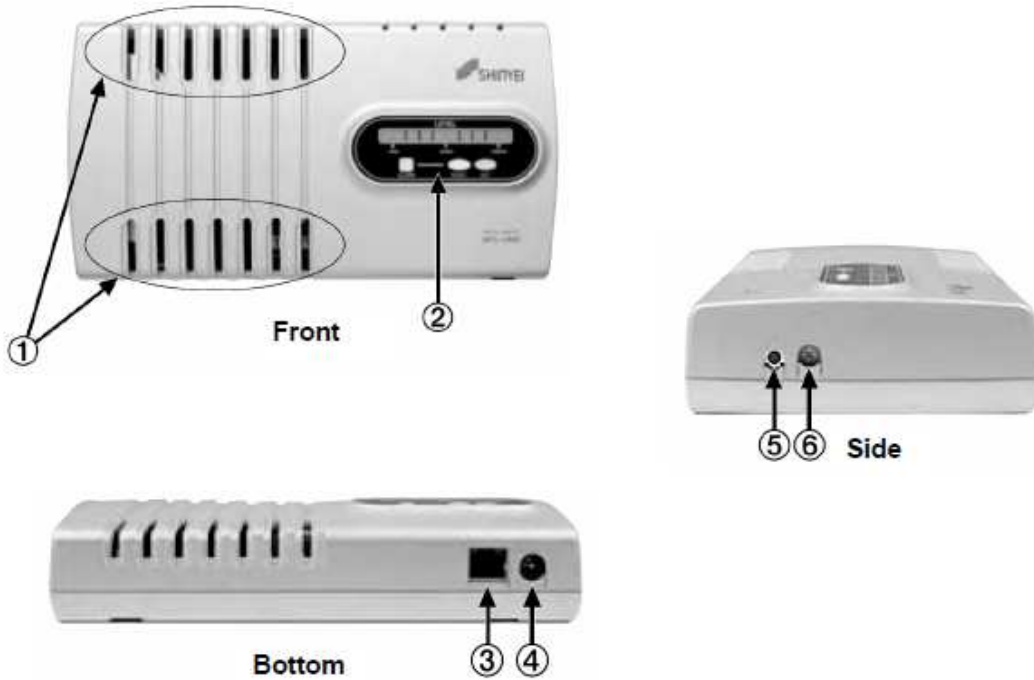
EtherNet communication

AES-1000-05N can be linked to EtherNet system with the purpose of monitoring air cleanliness level. You can use existing LAN cable in your factory and office.

Aerosol Sensor AES1-05N

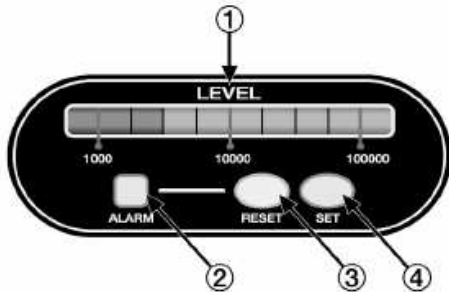
Aerosol Sensor AES1-05N has original sampling method using updraft airflow generated by built-in heater. AES-1000-05N have built in AES1-05N, which made it easy to set up anywhere you would like to check the particulate levels in the air.

Main Body



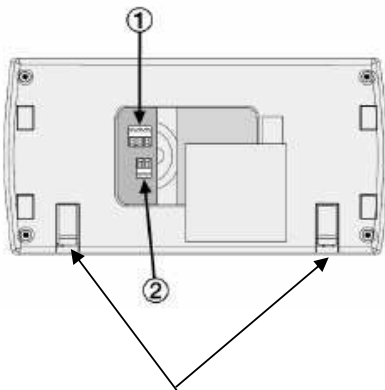
No.	Name	Function
	Vent	Air that came from bottom bent goes through built in sensor, then exits to top vent. Do not block the vents when install.
	Display	It shows the level of cleanliness by LED lights.
	LAN terminal	This terminal is for EtherNet communication (RJ-45). It enables to collect external data by connecting to Hub or PC in the network environment with LAN cable.
	Power jack	This terminal is for AC adapter.
	Reset button	Use this to initialize.
	Potentiometer	Use this to set up alarm output range by rotating.

Display



No.	Name	Function
	Level display bar	It shows the current clean level (equivalent of class) by LED lights.
	Alarm Display	Alarm LED light comes on when reaching to the setting level.
	Reset button	Use this to cancel alarm setting.
	Set button	Use this to set up alarm.

Backside of Main Body



No.	Name	Function
	Power input terminal	Use this to input power.
	Alarm output terminal	It enables open collector output in sync with alarm display. It can be used as output terminal for external alarm or alarm LED light.
	Latch	It locks the body on the mounting plate.

Installation

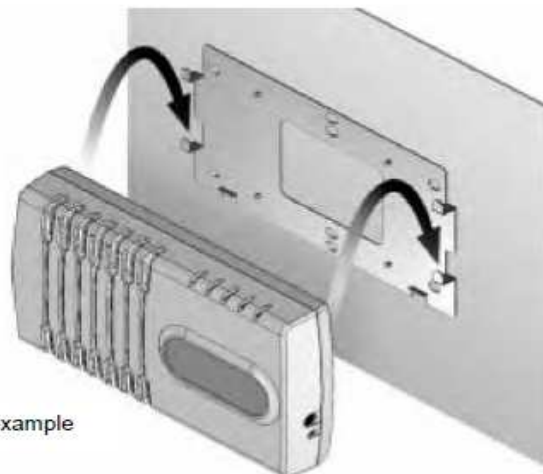
Please install AES-1000-05N vertically at right angle to surface.

Place a mounting plate with screws.

Put AES-1000-05N to the mounting plate and push it downward to get it locked.

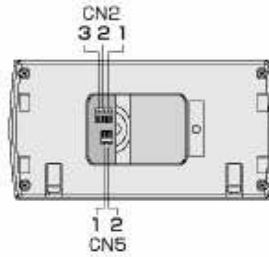
To detach from the mounting plate, use screwdriver to unlock the latch and push AES-1000-05N upward .

It is also possible to the stable stand.



Wall mounting example

Wiring



1) Connection to power supply

Use attached AC adapter for power supply. CN2 on backside of body can be also used when it is installed on the wall. (In case that both AC adapter and CN2 are connected, AC adapter will be primarily works.)

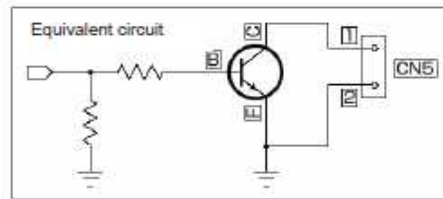
Pin	Signal	Function
1	Power supply	12VDC
2	N/A	N/A
3	GND	GND

Base connector: SMKDS 1/3-3.81 (Phoenix Contact Terminal Blocks)

Usable wire: Single wire 0.14 - 1.5 square millimeter
Twisted Wire 0.14 - 1.0 square millimeter (Equivalent to AWG 26-16)

2) Connection to alarm

In case of output alarm as external alarm, connect signal line to CN5.



Pin#	Signal	Function
1	TTL Open Collector output	Alarm output
2	GND	GND

Base connector: SMKDS 1/2-3.81 (Phoenix Contact Terminal Blocks)

Once alarm is output, internal shorts state occurs both on output side and GND side, otherwise it remains release state.

Usable wire: Single wire 0.14 - 1.5 square millimeter
Twisted Wire 0.14 - 1.0 square millimeter (Equivalent to AWG 26-16)

3) Communication

Use LAN cable in case of EtherNet Communication.

Use straight cable to connect to a Hub in a network, and use cross cable to connect directly to PC.

Measuring

- 1) Set up AES-1000-05N where to check the particulate levels in the air.
- 2) Connect to power supply.
- 3) First 5 minutes after turning on the power is preparation time.
LED lights come on gradually as power turns on, which indicates the start up period for the first 5 minutes. It starts measuring after past the preparation period of 5 minutes.
- 4) LED display shows equivalent of class converted by integrated value in 5 minutes measurement. Data on the display can be updated in every 5 seconds.

LED Lights Display	Equivalent of class Fed-Std-209E	ISO Class ISO 14644-1
0	100	5
1	1,000	6
2	2,000	
3	3,000	
4	5,000	
5	10,000	7
6	20,000	
7	30,000	
8	50,000	
9	100,000	8
10	Over 100,000	Over 8

Set UP Alarm

- 1) Rotate potentiometer by using screw driver. The number on the dial corresponds to LED level number.
In case of setting up #4 on the dial, alarm comes on when particle concentration in the air reaches level 4 on LED light display.
- 2) Press Set button as next step. The setting shall not apply until the set button is pressed.
Orange LED light comes on, indicating the setting after pressing the Set button. Orange light goes off in 3 seconds when the new setting is confirmed.

* It is possible to set up alarm, while rotating potentiometer and pressing the set button at the same time. In this case, orange LED light can show the setting level without looking at the dial # on the rotary switch. The new setting will apply after releasing the set button, and orange LED light disappears in 3 seconds.

Alarm

- 1) There are 3 types of alarms outputs available.
 - a) Buzz sounds alarm
 - b) LED light alarm
 - c) External alarm (TTL Open Collector output)

- 2) Above 3 types of alarms will be activated when particle concentration exceeds the setting level.
 The buzzer alarm would stop when Reset button is pressed, however, LED light alarm and Open Collector alarm remain on. LED light alarm and Open Collector alarm automatically stop when particle concentration level goes down lower than the setting.

- 3) All of the alarms remain activated unless Reset button is pressed when particle concentration exceeded and went back the setting below. All of the alarms stop when Reset button is pressed.

Pattern 1

	LED	Buzzer	Open Collector
Sensor output < Setting	Off	Off	Off
Sensor output > Setting	On	On	On
Press Reset button	On	Off	On
Sensor output < Setting	Off	Off	Off

Pattern 2

	LED	Buzzer	Open Collector
Sensor output < Setting	Off	Off	Off
Sensor output > Setting	On	On	On
Sensor output < Setting	On	On	On
Press Reset button	Off	Off	Off

- 4) The alarm output terminal on the back of body works as TTL Open Collector output. While alarm systems are on, internal shorts state occurs both on output side and GND side, otherwise it remains release state. You can use TTL Open Collector output to control sequencer or relay.

Output Rating: DC5V, 20mA. Max / DC12V, 8mA. Max / DC24V, 4mA. Max

EtherNet Communication

Set up IP address

- 1) Required Hardware and Software Systems for EtherNet Communication.

PC that can perform properly with Microsoft Windows.
Network card to accommodate above PC.
PC that works properly with installation of TCP/IP as network protocol.

- 2) Install (Device Installer Ver. 4.x.)

Device Installer Ver. 4.x (Lantronix, Inc.) needs to be installed into the system in order to set up IP address for Xport of AES-1000-05N.

The installer can be downloaded at

ftp://ftp.lantronix.com/pub/old_rel/deviceinstaller/Lantronix/4.1/4.1.0.9 for Windows 98/NT/2000/XP.

ftp://ftp.lantronix.com/pub/old_rel/deviceinstaller/Lantronix/4.2/4.2.0.4 for Windows 2000/XP/Vista.

ftp://ftp.lantronix.com/pub/old_rel/deviceinstaller/Lantronix/4.2/4.3/4.3.0.0 for Windows XP/Vista/7.

- 3) Start up the program after the installation is completed.

All AES-1000-05N that are connected to the PC will be displayed on the window as "Xport-OX", when you click [Search].



- 4) Select AES-1000-05N (Xport-OX) that you are trying to set up IP address for, click [Assign IP], then set up IP address and Subnet mask. Please note that Default gateway is set in blank.

Please consult your network administrator in case that applicable IP address and Subnet mask have restrictions in your network environment.



- 5) Set up IP address for other AES-1000-05N if you have. Please finish Device Installer when done with all set up for IP address.

Communication Specifications

- 1) Port# for IP address is already set up as "10001". If you need to change the #, set up new port# with Device Installer.
- 2) Data in sync with LED is updated in every 5 seconds and stored in memory inside AES-1000-05N. In order to load data from PC, establish socket communication of TCP/IP, then send data demand command "D" + CR.
- 3) AES-1000-05N responds "dABCDxxxxxxxx" + CR.

d (1byte)	Fixed
A (1byte)	LED Lights Level (0 to 9,A)
B (1byte)	Alarm Setting Level (0 to 9,A)
C (1byte)	Alarm ON/OFF On=1, Off=0 (indicate if alarm is on/off)
D (1byte)	LD Monitor Normal=0, Abnormal=1 (Indicate if LD is working properly)

Code:ASCII

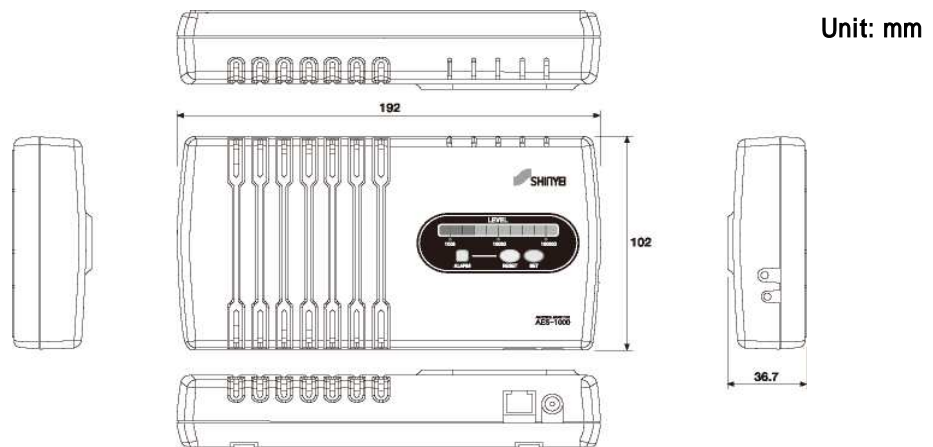
- 4) No data will be stored in the first 5 minutes after connected to power supply due to its start-up period. AES-1000-05N responds "B" + CR when the data demand command of "D" + CR is sent during the preparation period.

Specifications

Type	AES-1000-05N (0.5µm monitoring)
Cleanliness Class	From level of equivalent of Class 100 to Class 100,000
Sensor	AES1-05N Optical Sensor
Monitoring Particle Size	0.5 µm or above
Sampling Method	Updraft airflow generated by built-in heater
Display	10 x LED lights show equivalent of Class 100 - Class 100,000 100 - 1,000 - 2,000 - 3,000 - 5,000 - 10,000 - 20,000 - 30,000 - 50,000 - 100,000.
Alarm Display	Alarm LED light comes on when reaching to setting level.
Alarm Output	Open collector output in sync with alarm display.
Interface	Ethernet x 1 port /Lantronix,Inc. Xport
Supply Voltage	DC 12V +/- 10%
Operating Temperature/Humidity	0 to 40 deg. C, 30 to 80%rh

Configurations

1. Main Body



2. Mounting Plate

