

# DIT Environmental Solutions

**DONG IL TECHNOLOGY LTD.**



MAR., 2025 (ver 1.0)

# Our Goal

## Environmental Solutions

for IAQ monitoring & Improving Air Quality

PM  
Sensor

E.P.F

Cu+ care

Ionizer

# Application 1

## PM Sensor

Particulate Matter Sensing Module



- HVAC Controller
- Air Purifier
- Air Conditioner
- IAQ device

## E.P.F

Electrical Particulate Filter



- HVAC system (ERV)
- Air Purifier
- Air Conditioner

## Ionizer

Cluster Ion Generator Module



- Ventilation fan
- Air Purifier
- Air Conditioner
- Kitchen hood
- Shoes dryer

## Cu+Care

Electrostatic Sterilization Filter



- Sterilizer
- Air Purifier
- Air Conditioner



# Application2

## Applications



### PM Sensor

- HVAC Controller
- Room Controller
- Air Purifier
- Air Conditioner
- IAQ Monitor (Home/ Automotive)
- IoT Environmental Sensor

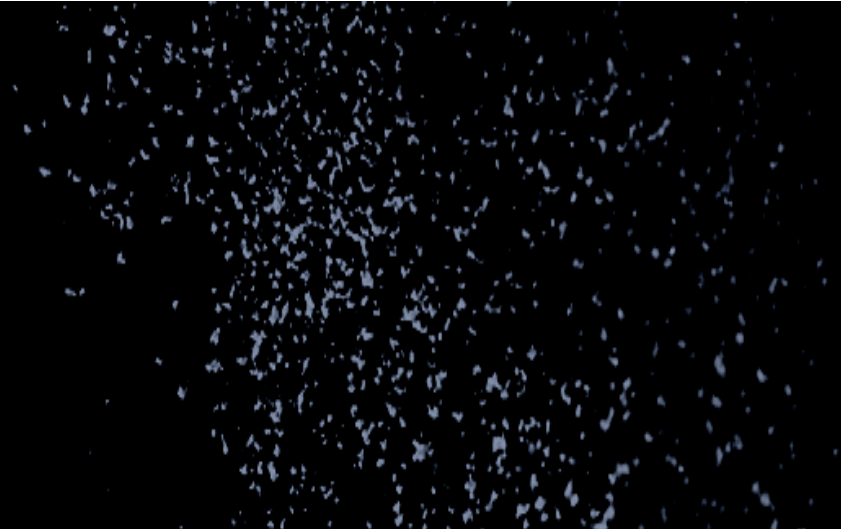
### Ionizer

- Air Purifier
- Air Sterilizer
- Air Conditioner
- Bathroom Ventilation System
- Kitchen Hood
- Shoes / Pet Dryer

### E.P.F / Cu<sup>+</sup>Care

- HVAC System (ERV)
- Air Purifier
- Air Sterilizer
- Air Conditioner



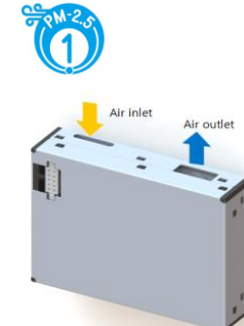

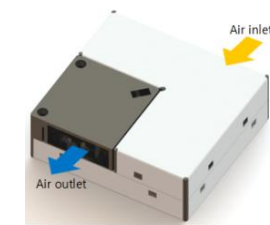
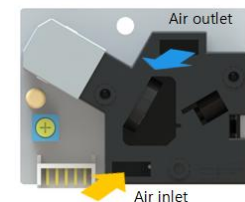
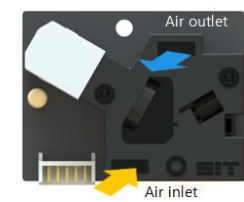
# PM Sensor



Accurately & Quietly detects  
invisible & vital fine particulate matter in your place

# PM Sensor Line-up

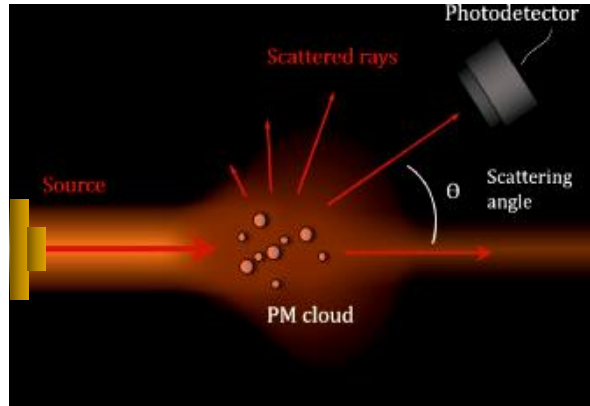
DIT developed from PM sensor Integrated Circuit (designed by Crepas Technologies) to Modules, in-house

Item	LASER PM Sensor					IR LED PM Sensor	
Product P/N	UPD-M010UAL	UPD-M010UBL	UPD-M010UCL	UPD-M010UDL	UPD-M010UEL	UPD-M025WC	UPD-M010WD
Image							
Output Information	PM1/2.5/10 ( $\mu\text{g}/\text{m}^3$ )	PM1/2.5/10 ( $\mu\text{g}/\text{m}^3$ )	PM1/2.5/10 ( $\mu\text{g}/\text{m}^3$ )	PM1/2.5/10 ( $\mu\text{g}/\text{m}^3$ )	PM1/2.5/10 ( $\mu\text{g}/\text{m}^3$ )	LPO (Low Pulse Oppupancy)	PM1/2.5/10 ( $\mu\text{g}/\text{m}^3$ )
Communication	UART (M.P) I <sup>2</sup> C (25.Q4)	UART (M.P) I <sup>2</sup> C (25.Q4)	UART (M.P) I <sup>2</sup> C (25.Q4)	UART (M.P) I <sup>2</sup> C (25.Q4)	UART (M.P) I <sup>2</sup> C (TBD)	PWM (M.P)	UART (M.P)
Dimension	41x36x11.6mm	48x40x12mm	48x37x12mm	48x40x12mm	38x35x12mm	59x45x22mm	59x45x22mm
Pin	8Pins	8Pins	10Pins	10pins	10pins	5Pins	5Pins
Measurement Range	0~1000 $\mu\text{g}/\text{m}^3$	0~1000 $\mu\text{g}/\text{m}^3$	0~1000 $\mu\text{g}/\text{m}^3$	0~1000 $\mu\text{g}/\text{m}^3$	0~1000 $\mu\text{g}/\text{m}^3$	Max 29000pcs/liter	0~500 $\mu\text{g}/\text{m}^3$
Accuracy	$\pm 10\mu\text{g}@0\sim 100\mu\text{g}/\text{m}^3$ , $\pm 10\%@101\sim 500\mu\text{g}/\text{m}^3$	$\pm 10\mu\text{g}@0\sim 100\mu\text{g}/\text{m}^3$ , $\pm 10\%@101\sim 500\mu\text{g}/\text{m}^3$	$\pm 10\mu\text{g}@0\sim 100\mu\text{g}/\text{m}^3$ , $\pm 10\%@101\sim 500\mu\text{g}/\text{m}^3$	$\pm 10\mu\text{g}@0\sim 100\mu\text{g}/\text{m}^3$ , $\pm 10\%@101\sim 500\mu\text{g}/\text{m}^3$	$\pm 10\mu\text{g}@0\sim 100\mu\text{g}/\text{m}^3$ , $\pm 10\%@101\sim 500\mu\text{g}/\text{m}^3$	$\pm 30\%@$ Reading Value	$\pm 20\mu\text{g}@0\sim 100\mu\text{g}/\text{m}^3$ , $\pm 20\%@101\sim 500\mu\text{g}/\text{m}^3$
Response Time	1s (Single Response)	1s (Single Response)	1s (Single Response)	1s (Single Response)	1s (Single Response)	1s (First reading 60s)	
Supply Volatage	5.0V $\pm 5\%$	5.0V $\pm 5\%$	5.0V $\pm 5\%$	5.0V $\pm 5\%$	5.0V $\pm 5\%$	5.0V $\pm 10\%$	

# Principle

## PM Sensor

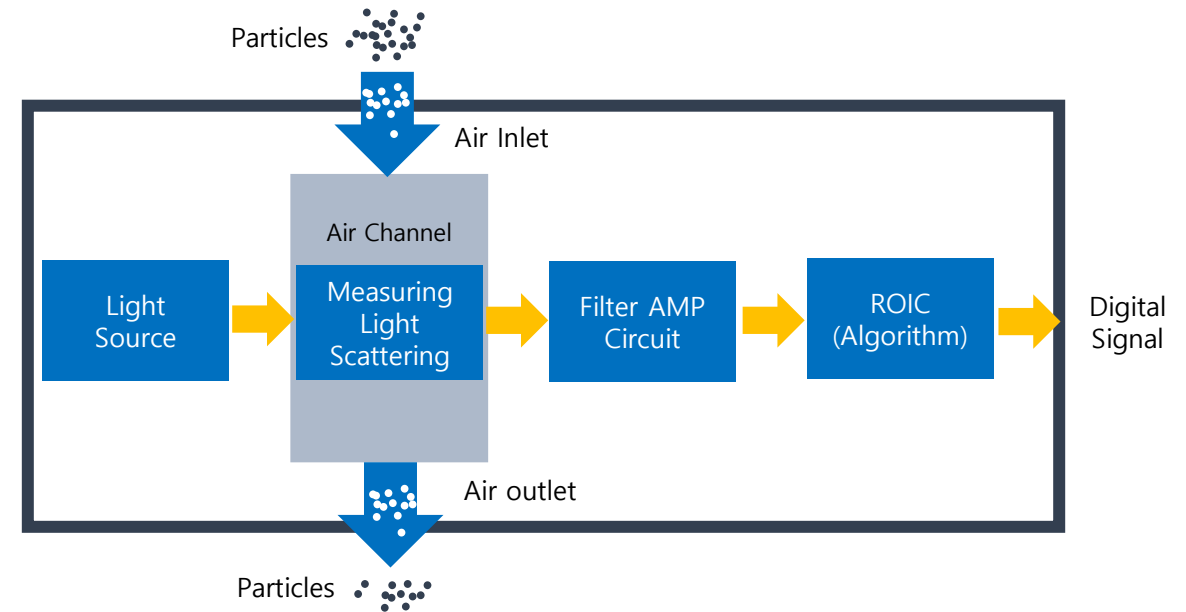
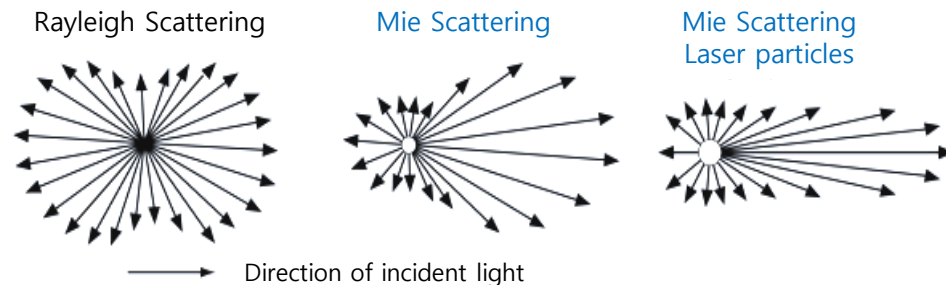
### Particulate Matter Sensing Module



## PM sensor is an optical sensor utilizing the principle of Mie Scattering among the light scattering methods

When fine particles enter into the sensor by fan or heater, they receive light from light sources such as Laser or IR LED and reflect it.

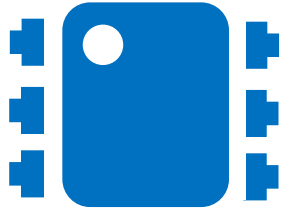
The amount of light scattering varies depending on the size and amount of dust particles, and if it is amplified and outputted (Analog, Digital) by an algorithm, the level or concentration of dust can be inferred in real time.



# Benefits

## PM Sensor

Particulate Matter Sensing Module



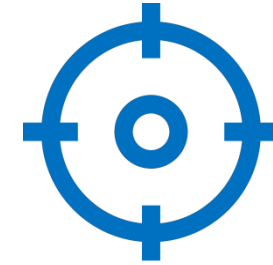
### Optimized ROIC

In-house PM Sensor exclusively for ROIC application  
(developed by Crepas Technologies)



### Low noise & constant speed Fan

Fan exclusively for fine dust sensor



### High accuracy

Excellent calibration technology  
In-house chamber and calibration system operation



### Compatibility

Mechanical compatibility with market products  
Gain & offset available



### Compact & slim

Easy to install



### Superior economic efficiency

Superior cost competitiveness compared to competitors





# Ionizer

Improve your life with the ozone-free ion generator  
created by Ceratrens® technology



# Ionizer Line-up

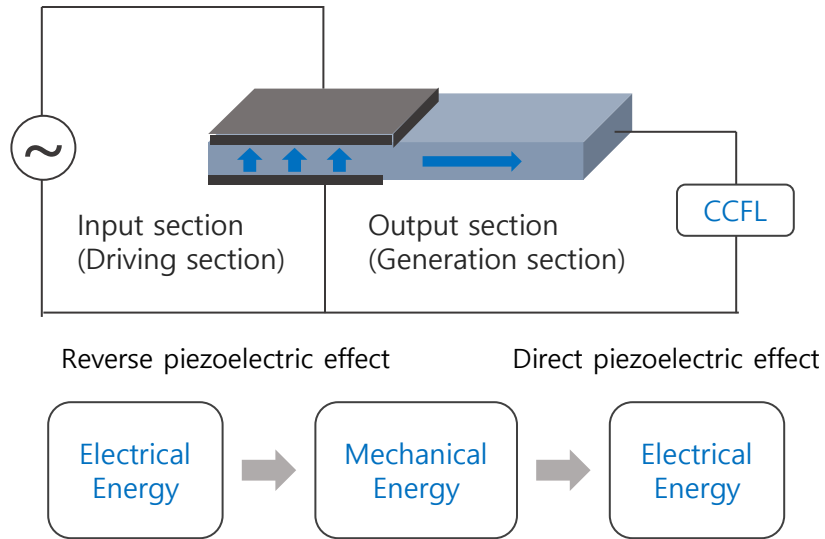
DIT provides safe high voltage solutions (HVPS: High Voltage Power Supply) and ionizer technology based on piezo ceramics

Item	AC Pulse Type		DC Pulse Type	
Product P/N	VCF-D40BA	VCF-D40BD1	VCF-D40NA	VCF-D40ND
Image				
Electrodes	Carbon Brush	Etching Pin (SUS304CSP-TA Material)	Etching Pin (SUS304CSP-TA Material)	Etching Pin (SUS304CSP-TA Material)
Dimension	55.8 x 50.7 x 17.1mm	55.8 x 50.7 x 17.1mm	55.8 x 50.7 x 17.1mm	55.8 x 50.7 x 17.1mm
Wire/ Housing	450±10mm / SMH250-04L	450±10mm / SMH250-04L	120±10mm / 12505HS-02	100±10mm / SMH200-04H
Ion Concentration	>1.2M/cc	>1.2M/cc	>1.2M/cc	>1.2M/cc
Input Current	20mA~50mA	20mA~50mA	20mA~50mA	20mA~50mA
Output Voltage	+3.5kV±0.5kV -4.0kV±0.5kV	+3.5kV±0.5kV -4.0kV±0.5kV	+3.7kV±0.7kV -3.7kV±0.7kV	+3.5kV±0.5kV -4.0kV±0.5kV
Input Voltage	DC12.0V±0.5V	DC12.0V±0.5V	DC12.0V±0.5V	DC12.0V±0.5V
Current Consumption	<1.0W	<1.0W	<0.54W	<0.54W
Operating RH&Temp Storage RH&Temp	-10~70°C / 20~85%RH -30~80°C / 20~90%RH	-10~70°C / 20~85%RH -30~80°C / 20~90%RH	-10~60°C / 20~85%RH -20~70°C / 20~90%RH	-10~60°C / 20~85%RH -20~70°C / 20~90%RH

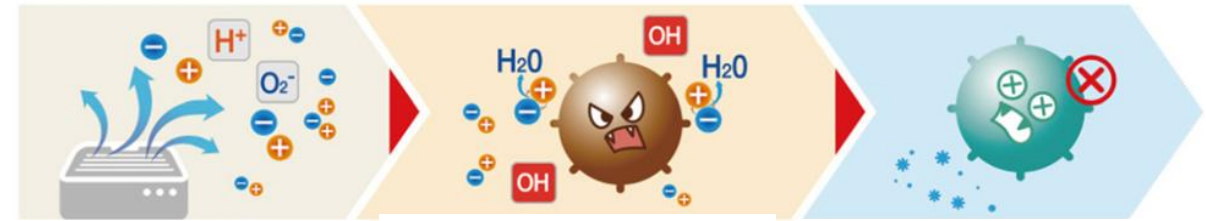
# Principle

## Cluster Ionizer

+/- Ion Generator in one Module



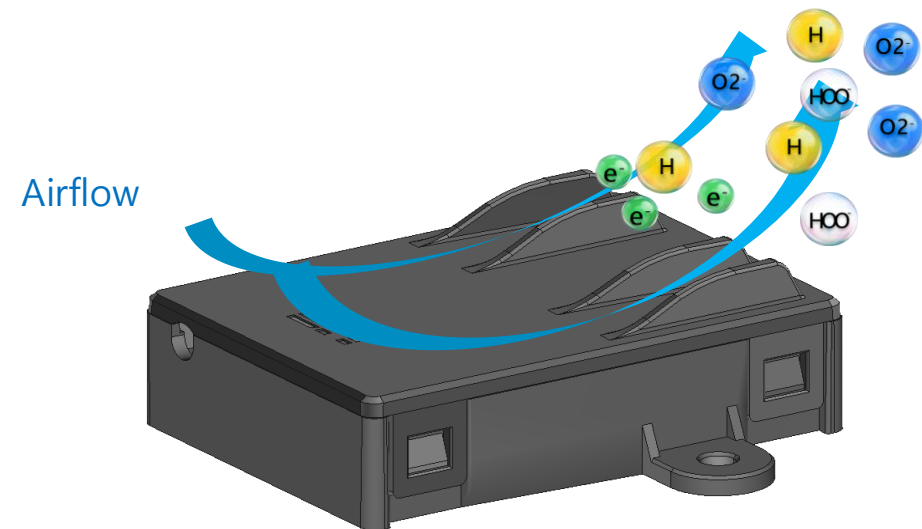
- I. High voltage generated by Ceratrans®
- II. Corona discharge occurs from (+) and (-) electrodes
- III. Generates over 1.2 million/cc ions & OH radical and spreads out in the air



**High voltage discharge**  
▶  $H^+$ ,  $O_2^-$  Ion emission

**Ionic bonding**  
▶ OH radical occurrence  
▶ Cohesion of hazardous bacteria and gas

**Removing hazardous bacteria, gas and dust**



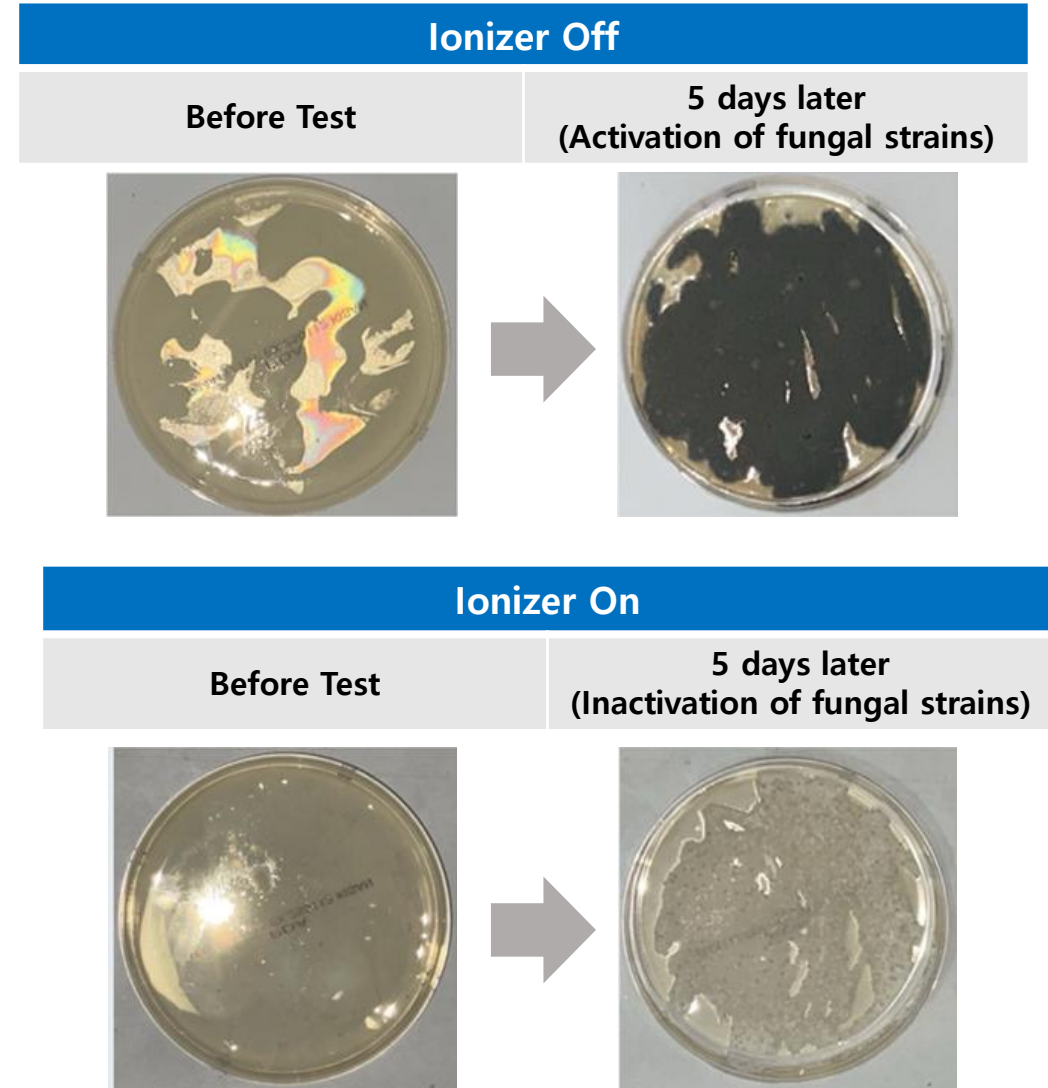
# Anti-fungi Test

## Anti-fungi Test Summary

- I. Subject: Anti-Fungal Effectiveness Test of Ionizer
- II. Specimen: Black fungi (*Aspergillus niger*)
- III. Test Condition
  - 1) Temperature: 25~28°C, Relative Humidity: 65~75%RH
  - 2) Test Chamber: Acryl Box (0.125m<sup>3</sup> =125L)
- IV. Test Method:
  - 1) Extracts Black fungies and mix them into distilled water
  - 2) Discharge a certain amount of the fungal strain into the culture medium placed in test chamber with pipette
  - 3) Conduct comparison test with/ without ionizer for 5 days
- V. Test Result: Refer to the right pictures



※ The test shows that ionizer can prevent the spread of fungi that reproduce well in place with high humidity such as bathroom, basement and so on.



# Benefits

PIEZO-CERAMIC

## Ceratrans®

In-house developed Piezo-ceramic applied  
Best awarded in Electronic parts contest in 1999



## Ozone Free

Ozone Free  
(Standard product basis: < 5ppb)



## 25 years of History

Piezo ceramic development in 1998.  
Joint development for  
Spi of company 'S'  
(Sole Provider)



## Customization

Customer requirement spec development available  
(Output, Electrode, Ozone, Ion density and more)



## Safety

Fire prevention  
Dust, foreign matter, moisture prevention



## Superior economic efficiency

In-house production for Key Components  
Decades of production know-how

# Customers

## HVAC



Room & HVAC Controller  
ERV (Energy recovery ventilation)  
System Air Conditioner  
Kitchen hood  
Ventilation system

## Consumer Appliance



Air Purifier  
Air Conditioner  
Air sterilization  
Shoes / Pet dryer  
Bidet

## ETC.



IoT device  
IAQ monitor for home  
IAQ monitor for automotive  
ETC.



**Thank you!**

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