

# Ionizer User Manual

**Model 2100**

Pulsed DC Ionization System



# Contents

1. Core Insight Introduction
2. Ionization Technology
  - A. Steady State DC Ionization
  - B. AC Ionization
  - C. Bipolar Pulsed AC Ionization
  - D. High Frequency AC Ionization
  - E. Pulsed DC Ionization
3. Application Guide
  - A. Basic ESD Control
  - B. Ionization for CDM/CBE Controls
4. Cautions and Personal Safety
  - A. Cautions
  - B. Personal Safety
5. General Specification
6. Drawings
7. Setup and Operation
  - A. Introduction
  - B. Contents in the box
  - C. Descriptions for Model 2100
  - D. Installation
  - E. Turning on the ionizer
  - F. Parameter Settings
8. Maintenance

## 9. Warranty and Services

## **1. CORE INSIGHT INTRODUCTION**

Core Insight is an ionization system manufacturer and supplier to ESD and contamination control areas. Core also provide general ESD Test & Measurement, Professional Audit Kits, EMI Noise Filter and Device Testing Equipment for HBM, TLP, VF TLP and CDM. Technical services are ESD Training, Process Assessment, ESD Control Program, Product Qualification Testing per ANSI/ESD Standards, Device Testing and System Level ESD Testing per IEC 61000-4-2.

Core Insight is major ESD distribution supplier in the field of semiconductor, flat panel display, automotive and electronic manufacturing working environment. Core founded in 2003 and represent for Prostat, On-Filter, Monroe Electronics, Electro-Tech Systems, Grund Technical Solutions, Lucas Signatone, SH&A, Dangelmayer Associate etc.

## **2. Ionization Technology**

Core Insight's CoreStat® Auto-Balanced Ionization System is exact same technology of SIMCO-ION (previously as known Ion Systems) which is their exclusive patents has been expired since 2009 and it has open for everybody. CoreStat® is a steady-state DC ionization technology with isolated high voltage section of power supply and maintain intrinsically balanced its offset voltage performance in specification ranges. All of Model 300 series and Model 3000 series ionizers are CoreStat® steady-state DC technology which aren't need adjust ion output for balance performance. It just need periodic cleaning emitter points for maintain decay performance.

Core Insight also offer traditional AC ionization technology for industrial applications such as roll to roll, winding & unwinding of films for static related contamination issues.

Core offer bipolar Pulsed AC ionizers which is lower frequency than conventional AC and output parameters are adjustable for each application such as FPD's manufacturing environment and others.

High Frequency AC is alternative solution for replacement of conventional AC for ESD control application and very small package ionization products. This technology applied lower high voltage level than conventional AC ionizers, but much faster switching time from

16kHz to 70kHz. This can achieve low offset voltage from ionizers and can be use ESD control application areas.

Pulsed DC ionization technology is the strength of Core Insight's ionization products for cleanroom particle contamination controls. There are many forms and configuration in this type of products which improves particle contamination issues in many places such as semiconductor front-end, back-end, flat panel display fab and many other industrial applications.

Core Insight offer several types of Charge Plate Monitor (CPM) or Test Kits for ionizer performance testing of qualification and compliance verification. Monroe Electronics' Model 288 is the latest version of CPM and highly accurate measurement equipment based on the original voltage following technology. Model 300 is cost effective ionizer measurement CPM equipment. Both two CPMs can remotely control and make measurement by software for detail analysis and test result reporting. This two equipment is perfectly compliance to ANSI/ESD STM3.1 standard requirement test.

Also, there are hand-held fieldmeter based test kit which is smaller plater, external charging source and integrated decay timer for compliance verification measurement per ANSI/ESD SP3.3 test requirement.

For more detail information about ionization and its test equipment, please feel free to contact our sales representative at [sales@coreinsight.co.kr](mailto:sales@coreinsight.co.kr) or local contacts.

### **3. Application Guide**

#### **A. Basic ESD Control**

It is mandatory requirements such as personal grounding, ESD safe worksurfaces and use ESD safe packaging material for all electronics industry. These are well known and easy to establish in ESD protected area (EPA) compare with following issues.

#### **B. Ionization for CDM/CBE Controls**

Every device has their own ESD sensitivities and they can damage by beyond this sensitivity limits. According to many IC manufacturing suppliers, over 99% of device ESD failures are CDM or CDM like and not HBM or very low possibility. Due to automation and device sensitivity continue to be lowering, vulnerability of device CDM are increasing. Not only CDM, but also Charge Board Event like ESD issues are increasing due to their complexity and large amount of charge stored on printed circuit board.

There are two strategical guidance has proposed by ESD Association. Lowering device charge level and increase resistance of contact materials are the key strategical elements to prevent ESD damage. As per ANSI/ESD S20.20-2014 latest version described, maximum allowing



field strength is 125V/inch for 200V CDM withstand threshold devices. To achieve this, using proper ionization is important solution to meet these requirements and less CDM/CBE ESD failures in production or field return from customer side.

Core Insight provides the best solution for static related issues with several types of ionization products and systems such as steady-state DC, AC, pulsed AC, high frequency AC and pulsed DC ionizations.

For more detail information about ionization and ESD controls in production, please feel free to contact our sales representative at [sales@coreinsight.co.kr](mailto:sales@coreinsight.co.kr) or local contacts.

## **4. Cautions and Personal Safety**

### **A. Cautions**

The use of improper input voltage may result in poor performance or damage of the unit.

The transformer should not be operated beyond the specified electrical limits as described in the Specification section of this document.

Damage caused to the transformer from operation in an environment that exceeds the specified limits will void the warranty.

Do not use this ionizer in an explosive environment. Poorly maintained ionizers could produce minuscule electric arcs at the emitter points. This may cause detonation in an explosive environment.

Damage to the product because of improper wiring connections at RJ-45 terminal or failure to heed maximum voltage limits will not be covered by the warranty.

There are no user serviceable parts inside this ionizer. Any unauthorized service will void the warranty and may result

in additional repair charge.

Before performing any maintenance on emitter points, shut down the power on the ionizer. Allow a minute for high voltage power supply to discharge.

## **B. Personal Safety**

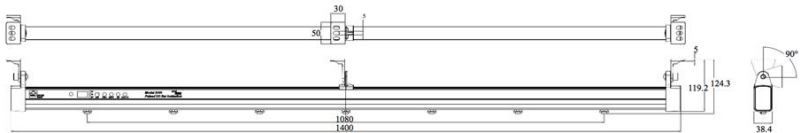
Do not wear wrist straps when access this ionizer units for maintenance reason as regular ESD control method and remove power connection from AC line source. Be sure that no wrist strap requires when service access to high voltage operational system.

## 5. General Specification

Input Voltage	24V DC
Ion Emission	Pulsed DC Technology
Offset Voltage	User Adjustable
Emitter Points	Tungsten 99.99%
On-Time	0.1 ~ 99.9 sec for Each Polarity 0.1 sec Resolution
Operation Mode	Standby, Pulsed DC
Display	3 digit FND Display
Control	Output Voltage, On-Time, Duty Cycle Adjustment for Each Polarity
Alarm	LED Alarms for Cleaning, Power Fail FND: Interlock Alarm Audio: Power Fail, Cleaning and Interlock Relay Output (Normal close type)
Output Monitoring	FMS Monitoring Interface
Material	Enclosure: ABS Chassis, Nozzle: Polycarbonate Bracket: Polycarbonate
Operating Environment	Temperature: 15 ~ 35°C Humidity: 35 ~ 85% RH
Dimensions	124 H x 50 D x L (600, 800, 1000, 1200, 1400, 1600, 1800, 2000, 2200, 2400, 2600, 2800, 3000)
Option	IR Remote Controller
Warranty	1 year

## 6. Drawings

### Model 2100 Dimensions



Variable length is available from 600 to 3000mm for each 200mm steps.

## 7. Setup and Operation

### A. Introduction

Model 2100 AirStat® ionizing bar are designed to control static in mini-environments, laminar flow hoods and workstations. Model 2100 AirStat® ionizing bar uses pulsed DC ionization technology and emitting ions generation is optimized for uniform discharge. For fine-tuning, output and balance adjustment can be achieved with FND display which shows you the output parameters for better Intuitional recognition. Model 2100 AirStat® ionizing bar come in a variety of lengths from 600mm to more than 3000mm. Model 2100 AirStat® ionizing bar is

designed enhanced self-power and controlled by itself without external.

## B. Contents in the box



Model 2100 AirStat® ionizing bar



RJ45 Cable

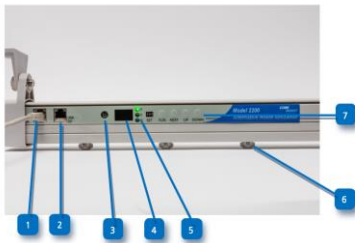


Remote Controller



DC Adapter (Optional – Required separate order)

## C. Descriptions for Model 2100 AirStat® Ionizing Bar



- 1) Link In: Input from cable or DC adapter
- 2) Daisy Chain: Power distribution to second or another bar
- 3) IR Receiver: Remote control signal receiver
- 4) FND: 3 digit FND display for adjust of output and alarm parameters
- 5) LEDs: Operation indication and Alarm
- 6) Emitter Points
- 7) Parameter Adjustable Switches: High voltage output, on-time, duty cycle, alarm level adjustment

#### **D. Installation**

It is highly recommended to choose DC adapter for using Model 2100 AirStat® Ionizing bar unless in-tool ionization and remote control application.

The wiring installation must be tested and qualified before the power is applied to the ionizing bar. See the following wiring instruction for Model 2100 AirStat® ionizing bar. Prior to connecting ionizing bar to power supply, test each

cable for opens, short and polarity. Do not connect the cable until the voltage and cable combinations are verified.

Link IN - Wiring Cable			
No.	Color	Item	Description
1	Orange/White	DC 24V -	DC input (-)
2	Orange	Alarm Relay	Alarm relay output common
3	Green/White	DC 24V +	DC input (+)
4	Blue	Alarm Relay	Alarm relay output

After the wiring has been tested, connect the cable and apply power to the ionizer. Performed the adjustment procedure to determine the final settings and if necessary, adjust individual parameters.

Place the ionizer in the desired location. Ionizer is powered by 24V DC and plug adapter into a properly grounded AC receptacle with the correct voltage for your power supply. Connect alarm cable to user monitoring terminal for indicating alarm status monitoring.

#### **E. Turning on the ionizer**

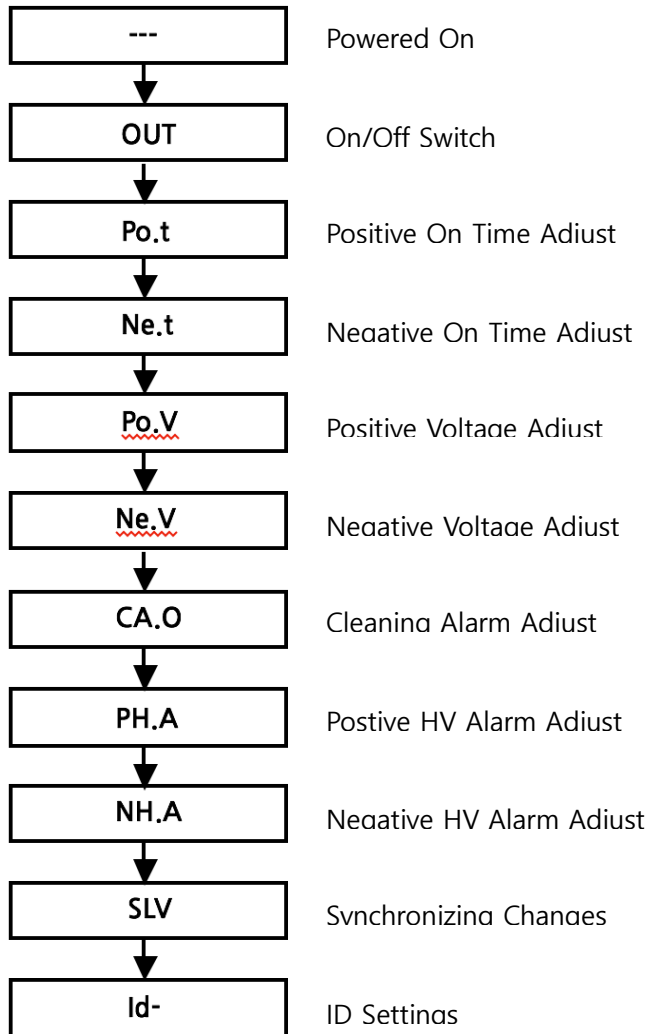
Once the ionizer is powered on, the green LED and FND will light. To adjust the position of the ionizer, move mounting bracket to the desired position and re-tighten the mounting bracket.



## **F. Parameter Settings**

Once the ionizer is powered on, ionizer will activate and operation at factory set. All of ionizers required test and initial setup with charge plate monitor (CPM).

Follows are the functions and features of Model 2100 AirStat® ionizing bar through FND display. User can select operation on/off, high voltage on-time for both polarity, high voltage output levels by 0.1kV resolution, cleaning alarm settings, power alarm setting, synchronizing output and ID settings.



Press FUN switch and click NEXT switch. Then FND will display as follows and all parameters can change press UP/DOWN switches. Once you change parameters, press FUN again and setting stored.

### 1) Power ON/OFF

Press FUN and UP/DOWN, FND will display as below.



### 2) On Time

Press FUN and press NEXT, P.O.t will display. 3.5 sec is default factory set. Press UP/DOWN to change value.



Press NEXT(2<sup>nd</sup>), Ne.t will display. 3.5 sec is default factory set. Press UP/DOWN to change value.



### 3) Voltage Adjust

Press FUN and press NEXT(3<sup>rd</sup>), Po.V will display. 4.5kV is default factory set. Press UP/DOWN to change value.



Press NEXT(4<sup>th</sup>), Ne.V will display. 3.9kV sec is default factory set. Press UP/DOWN to change value.



#### 4) Cleaning Setting

Default set is fixed one month and requires emitter point cleaning every month. If user disagree with this period and user can make disable this default setting. Press FUN and NEXT five times, then menu will display CA.O. Press UP/DOWN to change On/OFF.

#### 5) High Voltage Power Alarm

Press FUN and press NEXT(8<sup>th</sup>), PH.A will display. PH.L can adjust positive high voltage low level alarm setting. Press NEXT(9<sup>th</sup>) PH.O will display and this is for high level alarm setting.



When positive high voltage power alarm status, green round LED disappeared and red LED will blink with PH.L or PH.O display as below.



Press FUN and press NEXT(10<sup>th</sup>), NH.A will display. NH.L can adjust negative high voltage low level alarm setting. Press NEXT(11<sup>th</sup>) NH.O will display and this is for high level alarm setting.



When negative high voltage power alarm status, green round LED disappeared and red LED will blink with NH.L or NH.O display as below.



## 6) SLV – Polarity Change or Synchronizing

If user defined daisy-chain power distribution through RJ-45 cable, user can select either same polarity or different polarity operation of ionizers when they installed close each other as synchronization or independently. User need to contact manufacturer to get detail instructions how to use this function.

## 7) ID Addressing

Press FUN and press NEXT(13<sup>th</sup>), Id.- will display. User can define ID address from 001 to 999.

## 8) Remote Controller

User can change parameters from remote controller.



Press START to change parameters



Press FUN to get each parameter mode and save value



Press NEXT to move next mode



Press UP to get higher value setting



Press DOWN to get lower value setting



Type-in user want parameters from 0 to 9



Once all change parameters done, press  
END to exit from program mode

## 8. Maintenance

The performance of the ionizer is designed to be maintained primarily by the internal circuitry. Occasional cleaning of the case and emitter points is the only routine maintenance required. When user perform cleaning emitter points, CPM test required to make sure output of ionizers are fine.

### A. Recommended Cleaning Materials:

- 1) Cleanroom-compatible cleaning cloths (polyester cloth is recommended)
- 2) Cleanroom-compatible swabs
- 3) Cleanroom solution of 50% IPA (electronic-grade isopropanol) / 50% de-ionized water

### B. Cleaning inside of Enclosures

Moisten a cloth with the IPA solution. Wipe off any dirt

that may have accumulated inside of the unit.

### **C. Cleaning the Emitter Points**

Turn off the unit. Normally, the emitter points can be cleaned by using a jet of compressed air to blow off any dirt that may have accumulated on them. A swab moistened with the IPA solution may be used if required. If using a swab, gently wipe the tips of the emitter points until the dirt is removed. After cleaning make sure that the emitter point need to dry out about 20 minute.

## **9. Warranty and Service**

Core Insight, Inc. provides a limited warranty for all ionizers. New products manufactured or sold by Core are guaranteed to be free from defects in material or workmanship for a period of defined schedules from the date of initial shipment. Core's liability under its new product warranty is limited servicing (evaluating, repairing or replacement) any unit returned from customers that has not been subjected to misuse, neglect, lack of routine maintenance, repair, alteration or accident. In no event shall Core be liable for collateral or consequential damages.

To obtain service under this warranty, please contact sales representative at [sales@coreinsight.co.kr](mailto:sales@coreinsight.co.kr) or local contacts.