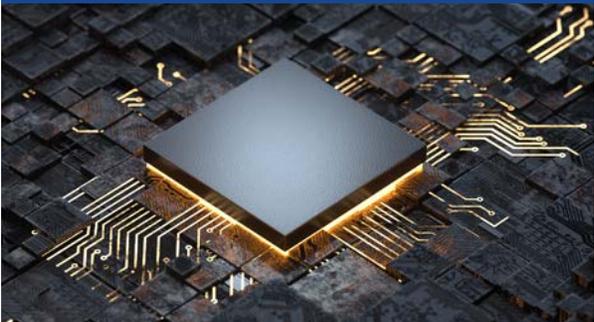




ADVANCED ESD PROTECTION

Bonding, Assembly & Test
for Back-end Semiconductor
Processing



SIMCO IONTM
An ITW Company



STATIC CHARGE

in Semiconductor Manufacturing

Static charge in semiconductor manufacturing, which is generated throughout the semiconductor manufacturing process, primarily results from the contact and separation of materials. It can impact productivity and yield in three key ways.

Electrostatic Attraction (ESA): Static charge electrostatically attracts particles from the air causing potential yield loss on wafers and reticles.

Electrostatic Discharge (ESD): Electrostatic discharge (ESD) causes instant or latent defects on reticles, wafers, or packaged chips.

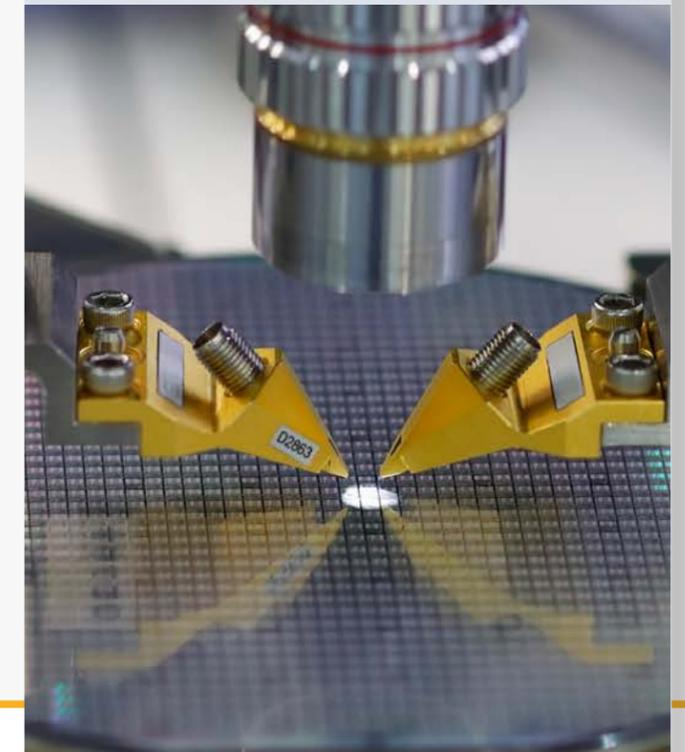
Electromagnetic Interference (EMI): The electromagnetic interference (EMI) generated by electrostatic discharges can trigger microprocessor lockup and robotic malfunctions that lead to product flow interruptions and costly tool downtime.

In the semiconductor back-end processes, some potential ESD hazards will impose during certain operations to assure the device's functionality. Such as wafer mount and saw on highly charged films, bonding with very fine line width, packaging with plastic molding, and in-socket test. With advanced packaging technology and intelligent circuitry designed to pack complicated systems into a small chip, sensitivity to electrostatic charge levels increased substantially.

Advanced semiconductor Back-end applications where ionization and monitoring solutions essential in improving productivity:

Back-End Manufacturing

- Wafer Probe
- Wafer Backgrinding
- Wafer Dicing
- Wafer/Panel Preparation
- Die Attached
- Encapsulation
- Redistribution Layer
- Formation
- Singulation
- Marking
- Final Test
- Interconnects
 - Bumping
 - Hybrid Bonding
 - Through Silicon via (TSV)



Simco-Ion, Technology Group, a Worldwide Leader in Advanced Ionization and Monitoring Solutions for Ultra-clean and ESD Control applications, is renowned for...

QUALITY. PERFORMANCE. RELIABILITY.

Simco-Ion, Technology Group delivers **ADVANCED ESD PROTECTION**; cutting-edge ionization and monitoring solutions tailored for semiconductor back-end in-tool and test applications in wafer-level and panel-level packaging. Our comprehensive portfolio includes bars, blowers, guns/nozzles, instrumentation, and continuous monitoring systems, all engineered with a commitment to advanced technology and exceptional sensitivity.

As wafer-to-wafer, die-to-wafer, die-to-die, and die-to-substrate interconnection technologies, such as hybrid bonding and through-silicon-via (TSV), drive the rapid transition of back-end semiconductor requirements to 5V and below, Simco-Ion, Technology Group ensures our ionization products not only meet but exceed performance demands. Featuring Novx closed-loop feedback control and an FMS interface, our solutions meet and exceed customers' performance requirements with unmatched precision and reliability for next-generation packaging needs.

ESSENTIAL REQUIREMENTS

For Today's Semiconductor Back-End Manufacturing Industries

Advanced ESD Protection – Electrostatic Discharge (ESD) is a critical concern for semiconductor back-end manufacturers, as it can cause latent failures, yield losses, and low-quality products. Addressing this challenge requires a focus on monitoring and protecting devices sensitive to ESD.

Voltage Control – Tighter voltage control is essential to reduce ESD risks in electronics manufacturing. The industry is moving toward stricter thresholds, with voltage limits expected to drop below 5V to prevent damage to sensitive devices.

Monitoring – To meet Industry 4.0 standards, the Novx Complete Electrostatic Control Management System offers advanced monitoring with closed-loop feedback and control, which ensures traceability, compliance, process optimization, proactive notifications, and more.



Critical Process ESD Monitoring



Field Voltage Detection System



MiniPulse ESD Event Detection



Family of Antennas



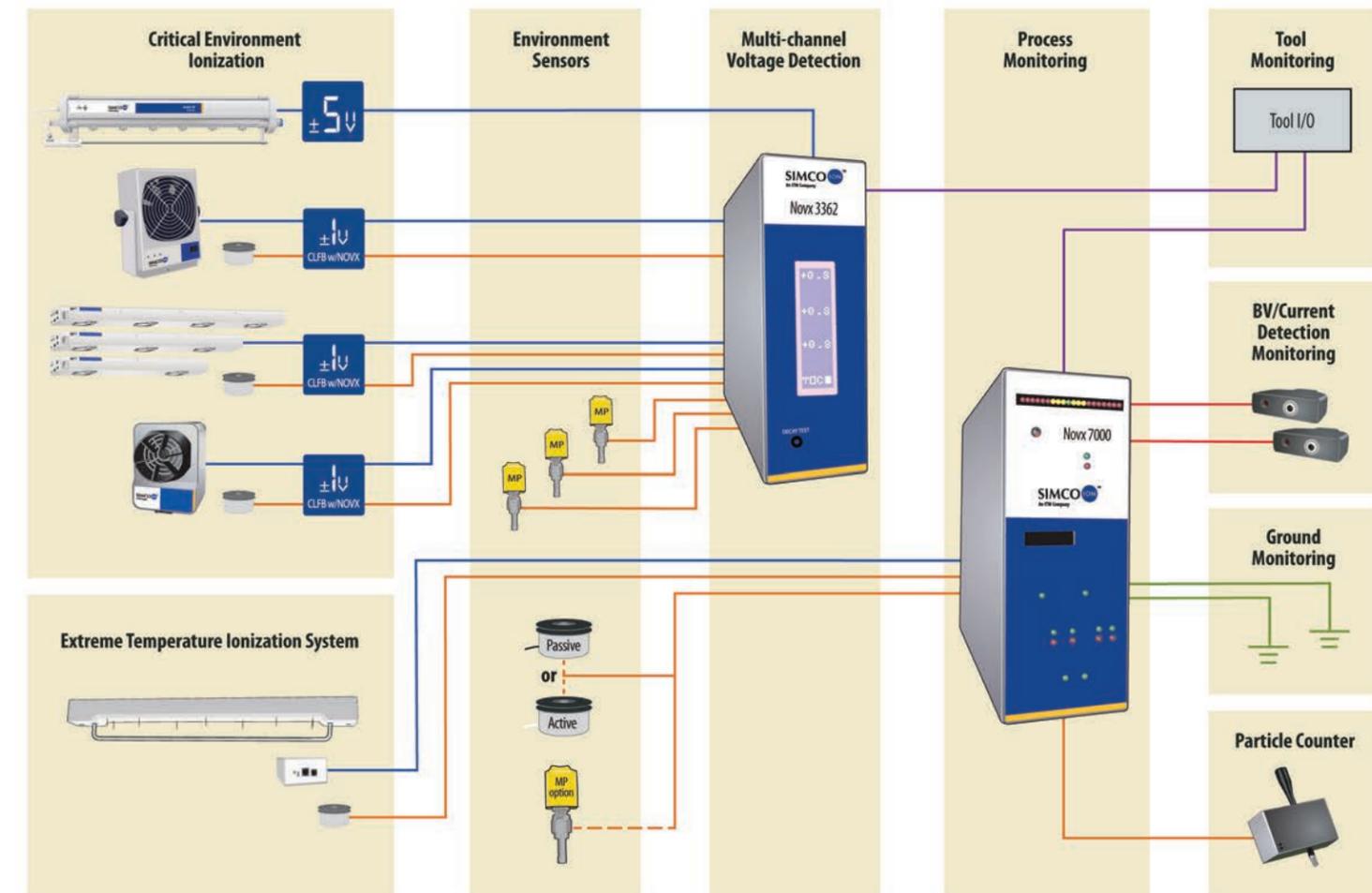
Calibrator Reader-2 Software

Smart Manufacturing Begins with Novx Advantage

COMPLETE SYSTEM SOLUTION

Monitoring, analyzing, and controlling electrostatic charge level and its discharge (ESD) is crucial as the devices become more sensitive to lower voltage breakdown thresholds. ESD has accounted for as much as 25% yield loss in semiconductor back-end manufacturing. The only effective way to reduce yield loss stemming from ESD threats is to monitor the problem area, analyze the result, and control potential issues during the bonding, assembly, packaging, and testing phases.

Simco-Ion, Technology Group offers Novx Electrostatic Sensing and Process Monitors to meet the challenges and requirements of Industry 4.0, providing the capability to simultaneously detect, measure, record, and monitor electrostatic voltage.



IONIZATION

in Assembly Packaging & Test Areas

For every type of process in manufacturing phase, our comprehensive product portfolio offers the appropriate solutions for monitoring, analyzing, and controlling environmental factors.

Ionization with Novx Advantage

Our latest ionization products, including benchtop and overhead blowers as well as compact ionizers, are designed to integrate seamlessly with our Novx Monitoring and Feedback Control systems. The Novx monitoring feedback sensor directly controls the ionized air balance within the equipment, maintaining a precise $\pm 1V$ balance.

Benchtop Blowers



In-tool Ionizers

Specially engineered in-tool ionizers provide the most efficient and cost-effective solution for managing static discharge in confined, hard-to-reach areas. Key features include seamless integration with your tool control system, exceptional ion balance, fast charge decay times, FMS connectivity, alarm notifications, and a range of advanced capabilities.

Compact Ionizers



Overhead Blowers



Ionizing Bars with Software Control

Micro Ionizers

Our comprehensive product line of micro ionizers is engineered explicitly for in-tool applications and challenging, hard-to-reach areas. These ionizers provide reliable and efficient static control in environments where conventional solutions may fall short. Their compact size allows seamless integration into tight spaces, ensuring optimal performance in critical applications across various industries.



Extreme Temperature Ionizing Systems

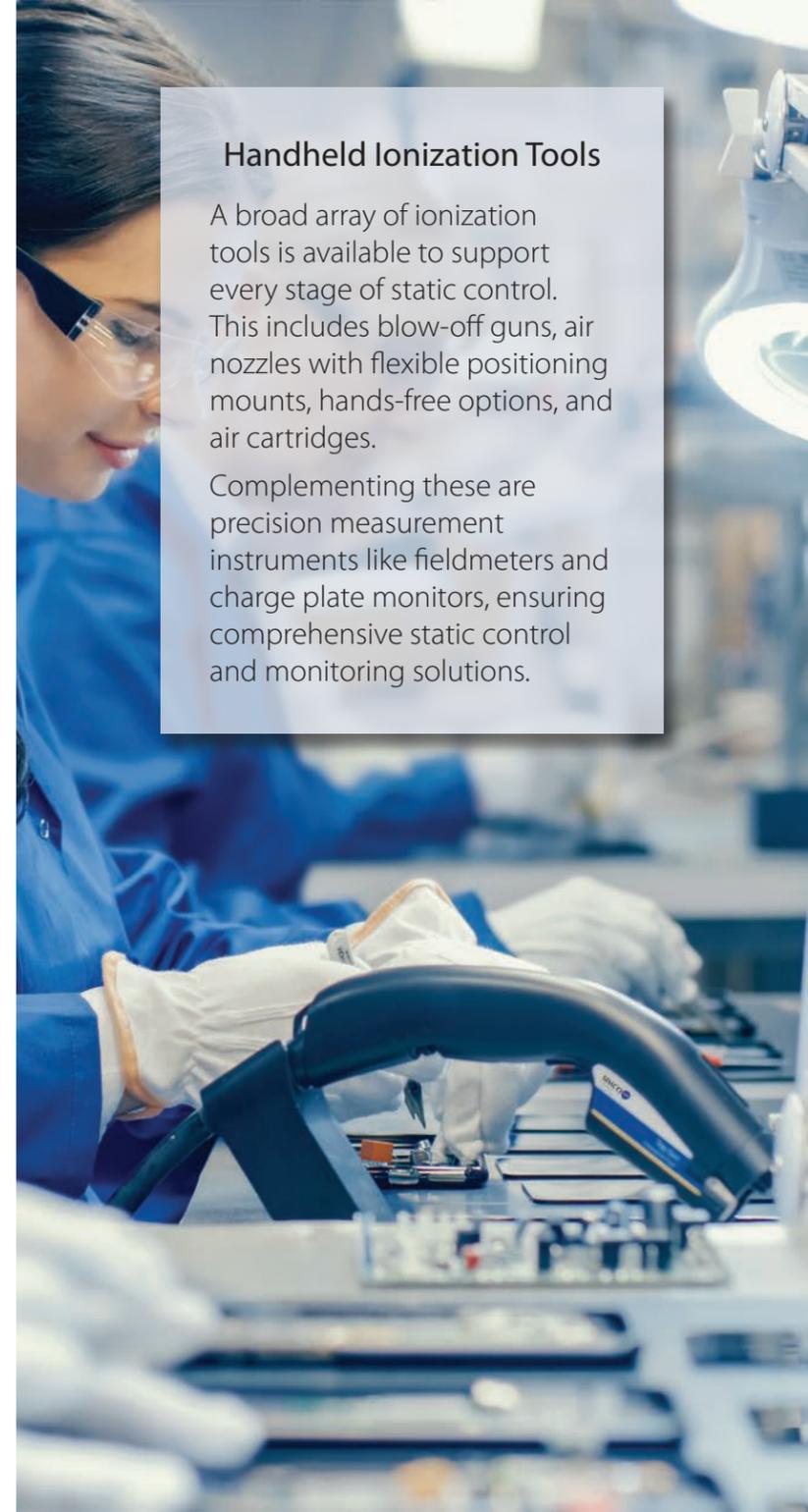
Specially designed to handle extreme temperature processes such as testing in environmental chambers or oven applications. The system consists of the extreme temp ionizers, along with its Controller and extremely temp passive sensor use closed-loop control to ensure the ionizer's output is balanced at the product location. Available in 526 mm, 210 mm and the latest mini length at 114 mm.

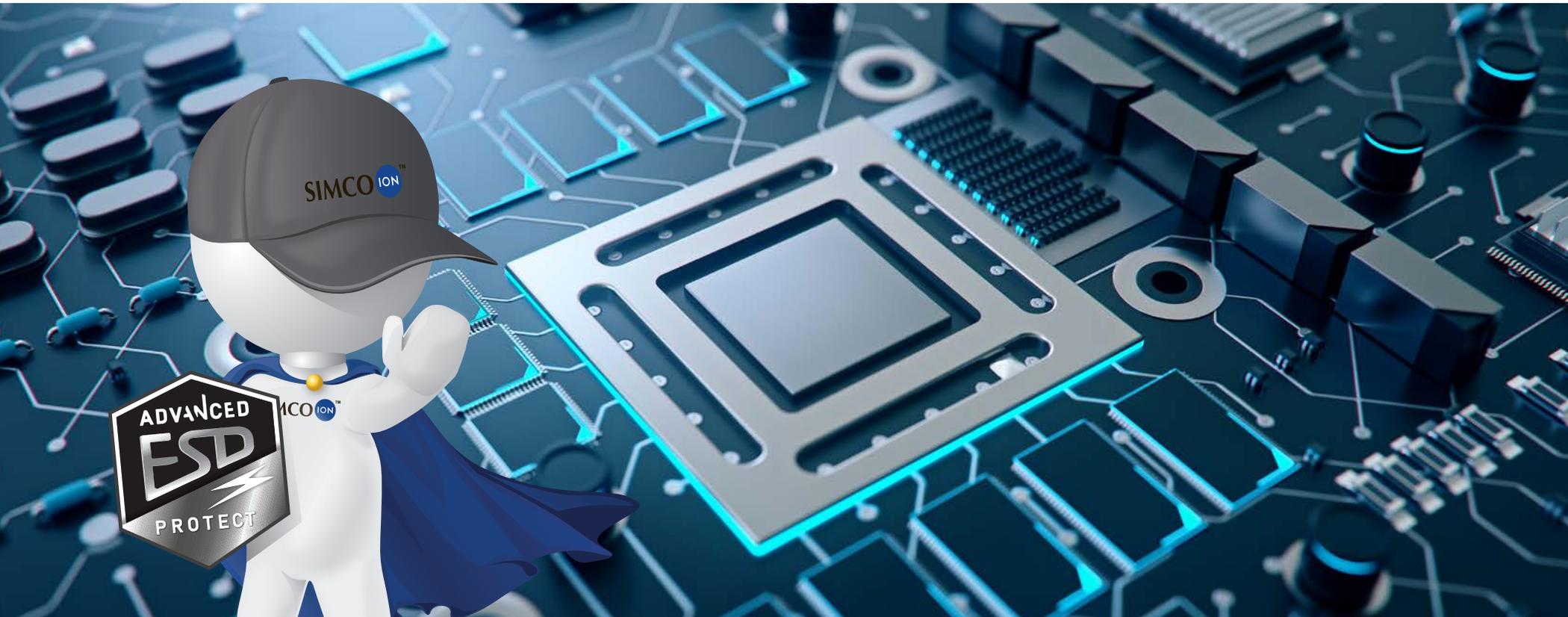


Handheld Ionization Tools

A broad array of ionization tools is available to support every stage of static control. This includes blow-off guns, air nozzles with flexible positioning mounts, hands-free options, and air cartridges.

Complementing these are precision measurement instruments like fieldmeters and charge plate monitors, ensuring comprehensive static control and monitoring solutions.





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