



# Digital AeroBar

## MODEL 5225

Ion's AeroBar Model 5225 is specifically designed to handle the demanding requirements of in-tool ionization. With high ion output providing fast neutralization of electric charge on wafers, charge can be reduced to comply with the E-78 recommended electrostatic levels for technology nodes down to 25 nm, the most stringent requirement of semiconductor manufacturers.

An aerodynamic design and cleanroom-compatible materials allow the Model 5225 to deliver complete and efficient ionization in mini-environments without disrupting laminar air-flow. Closed loop feedback control is provided with the Digital Sensor, which monitors and maintains ionization performance at the wafer level, extending calibration and maintenance cycles.









The Model 5225 is easily integrated with your tool, using either pre-compiled routines or open-source code examples. Tight integration with tool interfaces means a less costly solution to ionization, in addition to the benefits of reduced maintenance cost and better alarm handling. System alerts and messages are displayed at the tool controller for easy notification, taking the place of older, line signal notification systems.

### Features and Benefits

- Complete integration with tool control system
- Fully adjustable parameters for each AeroBar
- Closed-loop feedback with Sensor
- Ion current monitoring
- Several AeroBar lengths available including three lengths specifically designed for EFEMs
- Single-crystal silicon emitter points
- Setup, operation, and maintenance are controlled using the existing tool or IonMonitor software GUI
- Fine-tune ionization for individual process requirements in each area of the tool
- Provides constant ionization performance management despite changing conditions
- More consistent ion output and stable performance
- Flexible lengths means versatility for a variety of application designs
- Industry's demonstrated cleanest emitter point material, with no risk of wafer contamination from dopants or metals



# Specifications

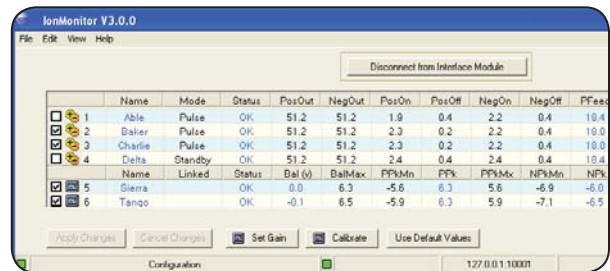
<b>Digital AeroBar Model 5225</b>	
<b>Input voltage</b>	24 VAC, 50/60 Hz, 1W typical, received from the Interface Module
<b>Control signal</b>	RS-485 from the Interface Module
<b>Output voltage</b>	0-20 kVDC, $\pm 10\%$ for each polarity on an individual AeroBar; positive or negative output levels can be adjusted separately through GUI
<b>Output current</b>	<15 $\mu$ A, current and voltage limited
<b>Connectors</b>	RJ-11 modular jack receptacles
<b>Regulation</b>	Output and balance stability is achieved by independently regulating the ion emission current of each polarity at each ionizer
<b>Timing</b>	Both on and off timing for each polarity are settable from 0-10 seconds at 0.1 second increments; LEDs on the bar indicate the polarity of the ion emission
<b>Operating mode</b>	Pulsed DC, steady-state DC, or standby
<b>Alarm</b>	Alarm activates when the bar is no longer able to maintain the preset ion output level. Alarm is displayed visually by a red LED in the middle of the ionizer chassis as well as on GUI. Settable threshold alarm limits for predictive maintenance.
<b>Emitter points</b>	Single crystal silicon, replaceable
<b>Preventative maintenance</b>	Annual, semi-annual, or quarterly emitter point cleaning depending on process sensitivity and presences of AMCs in environment
<b>Ozone</b>	<0.005 ppm (24-hour accumulation)
<b>EMI</b>	Below background level
<b>Cleanliness</b>	Better than ISO Class 2 (Fed Std. 209E)
<b>Indicators</b>	Individual red LEDs flash on for each polarity; middle red LED flashes rapidly when in alarm, all three LEDs blink at once when communication occurs; alarm relayed to tool GUI
<b>Dimensions</b>	2.1H x 1.2W x 22.4, 28.4, 35.7, 44.4, 55.6, 64.4, 75.5, or 84.4L inches (5.3H x 3.1W x 56.9, 72.1, 90.7, 112.8, 141.2, 163.6, 191.8, or 214.4 L cm)
<b>Weight</b>	1.5 lb (1.02 kg) for a 22 in (5.9) cm bar (approx. 6 oz per additional foot / 0.17 kg per additional 30 cm)
<b>Material</b>	ABS plastics, fire retardant
<b>Warranty</b>	Two year limited warranty
<b>Certifications</b>	SEMI F47    
<b>Interface Module Model 5200-IM6T</b>	
<b>Input voltage</b>	24 VDC, 1.5A, $\pm 5\%$
<b>Input signal</b>	Ethernet (RJ-45) or serial (RS-232/DB9)
<b>Output ports</b>	Six RJ-11 ports connect to up to six Model 5225 AeroBars
<b>Dimensions</b>	2.9H x 2.8W x 12.4L in. (7.4H x 7.1W x 31.5L cm)
<b>Weight</b>	4 lb (2 kg)
<b>Indicators</b>	Green power on LED, yellow communication LED, red alarm LED
<b>Certifications</b>	   

## Intelligent Integration

Ion's specially developed software eases integration into your system. Three different components are available to best suit your needs:

- A fully documented Application Programming Interface (API) minimizes integration time and cost.
- Open-source sample application in Visual C/C++ provides an example for use in developing your tool control software, or can be used as a stand-alone application on your tool controller or laptop.
- An ionizer hardware simulator allows for easy software development in the absence of ionizer hardware.

Ion's powerful software provides complete control over the ionization system. Settings include adjustments for operating modes (including pulsed DC, steady-state DC, or standby), synchronization, ontimes, offtimes, power output levels, and alarm thresholds for both positive and negative emitters, with independent control over each AeroBar. Sophisticated alarm and maintenance detection means less down time and costly diagnostic activity.



Ion's industry-first GUI centralizes all control and monitoring operations, simplifying operation and saving valuable time.

## Closed-loop Feedback

The Digital Sensor Model 5200-SR enhances the AeroBar system by monitoring ionization performance in closed environments and automatically adjusting ionization output based on the data. The Sensor is the only product of its kind to create this closed-loop ionization system. Wafers are always safe from static because ionization performance is constantly monitored and maintained at optimal settings.

## Ordering Information

<b>91-5225U-</b>	Digital AeroBar
<b>-22, 28, 36, 44, 56, 64, 76, 84</b>	
<b>91-5200-IM6T</b>	Interface Module
<b>33-2200</b>	100-240 VAC transformer
<b>91-5200-SW</b>	AeroBar system software
<b>91-5200-SR</b>	Digital Sensor



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