Ion Pro™ Benchtop Ionizer Installation, Operation, and Maintenance

Made in the United States of America

Figure 1. SCS Ion Pro™ Benchtop Ionizer

Description

The SCS Ion Pro™ Benchtop Ionizer is used for neutralizing electrostatic charges on insulators and ungrounded conductors. Its fast discharge times (< 1.5 seconds at 12 inches) and ±3 volt offset voltage exceed the required limits of ANSI/ESD S20.20 and ESD TR53. The Ion Pro™ Benchtop Ionizer monitors both its offset voltage (balance) and discharge time. The ionizer will alarm should its offset voltage exceed the required limits defined by ANSI/ESD S20.20 or discharge time take longer than 4.5 seconds. Steady-state DC emitters are spaced farther apart to prevent ion recombination, increase decay efficiency, and provide a broader coverage area of ionization. The Ion Pro™ Benchtop Ionizer's dual-speed fan produces consistent airflow performance. The Ion Pro™ Benchtop Ionizer features a stainless steel enclosure and multi-mount stand to minimize contamination and corrosion when used in clean or sensitive areas.

The SCS Ion Pro™ Benchtop Ionizer operates on Steady-state DC. Steady-state DC systems consist of separate negative and positive ion emitters connected by a pair of high-voltage cables to their respective high-voltage power supplies. DC power is constantly applied to the emitter points. The ionizer utilizes patented capacitance-based sampling from its internal sensor to continuously adjust the output, maintain its offset voltage, and minimize maintenance.

"The primary method of static charge control is direct connection to ground for conductors, static dissipative materials, and personnel. A complete static control program must also deal with isolated conductors that cannot be grounded, insulating materials (e.g., most common plastics), and moving personnel who cannot use wrist or heel straps or ESD control flooring and footwear. Air ionization is not a replacement for grounding methods. It is one component of a complete static control program. Ionizers are used when it is not possible to properly ground everything and as backup to other static control methods. In clean rooms, air ionization may be one of the few methods of static control available." [ESD Handbook ESD TR20.20 Ionization, section 5.3.6.1 Introduction and Purpose / General Information]

The Ion Pro™ Benchtop Ionizer and its accessories are available as the following item numbers:

Item	Description
770140	Ion Pro™ Benchtop Ionizer, 120 VAC
770141	Ion Pro™ Benchtop Ionizer, 220 VAC
770000	Power Cord, North America Plug
770001	Power Cord, UK Plug
770002	Power Cord, Europe Plug
770003	Power Cord, China Plug
770047	Benchtop Ionizer Boom Arm
770121	SMP Web App
770128	Power Relay, 120 VAC

SMP Static Management Program

The SCS Ion Pro™ Benchtop Ionizer is compatible with SCS Static Management Program (SMP). SMP continuously monitors your ESD process control system throughout all stages of manufacturing. SMP captures data from SCS workstation, equipment and ESD event continuous monitors and provides a real-time picture of critical manufacturing processes. All activity is stored into a database for on-going quality control purposes. SMP allows you to pinpoint areas of concern and prevent ESD events. Quantifiable data allows you to see trends, become more proactive and prove the efficiency of your ESD process control system. When paired with the Ion Pro Benchtop™ Ionizer, SMP will monitor its balance (offset voltage) and discharge time statuses.

SMP is sold separately. Click here to learn more.

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Packaging

1 Ion Pro™ Benchtop Ionizer
1 Power Cord with North America Plug (770140 only)
1 Emitter Point Cleaner

Figure 2. Ion Pro™ Benchtop Ionizer features and components

Features and Components

A. Status LEDs: The blue LED will illuminate when the ionizer is powered and its balance and discharge times are below the alarm thresholds. The negative red LED will illuminate and audible alarm will sound when the balance exceeds the negative balance alarm threshold. The positive red LED will illuminate and audible alarm will sound when the balance exceeds the positive balance alarm threshold. Both the negative and positive red LEDs will illuminate and audible alarm will sound when the discharge time exceeds the alarm threshold.

B. Volume Pushbutton Switch: Toggles the ionizer's settings for the audible alarm and balance alarm.

Feature	Procedure
Buzzer Volume	1. Push and release the switch while the ionizer is powered. 2. The ionizer will toggle its buzzer volume through 8 different settings. The 8th setting disables the buzzer.
CE Mode Balance Alarm (ionizer will alarm at ±7 V and greater)	1. Power the ionizer OFF. 2. Push and hold the switch while restoring power to the ionizer. 3. The buzzer will chirp once to indicate that it is in Critical Environment Mode.
Standard Mode Balance Alarm (ionizer will alarm at ±35 V and greater)	1. Power the ionizer OFF. 2. Push and hold the switch while restoring power to the ionizer. 3. The buzzer will chirp twice to indicate that it is in Standard Mode.

C. Ethernet Port: Provides network communication between the Ion Pro™ Benchtop Ionizer and SCS Static Management Program (SMP).

D. Fan Speed Switch: Rock the switch to the II position to set the fan speed to HIGH. Rock the switch to the I position to set the fan speed to LOW. Rock the switch to the 0 position to power the ionizer OFF.

E. Power Inlet: Connect the power cord here.

F. Power Relay Terminal: For use only with the SCS 770128 Power Relay. Use the Power Relay to control power to workbenches, hand tools, and other electronic devices when the Ion Pro™ Benchtop Ionizer is passes or alarms.

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Installation

Hardware Setup

Place the Ion Pro™ Benchtop Ionizer at a desired location where the airflow will not be restricted. The SCS 770047 Benchtop Ionizer Boom Arm may be used to save workspace and lift the ionizer off the workbench. Use the tilt lock knobs to aim the ionizer at the area to be neutralized. Ensure that the power switch is set to OFF. Connect the ionizer's power cord into an appropriate AC power source.

Note that placement of the ionizer is important in determining its effectiveness. The distance from the targeted object and fan speed affect the ionizer's performance. The discharge time will increase as the distance increases or fan speed is reduced.

Power Relay Accessory

The SCS 770128 Power Relay controls power to workbenches, hand tools, and other electronic devices dependent on the status of the SCS Ion Pro™ Benchtop Ionizer. A single logic input signal controls one high-current SPDT AC relay. This one relay trigger signal switches three AC outlets simultaneously using a single-pole double-throw relay. One outlet is normally on. Two are normally off. A fourth outlet is unswitched. All outlets are protected against surges and overloads.

Figure 3. SCS 770128 Power Relay

1. Determine the mounting location of the Power Relay. Locate it within reach of its included power cord. The Power Relay's mounting tabs may be to secure it onto a surface.
2. Connect the included power cord to the power inlet located on the side of the Power Relay. Connect the opposite end to an appropriate AC outlet.

   NOTE: The Power Relay is only rated to accept 90-120 VAC input voltage.
3. Connect the mono plug termination of the included interface cord to the Ion Pro™ Benchtop Ionizer. Connect the opposite end to the green connector on the side of the Power Relay.
4. Connect the power cord from the ionizer to the Always ON receptacle on the Power Relay.
5. Connect the power cord of the external electronic device to one of the Normally OFF receptacles on the Power Relay.
6. Toggle the Power Relay's power switch to the RESET position.
7. Toggle the Ion Pro™ Benchtop Ionizer's power switch to the ON position.
8. This setup will power the external electronic device whenever the ionizer is powered ON and no alarms are reported.

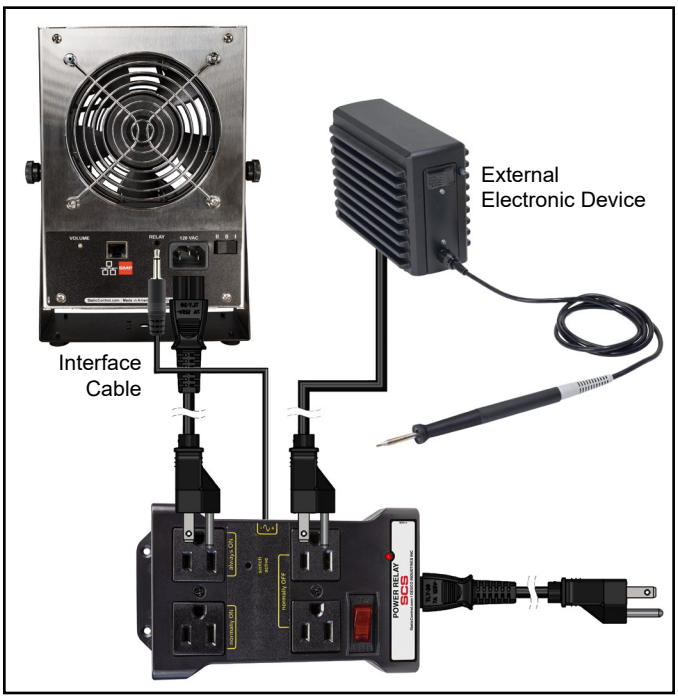

Figure 4. Connecting the Power Relay to the Ion Pro™ Benchtop Ionizer

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SMP Network Setup

The following procedure outlines how to connect the Ion Pro™ Benchtop Ionizer to SMP via a local area network (LAN). SMP must be installed on a PC prior to using this procedure. The diagram shown below illustrates a common SMP system setup that utilizes the server software, client software, WS Aware Monitor, EM Aware Monitor, Ground Master Monitor, and Ion Pro™ Benchtop Ionizer.

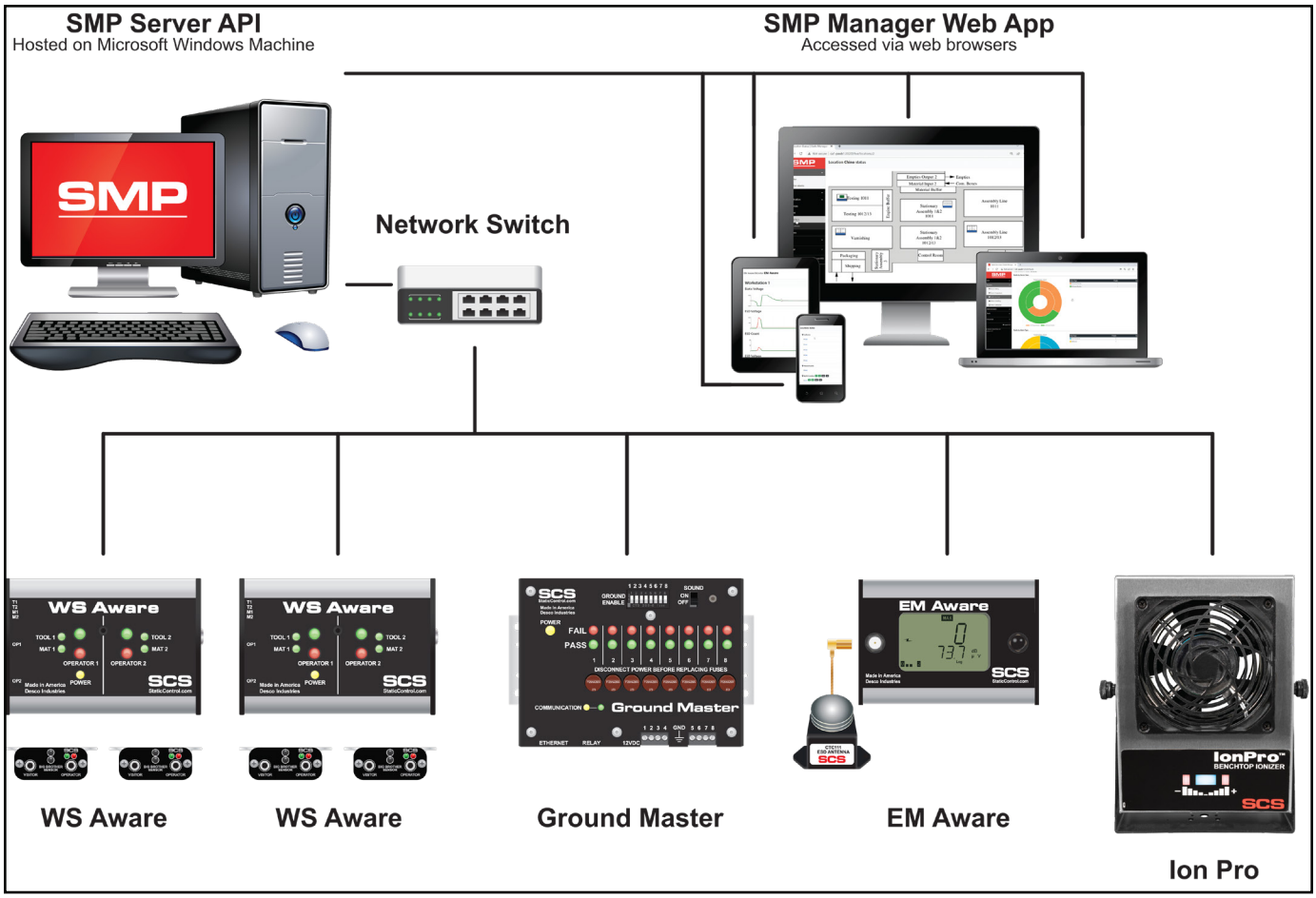

Figure 5. SMP system setup

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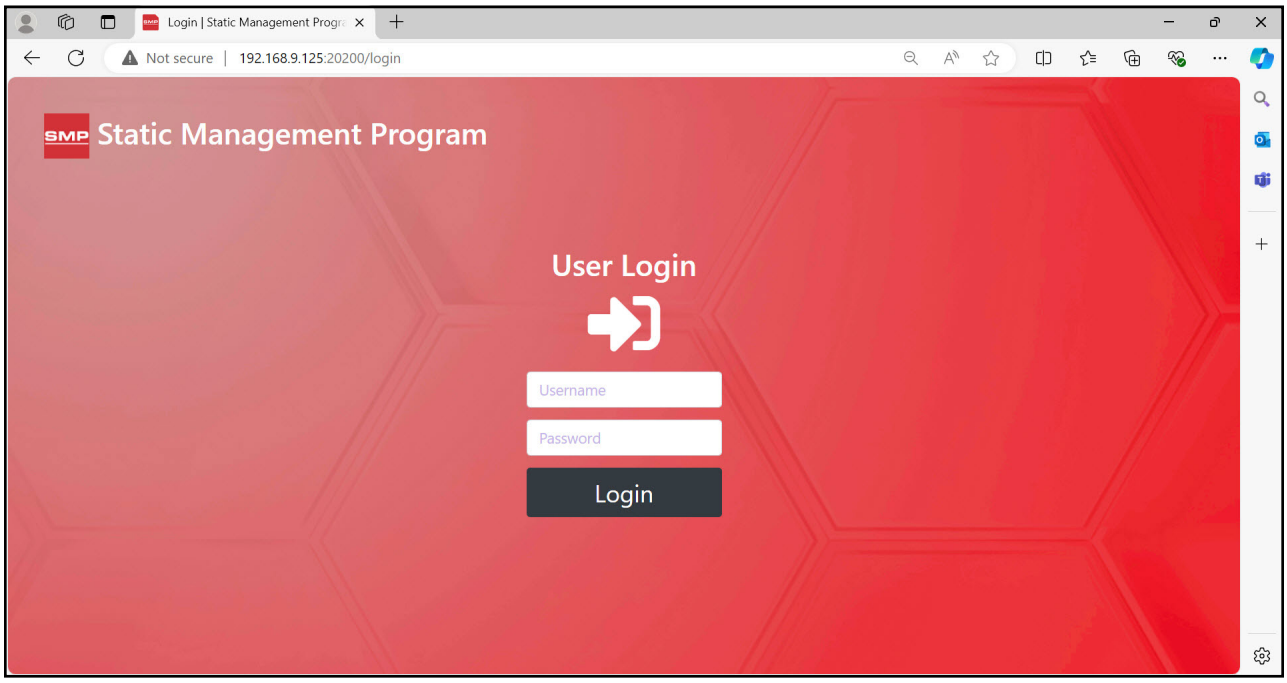
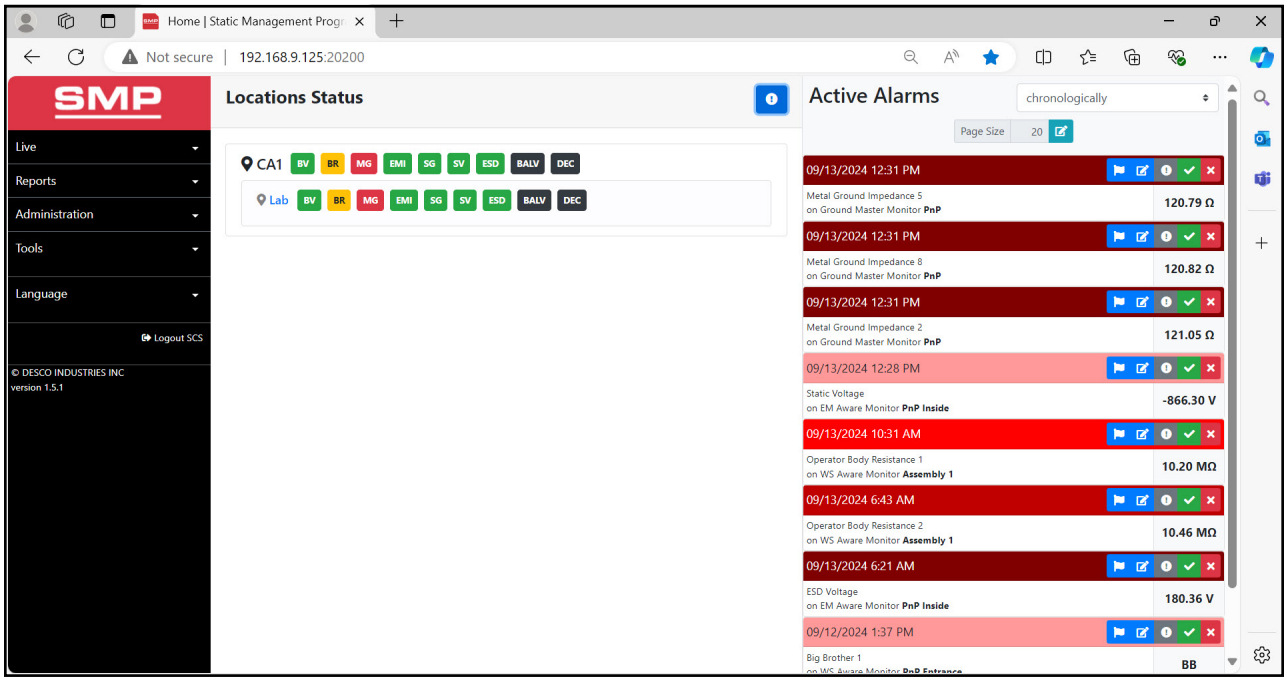
1. Verify that the Ethernet cable is securely connected to the network and Ion Pro™ Benchtop Ionizer. The LEDs on the Ethernet port will illuminate when a connection to the network is established.
2. Log into the SMP Web App with either the default credentials (see user guide TB-9116) or ones provided by the SMP Admin.



3. The dashboard view will provide activity for all SMP devices.



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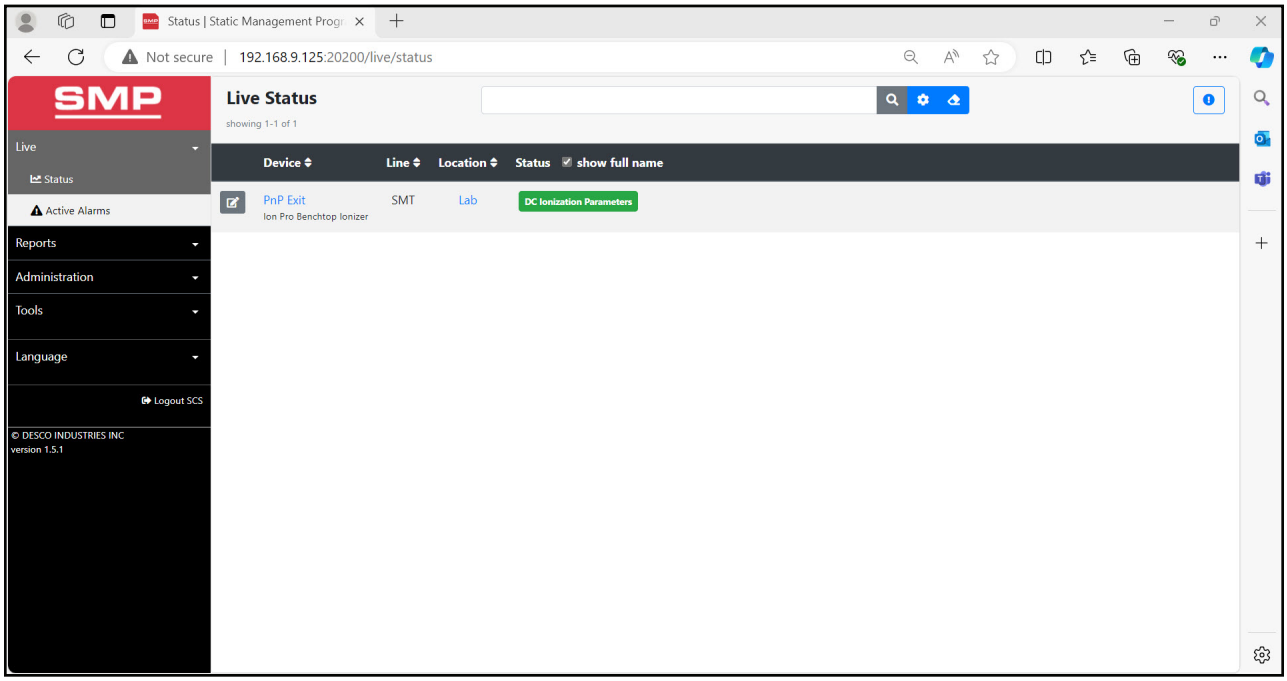
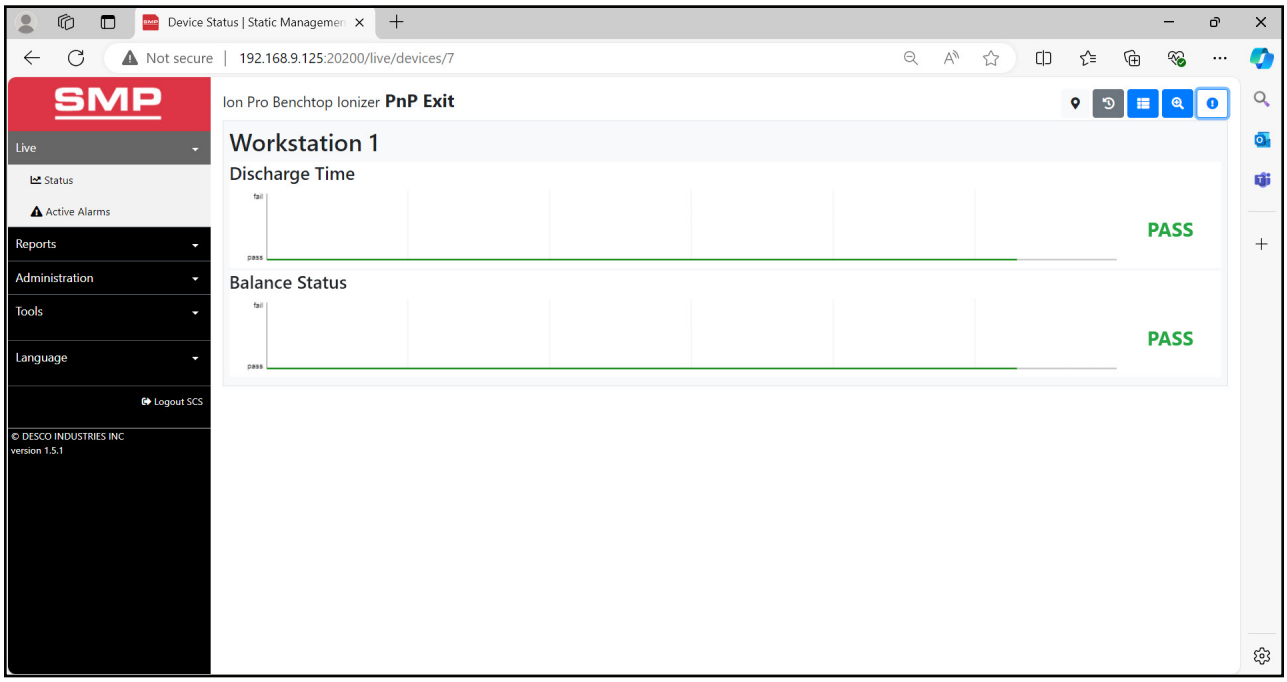
4. Go to the Live > Status page to view the status of the Ion Pro™ Benchtop Ionizer.



5. Select the device name to access the live results for all Ion Pro™ Benchtop Ionizer channels. The shortcuts at the top of the window are for generating history reports, toggling between different views of the data, zooming in/out, and showing/hiding the Alarms panel.



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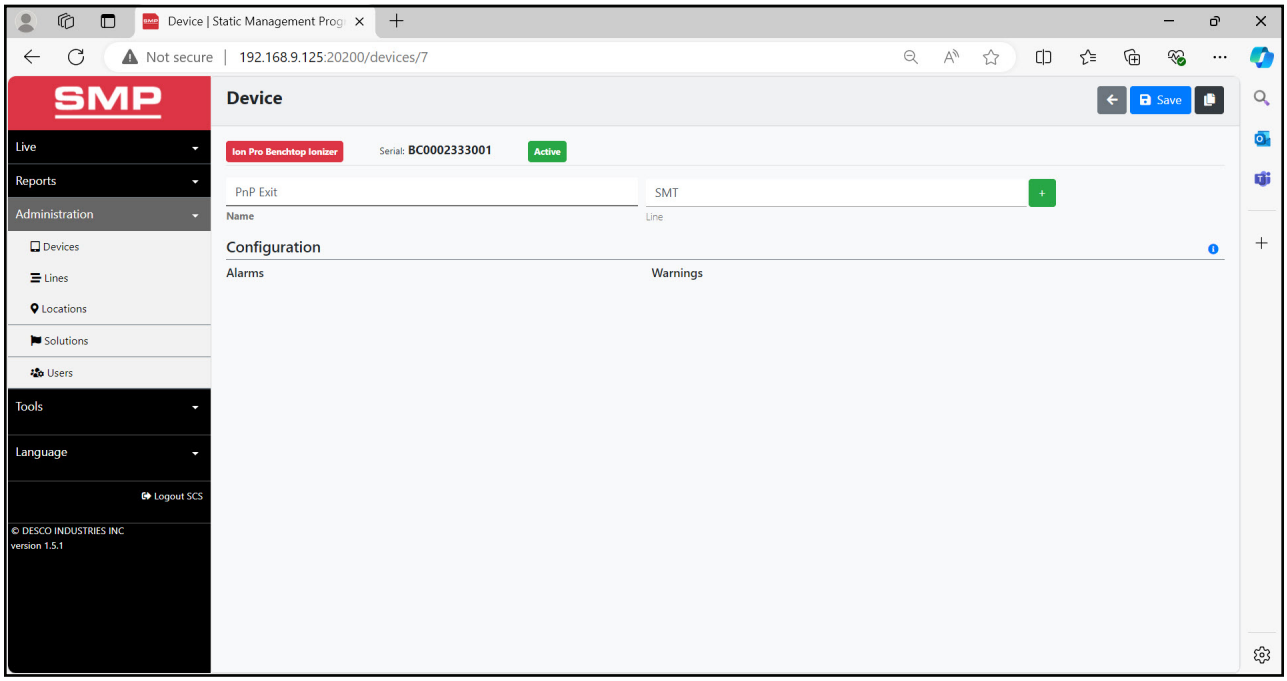
6. Go to the Administration > Devices page and select the Edit icon to access the Ion Pro™ Benchtop Ionizer's settings. In this screen, the device may be assigned a name and attached to a line.



7. Note: The Ion Pro Benchtop Ionizer's settings are factory configured. Only the fan speed may be configured by the user via the rocker switch located at the back of the ionizer.

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Operation

1. Position the ionizer so that maximum airflow is directed towards the items or area to be neutralized.
2. Rock the power switch to the I or II position. The ionizer will conduct a self-test upon power-up. All three LEDs will remain illuminated for approximately 15 seconds. The blue LED will remain illuminated during normal operation.
3. Set the fan speed switch to the desired setting. Higher airflow will result in faster discharge times.

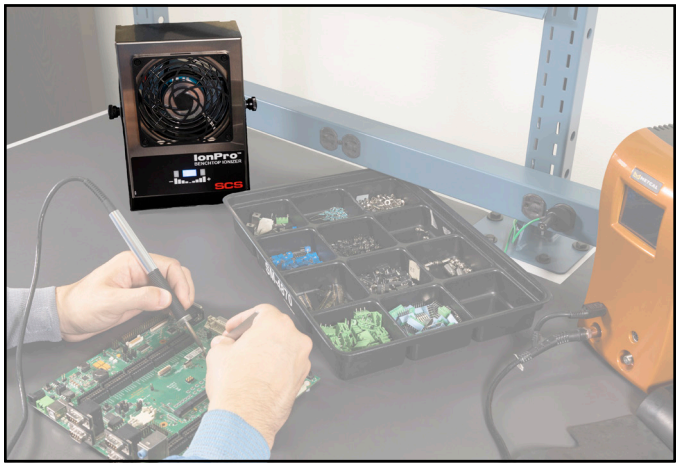

Figure 6. Using the Ion Pro™ Benchtop Ionizer at a workbench

Figure 7. Using the Ion Pro™ Benchtop Ionizer at a machine station

Maintenance

Occasional cleaning of the case and of the ionizing electrodes are the only routine maintenance procedures required.

CLEANING THE CASE

Wipe the case with a soft cloth moistened with water. If a stronger cleaning solution is required, mild soap with water may be used. The use of any other cleaning solutions is not recommended.

CLEANING THE EMITTER POINTS

NOTE: Disconnect the power to the ionizer whenever cleaning the emitter points.

When the emitter points become dirty, the internal circuitry of the ionizer will be automatically adjusted to emit an equal amount of positive and negative ions. Particulates on the emitter point may, however, inhibit ionization to a limited degree. The emitter points are located between the fan blades and the rear grill. A jet of clean, compressed air can be used to remove dirt on emitter points. If a more rigorous cleaning method is needed to remove particulate, clean the points with a cotton swab dampened with isopropyl alcohol. Access to the points is available through the rear grill. Be careful not to damage the points during cleaning.

Figure 8. Swinging the rear fan grill to access the emitter pins inside the Ion Pro™ Benchtop Ionizer

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Calibration

The SCS Ion Pro™ Benchtop Ionizer is factory adjusted to provide optimum performance. Further adjustment in the field is not possible. However, the following instructions can be followed to determine whether the Ionizer is performing to specifications. The testing follows the procedure outlined in the standard for Ionization, ANSI/ESD STM3.1. Please refer to this standard for more complete information.

Frequency of recalibration should be based on the critical nature of those ESD sensitive items handled and the risk of failure for the ESD protective equipment and materials. In general, SCS recommends that calibration be performed annually.

Periodically measure the balance and neutralization times of the Bencthop Air Ionizer to verify that it is performing within specifications. These measurements should be taken using a charged plate monitor. Calibration should be performed in accordance with the ESD Association ionization standard ANSI/ESD STM3.1. With the ionizer positioned a distance of 12 inches (30 cm), the neutralization (discharge) time of ±1000V to ±100V should be less than 1.5 seconds, and the balance should be ±3V or better.

Neutralization (Discharge) Times

The comparative efficiency of bench top ionizers is determined by a standard test published by the ESD Association: ANSI/ESD STM3.1. Typical positive and negative decay times (±1000V to ±100V) measured using this standard are shown in Figures 7 and 8.

NOTE: All discharge times are in seconds and representative only. They are not a guarantee. The discharge times were recorded in a factory ambient environment.

Specifications

Input Voltage and Frequency	770140: 100-120 VAC, 50/60 Hz 770141: 220-240 VAC, 50/60 Hz
Neutralization (Discharge) Time at 12"	< 1.5 seconds
Offset Voltage (Balance) at 12"	±3 V typical
Ion Emission	Steady-state DC
Airflow	Dual speed, 77 CFM max.
Ozone	<0.05 ppm
Discharge Time Alarm Threshold at 12"	4.5 s
Offset Voltage Alarm Threshold (Standard Mode)	±35 V approx.
Offset Voltage Alarm Threshold (CE Mode)	±7 V approx.
Power Consumption	10 W
Emitter Points	Tungsten
Dimensions (with stand)	9.1" H x 6.3" W x 3.1" D (231 mm x 160 mm x 79 mm)
Weight	4.4 lbs (2.0 kg)
U.S. Patents	9,404,945; 9,588,161
Country of Origin	United States of America

Limited Warranty, Warranty Exclusions, Limit of Liability and RMA Request Instructions

See the SCS Warranty - StaticControl.com/Limited-Warranty.aspx

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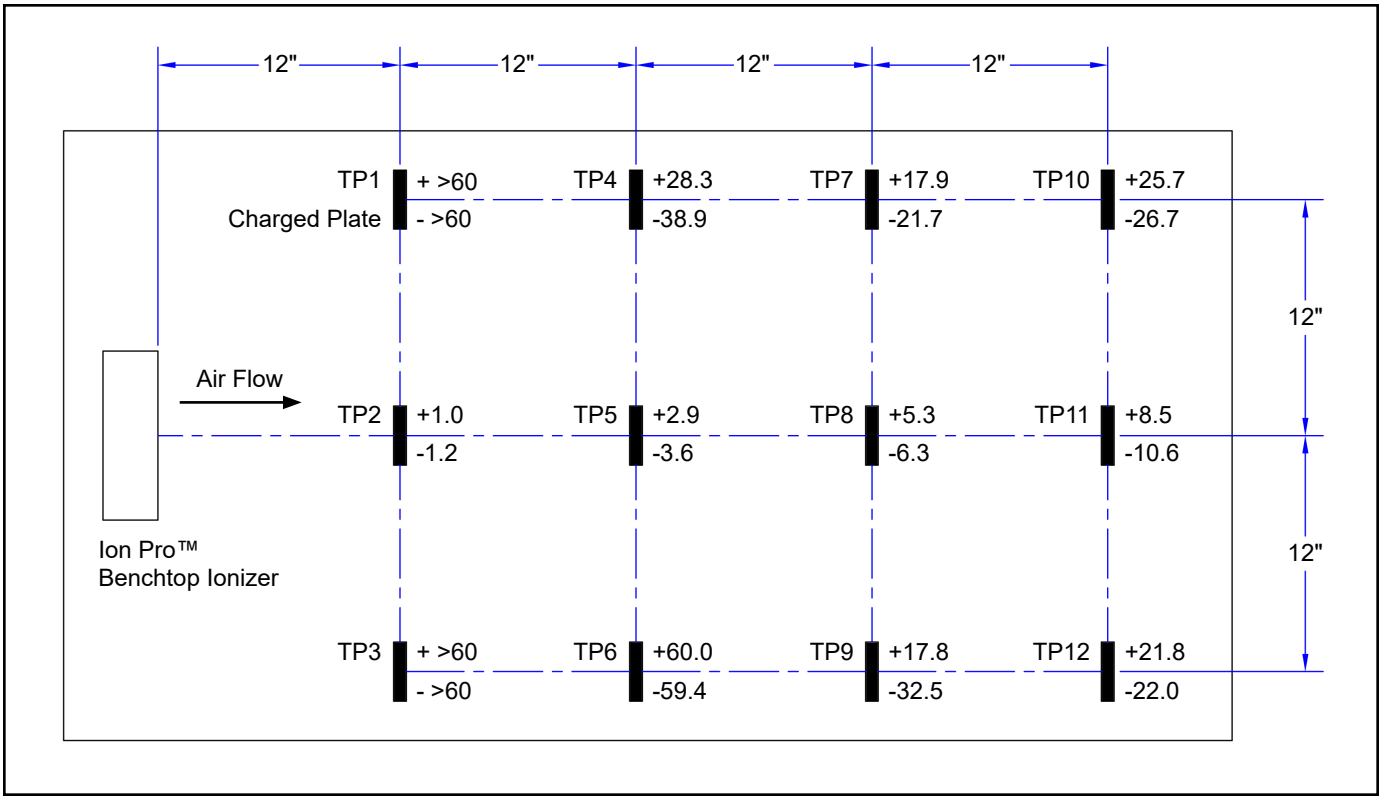

Figure 9. Neutralization (Discharge) Times at 120 VAC / 220 VAC, 60 Hz input

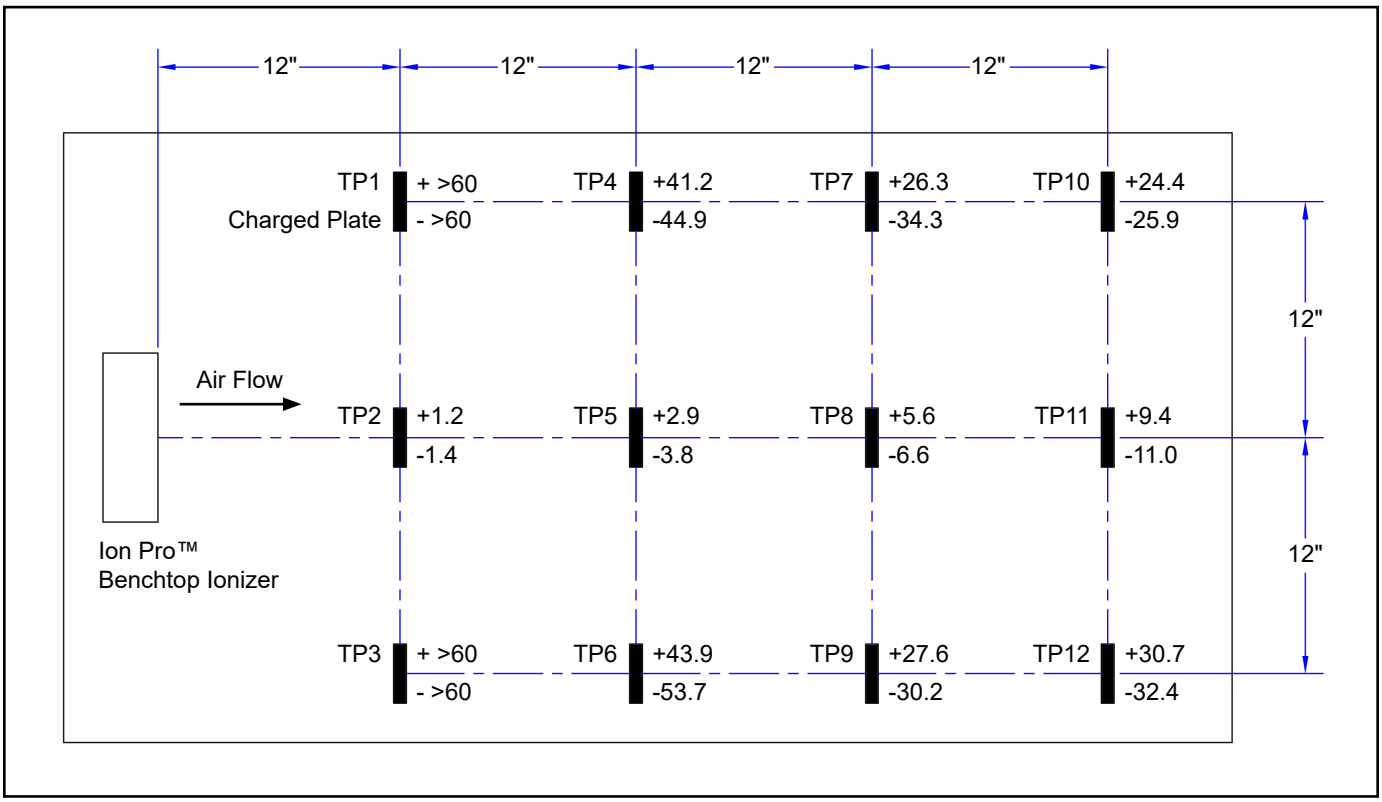

Figure 10. Neutralization (Discharge) Times at 100 VAC, 50 Hz input

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