



An ITW Company

IONIZATION SOLUTIONS



Digital Ionization Room System

Ceiling Emitter Model 5511

Controller Model 5580/5520

Handheld Terminal Model 5571

Remote Control Model 5570

IonManager Pro Software

User's Manual

About Simco-Ion

Simco-Ion develops, manufactures, and markets system solutions to manage electrostatic charge. As the world's largest provider of electrostatics management products and services, Simco-Ion improves its customers' business results by providing a total solution to their electrostatic discharge and electromagnetic interference challenges. Simco-Ion is a division of Illinois Tool Works (ITW) with its Technology Group located in Alameda, California. For more information about Simco-Ion visit www.simco-ion.com or call 800-367-2452. Simco-Ion is ISO 9001 and ANSI ESD S20.20 certified.

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Important Safety Information



Failure to follow these important safety cautions could result in damage to Digital AeroBar System components and voiding of your system warranty.

- ☑ Use proper input voltage to avoid damaging the unit.
- ☑ Verify that power to the controller and/or emitter is turned **off** before connecting or removing emitters or cables. Failure to do so may result in damage to the equipment
- ☑ Never power-down an emitter by removing the cables, as this can result in damage to the ionizer.
- ☑ Do not clean emitter points while unit is powered. Doing so may result in additional contamination and possible shock.
- ☑ To avoid personal injury or damage to the equipment, perform only the installation and maintenance procedures contained in this manual.

Wichtige Sicherheitshinweise



Failure to follow these important safety cautions could result in damage to Digital AeroBar System components and voiding of your system warranty.

- ☑ Achten Sie auf die korrekte Versorgungsspannung, damit das Gerät nicht beschädigt wird.
- ☑ Stellen Sie sicher, dass die Stromversorgung zum Steuergerät und / oder Emitter (Sender) vor dem Anschließen oder Entfernen von Emittlern oder Kabeln abgeschaltet werden. Nichtbeachtung kann zu Schäden am Gerät führen.
- ☑ Niemals einen Emitter durch Entfernen der Kabel abschalten. Dadurch kann der Ionisator beschädigt werden.
- ☑ Reinigen Sie keinesfalls Emitter-Punkte bei eingeschaltetem Gerät. Andernfalls kann es zu zusätzlicher Verunreinigung oder zu Stromschlag kommen.
- ☑ Führen Sie zur Vermeidung von Verletzungen oder Schäden am Gerät, nur die Installation und Wartung durch, wie sie in diesem Handbuch enthalten sind.

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1

Description

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1.1 Digital Ionization System

The Digital Ionization System is designed to provide uniform ionization throughout the open areas of a cleanroom. The system consists of several components that work together, including the Controller Model 5580 or 5520, the Ceiling Emitter Model 5511, the Handheld Terminal Model 5571, the Remote Control Model 5570, and IonManager Pro software. The Controller Model 5580 can power up to eighty Ceiling Emitter Model 5511's, while the Controller Model 5520 supports up to twenty Ceiling Emitter Model 5511's. A Handheld Terminal Model 5571 can be used with both controllers. The Remote Control Model 5570 is used with the Ceiling Emitter Model 5511 for individual settings. The IonManager Pro software allows users to monitor and control the system from a desktop PC, including maintaining a log of system events, paging/texting maintenance personnel when a fault is detected, and providing management reports by exception. All components are cleanroom compatible.

The Digital Ionization System provides precision adjustments to meet any environmental requirements and specifications. Alarm conditions can be set according to user preference.

Setting options include:

- Power output for both polarities, in 0.1% increments
- Ion pulse on and off timing, in 0.1 sec increments
- Alarm thresholds
- Alarm outputs

Other Documentation

- Operation of IonManager Pro software is covered in the IonManager Pro manual, Simco-Ion p/n 19-5582-SW-xx.
- Online Help is also available in IonManager Pro by clicking the Help button.

1.2 Ceiling Emitter Model 5511

The Ceiling Emitter Model 5511 features microprocessor-based technology, which enables adjustment and bi-directional communication with the controller. Mounted to (or inside of) a cleanroom ceiling, the Ceiling Emitter Model 5511 does not disrupt laminar airflow and is rated better than ISO Class 2 Fed Std 209(e) Class 1 for operation in a cleanroom environment.

The Ceiling Emitter Model 5511 is powered by the Controller Model 5580/5520 that supplies 24 VAC power to the emitters (see Figure 5). Ionization output can be adjusted and monitored at each Ceiling Emitter Model 5511 with the Remote Control Model 5570. Output levels and emitter status can also be monitored by the controller.

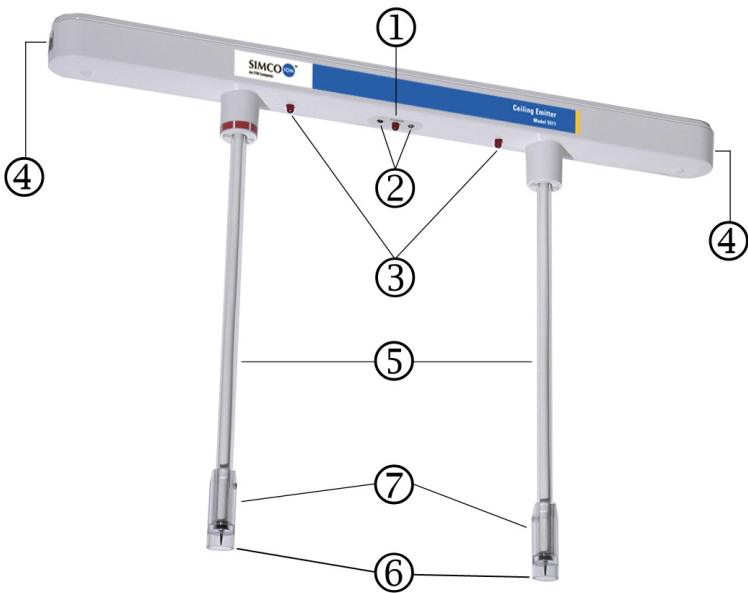


Figure 1. Ceiling Emitter Model 5511

1. **Alarm LED:** Alarm LED flashes when the emitter is in alarm or standby mode.

2. **Infrared Receiver and Transmitter LEDs:** Used with the Remote Control Model 5570; narrow beam range.
3. **Positive and Negative Ion Output Indicators:** LEDs indicate high voltage (HV) ionization. In Pulsed DC mode, lights alternately flash depending on which polarity has HV. Lights are continuously on when in Steady State mode. Both positive and negative ion indicators and the Alarm LED flash once simultaneously during communication.
4. **Modular Ports:** Emitters connect together from these ports using a 26 AWG (0.13 mm²) cable.
5. **Emitter Rods:** Rods are removable and offered in variable lengths: 2.5, 5, 10, 15, 24, 36, and 60 inches (63.5, 127, 254, 381, 609, 914, and 1524 mm).
6. **Emitter Points:** Points are replaceable.
7. **Emitter Point Protectors:** Point protectors are removable for cleaning emitter points.

Note: As the emitter communicates with the controller or with the 5570 remote control, all three red LEDs on the emitter will light for one second.

Hinweis: Wenn der Emitter (Sender) mit dem Controller oder mit der Fernbedienung 5570 kommuniziert, gehen alle drei rote LEDs am Emitter für eine Sekunde an.

Communication between the ceiling emitter and the controller is carried by an RS-485 serial network. All emitter setup parameters are stored at the emitter. The last parameters sent to the emitter before powerdown are recalled by the emitter upon power up.

1.3 Controller Model 5580/5520

The Controller Model 5580/5520 powers, monitors, and sets operating parameters for Model 5511 Ceiling Emitters. The controller is able to “talk” with each emitter, allowing accurate and specific monitoring of emitter status. Most controller functions can be performed using the six onboard buttons and the LCD display. The Handheld Terminal Model 5571 offers more specific and detailed information, and access to some additional functions. See the section in this chapter for a description of the Handheld Terminal Model 5571.

The onboard screen normally displays read-only status reports. Passwords are necessary to change any operating parameters. (See Appendix A Key and Menu Item Descriptions).



Figure 2. Controller Model 5580/5520

Controller Model 5580

The Controller Model 5580 can power up to two sets of 40 emitters (80 total emitters).

The Controller Model 5580 features an input voltage selection of 100/115/230 VAC. The setting on the 5580 must be changed by re-positioning the fuse drawer (see Figure 5). See Input Voltage

Selection on page 28 in Chapter 2 for instructions on setting the Controller Model 5580/5520 for the proper input voltage. See **Table 9. Replacement Fuses** in Chapter 4 for fuse replacement instructions.

Model 5580 Controller Front Panel

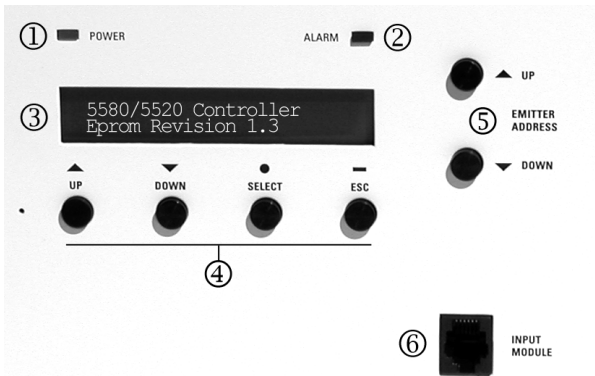


Figure 3. Controller Model 5580 Front Panel

1. **Green Power LED:** Lights when AC power is applied to the controller.
2. **Red Alarm LED:** Blinks when any emitter is in alarm or other non-OK condition.
3. **LCD Screen:** Displays operating parameters and status information.
4. **UP, DOWN, SELECT, Esc Buttons:** Used to scroll through multi-level menus and select items.
5. **Emitter Address UP/DOWN Buttons:** Used to select the address of a Ceiling Emitter Model 5511.
6. **Input Module:** Connects to the Handheld Terminal Model 5571.

Power/Fuse Input

1. **Input Fuse Drawer:** Provides primary circuit fusing and input voltage selection (5 x 20 mm type, rated 2.0A time-lag fuse 250V).
2. **On/off Rocker Switch**
3. **Power Input Receptacle**



Figure 4. Controller Model 5580 Power/Fuse Input

Model 5580 Controller Top Panel

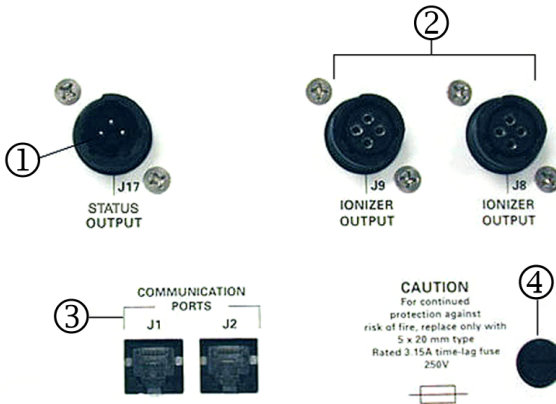


Figure 5. Controller Model 5580 Top Panel

1. **Status Output (J17):** Provides relay closure or 4–20 mA loop upon normal/alarm conditions.
2. **Ionizer Outputs (J8 and J9):** Connects to lines of up to 40 emitters each for a total of 80.
3. **RS-485 Communication Ports (J1 and J2):** Connects to a host computer.
4. **24 VAC Output Fuse Holder:** (5 x 20 mm type, rated 3.15A time-lag fuse 250V)

Controller Model 5520

The small footprint design of the Controller Model 5520 allows for compact installations. The 5520 can power two sets of ten emitters (20 total emitters).

The Controller Model 5520 features an input voltage selection of 100/115/230 VAC. The 5520 input voltage can be set by rotating the selector (see Figure 7). See Input Voltage Selection in Chapter 2 for instructions on setting the input voltage selection.

Model 5520 Controller Front Panel

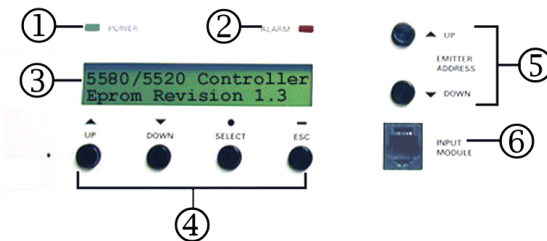


Figure 6. Controller Model 5520 Front Panel

1. **Green Power LED:** Lights when AC input is applied.
2. **Red Alarm LED:** Blinks when any emitter is in alarm or other non-OK condition.
3. **LCD Screen:** Displays operating parameters and status information.
4. **Up, Down, Select, Esc Buttons:** Used to scroll through multi-level menus and select items.
5. **Emitter Address Up/Down Buttons:** Used to select the address of a Ceiling Emitter Model 5511.
6. **Input Module:** Used to connect to the Handheld Terminal Model 5571.
7. **Emitter Address Up/Down Buttons:** Used to select the address of a Ceiling Emitter Model 5511.

Model 5520 Controller Bottom Panel

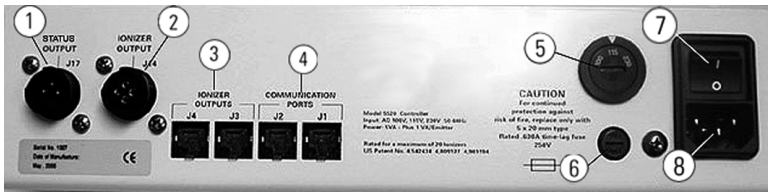


Figure 7. Controller Model 5520 Bottom Panel

1. **Status Output (J17):** Provides relay closure or 4-20 mA loop upon normal/alarm conditions.
2. **Ionizer Output (J14):** Connects to a line of up to 20 emitters.
3. **Two Ionizer Output Ports (J4 and J3):** Connects to lines of up to 10 emitters each; a combination between one of these modular ports and the ionizer output connector J14 may be used to connect up to 20 emitters.
4. **Two RS-485 Communication Ports (J2 and J1):** Connects to a host computer.
5. **Input Voltage Selector:** 110/115/230 VAC
6. **Input Fuse Holder:** The fuse is 5 x 20 mm type, rated 0.63A time-lag fuse 250V.
7. **On/Off Rocker Switch: Power input receptacle.**

1.4 Handheld Terminal Model 5571

The Handheld Terminal Model 5571 supplements and expands the use of the controller. It connects to the controller with a modular cable at the port labeled “Input Module” (see Figure 3 and Figure 6). The Handheld Terminal Model 5571 features 30 keys and a four-line LCD screen. For a description of the keys and key parameters (see Appendix A).

Upon powerup, the Handheld Terminal Model 5571 displays read-only information. To change operating parameters, a password is necessary. There are two levels of password access: the User Level and Master Level. The Master Level allows all parameters to be changed, while the User Level password allows only basic functions to be changed. These separate access levels provide protection against accidental changes unauthorized access.



Figure 8. Handheld Terminal Model 5571

1.5 Remote Control Model 5570

The Infrared Remote Control Model 5572 is used to read and modify the emitter parameters directly at the emitter. It features a narrow infrared beam that prevents communication errors with nearby emitters. For best results, hold the remote control within 18-24 inches (45.7-60.9 cm) of an emitter's vertical centerline and aim directly at the receive LED of the emitter. When the emitter receives transmission from the remote control, it will flash all three LEDs for one second. Each successive transmission is indicated with a one-second flash after the last received transmission.

There are four buttons on the Remote Control Model 5570: **Up**, **Down**, **Select**, and **Esc**. The **Up** and **Down** buttons are used to scroll through menu items. The **Select** button selects an item to be changed. The **Esc** button wakes the remote control from sleep mode, or exits from the activity of a parameter being changed.

As with the Handheld Terminal Model 5571, the Remote Control Model 5570 features two levels of access: a **User Menu** level, and a password-protected, full access **TFS Menu**. The User Menu level allows you to view current emitter settings and change the positive and negative output levels. With a password entered, the TFS Menu is accessed and all basic and advanced parameters can be changed.

Both the User Menu and TFS Menu feature two lines of information. The first line displays the item of the menu (for a description of Remote Control Model 5570 menu items, see Appendix A). The second line displays the current adjustment level or operation mode for that item. For example see Figure 9, the first line shows the Menu Item, in this case the PosOut (positive ionization output) item. The second line shows the value in percent for the positive output, in this case 030.8%.

An on/off slide switch is featured on the right side of the remote control. Upon powerup, the 5570 remote control shows the following:

UsrMenu
Ver 2.6

Battery Life and Replacement

The Remote Control Model 5570 uses two AA alkaline batteries. Life is approximately 60 hours for full operation, and approximately 500 hours while in sleep mode. If the battery voltage drops to ~2 volts, low battery is indicated by **LowBatt** on the second line of the LCD display. Turn the remote control off with the slide switch to conserve battery life.

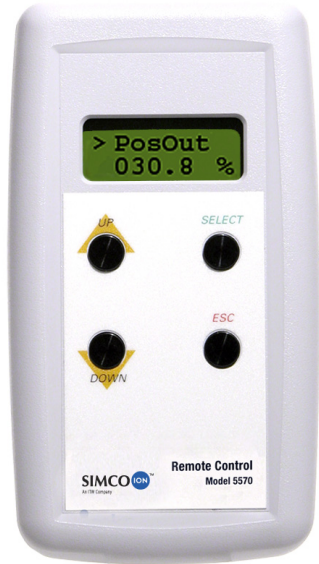


Figure 9. Remote Control Model 5570

Sleep Mode

The 5570 remote control automatically goes into sleep mode if there is no button activity for 15 seconds. Press the **Esc** button to awaken the remote control. While in sleep mode, the LCD displays:

Use ESC
To Awake

1.6 Options

The Ceiling Emitter Model 5511 features several options to fit diverse room environments:

- Different length rods to suit any application: 2.5, 5, 10, 15, 24, 36, and 60 inches (63.5, 127, 254, 381, 609, 914, and 1524 mm) lengths, and custom lengths available for order.
- Emitter rod stabilizer ensures steadiness on longer rods (included on 60 inch rods only)
- Machined titanium or single-crystal silicon emitter points.
- Custom mounting hardware (brackets, chains, rods).

See 5.3 Parts & Accessories in Chapter 5 for a list of system parts and optional accessories.

In addition to the basic system maintenance described in Chapter 4 section on page 67, several service plan options are offered from Simco-Ion. Contact Simco-Ion for more information on any of the above options.

1.7 IonManager Pro Software

IonManager Pro software can be used to setup, monitor, analyze, and manage the 5515/5582 Digital Ceiling Ionization System. The software manages system maintenance requirements by automating the administration of ionization performance. Contact Sales Services at (510) 217-0460 or saleservices@simco-ion.com to find out more about IonManger Pro software and its benefits.

IonManager Pro features a simple graphical image of the ionization system with drill-down hierarchy to individual components for instant identification of status and operational parameters. Alarm conditions are easily viewed from real-time graphical displays, e-mail alarm notifications, and integrated summary reports. System performance can be easily analyzed by accessing history logs or by using the software's statistical and graphing tools. Information can also be exported into common analysis packages.

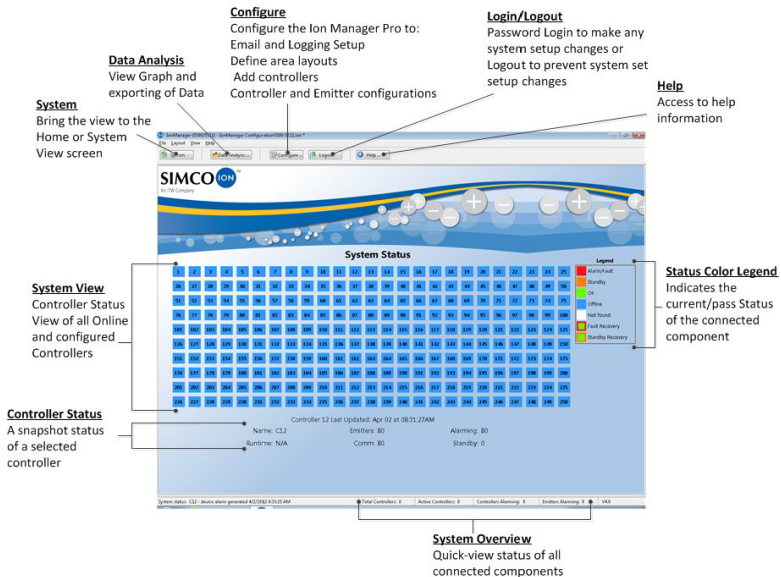


Figure 10. IonManager Pro Interface

2

Installation

- 2.1 Important Safety Information
- 2.2 Installation Guidelines
- 2.3 Emitter Installation
- 2.4 Controller Installation
- 2.5 Junction Box Installation
- 2.6 Wire Testing

This chapter describes how to install Digital Ionization System components. Procedures will vary depending upon your environment. Installation and adjustment by Simco-Ion personnel is available at any time and strongly recommended for the initial installation.

Installation involves mounting and wiring each component in an arrangement that satisfies environment and power requirements. Because environments vary, installation methods may differ from those presented in this section. The instructions in this chapter are intended to be flexible, and can be modified according to your application needs.

2.1 Important Safety Information



Before installing or operating any component of the system, carefully read the following safety information

- ☑ Verify the input voltage setting on the fuse drawer before applying power to the unit.
- ☑ Verify that power to the Controller is turned **off** before connecting or removing emitters or any other components.
- ☑ Never power-down an emitter by removing cables at the ionizer, as this can result in damage to the product.
- ☑ To avoid personal injury or damage to the equipment, perform only the procedures contained in these instructions.

2.1 Wichtige Sicherheitshinweise



Before installing or operating any component of the system, carefully read the following safety information.

- ☑ Überprüfen Sie vor dem Anschluss an die Stromversorgung die Einstellung der Eingangsspannung am Sicherungshalter.
- ☑ Stellen Sie sicher, dass vor dem Anschließen oder Entfernen von Emittlern oder anderer Komponenten die Stromversorgung zum Controller ausgeschaltet ist.
- ☑ Niemals einen Emitter durch Entfernen der Kabel am Ionisator abschalten. Dadurch kann das Produkt beschädigt werden.
- ☑ Führen Sie zur Vermeidung von Verletzungen von Personen oder Schäden am Gerät, nur die Installation und Wartung durch, wie sie in diesem Handbuch enthalten sind.

2.2 Installation Guidelines

Caution: To avoid personal injury or damage to the equipment, do not perform any procedures other than those contained in these instructions. Damage due to improper installation is not covered by the warranty.

Achtung: Führen Sie zur Vermeidung von Verletzungen von Personen oder Schäden am Gerät, nur die Installation und Wartung durch, wie sie in diesem Handbuch enthalten sind. Schäden durch fehlerhafte Installation werden nicht von der Garantie abgedeckt.

Two types of cables are included for wiring the equipment:

- **26 AWG cable (0.13 mm²):** Class 2 installations use 24 AWG (0.20 mm²). This modular cable is used to connect emitters together (called “daisy-chaining”), and connect between j-boxes and emitters.
- **22 AWG (0.3 mm²):** Class 2 installations use 18-22 AWG CL2P cable (0.3, 0.5, 0.8 mm²). This round cable is used between the controller and j-boxes.

Note: If your installation requires NEC Class 2 wiring, be sure to use the appropriate wiring materials. Simco-Ion recommends that Class 2 installations use cabling rated CMP or CL2P. Refer to the National Electrical Code for further information on class 2 wiring requirements.

In this manual, Class 2 cabling is noted after regular cables, indicated by “CL2P”.

Hinweis: Für eine Installation mit Verkabelung nach NEC Class 2 muss geeignetes Material verwendet werden. Simco-Ion empfiehlt hierzu Kabel der Kategorie CMP oder CL2P. Der National Electrical Code enthält weitere Informationen für die Verdrahtung gemäß Class 2. In diesem Handbuch wird auf Class 2 Verkabelung durch den Zusatz "CL2P" hingewiesen.

Ideally, first establish locations for the emitters. Mount the emitters, and then the controller. J-boxes can then be mounted and wired between. Wiring is performed in conjunction with mounting to complete the installation process.

Recommended Equipment and Tools

Charged Plate Monitor	Model 280A
Cable Tester	Mod - Tap Model SLT-3
Cabling Materials	<ul style="list-style-type: none"> • Connector shell • Pins • Cable clamp • #6 spade lugs, un-insulated
Tools	<ul style="list-style-type: none"> • AMP modular connector crimp tool • General purpose hand tools • Crimp removal tool • Pliers • Cutters • Wire strippers, Stripmaster Model #45-092 10-22 AWG (5.2-0.3 mm²); 12 AWG (3.3 mm²) strip hole modified to have 0.093" [2.362 mm] dia.)

Controller and Emitter Locations

It is convenient to choose locations for emitters first, and then the controller(s). Keep in mind the following considerations when determining locations for the units:

- ☑ Site requirements/restrictions
- ☑ Access to controls
- ☑ Access to a grounded power outlet within six feet of each controller
- ☑ Applicable building codes for bracket and screw mounting
- ☑ The least amount of distance for cables from the controller to emitters
- ☑ Emitters oriented so that the positive and negative polarities of adjacent emitter points alternate to avoid like-polarity emitter points being next to each other. The positive emitter rod is indicated by a striped red ring. This also helps maximize the positive/negative ion balance throughout the area.
- ☑ Locations for emitters should be selected to maximize the delivery of ionized air to static-sensitive areas.
- ☑ Emitters should not be placed closer than 24 inches (60.9 cm) from metal objects which attract and dissipate ions.
- ☑ Emitters should be adjacent to HEPA/ULPA filters to maximize ion delivery in the airflow.
- ☑ Emitters should be placed in rows, or offset rows, approximately four to eight feet (1.2–2.4 meters) apart.

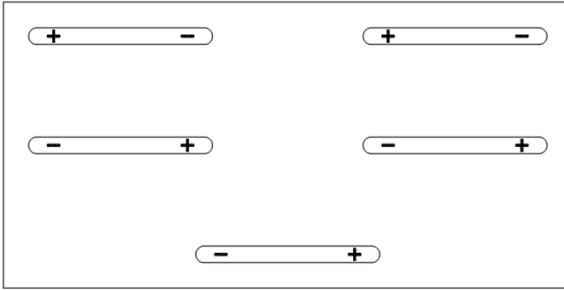


Figure 11. Emitter Polarity Placement

Determine the mounting locations for the junction boxes and emitters within the wiring length limit recommendations described in the table on the next page.

Tip: The following instructions apply to emitter installation using self-adhesive interlocking strips.

Tipp: Die folgenden Anweisungen gelten für die Installation von Emittlern mit selbstklebenden Befestigungsstreifen.

Create a layout map for emitters and controllers which can be referred to as units are mounted.

Function	Recommendation
Primary cable length from 5580 controller (either output J8 or J9) or 5520 controller (output J14) to the furthest junction box	250 ft. (76.2 m) maximum using #22 AWG/ 18–22 CL2P (0.3/0.8–0.5 mm ²) cable
Cable length per junction box	150 ft. (45.7 m) maximum using #26 AWG/ 24 CL2P (0.13 mm ² /0.20 mm ²)
Maximum number of emitters per junction box	10
Maximum number of emitters per 5580	80
Maximum number of emitters per 5520	20

Table 1. Controller/Emitter Wiring Limits

When planning the emitter locations and wiring layouts, the following controller output connector capacities should be kept in mind:

5520 Controller	20 emitters, max total
J3 (modular)	10 emitters, max
J4 (modular)	10 emitters, max
J14 (CPC)	20 emitters, max
5580 Controller	80 emitters, max total
J8 (CPC)	40 emitters, max
J9 (CPC)	40 emitters, max

Table 2. Controller Capacities

2.3 Emitter Installation

Standard ceiling emitter mounting involves the use of 3M Dual Lock™ cleanroom-compatible self-adhesive interlocking strips. Stainless steel brackets and other mounting methods are also available as options from Simco-Ion. Contact Simco-Ion Technical Support for advice on other mounting methods.

Emitter Rod Insertion

Emitter rods for the Ceiling Emitter Model 5511 are removable and are shipped uninstalled with the emitter. To install the rods, insert the end of the rod with the gold-plated plug into the collared receptacle on the emitter and rotate the rod 1/4 turn clockwise until it hits the stop.

Optional Rod Stabilizer Installation

The optional rod stabilizer kit (P/N 33-5511) is designed to provide support for the 60 inch emitter rods. It can be applied to shorter rods if required but may result in excessive buffeting due to non-laminar airflow conditions.

To attach the stabilizer to emitter rods:

1. If necessary, remove the emitter rods from the emitter by rotating them counter clockwise. Do not use the stem to pull them out.
2. To fit the stabilizer bracket around the rod, stretch out the bracket so that it snaps onto the rod. The brackets wrap around the stabilizer to allow for easy attachment.
3. Reinsert the emitter rods with the stabilizer attached on the rods.



Figure 12. Stabilizer Installed on Emitter Rods



Figure 13. Stabilizer in Place

Emitter Point Insertion

Emitter points are usually installed at the factory. If you have requested that emitter points be included separately, carefully install an emitter point into each emitter rod socket using a soft-jawed tool or gloved fingers. Take care not to damage the brittle, sharp tip.

Once emitter points are installed, seat the emitter point protector over the emitter point. The sharp tip of the emitter point will be slightly recessed in the protector. Secure the point protector to the emitter rod by tightening the 6-32 x 1/8 inch set screws with a torque screw driver set to 10 inch/oz. (the screwdriver needs to be fitted with a 1/16 inch [1.57 mm] cup point socket Hex driver). Do not over tighten the set screws. Over tightening can cause damage to the emitter point protector.

Emitter Mounting

Tip: The following instructions apply to emitter installation using self-adhesive interlocking strips.

Tipp: Die folgenden Anweisungen gelten für die Installation von Emittlern mit selbstklebenden Befestigungsstreifen.

Always clean the ceiling area where emitters will be mounted when using self-adhesive strips. Use 50–100% isopropyl alcohol or another appropriate cleaner (be sure the cleaner will not damage the ceiling surface). Remove all traces of HEPA filter sealing material (typically silicone) from the area where the self-adhesive strips are to adhere.

Peel off the lining from the interlocking strips and press the emitter to the clean, dry ceiling surface. Hold the emitter in place for five to ten seconds with firm pressure to allow the adhesive to set. Discard and replace any dual lock strip that has been applied to a surface and removed.

Emitter Wiring

Once an emitter is mounted, connect emitters together (also called “daisy chaining”) using 26 AWG/24 CL2P (0.13 mm²/0.20 mm²) modular cable terminated with insulation displacement (RJ-11) plugs. Different lengths of pre-made cables are available for use with emitters, but it may be necessary to construct your own cable to allow for custom sizing. The box below describes how to construct custom cables.

Plug the cable into one end of the emitter. Leave a small amount of slack at the emitter and then dress the cable along the ceiling, securing it every eighteen to twenty four inches with a self-adhesive cable tie block. Leave a small amount of slack at the next emitter.

Constructing a Custom-Length Cable

Tools needed:

- Modified Stripmaster #45-092 wire strippers (12 AWG/3.3 mm² hole modified to have 0.093" [2.362 mm] diameter)
- Diagonal wire cutters
- AMP modular connector crimper

Cut the cable to the desired length (see Figure 14) and attach an RJ-11 plug to the end as described below.

Ensure you have modified the stripper by running a small-diameter round file through the stripper blade cutout to open up the hole to 0.093" (2.362 mm) diameter.

1. Use the modified Stripmaster wire strippers to strip the outer insulation jacket of the cable 1/4" (6.35 mm) from the end. Arrange the wires in a flat row so they lay with the colors in the following left-to-right order: black, red, green, white (or yellow).
2. Use a pair of diagonal wire cutters to trim 1/16" (1.57 mm), straight across, off the ends of the four individual wires, so that no stray wire can short inside the plug.
3. (See). Note the order of the wire colors relative to the tab of the RJ-11 plug. Push the cable into the plug, seating all four wires fully into the plug. Verify this by looking through the plastic at the end of the plug to ensure the wire ends show through.
4. Insert the plug with cable into a crimping hand tool. The white (or yellow) wire should be on the right with the locking tab of the modular RJ-11 plug up (facing you). Crimp the modular plug to the end of the cable.
5. If you are using an RJ-11 plug on the other end of the cable, repeat this procedure.

6. Hold both plugs side by side, tab up (towards you), and confirm that the color coded wires are in the same positions in each plug with white (or yellow) in the right-most position.

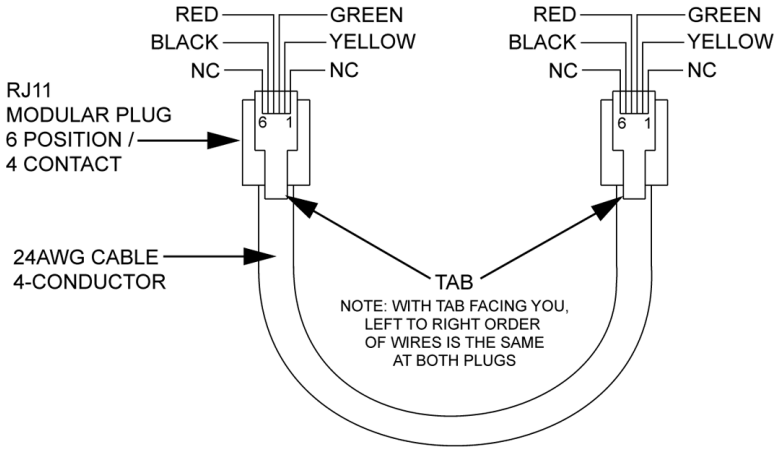


Figure 14. Interconnect Cable Assembly

2.4 Controller Installation

Before mounting the controller, it is important to ensure electrical requirements are considered.

Controller Electrical Requirements

The 5580/5520 controller must be installed within six feet of a properly grounded receptacle. If no such receptacle exists, one must be installed following the applicable building and National Electric Code requirements.

To reduce the risk of electric shock, this equipment has a grounding type plug with a third (grounding) pin. This plug will only fit into a grounding type power outlet. Do not alter the plug in any way. If the plug does not fit into the outlet, contact qualified personnel to install the proper outlet.

Input Voltage Selection

Caution: Disconnect the power cord from the controller before making any changes to the input voltage selection.

The use of improper input voltage may result in damage to the unit. Verify the input voltage setting on the fuse drawer before applying power to the unit.

Achtung: Ziehen Sie das Netzkabel vom Steuergerät ab, bevor Sie Änderungen am Wahlschalter für die Eingangsspannung machen.

Die Verwendung ungeeigneter Eingangsspannung kann zu Schäden am Gerät führen. Überprüfen Sie vor dem Anschluss an die Stromversorgung die korrekte Einstellung am Wahlschalter.

The Controller Model 5580 has a variable power input setting depending on how the fuse holder in the input fuse drawer is installed. The fuse drawer is located above the rocker switch in the AC power entry module on the bottom panel of the controller. If the setting is not correct for your installation, use a small, flatblade screwdriver to release the fuse drawer. Pull out the holder and rotate the fuse so that the proper voltage setting is displayed in the fuse drawer window.

The Controller Model 5520 features an external input voltage selector, located on the bottom panel next to the rocker switch and above the input fuse drawer. To change the setting, use a small, flatblade screwdriver to rotate the selector to the appropriate voltage.

By factory default, the input voltage is set to 230V. See **Chapter 4** for information on installing fuses.

Controller Mounting

The Controller Model 5520 features two flanges on each side of the chassis. The wall material will determine the type of mounting screw to be used.

The Controller Model 5580 features two keyholes on the back of the chassis. After placing the controller on the fasteners, gently push down in a vertical motion so the fasteners enter the slim, narrow part of the keyhole.

For safety considerations, the mounting systems used for the controllers should be able to support approximately four times the weight of the controller (16 pounds [7.25 kg] for the Controller Model 5520, and 30 pounds [13.6 kg] for the Controller Model 5580).

Once the controller and emitters are mounted, install and wire any necessary j-boxes to complete the connections.

Both controllers feature a status output connector. A status output connector enables connection to facility monitoring systems (FMS). The status output can operate in two modes: relay closure or 4–20 mA loop. The factory default setting is relay closure. The table below shows the state of pins on the connector for each mode.

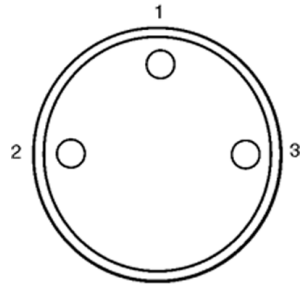


Figure 15. J17 Status Output Connector

J17 Status Output States	Alarm Active	Alarm Inactive	Brown Out
Current Loop J17.2–J17.1	20 mA	4 mA	0 mA
Relay Contact J17.1–J17.2	closed	open	closed
Relay Contact J17.2–J17.3	open	closed	open

Table 3. Status Output States

CPC Part Information

Simco-Ion offers all parts below as a completed assembly (Simco-Ion part number 33-1770-40). An AMP crimping tool is recommended to assemble the parts. (AMP part number 9308.)

Part	AMP P/N	Simco-Ion P/N	Description
Mating Plug	206060-1	18-0697	Shell size 11; four contact positions, standard sex
Female Crimp Sockets	66594-1	18-0680	20–24 AWG (0.5–0.20 mm ²), usually three pieces required/plug
Strain Relief Cable Clamp	206062-1	18-0640	One piece per plug
Cable		25-0815 (40 ft)	22 AWG (0.3 mm ²), 4-conductor

Table 4. CPC Part Information

2.5 Junction Box Installation

Junction boxes, or j-boxes, are used to “T” off from the 22 AWG/ 18-22 CL2P (0.3 mm²/0.3–0.8 mm²) trunkline to strings of up to ten emitters.



Figure 16. Junction Box

J-Box Mounting

J-boxes are mounted in the same manner as emitters, using cleanroom-compatible surface mount adhesive. Orient the j-box so that there is easy access to the modular receptacle on the side of the box.

J-Box Wiring

Unlike the cabling between emitters, wiring between the controller and j-boxes involves the use of four-conductor 22 AWG/ 18-22 CL2P (0.3 mm²/0.3–0.8 mm²) CMP-rated round cables. Typically, a main “trunk-line” of the cable is laid out from the controller to the j-boxes, with an AMP Circular Plastic Connector (CPC) assembled to the cable. The interior of the j-box is then wired.

Constructing a Custom-Length CPC Cable

Tools needed:

- Diagonal wire cutters
 - Wire strippers
 - AMP modular connector crimper #584951
1. Cut the four-conductor cable to your desired length and slide the cable clamp housing onto the cable.
 2. Strip the outer cable casing 1 inch (2.54 cm).
 3. Strip the individual wires 3/16 inch (4.74 mm).
 4. Attach the AMP crimp pins to each wire using the AMP crimping tool.

5. Install the crimp pins into the AMP connector body as follows:
 - Green = Pin 1
 - Red = Pin 2
 - Black = Pin 3
 - White (Yellow) = Pin 4
6. Assemble the cable clamp to the clamp housing using the supplied self-tapping screws.

Connect the Controller to the First J-Box

Caution: Do not connect the CPC to the controller while the controller is powered up.

Achtung: Schließen Sie die CPC nicht an das Steuergerät an wenn dieser eingeschaltet ist.

1. Verify that the controller is off and the power cord is disconnected.
 - On the 5580, connect the 22 AWG 22 AWG/ 18-22 CL2P (0.3 mm²/0.3–0.8 mm²) trunkline CPC plug(s) to either J9 or J8 ionizer outputs. Each line supports forty emitters on a j-box string, with no more than ten emitters per string.
 - On the 5520, connect the cable trunkline CPC plug to the J17 ionizer output for a line of up to 20 emitters with two j-boxes. In addition, the J4 and J3 ionizer output ports can be used for lines of 10 emitters each. A combination of one ionizer output port and the J14 output receptacle can also be used, for a total of 20 emitters (10 emitters max on one modular ionizer port).
2. Once the CPC is connected to the appropriate port on the controller, route the trunkline cable to the first j-box. Secure the cable neatly to walls and ceilings using self-adhesive wire tie mounts and nylon wire ties. See the section below for wiring connections inside the j-box.

Wire the Trunkline Cable to the J-Box

1. Remove the j-box cover. Cut the 22 AWG 22 AWG/ 18-22 CL2P (0.3 mm²/0.3–0.8 mm²) cable to a length that will allow for uncluttered placement inside the j-box, with a small amount of slack left over in the cable outside the j-box. Typically, the cable will continue out from this j-box to the next j-box.
2. Strip off approximately 1.5 inch (3.8 cm) of the outer insulation from the ends of the cables and strip the individual wires 3/8 inch (9.52 mm). If two cables are to be joined at the j-box, twist together like-colored wires and crimp both wires into a #6 spade lug. Attach each spade lug to its corresponding screw location as shown in Figure below and .
3. Re-install the j-box cover.

Note: The yellow wire of the j-box connects to the white wire of the cable while all other colors match from cable to j-box.

Hinweis: Der gelbe Leiter vom J-Gehäuse ist mit dem weißen Draht des Kabels verbunden. Alle anderen Farben von Kabel und J-Gehäuse stimmen überein.

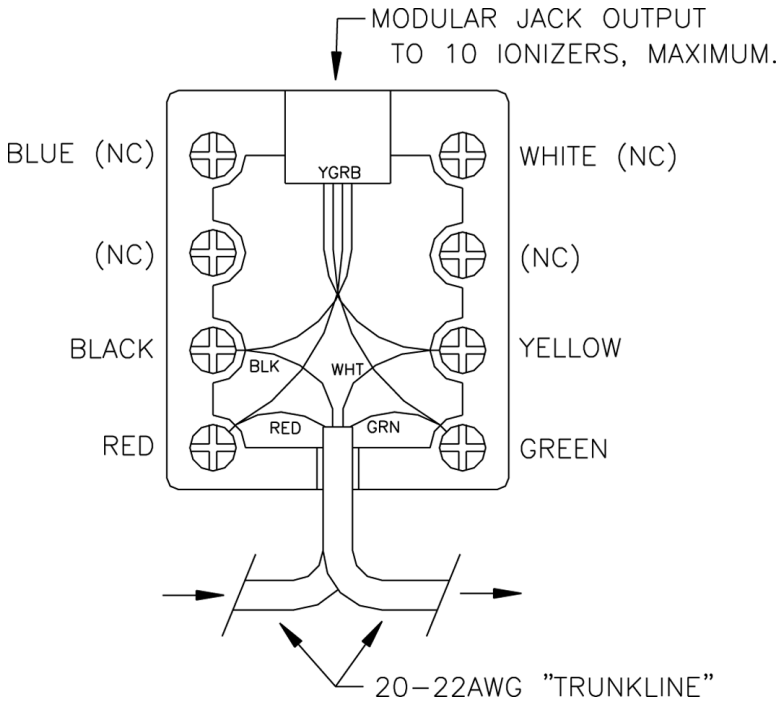


Figure 17. Junction Box Wiring

Function	Cable Color	Connector Pin	J-box	Signal Level
Common	Green	1	Green	Ground
RS-485B	Red	2	Red	1.5 VDC, no load
RS-485A	Black	3	Black	3.2 VDC, no load
Power	White	4	Yellow	24 VAC

Table 5. Cable/J-box Wiring Colors

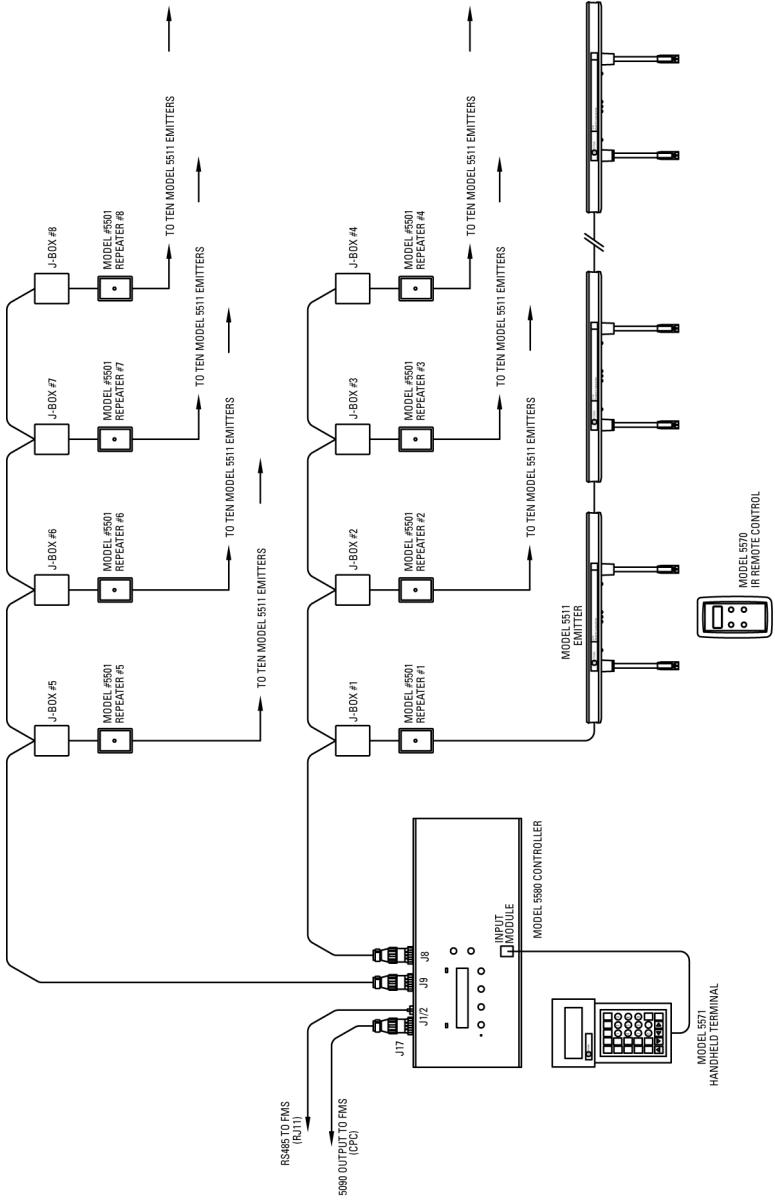


Figure 18. Wiring Layout

2.6 Wire Testing

Test all wiring before powering the system, or when the installation has been physically reconfigured. If a bad wire exists, emitters will go into alarm. Do not connect any power cords to the controller before testing the system wiring.

A Mod-Tap Model SLT-3 tester is used to test each modular interconnect cable for shorts and continuity.

Warning: Before testing any wiring, turn off the controller and disconnect power cables. Do not attempt to use the Mod-Tap tester on energized cables.

Warnung: Schalten Sie vor dem Testen der Verdrahtung den Controller aus und stecken Sie die Stromversorgungskabel ab. Benutzen Sie den Mod-Tap-Tester nicht an stromführenden Kabeln.

Controller Cables

To test the trunkline cable between the controller and the first j-box, two Mod-Tap testers are needed: one designated as “master” and the other as “remote”. In addition, an adapter needs to be constructed to connect the Mod-Tap tester to the CPC cable that connects to the controller. To construct the adapter:

1. Connect an RJ-11 plug to one end of a length of 26 AWG/24 CL2P (0.13 mm²/0.20 mm²) flat cable. The cable should be oriented so that the yellow wire is to the right, as viewed from the tab side of the RJ-11 plug.
2. Strip approximately 3/4 inch (19 mm) of outer insulation from the other end of the cable. Strip approximately 3/16 inch (4.74 mm) of insulation from each of the four wires.
3. Crimp a female connector (Simco-Ion part number 18-0685) to each of the four wires. Be sure that the electrical contact with the inner crimp of the female connector is sound and that the outer crimp grips the insulation.

4. Slide a cable clamp shell onto the wire, oriented with the threads towards the pins.
5. Insert each pin into the back end (numbered end) of the female CPC connector (Simco-Ion part number 18-0660) as follows:
 - Green = Pin 1
 - Red = Pin 2
 - Black = Pin 3
 - White (yellow) = Pin 4
6. Ensure the pin is fully inserted into the plastic body of the connector. A click should be felt or heard. Attach the cable clamp to the connector body and clamp the cable at the outer insulation.

With the adapter made, test the cable between the controller and j-box.

1. Disconnect the cable from the controller.
2. Connect the adapter to the CPC end of the cable.
3. Connect the adapter to the “master” Mod-Tap tester. The other end of the cable remains connected to the j-box.
4. Disconnect the cable leading from the first j-box to its emitter string and plug the “remote” Mod-Tap tester into the j-box.
5. Check the LED sequence on the tester for simultaneous green lights. Non-simultaneous, blinking green lights or red lights indicate a bad wire or problem.

Testing the J-Boxes

Make two short modular interconnect cables, as described in this chapter. Plug one end of each interconnect cable into the “USOC” receptacle on each half of the Mod-Tap tester. Connect the “master” half of the Mod-Tap tester to the first junction box in the row. Connect the “slave” half of the Mod-Tap tester to the second junction box. Move the Mod-Tap tester down the line to the next junction box until all are tested.

Check the LED sequence on both halves of the tester. Some cable faults will only appear on one half. The correct sequence will first light LED #1 and then LED #2 on the “master” half of the tester. Simultaneously, the green LEDs #1, and then #2, will light on the “remote” half. Red LEDs and non-sequenced LEDs on the “remote” indicate a problem.

3

Operation

3.1 Powering the System

3.2 About the Settings

3.3 Remote Control Model 5570 Settings

3.4 Handheld Terminal Model 5571 Settings

3.5 Controller Model 5520/5580 Settings

3.1 Powering the System

This section describes the process of initializing power to newly-installed emitters. Before turning on the controller, verify that the controller is set to the correct input voltage setting (see Chapter 2: Installation for more information).

Warning: Do not connect or disconnect emitters to and from the controller while the controller is powered!

Warnung: Verbinden oder trennen Sie keine Emitter mit bzw. von dem Controller wenn dieser eingeschaltet ist!

Follow the steps below to correctly power the system.

1. Ensure the emitters are connected to the controller as instructed in Chapter 2: Installation.
2. Power up the controller. The red alarm LED will blink on the controller. This alarm condition occurs at power up because the controllers are factory set to expect up to 80 addressed emitters upon initial power up, which have not yet been assigned. Emitters will run at factory default settings, but are not yet communicating with the controller.
3. Assign addresses to each emitter.
4. Perform a “find” function for emitter addresses.

3.2 About the Settings

This table shows which settings are possible to make using one of the three available components.

	IR Remote Control Model 5570	Handheld Terminal Model 5571	Controller Model 5520/5580	IonManager Pro Software
Set emitter addresses	●			
Set controller addresses		●	●	
Find connected emitters		●	●	●
Select an operation mode	●	●	●	●
Set emitter timing	●	●	●	●
Set output levels	●	●	●	●
Set alarm levels	●	●		●
Change the alarm % default		●		
Change alarm indicators		●		
Change controller polling periods		●		●
Change polling retry counts		●		
Change error condition counts		●		
Change synchronization periods		●		●
Change synchronization start preferences		●		
Poll emitter status		●	●	●

Table 6. Digital Ionization Room System Settings

About Emitter Addresses

An emitter address is a unique number assigned to an emitter within a system. For the controller to communicate with an emitter, the emitter must be assigned a unique address. If more than one emitter is assigned the same address, the controller may not be able to locate the address, and the count of total emitters will be skewed. If all emitters have unique addresses, the physical count of emitters should match the total counted by the controller. After the controller has identified an emitter by its address, it can monitor status and change settings for an emitter.

About Controller Addresses

A *controller address* is useful in installations where multiple controllers have been networked together, or where IonManager Pro (or other diagnostic software) is used to monitor the system. The default controller address is 01. If there is only one controller in the installation, it is not necessary to assign a unique number to it.

About Finding Emitters

Once emitters have unique addresses, the controller must “find” the addresses of the emitters. The status of emitters that are “found” can then be polled. This section describes how to use the onboard buttons of the controller or the Handheld Terminal Model 5571 to find connected emitters.

The “find” function of the controller must be run every time an emitter is added or removed from the installation.

About Selecting Operation Modes

The 5511 emitter can be set to operate in Pulsed DC mode, Steady State DC mode, or standby mode. Each ceiling emitter operates individually, so every emitter’s operating mode can be set differently, satisfying any layout configuration. An operation mode can be set using the Remote Control Model 5570, Controller buttons, or Handheld Terminal Model 5571.

Pulsed DC operation mode is the most efficient mode of ionization for room system installations, and will be set most often. Where short distances between the ionizer and the target exist and where good airflow is present, steady-state DC mode is appropriate.

The standby mode will turn off the ionizing high voltage supplies and the center alarm LED on the emitter will blink. Maintenance may be performed while in standby mode.

For applications where it is desirable to have all emitters set to the same operation mode, the mode can be set globally at the controller. For applications where emitters will have different operation modes, the modes can be set individually at the controller, or individually with the Remote Control Model 5570. Operation modes can be mixed in any combination in an installation.

The factory default mode is set to Pulsed DC mode, at 1.0 second on, 0.2 seconds off.

About Setting Emitter Timing

If emitters are set to the Pulsed DC operation mode, you must set the timing of the pulse. This section describes how to set the timing using the onboard buttons of the controller, the Handheld Terminal Model 5571, or the Remote Control Model 5570.

Because each emitter operates independently, timing may fall out of sync among emitters over time. The controller automatically sends a synchronization command every 60 minutes (default).

Note: In order for the alarm to function properly, the minimum on time setting must be greater than or equal to 0.7 seconds. The alarm will not operate if the on time setting is any lower.

Hinweis: Damit das Alarmsignal einwandfrei funktioniert, muss die An-Zeit größer oder gleich 0,7 Sekunden sein. Der Alarm funktioniert nicht wenn die Zeiteinstellung kleiner ist.

See the table below for suggested output level times for both the Controller Model 5580 and 5520.

Ceiling Height	onTime	offTime	Output
9 feet (2.74 m)	3 seconds	1 seconds	50%
12 feet (3.65 m)	4 seconds	1.5 seconds	50%

Table 7. Suggested Controller Settings

About Setting Output Levels

This section explains how to set the positive and negative output percentage level for an emitter. According to your application and environment, each emitter can be set at any output level to suit your needs. Likewise, emitters can be set to all have the same output level.

Note: Output levels that are set too low can trigger an alarm condition for an emitter. The factory default output level setting is 30% (approximately $\pm 7\text{kV}$ to $\pm 8\text{kV}$).

Hinweis: Zu niedrig eingestellte Ausgangspegel können die Alarmbedingungen für einen Emitter auslösen. Die werksseitige Einstellung für den Ausgangspegel ist 30% (ca. $\pm 7\text{ kV}$ bis $\pm 8\text{ kV}$).

About Setting Alarm Levels

Normally, alarm levels are automatically adjusted when the output levels are set, based on the alarm percentage value (alarm%%%) in the Misc menu. The alarm percentage value enables you to set the alarm percent default to fit your application needs. The default alarm percentage value is 25%, which means the alarm levels are automatically adjusted to 25% of the output level. For proper maintenance and performance, alarm percentage should be set to 50-75%.

Positive and negative alarm levels can also be changed individually, without changing the output levels, as long as the alarm levels are

adjusted **after** the output levels have been set. In addition, note the following:

- Changing the positive or negative output level will cause the corresponding alarm level to reset based on the alarm%%% parameter stored in the MISC menu group.
- If the alarm%%% parameter is set to 0, the alarm levels will not automatically track the output levels and the alarm may not function properly.

Alarm levels can be changed with the Remote Control Model 5570 or the Handheld Terminal Model 5571.

About Changing Alarm Indicator Settings

When polling emitters, the Controller Model 5580/5520 can recognize the following conditions:

- Normal operation
- Alarm mode
- Standby mode
- No reply from an emitter
- Emitter replies with garbled data

The factory default for each of the alarm conditions listed above is set to Y (on) for visual alarms. The factory default for audible alarms is set to N (off). It may be necessary within your application to set some or all of the error conditions to N (off), making audible and visual alarms silent. If a error condition is reported for an emitter, the controller will still display the error status on the LED screen. See below for a description of settings for each condition.

About Changing Controller Polling Periods

Once connected emitters are identified by the controller, the controller will periodically poll the status of each emitter. The controller polls emitters continuously in order. The total time it takes to poll all emitters is the number of emitters multiplied by the polling period. However, the total time is never less than 5 seconds, so the actual polling period is adjusted if the number of emitters is too small.

About Changing Polling Retry Counts

By default, the Controller Model 5580/5520 will try at least twice to communicate with an emitter. If your application contains noise or events that cause a premature error response, the number of communication retries can be increased up to ten attempts.

About Changing Error Condition Counts

When any conditions other than normal operation are recognized by the controller, the controller immediately reports the condition in its polling summary, and alarm indicators are triggered (if enabled). Error condition occurrences (standby, no reply, or bad reply) are counted by the count2Alarm parameter, with a default of one count. As with the polling retry counts, error occurrence validation counts can be set to up to ten count attempts. Setting the number of counts ensures that an error status will persist for that many counts before the alarm indicators are triggered. This helps filter out premature error responses, such as NoReply or BadReply, in the event there is noise or activity in the installation, and not a real problem.

About Changing Synchronization Periods

Periodically, the Controller Model 5580/5520 sends out a synchronization command (Sync) to all connected emitters to ensure consistent ion emission. How often the controller sends out a global Sync command to emitters can be set to meet your application requirements. The default is every 60 minutes.

About Changing Synchronization Start Prefs

Each emitter independently maintains its own high voltage firing sequence. The synchronization settings selects the start of the firing cycle. Any of the four events of posOn, posOff, negOn or negOff may be selected as the preferred start of the firing cycle. The default starting event is PosOn.

A global synchronization command (Sync) is provided periodically by the Controller Model 5580/5520 to tell emitters to re-start their firing cycle at the start event that has been selected at each individual emitter.

Note: The Sync command from the Controller Model 5580/5520 cannot globally set the emitters to a common start event--it only tells the emitters to re-start their firing cycles per their individually setup start events.

Hinweis: Der Sync-Befehl vom Controller Typ 5580/5520 kann nicht global die Emitter auf ein gemeinsames Start-Event setzen - er weist lediglich die Emitter an, die Sendezyklen entsprechend ihrer individuellen Setup-Start-Events wieder zu starten.

About Polling the Status of Emitters

As the controller communicates with connected emitters, status reports for each emitter are displayed on the controller's screen. The controller continuously communicates to each emitter on a round-robin basis and reports back the address of any emitter which may be in alarm, or have a error condition: standby, no reply, or bad reply. These may be accompanied by an audible alarm (if activated), and a blinking red LED on the controller.

The Handheld Terminal Model 5571 offers more detailed information about emitter status than the controller's LCD display, such as checking the status of emitters whether or not there are any error conditions.

Emitters are polled by the controller in order. If fifteen emitters are connected, and the polling period is one second, it will take at least fifteen seconds to poll the status of all emitters.

3.3 Remote Control Model 5570 Settings

Most menu items of the Remote Control Model 5570 require a password in order to be changed. The positive and negative output levels of an emitter can be changed without a password.

Setting Emitter Addresses

Set emitter addresses one at a time. Addresses are set as a numeric value from one to 80.

Tip: Create a map of the set emitter address assignments for later reference. Place the map in an easily-referenced location near the installation.

Tip: Erstellen Sie eine Übersicht der eingestellten Emitter-Adressen zum späteren Nachschlagen. Legen Sie die Übersicht einfach auffindbar in der Nähe der Anlage ab.

1. Turn on the Remote Control Model 5570 while holding down any button. The screen will display “**Password**”.
2. Enter in the following password: **Esc, Down, Up, Select, Select, Select, Select**. The screen will read:

**TFS Menu
Ver 2.6**

3. Use the **Up** or **Down** button to scroll to the Address item. Press Select.
4. Use the **Up** or **Down** button to change the address number while pointing the remote control directly at the middle LED on the emitter. Stop at a desired address number. The address is sent to the emitter immediately. Press **Esc** to exit the Select action. The emitter address will appear as a two-digit number, followed by the controller address in parentheses.

Tip: If you see “ReTry” or “&\$%#” on the bottom line of the Remote Control Model 5570, you may be too close to the emitter or the remote control is not lined up correctly. Move away from the emitter points and target the IR Remote Control Model 5570 at the center red LED.

Wenn Sie "ReTry" oder "&\$%#" in der unteren Zeile der Fernbedienung Modell 5570 lesen, könnten Sie zu nahe am Emitter sein oder die Fernbedienung ist nicht korrekt ausgerichtet. Entfernen Sie sich weiter weg von den Emitter-Punkten und richten Sie die IR-Fernbedienung 5570 auf das mittlere rote LED.

Setting Pulsed DC, Steady State DC, or Standby Mode

For room system installations, pulsed DC operation mode is the most efficient. The factory default setting is to pulsed. The TFS Menu, a second-level access menu, is used to set operation modes. A password is required to access this menu.

1. Hold down any button while turning on the remote control. A password prompt will appear.
2. Enter in the following password: **Esc, Down, Up, Select, Select, Select, Select**.
3. Use the **Up** or **Down** button to reach the **OpMode** item. Press **Select**.
4. Point the remote control directly at the LEDs on the AeroBar and use the **Up** or **Down** button to select the operation mode (**Standby, Pulsed, StdySDC**). Press **Esc** to exit.

Setting Timing

1. Access the TFS Menu by holding down any button while turning on the remote control. A password prompt will appear.
2. Enter in the following password: **Esc, Down, Up, Select, Select, Select, Select**.

3. Use the **Up** or **Down** button to reach the desired **PosOn**, **PosOff**, **NegOn**, or **NegOff** item. Press **Select**.
4. Use the **Up** or **Down** button to change the timing parameter. Press **Esc** to exit from the change action.

Setting Output Levels

1. Use the **Up** or **Down** button to reach the **PosOut** or **NegOut** item. Press **Select**.
2. Use the **Up** or **Down** button to adjust the output level accordingly. Press **Esc** to exit from the change action.

Testing the Alarm

1. Hold down any button while turning on the remote. Once the remote comes on, enter the following password: **Esc, Down, Up, Select, Select, Select, Select**.
2. Use the **Down** button to reach the **PosFdbk** or **NegFdbk** menu item. Note the value(s) for use in Step 4 below.
3. Continue pressing the down button until you reach the **PosAlrm** or **NegAlrm** menu item. Press **Select**.
4. Use the **Up** button to change the alarm level so that it is above the corresponding **Pos** or **Neg** FeedBack level. (Change the alarm levels one at a time.)

The center LED should blink intermittently. If the unit is in pulse mode the outer LEDs will alternate blinking. If the unit is in steady state mode both outer LEDs will remain lit.

5. Reset the alarm by going to the **PosOut** or **NegOut** menu item, depending on the alarm set the output to a different level which will reset the alarm level. Then set the output to the desired level.

Setting Alarm Levels

1. Hold down any button while turning on the remote control. A password prompt will appear.
2. Enter in the following password: **Esc, Down, Up, Select, Select, Select, Select**.

3. Use the **Up** or **Down** button to reach the **PosAlarm** or **NegAlarm** item. Press **Select**.
4. Point the Remote Control Model 5570 directly at the center AeroBar LED and use the **Up** or **Down** button to change the alarm level.

3.4 Handheld Terminal Model 5571 Settings

Note: Passwords entered with the Handheld Terminal Model 5571 will become invalid if the Handheld Terminal Model 5571 is disconnected from the controller, or the wrong password is later entered.

Hinweis: Mit dem Hand-Terminal 5571 eingegebene Passwörter werden ungültig wenn das Terminal vom Steuergerät getrennt wird oder wenn später das falsche Passwort eingegeben wird.

Setting Controller Addresses

Addresses are set as a numeric value from 1 to 32.

1. Press the **Password** key to bring up the password prompt.
2. Enter in the following master-level password: **1414222**. Press **Enter**. The screen will confirm master level password access.
3. Press the **Master** Menu key. Use the “**v**” or “**^**” key to select the boxID number.
4. Use the keypad to enter a new address number. Press **Enter**.
5. Press the **Sync** key. This sends the new controller address to the AeroBars. The screen will show:

Synchronize.....
Synchronize.....
Synchronize.....
Synchronize.....

Although synchronization is executed immediately, this message will remain on the screen until another key is pressed.

Finding Connected Emitters

1. Press the **Password** key to bring up the Password prompt.
2. Enter the following user level password: **1010321**. Press **Enter**.
3. Press the **Find** key.

Setting Pulsed DC, Steady State DC, or Standby Mode

For room system installations, pulsed DC operation mode is the most efficient. The factory default setting is to pulsed.

1. Press the **Password** key to bring up a password prompt.
2. Enter in the following master-level password: **1414222**. Press **Enter**.
3. Select the **OpMode** menu by pressing the **OpMode** key.
4. Select the AeroBar address with the **Addr Up** or **Addr Down** key. Select **0** if you desire to globally assign the same operation mode to all AeroBars.
5. Use the “<” or “>” key to choose the desired operation mode (**Standby**, **Pulsed DC**, or **Steady State DC**).

Setting Timing

1. Press the **Password** key to bring up the password prompt.
2. Enter the user-level password: **1010321**. Press **Enter**.
3. Press the **Pos Emitter** or **Neg Emitter** key.
4. Use the **Addr Up** or **Addr Down** key to select the emitter address in the upper left corner of the screen. Select **0** if you desire to change the timing of all the connected emitters to same on/off time.
5. Use the “v” or “^” keys to select the desired **posOn**, **posOff**, **negOn**, or **negOff** item.
6. Use the numeric keypad to select a new timing setting and press **Enter**.

Setting Output Levels

1. Press the **Password** key to bring up the password prompt.
2. Enter the user-level password: **1010321**. Press **Enter**.
3. Press the **Pos Emitter** key or the **Neg Emitter** key.
4. Select the emitter address with the **Addr Up** or **Addr Down** key. Select **0** if you desire to globally assign the same output level for all emitters.
5. Use the “**v**” or “**^**” key to select the desired **posOutput** or **negOutput** item.
6. Use the numeric keypad to input a new output percent. Press **Enter**.

Setting Alarm Levels

1. Press the **Password** key to bring up the password prompt.
2. Enter either the user-level password: **1010321** or the master-level password: **1414222**. Press **Enter**.
3. Press the **Pos Emitter** or **Neg Emitter** key.
4. Use the **Addr Up** or **Addr Down** key to select the AeroBar address in the upper left corner of the screen. Select address **0** if you desire to globally change the parameters of all the connected AeroBars at the same time.
5. Use the “**v**” or “**^**” key to select the **posAlarm** or **negAlarm** item.
6. Use the numeric key to select a new setting and press **Enter**.

Changing the Alarm Percentage Default

1. Press the **Password** key to bring up the password prompt.
2. Enter the master-level password: **1414222**. Press **Enter**.
3. Press the **Misc** key to select the **Misc** menu.
4. Use the **Addr Up** or **Addr Down** key to select the AeroBar address. Select address **0** if you desire to globally change the alarm default for all connected AeroBars at the same time.
5. Use the “**v**” or “**^**” key to select the **alm%%%** item to change.

6. Use the numeric keypad to enter a new setting. Press **Enter**.

Changing Alarm Settings

The factory default for audible alarms is set to N (off).

Audible	When set to Y, the audible alarm comes on when an error condition is reported from a polled emitter.
Alarm+/-	When set to Y, the Controller Model 5520 enables the alarm indicators if any emitters are in alarm.
Standby	When set to Y, the Controller Model 5520 enables the alarm indicators if any emitters are in standby mode.
BadReply	When set to Y, the Controller Model 5520 enables the alarm indicators if any emitters reply with garbled data.
NoReply	When set to Y, the Controller Model 5520 enables the alarm indicators if any emitters do not reply to a poll.

1. Press the **Password** key to bring up the password prompt.
2. Enter the master-level password: **1414222**. Press **Enter**.
3. Select the Master Menu by pressing the **Master** key.
4. Use the “**v**” or “**^**” key to select the parameter to change (**audible**, **alarm+/-**, **standby**, **BadReply** or **NoReply**).
5. Use the “**<**” or “**>**” key to select **Y** or **N**.

Testing the Alarm

1. Press the **Status** key. The following information is shown:

```
id: xx stat: OK
epromVER: x.x
posFdbk: xxx%
negFdbk: xxx%
```

The **epromVER** line describes the firmware version. Note the values of **posFdbk** and **negFdbk** which you will use to set Alarm values in Step 6 below. The id line describes the address of the AeroBar. Use the **Addr Up** or **Addr Down** key to view information for other AeroBars.

2. Press the **Password** key to bring up the password prompt. Enter the following password: **1414222**. Press **Enter**.

3. Press the **Pos Emitter** or **Neg Emitter** key.
4. Use the **Addr Up** or **Addr Down** key to select the AeroBar Model 5585 address in the upper left corner of the screen.
5. Use the “**v**” or “**^**” key to move the cursor to select the posAlarm or negAlarm item.
6. Change the alarm setting so that the **posAlarm** value is at least two percentage points or more above the posFdbk value. If desired, change the alarm setting for the negAlarm value so that it is at least two percentage points or more above the negFdbk value. Randomly check other bars.

The center LED on the ionizer should blink intermittently. If the unit is in pulse mode the outer LEDs will alternate blinking. If the unit is in steady state mode both outer LEDs will remain lit.

7. Reset the alarm to the original levels, or change the output levels to correspond with the new alarm levels.

Changing Controller Polling Periods

1. Press the **Password** key to bring up the password prompt.
2. Enter the master-level password: **1414222**. Press **Enter**.
3. Press the **Poll** key to select the **Poll** menu.
4. Use the numeric keypad to enter a new polling period.

Changing Polling Retry Counts

1. Press the **Password** key to bring up the password prompt.
2. Enter the master-level password: **1414222**. Press **Enter**.
3. Select the **Password** menu again by pressing the **Password** key and enter the following menu password: **12345 - -** (minus signs). Press **Enter**.
4. Use “**v**” or “**^**” to select the comRetries parameter to be changed.
5. Use the numeric keypad to input a new setting. Press **Enter**.

Changing Error Condition Counts

1. Press the **Password** key to bring up the password prompt.
2. Enter the master-level password: **1414222**. Press **Enter**.
3. Select the **Password** menu again by pressing the Password key and enter the following menu password: **12345 - -** (minus sign). Press Enter.
4. Use the “**v**” or “**^**” key to select the **count2Alarm** item.
5. Use the numeric keypad to input a new setting. Press **Enter**.

Changing Synchronization Periods

Sync periods may be set from 60 to 239 minutes.

1. Press the **Password** key to bring up the password prompt.
2. Enter the master-level password: **1414222**. Press **Enter**.
3. Select Master menu by pressing **Master** key.
4. Use the “**v**” or “**^**” key to select the **reSyncEvry** item.
5. Use the numeric keypad to input a new setting. Press **Enter**.

Changing Synchronization Start Preferences

1. Press the **Password** key to bring up the password prompt.
Enter the master-level password: **1414222**. Press **Enter**.
2. Press the Opmode key to select the **OpMode** menu.
3. Use the **Addr Up** or **Addr Down** key to select the AeroBar address you want to change the start preference for. Select address 0 if you desire to globally set the same start preferences for all connected AeroBars.
4. Use “**v**” or “**^**” key to select the synchronization preference: **posOn**, **posOff**, **negOn** or **negOff**.

Reading Polling Information

Polling an emitter with the Handheld Terminal Model 5571 offers more specific information about an emitter. To view information for one emitter, press the **Status** key.

The **Poll** key offers system-wide reports on emitter conditions. Two screens comprise the Poll menu: the Poll Error screen and the Aggregate Poll Error Count screen. Press the **Poll** key to bring up the Poll Error screen. The following is an example of what appears:

```
Poll Status.....  
PollEvry: 1.00 secs  
Polling #03/15 .....  
Polling Address #44
```

The second line shows that polling occurs once every second. The third line shows that the third out of fifteen connected emitters is currently being polled. The fourth line indicates which address the emitter has (address numbers may not match the order of emitters polled).

If there are emitters with a status other than OK, the last two lines of this Poll Error screen will cycle the error information. The problem (**noReply**, **alarm**, **badReply**, or **stndby**) will appear followed by the address of the affected emitter. An example of the two lines is:

```
10ok 02stndby 02alarm  
00badReply 01noReply
```

In this case, out of fifteen connected emitters, ten are OK, two are in standby mode, two are in alarm mode, none are responding with a bad reply, but one is giving no reply.

The second screen of the Poll menu is Aggregate Poll Error Count, which shows how many system-wide instances of error conditions have occurred. Press the “**v**” or “**^**” key to toggle to the screen from the first Poll Error screen. An example of the screen shows:

```
alarmCnts: 0000  
stndbyCnts: 0033  
badRplyCnts: 0000  
noReplyCnts: 0001
```

In this case, thirty-three instances of emitters in standby mode were counted, and one instance of a No Reply was counted. This could

mean one unit has been polled 33 times to be in standby mode, or that 11 units are in standby mode and have been polled three times. To clear all counts to zero, press the **Enter** key (you must have a password entered first). Pressing **Enter** resets the count only while in this screen.

The **Status** key is used to poll emitters on an individual basis. The two screens composing this menu are the Status screen and the Poll Error Count screen. Press the **Status** key to bring up the Status screen. Use the **Addr Up** or **Addr Down** key to select the emitter address you want to poll. The following is an example of what appears:

```
id: 05 stat:OK
epromVER: 3.0
posFdbk: 033.7%
negFdbk: 033.7%
```

In this case, the emitter address being polled is 05, and the status is OK.

If an emitter is not replying, the stat shows “**reTry**” and the three bottom lines show **NA**.

If an emitter is in alarm, the stat shows “**posAlrm**” or “**negAlrm**”, depending on which high voltage polarity is causing the alarm. Accordingly, the posFdbk or negFdbk shows an adjusted percent based on the lack of output.

If an emitter is in standby, the stat shows “**Standby**”.

The second screen of the Status menu is Poll Error Count, which shows the number of error conditions that have occurred for the emitter you are polling. Press the v or ^ button to toggle to the screen from the first Status screen. An example of the screen shows:

```
id: 05
Polling Errors
0000Alrms  0003Stnby
0000BadXX  0001NoRXX
```

In this case, the emitter address is 05, and three instances of Standby were reported for that address. There was also one instance of a NoReply report.

To clear all counts to zero, press the **Enter** key (you must have a password entered first). Pressing **Enter** resets the count only while in this screen.

3.5 Controller Model 5520/5580 Settings

Note: Passwords entered with the controller buttons will expire 120 seconds after the last button activity.

Hinweis: Über die Tastatur vom Controller eingegebene Passwörter verfallen 120 Sekunden nach der letzten Tasteneingabe.

Finding Connected Emitters

1. Press the **Select** and **Esc** buttons simultaneously to bring up the password prompt.
2. Enter the following password: **Esc, Down, Up, Select, Select, Select, Select**.
3. Select the Find menu by simultaneously pressing the **Addr Up** and **Addr Down** buttons. The controller will execute a search of addresses to find those that are connected. For more information about reading the results of finds, see **About Polling the Status of Emitters** in this chapter.

Setting Pulsed DC, Steady State DC, or Standby Mode

For room system installations, pulsed DC operation mode is the most efficient. The factory default setting is to pulsed.

1. Press the **Esc** and **Select** buttons simultaneously to bring up a password prompt.
2. Enter the following password: **Esc, Down, Up, Select, Select, Select, Select**.
3. Use the **Addr Up** or **Addr Down** button to select the address of the AeroBar you want to change the mode for. Select **0** if you desire to globally assign the same operation mode to all AeroBars.
4. Use the **Up** or **Down** button to reach the **OpMode** menu item. Press **Select**.
5. Use the **Up** or **Down** button to select the desired operation mode (**Standby, Pulsed, or StdySDC**).

6. Press **Esc** to exit the Select action.

Setting Timing

1. Press the **Esc** and Select buttons simultaneously to bring up the password prompt.
2. Enter the following password: **Esc, Down, Up, Select, Select, Select, Select**.
3. Use the **Addr Up** or **Addr Down** button to select the address of the emitter you want to set. Select **0** if you desire to globally change the timing of all the connected emitters to the same on/off time.
4. Use the **Up** or **Down** button to reach the desired **PosOn, PosOff, NegOn, or NegOff** item, Press **Select**.
5. Use the **Up** or **Down** button to change the timing parameter. Press **Esc** to exit from the change action.

Setting Output Levels

1. Press **Esc** and Select simultaneously to bring up the password prompt.
2. Enter the following password: **Esc, Down, Up, Select, Select, Select, Select**.
3. Use the **Addr Up** or **Addr Down** button to select the address of the emitter to be set. Select **0** if you desire to globally assign the same output level for all emitters.
4. Use the **Up** or **Down** button to reach the **PosOut** or **NegOut** item. Press **Select**.
5. Use the **Up** or **Down** button to change the output level percent. Press **Esc** to exit the change action.

Reading Polling Information

After 120 seconds of inactivity with the controller buttons, the screen shows a status report, or polling display. If there are any alarm conditions, including standby, bad reply, and no reply, an error summary is displayed along with the polling display.

If all connected emitters are operating properly, a polling screen is displayed. For example, fifteen emitters are connected to the controller. The screen shows:

Polling #03/15
Polling Address #05

The top line indicates that the third emitter out of fifteen connected emitters is being polled. The bottom line indicates the address number of that third emitter (in this case, the third emitter has the address 05).

If any emitters have a problem, a second screen appears which displays a summary of the problem. Emitters that have been polled to have an error status are polled more frequently than the regular round-robin schedule (usually within the next three polling opportunities), but not necessarily in a set order.

If any emitters have a status other than OK (**standby, alarm, bad reply, or no reply**), a polling summary screen will appear at least every five seconds to show which problems are occurring. For example, if two emitters out of the fifteen are in standby mode, two are in alarm, and one is not responding at all (no reply), a screen will appear showing:

10ok 02stndby 02alarm
00badReply 01noReply

The top line shows that ten emitters are OK, but two are in standby, and two are in alarm. The bottom line shows that no emitters are giving a bad (or garbled) reply, but one is not responding at all. Since five emitters now have a status other than OK, separate screens now appear between the first polling activity screen and the polling summary screen. The first is:

standby: 01, 11

This indicates that emitters addressed 01 and 11 are in standby mode. The second screen shows:

alarm+/-: 03, 07

Emitters addressed 03 and 07 are in alarm. A third screen appears now showing that the emitter with address 06 is not responding.

noReply: 06

In this case, five different screens are appearing--the error summary, three separate reports of which addresses have what problem, and the polling display screen shown in the **Reading Polling Information on page 58**.

Note: If only one emitter is connected to the controller, the polling activity screen will alternate every five seconds with the polling summary screen, even if the emitter has an OK status.

Hinweis: Ist nur ein Emitter am Controller angeschlossen ist, wechselt die Anzeige alle 5 Sekunden von Polling-Activity zu Polling-Summary, auch wenn der Emitter OK-Status hat.

4

Maintenance

- 4.1 Troubleshooting Alarms
- 4.2 Emitter Maintenance
- 4.3 Chassis Cleaning
- 4.4 Fuse Replacement
- 4.5 System Adjustment & Calibration
- 4.6 Maintenance Service

Caution: There are no user-serviceable parts inside the controller or emitter. Any unauthorized service will void the warranty and may result in additional repair charges.

Achtung: Es gibt keine vom Anwender zu wartenden Teile im Steuergerät oder im Emitter. Nicht autorisierter Service führt zum Erlöschen der Garantie und kann zu zusätzlichen Reparaturkosten führen.

4.1 Troubleshooting Alarms

A reported alarm may mean any of the following error conditions: No Reply, Standby, Bad Reply, or Alarm. Each condition triggers an alarm on the Controller Model 5520--the red alarm LED will blink, and the audible alarm will sound (if this option is enabled).

Note: The **Master Menu** key on the Handheld Terminal Model 5571 allows you to set visual and audible alarms on or off for each error condition. The default is on for all conditions except the audible alarm. It is recommended to always leave the visual alarm indicators on.

Hinweis: Die Master-Menü-Taste auf dem Handheld Terminal 5571 ermöglicht für jeden Fehlerzustand die visuellen und akustischen Alarme ein-oder auszuschalten. Default für alle Bedingungen ist ‚Ein‘, ausgenommen der akustische Alarm. Es wird empfohlen, die Anzeigen für visuellen Alarm eingeschaltet zu lassen.

The controller polling report will show how many AeroBars are in alarm and what addresses they have (see Chapter 2 for detailed instructions on reading polling reports).

If the controller indicates an alarm, check for the following problems:

- Input voltage is set incorrectly on the Controller Model 5520
- Power supply failure
- Blown controller fuses (see 4.4 Fuse Replacement in Chapter 4)
- Faulty or disconnected cables from AeroBar
- Shorted wiring (see 2.6 Wire Testing in Chapter 2 for instructions on testing wiring)

- Covered, dirty, or eroded emitter points (see 4.2 Emitter Maintenance in Chapter 4 for instructions on cleaning emitter points)
- Output levels set too low (see Chapter 3 for information on setting output levels)

4.2 Emitter Maintenance

Required Cleaning Materials

- Solution of 50% deionized water and 50% isopropyl alcohol (IPA) or Simco-Ion Emitter Point Cleaner (#22-1000)
- Cleanroom-compatible cloth or wipe
- Cleanroom approved swab (foam is not recommended)

Emitter point maintenance ensures continued optimum performance from emitters. Dirt or erosion to emitter points can be caused by a number of environmental factors, including airborne molecular contaminants.

Before cleaning or removing emitter points, the emitter must be powered down. There are three ways to remove power from emitters: turn off the controller, disconnect the in-coming modular cable at the emitter, or put the emitter in standby mode.

Turning off the controller is as simple as turning off the switch on the controller. See Chapter 3 for instructions on placing an emitter on standby mode.

Note: If an emitter is placed in standby mode, its high voltage LED indicators will not light and its alarm LED will flash on and off. The controller will go into alarm and report that the emitter is in standby.

Hinweis: Wenn ein Emitter in den Standby-Modus gesetzt ist, leuchten die zugehörigen Hochspannungs-LED-Indikatoren nicht und die Alarm-LED blinkt. Der Controller wird schaltet auf Alarm und meldet dass der Emitter sich im Standby-Modus befindet.

Emitter Point Inspection

Emitter points should be checked regularly for erosion or dirt on the tips of the points. Evidence of dirty emitter points may include black points, black or white dirt formed on the tips, and worn points.



Close up of an eroded titanium emitter point



Close up of dirt on silicon wire emitter point

Figure 19. Emitter Point Inspection

Emitter Point Cleaning

Caution: Do not clean emitter points while the unit is powered. Doing so may result in additional contamination and possible shock. After removing power from the emitter, allow a minute for the high voltage power supplies to discharge.

Achtung: Reinigen Sie keinesfalls Emitter-Punkte bei eingeschaltetem Gerät. Andernfalls kann es zu zusätzlicher Verunreinigung oder zu Stromschlag kommen. Warten Sie nach dem Ausschalten des Aerobars eine Minute, damit sich die Hochspannungs-Netzteile entladen können.

To clean the emitter points and areas around the emitter points, moisten a cleanroom-compatible swab or cleaning cloth in the IPA solution, or use Simco-Ion Emitter Point Cleaner. Gently rotate the swab or cleaning cloth around the emitter point. Take extra care to be gentle with non-metallic (silicon) points, as they are brittle and can be easily broken through careless handling.

Emitter Point Replacement

Emitter point replacement is recommended every two years, or when damage or erosion is evident.

1. Use a 1/16 inch (1.57 mm) hex socket Allen screwdriver to loosen the small set screw on the side of the emitter point protector. Remove the emitter point protector.
2. Grasp the emitter point with an appropriate tool and pull it out. If the emitter points are silicon, a soft jawed tool is required. Silicon points are brittle and care must be taken during removal and insertion to avoid breakage.
3. Clean the emitter point protectors by wiping them down with a cleanroom cloth moistened with the IPA solution. Install the new emitter points by pushing them into their sockets. The emitter point should slide to the bottom of the socket.
4. Replace the emitter point protector and fasten in place by retightening the set screw. Do not overtighten the screw or the protector may be damaged.

Replacement Emitter Points

Emitter Points	Part No.
Machined Titanium Point	#22-0350
Single-Crystal Silicon Point	#22-0360 (with stainless steel sleeve)
Emitter Point Cleaner	#22-1000

Table 8. Emitter Point Part Numbers

Emitter Rod Removal

If emitter rods are to be removed for any reason, push the rod towards the emitter body while rotating counter-clockwise. A cam-lock is built into the emitter rod connectors to prevent accidental release of the rods due to vibration or accidental contact.

- If a stabilizer is used with the rods, remove the stabilizer by pushing out the clip from around the rod.

4.3 Chassis Cleaning

Any unit of the Digital Room System can be cleaned if dirt has accumulated on its chassis. Use only a diluted IPA solution to clean a chassis. Do not use any cleaners or solvents that may damage the powder-coat finish of the controller.

To clean any chassis, moisten a cleanroom-compatible cloth with the IPA solution. Starting from one end, clean the entire case. Wipe all areas thoroughly. Change the cloth frequently to ensure that the dirt is completely removed from the chassis.

4.4 Fuse Replacement

Caution: Disconnect controller from AC power before attempting to replace fuses.

Achtung: Trennen Sie den Controller vom Versorgungsnetz, bevor Sie Sicherungen ersetzen.

The 5580 Controller features two fuses: an output and input fuse. The 5520 Controller features only an input fuse. If the input fuse on either Controller blows, then the Controller will be inoperable.

If the output fuse on the 5580 Controller blows, emitters will not receive power. However, the Controller will still operate. Polling reports will show “no reply” from all connected emitters (see **Chapter 3** for information on reading polling reports).

To replace the input fuses on the 5580 Controller, use a small flat-bladed screwdriver to press the release latch of the fuse drawer on the power entry module (located above the rocker switch). Pull the entire fuse drawer out of the power entry module.

Note: Unless you intend to change the Controller’s input voltage selection, do not remove the internal holder that is printed with the three input voltage selections.

Hinweis: Entfernen Sie nicht den internen Halter der mit den drei wählbaren Netzspannungen bedruckt ist, außer Sie wollen die Netzeingangsspannung vom Controller ändern.

Remove and replace the blown fuse(s). Re-insert the fuse holder into the power entry module and press it home until the latch engages.

To replace an input fuse in the 5520 Controller, insert a flathead screwdriver into the slot of the small, round holder labeled “Fuse”,

located next to the power cord receptacle on the bottom panel. Push in and turn counter-clockwise. The fuse holder will release. Remove and replace the fuse. To replace the holder, push it back in with the screwdriver, and twist clockwise to lock it in place.

Controller	Input Fuse	Output Fuse	Part No.
5520	0.630A 250V time lag 5x20 mm, 1 required	NA	#28-1447
5580	2.0A 250V time lag 5x20 mm, 2 required	3.15A 250V, 1 provided	2A: #28-1450 3.15A: #28-1455

Table 9. Replacement Fuses

4.5 System Adjustment & Calibration

Simco-Ion balance adjustment and calibration procedure is a regular part of installation and maintenance of the emitter and its components. Adjustment for the emitter may be performed at initial installation, during periodic checks of the entire system, or anytime additional components are added to the system.

Goals of Balance Adjustment and System Calibration

- Balanced, high ion density arriving to the surface
- Similar positive and negative decay times
- Maximum decay in the amount of available time
- Moderate voltage swings (Pulsed DC) or voltage offset (Steady-state DC) to eliminate the possibility of inducing voltage on the surface

Recommended Equipment

- Charge Plate Monitor Model 280A
- Tripod (optional)
- Anemometer

About Adjustment and Calibration

Environment variables and the physical properties of ions can lead to degraded ionization performance over time. This leads to a greater risk of static or the presence of voltage on your sensitive product surface.

In order to ensure optimal ionization performance and therefore static charge neutralization, ion delivery must be periodically regulated, or balanced. This procedure is commonly referred to as balance adjustment or system calibration.

Simco-Ion recommends performing an adjustment as part of a regular maintenance program. In general, emitters should be balanced every six months to a year. The actual frequency of

balance adjustment depends on the specific activity of your application and environment.

In Pulsed DC mode, positive and negative ions are released sequentially during onTimes. During offTimes, no ions are released and existing ions disperse. In Steady-state DC mode, both positive and negative ions are constantly produced. The goal of the adjustment procedure is to regulate the ion delivery, so that equal numbers of positive and negative ions arrive at the surface to neutralize static charges of either polarity in a specified amount of time.

Adjustment for the emitter may be performed at initial installation, during periodic checks of the entire system, or anytime additional components are added to the system.

Parameters Affecting Ionization

Calibration involves adjusting positive and negative ionization output levels and timing sequence of these outputs. In addition to the ionizer settings, be aware of the following variables that can affect balance:

- **Airflow:** The recommended airflow for effective ionization is 70-90 fpm. Low airflow moves the ions more slowly, allowing potential ion recombination and reducing the ions available to neutralize surfaces. High airflow moves the ions in a more direct path, reducing the surface coverage area.
- **Configuration:** Configuration changes differing from the original spec may change the way the ions disperse. Also, metal objects closer than 6 inches to the emitter will ground ions, reducing the amount of ions available to the surfaces.
- **Maintenance:** Contaminants in the environment are attracted to the emitter points. Dirty emitter points have an adverse effect on ion output and voltage balance. As a general rule, emitter points should be cleaned every 3 months, and ceiling emitters should be rebalanced every 6 months to a year.
- **Environment:** Changes in cleanroom humidity and background airflow may affect performance.

- **Location:** Specifications for the emitter location are based on the ceiling emitter location. Repositioning or changing the mounting distances may affect performance results.

Balance Adjustment Procedure

1. Choose a specification for the measurements.

If the facility has an existing specification for voltage swings and decay times, obtain these numbers. If specs are not available or do not exist, use the industry's typical setting. (± 50 to 100V for semiconductor tools and mini-environments and ± 100 to 150V for wafer fabrication in open areas.)

A desired balance and decay time will depend on the sensitivity of the product to electrostatic-related problems. Choose values that meet the static charge protection needs of your environment; for example, the appropriate voltage swings range decreases for areas more sensitive to electrostatic-related problems and increases for less sensitive products.

If possible, set the emitter mode, outputs, and timing to any pre-determined settings for your cleanroom. If no settings are available, use the following parameters for an optimized starting point: 50% Positive and Negative Power; 1.0 sec. onTimes; 0.2 sec. offTimes.

2. Set the CPM in an appropriate location for obtaining measurements.

Set the CPM (or its detachable plate for smaller spaces) in areas that are typical of your target surface. For large cleanrooms, a sampling of three or more areas is recommended.

After placing the CPM in its location, step away. Standing too close to the CPM may interfere with airflow and ion movement. Make sure all access doors are closed.

3. Record the Airflow. Use an anemometer to measure the airflow at the height of the CPM plate. Record the airflow along with the CPM measurements obtained at each sample location. Too high or low of an airflow rate will affect the true balance behavior of the ions. The recommended airflow for optimal ionization is 70-90 fpm.

4. **Take the measurements on the CPM.** The measurements taken on the CPM will record the following specifics:
 - Positive and negative peak voltages.
 - Balance (an average of the positive and negative voltage peaks).
 - Positive and negative decay time.
 - a) Allow the CPM to warm up for at least 15 minutes.
 - b) From the Main screen on the Model 280A CPM:
 - ⇒ Press **Auto**. The Auto test performs both Decay tests, followed by a balance test.
 - ⇒ Make sure the symbol "**D>**" is next to the test you want (usually the "Factory" test, which runs an auto test with standardized test parameters).
 - ⇒ Press **Start**
 - c) Note the numbers for +Vp (positive voltage peak), -Vp (negative voltage peak), and Vave (average or balance).
5. **Examine the Data and Adjust the emitters.** If the measurements have been taken for an operation area do not meet your specifications, adjust the emitter settings.

Understanding Ionization Modes, Voltage Swing and Output, and Decay Timing

Ionization Modes

All ceiling ionization systems are set to pulse mode, which provides fast decay times, to account for the long distances between the ceiling and the work surface.

Be aware of mounting emitters near grounded metal equipment (within 12 inches [30 cm] of the emitter).

Steady-state mode may be used when the distance between the wafer and emitter is less than 12 inches (30 cm), or when large metal objects are within 12 inches (30 cm) of the AeroBar.

Voltage Swing and Output

Voltage swing refers to the range of the CPM plate voltage between the positive and negative peak readings at sample locations.

The recommended typical voltage output range is 50-80%.

- **For Pulsed DC Mode:** Adjust the positive and negative output voltages so that the maximum swing values are within 20 volts of each other--averaging a value as close to zero as possible. The swings should not exceed 150 volts in either direction. Keep the voltage swings below 100 volts if it is possible to meet the desired decay time at this output level.
- **For Steady-state DC Mode:** Adjust the positive and negative output voltages so that the combined value of the positive and negative settings are as close to zero as possible and less than ± 20 volts.

Decay Timing

Decay timing is a measure of the time (in seconds) that it takes to decay a charge of +1000V to +100V, and -1000V to -100V. The conductive plate is charged to the initial test voltage of 1000V and is allowed to discharge to 10% of the initial test voltage. The time required for both polarities will be recorded.

In Pulsed DC mode, if decay times are too slow and voltage swings are greater than 100 volts, increase the positive and negative offTimes in 0.1 second increments.

Troubleshooting the Balancing Procedure

If Decay Times are too Long

Check that airflow is 70-90 fpm. If airflow is too low and cannot be changed, see the table labeled “**If Airflows Are Lower Than Tool Specification and Cannot Be Changed.**”

For Pulsed DC Mode	For Steady-state DC Mode
<ul style="list-style-type: none">If voltage swings are <100V, adjust + and - onTimes upward in 1 second increments until decay time stops improving or voltage swings become too high. Maintain last beneficial setting.If voltage swings are >100V, adjust + and - offTimes upward in 1 second increments until decay time stops improving or voltage swings become too high. Maintain last beneficial setting.	<ul style="list-style-type: none">Increase the + and - voltage outputs, maintaining a balance of ± 20 volts.

If Voltage Swings are too High (Pulsed DC Only)

If Voltage Outputs are >80%	If Voltage Outputs are <50%
<ul style="list-style-type: none">Decrease voltage outputs in 1% increments, maintaining balance, until swings are <100V or in desired range.	<ul style="list-style-type: none">Decrease + or - onTimes in 1 second increments, maintaining balance, until swings are <100V or in desired range.

If Airflows are Lower than Tool Specification and cannot be Changed

For Pulsed DC Mode	For Steady-state Mode
<ol style="list-style-type: none"><li data-bbox="114 233 494 375">1. Increase voltage outputs in 1% increments, maintaining balance until swings reach 100-150V. Do not exceed 90% output. If decay times are still too long, proceed to the next step.<li data-bbox="114 407 494 548">2. Increase + and - onTimes in 0.1 second increments, maintaining balance, until decay time improves or voltage swings become too high. Maintain last beneficial setting.<li data-bbox="114 581 494 690">3. Increase + and - offTimes in 0.1 second increments, maintaining balance, until performance stops improving. Maintain last beneficial setting.	<ol style="list-style-type: none"><li data-bbox="537 233 944 315">1. Increase voltage outputs in 1% increments, maintaining balance until output reaches 90%.<li data-bbox="537 347 944 402">2. If decay time is still too long, switch to Pulsed DC mode and balance.

4.6 Maintenance Service

If it is not practical for you to perform the maintenance procedures, a service contract may be arranged with Simco-Ion. Simco-Ion personnel will periodically come to your facility and perform any necessary cleaning or calibration adjustments.

Simco-Ion offers the following services to assist with the maintenance and calibration of your system:

- Semi-annual or quarterly emitter point cleaning
- Semi-annual calibration
- System and layout check



After service visits, Simco-Ion will provide a Certification Report which documents system performance throughout your facility. For more information, visit www.ion.com.



5



Specifications

- 5.1 Digital Ionization Room System
- 5.2 Dimensional Drawings
- 5.3 Parts & Accessories

5.1 Digital Ionization Room System

Ceiling Emitter Model 5511	
Input Voltage	24 VAC, 50/60 Hz, 1W (typ)
Output Voltage	0-20 kVDC, $\pm 10\%$ for each polarity; positive and negative output levels adjusted globally or individually at the Controller or locally with the Remote Control Model 5570
Output Current	<20 microamps; current and voltage limited to eliminate shock hazard
Control Signal	Output levels and timing are adjusted with the Remote Control Model 5570 or with the Controller Model 5580/5520 RS-485 connection
Output Control	Pos/neg output can be adjusted with the Remote Control Model 5570 at each emitter or remotely with the Controller Model 5580/5520
Connectors	RJ-11 jack receptacles on each end of the emitter
Regulation	Output and balance stability achieved by independently regulating the ion emission current of each polarity at each emitter
Timing	Precise timing (0-10 sec @ 0.1 sec resolution) is generated by local microcontroller; LEDs on each emitter indicate the polarity of the ion emission
Ion Emission	Pulsed or steady-state DC
Emitter Points	Single-crystal silicon or machined titanium; estimated emitter point life varies from 2-3 years depending on material used
Calibration	Annual, semi-annual, or quarterly depending on environment sensitivity
Ozone	<0.005 ppm (24-hour accumulation)
EMI	Below background level
LED Indicators	One flashing red ALARM middle of chassis
Alarm	Audible sounds at Controller Model 5520/5580 when alarm event occurs at any emitter; selectable with Handheld Terminal Model 5571
Components	Required Remote Control Model 5570, Controller Model 5520/5580
Emitter Rods	2.5, 5, 10, 15, 24, 36, 60 in. (63.5, 127, 254, 381, 609, 914, 1524 mm) lengths; emitter rod stabilizer (60" rod lengths only)
Mounting	Cleanroom-compatible, self-adhesive interlocking strips (standard), brackets (available options)
Dimensions	1.2H x 1.4W x 17.5L in. (3.10 x 3.61 x 44.45 cm)
Weight	16.4 oz (0.46 kg)
Certifications	  SEMI F47 RoHS Compliant

Controller Model 5580	
Power	10W + 1W per emitter
Input Voltage	100/115/250 VAC \pm 10%, 50/60 Hz voltage-selectable and fuse-protected
Output Voltage	24 VAC
Output Signal	RS-485 link to addressable 5511 Emitters
Capacity	80 emitters
Interface	On-board LCD, 6 keys for limited access to operating variables; Handheld Terminal Model 5571 for full access; second multidrop RS-485 channel for communication to host PC or FMS system; relay or 4-20 mA outputs for remote alarm indication
LED Indicators	Green POWER ON; red ALARM
Alarm	Audible beep to indicate alarm and/or other conditions
Dimensions	4.37W x 6.20H x 13.2L in. (111 x 157 x 335 mm)
Weight	7 lb (3.18 kg)
Certifications	  SEMI F47 RoHS Compliant

Controller Model 5520	
Power	4W + 1W per emitter
Input Voltage	100/115/250 VAC \pm 10%, 50/60 Hz voltage-selectable and fuse-protected
Output Voltage	24 VAC
Output Signal	RS-485 link to addressable emitters
Capacity	20 emitters
Interface	On-board LCD, six keys for limited access to operating variables; Handheld Terminal Model 5571 for full access; second multidrop RS-485 channel for communication to host PC or FMS system; relay or 4-20 mA outputs for remote alarm indication
Indicators	Green LED for power on; red LED for alarm; audible beep to indicate alarm and/or other conditions
Dimensions	2.76W x 2.96H x 12.42L inches (70 x 75 x 315 mm)
Weight	3.5 lb (1.59 kg)
Certifications	  SEMI F47 RoHS Compliant

Remote Control Model 5570

Power	Two 1.5V batteries; life approx. 60 hrs in full operation, 500 hrs in sleep mode
Indicators	Two-line, eight character display screen
Controls	Four keys: Up, Down, Esc, Select
I/O Signals	IRDA compatible 2-way InfraRed communication.
Cleanroom Class	Class 1 or better
Operating Range	Infrared operates @ 2 ft (6.9 cm) min and 10 ft (3.04 m) max (there is a 22 degree cone of operation from the transmitter)
Enclosure	ABS high-impact plastic, minimum particle traps
Dimensions	4.75H x 2.75W x .88L in. (121 x 70 x 22.3 mm)
Weight	1 lb (0.46 kg)

Certifications



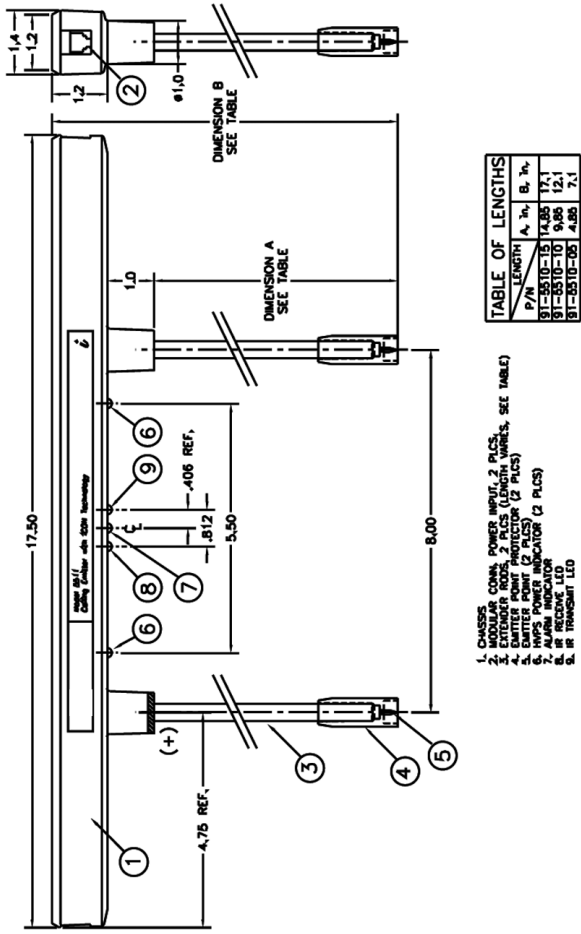
Handheld Terminal Model 5571

LCD Display	4 rows of 20 characters, US ASCII characters
Keys	30 keys
Data rate	300 to 9,600 bps
Connectors	6-pin female modular RJ-11 socket
Operating Env.	Temperature 32-122°F (0-50°C); Storage -4 - +158°F (-20 - +70°C); humidity 5-90% nominal, non-condensing
Enclosure	Cycloc ABS case
Dimensions	7.15H x 4.10W x 1D in. (181.6H x 104.1 x 25.4D mm)
Weight	8 oz (227g)

Certifications



5.2 Dimensional Drawings



- 1. CHASSIS
- 2. MODULAR CONN. POWER INPUT, 2 PLCS.
- 3. BATTERY PACK, 2 PLCS.
- 4. BATTERY PACK PROTECTOR (2 PLCS)
- 5. BATTERY PACK INDICATOR (2 PLCS)
- 6. ALARM INDICATOR (2 PLCS)
- 7. IR RECEIVER LED
- 8. IR TRANSMITTER LED
- 9. IR TRANSMITTER LED

Figure 20. Ceiling Emitter Model 5511

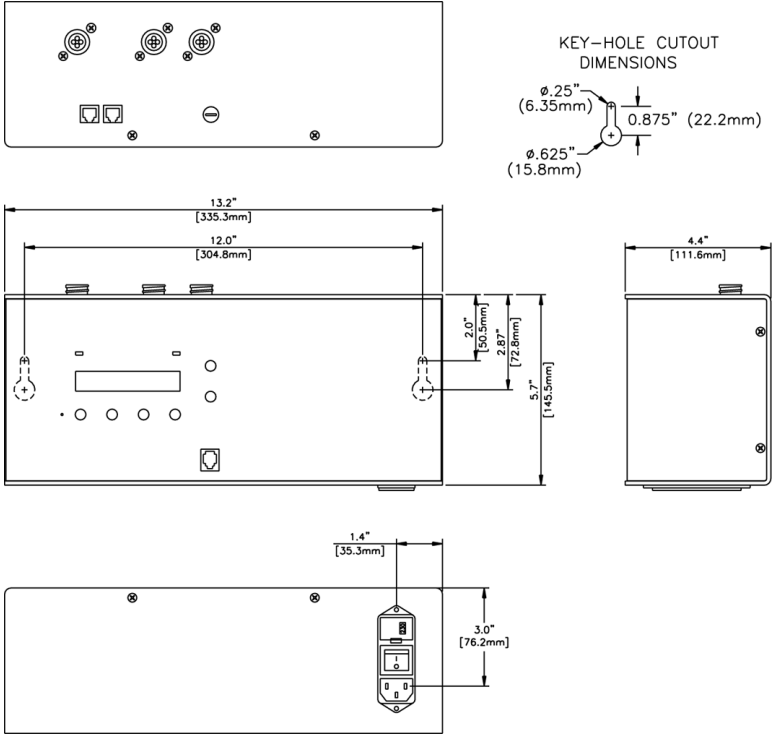


Figure 21. Controller Model 5580

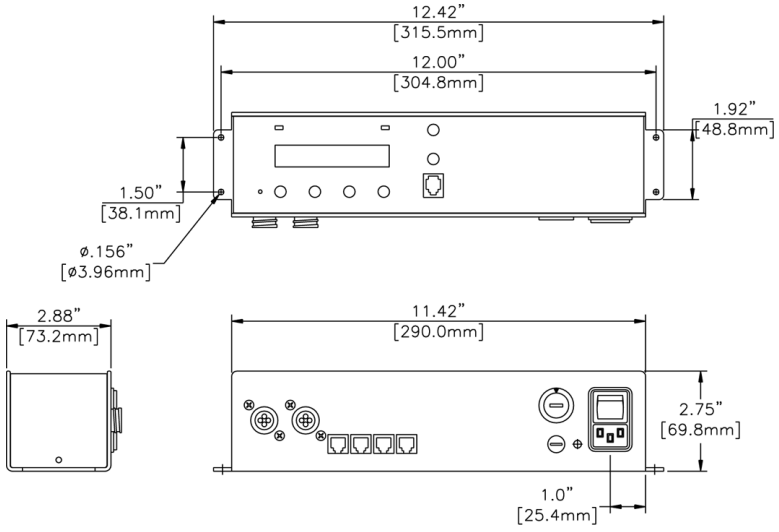


Figure 22. Controller Model 5520

5.3 Parts & Accessories

Ceiling Emitters	Part No.
5511 Ceiling Emitter, Silicon Emitter Points, 2.5" Rods	91-5511U-2.5-SDLR
5511 Ceiling Emitter, Silicon Emitter Points, 5" Rods	91-5511U-05-SDLR
5511 Ceiling Emitter, Silicon Emitter Points, 10" Rods	91-5511U-10-SDLR
5511 Ceiling Emitter, Silicon Emitter Points, 15" Rods	91-5511U-15-SDLR
5511 Ceiling Emitter, Silicon Emitter Points, 24" Rods	91-5511U-24-SDLR
5511 Ceiling Emitter, Silicon Emitter Points, 36" Rods	91-5511U-36-SDLR
5511 Ceiling Emitter, Silicon Emitter Points, 60" Rods	91-5511U-60-SDLR
5511 Ceiling Emitter, Titanium Emitter Points, 2.5" Rods	91-5511C-2.5-SDLR
5511 Ceiling Emitter, Titanium Emitter Points, 5" Rods	91-5511C-05-SDLR
5511 Ceiling Emitter, Titanium Emitter Points, 10" Rods	91-5511C-10-SDLR
5511 Ceiling Emitter, Titanium Emitter Points, 15" Rods	91-5511C-15-SDLR
5511 Ceiling Emitter, Titanium Emitter Points, 24" Rods	91-5511C-24-SDLR
5511 Ceiling Emitter, Titanium Emitter Points, 36" Rods	91-5511C-36-SDLR
5511 Ceiling Emitter, Titanium Emitter Points, 60" Rods	91-5511C-60-SDLR
Controllers	
5520 Digital Controller, supports up to 20 ionizers, Pwr Cord Includ.	91-5520R
5520 Digital Controller, supports up to 80 ionizers, Pwr Cord Includ.	91-5580R
FMS	
CPC Cable, 22 AWG, 3 Conductor, 1 Plug, 40 feet (12.2m)	33-1790-40
FMS Interface Module (no power cord required)	91-5090R
Handheld Remotes	
Infrared Handheld Remote for Ceiling Emitter Model 5511	91-5570
Handheld Terminal for Controllers 5520 and 5580	91-5571

Accessories

Emitter Points	Part No.
Class One (Titanium) Emitter Point(s)	22-0350
Ultraclean (Silicon) Emitter Point(s)	22-0360
Emitter Point Cleaners (Box of 50)	22-1000
Rod Assemblies	
Rod Assembly, 2.5" with holder and screw	85-5510-2.5
Rod Assembly, 5" with holder and screw	85-5510-05

Rod Assembly, 10" with holder and screw	85-5510-10
Rod Assembly, 15" with holder and screw	85-5510-15
Rod Assembly, 24" with holder and screw	85-5510-24
Rod Assembly, 36" with holder and screw	85-5510-36
Rod Assembly, 60" with holder and screw	85-5510-60
Rod Stabilizer Kit	33-5511
Cabling and Accessories	
RJ-11 Modular Phone Plug, 6 Connector	18-1723
22 AWG, 4-conductor round cable	25-0815
26 AWG, 4-conductor flat ribbon cable	25-20900
26 AWG, 4-conductor flat modular cable, silver satin	25-20907
Junction Box	33-1825
Dual-Loc	20-1005
Power Cords	
2.5 meter/ 8.2 foot IEC power cable (US plug)*	25-20660
2.5 meter/ 8.2 foot IEC power cable (UK plug)	25-20710
2.5 meter/ 8.2 foot IEC power cable (German Schuko plug)*	25-20735
3 meter/ 10 foot IEC power cable (US plug)*	25-0670
4.6 meter/ 15 foot IEC cable (US plug)*	25-0680
3 meter/ 10 foot IEC cable (No plug)*	25-0700
Software	
IonManager Pro	91-5582-SW-xx

6

Warranty & Service

Simco-Ion provides a limited warranty for the Digital Ionization Room System which includes the Ceiling Emitter Model 5511, the Controller Model 5580 or 5520, the Handheld Terminal Model 5571, and the Remote Control Model 5570. products manufactured or sold by Simco-Ion are guaranteed to be free from defects in material or workmanship for a period of two (2) years from date of initial shipment. Simco-Ion liability under its new product warranty is limited to servicing (evaluating, repairing, or replacing) any unit returned to Simco-Ion that has not been subjected to misuse, neglect, lack of routine maintenance, Simco-Ion repair, alteration, or accident. In no event is Simco-Ion be liable for collateral or consequential damages. Consumable items such as, but not exclusive to, emitter points, emitter wires, batteries, filters, fuses or light bulbs are only covered under this warranty if found defective as received with the new product.

To obtain service under this warranty, please contact Simco-Ion Technical Support at techsupport@simco-ion.com or (510) 217-0470.

Appendix A

Key & Menu Item Descriptions

A1 Remote Control Model 5570 Buttons

A2 Handheld Terminal Model 5571 Keys

A3 Controller Model 5580/5520 Buttons

A1 Remote Control Model 5570 Buttons

The following is a list of the parameters found in the TFSMenu of the Remote Control Model 5570. Only the Status, PosOut, and NegOut are found in the User Menu. Use the **UP** or **DOWN** buttons to scroll through these parameters.

Status	<p>Indicates the reported status of an emitter as follows:</p> <ul style="list-style-type: none"> • Ok: if the emitter is operating normally. • Standby: if the emitter is in standby. • PosAlrm: if the positive emitter is in alarm. • NegAlrm: if the negative emitter is in alarm. • Pos&Neg: if both positive and negative emitters are in alarm. • Retry: if the emitter did not reply to a communication query. • #%&@\$#: if the reply from the emitter is not valid.
PosFdbk/NegFdbk	The current feedback of the positive or negative emitter, given in percent. Range is 0 to 100%.
Address	Identifies the network address of the emitter. See Chapter 3: Operation for information on setting or finding addresses using this parameter.
OpMode	<p>Indicates the operating mode of the emitter, as follows:</p> <ul style="list-style-type: none"> • Standby: if the emitter is in standby. (Emitter is powered but ionization is turned off.) • StdySDC: if the emitter is continuously generating both positive and negative ionization. • Pulse: if the emitter is alternately generating the positive or negative ionization with an optional off period between polarities.
PosOn/PosOff	Indicates the on time of the positive emitter with a range of 0.5 to 9.9 seconds, and the off time of the positive emitter with a range of 0.0 to 9.9 seconds.
NegOn/NegOff	Indicates the on time of the negative emitter, with a range of 0.5 to 9.9 seconds, and the off time of the negative emitter with a range of 0.0 to 9.9 seconds.
PosOut/NegOut	Indicates the output of the positive and negative emitters, with ranges of 0 to 100%.
PosAlrm/NegAlrm	Indicates the alarm setpoint with a range of 0 to 100%.
Eprom	Identifies the software release version of the Emitter Model 5511.

A2 Handheld Terminal Model 5571 Keys

There are 30 keys on the Handheld Terminal Model 5571. They are defined as follows.



Figure 23. Handheld Terminal Model 5571 Keypad

Key	Function
Sync	<p>Broadcasts a synchronization command to Emitter Model 5511; requires User or Master level password for activation. When pressed, the following appears:</p> <p style="text-align: center;">Synchronize Synchronize Synchronize Synchronize</p>
Find	<p>Finds addressed emitters; requires User or Master level password. When pressed, the following appears:</p> <p style="text-align: center;">Searching Units Found: XX Last Address: XX All units searched</p>
Poll	<p>Displays polling information on the Handheld Terminal Model 5571; no password is needed to access. A User or Master level password is required to change the Poll Evry count. When pressed, the following is shown:</p> <p style="text-align: center;">Poll Status pollEvry : XXX secs Polling #xx/xx Polling Address #XX</p>
Poll screen + v or ^ key (Aggregate Poll Error)	<p>While in the Poll screen, use the v or ^ key to toggle to the Aggregate Poll Error Count menu. (Use v or ^ to toggle back to Poll screen.) Shows total non-OK polling counts for all emitters. If the User or Master level password is entered, the error count can be cleared to zero by pressing ENTER.</p> <p style="text-align: center;">alarmCnts : 00000 stndbyCnts : 00033 badRplyCnts : 00000 noRplyCnts : 00001</p> <ul style="list-style-type: none"> • “alarmCnts” refers to the number of times emitters were polled to be in alarm (in this case, none). • “stndbyCnts” refers to the number of times emitters were polled to be in standby mode (in this case, 33 times). • “badRplyCnts” refers to the number of times emitters were polled to have a BadReply (in this case, none). • “noRplyCnts” refers to the number of times emitters were polled to have no reply (in this case, one instance). <p>See the About Polling the Status of Emitters on page 47 in Chapter 3 for more information.</p>
Address Down	<p>Located next to the Poll button, this key is used to select the next numerically lower emitter address.</p>

Address Up	Located next to the ADDR DOWN button, this key is used to select the next numerically higher emitter address.
Status	<p>Shows status of a selected emitter; no password is needed to access. When pressed, the following is shown:</p> <p style="text-align: center;">id: XX stat: OK epromVER: 2.0 posFdbk: XXX% negFdbk: XXX%</p> <ul style="list-style-type: none"> • “id” refers to the address of the emitter. • “stat” refers to the status of the emitter (in this case it is OK). • “epromVER” refers to software version of the emitter. • “posFdbk” refers to the positive feedback level, in percent. • “negFdbk” refers to the negative feedback level, in percent.
Status screen + v or ^ key (Poll Error Count)	<p>While in the Status screen, use the v or ^ key to toggle to the Poll Error Count menu. This screen shows total non-OK polling counts for the selected emitter.</p> <p style="text-align: center;">id: 71 Polling Errors 0000Alrms 0003Stnby 0000BadXX 0001NoRXX</p> <ul style="list-style-type: none"> • “id” refers to the emitter address being polled (in this case, address #71). • “0000Alrms” refers to the number of alarm counts for that emitter (in this case, none). • “0003Stnby” refers to the number of standby counts for that emitter (in this case, this emitter was polled three times as standby). • “0000BadXX” refers to the number of bad reply counts for that emitter (in this case, none). • “0001NoRXX” refers to the number of NoReply counts for that emitter (in this case, the emitter did not reply once). <p>To clear all counts to zero, press Enter while in this screen. A User or master level password must be entered to perform this function.</p> <p>Polling error counts per emitter can be seen in the Poll Error Count menu, toggled to from the Status screen.</p> <p>See About Polling the Status of Emitters on page 47 in Chapter 3 for more information.</p>

<p>Password</p>	<p>Displays prompt to input User or Master level passwords:</p> <p style="text-align: center;">Enter Password</p> <p style="text-align: center;">:</p> <p>When a User password is successfully entered, the following is shown (this is also shown for the master password, with "Master Level" indicated instead):</p> <p style="text-align: center;">User Level. Password Confirmed. Data Entry Accepted.</p>
<p>Pos Emitter</p>	<p>Shows positive emitter settings for a selected emitter; no password is needed to read; User or Master level is password needed to change data. When pressed, the following is shown:</p> <p style="text-align: center;">id: XX stat: OK posOutput: XXX% posAlarm: XXX% pOn: XXXs pOff: XXXs</p> <ul style="list-style-type: none"> • "id" refers to the address of the emitter. • "stat" refers to the status of the emitter (in this case it is OK). • "posOutput" refers to the positive output level in percent. • "posAlarm" refers to the positive alarm set point, in percent. • "pOn" refers to the positive on time, in seconds. • "pOff" refers to the positive off time, in seconds.
<p>Neg Emitter</p>	<p>Shows negative emitter settings for a selected emitter; no password is needed to read; User or Master level is password needed to change data. When pressed, the following is shown:</p> <p style="text-align: center;">id: XX stat: OK negOutput: XXX% negAlarm: XXX% nOn: XXXs nOff: XXXs</p> <ul style="list-style-type: none"> • "id" refers to the address of the emitter. • "stat" refers to the status of the emitter (in this case it is OK). • "negOutput" refers to the negative output level in percent. • "negAlarm" refers to the negative alarm setpoint in percent. • "nOn" refers to the negative on time, in seconds. • "nOff" refers to the negative off time, in seconds.

<p>Op Mode</p>	<p>Shows the operation mode for a specific emitter; no password is needed to read; Master password needed to change data. When pressed, the following is an example of what is shown:</p> <p style="text-align: center;">id: XX stat: OK opMode: Pulse sync: NegOn autoOff: 000 Cnt</p> <ul style="list-style-type: none"> • “id” refers to the address of the emitter. • “stat” refers to the status of the emitter (in this case it is OK). • “opMode” refers to operation mode of the emitter (Pulse, StdySDC, or Standby; use the < or > key to change). • “sync” refers to the restart state used when a synchronization command is received from the controller. Modes are as follows: <ul style="list-style-type: none"> - NegOn: starts emitter timing cycle with negative on state - NegOff: starts emitter timing cycle with negative off state - PosOn: starts emitter timing cycle with positive on state - PosOff: starts emitter timing cycle with positive off state - None: sync command is ignored • “autoOff” refers to the Autoshtutoff count (0-250 counts). If the count is not 0, the autoshtutoff count puts an emitter in standby mode if the number of continuously detected alarm events equal or exceed the count.
<p>Misc Menu</p>	<p>Shows miscellaneous parameters of a selected emitter; no password is needed to read; Master password needed to change data. When pressed, the following is shown:</p> <p style="text-align: center;">id: XX stat: OK autoCon: Off aOffset: XXX% almr%%%: XXX%</p> <ul style="list-style-type: none"> • “id” refers to the address of the emitter • “stat” refers to the status of the emitter (in this case it is OK) • “autoCon” matches the negative ion feedback level against that of the positive ion feedback level when set to ON, based on the aOffset value • “aOffset” refers to the alarm balance offset, in percent • “almr%%%” refers to the automatic alarm setpoint in percent, in relation to the pos/neg output percentage. When set to 0, alarm levels are not automatically adjusted to match changes in output levels and alarm setpoints can be independantly set for each polarity. Factory default for almr%%% is 25% for automatic adjustment of both Pos and Neg alarm.

Shows controller setup; no password is needed to read, Master password needed to change data. See Appendix B for a list of factory defaults for these parameters. When pressed, the following is shown:

boxID: XX audible: Y
alm+/-: Y standby: Y
badRply: Y noReply: Y
reSyncEvry: 060 mins

Master Menu

- “boxID” refers to the address of the controller.
 - If “audible” is Y, the audible alarm is enabled.
 - If “alm+/-” is Y, the controller alarm is enabled when an emitter is in alarm.
 - If “standby” is Y, the controller alarm is enabled when an emitter is in standby mode.
 - If “badRply” is Y, the controller alarm is enabled when an emitter gives a bad reply.
 - If “noReply” is Y, the controller alarm is enabled when an emitter gives no reply.
 - “reSyncEvry” refers to the number of minutes the controller automatically sends out a synchronization command to emitters.
-

See the highlighted keys in the figure below for the following descriptions.



Figure 24. Handheld Terminal Model 5571 Keypad

^	Selects next parameter
v	Selects next parameter
<	Selects lower entry of parameter (N)
>	Selects higher entry of parameter (Y)
Esc	Exits data entry mode
0-9	Numerical entries
-	Negative sign
.	Decimal point

A3 Controller Model 5580/5520 Buttons

Button(s)	Function
<p>Up and Down</p>	<p>Scroll up or down to access the list of menu item; no password is needed to view these items. However, a password is required to change any information for these items.</p> <ul style="list-style-type: none"> • NegOff and NegOn: Indicates the on time of the negative emitter, with a range of 0.5 to 9.9 seconds, or the off time of the negative emitter with a range of 0.0 to 9.9 seconds. • NegOut and PosOut: Indicates the output of the positive and negative emitters, with ranges of 0 to 100%. • PosOff and PosOn: Indicates the on time of the positive emitter with a range of 0.5 to 9.9 seconds, and the off time of the positive emitter with a range of 0.0 to 9.9 seconds. • OpMode: Indicates the operating mode of the emitter, as follows: <ul style="list-style-type: none"> - Standby: if the emitter is in standby. (Emitter is powered but ionization is turned off.) - StdySDC: if the emitter is continuously generating both positive and negative ionization. - Pulse: if the emitter is alternately generating the positive or negative ionization with an optional off period between polarities. • NegFdbk and PosFdbk: The current feedback of the positive or negative emitter, given in percent. Range is 0 to 100%. • Status: Indicates the reported status of an emitter as follows: <ul style="list-style-type: none"> • Ok: if the emitter is operating normally. • Standby: if the emitter is in standby. • PosAlrm: if the positive emitter is in alarm. • NegAlrm: if the negative emitter is in alarm. • Pos&Neg: if both positive and negative emitters are in alarm. • Retry: if the emitter did not reply to a communication query. • #%&@\$#: if the reply from the emitter is not valid. • Status: Indicates the reported status of an emitter as follows: <ul style="list-style-type: none"> - Ok: if the emitter is operating normally. - Standby: if the emitter is in standby. - PosAlrm: if the positive emitter is in alarm. - NegAlrm: if the negative emitter is in alarm. - Pos&Neg: if both positive and negative emitters are in alarm. - Retry: if the emitter did not reply to a communication query. - #%&@\$#: if the reply from the emitter is not valid.
<p>Up and Down together</p>	<p>Press the two buttons simultaneously to broadcast a global firing cycle synchronization command. A password is needed to execute this function. When performed, the screen shows:</p> <p style="text-align: center;">Synchronize Synchronize</p>

Esc	Exit from the select mode, or awaken remote control from slumber
Select	Access the parameter to make a change
Addr Up	Select the next higher emitter address
Addr Down	Select the next lower emitter address
Addr Up and Addr Down together	Pressing both buttons together performs a Find function (see Finding Connected Emitters in Chapter 3 for more information), requires a password to access.

Appendix B

Factory Defaults

Default parameters shipped with the Digital Ionization System.

Controller Address (unless noted by label)	01
Emitter Address	01
Numeric Address Limit, Controller	32
Maximum Emitters per 5580	80
Maximum Emitters per 5520	20
Audible Alarm	Off
Input Voltage	230V
Resynch Every	60 minutes
count2Alarm	1 count
comRetries	2 counts
Pos/Neg Output	30%
Pos/Neg Alarm	approx. 7% (25% of 30% output setting)
Pos/Neg onTime	1.0 second
Pos/Neg offTime	0.2 second
Operation Mode	Pulsed
Sync	Pos ON
Auto Off	000 Count
Poll Every	2 seconds
Alarm +/- (in Master Menu)	Set to Y (on)
Bad Reply (In Master Menu)	Set to Y (on)
Standby	Set to Y (on)
No Reply	Set to Y (on)
Alrm%%%	25% (automatically sets Pos/Neg alarm parameter at this percentage of the Pos/neg output level)
FMS Output State	Relay closure

Notes

Notes

**ISO 9001
CERTIFIED**



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