



An ITW Company

# **IQ Power™ HL Power Supply**

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## **INSTALLATION AND OPERATING INSTRUCTIONS**

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## 1. DESCRIPTION

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**IQ Power™ HL Power Supply:  
Associated Equipment for the IQ Power™ HL Static Bar  
Appareillage Connexe  
For use in Non-Hazardous (Unclassified) locations only**

Simco-Ion's IQ Power™ HL Power Supply provides microprocessor controlled high voltage DC output to the static bar. The high voltage causes the ionizing pins on the static bar to generate positive and negative ions. The electric field from the static charge on the material being processed will attract opposite polarity ions from the static bar causing the material to be neutralized. The excess ions will either recombine in air or dissipate to ground.

The IQ Power™ HL Power Supply only supports operation of speed and hybrid type static bars.

The IQ Power™ HL static bar is tailored to the application. Speed bars are optimized to operate on high speed webs at distances of 50 to 230 millimeters [2 to 9 inches]. Hybrid bars operate at distances of 150 to 460 millimeters [6 to 18 inches] on webs where the web path is somewhat variable.

The IQ Power™ HL static bar has a plug-in style high voltage connector for fast and easy installation. The connector features a pin that “tells” the IQ Power™ HL Power Supply what type IQ Power™ HL bar is installed and optimizes the power supply output for that type of bar.

## 2. SAFETY

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Simco-Ion recommends that these instructions be read completely before installation or operation is attempted. Failure to do so could result in personal injury and/or damage to the equipment.



**NOTE** – Statements identified with NOTE indicate precautions necessary to avoid potential equipment failure.



**CAUTION** – Statements identified with CAUTION indicate potential safety hazards.



**NOTE** – This equipment must be correctly installed and properly maintained. Adhere to the following notes for safe installation and operation:

1. Read instruction manual before installing or operating equipment.

2. Only qualified service personnel are to perform installation and repairs.
3. All equipment must be properly grounded, including the machine frame to which the equipment is mounted.
4. Disconnect input power to power supply before connecting or disconnecting static neutralizing bars to the high voltage power supply.
5. Do not operate the power supply in close proximity to flammable liquids.



**CAUTION** – This product is intended to be supplied by a Listed AC Adapter or Power Unit marked “Class 2” or “LPS” and rated output 24V === DC, 3.75A.



**CAUTION** – Electrical Shock Hazard

Disconnect input power to the power supply before connecting or disconnecting static neutralizing bar or performing any maintenance to the system. Avoid touching static neutralizing bar when power supply is energized.



**CAUTION** – Fire Hazard

Do not install or operate the power supply in close proximity to any flammable liquids or solvents.

**WARNING** – Substitution of components may impair intrinsic safety. (refer to Figure-5.1)

**AVERTISSEMENT** – La substitution de composants peut compromettre la securite intrinseque. (referez-vous au schema 5.1)

### 3. FEATURES

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- Single momentary push-button calibration simplifies set-up.
- Bar graph display indicates ionizing performance of system.
- Indicators display status of neutralizing system, power, service required and detection of system faults.
- Relay contact output “echoes” indicators for remote sensing and alarm.

#### 4. SPECIFICATION

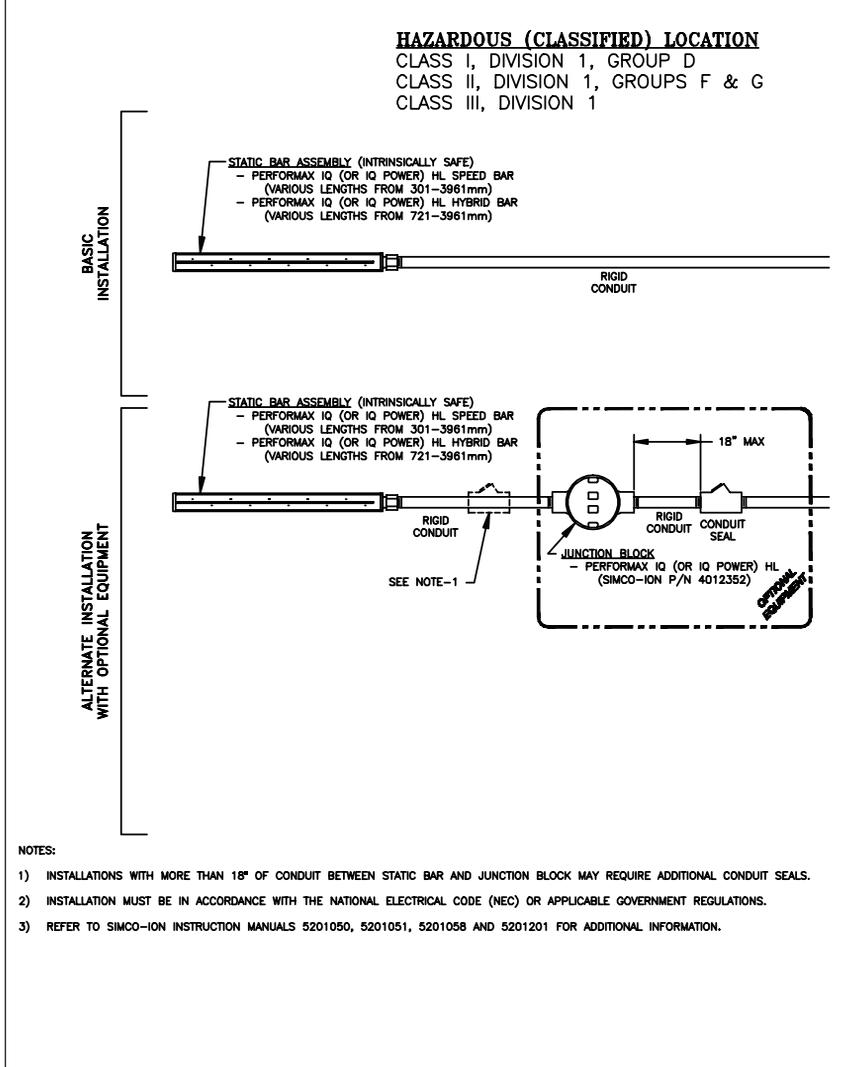
<b>IQ Power™ HL Power Supply</b>	
Input Power:	24V === DC, 1.5A from AC adapter
Output Voltage:	+/-7kV "Speed Bar" +/-8kV "Hybrid Bar"
Dimensions:	202mmL x 123mmW x 106mmH [7.95"L x 4.85"W x 4.17"H]
Weight:	1.94 kg [4.28 lb]
Max. Operating Temp:	43°C [110°F]
Housing:	Aluminum, blue polyester powder coated
High Voltage Connectors:	2 proprietary IQ Power™ HL plug-in outlets

<b>AC Adapter</b>	
Type	"Universal" desktop
Input Power:	100–240V ~ AC 50/60Hz input (IEC 320 inlet)
Output:	24V === DC, 3.75A maximum
Dimensions:	132mmL x 60mmW x 34mmH 5.19"L x 2.36"W x 1.34"H]
Weight:	0.45 kg [1.0 lb]
Housing:	Thermoplastic, black

## 5. INSTALLATION

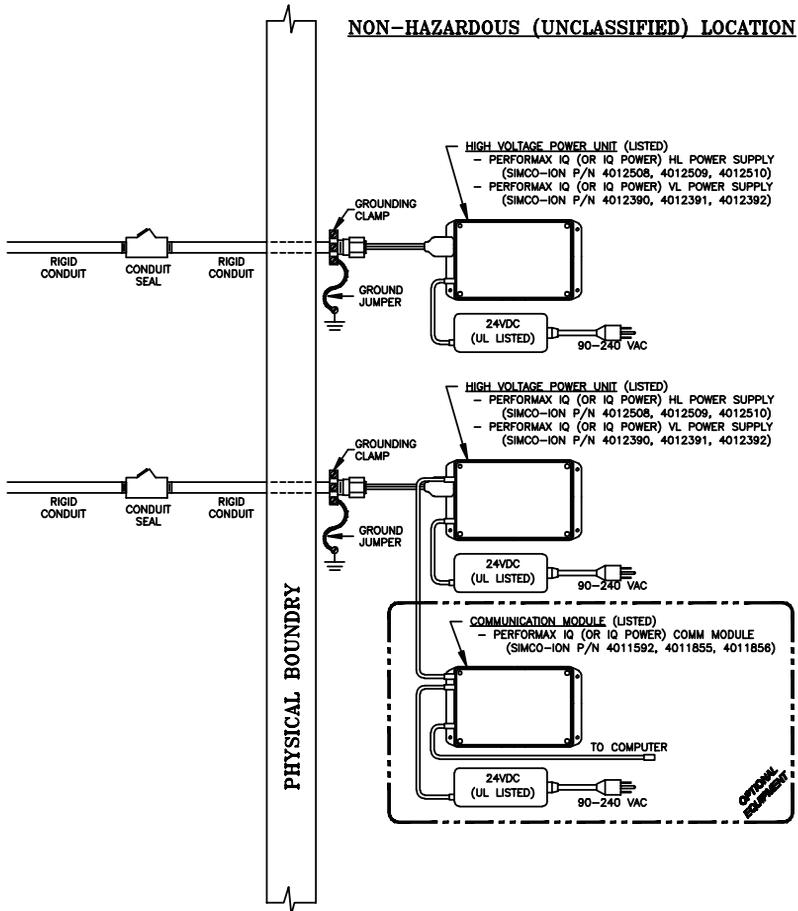
Figure 5.1 IQ Power™ HL Control Drawing

### 5.1 Mounting the Power Supply



NOTES:

- 1) INSTALLATIONS WITH MORE THAN 18" OF CONDUIT BETWEEN STATIC BAR AND JUNCTION BLOCK MAY REQUIRE ADDITIONAL CONDUIT SEALS.
- 2) INSTALLATION MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) OR APPLICABLE GOVERNMENT REGULATIONS.
- 3) REFER TO SIMCO-ION INSTRUCTION MANUALS 5201050, 5201051, 5201058 AND 5201201 FOR ADDITIONAL INFORMATION.



A. Locate at a convenient place within reach of the static bar high voltage cable. Power for the AC adapter and an electrical ground connection must

be available.

B. Secure to the mounting surface (commonly a machine frame) using M5 or M4 [#10 or #8] hardware (not supplied).

**NOTE** - Do not apply line voltage to the AC adapter until installation is complete. Also ensure that all input power switches are in the OFF (0) position.

**CAUTION** - Do not install the power supply within hazardous (classified) locations. Install in non-hazardous (unclassified) locations only (refer to Figure 5.1)



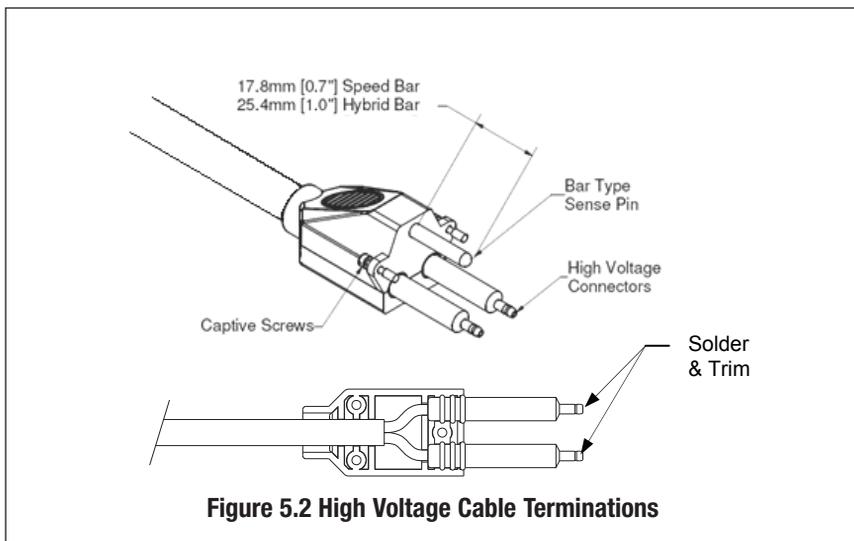
## 5.2 Electrical Connections

A. **Ground** power supply by connecting a ground lead between the ground terminal on the flange of the power supply and a good electrical machine ground.



B. **Connect static bar** by cutting the high voltage cable to length, terminating the leads, and connecting to the power supply: (Refer to Figure 5.2)

1. Cut HV cable to length, leaving an extra 3¼” for the connector.
2. Strip black plastic jacket back 2½”, being careful not to nick the insulation of the HV wires.
3. Strip insulation of HV wires back ¾”, being careful not to nick the conductor of the HV wire.
4. Straighten conductors and insert into HV connector until conductor protrudes out from the tip of the connector.
5. Solder conductor to tip of connector by applying solder to exposed conductor. Ensure that that solder does not overflow and fill neck area of tip.
6. Trim off excess conductor protruding from tip of connector.



**Figure 5.2 High Voltage Cable Terminations**

7. Place HV Connectors into the HV plug bottom. The black plastic jacket should be fully engaged in the strain relief section of the HV plug. Flex conduit (where used) should be fully engaged in the hub section of the HV plug.
8. Install the HV plug top onto bottom making sure the plug comes together properly with no binding or gapping. Hold together firmly.
9. Insert nylon screws through holes in plug bottom and tighten to secure plug together (do not over tighten screws).
10. Then plug in high voltage connector on static bar to HV1 or HV2 on power supply. Secure high voltage connector with the (2) captive screws on the sides of the connector. Do not over-tighten.



**CAUTION – Shock Hazard**

Do not connect static neutralizing bar with power supply energized. Disconnect input power or switch power off before connecting static bar.



**NOTE –** Failure to fully seat the high voltage connectors into the power supply connectors may result in permanent damage to the bar, cable or power supply.

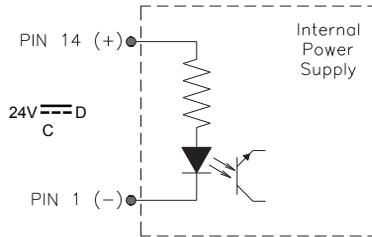
C. **Connect power supply alarm output** (if used). The power supply “Alarm Output” is a standard DB25 pin connector located on the end of the IQ Power™ HL Power Supply. A maximum distance of 3 meters [10 feet] or less is recommended.



Pin	Description	Pin	Description
1	Remote on/off optocoupler (-)	10	No connection
14	Remote on/off optocoupler (+)	6	No connection
		19	No connection
2	Clean Bar Relay (common)*	11	Power Relay (common)*
3	Clean Bar Relay (norm close)*	7	Power Relay (normal closed)*
16	Clean Bar Relay (norm open)*	20	Power Relay (normally open)*
8	Fault Relay (common)*		
4	Fault Relay (normally closed)*	12	Power in (ground)**
17	Fault Relay (normally open)*	24	Power in (ground)**
9	Bar On Relay (common)*	13	Power in (+24V === DC)**
5	Bar On Relay (normal closed)*	25	Power in (+)**
18	Bar On Relay (normally open)*		

\*30V 1A Rating on Contacts

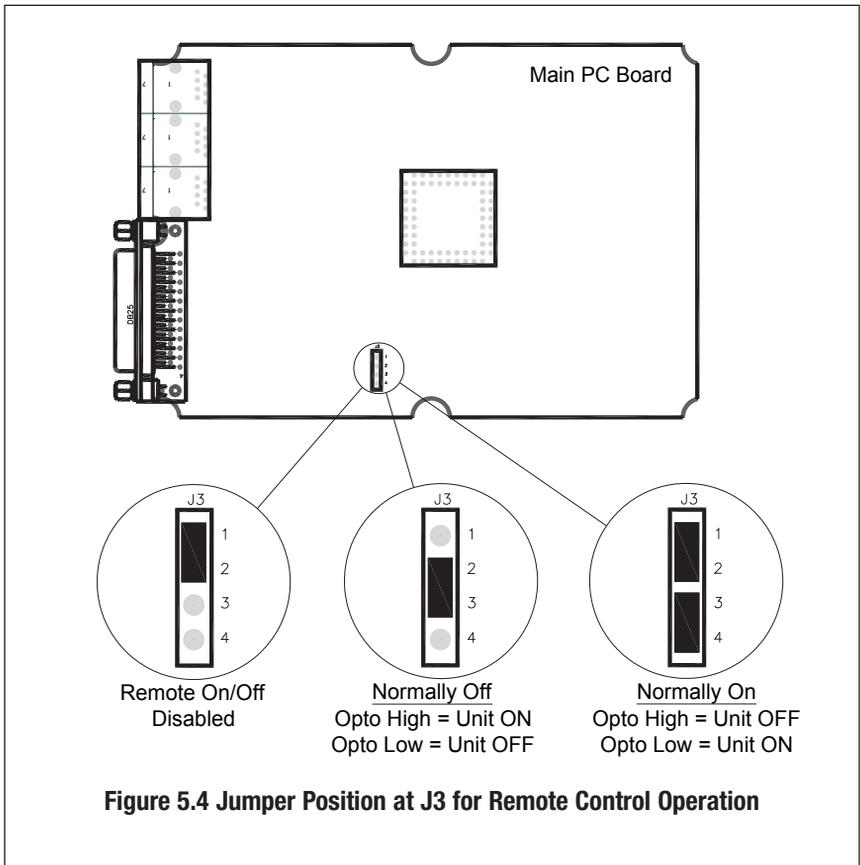
\*\*1.6A Rating, Connect pins 12 & 24 in parallel and 13 & 25 in parallel



**Figure 5.3 Alarm Output Connections**

The power supply alarm output provides a variety of relay contact outputs that echo the status of the power supply indicator lights. The relay contacts are rated for a maximum of 1A at 30V  $\text{---}$  DC. The alarm output connector also provides a means of remote power in. (Refer to Figure 5.3)

D. **Remote On/Off Control** (if used). The power supply “Alarm Output” connector also provides for remote on/off control of the power supply. Remote on/off control is configured with a jumper on a pin header on the main power supply circuit board. The default configuration is with the remote control disabled. The remote control can be configured “normally off” or “normally on” by the jumper setting (refer to Figure 5.4). To access the jumper the cover will have to be removed from the power supply. Disconnect all input power from the power supply then remove the six screws securing the cover and slowly and carefully remove the cover.



There is a ribbon cable connecting the face label on the cover to the main circuit board. Use care not to disconnect this cable. If the cable becomes disconnected, lift the latches on the sides of the ribbon cable connector, insert the ribbon cable fully into the connector and press the latches back down.

Reposition the jumper to enable the remote control either “normally on” or “normally off”, as desired (refer to Figure 5.4). Then replace the cover and secure with the six screws.

When operating a power supply using the remote control circuit, power may be applied through the “Alarm Output” connector or the “Power In” connector on the end panel. If the “Power In” connector on the end panel is used, the “Power” switch must be set to the ON (1) position.

Remote control is established by applying 24V === DC to the “Alarm Output” connector pins as specified in Figure 5.3. The user-applied 24V === DC drives a low current optoisolator on the IQ Power™ HL Power Supply main circuit board, turning the power supply on or off, depending on the configuration of jumper J3.

- E. **Connect other power supplies** (if used). IQ Power™ HL Power Supplies can be connected together via a “data buss”. The data buss allows one IQ Power™ HL Communication Module to serve multiple IQ Power™ HL Power Supplies and feed the data from all power supplies into the network. A total of 10 power supplies may be chained together on one data buss. Special cables for the data buss must be 8-conductor modular cables with RJ-45 connectors wired “straight through” (reference color: white).

If multiple IQ Power BPS power supplies are connected together, each power supply must be given a unique address. This is necessary to enable reliable digital communication. The power supplies should each be given a unique address prior to connection with the “data buss” (the chaining together of power supplies). See section 6.3 Power Supply Number (address) for details on re-addressing the power supplies.

The modular cable plugs into either “PS COMM 1” connector on a power supply and chains to the next power supply where it again plugs into either “PS COMM 1” connector.

- F. **Connect AC Adapter** (make sure “POWER” switch on power supply is in the “OFF” (0) position). Route low voltage wire clear of moving machine parts and protect it from abrasion. Secure using nylon wire ties (not supplied). Do not over tighten. Insert barrel connector into “POWER IN” connector on the power supply. Hand tighten barrel connector nut to secure.

Connect line voltage to input side of AC adapter. The AC adapter is a universal input type that accepts line voltage from 100 to 240 V  $\sim$  AC 50/60Hz. The AC adapter line voltage connector accepts a line cord with an IEC 320 connector (supplied). The line cord also provides electrical ground to the AC adapter. Check electrical ground integrity in the line voltage receptacle used for the AC adapter. This ground must not be defeated.

- G. **Connect user supplied power** (if used). In cases where the user does not want to use the AC adapter but wants to supply 24V  $\equiv$  DC power to the IQ Power™ HL Power Supply, user supplied 24V  $\equiv$  DC power may be applied two ways.

The “Power In” connector on the end panel of the IQ Power™ HL Power Supply may be used to supply power to the system. This connector requires the use of a Switchcraft 760K barrel type power plug. The plug should be wired +24V  $\equiv$  DC to center and common (ground) to outer barrel. The common must be bonded to electrical ground. Wired in this fashion, the “Power” switch on the end panel of the power supply is in circuit.

Alternatively, the “Alarm Output” connector on the end panel of the IQ Power™ HL Power Supply may be used to supply power to the system. This connector requires the use of a standard DB25 connector. The connector should be wired:

- +24V  $\equiv$  DC to pins 13 & 25
- Common (ground) to pins 12 & 24

To ensure current carrying capacity, two pins are used for each connection. The common must be bonded to ground. Wired in this fashion, the “Power” switch on the end panel of the power supply is bypassed. (refer to Figure 5.3)

Power supplied in the above fashion must have adequate current available to power all components on the system (maximum 4A). Input power should be appropriately fused for safety purposes.

## 6. OPERATION

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**NOTE** – Before switching on power supply; ensure that units are properly grounded and that static bar & probes are properly installed.

### 6.1 Power Supply Indicators

**Power:** Lights (green) to indicate power is on and the IQ Power™ HL Power Supply is ready to operate.

**Comm:** Lights (green) to indicate digital communication is established with an IQ Power™ Communication Module or Control Station. The Comm light will flicker to indicate communication activity.

**Bar On:** Lights (green) to indicate when the static neutralizing bar is active.

**Fault:** Lights (red) to indicate faulty condition of static bar, power supply or high voltage connections. Power will have to be turned off to clear the fault. When fault is cleared and power is restored, the fault light will be extinguished.

**Clean Bar:** Lights (yellow) to indicate need to clean static bar. Clean Bar indicator may light with low ion output (dirt build-up on ion emitters) or high output current (conductive contamination on face of bar).

**Mode:** The indicator next to the type of bar connected will light (green). “Speed” or “Hybrid” will be indicated. In cases where two different types of bars are connected, the system will set for the safer of the two operating voltages and light the corresponding Mode indicator.

The Output indicators (along with the Mode indicators) also indicate the **power supply number** during start-up of the power supply.

**Output:** The output indicators range from “Low” to “High” in 10 steps (2-red, 3-yellow, 5-green) and light to indicate the system relative ion output. The output will normally be in the high range. Low output generally indicates the need to clean the static bar.

### 6.2 Power Supply Operators

**Calibrate:** Is a momentary push button switch located on the face label. Pressing the face label firmly on “Calibrate” initiates the calibration sequence and sets the relative nominal ion output for the system.

The Calibrate button is also used to change the **power supply number**. This number is used in software to identify the power supply in systems that contain multiple power supplies and include an optional Communication Module.

**System Start-up:**

- A. Apply line voltage to the AC adapter.
- B. Move the power supply “Power” switch to the “On” (1) position.
- C. The power supply indicators will briefly self-test during which all will light.
- D. Immediately after the self-test, the power supply number (default: 01) will be briefly displayed. (see 6.3 Power Supply Number)
- E. After the power supply number displays, the power supply indicators will settle to display the system status.

On new systems the output indicator will settle to display low output, initial calibration must be performed.



**NOTE** – Calibration should be performed when the system is first installed and may be performed after the static bar has been cleaned and the system verified as operating correctly.

- F. If the system is new, perform an initial calibration. The initial calibration sets the relative nominal ion output for the system. The calibration should only be performed on IQ Power™ HL systems that are new or just cleaned and known to be in proper working order.

During calibration the target to be neutralized (web, film, etc.) may remain in place, but **MUST NOT BE MOVING**. If the web is moving past the static bar (e.g. the machine is in operation) the calibration may be faulty.

The system should be “on” and in the operating mode (not in start-up self-test or power supply number display modes). Press the face label on the power supply firmly on the word “Calibrate”. This will initiate the calibration sequence and set the relative nominal ion output for the system.

During calibration the system output will be cycled and the three mode lights will illuminate. At completion of the calibration the speed and distance lights will flicker. The indicated ion output will be high. The calibration sequence takes less than one minute.

The calibration data is stored in non-volatile memory and used on subsequent power ups.

### 6.3 Power Supply Number (Address)

Each IQ Power™ HL PS has two numbers associated with it. These numbers serve to identify the power supply in digital communications. One number is the IQ Power™ / Performax IQ HL PS address, which can be a number of 1 through 10 (the default is “1”). The other number is the IQ Power™ Station number, which can be a number of 1 through 30 (the default is “30”).

When the IQ Power™ HL PS is first turned on it will illuminate all LED indicators as a self test. Then it will briefly display first the IQ Power™ / Performax IQ address in steadily lit indicators and then it will display the Ion Power station number in flashing indicators. See the following table for interpreting the address numbers.

**Power Supply Number Table**

<b>IQ Power/ Performax IQ HL PS address</b>	<b>Ion Power Station number</b>	<b>OUTPUT LED illuminated</b>	<b>SPEED MODE LED</b>	<b>HYBRID MODE LED</b>	<b>DISTANCE MODE LED</b>
1 (default)	1	LOW (1)	-	-	-
2	2	2	-	-	-
3	3	3	-	-	-
4	4	4	-	-	-
5	5	5	-	-	-
6	6	6	-	-	-
7	7	7	-	-	-
8	8	8	-	-	-
9	9	9	-	-	-
10	10	(none)	On	-	-
1	11	LOW (1)	On	-	-
2	12	2	On	-	-
3	13	3	On	-	-
4	14	4	On	-	-
5	15	5	On	-	-
6	16	6	On	-	-
7	17	7	On	-	-
8	18	8	On	-	-
9	19	9	On	-	-
10	20	(none)	On	On	-
1	21	LOW (1)	On	On	-
2	22	2	On	On	-
3	23	3	On	On	-
4	24	4	On	On	-
5	25	5	On	On	-
6	26	6	On	On	-
7	27	7	On	On	-
8	28	8	On	On	-
9	29	9	On	On	-
1	30 (default)	(none)	On	On	On

Adjusting the power supply number is only necessary in systems with multiple power supplies daisy chained to a Communication Module or monitoring device. Having multiple power supplies with the same numbers connected to a Communication Module or monitoring device is not permitted.

To adjust the power supply number, turn the unit on and wait for the LED self-test to complete. The COMM light will briefly stay lit and the power supply number may be adjusted at this time. Press and hold the Initial Calibration button until the power supply number increments by one (5 second window). Subsequent presses of the Initial Calibration button will increment the power supply numbers (5 second window). The Ion Power station number will be displayed and the IQ Power™ / Performax IQ HL PS address will “map” as shown on the Power Supply Number Table. The incrementing “wraps around”. Stop pressing the Initial Calibration button when the desired power supply numbers have been reached. Wait 5 seconds, the COMM light will go out and the Speed and Distance LEDs will flicker, indicating the power supply numbers have been saved.

To reset the unit to its factory default power supply numbers (see Power Supply Number Table), press and hold the Initial Calibration button while turning the unit on. Continue holding down the Initial Calibration button while the Output indicators “count-up” and when the COMM light starts flashing, then release the Initial Calibration button. When just the Speed and Distance LED flicker, the default power supply numbers (address = ”1”, station number = ”30”) are saved.

## 7. MAINTENANCE

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**NOTE** – Only qualified service personnel are to perform maintenance tasks.



**CAUTION** – Electrical Shock Hazard

Turn off power supply before cleaning bar or performing any maintenance on the system.

The accumulation of contamination on the ionization emitter points and static bar surfaces will reduce neutralizing efficiency of the bar, therefore it is recommended that maintenance of the system be performed when the Clean Bar indicator on the display module illuminates or every three weeks, whichever comes first. Dirty environments may require more frequent cleaning. Maintenance should be performed by qualified service personnel only.

### Cleaning the Static Bar

A clean brush with nylon bristles should be used to keep the ionization emitter points of the static bar clean. Periodic use of the brush will prevent deposits from accumulating on the points. The emitter points must remain sharp for optimum operation.



**NOTE** – Do not scrape points with any hard or sharp object that may damage points.

- A. Turn off power supply.
- B. Remove dirt particles deposited on the static bar with a dry, stiff nylon bristle brush.
- C. Blow off the static bar with clean, dry compressed air.
- D. Remove resistant coatings deposited on static bar by wiping with isopropyl alcohol or mineral spirits applied to a clean cloth. Apply isopropyl alcohol or mineral spirits to a stiff nylon bristle brush and thoroughly scrub the ionization emitter channels of the bar.
- E. Blow static bar dry with clean, dry compressed air and ensure the bar is completely dry before re-applying power to the bar.



**NOTE** – Do not soak static bar or related components in alcohol or mineral spirits. Do not use harsh solvents such as lacquer thinner, naphtha or acetone.

## 8. TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Power indicator NOT illuminated.	Power not on at power supply.	Turn on Power switch on end of power supply case.
	Poor electrical connections.	Check input power connections, both 24V === DC and line voltage.
	Defective AC adapter.	Replace AC adapter.
Clean Bar indicator illuminated.	Process material fouling static bar ion emitters.	Remove process material from static bar.
	Dirt build-up on ion emitters or conductive contamination on face of bar.	Clean ion emitters and static bar. See Maintenance section for details.
Bar ON indicator NOT illuminated.	No static bar connected.	Install static bar and connect to power supply.
	Static bar high voltage connector is not connected.	Turn off power, reconnect static bar and secure plug with captive screws.
	Static bar high voltage connector missing bar type sense pin.	Replace static bar high voltage connector plug.
Fault indicator illuminated.	Static bar mounted too close to grounded metal.	Separate static bar from grounded metal.
	Damage to high voltage connector.	Replace high voltage connector.
	Damage to high voltage cable.	Replace static bar.
	High voltage module inside power supply faulty	Replace high voltage module.

## 9. REPLACEMENT PARTS

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	<u>Part Number</u>
IQ Power™ HL Power Supply: (no AC adapter)	4012508
(With AC adapter, 100/120V ~ AC Jap/ N.Amer. Cord)	4012509
(With AC adapter, 230V ~ AC N.Amer. Cord)	4012510
AC Adapter (100-240V ~ AC input, standard, 1.6A)	4108104
AC Adapter (100-240V ~ AC input, large, 3.75A)	4108774
Line Cord, 100/120V ~ AC Japan/ N. Amer.	4106272
Line Cord, North American 230V ~ AC	4106274
Modular Cable (8-conductor, <u>straight through wired</u> , RJ-45) for use between multiple IQ Power™ HL Power Supplies:	
(0.91 meter [3 foot] white)	4520788
(2.13 meter [7 foot] white)	4520789
(4.27 meter [14 foot] white)	4520791
(7.62 meter [25 foot] white)	4520792
HL Junction Block	4012352
HL Conduit Seal	4108231

## 10. WARRANTY

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This product has been carefully tested at the factory and is warranted to be free from any defects in materials or workmanship. Simco-Ion will, under this warranty, repair or replace any equipment that proves, upon our examination, to have become defective within one year from the date of purchase.

The equipment being returned under warranty should be shipped by the purchaser to Simco-Ion, 2257 North Penn Road, Hatfield PA 19440, transportation prepaid and insured for its replacement cost. Prior to returning any goods for any reason, contact Simco-Ion Customer Service at (215) 822-6401 for a Return Authorization Number. This number must accompany all returned items.

This warranty does not apply when the equipment has been tampered with, misused, improperly installed, altered, has received damage through abuse, carelessness, accident, connected to improper line voltage, or has been serviced by anyone other than an authorized factory representative.

The warranty does not apply when Simco-Ion parts and equipment have been energized by other than the appropriate Simco-Ion power supply or generator, or when a Simco-Ion power supply or generator has been used to energize other than Simco-Ion parts and equipment. Simco-Ion makes no warranty, expressed or implied, nor accepts any obligation, liabilities, or responsibility in connection with the use of this product other than the repair or replacement of parts stated herein.

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