



An ITW Company

IQ Power™ IQ HLC Power Supply and Remote Display Module

Associated Equipment for the IQ Power™ HL Static Bar

INSTALLATION AND OPERATING INSTRUCTIONS

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1. SAFETY WARNINGS

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.

WARNING! – Statements identified with **WARNING** indicate potential serious injury 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.



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 $\overline{=}$, 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.



WARNING! – **Fire Hazard**

Do not install or operate the Remote Display Module in close proximity to any flammable liquids or solvents.



WARNING! – Substitution of components may impair intrinsic safety. (See **Figure 3a & 3b**)

2. INTRODUCTION

Simco-Ion's IQ Power™ HLC Power Supply and Remote Display Module provide 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 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™ HLC Power Supply is agency approved for mounting within hazardous locations:

- Class I, Division 1, Group D
- Class II, Division 1, Groups F and G
- Class III, Division 1

Features

- 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.

3. SPECIFICATIONS

IQ Power™ HLC Power Supply	
Input Power:	24V === DC, 1.5A from AC adapter
Output Voltage:	+/-7kV == "Speed Bar" +/-8kV == "Hybrid Bar"
Dimensions:	388mmL x 235mmW x 159mmH [15.25"L x 9.25"W x 6.25"H]
Weight:	14.5 kg [32 lb]
Max. Operating Temp:	43°C [110°F] maximum
Housing:	Cast Aluminum

IQ Power™ Remote Display Module	
Input Power:	24V=== , 2.0A (maximum system current)
Dimensions:	202L x 123W x 58H mm [7.95"L x 4.85"W x 2.28"H]
Weight:	0.7 kg [1.5 lb]
Operating Temp:	43°C [110°F] maximum
Enclosure:	Aluminum, blue polyester powder coated

AC Adapter	
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

4. INSTALLATION

Mounting the Power Supply

- A. Locate at a convenient place within reach of the static bar high voltage cable. Note the Power Supply is agency listed for mounting within hazardous (classified) locations (see **Figure 3a & 3b**).
- B. Secure to the mounting surface (commonly a machine frame) using M10 [3/8"] 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.

Mounting the Remote Display Module

- A. Locate at a convenient place within reach of the power supply 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).



WARNING! – Do not install The Remote Display Module within hazardous (classified) locations. Install in non-hazardous (unclassified) locations only (see **Figure 3a & 3b**).

Electrical Connections

- A. **Ground** the Power Supply by connecting a ground lead between the metal conduit to the Power Supply and a good electrical machine ground. Note that conduit seals must be properly installed to prevent the propagation of vapors and flames through conduit runs (see **Figure 1**). Outer jacket of modular cables must be removed (and individual wires separated) before filling conduit seals with cement.
- B. **Connect static bar** by cutting the high voltage cable to length, terminating the leads, and connecting to the Power Supply: (See **Figure 2**)

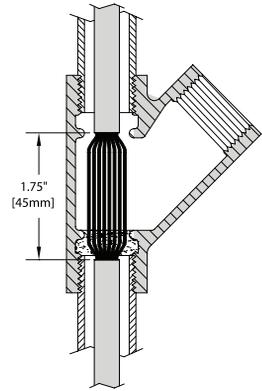


Figure 1. Conduit Seal

1. Strip black plastic jacket back $3\frac{1}{4}$ " (being careful not to nick the insulation of the HV wires) and strip insulation of HV wires back 1" using a wire stripper (being careful not to nick the conductor of the HV wire).
2. Straighten conductors and insert into HV connector until conductor protrudes out from the tip of the connector.
3. Solder conductor to tip of connector by applying solder to exposed conductor. Ensure that solder does not overflow and fill neck area of tip.
4. Trim off excess conductor protruding from tip of connector.

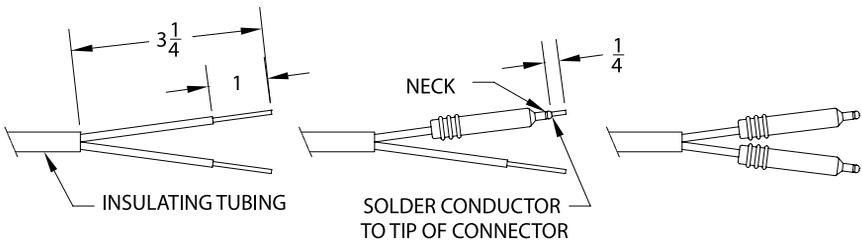


Figure 2. High Voltage Cable Terminations

5. Plug connectors into sockets labeled HV1 or HV2 on the Power Supply.

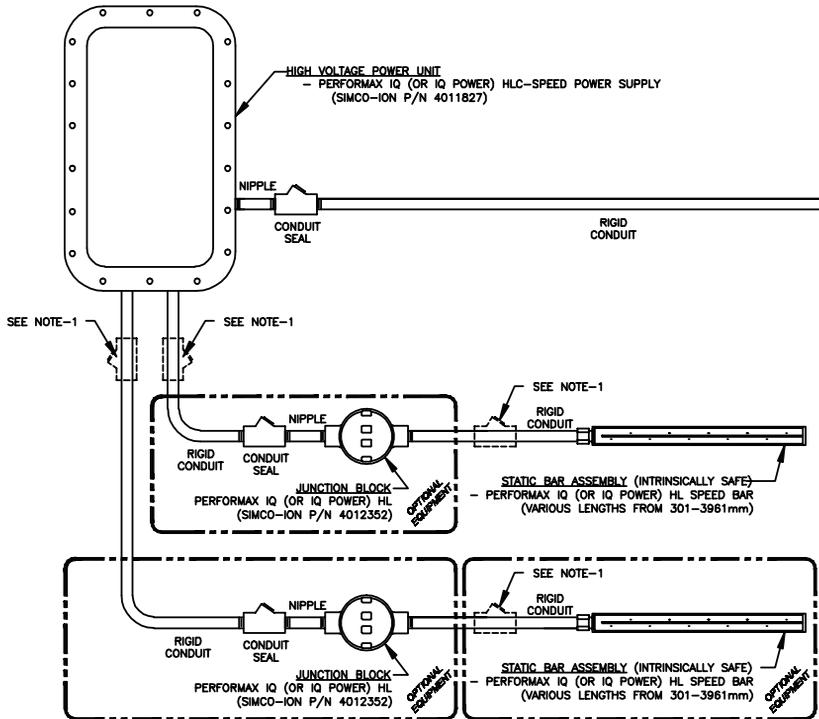


CAUTION! – Shock Hazard

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

HAZARDOUS (CLASSIFIED) LOCATION

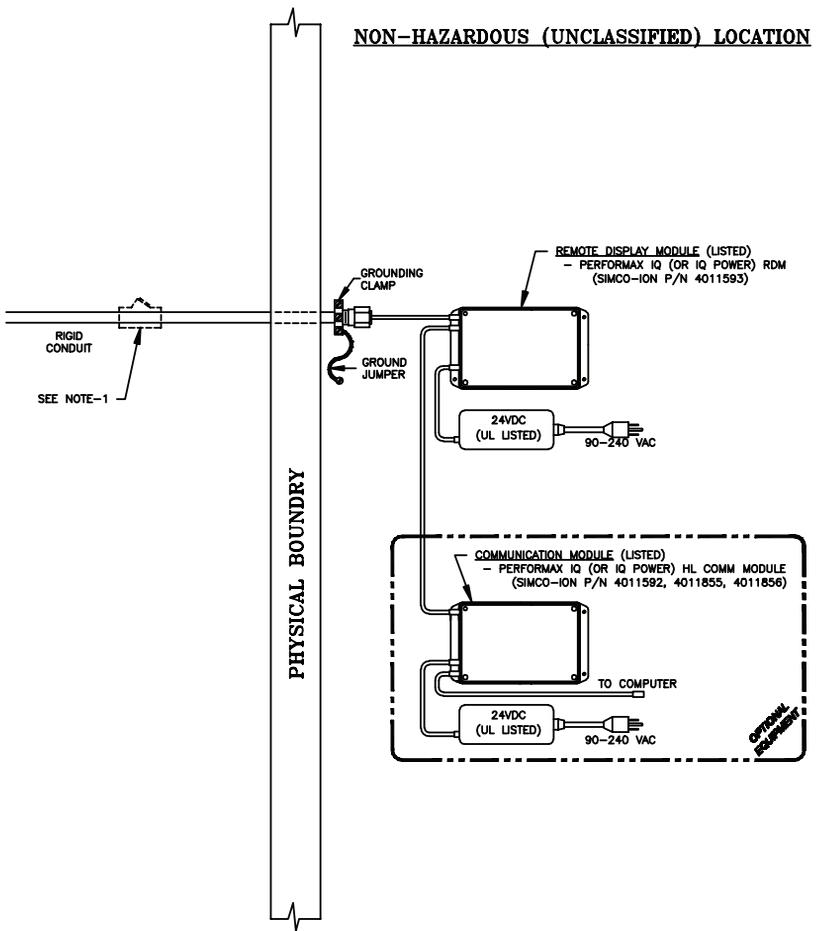
CLASS I, DIVISION 1, GROUP D
CLASS II, DIVISION 1, GROUPS F & G
CLASS III, DIVISION 1



NOTES:

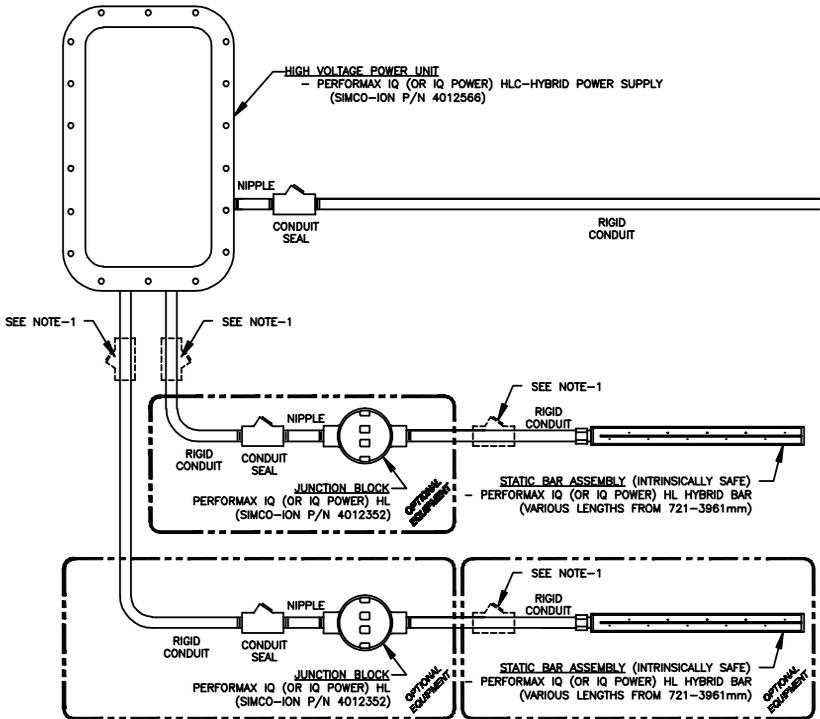
- 1) INSTALLATION MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) OR APPLICABLE GOVERNMENT REGULATIONS.
- 2) REFER TO SIMCO-ION INSTRUCTION MANUALS 5201050, 5201051, 5201059, 5201070 AND 5201200 FOR ADDITIONAL INFORMATION.

Figure 3a. IQ Power™ HLC-SPEED Control Drawing



HAZARDOUS (CLASSIFIED) LOCATION

CLASS I, DIVISION 1, GROUP D
CLASS II, DIVISION 1, GROUPS F & G
CLASS III, DIVISION 1



NOTES:

- 1) INSTALLATION MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) OR APPLICABLE GOVERNMENT REGULATIONS.
- 2) REFER TO SIMCO-ION INSTRUCTION MANUALS 5201050, 5201051, 5201059, 5201070 AND 5201200 FOR ADDITIONAL INFORMATION.

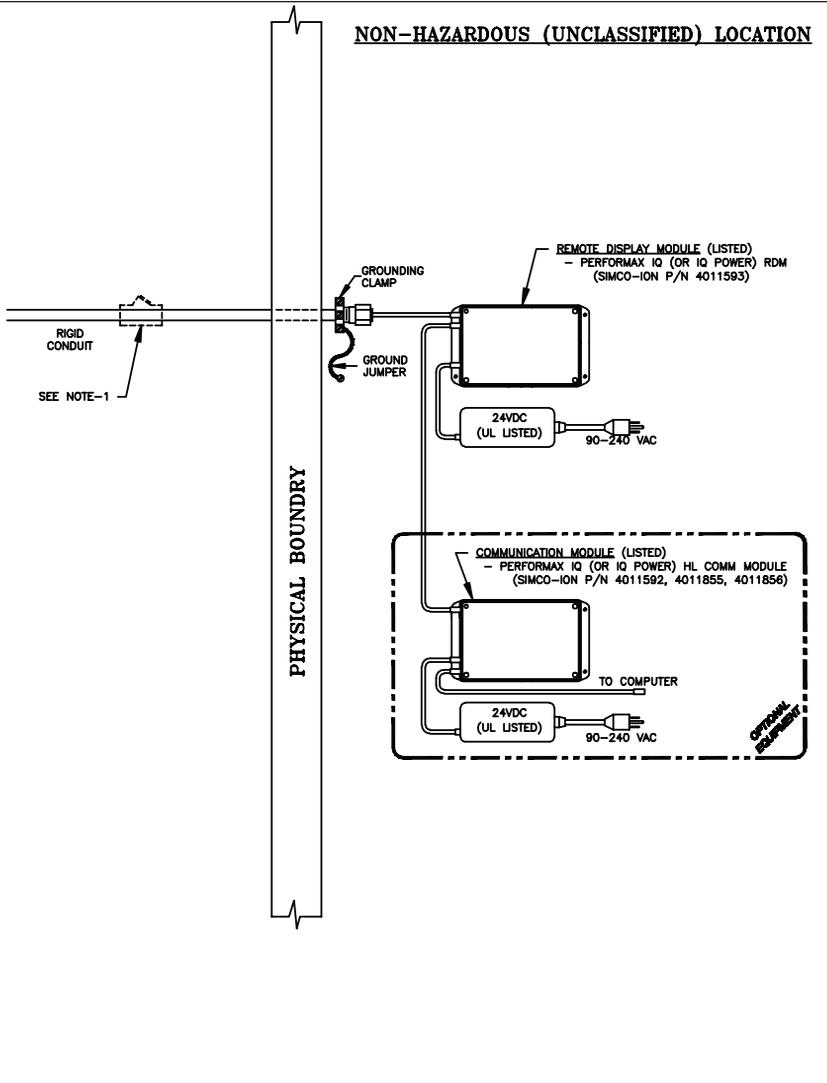


Figure 3b. IQ Power™ HLC-HYBRID Control Drawing



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 Remote Display Module.** Plug one end of modular cable into one of the Power Supply “PS COMM1” jacks. Run the cable through rigid metal conduit (see **Figure 3**) to the Remote Display Module. Plug the other end of the cable into the “RDM COMM2” jack.
- D. **Connect Power Supply alarm output** (if used). The Remote Display Module “Alarm Output” is a standard DB25 pin connector. A maximum distance of 3 meters [10 feet] or less is recommended. The Remote Display Module alarm output provides a variety of dry relay contact outputs that indicate the status of the power supply. The relay contacts are rated for a maximum of 1A at 30V $\overline{=}$. The alarm output connector also provides a means of remote power in. (See **Figure 5**)
- E. **Remote On/Off Control** (if used). The Remote Display Module “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 Remote Display Module 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 (see **Figure 6**). To access the jumper the cover will have to be removed from the Remote Display Module. Disconnect all input power, 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 (see **Figure 6**). 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 $\overline{=}$ to the “Alarm Output” connector pins as specified in **Figure 6**. The user-applied 24V $\overline{=}$ drives a low current optoisolator on the main circuit board, turning the Power Supply on or off, depending on the configuration of jumper J3.

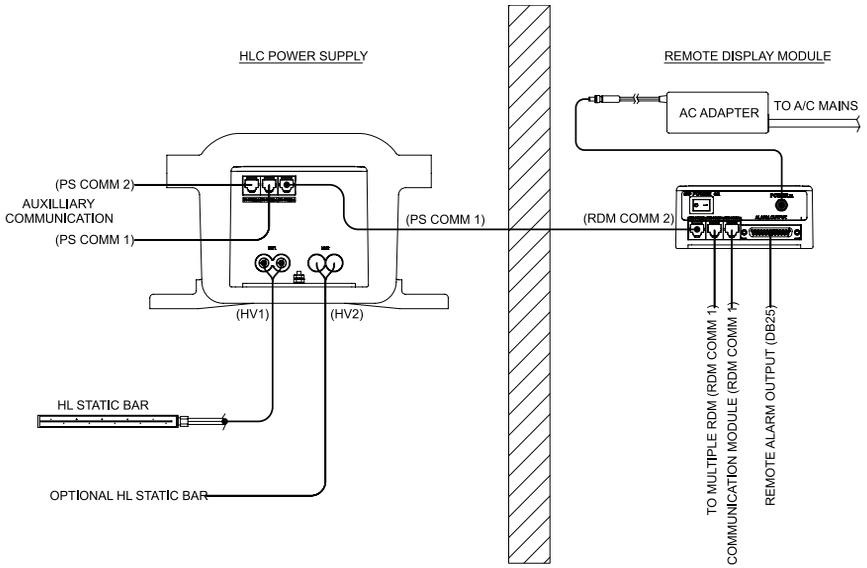
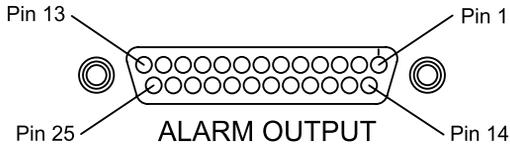


Figure 4. Interconnection Block Diagram



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

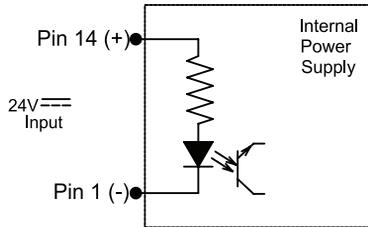


Figure 5. Alarm Output Connections

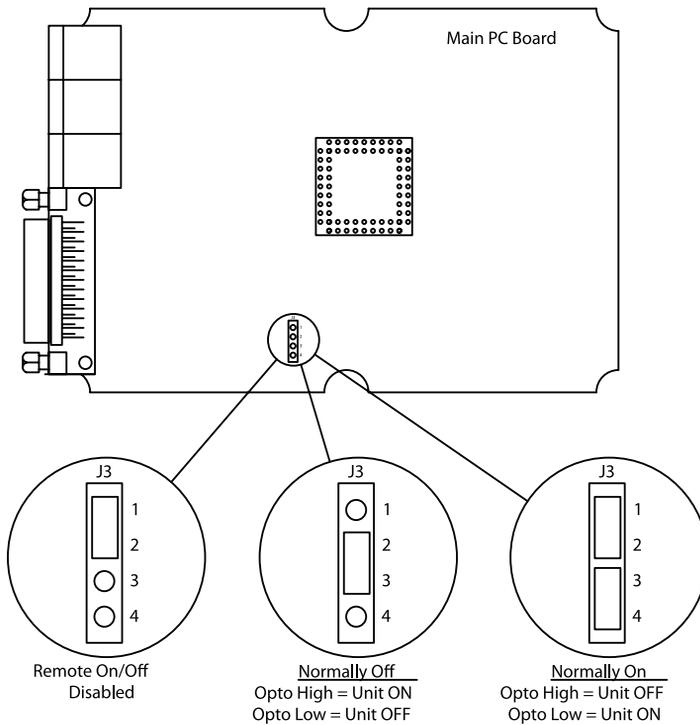


Figure 6. Jumper Position at J3 for Remote Control Operation

F. **Connect other Power Supplies** (if used). IQ Power™ HLC Power Supplies can be connected together via a “data buss”. The data buss allows one IQ Power™ Communication Module to serve multiple IQ Power™ HLC 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.

Note that each Power Supply requires its own Remote Display Module. The modular cable plugs into either “RDM COMM 1” connector on a Remote Display Module and chains to the next Remote Display Module where it again plugs into either “PS COMM 1” connector. Each Remote Display Module then connects to one, and only one, Power Supply.

- G. **Connect AC Adapter** (make sure “POWER” switch on Remote Display Module 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 Remote Display Module. 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 240V \sim 50/60 Hz. 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.

- H. **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 power to the IQ Power™ HLC Power Supply, user supplied 24V \equiv power may be applied two ways.

The “Power In” connector on the end panel of the IQ Power™ Remote Display Module 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 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 Remote Display Module is in circuit.

Alternatively, the “Alarm Output” connector on the end panel of the IQ Power™ Remote Display Module 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 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 Remote Display Module is bypassed (see **Figure 5**).

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.

5. OPERATION



NOTE! – Before switching on Power Supply; ensure that units are properly grounded and that static bar & probes are properly installed.

Remote Display Module Indicators

Power: Lights (green) to indicate power is on and the IQ Power™ HLC 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 power supply connected will light (green). “Speed” or “Hybrid” will be indicated.

The Output indicators (along with the Mode indicators) also indicate the **RDM Address** 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.

Remote Display Module Start-Up

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 RDM number. This number is used in software to identify the Remote Display Module and Power Supply in systems that contain multiple Power Supplies and include an optional Communication Module or monitoring device. The Calibrate button is also used to reset the unit to factory default settings.

System Start-up

- A. Apply line voltage to the AC adapter.
- B. Move the Remote Display Module “Power” switch to the “On” (1) position.
- C. The Remote Display Module indicators will briefly self-test during which all will light.
- D. Immediately after the self-test, the RDM numbers will be briefly displayed. (see 6.3 Power Supply Number)
- E. After the RDM Address displays, the Remote Display Module 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. Calibration should only be performed on IQ Power™ HLC 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.

Press the face label on the Remote Display Module 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 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™ RDM has two numbers associated with it. These numbers serve to identify RDM and power supply pair in digital communications. One number is the IQ Power™ / Performax IQ RDM address, which can be a number of 1 through 10 (the default is “1”). The other number is the Ion Power Station number, which can be a number of 1 through 30 (the default is “30”).

When the IQ Power™ RDM 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

IQ Power/ Performax IQ RDM address	Ion Power Station number	OUTPUT LED illuminated	SPEED MODE LED	HYBRID MODE LED	DISTANCE MODE LED
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 Calibrate button until the power supply number increments by one (5 second window). Subsequent presses of the Calibrate 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 Calibrate 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 Calibrate button while turning the unit on. Continue holding down the Calibrate button while the Output indicators “count-up” and when the COMM light starts flashing, then release the Calibrate button. When just the Speed and Distance LED flicker, the default power supply numbers (address = “1”, station number = “30”) are saved.

6. MAINTENANCE



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.

7. TROUBLESHOOTING

Problem	Cause	Solution
Power indicator NOT illuminated	Power not on at remote display module	Turn on Power switch on end of remote display module case
	Poor electrical connections	Check input power connections, both 24V  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 and reconnect static bar
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

8. REPLACEMENT PARTS

Description	Part Number
IQ Power™ HLC Replacement Power Supplies	
SPEED (for use with HL Speed Bars only)	4110350
HYBRID (for use with HL Hybrid Bars only)	4110351
IQ Power™ Remote Display Module (no AC adapter)	4011593
AC Adapter (100-240V  input, standard 1.6A)	4108104
AC Adapter (100-240V  input, large 3.75A)	4108774
Line Cord (100/120V  , Japan/North America)	4106272
Line Cord (230V  , North America)	4106274
Modular Cable (8-conductor, cross-over wired, RJ-45) for use between IQ Power™ Remote Display Module and IQ Power™ HLC Power Supply	
0.91m [3 ft] black	4520785
2.13m [7 ft] black	4520786
4.27m [14 ft] black	4520787
7.62m [25 ft] black	4520784
Modular Cable (8-conductor, straight through wired, RJ-45) for use between multiple IQ Power™ Remote Display Modules	
0.91m [3 ft] white	4520788
2.13m [7 ft] white	4520789
4.27m [14 ft] white	4520791
7.62m [25 ft] white	4520792
HL Junction Block	4012352
HL Conduit Seal	4108231

9. WARRANTY

Simco-Ion equipment has been carefully tested and inspected at the factory and is warranted to be free of defects in material, workmanship. Simco-Ion will, under this warranty, repair or replace any equipment which proves, upon our examination, to have become defective within the Warranty period from the date of purchase. A one-year Warranty applies to all Simco-Ion equipment. A six-month Warranty applies to Eltex equipment. Equipment is to be returned by the purchaser to Simco-Ion, 2257 North Penn Road, Hatfield, Pennsylvania, 19440, transportation pre-paid and insured for its full purchase price. Prior to returning goods for any reason, contact Simco-Ion for an Authorized Return Number. This number must accompany all returns. The Warranty does not apply when the equipment has been tampered with, misused, improperly installed, altered, been damaged 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 Simco-Ion power supplies or generators have been used to energize other than Simco-Ion parts and equipment.

Simco-Ion makes no warranty, expressed or implied, not accepts any obligation, liabilities or responsibility in connection with the use of these products other than the repair or replacement of parts as stated herein.

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