



An ITW Company

IQ Power™ HL Sensor Interface

INSTALLATION AND OPERATING INSTRUCTIONS

TABLE OF CONTENTS

1. SAFETY WARNINGS	1
2. DESCRIPTION	2
3. SPECIFICATIONS	3
4. INSTALLATION	4
Unpacking	4
Mounting.....	4
HL Sensor(s) and Intrinsic Safety Barriers.....	6
Electrical Connections	6
Connect Sensor(s).....	11
Sensor Number.....	11
Set Up.....	12
5. OPERATION	14
Sensor Interface Indicators.....	14
6. MAINTENANCE	15
Cleaning	15
7. TROUBLESHOOTING	15
8. PARTS & ACCESSORIES	17
9. WARRANTY & SERVICE	17

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.

ATTENTION – Les déclarations identifiées avec ATTENTION indiquent des dangers potentiels pour la sécurité.



WARNING – Statements identified with WARNING indicate potential serious injury hazards.

AVERTISSEMENT – Les déclarations identifiées avec AVERTISSEMENT indiquent un risque de blessures graves.



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 machine frame to which the equipment is mounted.
4. Disconnect input power before connecting or disconnecting any equipment.



WARNING – Fire Hazard

Do not install or operate the Sensor Interface in close proximity to any flammable liquids or solvents.

AVERTISSEMENT – Risque d'incendie

Ne pas installer ou utiliser l'interface de capteur à proximité de liquides ou de solvants inflammables

2. DESCRIPTION

The IQ Power HL Sensor Interface acts as a gateway between the HL Sensors inside a hazardous location area and the IQ Power Control Station outside of the hazardous location. Up to eight (8) sensors can be connected to the HL Sensor Interface to monitor processed materials for the presence, polarity and intensity of electrostatic charges. All communication between the sensor and interface is digital to prevent corruption of readings. The interface also provides indicators for sensors connected and overall system status. The sensor and interface allow for detection of the undesirable condition of excess static electricity and provides for system operation in CLFB (Closed-Loop Feed Back) mode with additional static neutralizing hardware.

The IQ Power HL Sensor Interface is agency approved for use outside of hazardous locations.

IQ Power HL Sensors used with the Sensor Interface must be connected through a pair of (user supplied) Intrinsic Safety Barriers to maintain hazardous location approval. One of the Intrinsic Safety Barriers provides protection for the circuit powering the sensor. The other Intrinsic Safety Barrier provides protection for the digital communication circuit of the sensor. Barriers must be compatible with device parameters as stated in Control Drawing 5150010 and located outside the Hazardous Location area.

The IQ Power HL Sensor may be integrated with an IQ Power system to provide closed-loop feedback (CLFB) control of static elimination. This provides for better neutralization of static charges. Closed-loop control will minimize troublesome under-compensation and over-compensation often found in simple (open loop) static neutralizing applications. Sensing charge on processed material also has a benefit of monitoring the static neutralizer's performance. If static charge on the processed material becomes excessive, it could be an indication of service needed at the static neutralizing bar.

Two digital communication modes are available. One mode prioritizes neutralizer data, which is appropriate for typical operation. The other mode prioritizes sensor data and alarms, which would be used in applications where response to changing static charge levels is critical.

Static charge may not be readily apparent on processed materials. The IQ Power HL Sensor makes the intangible tangible, by providing hard data about electrostatic charges on processed materials. The sensor itself uses field sensing technology that provides accurate and long term stability of static field measurement. A further benefit of this technology is freedom from zero drift in the measurement.

3. SPECIFICATIONS

Input Power	24 VDC, 1.0A from IQ Power Control Station or equivalent
Dimensions	202L x 123W x 58H mm [7.95"L x 4.85"W x 2.28"H]
Weight	0.73kg [1.6 lb]
Operating Temperature	104°F [40°C] max
Enclosure	Aluminum, blue epoxy powder coat
Compliance	RoHS
Approvals	cETLus, 4000065

4. INSTALLATION



NOTE – DO NOT USE any Ethernet cables with IQ Power systems (POWER & COMM). Avoid permanent equipment damage by using only Simco-Ion modular cables. (Refer to Section 8, Parts & Accessories).

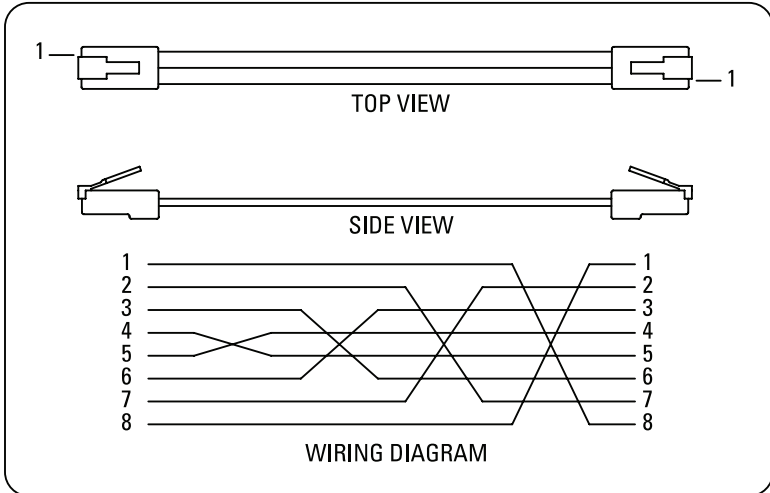


Figure 1: IQ Power Crossover Modular Cable (black)

Unpacking

Carefully remove all equipment from its carton and inspect contents:

- Check that details on packing slip correspond to details of product received.
- Check that equipment is free from damage.
- If any damage has occurred during shipment, notify local carrier at once. A report should also be forwarded to Simco-Ion, 2257 North Penn Road, Hatfield, PA 19440. See Section 9 of this manual for Return Shipment information.

Mounting

- A. Locate at a convenient place within reach of modular cable from control station.
- B. Secure to mounting surface (commonly a machine frame) using M5 or M4 [#10 or #8] hardware (not supplied).



WARNING – Do not install Sensor Interface within hazardous (classified) locations. Install in non-hazardous (unclassified) locations only.

AVERTISSEMENT – Ne pas installer l'interface de capteur dans les emplacements dangereux (classifiés). Installer dans des emplacements non dangereux (non classifiés) seulement.

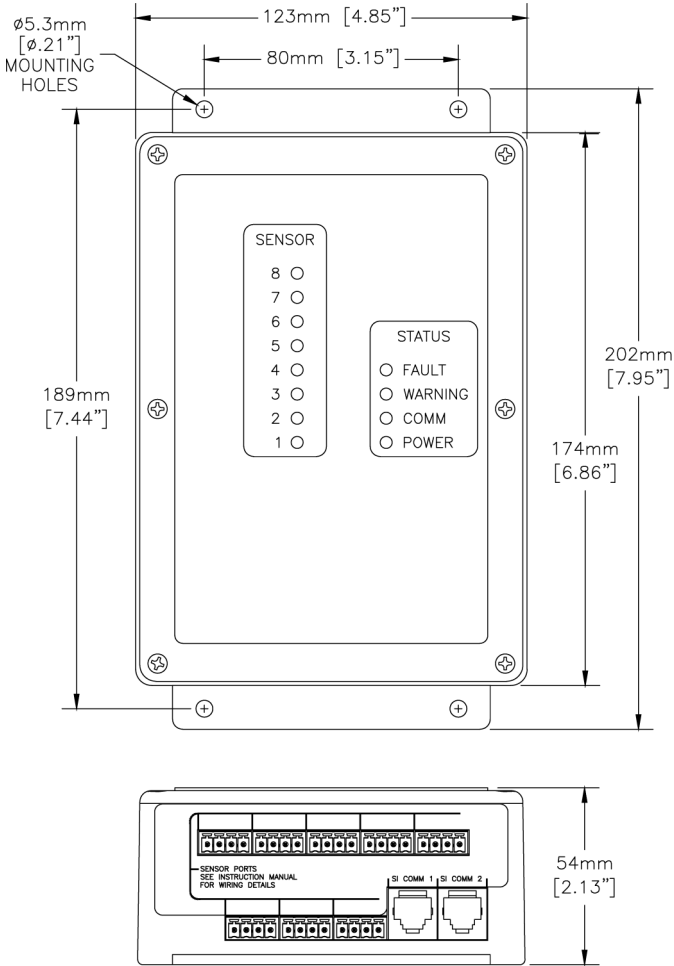


Figure 2: IQ Power HL Sensor Interface Mounting

HL Sensor(s) and Intrinsic Safety Barriers

Mount and connect IQ Power HL Sensor(s) and Intrinsic Safety Barriers as per instructions included with units and Control Drawing 5150010.

Electrical Connections

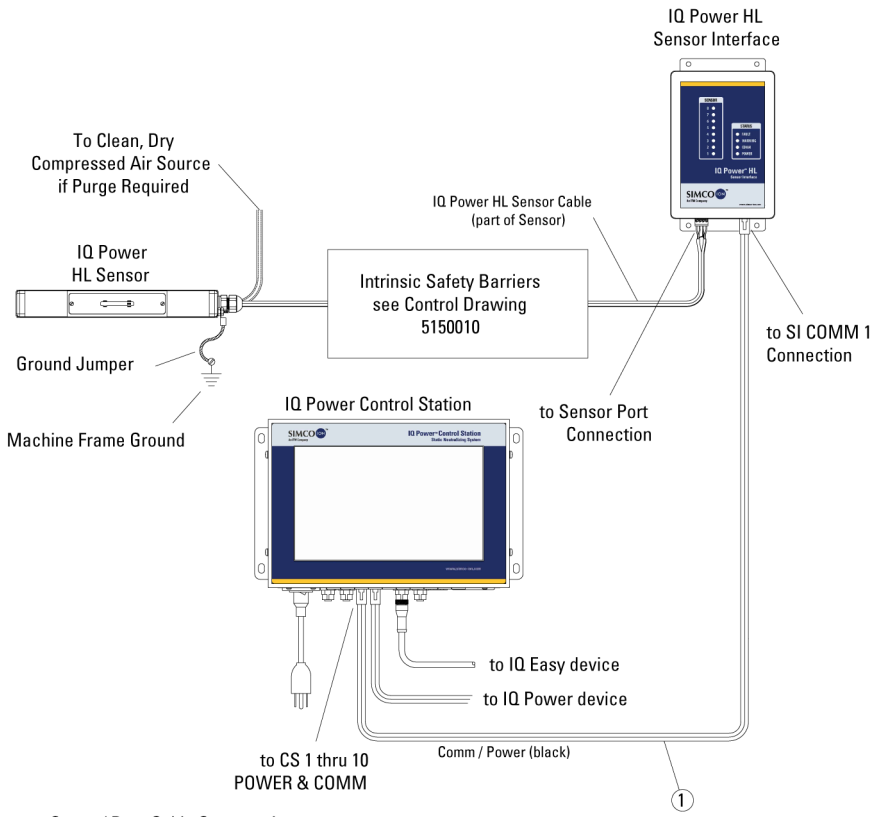


NOTE – Turn line voltage power off at IQ Power Control Station before connecting / disconnecting any devices. This is to avoid potential equipment failure and ensure proper digital communication.

The IQ Power HL Sensor connects to an IQ Power Control Station through the IQ Power HL Sensor Interface. Up to 8 sensors may be connected to an interface. The Sensor Interface may be connected directly to the Control Station or the Sensor Interface may be connected in conjunction with an HL or HLC static neutralizing power supply. When the Sensor Interface is connected to an HL power supply, the Sensors are automatically paired with the power supply. When the Sensor Interface is connected to an HLC power supply, the sensors have to be manually paired with the power supply. This prepares the system for operation in the CLFB (Closed-Loop Feedback) mode.

Connecting Sensor Interface directly to Control Station

Use the 2.13 meter [7 foot] (black) modular cable supplied with unit. Longer cables (not supplied) are available. Cables for Sensor Interface must be 8-conductor modular cable with RJ-45 connectors wired “crossover” (reference color: black, Figure 1).



Comm / Data Cable Construction

- ① Crossover Wired   Reference color black

DO NOT USE any Ethernet cables.
 See Section 8 Parts and Accessories for available cable lengths and part numbers.

Figure 3: IQ Power Connections (Sensor Interface directly to Control Station)

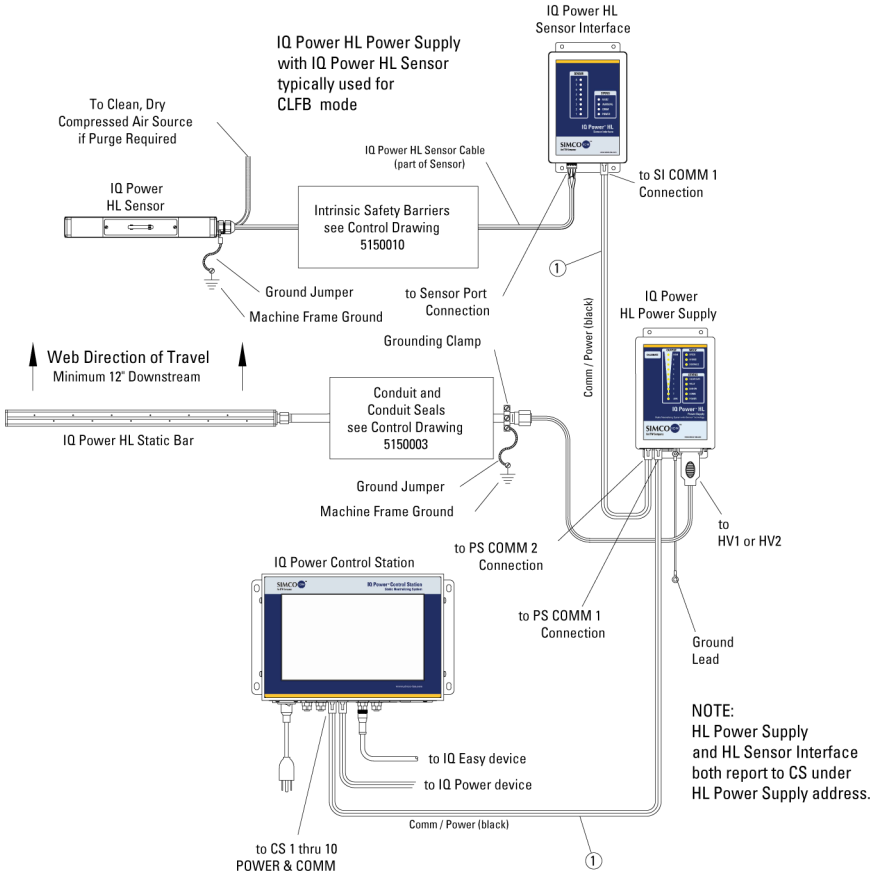
The modular cable plugs into either “SI COMM 1” on Sensor Interface and one of the “POWER & COMM” connectors on the Control Station.

Modular cables should not be run parallel with static bar high voltage cable. Route modular cables clear of moving machine parts and protect them from abrasion. Secure using nylon wire ties (not included). Do not over-tighten wire ties.

If there is an excess of modular cable, do not coil it in vicinity of static bar high voltage cable. If possible, cut modular cable to length and re-terminate using an RJ-45 connector installed with the same polarization as connector removed (note orientation of rib / wire color sequence to modular connector).

Connecting Sensor Interface to Control Station through HL Power Supply

Use the 2.13 meter [7 foot] (black) modular cable supplied with units. Longer cables (not supplied) are available. Cables for Sensor Interface must be 8-conductor modular cable with RJ-45 connectors wired “crossover” (reference color: black, Figure 1).



Comm / Data Cable Construction

① Crossover Wired   Reference color black

DO NOT USE any Ethernet cables.

See Section 8 Parts and Accessories for available cable lengths and part numbers.

Figure 4: IQ Power Connections (Sensor Interface to Control Station through HL Power Supply)

The modular cable plugs into either “SI COMM 1” on Sensor Interface and connector “PS COMM 2” on the HL power supply.

A second modular cable is plugged into either of the HL power supply “PS COMM 1” connectors and one of the “POWER & COMM” connectors on the Control Station.

Modular cables should not be run parallel with static bar high voltage cable. Route modular cables clear of moving machine parts and protect them from abrasion. Secure using nylon wire ties (not included). Do not over-tighten wire ties.

If there is an excess of modular cable, do not coil it in vicinity of static bar high voltage cable. If possible, cut modular cable to length and re-terminate using an RJ-45 connector installed with the same polarization as connector removed (note orientation of rib / wire color sequence to modular connector).

Connecting Sensor Interface with HLC to Control Station

Use the 2.13 meter [7 foot] (black) modular cable supplied with units. Longer cables (not supplied) are available. Cables for the Sensor Interface must be 8-conductor modular cable with RJ-45 connectors wired “crossover” (reference color: black, Figure 1).

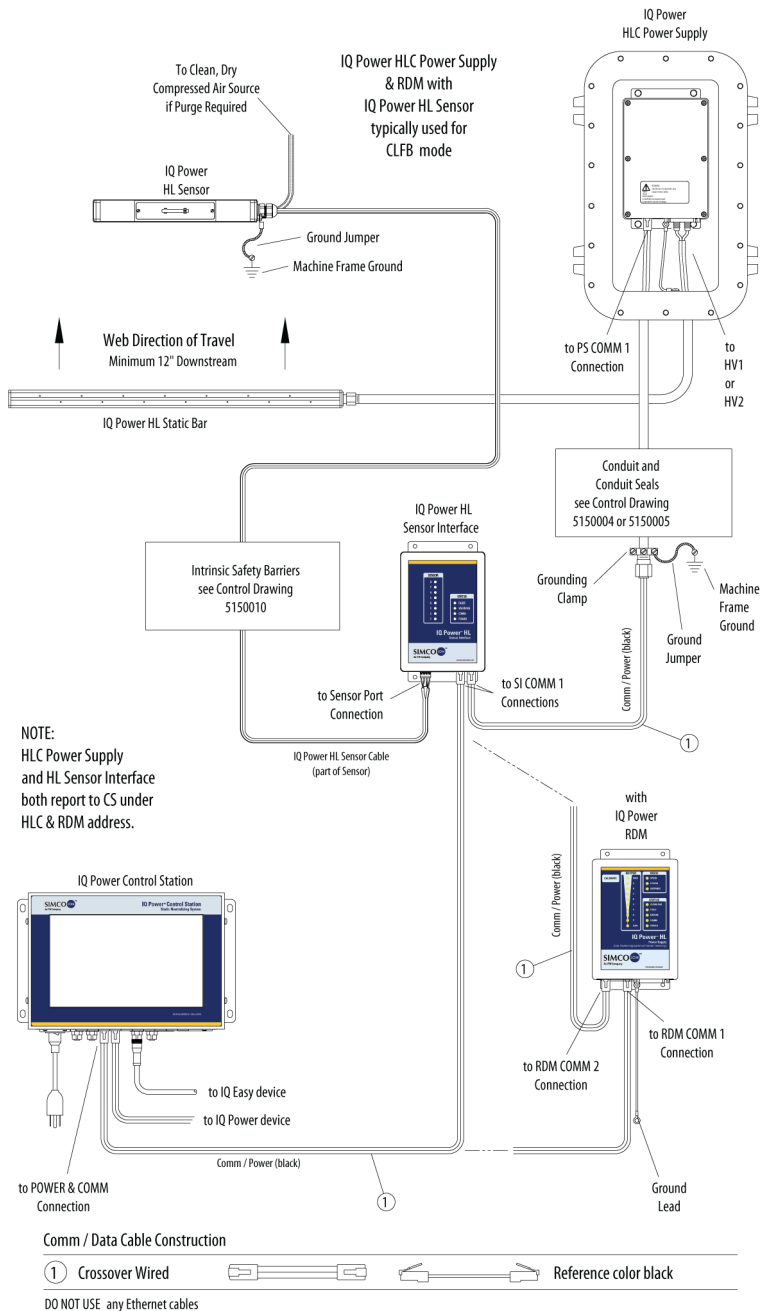


Figure 5: IQ Power Connections (Sensor Interface with HLC to Control Station)

A modular cable is plugged into either of the HLC power supply “PS COMM 1” connectors and either of the “SI COMM 1” connectors on the Sensor Interface.

The second modular cable plugs into the other “SI COMM 1” connector on the Sensor Interface and one of the “POWER & COMM” connectors on the Control Station.

Route modular cables clear of moving machine parts and protect them from abrasion. Secure using nylon wire ties (not included). Do not over-tighten wire ties.

If there is an excess of modular cable, if possible, cut modular cable to length and re-terminate using an RJ-45 connector installed with the same polarization as connector removed (note orientation of rib / wire color sequence to modular connector).

Connect Sensor(s)

The IQ Power HL Sensors are connected to the Sensor Interface through Intrinsic Safety Barriers as per instructions included with units and Control Drawing 5150010.

The 4-position terminal block from the sensor may be plugged into any Sensor Port on Sensor Interface. There are 8 Sensor Ports available.



NOTE – Do not plug two or more sensors with the same Sensor Number into the same Sensor Interface. Duplication of Sensor Numbers on an interface will cause unstable operation and corruption of data.

Sensor Number

Each IQ Power HL Sensor is assigned a Sensor Number. The sensor number may be 1 through 8. The IQ Power HL Sensor comes from the factory with a label on its cable identifying its assigned Sensor Number.

The Sensor Number is used to identify the sensor and data associated with it. When the sensor is connected to an IQ Power Sensor Interface, an indicator will illuminate next to the corresponding Sensor Number. The Sensor Number will also appear on the Control Station display to indicate data received from that specific sensor and adjustments that may be made to that specific sensor.

In connecting sensors to a given IQ Power Sensor Interface, sensor numbers may NOT be duplicated. Connecting multiple sensors with the same Sensor Number to an interface will result in unstable operation and corruption of sensor reporting data.

Each sensor will light an indicator on the Sensor Interface that corresponds to its Sensor Number. If the total number of indicators lit does not match the quantity of sensors connected to the interface, check for a duplication of Sensor Numbers.

The Sensor Number is normally assigned at the factory and a label is applied to the cable end indicating Sensor Number. The Sensor Number may be changed in the field, see procedure 5201257.

Set Up

A variety of information can be checked and operating parameters set for the IQ Power HL Sensor through the IQ Power Control Station via the Sensor tab. Tap on the device icon for the sensor interface or neutralizer to access these pages. Then tap on sensor tab for details about a particular sensor. To edit or select an operating parameter, tap on the pencil icon to right of parameter description.

If a Sensor Interface is to be used with an HLC power supply, they will have to be “paired”. To pair an HLC power supply and Sensor Interface they must have the same Address number. This will require manually setting the Sensor Interface Address number to the same as the HLC power supply. They will appear on the Control Station as a single device with multiple tabs.

Device Name: A user editable name to identify specific Sensor Interface.

Sensor Quantity: The number of sensors connected to sensor interface.

Mounting Distance: A user entered dimension, the spacing between face of sensor and web (surface being measured). The factory default mounting distance is 4” (100 mm).



NOTE – This information (Mounting Distance) **MUST** be correct. It is used by the sensor for calibration. If this information is not correct, the sensor calibration will be incorrect.

Average: The average web voltage of all sensors connected to interface. If the Sensor Interface is paired with a static neutralizer, the average for CLFB (Closed Loop Feedback) will also be displayed.

Sensors for CLFB: If Sensor Interface is paired with a static neutralizer, the sensors selected for CLFB will be displayed by their sensor number. The user selects these sensors.

System Priority (Sensor Technology 2.0): Allows setting digital communication to prioritize neutralizer data for typical operation or to prioritize sensor data for applications where response to static charge levels is critical.

Warning Setpoint: The web voltage level at which the sensor will set a “Warning” and display an alarm icon on Control Station display. The factory default value is 5 kV, however this value may be user adjusted.

Fault Setpoint: The web voltage level at which the sensor will set an “Alarm” and display an alarm icon on Control Station display. The factory default value is 20 kV, however this value may be user adjusted.

Web Voltage Sensor x: The web voltage from sensor “x”, where “x” is the sensor number.

Calibration Date Sensor x: The date sensor “x” was calibrated, where “x” is the sensor number also reports the firmware revision in the sensor assembly circuit board.

Up Time: The amount of time that sensor interface has been up and running.

Device Address: The address of Sensor Interface, a number 1 thru 10, used by the Control Station to differentiate devices and also used to define association between devices.

Device Version: The firmware revision in interface circuit board.

Device Locator Utility: Causes indicator lights on the device (Sensor Interface) to flicker for a brief time to aid in verifying location of a given device.

Alarm Test Utility: Causes an alarm output to aid in checking / troubleshooting alarm sensing connections.

Closed-Loop Feedback (CLFB) Mode: The IQ Power HL Sensor can be used as part of a closed-loop feedback system to control an IQ Power Static Bar. In this configuration the ion output from the static bar is optimized to provide the best possible web neutralization. If the IQ Power HL Sensor is connected to the system through a static neutralizing power supply (HL or HLC & RDM), the sensor will automatically be paired with the neutralizer and a sensor tab will appear on the page for the neutralizer. Pairing may also be achieved manually by changing device address of the Sensor Interface to the same number as the neutralizer address. Setting the Operation Mode to CLFB (closed-loop feedback) is performed on the Static Bar device page, under the Neutralizer tab. In this operating mode, the static neutralizing bar **MUST** be upstream (before) the sensor.



NOTE – In CLFB, communication System Priority will automatically set to “Neutralizer”.

5. OPERATION



NOTE – Before switching on power; ensure units are properly grounded and the Sensor, Isolation Barriers & Sensor Interface are all properly installed.

Operation of Sensor Interface is controlled through the IQ Power Control Station. In operation, a device icon appears on the IQ Power Control Station Home Page. Tapping on the device icon for the sensor interface enters a page a tab containing information about each sensor. This includes descriptive information such as the device name and firmware revision levels. User inputs such as the sensor mounting distance (critical for correct calibration), warning and alarm set points, device name and add'l info. Output information includes web voltage for each sensor. Warning and alarm outputs are also included in these pages.

Sensor Interface Indicators

Power: Lights (green) to indicate power is applied to interface.

Comm: Lights (green) to indicate digital communication is established with an IQ Power Control Station.

Warning: Lights (yellow) to indicate the user adjustable web voltage warning set point is being exceeded. The (green) light next to the Sensor number for the associated sensor will also blink. This is a non-latching feature; the indicator light will go out when web voltage drops below the warning set point.

Fault: Lights (red) indicates the user adjustable web voltage alarm set point is being exceeded. The (green) light next to the Sensor number for the associated sensor will also blink. This is a non-latching feature; the indicator light will go out when web voltage drops below the alarm set point.

The Fault indicator will flicker to indicate a communication failure or sensor failure.

Sensor: Lights (green) to indicate sensor(s) connected to the interface. The number associated with the lit indicator is the Sensor Number for the sensor(s) connected.

System Priority: Selection of system data communication priority is available through the IQ Power Control Station (with Sensor Technology 2.0). One mode prioritizes neutralizer data, which is appropriate for typical operation and required for CLFB operation. The other mode prioritizes sensor data and alarms, which would be used in applications where response to changing static charge levels is critical. To adjust the system priority access the Sensor tab on the Control Station and select the desired button.

6. MAINTENANCE



NOTE – Turn off power to Sensor Interface before performing any maintenance.

Cleaning

Clean sensor interface using a lint-free wiper moistened (but not saturated) with a 50/50 mix of isopropyl alcohol and water. Avoid soaking face label and electrical connectors. Allow sensor interface to dry completely before applying power.

7. TROUBLESHOOTING



NOTE – Only qualified personnel are to perform troubleshooting tasks.

Problem	Cause	Solution
Power indicator on interface NOT illuminated	No supply voltage from Control Station	Turn on Control Station Change POWER & COMM connection at Control Station
	Wiring problem between interface and Control Station	Check wiring for cuts or breaks Check connectors for disconnection
Warning indicator on interface illuminated and a sensor number indicator is blinking*	Interface is in “Warning” (web voltage above Warning Setpoint)	Correct problem causing high web voltage Increase Warning Setpoint to eliminate nuisance warning
Fault indicator on interface illuminated and a sensor number indicator is blinking*	Interface is in “Alarm” (web voltage above Alarm Setpoint)	Correct problem causing high web voltage Increase Alarm Setpoint to eliminate nuisance alarms
Fault indicator on interface flickering (Comm indicator illuminated)*	Internal fault in interface	Cycle power to interface to see if fault clears

Fault indicator and sensor number indicator on interface are flickering (Comm indicator illuminated)*	Wiring problem between sensor and interface	Check sensor wiring for cuts or breaks Check connectors for disconnection
	Problem with sensor module	Disconnect sensor and cycle power to verify if sensor is the problem Repair or replace defective sensor
Comm indicator on interface NOT illuminated	Wiring problem between interface and Control Station.	Replace interface modular cable with known good cable
Incorrect number of Sensor indicators are illuminated on interface Ex: 3 sensors connected, only 2 Sensors LEDs lit	Duplicate sensor numbers	Check sensor numbers for duplication. See 5201257 for changing sensor number

* If Warning or Alarm is activated, see Control Station and tap on Warning / Alarm icon for details.



NOTE – Device power input is protected by an internal fuse identified as F1 that is replaceable only by qualified service personnel. Use cartridge-type fast acting 5x20 mm fuses rated 125V, 4A only (such as Little Fuse 0235004, HXP or equivalent).



NOTE – Device sensor ports are protected by internal fuses identified as F2-F9 that are replaceable only by qualified service personnel. Use radial time-lag type fuses rated 250V, 250 mA only (such as Little Fuse 37402500410 or equivalent).

8. PARTS & ACCESSORIES

Part Description	Part Number
IQ Power HL Sensor Interface	4016498
Modular Cable (IQ Power 8-conductor, crossover wired, RJ-45) for use between Sensor Interface and other IQ Power devices. DO NOT USE Any Ethernet Cables (Figure 1)	
0.91 meter [3 foot] black	4520785
2.13 meter [7 foot] black	4520786
4.27 meter [14 foot] black	4520787
7.62 meter [25 foot] black	4520784
15.24 meter [50 foot] black	4520844
22.86 meter [75 foot] black	4520845
30.48 meter [100 foot] black	4520832

9. WARRANTY & SERVICE

This product has been carefully tested at the factory and is warranted to be free from 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 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.

Information in this publication supersedes that in all previous published material.

Specifications are subject to change without notice.

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