

IRIS Room Ionization System Operation and Maintenance Instructions



Made in the
United States of America



Figure 1. EMIT IRIS Power Supply



Figure 2. EMIT IRIS Tablet PC with TEAM5 IRIS Client Software

Description

The EMIT Intelligent Room Ionization System (IRIS) neutralizes electrostatic charges in an entire cubic volume of a room environment. Applications for IRIS include Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA).

Electrostatic Discharge is the presence of excess charge on a surface which can create an electrostatic field that causes the formation of a spark and damages microelectronic components. IRIS creates a static protective environment for ESD sensitive items by reducing static charges on surfaces. Controlling surface charge and static contamination is a key component of optimum product handling procedure in a high yield environment.

Electrostatic Attraction is the presence of charged surfaces that accelerate the deposition of particles of opposite polarity, accelerating contamination within the environment. IRIS reduces particle charge and surface charge. Without mutual attraction, a particle will remain suspended in the airflow, moving harmlessly by the process and exiting through the air handler of the clean room.

| Item | Description |
|-------|--|
| 50849 | IRIS Power Supply |
| 50879 | IRIS Tablet PC with TEAM5 IRIS Client Software |

The EMIT IRIS Room Ionization System meets the ANSI/ESD S20.20-2007 required limit less than ± 150 volts offset voltage (balance) tested in accordance with ANSI/ESD STM3.1 for room ionization systems. Per S20.20 Discharge Time required limits are "user defined". Compliance Verification per ANSI/ESD S20.20 is to be per ESD TR53 using a Charged Plate Monitor or a SP3.3 Ionization Test Kit.

ANSI/ESD S20.20 section 6.2.3.1 Protected Areas Requirement states: "Ionization or other charge mitigating techniques shall be used at the workstation to neutralize electrostatic fields on all process essential insulators if the electrostatic field is considered a threat." Air ionization can neutralize the static charge on insulators (which cannot be grounded) and isolated conductors (which are not grounded) by producing separate charges in the molecules of the gases of the surrounding air. When an electrostatic charge is present on objects in the work environment, it will be neutralized by attracting opposite polarity means of charges from the ionized air. Note that ionization systems should not be used as a primary means of charge control on conductors or people [Reference: EN 61340-5-2 clause 5.2.9].

Features and Components

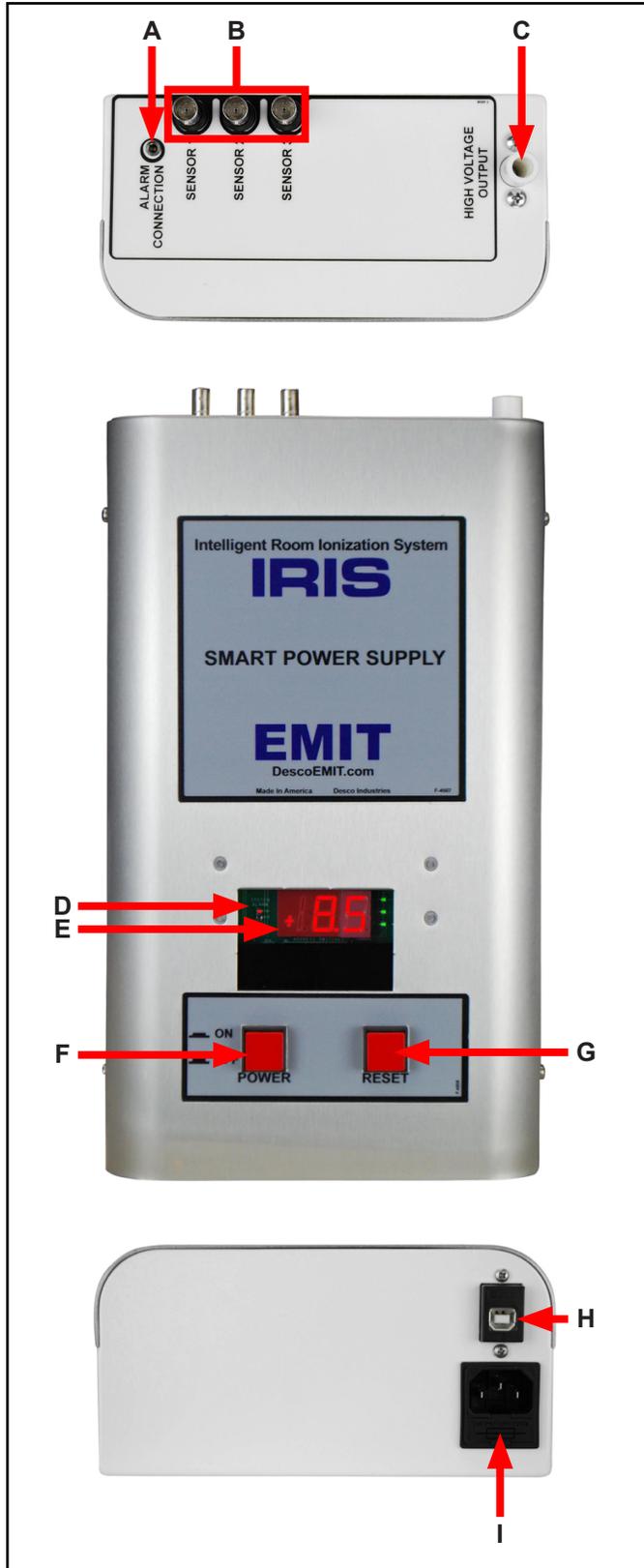


Figure 3. IRIS Power Supply features and components

A. Alarm Connection: May be connected to an external buzzer or light fixture. Contact EMIT Customer Service for more information.

B. Sensor Ports: 3 sensors are used to monitor the stability of each zone.

C. High Voltage Output: Provides power to the ion bars.

D. Alarm LED: Illuminates red and sounds buzzer when one of the following alarm conditions are met:

- IRIS Power Supply malfunction
- Communication lost between the IRIS Power Supply and IRIS Tablet PC

E. LCD Display: Displays current output voltage.

F. Power Switch: Powers the Power Supply.

G. Reset Switch: Resets the Power Supply's alarm.

H. IRIS Computer Tablet USB Port: Connect to the TEAM5 IRIS Computer Tablet using this port.

I. IEC Power Cord Inlet: Connect the power cord here.

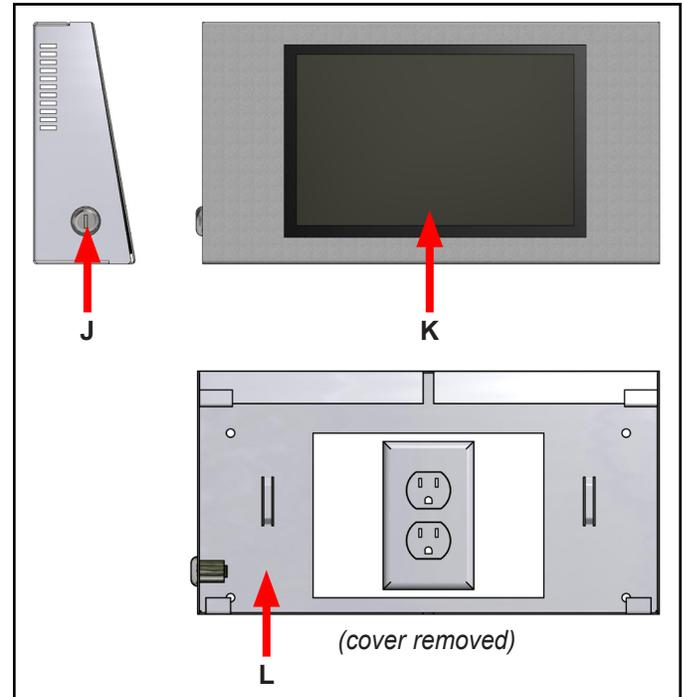


Figure 4. IRIS Tablet PC features and components

J. Key Lock: Secures the enclosure shut and prevents any tampering to the tablet PC's connections.

K. Touchscreen Tablet PC: Runs the TEAM5 IRIS Client Software.

L. Backplate: Use the cut-out to mount the backplate over a power outlet and prevent any tampering to the power plugs.

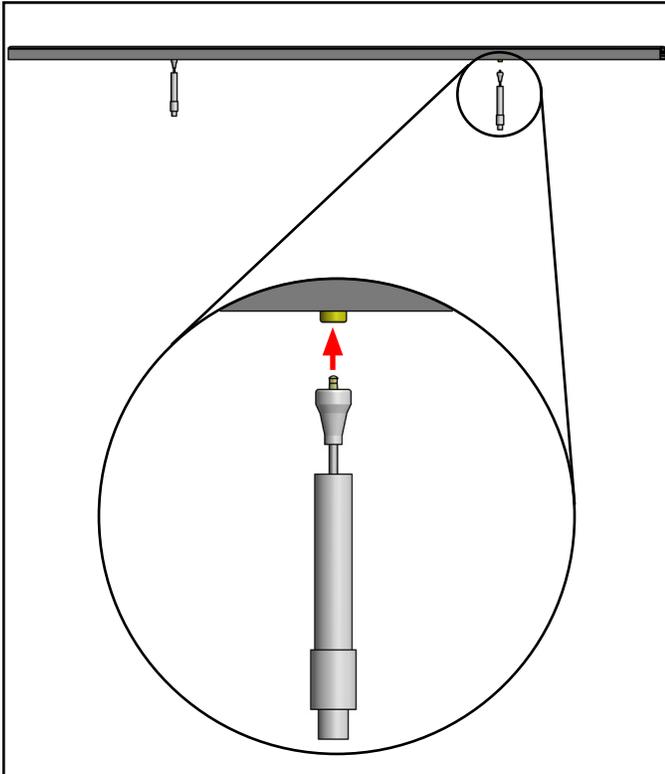


Figure 5. IRIS Ion Bar and Emitter

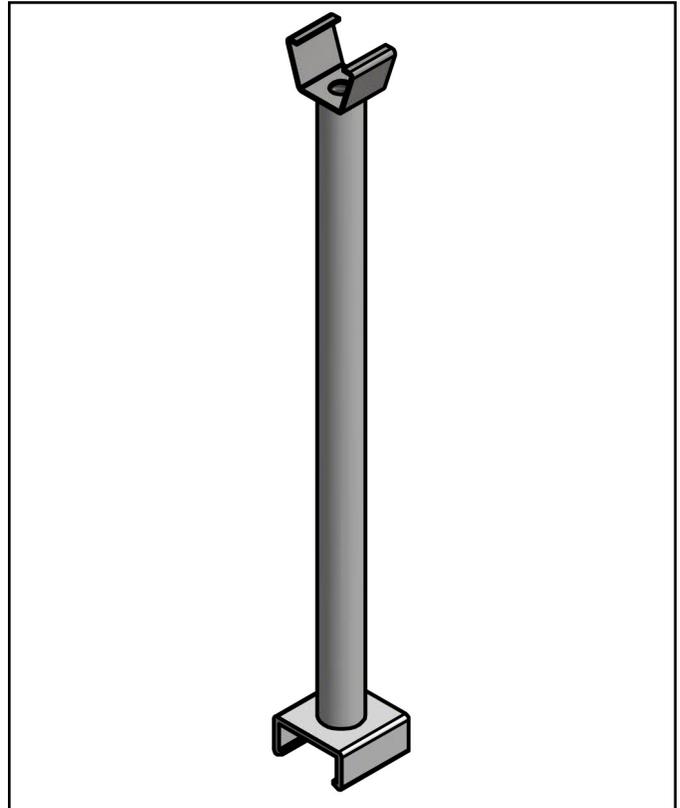


Figure 7. IRIS Ion Bar Hanger

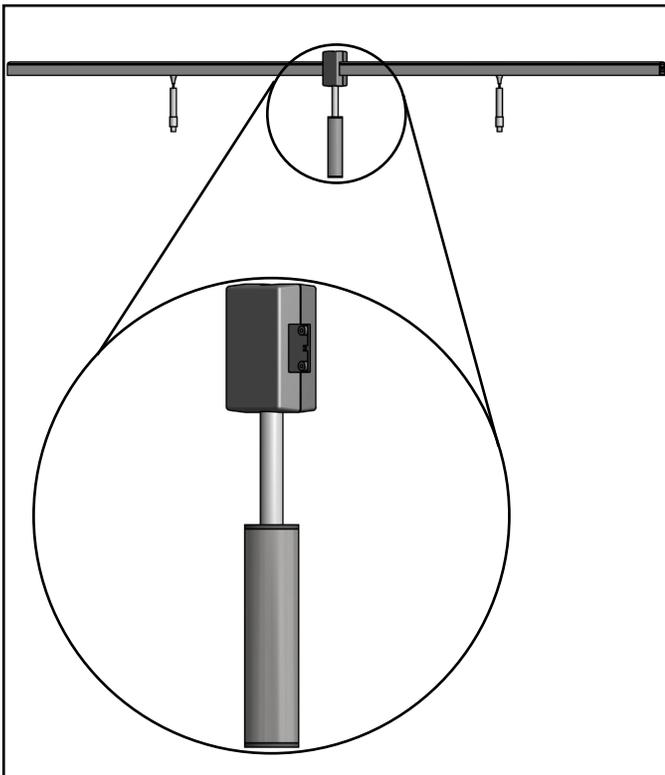


Figure 6. IRIS Ion Bar and Sensor

Zone Setup

Each IRIS Zone is supported by one IRIS Power Supply. The power supply can power and control up to 300 overhead mounted emitters covering approximately 5,200 square feet. Standard ABS components and a modular design allow the emitters to be configured to fit most pre-existing rooms. Each emitter produces bi-polar ionization resulting in stable ion production when in use.

Each IRIS Zone is independently controlled by TEAM5 IRIS Client Software. TEAM5 IRIS Client Software logs all significant events to a database for ongoing analysis and for compliance with ISO-9000 and ANSI/ESD S20.20 requirements.

Total ion concentration is controlled by changing the voltage levels and length of pulse. Higher voltage and longer overall pulse duration will produce a greater number of free air ions. Ion offset voltage balance is set to an optimal point by controlling the "ON" time ratio between positive and negative pulses to the emitter point.

Installation of the ionization system consists of conduit bars attached to the ceiling of the room with stainless steel brackets. These brackets attach to standard 2' x 4" drop ceiling frames with or without HEPA filters. The brackets and hangers are mounted to allow the changing of lights and filters with minimal interference.

Zone Monitoring and Feedback

Each IRIS power supply incorporates 3 external sensors to provide feedback to monitor stability of each zone. Each sensor is assigned an alarm threshold. The stability of each zone is controlled by the set duration of power to each emitter. During the initial calibration process, the power state is adjusted manually via the TEAM5 IRIS Client Software while monitoring the work environment with a Charge Plate Monitor until the desired conditions are achieved. The duration of each power state is recorded and saved during calibration. These values are then used by the client computer to control the power supply during normal use.

A sensor alarm is triggered if the sensor or power values deviate from the saved calibration value by more than the selected alarm range percentage. A “soft alarm” alerts the system operator of the issue without turning off the IRIS system. A “hard alarm” alerts the system operator of the issue and turns off the IRIS power supply. A tolerance threshold can be set to alarm whenever the room system’s performance shifts too far from its calibrated values. Sensors may be disabled due to unordinary maintenance or activity in clean room.

Maintenance

Periodic maintenance including general cleaning, emitter pin cleaning and recalibration may be necessary. All power supplies must be turned off before any maintenance procedures are taken. The conduits and housings may be wiped clean using an all purpose cleaner (make sure that all cleaners used are consistent with requirements of the controlled environment/ cleanroom and ESD Protected Area). The emitter points should be cleaned using a swab dampened with Isopropyl.

TEAM5 IRIS Client Software

The IRIS Power Supply is controlled by a serial communication line hard wired to the IRIS Tablet PC with TEAM5 IRIS Client Software. TEAM5 IRIS Client Software monitors and displays the feedback from each of the three sensors and the high voltage output from the power supply. TEAM5 IRIS Client Software is used to set calibration profiles. A “Factory Default” profile will be set at the time of the initial install of IRIS. Additional profiles may be added and saved.

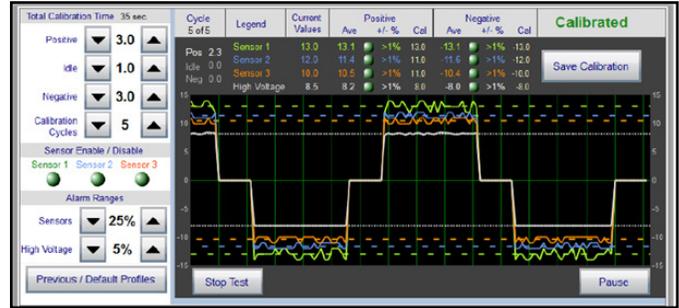


Figure 8. TEAM5 IRIS Client Software screenshot



Figure 9. TEAM5 IRIS Client Software in operation on the IRIS Touchscreen Tablet PC

TEAM5 IRIS Server Software

TEAM5 IRIS Server Software allows for each zone to be monitored remotely. TEAM5 IRIS Client and TEAM5 IRIS Server communication takes place over a local area network (LAN). Multi-zone power cycle synchronization allows multiple zones in the same room/ area to be coordinated for optimal performance.

Design and Installation Quotes

EMIT includes application, engineering and sales consulting with each IRIS installation. Each IRIS is designed to provide a solution for particular needs of a controlled environment. This includes accurately estimating the cost (purchase, installation, and maintenance) and layout of the system. With the quote, EMIT will provide layout drawings, system specifications and certifications, detailed parts lists and installation project plans. EMIT works directly with its Chino, CA factory to coordinate delivery schedules and installation. IRIS support is provided throughout its ownership.

For more information, please [click here](#) and complete an IRIS Referral Form.

Specifications

Description:

Single-wire, bipolar, corona ionization system conforming to ANSI/ESD S20.20, tested per ANSI/ESD STM3.1 and ESD TR53

Charge Decay (Discharge Time):

$\pm 1000V$ to $\pm 100V$ in 300 seconds or less (60 seconds typical)

Input Voltage:

90VAC to 260VAC, 47 to 63Hz, 65 W

Input Connector:

IEC 60320-1 C-14

Open Circuit Output Voltage:

0 kVDC to 10 kVDC $\pm 5\%$

Short Circuit Output Current:

200 μA MAX digitally controlled, additional current limitation via 100 megohm series resistor

Emitter Capacity:

300 per power supply (5,200 square foot area)

Emitter Control:

Fully programmable, 0-99.9 second ionization ON cycle for each polarity with selectable quiescent periods between cycles

Power Supply Indicators:

Power ON, alarm, positive and negative voltage output and neutral delay

Zone Sensors:

Independent, cylindrical detectors with BNC connectors, RG58 or equivalent cabling (provided)

Power Supply Weight:

30 lbs (14 kg)

Offset Voltage (Balance):

$< \pm 150V$ per ANSI/ESD S20.20-2007

Calibration:

Semi-annual calibration recommended

Tablet PC Operating System:

Windows 10 Pro

IRIS Amendment

EMIT IRIS installation includes:

- Installation
- Configuration
- Calibration

The performance of the EMIT IRIS – Intelligent Room Ionization System is directly related to uniform airflow throughout the area being ionized. Minimum laminar airflow of 70 FPM and distance from emitter to test surface of 5' is necessary to enable the system to meet Offset Voltage (Balance) and Voltage Decay (Discharge Times) performance specifications. In the event that minimum environment specifications cannot be met, some system modification may be required. In addition, some large objects (machines, etc.) may have a significant effect on the ionization performance in the vicinity of the objects.

Upon completion of IRIS Installation, IRIS will be calibrated to the required limits of ANSI/ESD S20.20-2007 with offset voltage of less than $\pm 150V$, as well as predetermined decay times agreed upon by both customer and EMIT tested per ESD TR53. Any changes to the environment of the IRIS installation Scope of Work after the installation may require modifications and recalibration. This includes and is not limited to airflow changes to the environment, layout changes (including work benches and machinery). All ionizers require periodic maintenance, emitter pin cleaning, and recalibration. Associated costs are not included in the original purchase price. All testing and recalibration of the IRIS performed after installation will be quoted to the customer for parts and labor separately from the initial Quotation and Purchase Order.

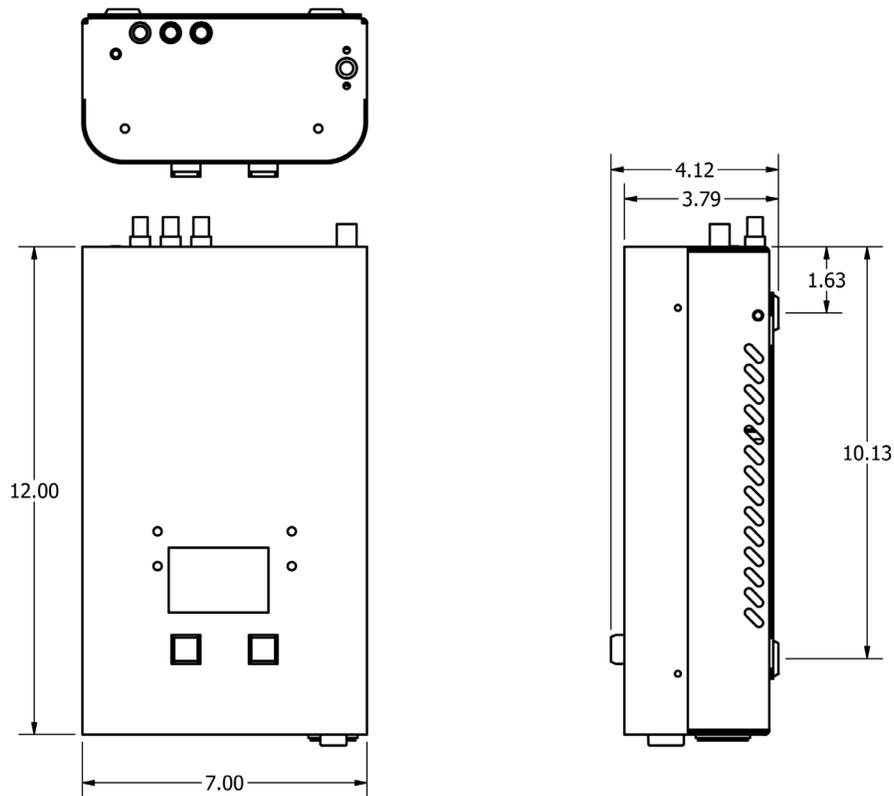


Figure 10. IRIS Power Supply overall dimensions (inches)

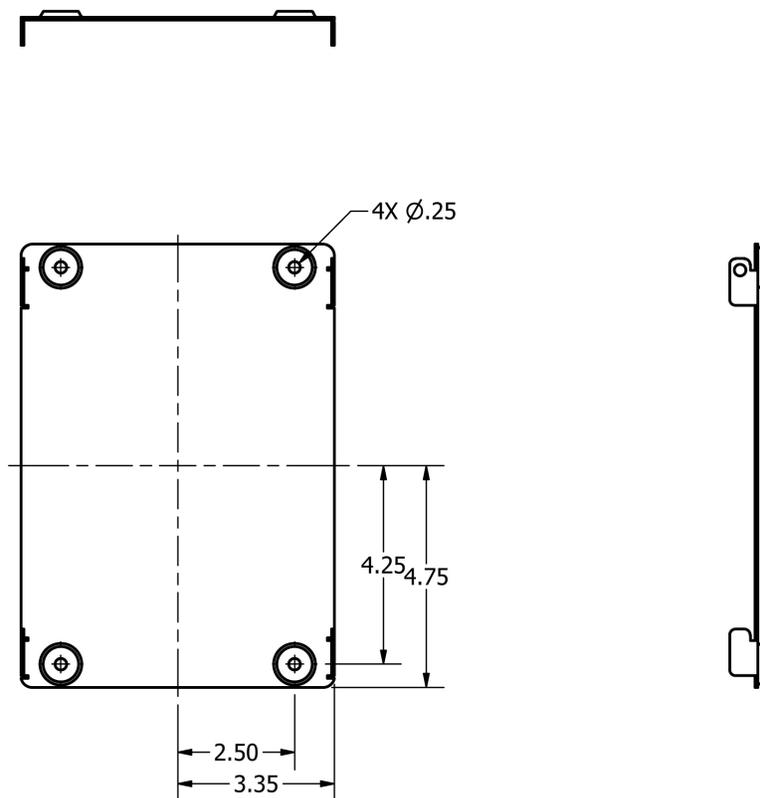


Figure 11. IRIS Power Supply mounting bracket dimensions (inches)

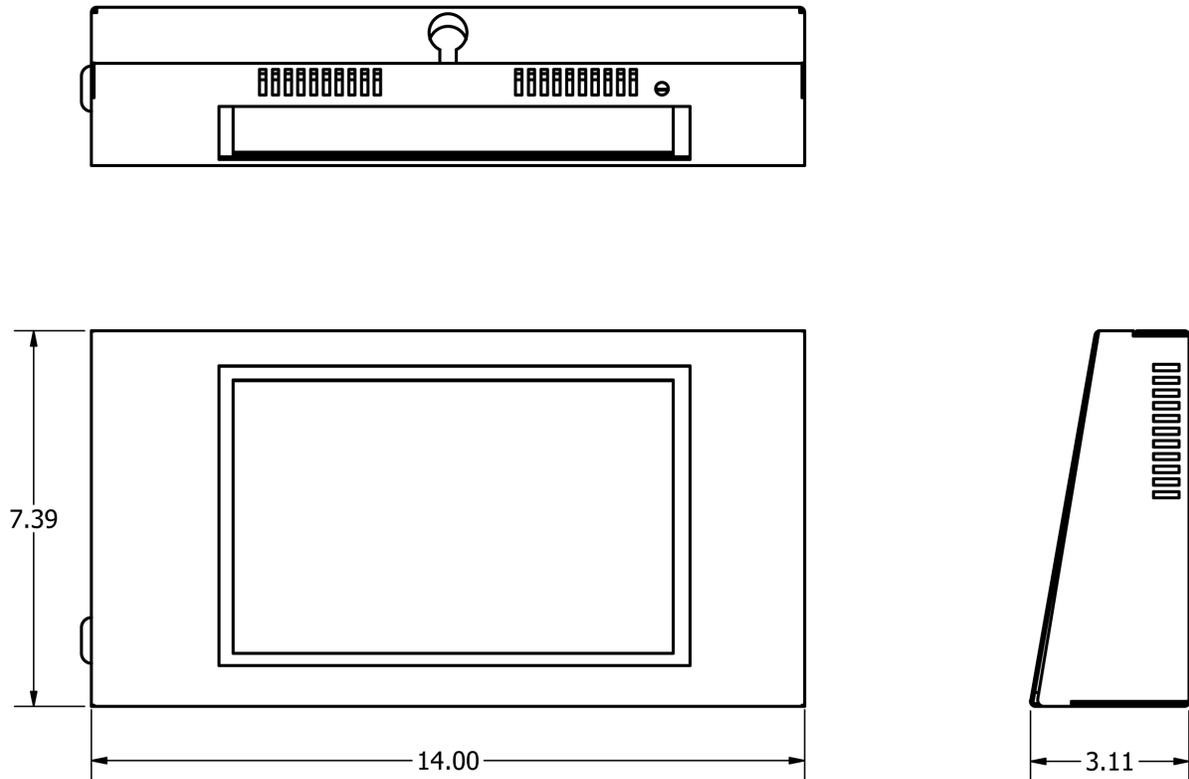


Figure 12. IRIS Tablet PC overall dimensions (inches)

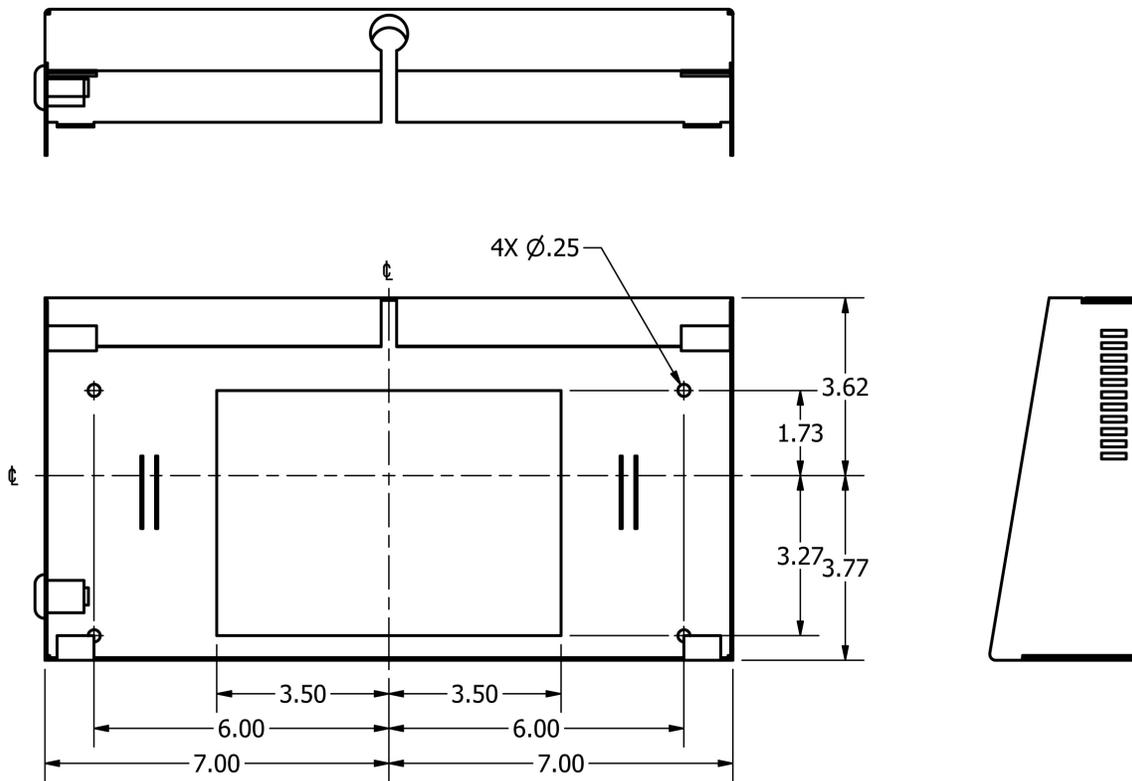


Figure 13. IRIS Tablet PC mounting bracket dimensions (inches)

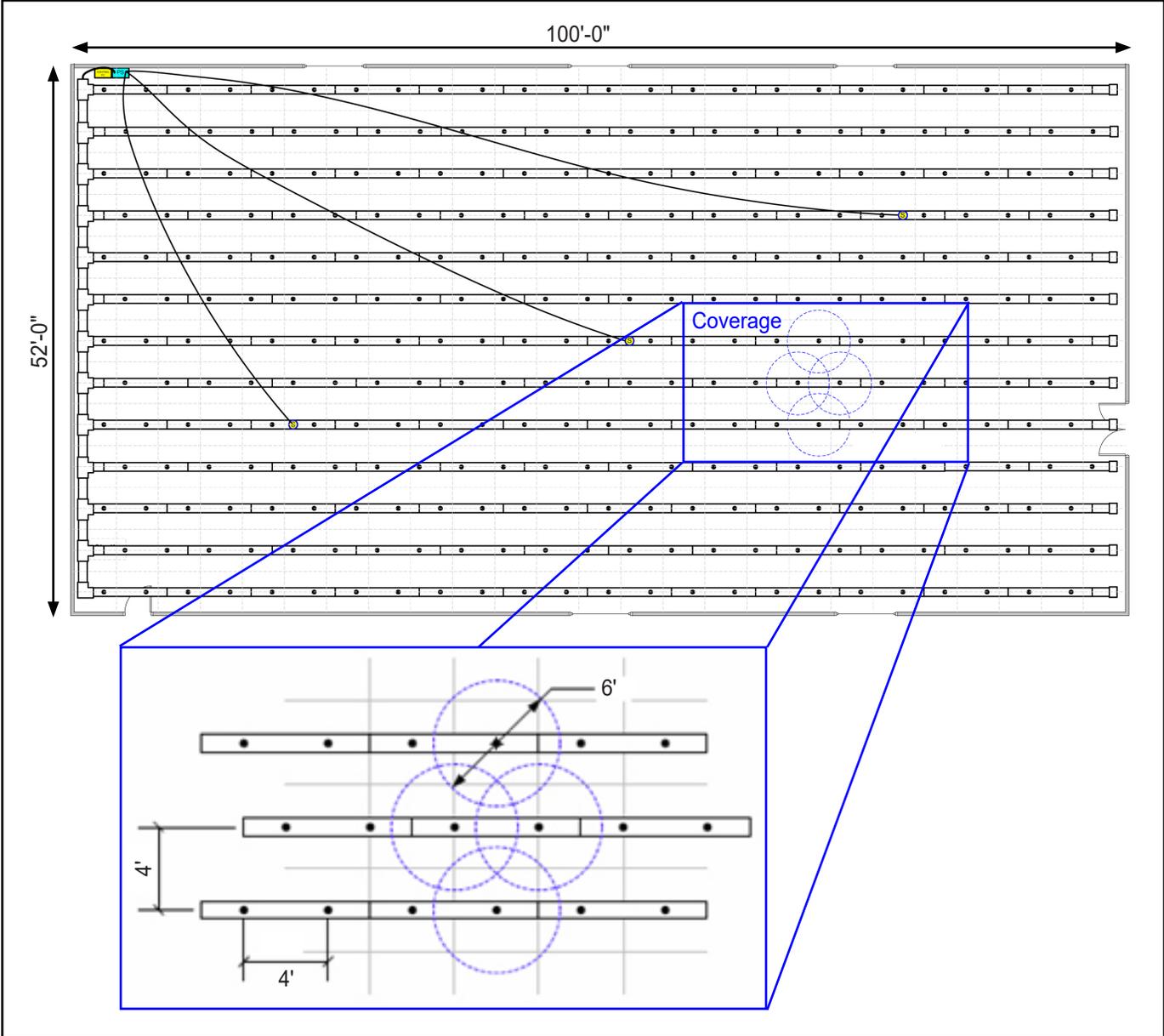


Figure 14. Average room coverage of 5,200 square feet

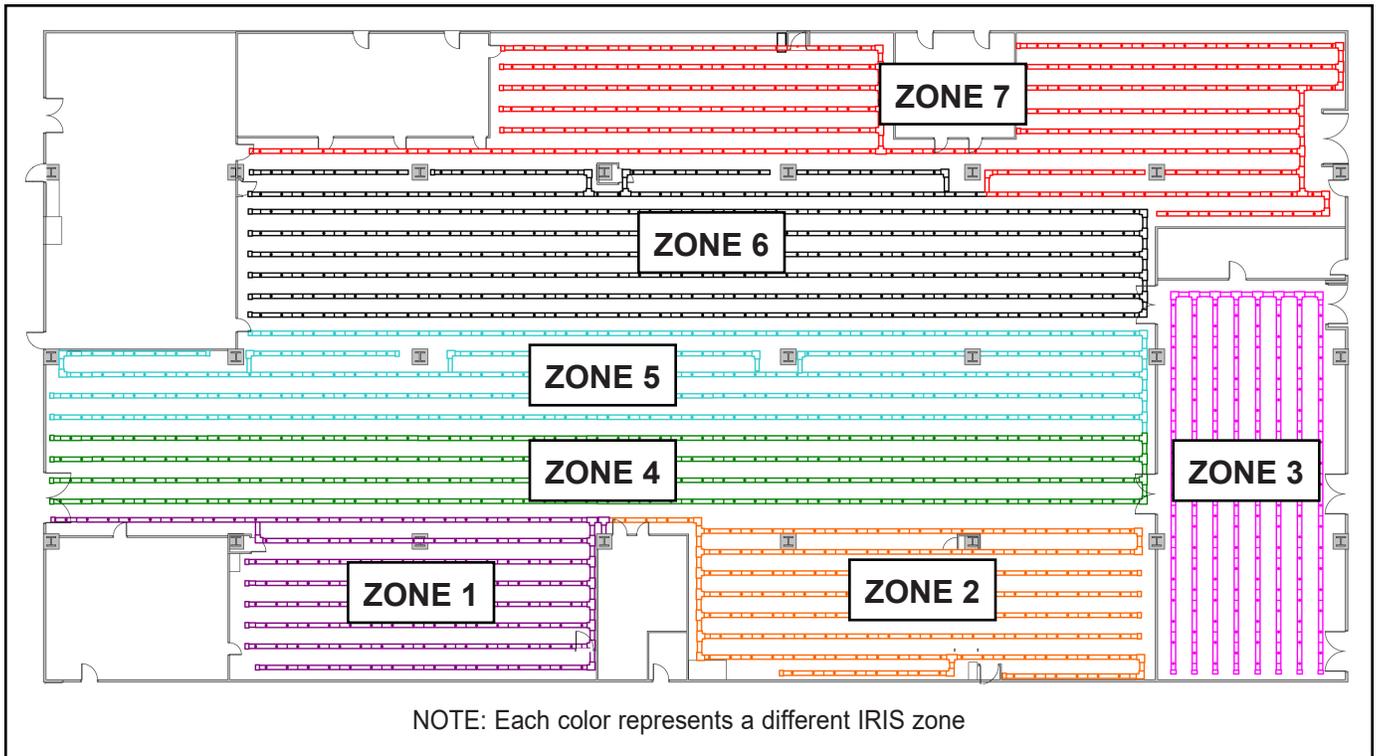


Figure 15. IRIS room layout with 7 zones

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

See the EMIT Warranty - <http://EMIT.DescoIndustries.com/Warranty.aspx>