

## Ultra Low Voltage Monitor Installation, Operation and Maintenance



Made in the  
United States of America



Figure 1. EMIT 50580 Ultra Low Voltage Monitor with Remotes.

### Description

The patented\* EMIT Ultra Low Voltage Monitor provides continuous ground monitoring of two operators, two supervisors, two worksurfaces and two tool grounded stations using dual polarity resistive loop technology. This technology allows the operator to typically be near zero volts with respect to equipment ground. The Ultra Low Voltage Monitor is unaffected by capacitance variations associated with personnel and environmental conditions. This monitor has two charge detection indicators that monitor voltage on the operators' circuits.

Continuous Monitors pay for themselves improving quality, productivity, eliminating wrist strap daily testing and test result logging. Per ANSI/ESD S1.1 section 6.1.3 Frequency of Functional Testing "The wrist strap system should be tested daily to ensure proper electrical value. Daily testing may be omitted if constant monitoring is used." Per ESD Handbook ESD TR20.20 section 5.3.2.4.4 "Typical Test programs recommend that wrist straps that are used daily should be tested daily. However, if the products that are being produced are of such value that knowledge of a continuous, reliable ground is needed, and then continuous monitoring should be considered or even required."

### EMIT SIM Software

The EMIT Ultra Low Voltage Monitor is compatible with EMIT SIM Software. EMIT SIM provides a platform to monitor and record the activity of your EMIT Smart Products. Save costs by using EMIT SIM to eliminate the need to rely on people to physically check the status of continuous monitors and ionizers every day. This software also features tools for generating activity reports and calibration / maintenance schedule management.



[Click here](#) to learn more.

### Packaging

- 1 Ultra Low Voltage Monitor
- 2 Remotes
- 1 Power Adapter, US Plug  
(12VDC @ 500 mA, center positive)
- 2 Dual-Wire Elastic Wrist Straps
- 1 Snap Kit
- 2 Operator Modular Cables (Grey)
- 2 Mat Ground Cords (Black and White)
- 2 Tool Ground Cords (White)
- 1 Monitor Ground Cord (Green with Yellow Stripe)
- 1 Certificate of Calibration

### Features and Components

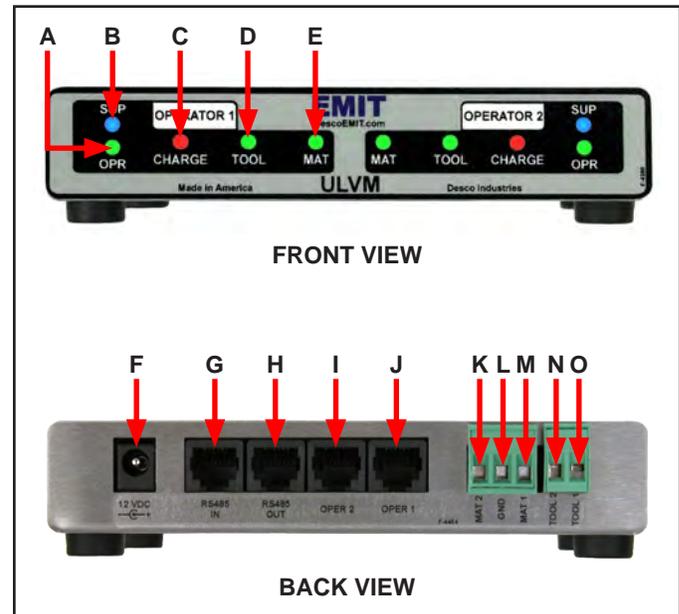


Figure 2. Ultra Low Voltage Monitor features and components.

### ULTRA LOW VOLTAGE MONITOR (See Figure 2)

The following features apply to both the OPERATOR 1 and OPERATOR 2 circuits of the monitor.

**A. Operator LED:** When the LED is illuminated green, the operator is properly grounded. When the LED is illuminated red and the alarm sounds, the operator is not properly grounded. The LED illuminates orange when the wrist cord is properly parked onto the remote's parking station.

**B. Supervisor LED:** If the supervisor is plugged in and the operator is not, the blue LED will blink and alarm will sound. When the LED is illuminated a continuous blue, the supervisor is properly grounded. When the LED blinks and the alarm sounds, the supervisor is not properly grounded.

\*US patents 6,052,053 and 6,205,408

**C. Charge LED:** When the LED is off, the charge is < 2.5 VDC. When the LED is illuminated red and the alarm sounds, the charge is > 2.5 VDC.

**D. Tool LED:** When the LED is illuminated green, the tool is properly grounded. When the LED is illuminated red and the alarm sounds the tool is not properly grounded.

**E. Mat LED:** When the LED is illuminated green, the worksurface mat is properly grounded. When the LED is illuminated red and the alarm sounds, the worksurface mat is not properly grounded.

**F. Power Jack:** Connect the included 12VDC power adapter here.

**G. RS-485 IN:** Software communication input. To be used with EMIT SIM Software for real time data acquisition.

**H. RS-485 OUT:** Software communication output. To be used with EMIT SIM Software for real time data acquisition.

**I. Operator 2 Remote Jack:** Connect the grey operator modular cable from remote 2 here.

**J. Operator 1 Remote Jack:** Connect the grey operator modular cable from remote 1 here.

**K. Mat 2 Terminal:** Monitors worksurface mat 2.

**L. Ground Terminal:** Common ground point for the monitor. Connect the green and yellow ground cord here.

**M. Mat 1 Terminal:** Monitors worksurface mat 1.

**N. Tool 1 Terminal:** Monitors tool station 1.

**O. Tool 2 Terminal:** Monitors tool station 2.

**A. Monitored Supervisor Jack:** Where the supervisor inserts the wrist cord plug.

**B. Monitored Operator Jack:** Where the operator inserts the wrist cord plug.

**C. Dual 4mm Parking Station:** Once the wrist cord is parked, the corresponding Operator LED will remain green for approximately 3 seconds and will then illuminate orange. While parked, the wrist cord disables the alarm, allowing the operator to leave the workstation.

**D. Operator Remote Jack:** Connect one end of the grey operator modular cable here. The other end is to be connected to the corresponding operator remote jack located at the back of the monitor.

## Installation

1. Remove the monitor from the carton and inspect for damage.
2. Determine the mounting location of the Ultra Low Voltage Monitor. The front panel should be visible to both operators.
3. Determine the mounting locations of the operator remotes. Make sure to place the remotes at a distance that enables its leads to reach the monitor.
4. Install the remotes to the workbench or another surface using the provided screws.

**NOTE:** The Ultra Low Voltage Monitor remotes are configured differently from other EMIT remotes. Be sure to only use the remotes that were packaged with your Ultra Low Voltage Monitor.

5. Attach the tinned wire ends of the mat cords to their appropriate screw terminal block connection located on the back of the unit (see Figures 2 and 4). The white cord is for OPERATOR 1 and the black cord is for OPERATOR 2.

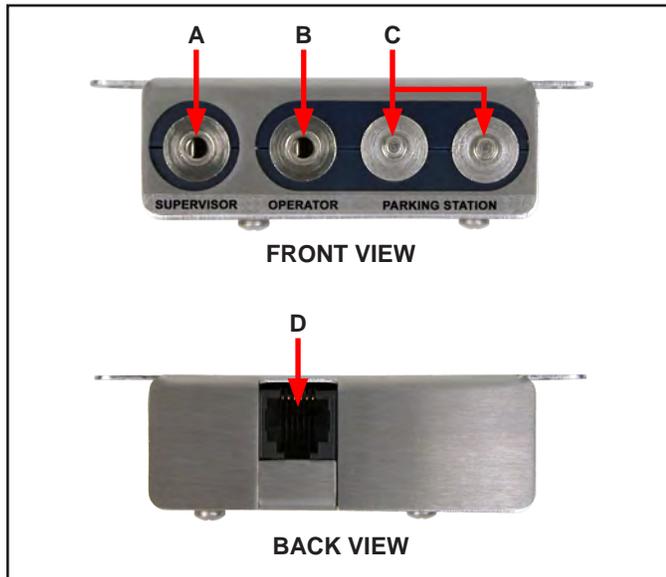


Figure 3. Remote features and components.

## REMOTE (See Figure 3)

The following features apply to both remotes included with the Ultra Low Voltage Monitor.

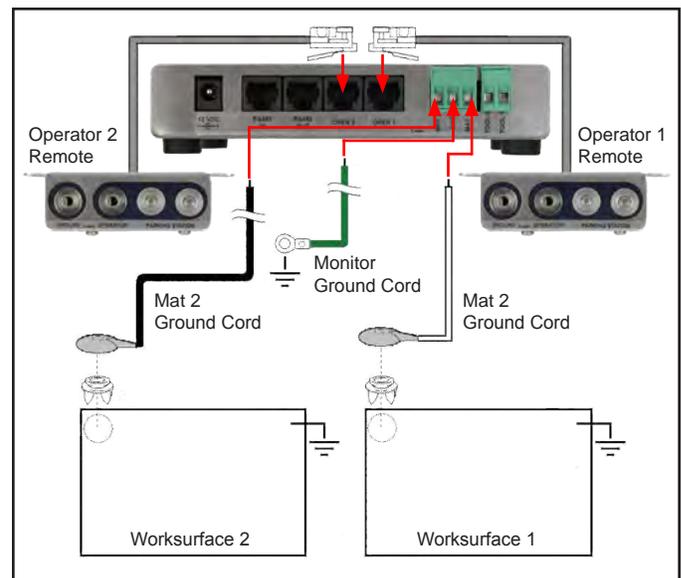


Figure 4. Installing the Ultra Low Voltage Monitor and Remotes.

6. Route the hard-wired mat monitor cords from the back of the monitor to the snaps attached to the ground mats. Snap the white mat ground cord to the properly grounded OPERATOR 1 mat and the black mat ground cord to the properly grounded OPERATOR 2 mat.
7. Attach the tinned wire end of the green and yellow ground cord to the screw terminal labeled "GND" on the back of the monitor. Attach the ring terminal end to a ground point. It is important that this ground cord is attached to a different ground point than that of the worksurface mats. The face plate screw of a grounded AC wall outlet may provide a convenient connection point.
8. Insert the modular plugs of each remote cord into their appropriate modular jacks located on the back of the unit (see Figures 2-4).
9. Connect the DC power supply to the power jack located on the back of the unit. Route the wire from the supply to a nearby AC outlet and plug the power supply into the outlet. Make sure the voltage and frequency match those listed on the power supply. The monitor is now powered.
10. Once powered, the monitor will cycle through all of its LEDs.

## Operation

### USING THE MONITOR

**NOTE:** Elastic wrist straps are only compatible with the default operator test voltage of 200 mV. Metal wrist straps must be used if the operator test voltage is programmed to 100 mV or 50 mV. Apply an approved dissipative hand lotion such as [Menda Reztore™ ESD Hand Lotion](#) to your wrist prior to use for optimum results.

1. Plug a wrist strap cord, not attached to the wristband, into the monitored jack labeled OPERATOR located on the remote (See Figure 3). This automatically activates the selected operator channel. The corresponding operator LED should illuminate red and the alarm should sound on the monitor.
2. Remove the charges from your body by making contact with a properly grounded ESD worksurface. Snap the cord to the wristband, and fit it snugly onto your wrist. This should silence the audible alarm and cause the corresponding operator LED to switch from red to green. If this does not happen, examine the wrist cord for continuity or damage and your wrist band to ensure that it is securely fit. If you have dry skin, apply an approved dissipative hand lotion such as Menda Reztore™ ESD Hand Lotion. When leaving the area, the user can attach it to the parking station located on the remote. The corresponding operator LED will illuminate green and the audible alarm will shut off when the cord is attached to the parking snap. After approximately 3 seconds, the LED will change from green to orange indicating a parked condition.

## PARKING STATION

The audible alarm is designed to alert both the operator and supervisor. The parking snap feature allows the operator to disconnect when leaving the work area without sounding the audible alarm. It also provides a means for wrist cord storage. The user can then disconnect the wrist cord from the wrist band and attach it to the parking snap for storage. If the operator removes the wrist cord plug from the Operator banana jack, the audible alarm will sound until the cord is either properly grounded or parked onto the parking station.

## Calibration

The Ultra Low Voltage Monitor is calibrated to standards traceable to NIST. Frequency of recalibration should be based on the critical nature of those ESD sensitive items handled and the risk of failure for the ESD protective equipment and materials. In general, we recommend that calibration be performed annually.

Use the EMIT 50524 Limit Comparator for Dual-Wire Monitors to perform periodic testing (once every 6-12 months) of the Ultra Low Voltage Monitor. The Limit Comparator can be used on the shop floor within a few minutes virtually eliminating downtime, verifying that the monitor is operating within tolerances.

See [TB-6542](#) for more information.



Figure 5. EMIT 50524 Limit Comparator for Dual-Wire Monitors.

## Specifications

Operating Voltage	100-240 VAC, 50/60 Hz
Operating Temperature	32°F - 104°F (0 - 40°C)
Monitor Dimensions	5.4" x 3.4" x 1.0" (13.7cm x 8.6cm x 2.5cm)
Monitor Weight	0.7 lbs (0.3 kg)
Remote Dimensions	2.6" x 1.1" x 0.9" (6.6cm x 2.8cm x 2.3cm)
Remote Weight	0.2 lbs (0.1 kg)

## DEFAULT TEST VOLTAGES

Operator	200 mV
Supervisor	200 mV
Worksurface	200 mV
Tool	200 mV

## CUSTOM PROGRAMMABLE FEATURES\*\*

Operator Test Voltage	50 mV, 100 mV
Supervisor	N/A
Worksurface Monitor	Disable
Tool Monitor	Disable

*\*\*All custom programming is completed by the manufacturer. Contact EMIT Customer Service to place a custom order prior to the shipment of the monitor.*

## TEST LIMITS

Operator	Low Fail: < 1.72 megohms Pass: 2 - 9 megohms High Fail: > 11.5 megohms
Supervisor	Low Fail: < 1.72 megohms Pass: 2 - 9 megohms High Fail: > 11.5 megohms
Worksurface	Pass: < 3 megohms Fail: > 3.5 megohms
Tool	Pass: < 7 ohms Fail: > 10 ohms
Charge Detector	Detects > 2.5 VDC on operator

**NOTE:** Worksurface must have a conductive layer such as Dual Layer Rubber or Dissipative 3-Layer Vinyl or Micastat® Dissipative Laminate with conductive buried layers. EMIT Continuous Monitors are not recommended for use with homogeneous matting.

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

See EMIT's Warranty -

<http://emit.descoindustries.com/Warranty.aspx>