

## Zero Volt Monitor Solo Installation, Operation and Maintenance



Made in the  
United States of America



Figure 1. EMIT Zero Volt Monitor Solo

### Description

Leading companies use continuous monitors as a cost effective component in satisfying the section 7.3 Compliance Verification Plan requirements of ANSI/ESD S20.20.

The EMIT Zero Volt Monitor (ZVM) Solo is a single station continuous monitor for operator, supervisor, ESD worksurface, and metal tool fixture ground. It will continuously monitor the ground integrity and charge generation of one operator and supervisor as well as the ground integrity for one ESD worksurface and one optional metal tool fixture. It eliminates the need for periodic testing and record keeping of wrist straps. This single station monitor also features communication ports that allow it to be used with EMIT SIM Software for data tracking and management.

The patented\*\* ZVM Solo is designed with Dual Polarity Technology for true continuous monitoring (versus pulsed or intermittent) of wrist strap functionality (path to ground and presence of 1 megohm Resistor) and operator safety according to accepted industry standards without capacitance variations from personnel or environment. Dual Polarity Technology uses dual-wire wrist cords to place positive voltage on one line and negative voltage on the other, resulting in near zero voltage at the operator.

The ZVM Solo will also detect Direct Current Voltage (VDC) that is greater than  $\pm 2.5$  VDC if the operator generates or comes in contact with a voltage that would be dangerous to an ESD susceptible item. Each ZVM Solo is calibrated with accepted procedures and standards traceable to the National Institute of Standards and Technology (NIST) and includes a NIST certificate.

Continuous Monitors pay for themselves improving quality, productivity, eliminating wrist strap daily testing and test result logging. Continuous Monitors eliminate the need for users to test wrist straps and log the results; by their function, these monitors satisfy the ISO and ANSI/ESD S20.20 test logging requirement. ANSI/ESD S20.20 section 7.3 states "Compliance verification records shall be established and maintained to provide evidence of conformity to the technical requirements." Per ANSI/ESD S1.1 Annex A.3 "Daily (wrist strap system) testing may be omitted 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."

The EMIT ZVM Solo is available in the following models:

Item	Power Adapter
50576	North America
50577	Asia
50579	Europe

### EMIT SIM Software

The EMIT ZVM Solo 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 ZVM Solo
- 1 Desco 09163 Dual-Wire Elastic Wrist Strap
- 1 Power Adapter, 12VDC
- 1 Mat Monitor Cord (Black)
- 1 Tool Monitor Cord (White)
- 1 Monitor Ground Cord (Green and Yellow)
- 1 Push and Clinch Snap
- 1 Washer
- 1 Flat Head Screw, 6-32 thread
- 1 Alligator Clip
- 1 Ring Terminal
- 2 Hook and Loop Fastener Strips
- 4 Cable Clips with Adhesive
- 1 Certificate of Calibration

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

## Features and Components

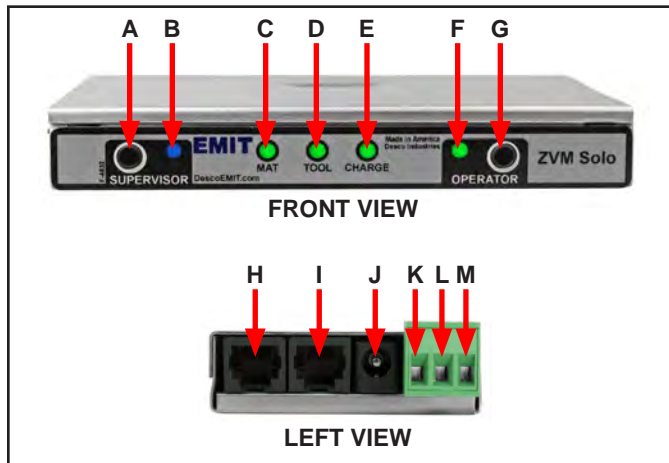


Figure 2. ZVM Solo features and components

**A. Monitored Supervisor Jack:** Where the supervisor inserts the wrist strap cord plug. An operator must be connected to the operator jack in order for the supervisor jack to be used.

**B. Supervisor LED:** When the LED is illuminated blue, the supervisor is properly grounded. When the LED is flashing blue and the alarm sounds, the supervisor is not properly grounded.

**C. 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.

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

**E. Charge LED:** When the LED is off, the charge is within the set limit. When the LED is illuminated red and the alarm sounds, the charge is outside the set limit.

**F. 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 blinks red when the operator is not connected. This serves as a reminder to connect to the monitor when returning to the workstation.

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

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

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

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

**K. Monitored Tool Terminal:** Monitors tool station. Connect the white tool monitor cord here.

**L. Monitored Mat Terminal:** Monitors a worksurface mat for proper dissipative resistance and static charges. Connect the black mat monitor cord here.

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

## Installation

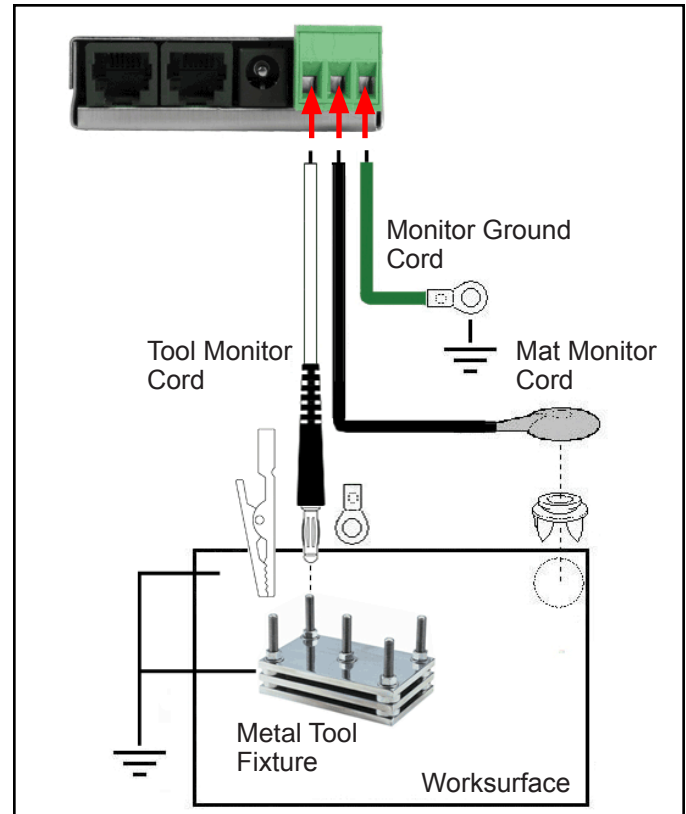


Figure 3. Installing the ZVM Solo

1. Remove the monitor from the carton and inspect for damage.

**NOTE:** All ZVM Solos are packaged with a wire shorting the tool terminal to the ground terminal. This is to prevent the tool circuit from alarming when not in use. Contact EMIT Customer Service to be provided with instructions to turn off the tool monitor circuit.

2. Determine the mounting location of the ZVM Solo. The front panel should be visible to the operator. Use the included hook and loop fastener strips if preferred. EMIT offers the 50578 Mounting Bracket (not included) as an alternative method to mount the ZVM Solo.
3. Attach the tinned wire end of the mat monitor cord to its appropriate terminal block connection located on the side of the unit.
4. Route the mat monitor cord from the side of the monitor to the worksurface mat. Use either the included push and clinch snap or washer and screw to secure the cord to the mat. The worksurface mat requires a separate ground cord (not included).

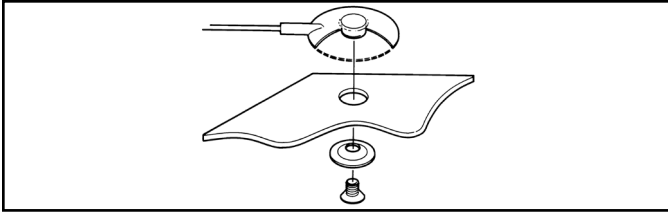


Figure 4. Screw allows mat monitor cord to be bolted to mat to keep cord from disconnecting

5. Attach the tinned wire end of the included monitor ground cord to the appropriate terminal block connection on the side 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 mat. The face plate screw of a grounded AC wall outlet may provide a convenient connection point.
6. If applicable, attach the tinned wire end of the tool monitor cord to the appropriate terminal block connection on the side of the monitor. The included alligator clip or ring terminal may be applied to the banana plug for a secure connection to the grounded metal tool fixture that you choose to monitor.
7. Connect the DC power adapter to the power jack located on the side of the unit. Route the wire from the supply to a nearby AC electrical outlet and plug the power adapter into the outlet. Make sure the voltage and frequency match those listed on the power adapter. The monitor is now powered.

## Operation

### USING THE MONITOR

**NOTE:** Elastic wrist straps are only compatible with the default operator test voltage of 1.25V. Metal wrist straps must be used if the operator test voltage is set to 50mV. Apply an approved dissipative hand lotion such as [Menda Reztore™ ESD Hand Lotion](#) to your wrist prior to use for optimum results.

1. The monitor's operator LED will be blinking red indicating that it is ready for the operator to connect.
2. Fit the wristband snugly onto your wrist.
3. Snap the wrist cord to the wristband.
4. Plug the wrist cord into the monitored jack labeled OPERATOR (see Figure 2). The corresponding operator LED will switch from blinking red to solid green. This indicates that the operator is properly grounded.
5. If this does not happen, examine the wrist cord for continuity or damage and your wrist band to ensure that it is securely fit.
6. A supervisor may plug their wrist strap into the SUPERVISOR jack once an operator is connected to the monitor. The monitor will alarm if a wrist strap is connected to the SUPERVISOR jack without an operator connected to the OPERATOR jack.



Figure 5. Using the ZVM Solo

## Calibration

The ZVM Solo 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 ZVM Solo. 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 6. 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	4.7" x 2.3" x 0.7" (11.9cm x 5.8cm x 1.8cm)
Monitor Weight	0.3 lbs (0.1 kg)

## DEFAULT TEST VOLTAGES

Operator	1.25 V
Supervisor	1.25 V
Worksurface	200 mV at 3 megohms
Tool	25mV
Typical Response Time	.058 seconds

## DEFAULT 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	> ±2.5 VDC on operator

## OPTIONAL TEST VOLTAGES†

Operator	50 mV
Supervisor	50 mV
Worksurface	1.25 V at 3 ohms
Typical Response Time	.46 seconds

## OPTIONAL TEST LIMITS†

Worksurface	Pass: < 2.5 ohms Fail: > 3.5 ohms
Charge Detector	> ±1.25 VDC on operator

## OPTIONAL SETTINGS†

Worksurface Monitor	ON / OFF
Tool Monitor	ON / OFF
Charge Detector	ON / OFF

**\*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.

†Contact EMIT customer service for information on modifying these settings.

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

See EMIT's Warranty -

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