



Made in the  
United States of America

# Dual-Wire Dual Operator Monitor Installation, Operation and Maintenance



Figure 1. Desco 19662 Dual-Wire Dual Operator Monitor

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 if constant monitoring used.” Per ESD Handbook ESD TR 20.20 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.”

## Description

The Desco [19662](#) Dual-Wire Dual Operator Monitor monitors two operators and two ESD worksurfaces eliminating the need for periodic testing and record keeping of wrist straps. The Dual-Wire Dual Operator Monitor uses low-voltage steady state DC continuous-loop technology to continuously monitor (versus pulsed or intermittent) dual-wire wrist strap functionality. Independent audio and visual alarm conditions identify the status of the worksurfaces and operators. Two operator remotes with 10 foot cables are included for use at adjacent workstations. Each monitor is calibrated with accepted procedures and standards traceable to the National Institute of Standards and Technology (NIST).

The Dual-Wire Dual Operator Monitor and its accessories are available in the following item numbers:

| Item                  | Description                            |
|-----------------------|----------------------------------------|
| <a href="#">19662</a> | Dual-Wire Dual Operator Monitor        |
| <a href="#">19663</a> | Mounting Brackets                      |
| <a href="#">50524</a> | Limit Comparator                       |
| <a href="#">50525</a> | Replacement Operator Remote Kit, Black |
| <a href="#">50526</a> | Replacement Operator Remote Kit, White |
| <a href="#">19262</a> | Replacement Power Adapter, 12 VDC      |

## Dual Wire Monitor Technology

Desco dual wire dual operator monitors uses a loop electrical resistance technology. A +5 or +8 volt test signal<sup>1</sup> is generated by the monitor and placed on one conductor of the dual wire wrist strap. The test voltage is bridged to the opposite conductor through the skin of the wearer of the wristband and returned to the monitor. Resistance is monitored with a stable continuous signal through one conductor, across the skin of the operator, and returning to the monitor through the opposite conductor. Desco dual wire dual operator monitors determine that the operator’s path-to-ground is between the 10 or 35 megohms<sup>2</sup> upper limit (adjustable) and 1 megohm<sup>1</sup> lower limit.

## Packaging

### [19662](#) Dual-Wire Dual Operator Monitor

- 1 Dual-Wire Dual Operator Monitor
- 1 Power Adapter, 12VDC, with interchangeable plugs (North America, UK/Asia, Europe)
- 2 Operator Remotes with Attached Cables (1 Black, 1 White)
- 2 White Mat Monitor Cords
- 1 Monitor Ground Cord

### [19663](#) Mounting Brackets

- 2 Mounting Brackets
- 4 Pan Head Screws, 8-32 x 1/8"

1. See Operator Test Voltage section below for pass/fail specs. User should determine if these voltages can damage the device being handled. Other lower voltage monitoring systems may need to be considered.
2. See Operator Test Range section below for pass/fail specs.

## Features and Components

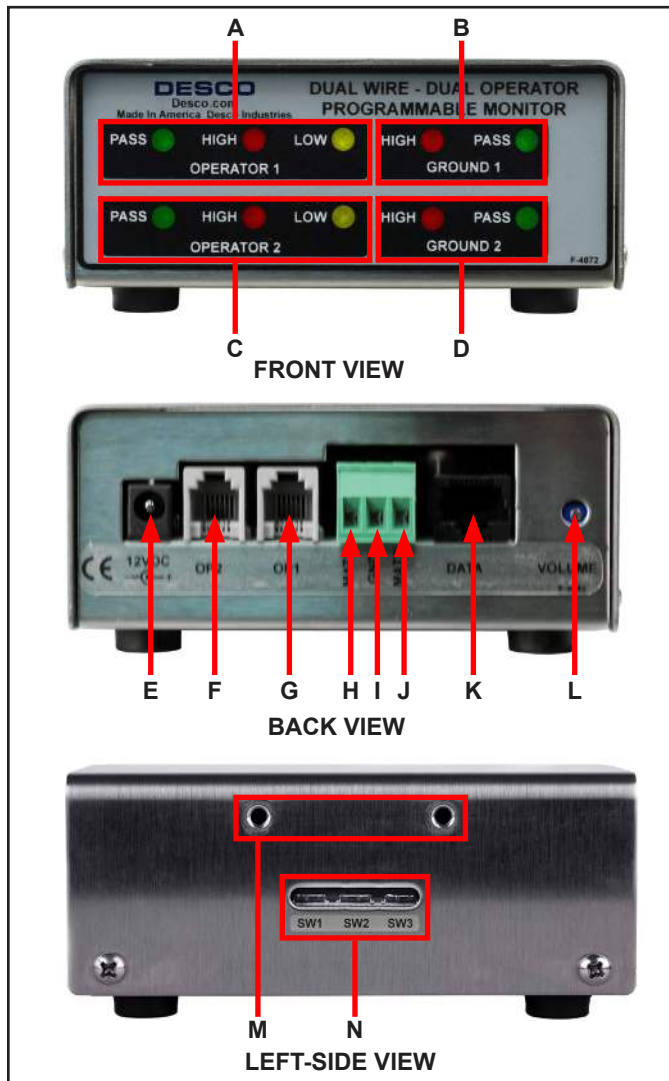


Figure 2. Dual-Wire Dual Operator Monitor features and components

**A. Operator 1 Status LEDs:** When the green LED is illuminated, operator 1 is properly grounded. When the LED is illuminated red or yellow and the alarm sounds, operator 1 is not properly grounded.

**B. Worksurface 1 Status LEDs:** When the green LED is illuminated, worksurface 1 is properly grounded. When the red LED is illuminated and the alarm sounds, worksurface 1 is not properly grounded.

**C. Operator 2 Status LEDs:** When the green LED is illuminated, operator 2 is properly grounded. When the LED is illuminated red or yellow and the alarm sounds, operator 2 is not properly grounded.

**D. Worksurface 2 Status LEDs:** When the green LED is illuminated, worksurface 2 is properly grounded. When the LED is illuminated red and the alarm sounds, worksurface 2 is not properly grounded.

**E. Power Jack:** Connect to the included 12VDC power adapter.

**F. Operator 2 Remote Jack:** Connect to the black operator remote cable.

**G. Operator 1 Remote Jack:** Connect to the white operator remote cable.

**H. Monitored Mat 1 Terminal:** Monitors a worksurface mat for proper dissipative resistance and static charges. Connect the white mat monitor cord here.

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

**J. Monitored Mat 2 Terminal:** Monitors a worksurface mat for proper dissipative resistance and static charges. Connect the black monitor cord here.

**K. Data Output:** For manufacturer use only.

**L. Alarm Audible Adjustment:** Turn the trimpot counter-clockwise to increase the audible alarm volume and clockwise to decrease it.

**M. Mounting Holes:** 8-32 PEM nuts are located on the left and right sides of the monitor for pairing with the Desco [19663](#) Mounting Brackets.

**N. Operator Setting Switches:** Toggles the monitor's settings for operator test voltage and high test limit.

Switches 1 and 2 control the operator test voltage.

| Switch 1 | Switch 2 | Operator Test Voltage |
|----------|----------|-----------------------|
| RIGHT    | LEFT     | 5V                    |
| LEFT     | RIGHT    | 8V                    |

Switch 3 controls the operator HIGH test limit.

| Switch 3 | HIGH Limit Resistance                   |
|----------|-----------------------------------------|
| RIGHT    | 10 megohms (1 x 10 <sup>7</sup> ohms)   |
| LEFT     | 35 megohms (3.5 x 10 <sup>7</sup> ohms) |

default setting

## Installation

1. Locate and appropriate AC outlet near the Dual-Wire Dual Operator Monitor, and test it for proper wiring and grounding prior to use. The Desco AC Outlet Analyzer or similar test equipment may be used to verify the outlet's functionality.
2. Determine the mounting locations of the operator remotes. Be sure to install the remotes at a distance that enables the 10 foot leads to reach the back of the monitor.
3. Install tinned wire ends of the mat (must be grounded separately) cords to their appropriate screw terminal block located at the back of the monitor.
4. Install the tinned wire end of the green and yellow monitor ground cord to the ground terminal located at the back of the monitor. Install its ring terminal to an appropriate ground point. Be sure to use a different ground point than the one used for the mats. The face plate screw of a grounded AC wall outlet may provide a convenient connection point.
5. Route the mat cords from the back of the monitor to the snaps on the worksurface mats.
6. Insert the operator remote cables into their appropriate jacks located at the back of the monitor. The white cable is for operator #1. The black cable is for operator #2.
7. Connect the power adapter to the power jack located at the back of the monitor. Plug the power adapter into a proper AC power outlet. The monitor is now powered.

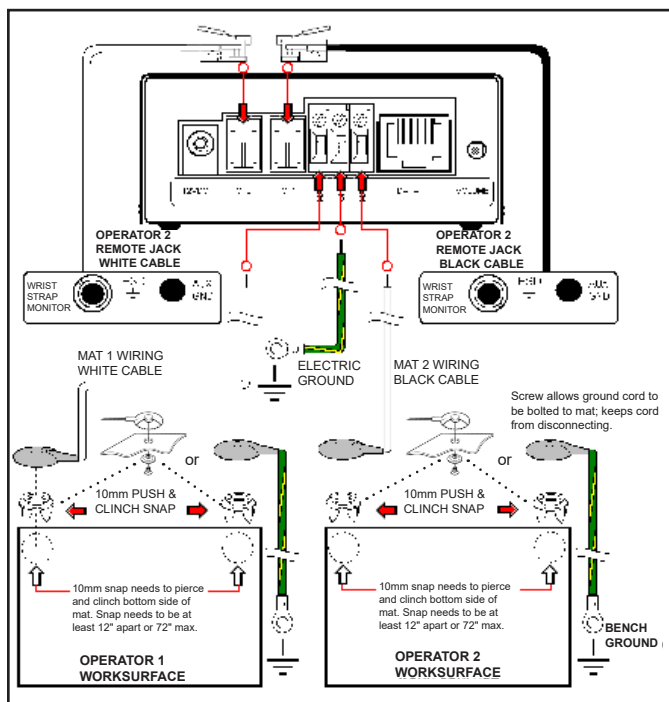


Figure 3. Installing the Dual-Wire Dual Operator Monitor

## Operation

1. Monitoring of the operators will remain in the STANDBY condition until a wrist cord is plugged into the operator remote. STANDBY mode is indicated by a blinking yellow operator LED.
2. Plug a wrist strap cord, not attached to the wristband, into the monitored jack labeled WRIST STRAP MONITOR located on the remote. This automatically activates the selected operator channel. The corresponding operator LED should illuminate red and the alarm should sound on the monitor.
3. Remove the charges from your body by making contact with a properly grounded ESD worksurface.
4. 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](#).
5. The AUX GND jack located on the operator remote is a grounded and unmonitored connection for guests, or other equipment grounds. It must be used with a single-wire Banana plug style cord.



Figure 4. Using the Dual-Wire Dual Operator Monitor

## Calibration

The Dual-Wire Dual Operator 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 Dual-Wire Dual Operator 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

|                                                       |                                                                                                                                                             |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Input Voltage and Frequency (External Adapter)</b> | AC/DC Power Adapter<br>Power Input:<br>100-240 VAC, 50/60 Hz<br>Power Output:<br>12 VDC @ 0.50 A<br>Cable Length:<br>5 ft. (1.5 m)                          |
| <b>Operating Temperature</b>                          | 50 to 95 °F (10 to 35 °C)                                                                                                                                   |
| <b>Environmental Requirements</b>                     | Indoor use only at altitudes less than 6500 ft. (2 km)<br>Maximum relative humidity of 80 % up to 85 °F (30 °C) decreasing linearly to 50 % @ 85 °F (30 °C) |
| <b>Dimensions (Monitor)</b>                           | 4.4" x 4.7" x 2.1"<br>(112 mm x 119 mm x 53 mm)                                                                                                             |
| <b>Weight (Monitor)</b>                               | 1.1 lbs. (0.5 kg)                                                                                                                                           |
| <b>Operator Test Range</b>                            | 1.91 megohms to 35 megohms (default)<br>or<br>1.91 megohms to 10 megohms (±10 %)                                                                            |
| <b>Worksurface Test Limit*</b>                        | 3.5 megohms (±10 %)                                                                                                                                         |
| <b>Operator Test Voltage</b>                          | 8 V (default) or 5 V                                                                                                                                        |
| <b>Worksurface Test Voltage</b>                       | 200 mV                                                                                                                                                      |
| <b>Country of Origin</b>                              | United States of America                                                                                                                                    |

\*The worksurface mat must have a dedicated conductive layer. Desco workstation monitors are not recommended for use with homogeneous matting.

ANSI/ESD S20.20 requires the use of a surface resistance meter for periodic verification of a worksurface's resistance-to-ground (Rtg). Constant monitors may not be used as a substitute for this requirement.

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

See the Desco Warranty - [Desco.com/Limited-Warranty.aspx](https://Desco.com/Limited-Warranty.aspx)

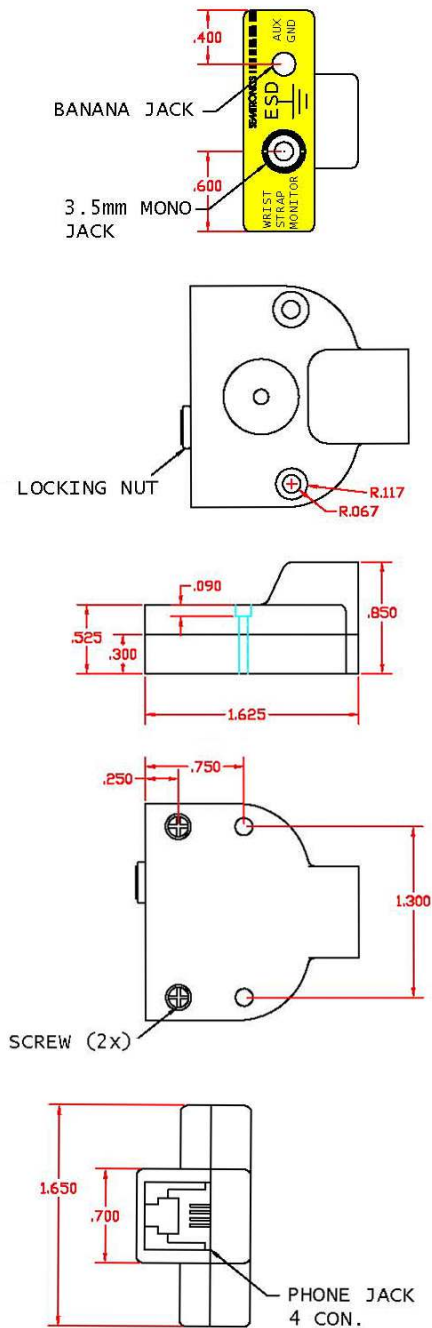


Figure 6. Operator Remote dimensions

Replacement remotes are available as Desco items 50525 and 50526