724 Plus Workstation Monitor Installation, Operation and Maintenance

Made in the United States of America

Figure 1. SCS 724 Plus Workstation Monitor

Description

The SCS 724 Plus Workstation Monitor continuously monitors the path-to-ground integrity and body voltage of two operators, as well as the path-to-ground integrity for one conductive or dissipative worksurface. The 724 Plus Workstation Monitor eliminates the need for periodic testing and record keeping of wrist straps.

The 724 Plus Workstation Monitor is designed with digital signal processing technology for true continuous monitoring (versus pulsed or intermittent) of wrist strap functionality (path-to-ground and presence of two 1 megohm resistors) and operator safety according to accepted industry standards. It is unaffected by capacitance variations from personnel or the environment. Digital signal processing technology uses dual-wire wrist straps to apply a low test voltage of 0.40 V onto the operator for the handling of sensitive components.

The 724 Plus Workstation Monitor features operator body voltage detection. It will alarm if the operator generates or comes in contact with voltage that would be dangerous to an ESD susceptible item. Each 724 Plus Workstation Monitor is calibrated with accepted procedures and standards traceable to the National Institute of Standards and Technology (NIST) and includes a certificate of calibration.

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.”

The 724 Plus Workstation Monitor and its accessories are available as the following item numbers:

Item	Description
770724	724 Plus Workstation Monitor
770732	Operator Remote, Dual
770733	Operator Remote, Workstation 2
770734	724 Plus Monitor Verification Tester
770735	Replacement Nylon Plug for 770733 Operator Remote, Pack of 20
CTA212	Power Adapter, 100-240 VAC Input, 12 VDC 1.5 A Output, All Plugs

Packaging

770724 724 Plus Workstation Monitor

1 724 Plus Workstation Monitor
1 Dual Operator Remote
1 Operator Remote Cable
1 Mat Monitor Cord (White)
1 Monitor Ground Cord (Green and Yellow)
1 Countersunk Washer
1 Flat Head Screw, 6-32 x 1/4"
4 Pan Head Screw, #6 x 3/8"
1 Power Adapter, 12 VDC, with interchangeable plugs (North America, UK/Asia, Europe)

770732 Dual Operator Remote

1 Dual Operator Remote
1 Operator Remote Cable
2 Pan Head Screw, #6 x 3/8"

770733 Workstation 2 Operator Remote

1 Workstation 2 Operator Remote
1 Operator Remote Cable
2 Pan Head Screw, #6 x 3/8"
1 Black Nylon Plug

U.S. Patents 6,930,612; 9,983,251

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Features and Components

724 Plus Workstation Monitor

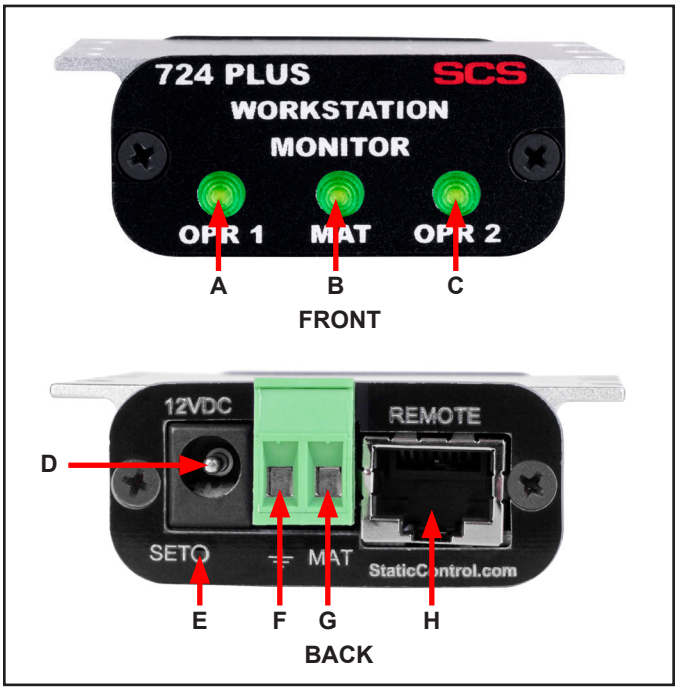

Figure 2. 724 Plus Worstation Monitor features and components

A. Operator 1 LED: Illuminates green when operator 1 is properly grounded and his/her body voltage level is below the preset alarm level. Illuminates solid red and audible alarm sounds when operator 1 is above the resistance limit. Blinks yellow and audible alarm sounds when operator 1 is below the resistance limit. Blinks red and audible alarm sounds when the body voltage on operator 1 is above the preset alarm level. Both the Operator 1 and Operator 2 LEDs blink red simultaneously should the operator remote become disconnected from the monitor.

B. Mat LED: Illuminates green when the worksurface mat is properly grounded. Illuminates red and audible alarm sounds when the worksurface mat is not properly grounded.

C. Operator 2 LED: Illuminates green when operator 2 is properly grounded and his/her body voltage level is below the preset alarm level. Illuminates solid red and audible alarm sounds when operator 2 is above the resistance limit. Blinks yellow and audible alarm sounds when operator 2 is below the resistance limit. Blinks red and audible alarm sounds when the body voltage on operator 2 is above the preset alarm level. Both the Operator 1 and Operator 2 LEDs blink red simultaneously should the operator remote become disconnected from the monitor.

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

E. Set Switch: Toggles the monitor's settings for the audible alarm, mat monitor circuit, and operator high test limit.

Feature	Procedure
Enable / Disable Audible Alarm	1. Push and release the switch while the monitor is powered. 2. All 3 LEDs will cycle power. 3. A chirp from the buzzer will indicate that the audible alarm is enabled. No chirp will indicate that the audible alarm is disabled.
Enable / Disable Mat Monitor Circuit	1. Push and hold the switch until all 3 LEDs illmuniate. 2. Release the switch. 3. An illuminated MAT LED indicates that the mat monitor circuit is enabled. A non-illuminated MAT LED indicates that the mat monitor circuit is disabled.
Operator High Test Limit - 10 megohms	1. Disconnect the monitor from power. 2. Push and hold the switch while restoring power to the monitor. 3. The operator LEDs will blink green upon boot-up to indicate a 10 megohm operator high test limit.
Operator High Test Limit - 35 megohms	1. Disconnect the monitor from power. 2. Push and hold the switch while restoring power to the monitor. 3. The operator LEDs will blink red upon boot-up to indicate a 35 megohm operator high test limit.

F. Ground Terminal: Common ground point for the monitor.

G. Monitored Mat Terminal: Monitors a worksurface mat for proper dissipative resistance. Use the included white mat monitor cord to connect the worksurface mat to this terminal.

H. Operator Remote Jack: Use the included operator remote cable to connect an operator remote to this connector. The monitor will alarm should the operator remote cable disconnect from this connector.

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Dual Operator Remote

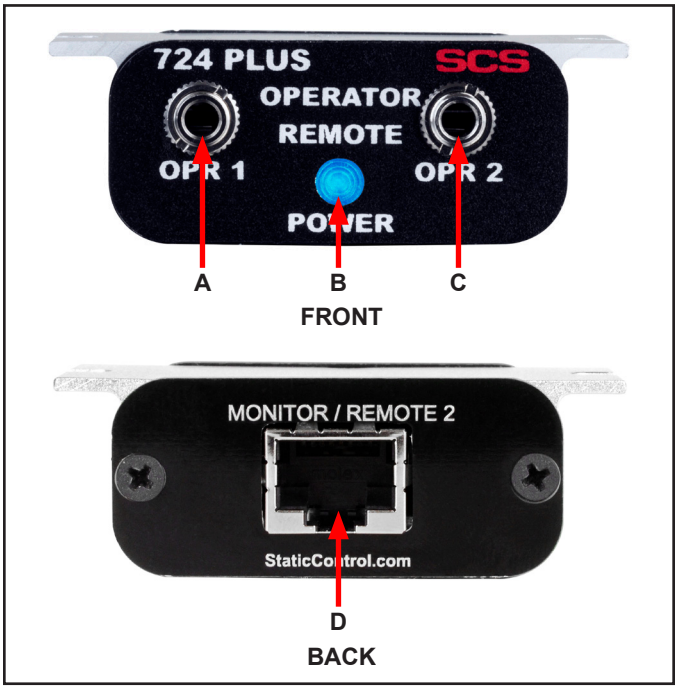

Figure 3. Dual Operator Remote features and components

A. Monitored Operator 1 Jack: Insert the dual-wire wrist cord of an operator here to monitor his/her body voltage and connection to ground.

B. Power LED: Illuminates solid blue when the Dual Operator Remote is powered.

C. Monitored Operator 2 Jack: Insert the dual-wire wrist cord of an operator here to monitor his/her body voltage and connection to ground.

D. Monitor / Workstation 2 Operator Remote Jack: Use the included operator remote cable to connect the 724 Plus Workstation Monitor to this connector. The monitor will alarm should the operator remote cable disconnect from this connector.

Workstation 2 Operator Remote

Figure 4. Workstation 2 Operator Remote features and components

A. Power LED: Illuminates solid blue when the Dual Operator Remote is powered.

B. Monitored Operator 2 Jack: Insert the dual-wire wrist cord of an operator here to monitor his/her body voltage and connection to ground.

C. Monitor Remote Jack: Use the included operator remote cable to connect the 724 Plus Workstation Monitor to this connector. The monitor will alarm should the operator remote cable disconnect from this connector.

D. Dual Operator Remote Jack: Use the included operator remote cable to connect the Dual Operator Remote to this connector. The monitor will alarm should the operator remote cable disconnect from this connector.

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Installation

724 Plus Workstation Monitor and Dual Operator Remote

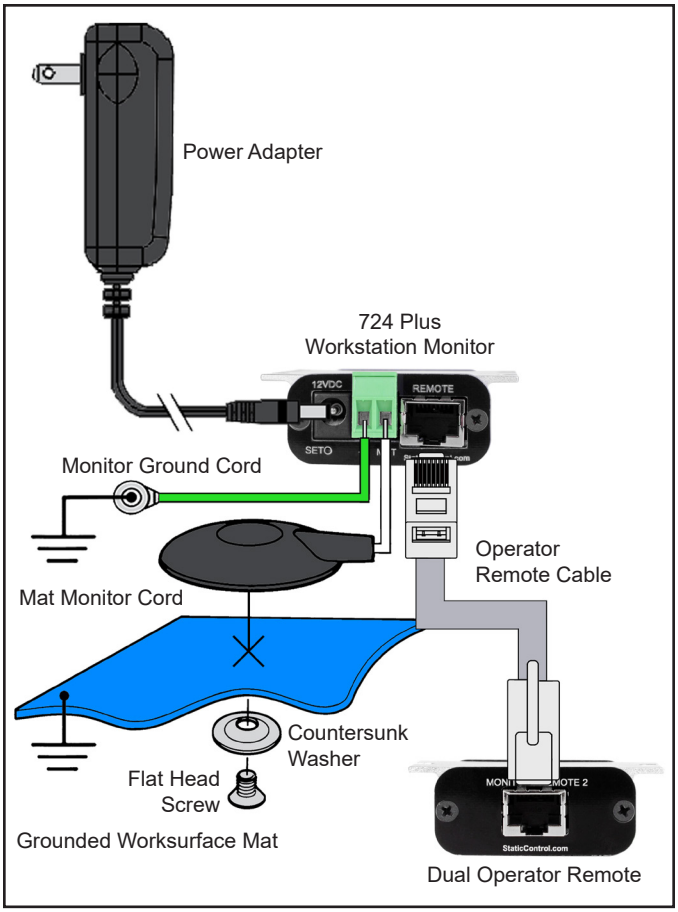

Figure 5. Installing the 724 Plus Workstation Monitor and Dual Operator Remote

1. Remove the 724 Plus Workstation Monitor and its Dual Operator Remote from the carton.
2. Determine the mounting location of the 724 Plus Workstation Monitor. Its display should be visible to the operator(s). Use its enclosure's mounting tabs to secure it underneath a shelf or ledge.
3. Determine the mounting location of the Dual Operator Remote. Its jacks should be accessible to operators. Locate it within reach of the included operator remote cable. Use its enclosure's mounting tabs to secure it underneath a table top or equipment.
4. Connect the included operator remote cable to the dual operator remote connector located on the back of the 724 Plus Workstation Monitor.
5. Route the operator remote cable from the back of the 724 Plus Workstation Monitor to the Dual Operator Remote. Connect the cable to the back of the Dual Operator Remote.
6. Insert the tinned termination of the mat monitor cord into the mat terminal located on the back of the 724 Plus Workstation Monitor. Use a small screwdriver to secure the wire to the terminal block.
7. Route the mat monitor cord from the back of the 724 Plus Workstation Monitor to the grounded worksurface mat. Use the included countersunk washer and flat head screw to secure the cord to the grounded mat.

   NOTE: The worksurface must be connected directly to ground without the use of a 1 megohm resistor.

   Per ANSI/ESD S6.1 Section 5.2.1 Common Point Ground:
   "All of the grounding conductors from each of the ESD technical elements (excluding level 2 technical elements) used within an EPA shall be terminated at the same electrically equivalent point. The common point ground may be a terminal strip, bus bar or any other convenient configuration that is, within itself, electrically continuous to no greater than 1 ohm measured from point to point with an ohmmeter as specified in paragraph 6.1.1."
8. Insert the tinned termination of the ground cord into the ground terminal located on the back of the 724 Plus Workstation Monitor. Use a small screwdriver to secure the wire to the terminal block.
9. Attach the other end of the ground cord to a ground point. The face plate screw of a grounded AC wall outlet may provide a convenient connection point.
10. Connect the power adapter to the power jack located on the back of the 724 Plus Workstation Monitor. Route the wire from the supply to a nearby AC outlet and plug it into the outlet. Make sure the voltage and frequency match those listed on the power supply. The 724 Plus Workstation Monitor is now powered.

Workstation 2 Operator Remote

Figure 6. SCS 770733 Workstation 2 Operator Remote

When paired with the 724 Plus Workstation Monitor, the SCS 770733 Workstation 2 Operator Remote may be used to monitor a second operator at a nearby independent workstation. It allows the second operator to connect to his/her own operator remote rather than share the Dual Operator Remote included with the 724 Plus Workstation Monitor. Use the following procedure to add the Workstation 2 Operator Remote to an existing 724 Plus Workstation Monitor setup.

1. Disconnect the 724 Plus Workstation Monitor from power.
2. Determine the mounting location of the Workstation 2 Operator Remote. Its jack should be accessible to the second operator. Locate it within reach of the included operator remote cable. Use its enclosure's mounting tabs to secure it underneath a table top or equipment.
3. Connect the operator remote cables to the 724 Plus Workstation Monitor, Dual Operator Remote, and Workstation 2 Operator Remote as shown in Figure 7.
4. Insert the included black nylon plug into the operator 2 jack located on the Dual Operator Remote. This will prevent operators from using this jack once the Workstation 2 Operator Remote is installed.

   NOTE: The operator 2 jack on the Dual Operator Remote must be plugged with the nylon plug when adding the Workstation 2 Operator Remote to the setup. The 724 Plus Workstation Monitor will alarm should it detect a Workstation 2 Operator Remote and vacant operator 2 jack on the Dual Operator Remote.
5. Reconnect the 724 Plus Workstation Monitor to power.

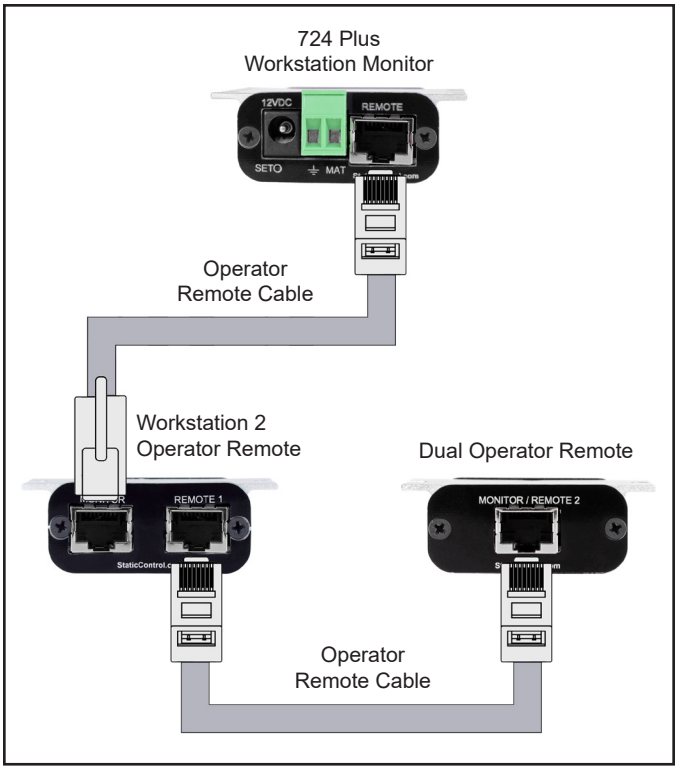

Figure 7. Cabling the Workstation 2 Operator Remote to the 724 Plus Workstation Monitor and Dual Operator Remote

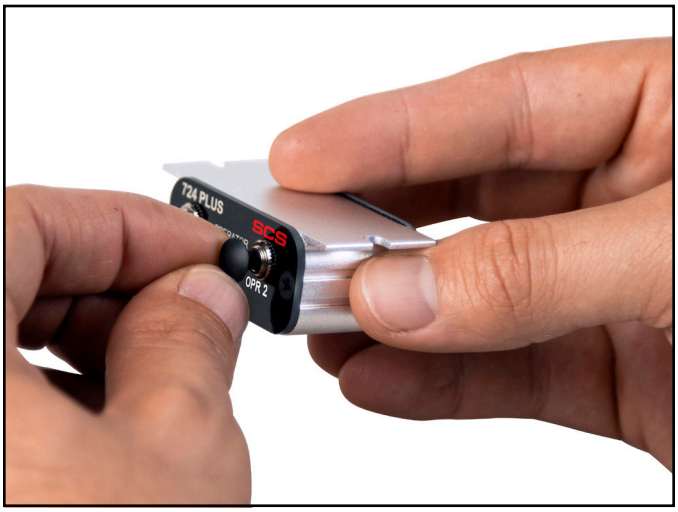

Figure 8. Inserting the black nylon plug into the operator 2 jack on the Dual Operator Remote

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Operation

Using the Monitor

1. Fit the wristband snugly onto the wrist.
2. Snap the wrist cord to the wristband.
3. Plug the wrist cord into one of the operator jacks on the Dual Operator Remote. The corresponding operator LED will illuminate solid green on the 724 Plus Workstation Monitor. This indicates that the operator is properly grounded.
4. If this does not happen, examine the wrist cord for continuity or damage and the wristband to ensure that it fits securely. If you have dry skin, apply an approved dissipative hand lotion such as Menda Reztore® ESD Hand Lotion.

Figure 9. Using the 724 Plus Workstation Monitor when mounted underneath a surface

Figure 10. Using the 724 Plus Workstation Monitor when mounted on top of a surface

Alarm Types

LED(s)	Behavior	Condition
Mat	Solid red	Worksurface not grounded
Operator 1 or 2	Blinking yellow	Operator below low limit threshold
Operator 1 or 2	Solid red	Operator above high limit threshold
Operator 1 or 2	Blinking red	Operator body voltage
Operator 1 & 2	Blinking red	Operator remote disconnected

Calibration

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, SCS recommends that calibration be performed annually.

Use the SCS 770734 724 Plus Monitor Verification Tester to perform periodic testing (once every 6-12 months) of the 724 Plus Workstation Monitor. The Verification Tester can be used on the shop floor within a few minutes virtually eliminating downtime, verifying that the tester is operating within tolerances.

Figure 10. SCS 770734 724 Plus Monitor Verification Tester

Specifications

Power	
Power Adapter 100-240VAC 50-60 Hz	Output: 12 VDC @ 1.5 A Output Plug Polarization: Center Positive Output Plug: 5.5 mm O.D. x 2.1 mm I.D. x 9.5 mm L
Operator	
Wrist Strap	Dual-Wire
Amount Monitored	2
Resistance Limit	1.5 megohms to 10 megohms
Body Voltage Limit	±2.5 VDC
Test Voltage	0.40 V @ open circuit, peak-to-peak
Test Accuracy	±15%
Worksurface Mat	
Amount Monitored	1
Resistance Limit*	3.7 megohms
Test Accuracy	±10%
General	
Alarm	LEDs and buzzer
Alarm Response Time	500 ms
Dimensions (Monitor)	0.85" x 2.40" x 2.60" (22 mm x 61 mm x 66 mm)
Dimensions (Operator Remote)	2.41" x .84" x 1.13" (61 mm x 21 mm x 29 mm)
Operator Remote Cable Length	7 ft. (2.1 m)
Weight (Monitor)	0.14 lbs. (64 g)
Weight (Operator Remote)	0.07 lbs. (32 g)
Country of Origin	United States of America

*The worksurface must have a conductive layer such as Dual Layer Rubber or Dissipative 3-Layer Vinyl with conductive buried layers. SCS 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 SCS Warranty - StaticControl.com/Limited-Warranty.aspx

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