

***ESD association technical report***

***ESD TR1.0-01-01***  
(TR12-01)

***Survey of Constant (Continuous)  
Monitors for Wrist Straps***

***Authors:***

Brent Beamer, Static Control Components  
Don Boehm, Novx Corporation  
Julius Brodbeck, USAF  
Larry Burich, Lockheed Martin  
Cheryl Checketts, Motorola  
Steve Koehn, 3M  
James Mann, Protective Solutions  
Jeff Salisbury, Semtronics



*Electrostatic Discharge Association  
7900 Turin Road, Bldg 3  
Rome, NY 13440*

---

## **Caution Notice**

---

**ESD Association standards and publications are designed to serve the public interest by (i) eliminating misunderstandings between manufactures and purchasers, (ii) facilitating the interchangeability and improvement of products and (iii) assisting the purchaser in selecting and obtaining the proper**

**products for his particular needs. The existence of such standards and publications is not intended in any respect to preclude any member or nonmember of the Association from manufacturing or selling products not conforming to such standards and publications. Nor is it intended for a standard or publication published by the Association to preclude its voluntary used by non-members of the Association whether the document is to be used either domestically or internationally. Recommended standards and publications are adopted by the ESD Association without intending to infringe upon any intellectual property rights of third parties with respect to articles, materials or processes described in such standards. The Association does not assume any liability to any intellectual property owner, nor does it assume any obligation whatever to other parties following the recommended standard or publication.**

**A Technical Report is a collection of technical data or test results published as an informational reference on a specific material, product, system or process. The opinions expressed in this Technical Report are the opinions of the author(s) and may or may not be endorsed by the ESD Association.**

## **ESD Association Technical Report**

### ***Survey of Constant Monitors for Wrist Straps***

#### **1.0 Introduction**

Since people are one of the greatest sources of static electricity and ESD, proper grounding is paramount. One of the most common ways to ground people is with a wrist strap. Ensuring that wrist straps are functional and are connected to people and ground is a continuous task.

#### ***Wrist strap checkers***

The wrist strap checker is a tool for testing the proper operation of the wrist strap system (wristband, coiled cord, and connection of the band to the person). It measures the resistance of the wrist strap system as worn. User friendly and reliable, wrist strap checkers are commonly used for wrist strap evaluation in many electronic manufacturing operations.

While effective at the time of testing, wrist strap checker use is periodic. The failure of a wrist strap between checks may expose products to -damage from electrostatic charge. If the wrist strap system is checked at the beginning of a shift and subsequently fails, then an entire shift's work could be suspect.

Wrist strap checkers are usually placed in a central location for all to use. Wrist straps are stressed and flexed to their limits at a workstation. While a wrist strap is being checked, it is not stressed, as it would be under working conditions. Opens in the wire at the coiled cord's strain relief are sometimes only detected under stress.

Even if the wrist strap is working properly, a bad ground connection will render the wrist strap system ineffective. Ground connections should be tested at the time of initial installation and periodically thereafter. Assumptions should not be made that the grounding system is properly installed and will remain permanently connected.

#### ***Constant monitors***

Constant monitors, also called continuous monitors in ESD-S20.20, were designed to provide testing of the wrist strap system. While a number of technologies have been utilized, the goal remains consistent; electrical connections are tested between the ground point, coiled cord, wristband, and body while the wearer performs operations on static sensitive items. Failures are reported via audible and visual alarms.

#### **2.0 Types of Constant Monitors**

There are several types of constant monitors available. A brief discussion of the technologies used for constant monitoring will make differentiation easier.