



# Ground Man Ground Monitors for Tools

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## Protect your sensitive boards from overvoltage and electrostatic discharge

Grounding is the most fundamental element of ESD management in manufacturing and in service. A broken ground connection may result in personnel exposure to dangerous voltage, equipment lockup or malfunction and damage to sensitive components.

3M™ Ground Man Monitors offer continuous monitoring of proper ground connection of up to 3 points in the tools. With individual status indication, Ground Man Monitors show which ground connection is being monitored, which one is within specification and which one has failed. Patented enabling feature for each ground connection allows for accurate and safe indication of ground condition for each monitored point.

Miniature and inobtrusive, the Ground Man Monitors are easy to install and easy to connect. Ground impedance alarm levels can be set by the user to satisfy a broad range of requirements and compliance with such standards as ANSI 6.1 and ANSI/ESDA S.20.20. Examples of applications for Ground Man Monitors include SMT pick-and-place tools, IC handlers, wire bonders, die attach and other tools.

In order to further improve reliability of ground connections, Ground Man Monitors provide logic level signal to the host tool -- this way the tool can be shut down in case of ground failure. The 3M™ Ground Man Plus Monitor adds wrist strap monitoring to assure that only properly grounded operators work with the sensitive devices. The operator is monitored for proper connectivity and for excessive body voltage.



### Applications

Electronics Assembly  
Semiconductor Device Manufacturing  
Medical Environment  
Military  
Aerospace  
Wherever sensitive components are being handled

### Features

Ground impedance monitoring  
Adjustable impedance alarm level  
Enable/Disable for each ground  
Output to the host tool  
Operator wrist strap monitoring  
Operator body voltage monitoring  
Patented replaceable wriststrap jack  
Audio and visual alarms  
Sound alarm on/off

### Key Advantages

#### ANSI/ESDA S.20.20 Compliant

Ground Man monitors measure ground impedance in accordance with requirements of ANSI/ESDA S.20.20 standard.

#### Adjustable Alarm Threshold

The alarm threshold can easily be adjusted at any time in a range of 1 to 20 Ohms.

#### Output to the Tool

Ground Man Monitors provide logic signal to the tool to shut it down when any of the grounds fail.

#### Complete Tool Coverage

The Ground Man Plus Monitors provide complete grounding coverage of a tool. With the Ground Man Plus Monitors, you would cover all important ground connections in the tool and an operator.

#### 3M™ Down to Earth Family

Ground Man and Ground Man Plus Monitors are members of the new 3M™ Down to Earth Monitor family -- a practical and cost-effective solution to ESD and EOS in electronics assembly.

## Ground Man

CTC333

## Ground Man Plus

CTC334

Ground Monitors for Tools



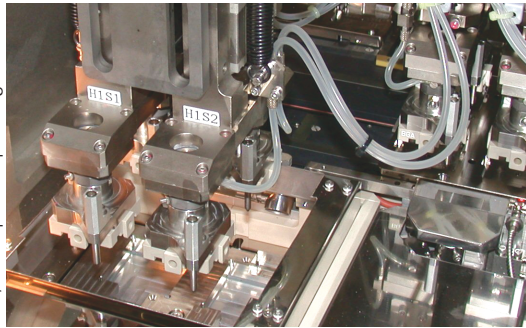
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## Is Your Tool Grounded?

Most of the tools are comprised of many parts which are not always connected together. Good mechanical contact does not automatically assure proper electrical contact. Sometimes anodized metal surfaces make them essentially an insulator. Moving parts are often grounded via ball bearings which makes good contact only when stopped -- otherwise the contact is highly intermittent. It is very important to test proper grounding not only of the tool's frame, but also of all conductive parts of the tool - not only when the tool stops, but during the tool's motions.

3M™ Ground Man monitors offer a reliable and easy-to-use means of continuous assurance of proper grounding of key elements of the tools.



Production tools typically have many separate parts that need to be grounded

Parameter	Ground Man	Ground Man Plus
<b>Overvoltage Alarm</b>		
Ground impedance range	1 ... 20 Ohms	1 ... 20 Ohms
Number of monitored grounds	3	3
Ground Enable	Yes, each individual ground	Yes, each individual ground
<b>Operator Grounding</b>		
Wrist strap		Dual, 3.5mm plug
Operator's resistance alarm		Yes
Operator body voltage alarm		Yes
<b>Alarm</b>		
Visual	LED	LED
Audio	Buzzer	Buzzer
<b>Interface</b>		
Output on Ground Failure	Logic Level Any ground failure	Loic Level Any ground or wrist strap failure
<b>General</b>		
Power	External adapter	External adapter
Dimensions	0.85"H x 2.4"W x 2.5"L 22 mm x 61mm x 63mm	0.85"H x 2.4"W x 2.5"L 22 mm x 61mm x 63mm

## Importance of Grounding

Grounding is the most important component of ESD protection. One of the best returns on investments in ESD improvements is always in improving and maintaining proper grounding for all equipment and all parts of the equipment.

Good grounding assures that all conductive parts of the tool have the same potential and do not introduce electric over-stress and electrostatic discharges during the tool's operation.

Ground Man monitors provide accurate monitoring of grounding even in the presence of noise where a typical multimeter fails. ESD or not, the first and foremost importance of grounding is safety. Properly grounded tools will not expose an operator to dangerous high voltage in case of tool malfunction or problems with wiring. Only continuous monitoring can provide assurance of proper grounding.

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## Ordering Information

Ground Man and Ground Man Plus are shipped with:

- Power adaptor
- User's Guide

Please contact factory for other options and accessories.

## CTC-33X-Y

Ground Man	3
Ground Man Plus	4
Universal Power Adapter	WW

Accessories

Dual Conductor Fabric Wrist Band	<b>2368</b>
Dual Conductor Coiled Ground Cord, 10 ft.	<b>2370</b>
Replacement Terminal Board w/Jack	<b>CTA251</b>



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