of the cabling. Even turning off a motor can generate a large spike as the magnetic field collapses.

Proper handling of electronic components

The only effective solution to protect against damage from static electricity is a complete ESD protection system, including guidelines for handling, packaging, and shipping electronic components to minimize the possibility of damage.

Rules for safe handling of static sensitive components

Rule #1: Handle components only at a static safeguarded work station.

Handle all static sensitive components at a work area equipped with a grounded static dissipative mat and grounded wrist straps. Test wrist straps on a regular basis to be certain the continuity is intact. When working in the field, always use portable static-dissipative mats and wrist straps. If components must be set down, place them only on the grounded mat.

Rule #2: Transport all static sensitive components in the proper static protective device.

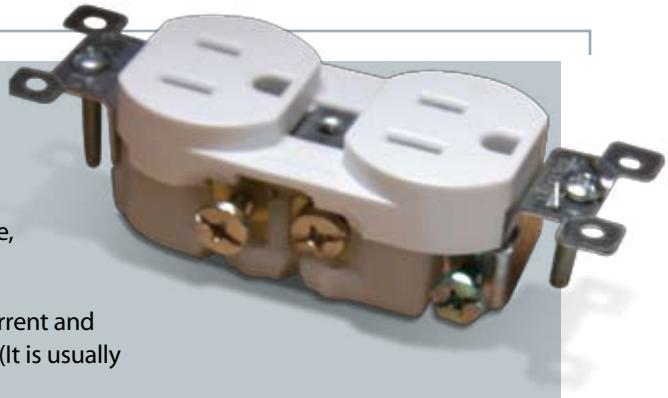
Whenever a static sensitive component is removed from a grounded enclosure, place it in a static shielding bag. A damaged board to be returned to the manufacturer should be placed in a static shielding bag to prevent further damage in shipping. Place separate EPROMS or ICs with prongs into conductive foam or inside DIP tubes. When using static bags, fold the open end of the bag and seal with tape or a warning label declaring that the contents are static sensitive. If using clear DIP tubes or conductive foam for ICs, enclose them in a static shielding bag as well.

Pink polyethylene bags are not static shielding. These bags protect contents only from static charging within the bag. They do not protect from static discharge caused by external electrostatic fields.

For complete ESD protection, we recommend the laminated blue/black conductive static shielding bags. We stock the most popular sizes of these multilayer bags, and they can be reused as long as they are intact. Other static shielding bags, conductive foam, and DIP tubes can be purchased at most electronics supply stores.

Rule #3: Make sure your supplier follows Rule #1 and Rule #2. ■

Respect for the AC receptacle



There are three connections in a standard AC receptacle—the Hot wire, the Neutral wire, and the Ground connection.

The Hot connection is, as the name implies, the one that carries the current and is usually at approximately 120 VAC (Volts AC) with respect to ground. (It is usually the black wire on the gold terminal of the duplex outlet.)

The Neutral connection is the one that completes the path for the power from the Hot wire. It is usually the white wire on the silver terminal of the duplex outlet. This connection should be connected to ground at the distribution or circuit breaker box. NEVER DEPEND ON THIS CONNECTION TO BE A GROUND. This wire is, at best, "grounded" but can develop a significant voltage with respect to ground for a number of reasons.

The Ground connection is actually connected to ground in a properly configured installation. Testing this connection should always be done before depending on it. Testing should be done in the following manner:

1. Using a multimeter and INSULATED probe, set the meter to the 120 (or more) AC voltage range and connect the probes to the ground connector and a good earth ground such as a cold water pipe or other clear and confirmed ground. You should be able to adjust the meter range down to its lowest reading and not see any voltage at all. If you see any voltage reading that is stable, the ground is not up to the National Electrical Code and a licensed electrician should be called in to remedy the situation.
2. If you do not see a voltage, set the meter to read resistance and check the resistance reading. It should be less than 2 ohms. If not, there is a problem that needs to be rectified by a licensed electrician. NOTE: Do not attempt this step if the reading in step 1 shows any voltage or you will damage your meter! ■