

# 36 GDS Helpsheet



*World Leaders in Computer Controlled Testing  
Systems for Geotechnical Engineers and Geologists*

Hardware

Advanced Controller

Earth Paths Upgrade

---

## 1. Overview

---

The main board of the controller has on it several electronic components. These components each have a range of performance within their individual specifications. Sometimes the statistical mix of these specifications (which may be marginal) can combine to cause a malfunction in some circumstances. This can sometimes happen in the digital controller when static electricity is discharged onto the body of the controller. This charge is earthed through the earth paths of the controller. This can cause a wave of voltage to flow across the board and in some cases cause the microprocessor to "crash". This is then seen by the user as a lost IEEE address and/or a false pressure zero offset. This helpsheet describes an upgrade which improves the earth paths within the controller in and around the main board and power supply. The upgrade consists of upgrading the earth paths on the main board itself as well as upgrading the earthing associated with the link between the main board and power supply.

## 2. Main Board

---

Open the controller case and remove the main board using the procedures given in Helpsheet 7. Near the IEEE connector inside the case you will see a small earth wire which connects the case to the board. Unplug the little link from the board, cut the earth lead off close to the case and throw the earth lead away.

Referring to the diagram, you will see a schematic representation of the earth paths upgrade. Using a solder sucker, de-solder the 7 earthed pins of IEEE CON 3 and the two 0V pins of CON 5. Strip and tin about 20mm of the blue wire supplied. Solder onto the 7 IEEE pins. Pull the wire over to the 0V pins on CON 5. Cut, strip and tin the blue wire to length. Make onto the 0V pin and solder.

Referring to the diagram, scrape the solder resist from the main earth track between the two plated-through holes at the left-hand end of the track. This earth track is the third one up in the bottom right hand corner of the board. Tin the scraped track with solder. Strip and tin 5mm of the blue wire. Solder to the earth track. Pull the wire over to the 0V pins on CON5. Cut, strip and tin the blue wire to length. Make onto the 0V pin and solder.

Replace the main board into the controller using the procedures given in Helpsheet 7.

## 3. Power Supply

---

The power supply is located to the right of the main board. This is a printed circuit board. The purpose of the power supply is to receive the 240V ac (or 120V ac) and convert it into 24V, 12V, -

12V and 5V dc. These dc voltages are connected to the main board by a loom of wires which are white, blue, orange, yellow, black (2) and red (2). The black wires are earth wires. Using snips, cut back the binding of the loom to free about 80mm of the black wires from the main board connector. Select one of the 2 black wires and cut it near the top of the loop where the loom curves up and over to the main board connector. Strip both ends for about 5mm.

Cut a section of new earth wire (this should be yellow with green stripe) about 200mm long. Strip each end by about 5mm. Tin one end. Solder the tinned end to the earth star connector screwed to the bottom of the case. Take the free stripped end of this earth wire and the power supply end of the cut black wire and insert them together into one end of an insulated crimp connector (butt type). Crimp them together. Then insert the main board end of the cut black wire into the other end of the crimp connector. Crimp them together. Check the continuity from the main board connector black 0V through to the power supply and to the earth star connector to make sure you have good connections. Both the earth of the main board and the earth of the power supply are now commoned to the earth on the case.