

Geoprobe® 3-Position EC Test Load

Quality Assurance Testing of the Wenner Array Electrical Conductivity (EC) Logging System with the EC Test Load (P/N 37785)

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The 3-Position Electrical Conductivity (EC) Test Load is an important tool for performing quality assurance (QA) testing of the Wenner array soil EC logging system prior to placing the probe in the ground to collect EC data. The EC Test Load (Fig. 1) checks the entire system, from signal conditioning to probe continuity and isolation to voltage and current measurement.

Three different soil EC values are simulated by the EC Test Load when using a Geoprobe® SC400, SC500 or HPT probe in Wenner array mode in conjunction with an EC Test Jig. The EC Test Load cannot be used to perform QA testing of the Wenner array in top, middle or bottom dipole mode.

IMPORTANT: Perform a QA test on the EC logging system using the EC Test Load prior to every soil EC log.

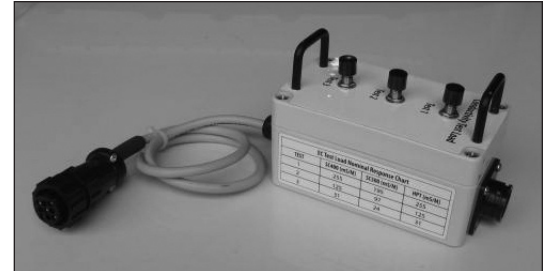


Figure 1: The 3-Position EC Test Load (P/N 37785) is used to perform QA testing of Wenner array soil EC logging systems.

Testing Procedure

1. Install the EC Test Load by connecting the test load cord to the test jig port on the back of the Field Instrument. Connect the EC Test Jig cord to the EC Test Load as shown in Figure 2.
2. Place the Wenner array probe on the EC Test Jig. Orient the probe so that the Test Jig cord and the probe cord are on the same end (Fig.2).
3. Start the Field Computer and probing software. Run through the instrument and probe tests as instructed by the software cues. Choose "Wenner", if available, and continue to the logging screen. If Wenner is not available, there is a problem with the EC logging system and a QA test may not be performed using the EC Test Load.

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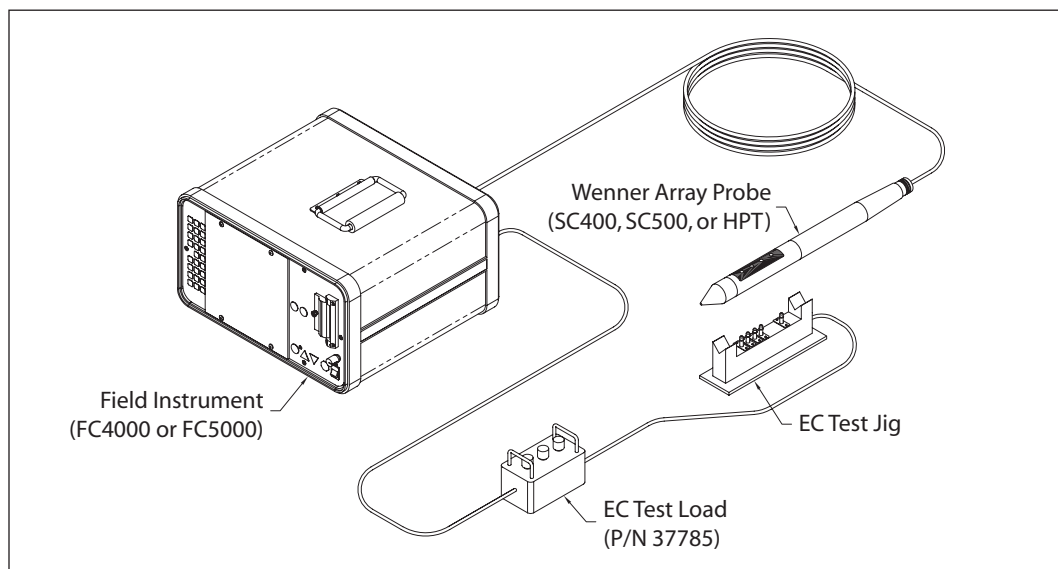


Figure 2: The EC Test Load is installed between the Field Instrument and EC Test Jig.

4a. **FC5000 Field Instrument**

With the probe still placed on the EC Test Jig, press and hold the “Test 1” button on the EC Test Load. Record the EC value from the data column on the Field Instrument. (Press the F1 key on the instrument touch pad to see the data column if not present by default).

The EC reading from the instrument should correspond to the “Test 1” value in the chart on the side of the EC Test Load. This chart is recreated here in Table 1. Repeat Step 4a for the “Test 2” and “Test 3” buttons.

4b. **FC4000 Field Instrument**

FC4000 users must run a short log to obtain EC values using the EC Test Load.

With the probe still placed on the EC Test Jig, press and hold the “Test 1” button on the EC Test Load while manually running the stringpot to collect approximately one foot of data.

The EC reading from the instrument should correspond to the “Test 1” value in the chart on the side of the EC Test Load. This chart is recreated here in Table 1. Repeat Step 4b for the “Test 2” and “Test 3” buttons.

5. Calculate the percent deviation from the nominal responses in Table 1 for each instrument reading from Tests 1 thru 3. Sample results and the calculated deviations are given in Table 2.

EC readings generated with the EC Test Load should be within 7% of the values given in Table 1. Values outside of the 7% window may indicate a problem with the electrical continuity to the probe, loss of electrical isolation in the probe, or (less likely) a fault in the EC measurement system.

Continuity and isolation problems should be indicated by the standard probe test made using the EC Test Jig prior to activating the EC Test Load. Refer to the results of the standard probe test if the instrument readings made using the EC Test Load are not within 7% of the nominal responses indicated in Table 1.

IMPORTANT: Do not begin logging until there is assurance that the soil EC system is capable of accurate measurements.

Table 1: EC test load nominal responses for SC400, SC500, and HPT probes.

EC Test Load Nominal Response Chart			
Test	SC400 Probe (mS/m)	SC500 Probe (mS/m)	HPT Probe (mS/m)
1	255	195	195
2	125	97	97
3	31	24	24

Table 2: Sample EC test results using the EC Test Load with an SC500 Probe.

EC Test Load Results - SC500 Probe			
Test	Nominal Response ¹ (mS/m)	Probe Response ² (mS/m)	Deviation (%)
1	195	198.4	1.7
2	97	97.6	0.6
3	24	24.5	2.1

¹ Value from Table 1 for SC500 probe.

² Instrument EC reading with EC Test Load activated



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