

Bird Dog 3

GeoTest Manual

Mark Day



DOCUMENT REVISIONS

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Introduction

System Description

The Bird Dog 3 system is an independent analog to digital acquisition system, especially designed for quality control testing and repair of seismic geophone units and geophone strings.

The Bird Dog 3 System consists of the following:

- Bird Dog 3 Unit – Digital to Analog converter unit with Ethernet interface. BD3 is a 32-bit acquisition unit with each box containing 3 channels. The Bird Dog 3 uses a 16-bit D/A output for the Geophone Test signals
- Computer – The BD3 unit connects to a computer with Windows XP, Windows 7 or Windows 8 operating system and an Ethernet Network Interface Card (NIC).
- GeoTest software operates on the computer and communicates to the BD3 unit. The Software package allows viewing, analysis, and storage of the acquired signals.
- Connection cables are included to connect:
 - Power (11-18 VDC)
 - Geophone being tested
 - Ethernet cable to connect BD3 to computer

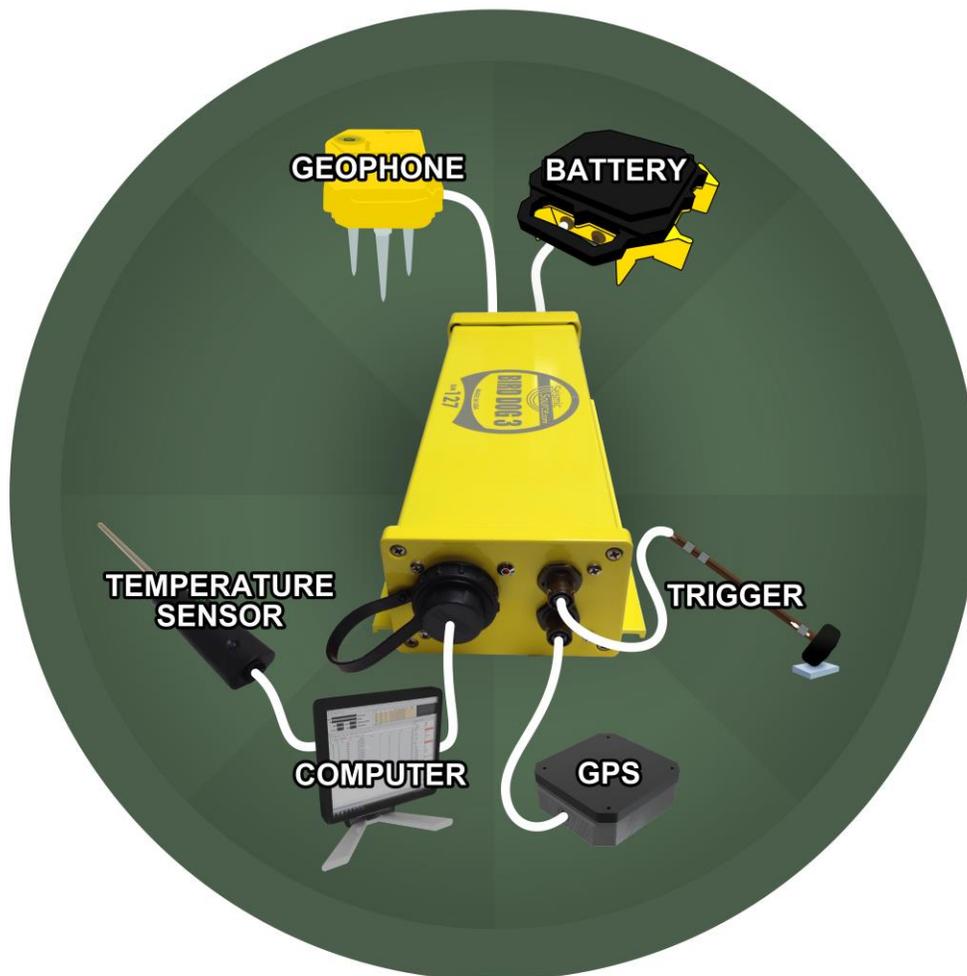
WinPCap

WinPCap software needs to be installed. This software improves the Ethernet reliability and speed on most computers. WinPCap is included on the GeoTest install disk

The latest WinPCap can be downloaded from: <http://www.winpcap.org/>

Cable Connections

- Connect BD3 to computer with patch cable provided
- Connect 11-18 VDC supply to BD3 power cable (polarity does not matter). The power connects to the 2-pin connector on the BD3 unit. Make sure voltage to box is at least 11 volts. The power LED will operate with lower voltage, but the unit will not perform properly.
- Connect the standard geophone test cable. Connect the 55-pin circular connector to the BD3 unit, connect the geophone test clips to the geophone under test.

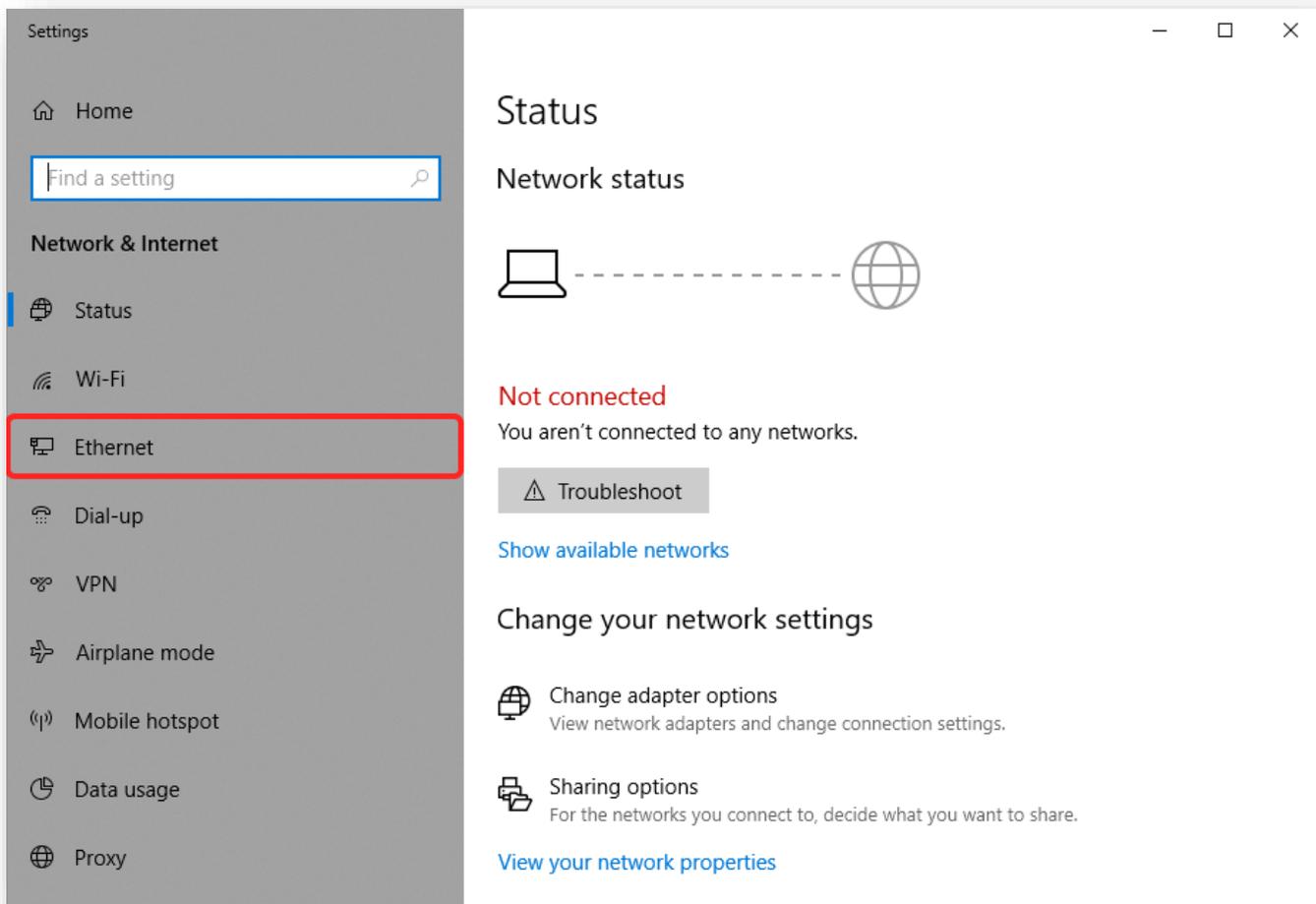


Network Settings

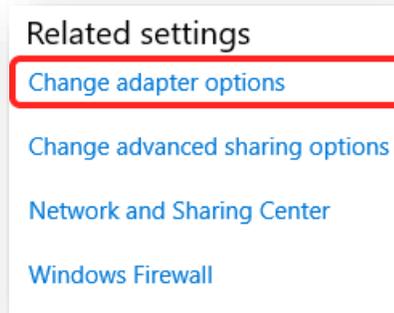
Sigma 4+ units are set up on a 10.x.x.x IP address, so your computer needs to be set up on the same network to establish communication.

Begin by opening your Network Settings.

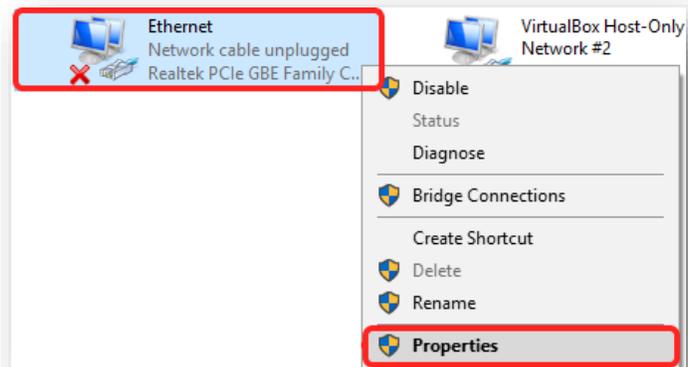
1. Click on **Ethernet** under Network & Internet on the left-side menu.



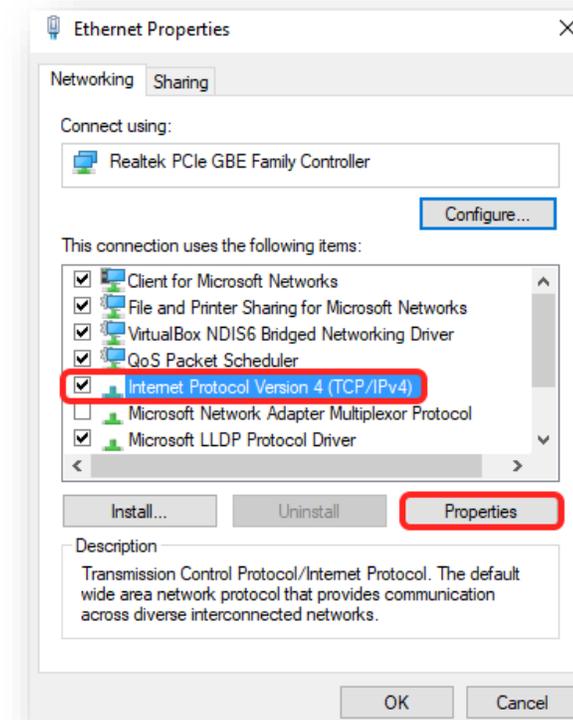
2. Select **Change Adapter Options**.



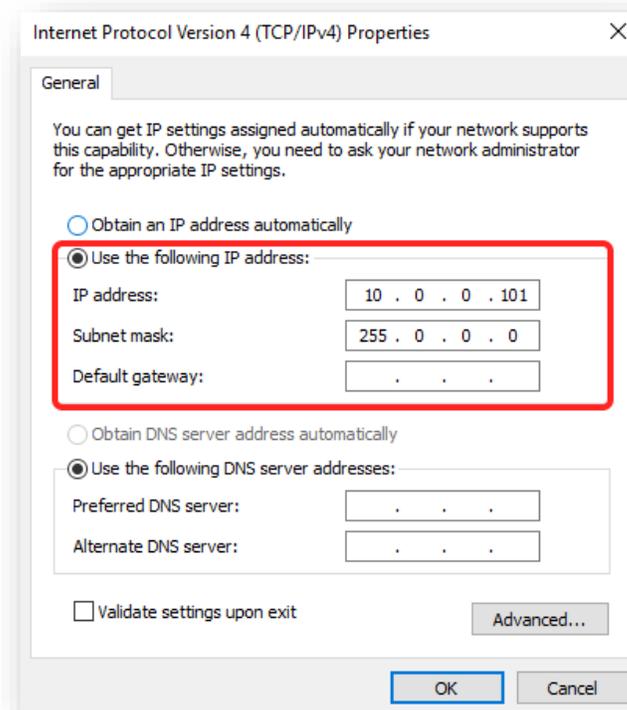
3. Right click **Ethernet** and select **Properties**.



4. Select **Internet Protocol Version 4** and click **Properties**.



5. Click **Use the following IP address**
6. Set your IP address to **10.0.0.101**
7. Set your Subnet mask to **255.0.0.0**
8. Click **OK**



Finally, connect your unit to your computer through the network port.

NOTE: If your computer is unable to communicate with the unit, temporarily disable your virus protection and firewall, as they may be blocking the connection. Windows Defender can also block this connection.

Option Overview

The standard BD3 is a 3 channel Geophone Test unit. Various options are available for testing of Servo Hydraulic Vibrators and Hydrophones

VIBQC Option -3 channel

The BD3-3 VibQC Option consists of the following:

- BD3 VibQC External Box
- VibQC cable kit
- Two external magnetic accelerometers

This kit enables testing of Servo hydraulic Vibrators. The independent accelerometers allow verification of correct polarity and operation of the system. The Weighted Sum or Ground Force signal can be recorded and compared against the True Reference Signal.

Portable Bird Dog 3 unit

The BD3-3 unit is also available in a portable version. This version has a built-in battery and display.

The portable BD3 Geophone tester can be used without a computer. Each string is tested, and the results are shown on the Display. The results are also saved in the non-volatile memory in the device.

The saved Geophone results can be downloaded to computer and a summary report is available.

Hydrophone Test Option

A Hydrophone Test Option is also available for the BD3-3 unit. The Hydrophone Test Option consist of the following:

- BD3 Hydrophone Test Sound Tube
- Hydrophone Test audio amplifier
- Hydrophone Test Cable kit

GeoTest 4

GeoTest is compatible with Windows XP and newer operating systems. This software program allows complete testing of geophones and geophone strings when connected to the Bird Dog 3 units. After installing the software, click on the GeoTest icon and start the program.

The main menu of the program is located at the left side of the program window. It allows you to navigate between three main selections.



They are **Geophone Test**, **Project** and **Setting**.

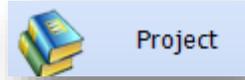
- **Geophone Test** is used to perform the Geophone Test.
- **Project** is used to view the saved data.
- **Setting** is used to setup the GeoTest parameters.

The projects and settings must be setup prior to performing any Geophone Testing.

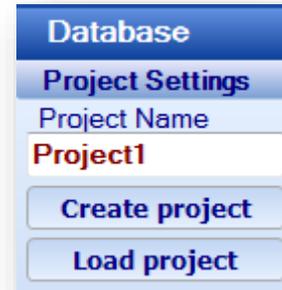
Project Setup

Create Project

Press the **Project** button to view the Project Menu



Type the name of the Project and press "Create Project" to create a new project. Existing projects can also be loaded by pressing the "Load Project" button



Settings

Press the **Settings** Menu to enter the GeoTest setting Menu

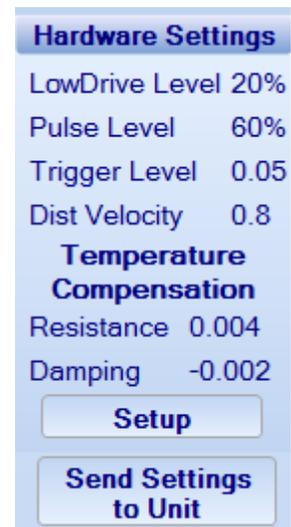


Hardware Settings

The Drive levels for the various tests are setup with the Hardware settings menu. The temperature compensation correction values can also be entered. The values shown are the standard values.

To change settings, press the "SETUP" button and edit the values.

Press **Send Settings to Unit** to send the Hardware settings to the BD3 unit.



Most geophones have the distortion specified at 1.8 cm/sec (0.7 in/sec) velocity. Geotest allows this drive level to be changed. Enter the desired drive level for the distortion test. Normal entry is 1.800 cm/sec.

Drive for Low Drive Z – This entry is used to set the drive level for the Low Drive Impedance Test. Enter the % of normal drive for the low drive Z tests.

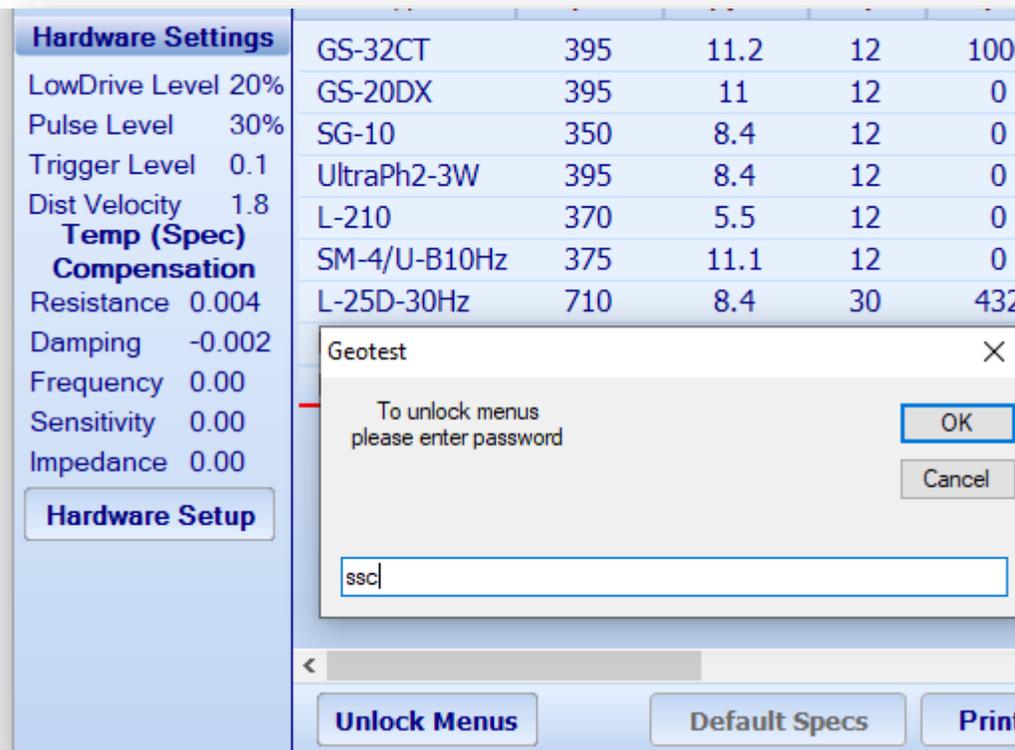
For test purposes only the Pulse Drive can be adjusted in this menu.

Lock Feature

There is also a “lock” feature in the program. This allows the technician to “lock out” the critical entries of the program for unskilled operators.

Click the **lock** button in the setting menus to lock the menus.

To Unlock the menus, enter the password “**ssc**”.



Geophone Selection and Settings

To obtain the correct test results the geophone parameters for the units under test must be entered and selected. All geophones are listed in Geophone Specification table. To select a geophone for the test, click on it with the left mouse button. You can also modify existing geophone specifications or add new geophones to the table.

Seismic Source Co Date : 25 Aug 2014 Copyright 2001 - 2014

Single Serial Parallel Cable Resistance Interval Lead-in Units US
 String 6 X 1 10.0 Ohm/km 1.0 m 1.0 m Metric cm

Geophone Settings Type Blue Geophone New Auto fill specification

Coil Resistance (Rc, Ohm)	395	Shunted Impedance (Zts, Ohm)	658.8
Moving Mass (M, gram)	11.2	Case to Coil Motion (Disp, mm p-p)	1.52
Drive Frequency (Fd, Hz)	12	Temperature (deg C)	25
Shunt Resistor (Enter 0 for none)(Rd, Ohm)	1000	Tolerance Settings	
Natural Frequency (Fn, Hz)	10	Frequency Tolerance (+ / -) %	3 3
Open circuit Damping (Bo)	0.316	Damping Tolerance (+ / -) %	3 3
Shunted Damping (Bt)	0.7012	Sensitivity Tolerance (+ / -) %	3 3
Open circuit Sensitivity (Go, V/m/s)	27.5	Resistance Tolerance (+ / -) %	3 3
Shunted Sensitivity (Gs, V/m/s)	19.71	Impedance Tolerance (+ / -) %	6 6
Shunted Resistance (Rcs, Ohm)	283.2	Distortion Tolerance %	0.1

Type	Rc,Ohm	M,gram	Fd,Hz	Rd,Ohm	Fn,Hz	Bo	Bt	Go,V/m/s	Gs,V/m/s	Rcs,Ohm	Zts,Ohm
GS-30CT	395	11.2	12	1000	10	0.316	0.7	27.5	19.7	284	658.8
GS-20DX	395	11	12	0	10	0.3	0.3	28.0	28.0	395	1957.6
SG-10	350	8.4	12	0	10	0.68	0.68	22.8	22.8	350	1040
UltraPh2-3W	395	8.4	12	0	10	0.68	0.68	27.5	27.5	395	1400.5
L-210	370	5.5	12	0	10	0.67	0.67	19.5	19.5	370	1151.7
SM-4/U-B10Hz	375	11.1	12	0	10	0.25	0.25	28.8	28.8	375	2227.2
L-25D-30Hz	710	8.4	30	432	30	0.2695	0.711	39.92	15.1	269	370
GS-32CT	395	11.2	12	1000	10	0.316	0.7	27.5	19.7	283.2	658.8
Sm7_10hz	375	11	12	1000	10	0.25	0.7	28.8	20.95	272.7	713.7
PS-1	3400	770	12	8750	1	0.36	0.7002	200.0	144.03	2448.6	2515.4
PS-1 undamped	3400	770	12	0	1	0.36	0.36	200.0	200.0	3400	3498.5
L22	5470	72.8	12	0	2	0.46	0.46	112.0	112.0	5470	6230.2
L22 damped	5470	72.8	12	20000	2	0.46	0.7292	112.0	87.95	4295.2	4832.8
Blue Geophone	395	11.2	12	1000	10	0.316	0.7012	27.5	19.71	283.2	658.8

To add a new Geophone, press **New** button and type in parameters in the top section of the Geophone Settings screen.

The Auto Fill feature can be used to compute impedance, shunted sensitivity and damping. When possible, the empty fields will be computed and filled when the Auto Fill button is pressed.

Example: Enter: Rc ,M, Fd, Rd, Fn, Bo, Go, Displacement. AutoFill computes: Bt, Gs, Rcs, Zts.

Entries must be blank for auto fill to work. (Use delete key if you want to recalculate entered value)

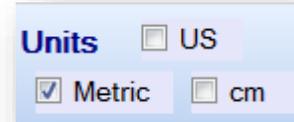
After all entries in the top portion are correct, press **Save Geophone** button at the bottom of the screen to save the new geophone and its parameters.

Enter all parameters for a single geophone. The Geotest program will compute the specifications for the string using the single geophone specification.

- Type – This is a text entry that allows the user to identify the parameters when selecting the geophone type. This can be the detailed name or as simple as red ones and blue ones
- Rc-Coil Resistance – Coil Resistance of the geophone.
- M- Moving Mass – Moving Mass of the geophone is used to compute the sensitivity of the geophone
- Fd- Geophone Drive Frequency – determine the frequency that will be used for the distortion and impedance tests
- Rd- Damping Resistor – Enter the value of the damping resistor. A zero should be entered when there is no shunt resistor.
- Fn- Natural Frequency – Enter natural frequency of the geophone.
- Bo – Open circuit Damping – Enter the open circuit damping. This is the damping of the geophone with no damping resistor.
- Bt – Shunted damping – Enter the damping of the geophone with the damping resistor.
- Go – Open circuit Sensitivity – Enter the sensitivity of the geophone with no damping resistor.
- Gs – Shunted Sensitivity – Enter the shunted sensitivity of the geophone. This is the sensitivity of the geophone with the shunt resistor.
- Rcs- Shunted Resistance – Enter the DC resistance of the geophone with the shunt resistor.
- Zts- Impedance – Enter the shunted impedance of the geophone at the Fd (Drive Frequency).
- Disp – Displacement of the geophone – Enter the peak to peak displacement of the geophone. This entry is used to compute the Step drive level.
- Temp – Enter the temperature that the geophone is specified at. Most geophone manufacturers use 20 degrees C to specify the geophone. OYO/Geospace use 25 degrees C to specify their geophones.

Unit Selection

Units – Metric, Centimeters, and Inches - use this selection to switch between English and metric units. Note: Moving Mass is always entered in grams



To perform test of geophone strings check String checkbox and enter number of series and parallel phones.



You can quickly switch between String or Single geophone in the Main Test Window by checking the appropriate checkbox.

String Resistance

There are entries in the program to compensate for the resistance in the wire in a geophone string. The resistance of the cable should be entered as xx ohms per 1000 meters. This value is typically about 120 ohms per 1000 meters.

Enter the lead in length of the cable used on the string, and the spacing between the geophones. All the entries should be in meters.

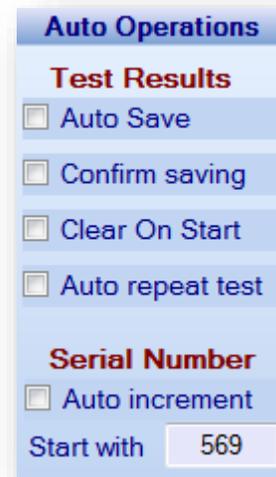
GeoTest will automatically compute the added resistance and impedance caused by the wire in the geophone string

Typical String Resistance Entries

- 70 Break Wire: 35 ohms / 1,000ft or 114 ohms per 1 km
- 100 Break Wire: 24 ohms / 1,000ft or 78 ohms per 1 km
- 150 Break Wire: 14 ohms / 1,000ft or 45 ohms per 1 km
- 225 Break Wire: 4 ohms / 1,000ft or 13 ohms per 1 km

Auto Operations

Auto Operation can be enabled to improve the efficiency of the test.



The image shows a software dialog box titled "Auto Operations". It is divided into two main sections: "Test Results" and "Serial Number".

Test Results section includes four checkboxes, all of which are currently unchecked:

- Auto Save
- Confirm saving
- Clear On Start
- Auto repeat test

Serial Number section includes one checkbox, which is currently unchecked:

- Auto increment

Below the "Auto increment" checkbox, there is a label "Start with" followed by a text input field containing the number "569".

Test Mode

The main Geophone Test window shows which test are currently selected, the geophone type selected, and the results of the previous test or results loaded from database

In this window you can quickly switch between Single geophone or String.

The Frequency, Damping, Sensitivity, and Resistance test will all be performed as one test. Also, the Impedance and Distortion will be performed as one test. Clicking any of these tests will enable all of them.

The Polarity test is performed separately.

The Leakage test is also performed separately, and a special cable configuration must be used.

The screenshot shows the Geotest software interface with the following data:

Geophone Test		Frequency		Damping		Sensitivity		
Result	Error	Result	Error	Result	Error	Result	Error	
10.16 Hz	1.6%	Pass	0.699	1.8%	Pass	20.97	0.1%	Pass
Tolerance +5.0 % / -5.0 %		Tolerance +5.0 % / -5.0 %		Tolerance +5.0 % / -5.0 %		Tolerance +5.0 % / -5.0 %		
Resistance		Impedance		Distortion				
Result	Error	Result	Error	Result	Error	Result	Error	
276.2 Ohm	1.3%	Pass	703.5 Ohm	1.4%	Pass	0.06 %	Pass	
Tolerance +2.5 % / -2.5 %		Tolerance +5.0 % / -5.0 %		Tolerance 0.2 %				
Polarity		Leakage		Low Drive Z				
Positive				713.7 Ohm				
Pos	Neg	Result			Result	Error		
---	---	---						
		Tolerance 1000 kOhm		Tolerance +5.0 % / -5.0 %				

New Test - Press Start

Temperature Entry

At the top right of the screen, the temperature of the geophone should be entered.

The geophone parameters will change depending on temperature. The Geotest program will automatically adjust the test readings to show what the results would have been at 20 degrees C operation. Enter the temperature of the geophone under test. The results of the test will be modified depending on the temperature entry. The Geotest program uses the temperature entered in the Geophone Specification to compute the temperature offset. Most manufacturers specify the geophone at 20 degrees C. (OYO/Geospace specify their geophones at 25 degree C).

With Optional Temperature Probe, the temperature entry will automatically update

Start the Test

Press **Clear** button to clear the results stored in memory and shown on the screen.

Press **Start** button to acquire new test data.

Press the **Add/Repeat** button to add new data to the Test Result. This button is used to add the Polarity Test information to existing test data.

Press the **Stop** button or escape button (Esc) to stop the Polarity test



After recording new data, the results of the test will be shown on the screen. Depending on the result and tolerance settings the program will mark the results with Pass or Fail. If the tests results are within the user specified limits the tolerance box will be green, if the test result is outside the limits the tolerance box will be red.

Storing Data to Database

After acquisition is finished you can save new data to database. To do that click the Save button at the bottom of the main Screen or press "S" key. A window will appear where you can enter a Serial Number and a Comment for current record. By default, this window displays a comment from the previous record.

Results		Date: 24.02.2006	
Geophone type	GS-30CT	String	Single
DAQ Number	136	Channel	1
Frequency	9.97 Hz	Distortion	0.14%
Damping	67.2%	LoDrvImpedance	
Resistance	349.6 Ohm	Polarity	
Sensitivity	0.252	Leakage	
Impedance	1069.1 Ohm		
Serial Number		Temperature	20.0 °C
Comment			
<input type="text"/>			

Polarity Test

Select Polarity test in the main test window and press Start button. The program will switch to waiting mode. Slightly tap the geophone. If geophone signal exceeds Trigger level, then the program will show results on the screen.

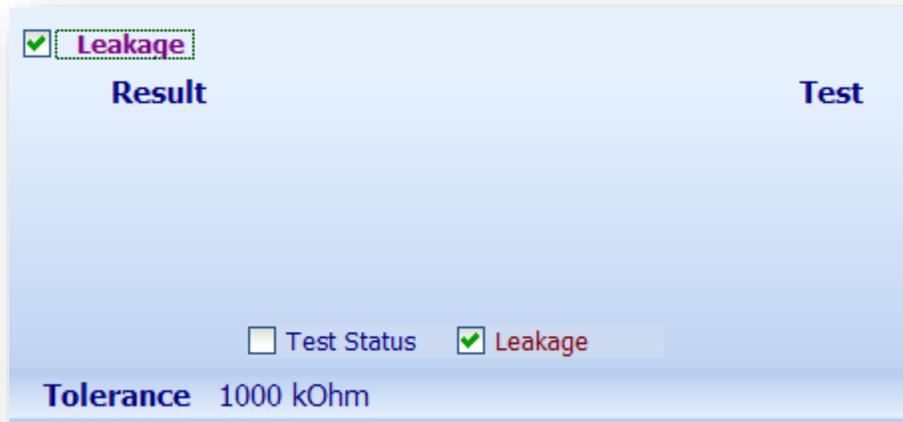


You can change Polarity trigger level in the menu Settings->Hardware Setting.

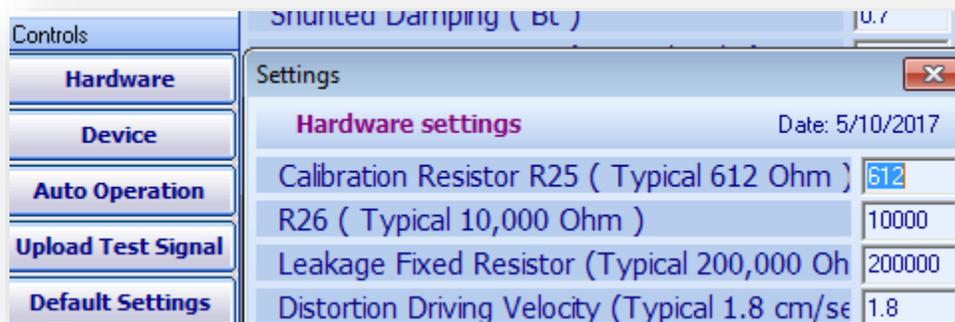
Press the **Stop** button or escape button (**Esc**) to stop the Polarity test

Leakage Test

First enable the Leakage Test menu by selecting the Leakage Test in the System Messages Screen.



The Leakage test recommends using a 200 Kohm resistor. This resistor needs to be measured accurately for accurate Leakage measurements. Enter the exact value used for the parallel resistor in the leakage tests in the hardware settings menu



A resistor, typically 200Kohm, is connected between the positive and negative geophone connectors on the Bird Dog 3 cable. The positive end of the cable should be connected to one end of the geophone string. The negative end of the cable needs to be connected to a ground point to measure leakage.

Typically, a large water container is used to test leakage. The positive end of the Geophone Test cable should be connected to one end of the geophone string. The negative end of the Geophone Test cable is terminated in the large water container.

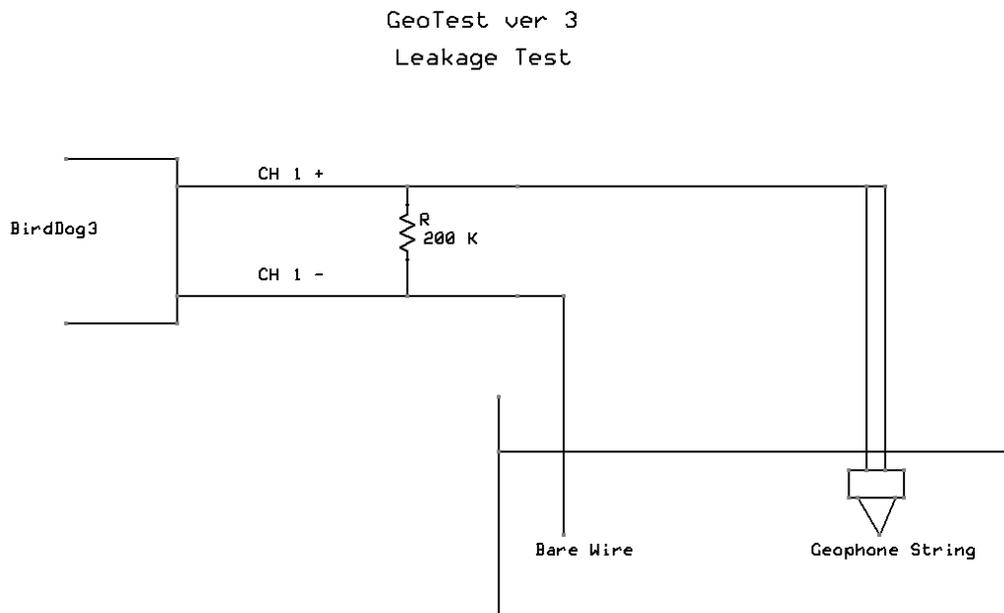
The geophone string is submerged in this water container. The Leakage test will measure the resistance between the positive and negative leads of the cable ignoring the 200Kohm fixed resistor. The correct value of the resistor must be entered in the Options-Hardware Setup-Leakage Fixed resistor entry. This test is used to verify if the electrical isolation of the geophone string is adequate.

Connect both Positive and Negative side of the Geophone under test to the + connector

- Ch1 + - Pin A
- Aout – Pin CC
- One side of 200 K resistor

Connect the Negative connector to a probe which is terminated in water container

- Ch1 – Pin B
- Aout FB – Pin GG
- Other side of 200 K resistors



Project Database

GeoTest database includes tolerance settings for each geophone setting. Different Geophones have different manufacturer specifications, and these specifications and tolerances are entered into the database.



All the columns can be moved, so the most important columns are shown.

The data can be filtered and sorted.

The database is also used to sort and analyze the saved data. Various export and report features are available within the database.

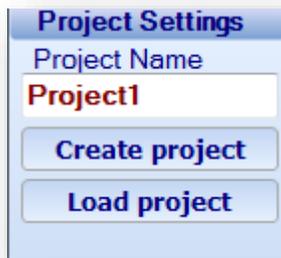
Record	Date	Time	String	Temp	Comment	Lead	Interv	Freq	Damp	Res	Sens	Imp	Dist	Polarity	SpecFr	SpecD	SpecR	SpecsS	CoilRe	Movin	TestFr	DistTo	Lr
8/5/2014	2:05:03	PM	Single	20	All three at	0	0	10.16	0.699	276.2	20.97	703.1	0.05	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:05:03	PM	Single	20	All three at	0	0	9.79	0.711	278	20.68	687.6	0.08	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:05:03	PM	Single	20	All three at	0	0	9.68	0.717	277	20.55	667.6	0.08	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:09:26	PM	Single	20		0	0	10.16	0.699	276.2	20.97	703.3	0.05		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:09:26	PM	Single	20		0	0	9.79	0.711	278	20.65	690.5	0.07		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:09:26	PM	Single	20		0	0	9.72	0.721	277	20.66	673.9	0.07		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:11:29	PM	Single	20		0	0	10.16	0.699	276.2	20.97	703.5	0.06		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:11:29	PM	Single	20		0	0	9.76	0.707	277.9	20.57	693.8	0.05		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:11:29	PM	Single	20		0	0	9.73	0.731	276.8	20.71	681.2	0.05		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:20:44	PM	Single	20		0	0	10.15	0.698	276.2	20.95	703.5	0.04	Negative	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:20:44	PM	Single	20		0	0	9.8	0.708	278	20.66	690.6	0.08	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:20:44	PM	Single	20		0	0	9.64	0.713	276.9	20.45	663.9	0.11	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:22:31	PM	Single	20		0	0	10.16	0.698	276.2	20.96	703.4	0.05	Negative	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:22:31	PM	Single	20		0	0	9.79	0.711	278	20.7	691.9	0.07	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:22:31	PM	Single	20		0	0	9.68	0.714	277.1	20.55	672.1	0.1	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:38:32	PM	Single	20		0	0	10.16	0.698	276.2	20.96	703.6	0.06		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:38:32	PM	Single	20		0	0	9.81	0.716	278	20.72	695.2	0.07		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:38:32	PM	Single	20		0	0	9.76	0.727	277	20.78	681.1	0.07		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:45:21	PM	Single	20	bad BD3-3	0	0	10.14	0.689	4121.5	12.88	10534	15.06		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:45:21	PM	Single	20	bad BD3-3	0	0	9.77	0.706	276.9	20.71	694.1	0.05		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	2:45:21	PM	Single	20	bad BD3-3	0	0	9.73	0.729	278.6	20.89	685	0.06		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	3:43:42	PM	Single	20		0	0	10.28	0.712	4119.6	13.13	10523	14.89		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	3:43:42	PM	Single	20		0	0	9.73	0.709	276.9	20.63	693.1	0.18		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	3:43:42	PM	Single	20		0	0	9.73	0.72	278.2	20.86	708.3	0.06		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	3:47:32	PM	Single	20	new BD3-3	0	0	10.22	0.708	271	21.33	687.5	0.06		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	3:47:32	PM	Single	20	new BD3-3	0	0	9.9	0.723	270.8	21.01	662	0.17		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014	3:47:32	PM	Single	20	new BD3-3	0	0	9.88	0.735	270	21.1	701.6	0.04		10.0	0.686	272.7	20.95	375	11	12	0.2	
8/6/2014	10:58:49	AM	6 x 1	20		0	0	10.07	0.711	1698.2	118.22	3933.6	0.08		10.0	0.707	279.0	19.7	395	11.2	12	0.1	
8/6/2014	10:59:16	AM	6 x 1	100		0	0	10.05	0.708	1698.1	118.09	3933.5	0.08		10.0	0.695	339.2	19.7	395	11.2	12	0.1	
8/7/2014	9:17:35	AM	Single	25	box 118	1	1	10.35	0.695	277.4	20.91	706.6	0.06		10.0	0.68	276.6	20.95	375	11	12	0.2	
8/7/2014	9:17:35	AM	Single	25	box 118	1	1	9.8	0.714	277.1	20.77	694.1	0.04		10.0	0.68	276.6	20.95	375	11	12	0.2	
8/7/2014	9:17:35	AM	Single	25	box 118	1	1	9.69	0.724	278.1	20.76	689.7	0.05		10.0	0.68	276.6	20.95	375	11	12	0.2	
8/7/2014	9:20:32	AM	Single	25	box 101	1	1	10.35	0.695	275.9	20.77	703.4	0.05		10.0	0.68	276.6	20.95	375	11	12	0.2	
8/7/2014	9:20:32	AM	Single	25	box 101	1	1	9.77	0.711	277.4	20.62	695.3	0.04		10.0	0.68	276.6	20.95	375	11	12	0.2	
8/7/2014	9:20:32	AM	Single	25	box 101	1	1	9.67	0.723	276.3	20.55	687.5	0.05		10.0	0.68	276.6	20.95	375	11	12	0.2	

The following Projects operations can be performed:

- **Create Project** – Select “Create Project” to open a new project
- **Load Project** – Select “Load Project” to open an existing project which has been previously saved to the database

Create Project

Enter a new project name and press the **Create Project** button to create a New project menu



Load Project

Press the “Load Project” button to open the Load Project menu and select the project to open.

Database Layout Menu

The database layout menu allows the user to select which parameter to view in the database and on the reports. The column titles can also be changed.



A check mark enables the field to be displayed in the database.

Reports

The Geotest program has a powerful and flexible function of creating reports. Report is generated using information currently visible in Database Window. Using Layout Settings, Filters, Range and Tolerance you can display only information that you need. Information from the screen will go to the report.



Select Save to CSV file to export data to a CSV text file

SrcSig Operation

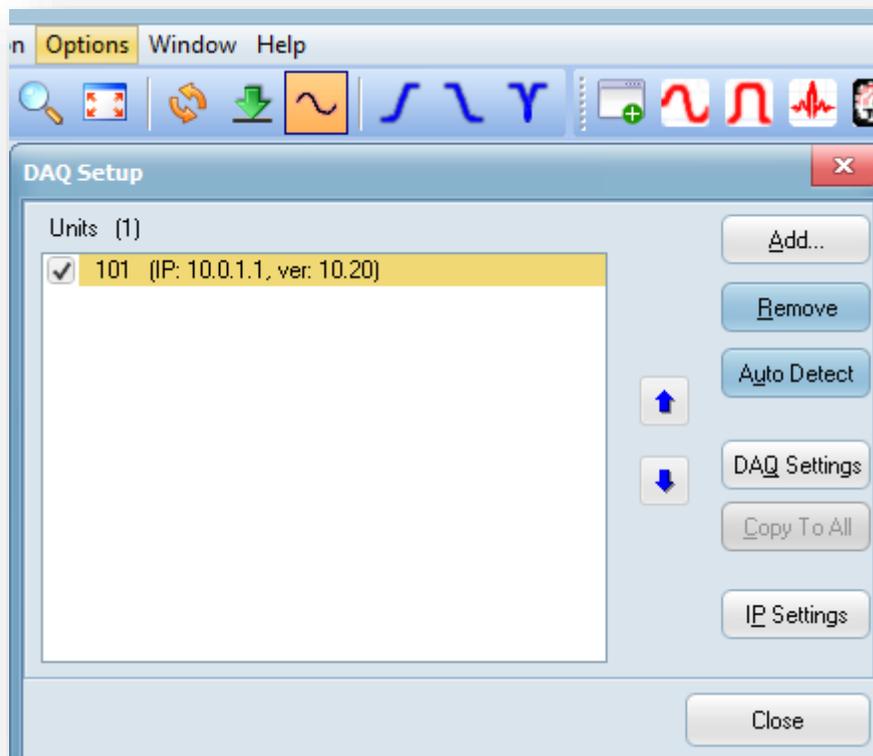
SrcSig can be used to view the actual test response of the Geophone. This software allows viewing of the geophone tests voltage and response.

After starting GeoTest, start SrcSig.

Go to the Options-Device-DAQ Setup. Remove all Devices and then do an "Auto Detect". The BD3 units that are connected to the computer should appear in the list.

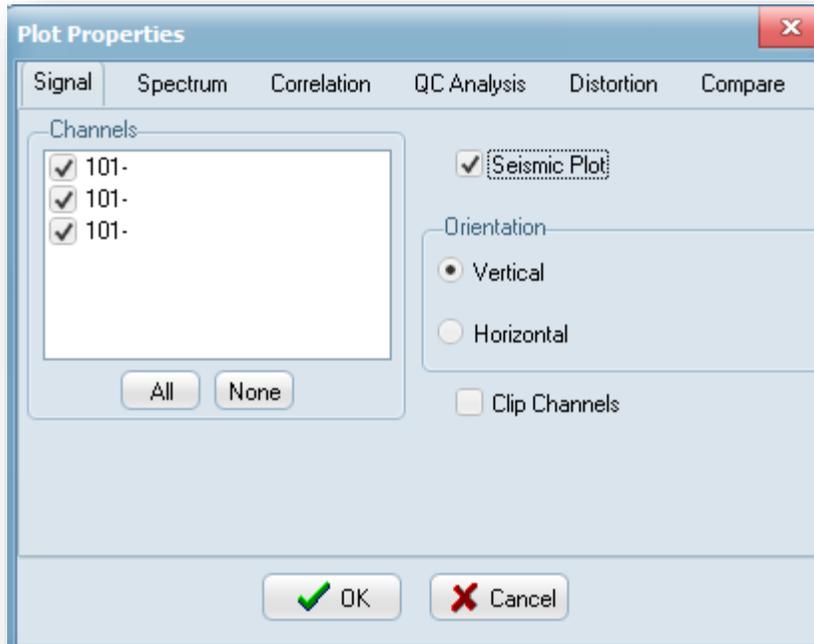
Click the box to show a "check mark" to enable the unit

Press "Close" to close this setup window.

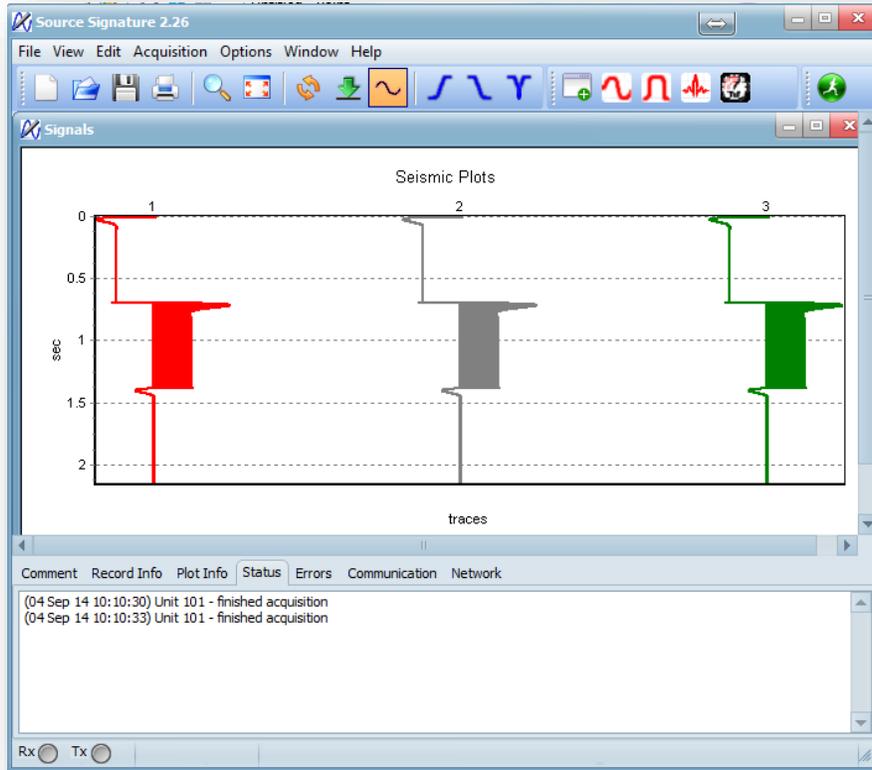


Run a test with GeoTest. SrcSig should automatically receive the data. The status bar at the bottom of the screen will show the Status of the BD3 unit. After the test is completed a “finish acquisition” message should appear in the status window.

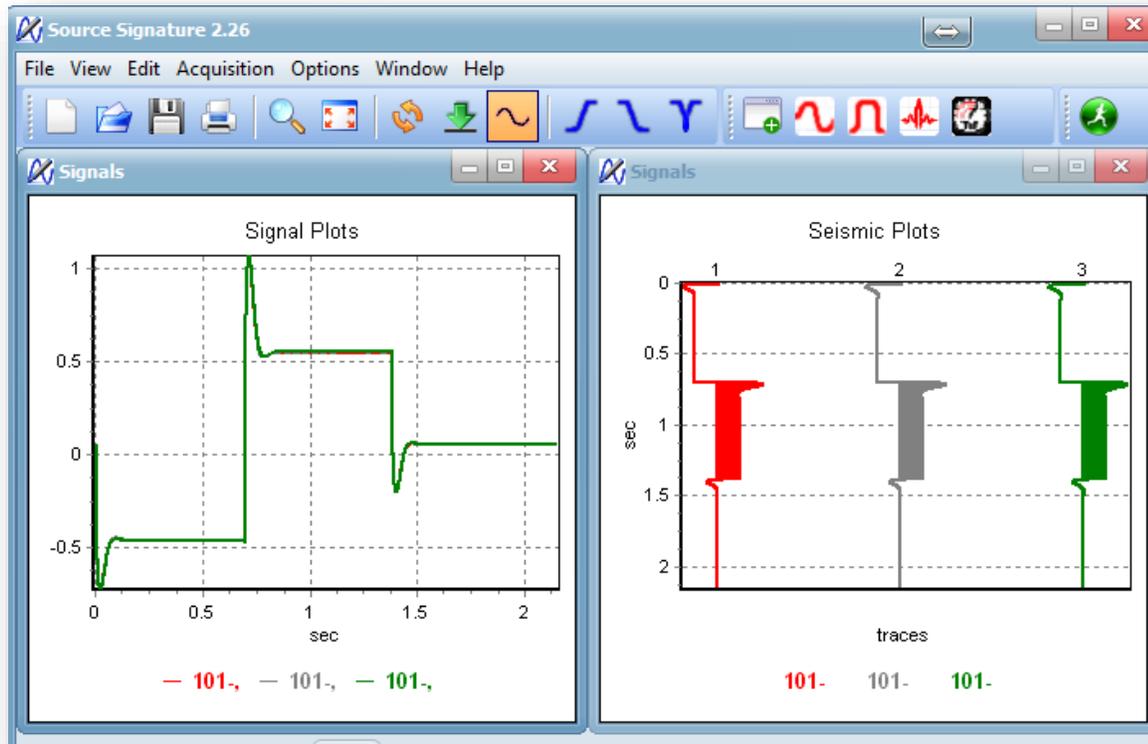
Press the **new plot** button and select the graph that you would like to view. Normally, Signal Trace is selected.



The Seismic Plot allows viewing of all three channels at the same time.



Viewing the signal traces in “non” seismic mode allows viewing of the actual voltages applied to the Geophone.



The Step Function is used to test

- Frequency
- Damping
- Sensitivity
- Resistance

The sine Wave is used to Test

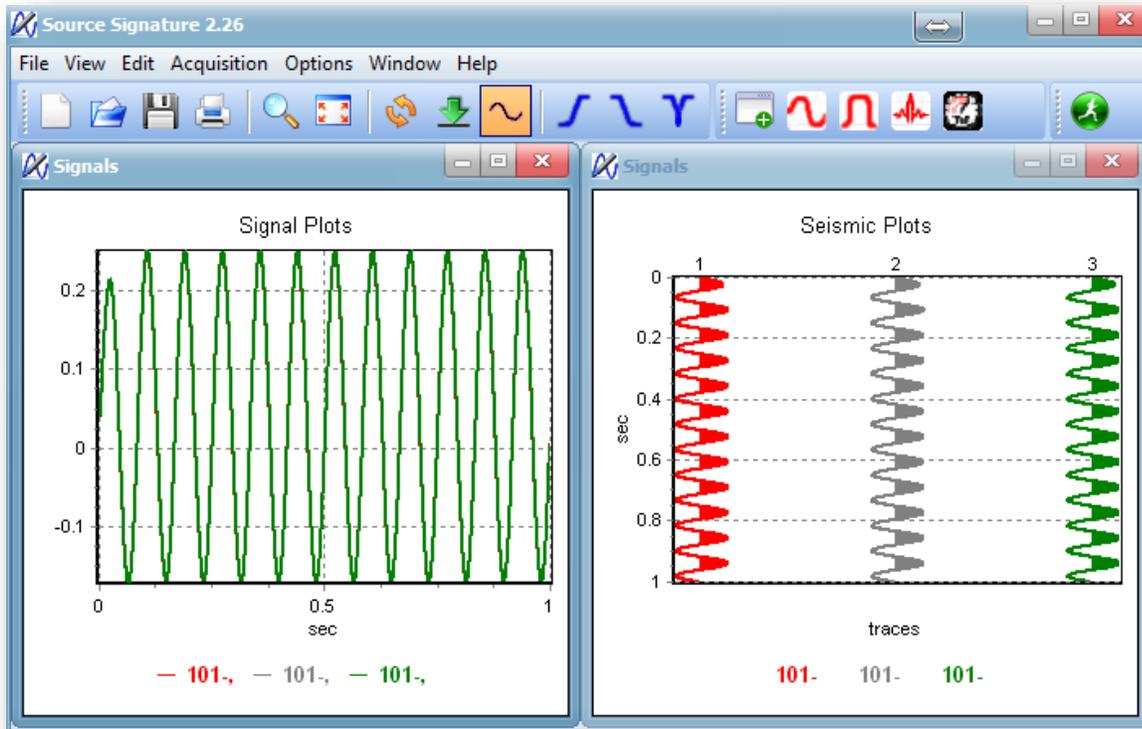
- Impedance
- Distortion

Low Drive Z is also a sine wave. It is a separate test with a lower sine wave voltage.

The Polarity Test is the final Test that can be viewed with the SrcSig software.

Select these tests one at a time to view them in SrcSig.

Sine Wave Test Example:



Geophone Tests

Natural Frequency – The Bird Dog 3 unit performs a step response to determine the frequency of the geophone. The zero crossings are used to determine the period of the response. The computed damping and the period are then used to determine the natural frequency of the geophone element.

Damping – The Bird Dog 3 unit performs a step response test to determine the damping of the geophone. The peak amplitude of the oscillations occurring after the step response is used to determine the damping of the geophone. The quicker the amplitudes decrease the larger the damping will be.

Sensitivity - The Bird Dog 3 unit performs a step response test to determine the sensitivity of the geophone. During the step the element is raised using a constant current source. The amplitude response after the step, the moving mass of the element, the computed natural frequency, and the computed damping are all used to compute the sensitivity of the geophone element.

Resistance – The Bird Dog 3 unit applies a constant current to the geophone and measures the voltage across the element. The resistance is then computed by dividing the Voltage by the current.

Impedance – The Bird Dog 3 applies an AC signal at the frequency selected in the geophone specification. The impedance is then measured like the way the resistance was measured. When different frequencies are selected the impedance will change.

Distortion – The Bird Dog 3 computes the distortion with the same signal used for impedance. An FFT is performed to convert the signal to the frequency domain. The driven frequency (Fundamental) Energy is then compared to the energy of the higher frequencies (noise). The ratio of the Noise/Fundamental is used to compute the % total harmonic distortion.

Polarity – The Bird Dog 3 records the data from the geophone and looks for the first break. A tap on the top of the element producing a positive voltage is considered “Positive” polarity. A negative first break pulse is considered “Negative” polarity. This is consistent with the SEG recommended polarity standard (Downward Motion (Tap on top) = Positive Voltage).

The polarity test can be set to “repeat”. When “repeat” is selected the test will repeat until it is stopped. Two different audible tones are made by the computer, one for positive polarity and one for negative polarity. The result of the last test will be saved to the database when the data is stored.

Leakage – A resistor typically 200Kohm is connected between the positive and negative geophone connectors on the Bird Dog 3 cable. The positive end of the cable should be connected to one end of the geophone string. The negative end of the cable needs to be connected to a wire that is terminated in a large water container. The geophone string is submerged in this water container. The Leakage test will measure the resistance between the positive and negative leads of the cable ignoring the 200Kohm fixed resistor. The correct value of the resistor must be entered in the Options-Hardware Setup-Leakage Fixed resistor entry. This test is used to verify the electrical isolation of the geophone string is adequate.

Geophone Mounting and Isolation

For proper test results, it is important that the geophone or the geophone string under test be isolated from normal ground movement. This is especially important when working in a trailer or other portable building.

A simple isolation box can be made by filling a box with sand and placing the box on a piece of foam rubber. Planting the geophones under test in the “sand box” will greatly improve the reliability of the tests.

Wiring Documentation

Power LED

Illuminates when power is applied to box.

Caution if Battery voltage drops below 11 volts, LED will light but Bird Dog 3 will not perform properly

Three pin trigger Connector

A- TB active – A

B- TB return – B

Power – 2 pin MS to X9 connector

A - +battery – A

B – negative battery - B

The Bird Dog 3 unit has a bridge rectifier built into the power circuit, so the unit will power with either polarity on the battery connection. There are two internal fuses on the board to prevent damage to the unit. However, we still recommend using an external fast blow fuse of 2 amps.

The unit can be powered from any DC source supplying a minimum of 11 VDC to a maximum of 37 VDC.

Ethernet – 10 base T

Standard Patch cable to Computer

4-pin GPS Connector

- A Battery +12 volts (supplies power to GPS receiver)
- B GPS RX (receives GPS data from GPS receiver)
- C GPS PPS
- D Ground

An external GPS receiver can be connected to the 19 pin GPS connector using a PT06A-14-19P. The GPS receiver must be setup for

- 19200 baud
- \$GPGGA and \$GPRMC messages only

PT 22-55 connector

Pin	Signal	Pin	Signal
A	Ch 1 pos	b	Ch 13 pos
B	Ch 1 neg	c	Ch 13 neg
C	Ch 2 pos	d	Ch 14 pos
D	Ch 2 neg	e	Ch 14 neg
E	Ch 3 pos	f	Ch 15 pos
F	Ch 3 neg	g	Ch 15 neg
G	Ch 4 pos	h	Ch 16 pos
H	Ch 4 neg	i	Ch 16 neg
J	Ch 5 pos	j	Ch 17 pos
K	Ch 5 neg	k	Ch 17 neg
L	Ch 6 pos	m	Ch 18 pos
M	Ch 6 neg	n	Ch 18 neg
N	Ch 7 pos	p	Ch 19 pos
P	Ch 7 neg	q	Ch 19 neg
R	Ch 8 pos	r	Ch 20 pos
S	Ch 8 neg	s	Ch 20 neg
T	Ch 9 pos	t	Ch 21 pos
U	Ch 9 neg	u	Ch 21 neg
V	Ch 10 pos	v	Ch 22 pos
W	Ch 10 neg	w	Ch 22 neg
X	Ch 11 pos	x	Ch 23 pos

Y	Ch 11 neg	y	Ch 23 neg
Z	Ch 12 pos	z	Ch 24 pos
a	Ch 12 neg	AA	Ch 24 neg

Bird Dog 3 – GeoTest ver 4 Cable

Geophone1 Plus - (Ch1 +) - Pin A

Geophone1 Minus - (Ch1-) – Pin B

Geophone1 Plus - (Ch2 +) - Pin C

Geophone1 Minus - (Ch2-) – Pin D

Geophone1 Plus - (Ch3 +) - Pin E

Geophone1 Minus - (Ch3-) – Pin F