



# Portable Bird Dog 3

## Geophone Test system

User's Manual



## **Portable BD3 User's Manual**

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# 1 Introduction

## 1.1 System Description



The PORTABLE BD3 system is a 3 channel geophone test system. The system can be used in stand-alone mode or connected to a computer for real time viewing of the data. Optional GPS system provides accurate GPS timing and positioning.

The PORTABLE BD3 uses standard 10/100 Base RJ45 network connection and standard TCP/IP network protocol. The PORTABLE BD3 can be connected to any standard network configuration. This allows standard WiFi system to be used with the Portable BD3 unit.

The PORTABLE BD3 has provisions for the following features

- 3 channel Geophone Test. Simultaneous testing of three geophone.
- GPS receiver for position information
- GPS receiver for timing reference, and adjustment of internal oscillator
- Compact Flash for storage of acquired signals
- Multiple PORTABLE BD3 units can be recorded simultaneously using standard wired or wireless network
- Standalone mode with GPS allows PORTABLE BD3 units to perform geophone test without a computer.
- Temperature Sensor for GeoTest software or plugged directly into the Portable BD3 unit.
- Internal battery for standalone operation
- Hydrophone Test Option

The PORTABLE BD3 System consists of the following:

- PORTABLE BD3 Unit – Geophone Test unit with Ethernet interface. PORTABLE BD3 is a portable geophone test unit that can simultaneously test 3 geophone strings.
- Computer – The PORTABLE BD3 unit connects to a computer with Windows 8, Windows 7, Windows Vista, Windows XP, Windows 98, Windows NT or Windows 2000 operating system and an Ethernet Network Interface Card (NIC). The computer can be used to view test results real time, or download the test data from the Portable BD3 unit.
- Battery Charger and 12 volt power cable
- GeoTest software operates on the computer and communicates to the PORTABLE BD3 units. The Software package allows viewing, analysis, setup and storage of the acquired geophone signals.
- Connection cables are included to connect:
  - Power (11-18 VDC)
  - Ethernet cable to connect PORTABLE BD3 to computer
  - Three channel geophone test cable – Custom cables are available upon request
  - Temperature Sensor

## PORTABLE BIRD DOG 3

# First Time Power Setup

When you first receive the Bird Dog 3 Portable Unit, it will not power on until the following setup procedure is performed.

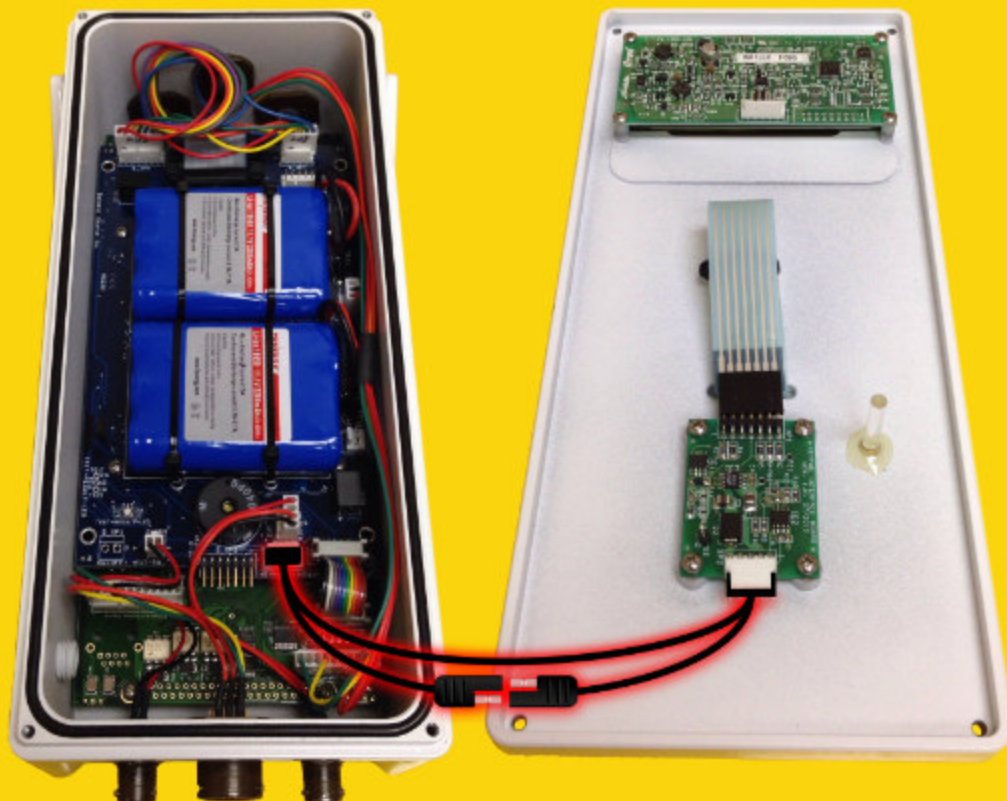
First, remove the 4 corner screws that secure the lid to the enclosure.

After removing the lid you will find 2 loose **TRAILER PLUG CONNECTORS**.

Connect these connectors and the Bird Dog 3 Portable will turn on.

Turn it back off by pressing the  button on the front of the lid.

Resecure the lid to the enclosure using the 4 corner screws.



**Note:** When securing the lid be careful not to pinch any wires.

## **1.2 PORTABLE BD3 Software Installation and Setup**

Insert the GeoTest CD in your computer. The CD will automatically install the GeoTest program and PORTABLE BD3 manual.

- GeoTest.exe – Program is used to setup, acquire, analyze, and store the geophone test data.
- PORTABLE BD3 manual

## **1.3 Ethernet Setup**

The Ethernet must be setup before using the PORTABLE BD3 system with a computer.

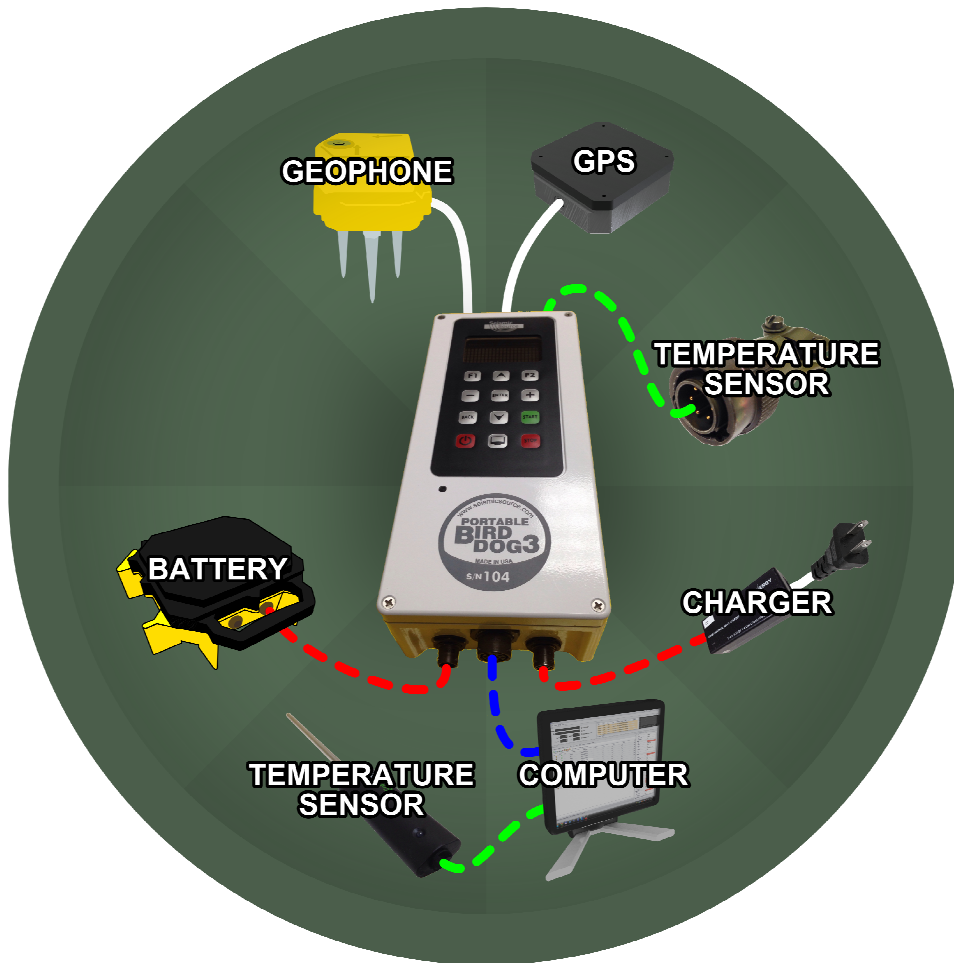
Please refer to Ethernet setup section of the manual for detailed instructions on setting up the Ethernet settings on your computer.

## 2 Portable BD3 Setup

### 2.1 PORTABLE BD3 Unit



### 2.1.1 Cable Connections



- Connect PORTABLE BD3 to computer with patch cable provided.
- Connect 2 pin battery Power cable to PORTABLE BD3 unit, or use the internal battery.
- **Note: The PORTABLE BD3's can operate on,**
  - **Internal battery**
  - **External DC battery. Voltage should be between 10 and 18 volts**
  - **Internal battery with the battery charger**
- Connect the Geophone Test cable to the connector labeled GEO on the unit
- Connect the optional GPS unit to 4 pin GPS connector.
- An optional Temperature Sensor can be connected to the unit or to the computer



## 2.2 Geophone Element Selection


The Portable BD3 unit must be setup for the correct Geophone configuration before a test can be performed.

The Geophone test settings should be setup using the GeoTest program on the computer. Different Geophones settings can be setup on the computer.

The String configuration can be setup on the Portable BD3 unit for portable operation, or with the computer when operated with the GeoTest software.


## Step 1 – Geophone Element Setup

Use the GeoTest Program to setup the Geophone element to be tested. Enter the specifications from the Geophone manufacturer.

Seismic Source Co				
 <div> <input checked="" type="checkbox"/> Single           <input type="checkbox"/> String           Serial: <input type="text" value="6"/> X <input type="text" value="1"/>           Parallel: <input type="text" value="10.0"/> Ohm/km           Interval: <input type="text" value="1.0"/> m           Lead-in: <input type="text" value="1.0"/> m           Units: <input checked="" type="checkbox"/> US <input checked="" type="checkbox"/> Metric <input type="checkbox"/> cm </div>				
<b>Geophone Settings</b> <div>           Type: <input type="text" value="GS-30CT"/>           New           Auto fill specification </div>				
Coil Resistance ( Rc, Ohm )	395	Shunted Impedance ( Zts, Ohm )		
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	<b>Tolerance Settings</b>		
Natural Frequency ( Fn, Hz )	10	Frequency Tolerance ( + / - ) %	3	3
Open circuit Damping ( Bo )	0.316	Damping Tolerance ( + / - ) %	3	3
Shunted Damping ( Bt )		Sensitivity Tolerance ( + / - ) %	3	3
Open circuit Sensitivity ( Go, V/m/s )	27.5	Resistance Tolerance ( + / - ) %	3	3
Shunted Sensitivity ( Gs, V/m/s )		Impedance Tolerance ( + / - ) %	6	6
Shunted Resistance ( Rcs, Ohm )		Distortion Tolerance %	0.1	

Normally leave the “Shunted” values blank. Then press the “Auto Fill Specifications” and the computer software will automatically compute the correct values.

Change the name of the geophone to something unique and meaningful



☒ Single
 ☐ String

Serial
 
 X
 Parallel

Cable Resistance
  Ohm/km

Interval
  m

Lead-in
  m

Units
 ☒ US
 ☐ Metric
 ☐ cm

Geophone Settings

Type
 
 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 )	19.7133	Impedance Tolerance ( + / - ) %	6	6
Shunted Resistance ( Rcs, Ohm )	283.2	Distortion Tolerance %	0.1	

When everything is correct press the save geophone button at the bottom of the screen

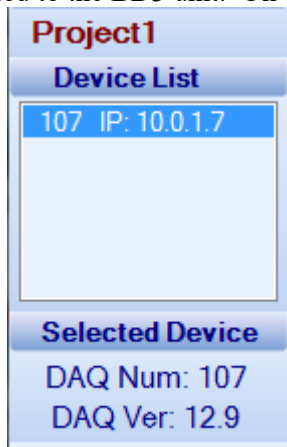
Save Geophone

The Geophone is now saved to the computer program.



Multiple Geophone settings can be saved in the geophone settings dialog. This allows different types of geophones to be tested. It is recommended that a maximum of 10 different settings are used at any one time. The geophones settings can be exported and imported from the computer memory using the export and import geophone icons.

After everything is correct the settings must be uploaded to the Portable BD3 unit. Make sure the Computer is connected to the BD3 unit. On the main test screen of the BD3 the Unit ID should appear



The new Geophone settings will be uploaded to the Portable BD3 unit when the GeoTest program initiates a test. At least one test must be run with the GeoTest program to upload the new settings to the Portable BD3 unit.

## **2.3 Tests, String Setup and Drive Level Selections**

When using the GeoTest software, all of the test selections, string setup and drive levels are set by the computer program.

When using the Multiple PORTABLE BD3 the string setup and drive levels are set by the Portable BD3 unit. The settings in the Portable BD3 must match the geophone string being tested.

## 3 Portable BD3 Operation

### 3.0 Portable BD3 Operation

After setting up the desired Geophone Specification with the GeoTest software, the string setup and drive levels must be setup on the portable BD3. After the correct settings have been entered, the portable BD3 unit is ready to test Geophones.

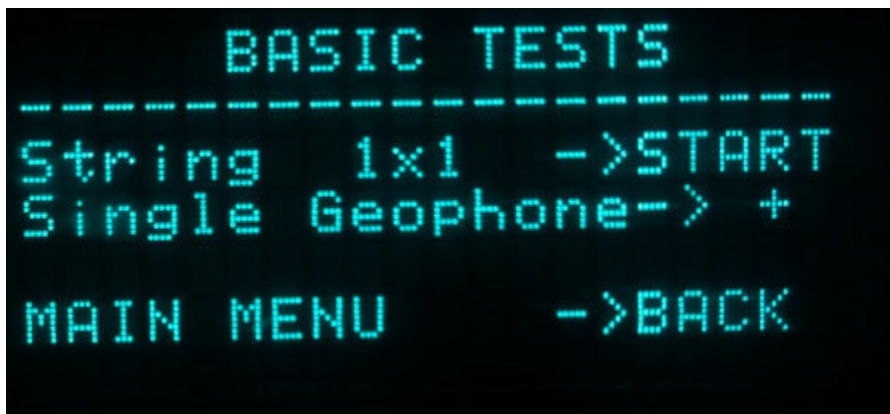
From the main menu press the “Start” button to open the Geophone Test menu.



```
GPS Not      Bat=11.3V
Active      t°=+25.0°C

Operate      -> START
Setting      -> F1
Browse Records-> F2
```

Press the “Start” button to start the Geophone String test



```
----- BASIC TESTS -----
String 1x1 -> START
Single Geophone-> +
MAIN MENU -> BACK
```

## Single Element Testing

When a single channel is selected, immediately after the test is completed the display will show the result of the Test. Pass or Fail will be displayed.

If the Test Failed a letter will be shown to show which test failed

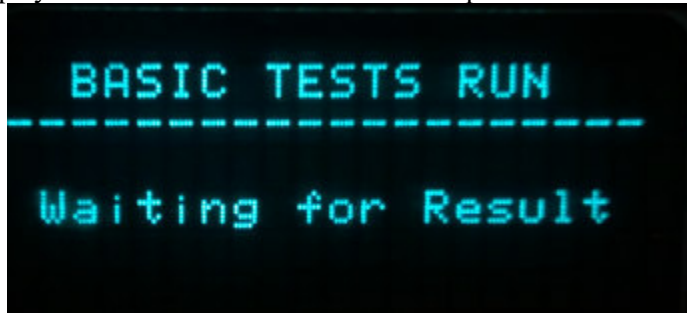
- F = Resonant Frequency of the Geophone
- R= DC Resistance of the Geophone
- In = Impedance of the Geophone at Normal Drive Level
- Is = Impedance of the Geophone at “small” Drive Level
- D = Damping of the Geophone
- d= Distortion of the Geophone
- S=Sensitivity of the Geophone
- N= ambient Noise of the Geophone



Pressing Enter will show the detailed results

Press F2 to save the results

The display will show the status of the Test Sequence



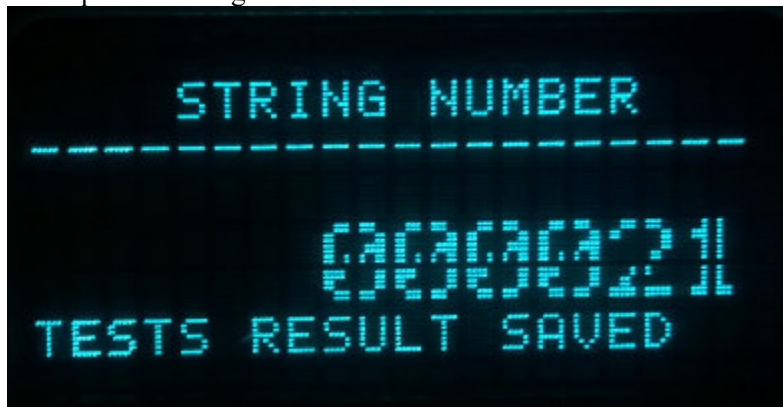
When the test is completed the results are compared against the limits entered for the Geophone under test. A “PASS/FAIL” result is shown for each channel.



Pressing the “F1” key will “Repeat” the test and will not save the current test results.

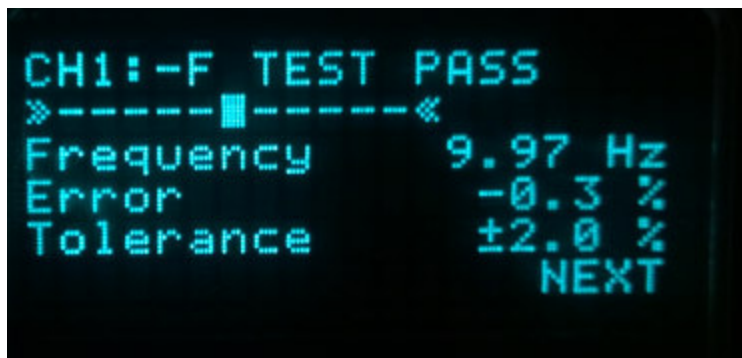
Pressing the “F2” key or the “Start” button will save the current results to the internal memory of the unit and prepare the unit for a “new” test

A unique ID “String Number” is saved with each record



After the test is complete, pressing the “Enter” button will show the detailed results. The result of each test is shown.

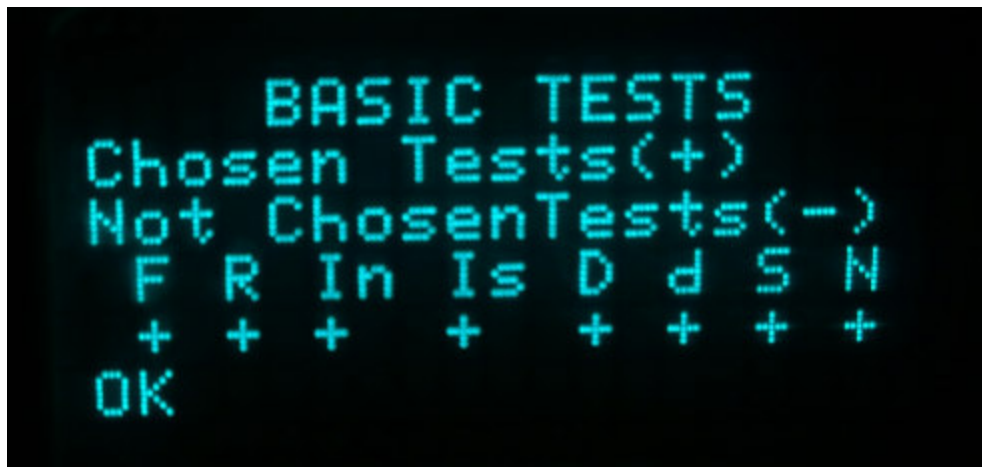
The detailed results are shown one at a time for each parameter tested.



Press the “F2” key to view the next parameter or press the “Back” button to view the previous parameter.

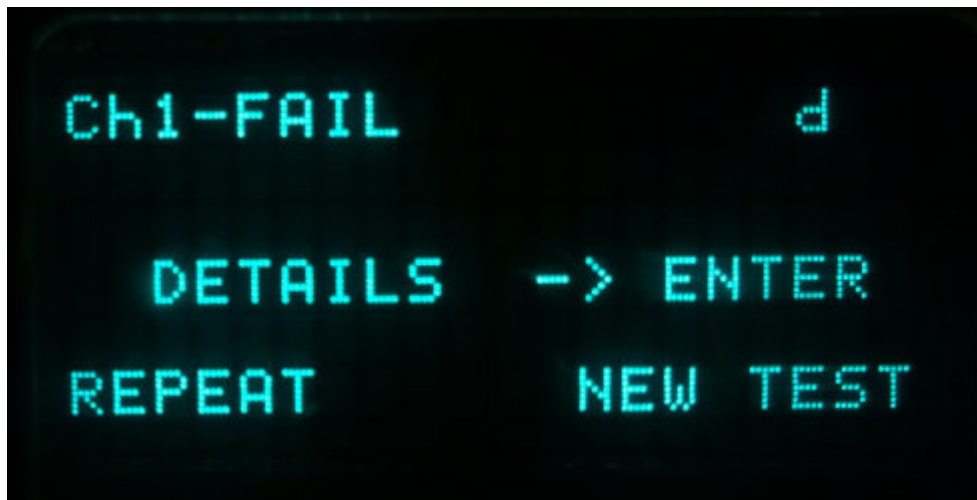
### 3.1 Portable BD3 basic tests

The Portable BD3 uses the following abbreviations for each of the parameters tested:



F = Resonant Frequency of the Geophone  
 R= DC Resistance of the Geophone  
 In = Impedance of the Geophone at Normal Drive Level  
 Is = Impedance of the Geophone at “small” Drive Level  
 D = Damping of the Geophone  
 d= Distortion of the Geophone  
 S=Sensitivity of the Geophone  
 N= ambient Noise of the Geophone

After the portable BD3 performs a test, either a PASS or FAIL code is shown on the screen. The portable BD3 uses the codes to show which test failed.



This Screen shows that Ch1 failed the d= Distortion Test

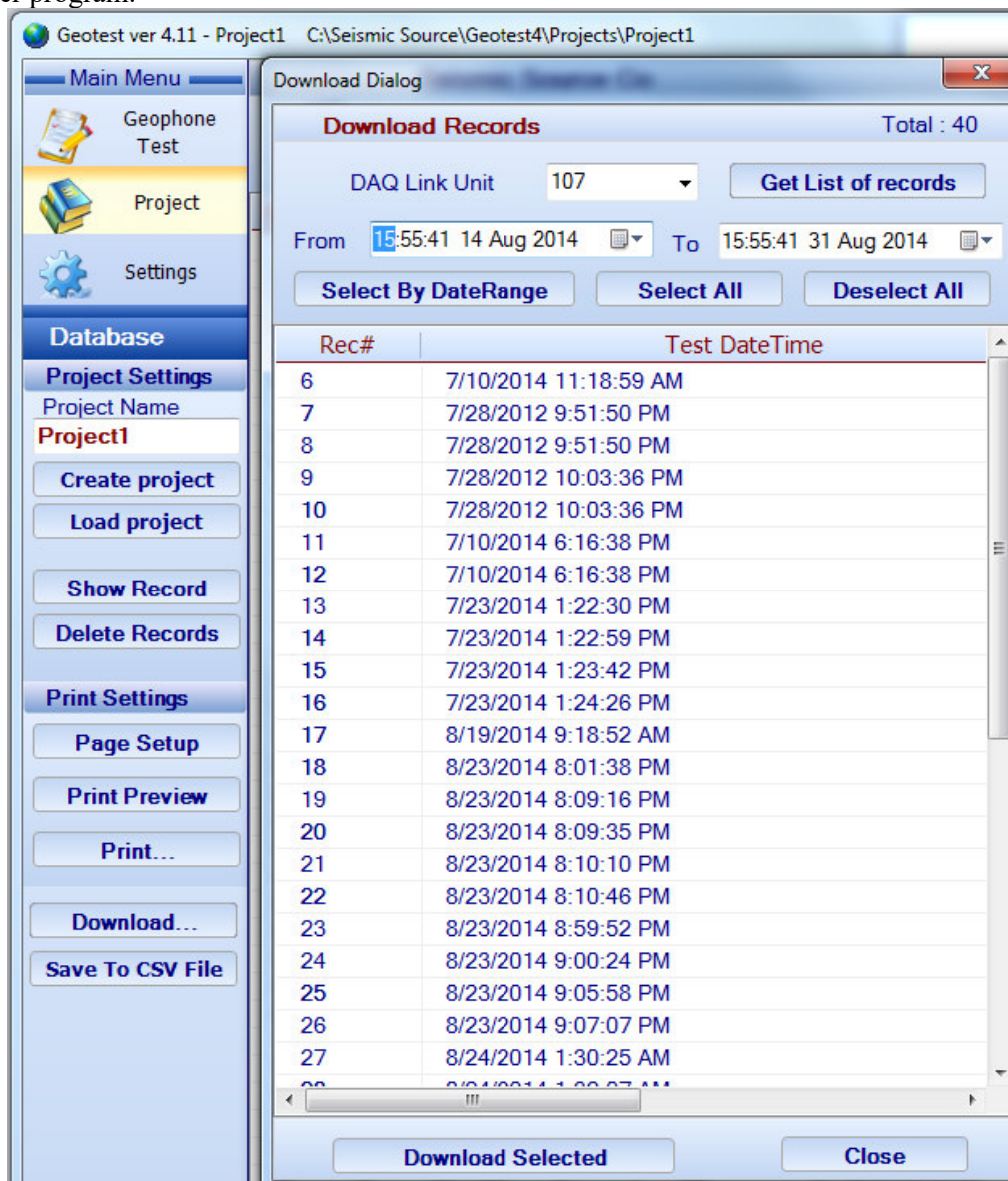
## 3.2 Uploading Results to GeoTest

The data saved on the Portable BD3 can be uploaded to the GeoTest's database. The data can then be analyzed and detailed reports can be made.

Select the project tab on the GeoTest main screen.

Select the "Download" option

The serial number of the Portable BD3 will appear. Press the get list button and select the files to upload to the computer program.





## 4.0 PORTABLE BD3 Configuration Menus

Before testing any geophone string with the Portable BD3 unit, all of the user settings must be entered.

From the main menu, Press F1 to go to the Setting Menus

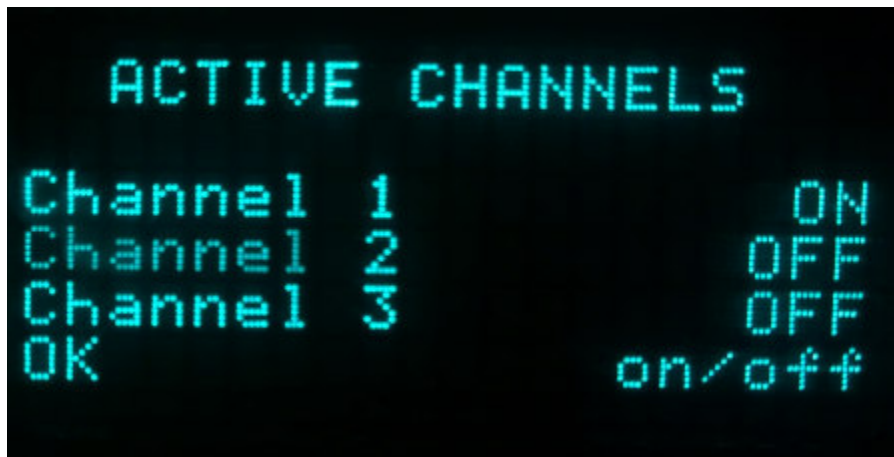
### 4.1 General Settings Selections

- Active Channels
- Tests Selection'
- Basic Test Choice
- String #/ Auto Increment
- String Configuration
- Auxiliary Options
- Test Options

#### 4.1.1 Active Channels

Use this menu to select 1, 2 or 3 simultaneous geophone test.

The following screen shows the setup for a single channel test unit



#### 4.1.2 Test selection.

There are three Test that can be performed

- Basic Test. (See basic Test Choice Selection)
  - Frequency
  - Damping
  - Distortion
  - Sensitivity
  - Impedance
  - Etc.
- Polarity Test
- Leakage Test

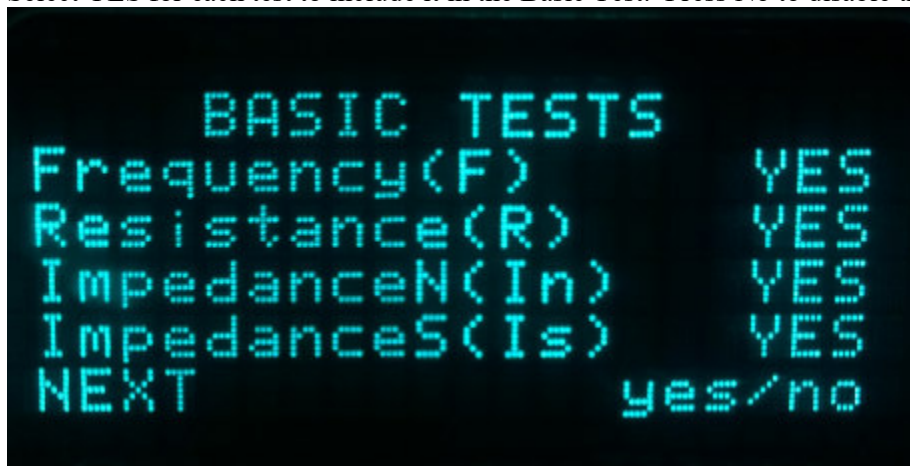
The Standard Geophone Test includes the Basic Test plus Polarity. Choose the “Basic+Polarity” for normal operation.



#### 4.1.3 Basic Test Choice

This menu allows various test to be selected for the “Basic Test”

Select YES for each test to include it in the Basic Test. Press No to disable this test.



```

      BASIC TESTS
Distortion(d)      YES
Sensitivity(S)     YES
Noise(N)           YES
NEXT               yes/no

```

The Portable BD3 uses the following abbreviations for each of the parameters tested:

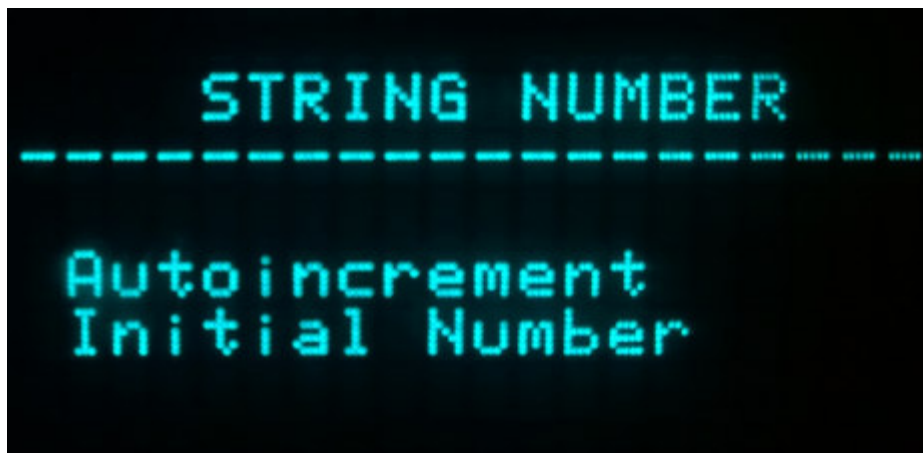
```

      BASIC TESTS
Chosen Tests(+)
Not Chosen Tests(-)
  F R In Is D d S N
  + + + + + + + +
OK

```

F = Resonant Frequency of the Geophone  
 R = DC Resistance of the Geophone  
 In = Impedance of the Geophone at Normal Drive Level  
 Is = Impedance of the Geophone at "small" Drive Level  
 D = Damping of the Geophone  
 d = Distortion of the Geophone  
 S = Sensitivity of the Geophone  
 N = ambient Noise of the Geophone

String #/ Auto Increment



#### 4.1.4 String Configuration Menu



The correct Geophone Type and String Type must be entered correctly for the Portable BD3 to properly test a geophone string.

If the correct Geophone is not in the list, then GeoTest software is used to create the correct geophone and upload the data to the BD3 unit.

The lead-in distance and Interval is used to adjust the resistance and impedance measurements when using strings with long wires.

#### 4.1.4.1 Geophone Type



Press Change to change Geophone Types



## 4.1.5 Auxiliary Options

### 4.1.5.1 Measurement Systems –

- Select either English or metric

### 4.1.5.2 Temperature option –

- Select either
  - Manual Setting – If Manual setting is used, then enter the temperature in Centigrade
  - Use External Temperature Sensor

### 4.1.5.3 Standby Time –

- Set Timeout to auto shut down the unit when no activity. Normally set to 8 minutes

### 4.1.5.4 Display Brightness –

- Set to low value to improve battery life. Set to high value for sunlight readability. Use the + and – keys to increase or decrease the brightness

### 4.1.5.5 Auto Off, Beeper, GPS

- Auto Off – Must be enable for the system to automatically power OFF after standby time
- Beeper On/Off
- GPS enable or disable

## 4.1.6 Test Options

### 4.1.6.1 Low Drive Level

- Set drive level for Low drive Impedance test – Normally set to 20%

### 4.1.6.2 Pulse Level

- Set the pulse drive level for the Basic Tests. Normally set to 60%

### 4.1.6.3 Polarity Trigger Level

- Set the voltage trigger level for the polarity test. Normally set to 100 mV

### 4.1.6.4 Velocity for the Distortion Test

- .Normally set to 0.80 cm/sec

### 4.3.5 GPS

The GPS menu can be used to check the status of the GPS receiver. Press the Get Position button and the screen will be updated with the latest serial message from the GPS receiver. The GGA string will show the data from the receiver. If valid GPS data is received, then the Latitude, Longitude, Altitude and time will be displayed.

The GPS receiver can be connected internally to the unit or can be connected to the external connection. Select the correct GPS configuration.

The PORTABLE BD3 is designed to have an external GPS receiver connected to the 4 pin connector on the PORTABLE BD3 unit.

The GPS receiver can be connected to the 4 pin GPS connector using the PT06A-08-4P.

The normal Seismic Source GPS receiver is setup for 19,200 baud.

To operate another brand of GPS receiver, the receiver must be setup with third party software for the following:

- RS232 serial at 4800, 9600, or 19.2 K baud
- \$GPGGA and \$GPRMC messages – do not enable any other message
- PPS pulse – TTL level pulse per second

Connect the GPS receiver to the 4 pin GPS receiver

#### **4PIN GPS CONNECTOR (PT06A-08-4P)**

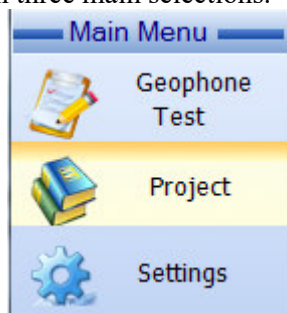
##### **4 PIN GPS CONNECTOR**

A - +Battery - A  
B – RS232 Receive – B  
C – PPS pulse – C  
D – GND – D

## 5 GeoTest ver 4 Program Operation

The GeoTest program 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.

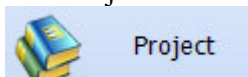
- Geophone Test is used to perform the Geophone Test.
- Project is used to view the saved data.
- Setting is used to setup the GeoTest parameters

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

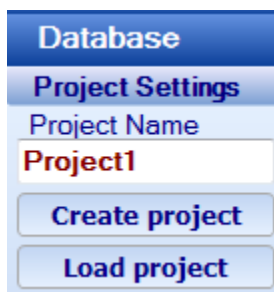
### 5.1 Setup

#### 5.1.1 Create Project

Press the Project button to view the Project Menu



A new project should be created before starting the test.



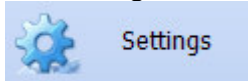
Type the name of the Project and press “Create Project” to create a new project.

Existing projects can also be loaded by pressing the “Load Project” button



## 5.1.2 Settings

Press the setting Menu to enter the GeoTest setting Menu



### 5.1.2.1 Hardware Settings

Hardware Settings	
LowDrive Level	20%
Pulse Level	60%
Trigger Level	0.05
Dist Velocity	0.8
<b>Temperature Compensation</b>	
Resistance	0.004
Damping	-0.002
<b>Setup</b>	
<b>Send Settings to Unit</b>	

The Drive levels for the various test are setup with the Hardware settings menu.

Also the temperature compensation correction values can 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 Portable 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.

### 5.1.2.2 Geophone Selection and Settings

To obtain the correct tests 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 just 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 ☐ String Serial: 6 Parallel: X Cable Resistance: 10.0 Ohm/km Interval: 1.0 m Lead-in: 1.0 m Units: ☐ US ☒ 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	<b>Tolerance Settings</b>	
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

Figure 5.6 Geophone Specifications

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

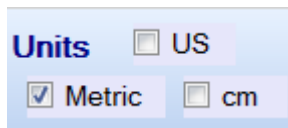
Entries must be blank for auto fill to work. (Use delete key if you want to recalculate entered value)

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.

### 5.1.2.3 Units



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

#### 5.1.2.4 Units

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



	Serial	Parallel	Cable Resistance	Interval	Lead-in
<input checked="" type="checkbox"/> Single <input type="checkbox"/> String	6	X 1	10.0 Ohm/km	1.0 m	1.0 m

Figure 5.7 String Selection

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

#### 5.1.2.4 String Resistance



	<input checked="" type="checkbox"/> <b>Single</b>	<b>Serial</b>	<b>Parallel</b>	<b>Cable Resistance</b>	<b>Interval</b>	<b>Lead-in</b>
	<input type="checkbox"/> String	6	X 1	10.0 Ohm/km	1.0 m	1.0 m

There are entries in the program to compensate for the resistance in the 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.

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

The GeoTest program automatically computes the added resistance and impedance of the caused by the wire in the geophone string

#### Typical String Resistance Entries

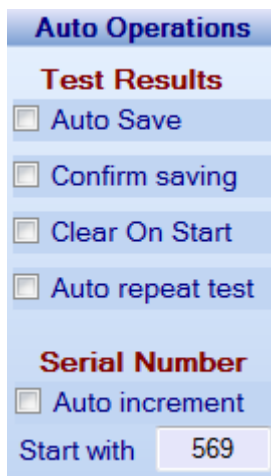
70 Break Wire: 35 ohms / 1,000ft or 114 ohms per 1 km

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

#### 5.1.2.4 Auto Operations



Auto Operations	
Test Results	
<input type="checkbox"/>	Auto Save
<input type="checkbox"/>	Confirm saving
<input type="checkbox"/>	Clear On Start
<input type="checkbox"/>	Auto repeat test
Serial Number	
<input type="checkbox"/>	Auto increment
Start with	569

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

## 5.2 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.

Geotest ver 4.11 - Project1 C:\Seismic Source\Geotest4\Projects\Project1 Date : 25 Aug 2014 Copyright 2001 - 2014

**Seismic Source Co**

**Geophone Type** Sm7\_10hz ☒ Single ☐ String **Serial** 6 **Parallel** X 1 ☒ Manual ☐ USB Sensor ☐ Internal Sensor **Temperature** 20

**Natural Frequency** 10 Hz

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

**New Test - Press Start**

Selected Device: DAQ Num: 107 DAQ Ver: 12.9

Selected Chans: ☒ Channel 1 ☐ Channel 2 ☐ Channel 3

Figure 5.8 Test Mode Window

## 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

### 5.2.1 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

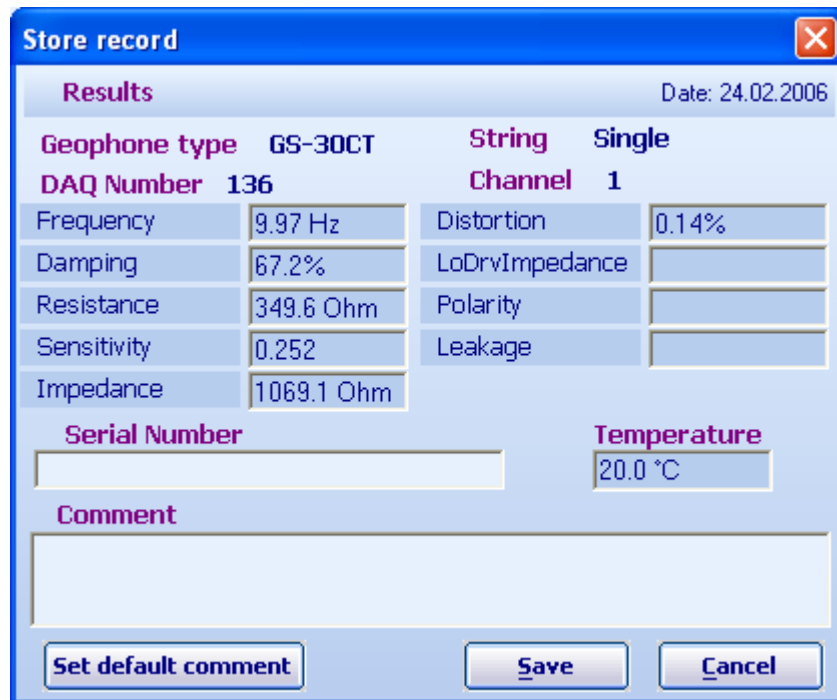
After recording new data the results of the test will be shown on the screen. Depending on the result and tolerance settings the program will mark the results with Pass or Fail. If the tests results are within the user specified limits the tolerance box will be green, if the test result is outside the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



## 5.2.2 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.

A dialog box titled "Store record" with a close button (X) in the top right corner. The dialog contains a "Results" section with a date "Date: 24.02.2006". Below this, there are two columns of data. The left column contains "Geophone type" (GS-30CT), "DAQ Number" (136), "Frequency" (9.97 Hz), "Damping" (67.2%), "Resistance" (349.6 Ohm), "Sensitivity" (0.252), and "Impedance" (1069.1 Ohm). The right column contains "String" (Single), "Channel" (1), "Distortion" (0.14%), "LoDrvImpedance", "Polarity", and "Leakage". Below the data, there are two input fields: "Serial Number" and "Temperature" (20.0 °C). At the bottom, there is a large text area for "Comment" and three buttons: "Set default comment", "Save", and "Cancel".

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			
Set default comment		Save	Cancel

Figure 5.9 Save Results to Database

### 5.2.3 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

## 5.3 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:

Seismic Source Co

Date: 25 Aug 2014

Records: 1/ 1/2000 To 8/20/2014 Field Name: <None> Min: Max: Reset to default

Record	DateTime	String	Temp	Comment	LeadI	Interv	Freq	Damp	Res	Sens	Imp	Dist	Polarity	SpecFr	SpecD	SpecR	SpecS	CoilRe	Movin	TestFr	DistTo	LowDrv
8/5/2014 2:05:03 PM	Single	20	All three at	0	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	

All of 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.

Seismic Source Co

Date: 25 Aug 2014 Copyright 2001 - 2014

Records: 1/ 1/2000 To 8/20/2014 Field Name: <None> Min: Max: Reset to default

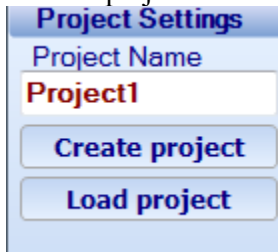
Record	DateTime	String	Temp	Comment	LeadI	Interv	Freq	Damp	Res	Sens	Imp	Dist	Polarity	SpecFr	SpecD	SpecR	SpecS	CoilRe	Movin	TestFr	DistTo	LowDrv
8/5/2014 2:05:03 PM	Single	20	All three at	0	0	0	10.16	0.699	276.2	20.97	703.1	0.05	Positive	10.0	0.686	272.7	20.95	375	11	12	0.2	
8/5/2014 2:05:03 PM	Single	20	All three at	0	0	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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 BD-3	0	0	0	10.14	0.699	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 BD-3	0	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 BD-3	0	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	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	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	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 BD-3	0	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 BD-3	0	0	0	9.9	0.703	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 BD-3	0	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	0	10.07	0.711	1658.2	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	0	10.05	0.708	1698.1	118.09	3933.1	0.08		10.0	0.595	339.2	19.7	395	11.2	12	0.1	
8/7/2014 9:17:35 AM	Single	25	box 118	1	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	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	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	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	1	9.77	0.711	277.4	20.62	685.3	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	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

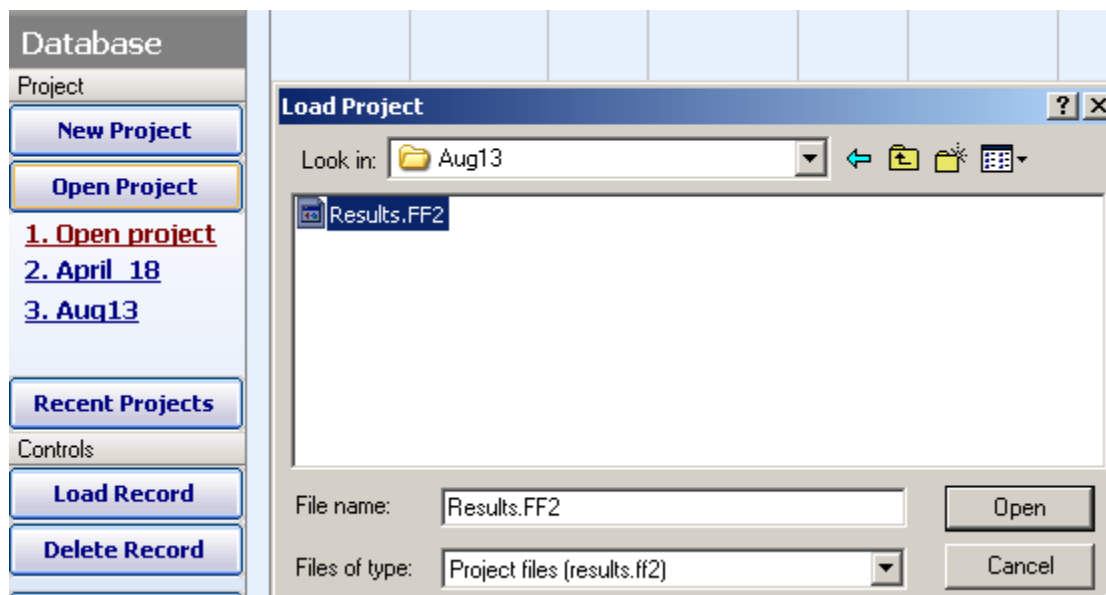
### 5.3.1 Create Project

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

The image shows a screenshot of a software interface titled "Project Settings". It features a text input field labeled "Project Name" containing the text "Project1". Below the input field are two buttons: "Create project" and "Load project". The entire dialog box has a light blue background and a thin border.

### 5.3.2 Load Project

Press the “Load Project” button to open the Load Project menu



Select the project to open

### 5.3.5 Database Layout Menu

#### Layout Settings

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.

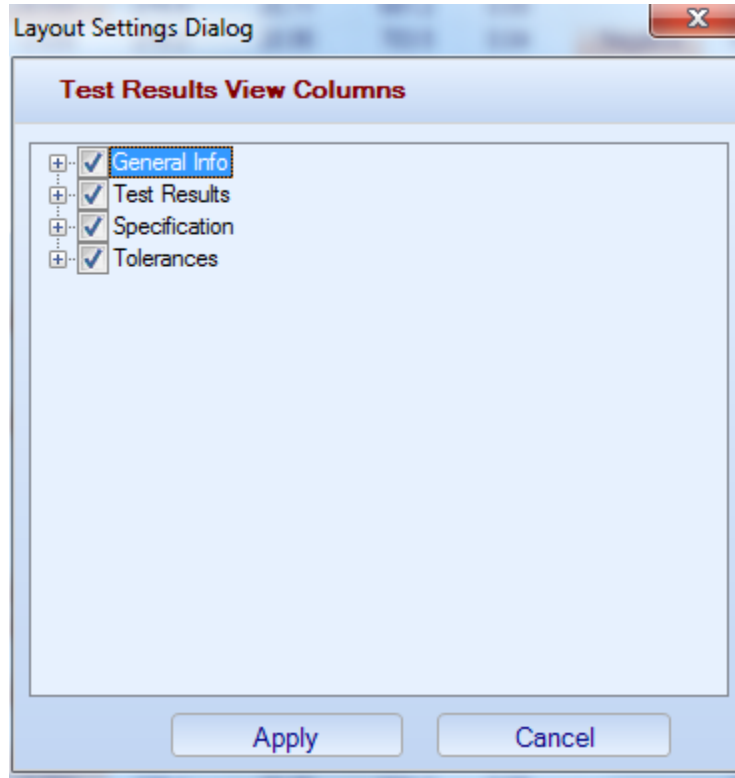


Figure 5.11 Layout Settings

### 5.3.6 Reports

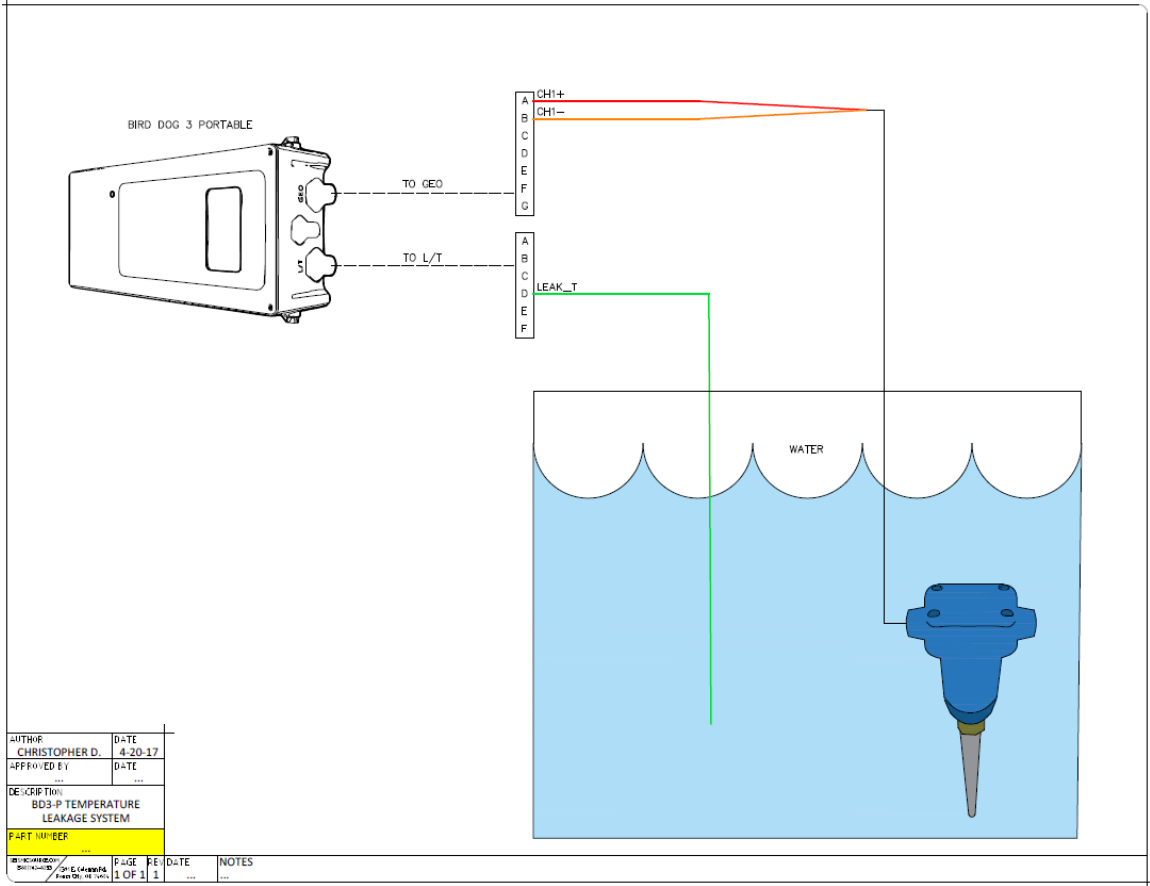
The Geotest program has a powerful and flexible function of creating reports. Report is generated using information currently visible in Database Window. Using Layout Settings, Filters, Range and Tolerance you can display only information that you need. Information from the screen will go to the report.



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

5.4 Leakage Test

The Portable BD3 can also perform Leakage Test



The picture shows the connections required.

On the Connector L/T connect pin D to the Water Bucket. Connect the Geophone to the standard Geophone input connector. Drop the Geophone and Cable into the Water bucket.

When leakage test is selected on the Portable BD3 the leakage will show 99 Mega Ohms for no Leakage, and less than 1 Mega Ohm when leakage occurs.



## 6 SrcSig Operation

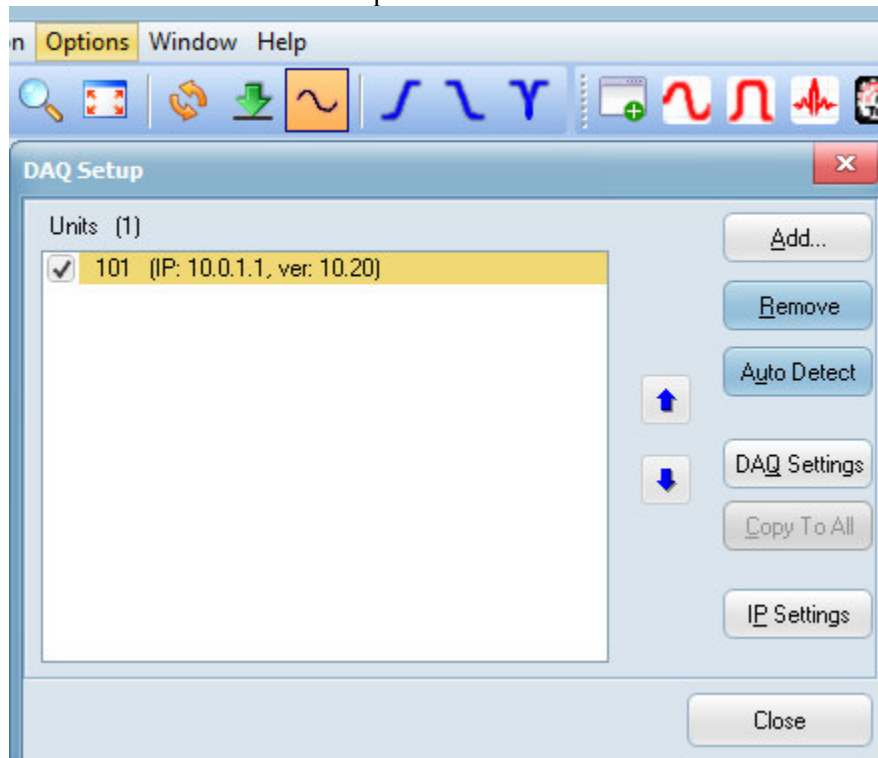
SrcSig software can be used to view the actual test response of the Geophone. This software allows viewing of the geophone tests voltage and response.

After starting the GeoTest software, start the SrcSig software.

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.

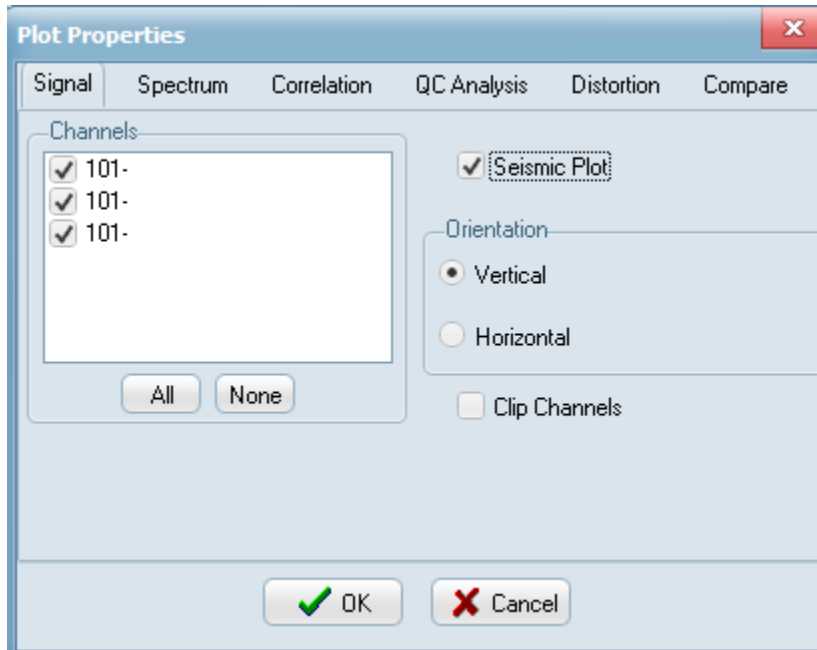


Run a test with the GeoTest software. The SrcSig should automatically receive the data. The status bar at the bottom of the screen will show the Status of the BD3 unit. After the test is completed a “finish acquisition” message should appear in the status window.

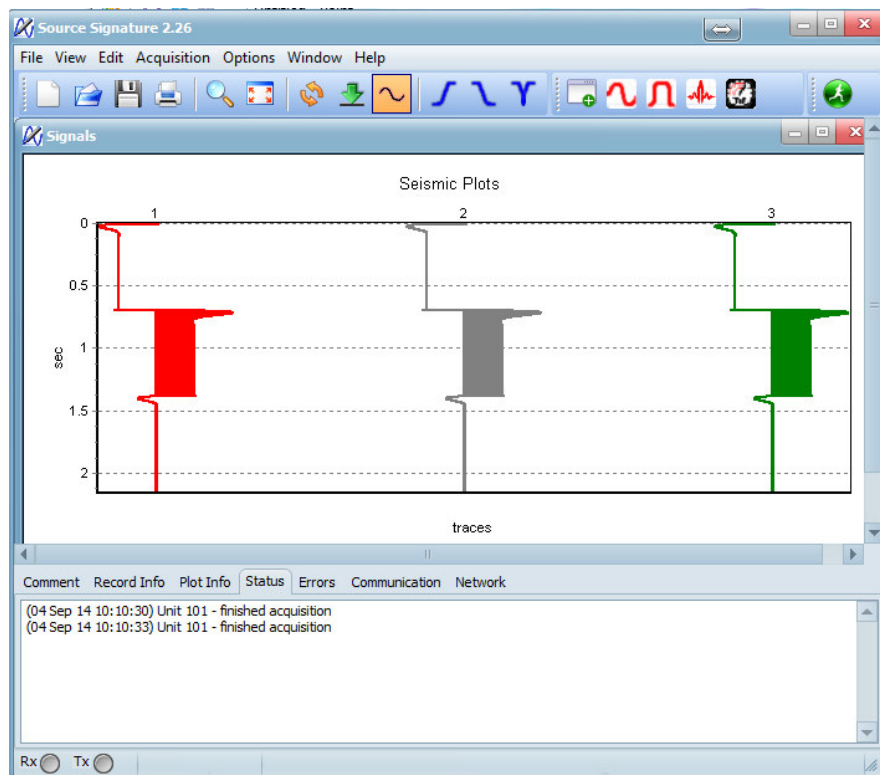


New Plot

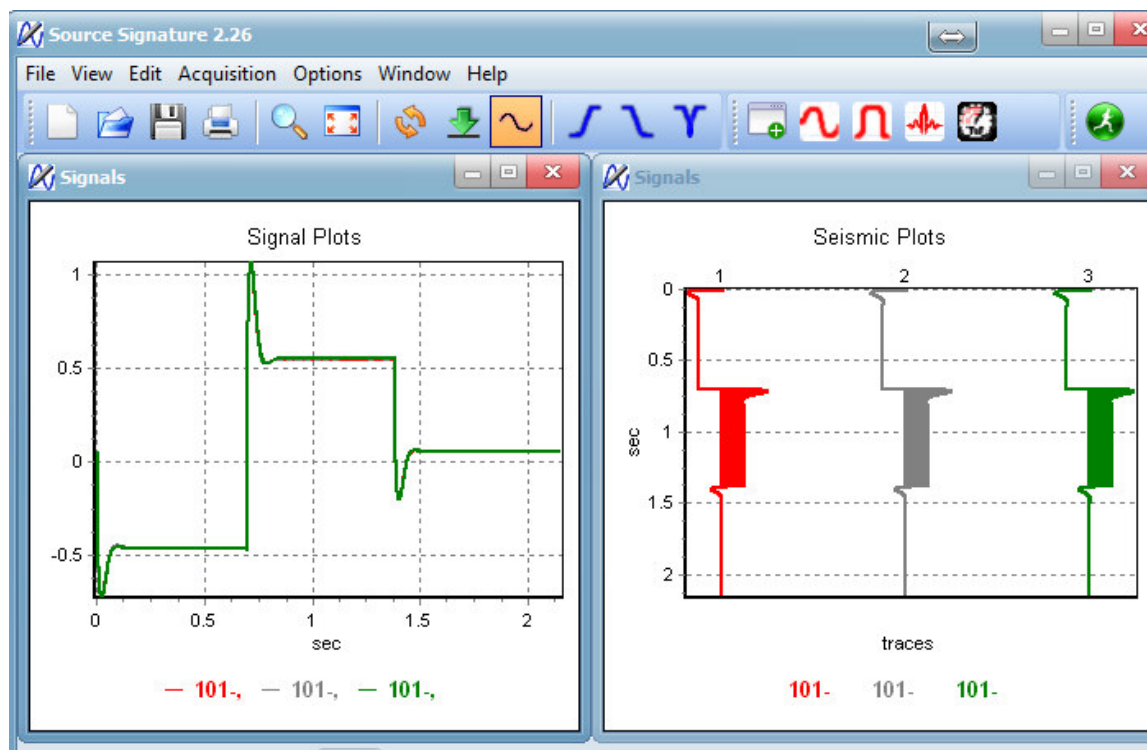
Press the “new plot” button and select the graph that you would like to view. Normally Signal Trace is selected.



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

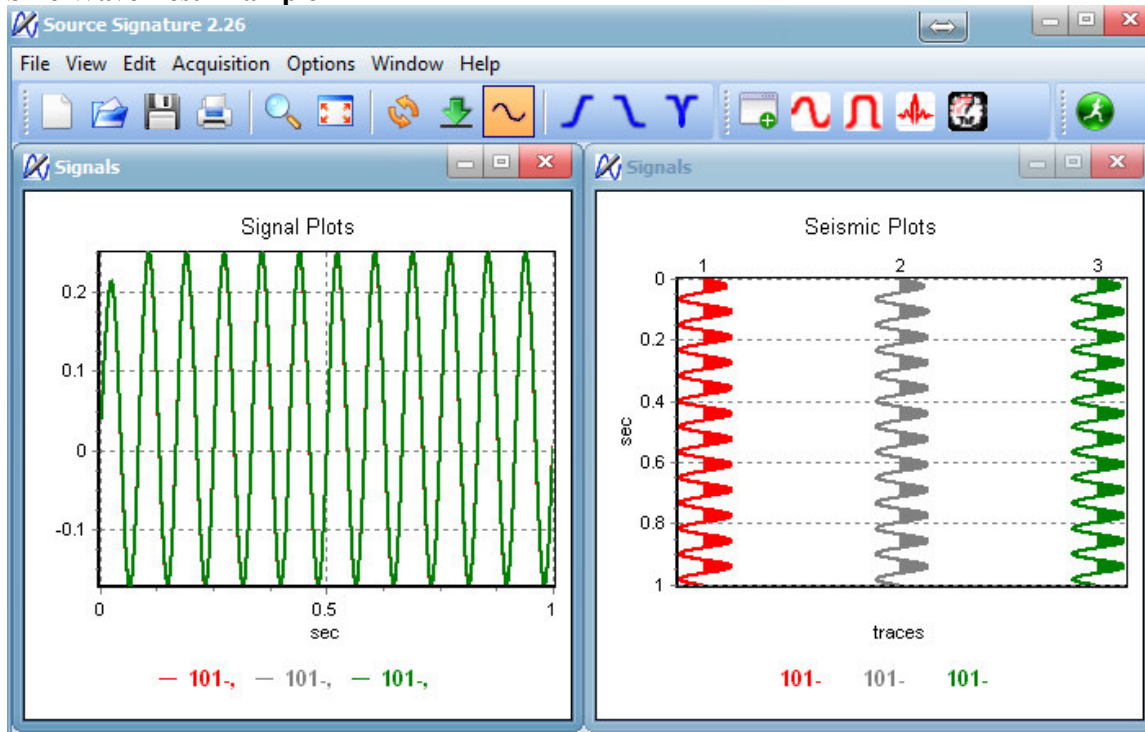
- Impedance
- Distortion

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



## 7 Ethernet Setup

Normally, it is necessary to set up a fixed TCP/IP address for the computer to communicate with the PORTABLE BD3 unit.

**IP Address SET to FIXED IP ADDRESS – 10.0.0.101**

**All Firewalls Disabled**

## 7.1 Windows VISTA Operation

When using Windows Vista Operating System the GEOTEST program cannot be installed in the Program Files subdirectory.

A new subdirectory on the C drive should be made and the GeoTest.exe should be copied to this subdirectory. IP address setup must be set to a fixed IP address and all firewalls must be disabled.

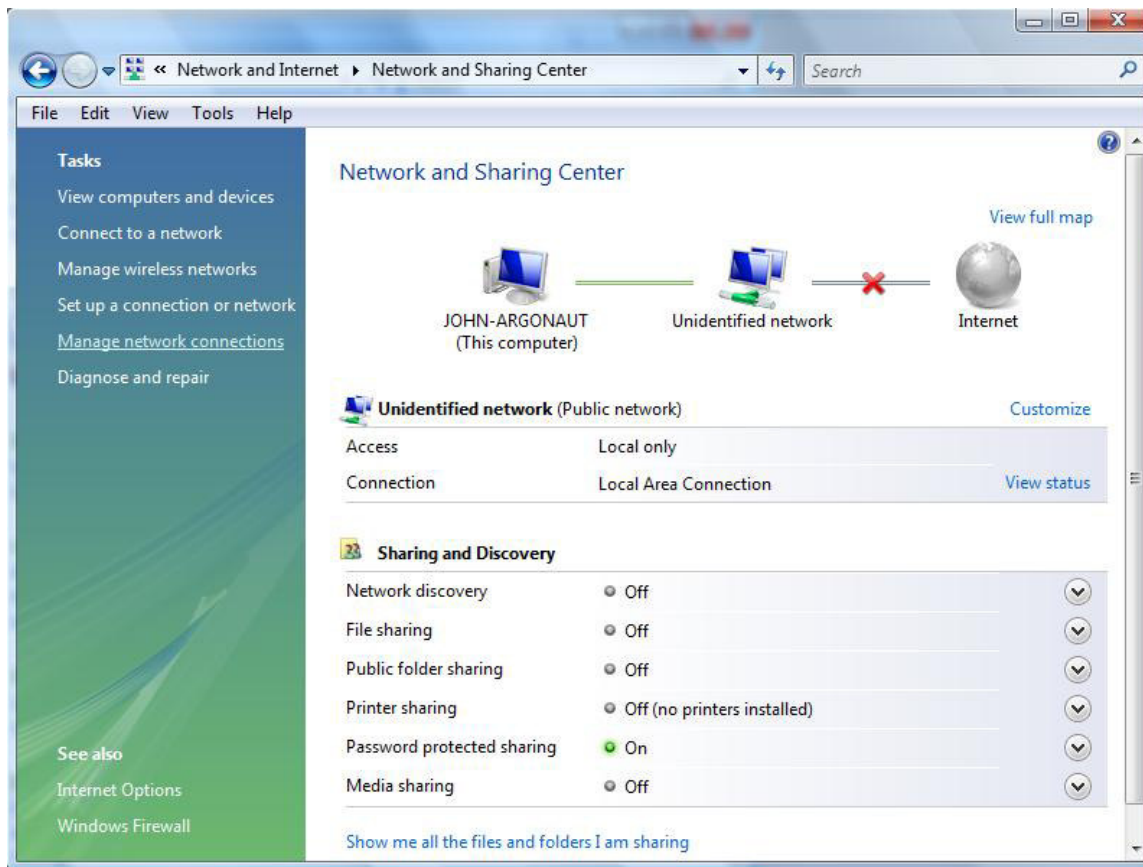
### Disable the Windows Firewall by selecting the Firewall selection in the “Network and Internet” selection in the Control Panel

With Windows Vista computer, the Ethernet setup is done by the following procedure:

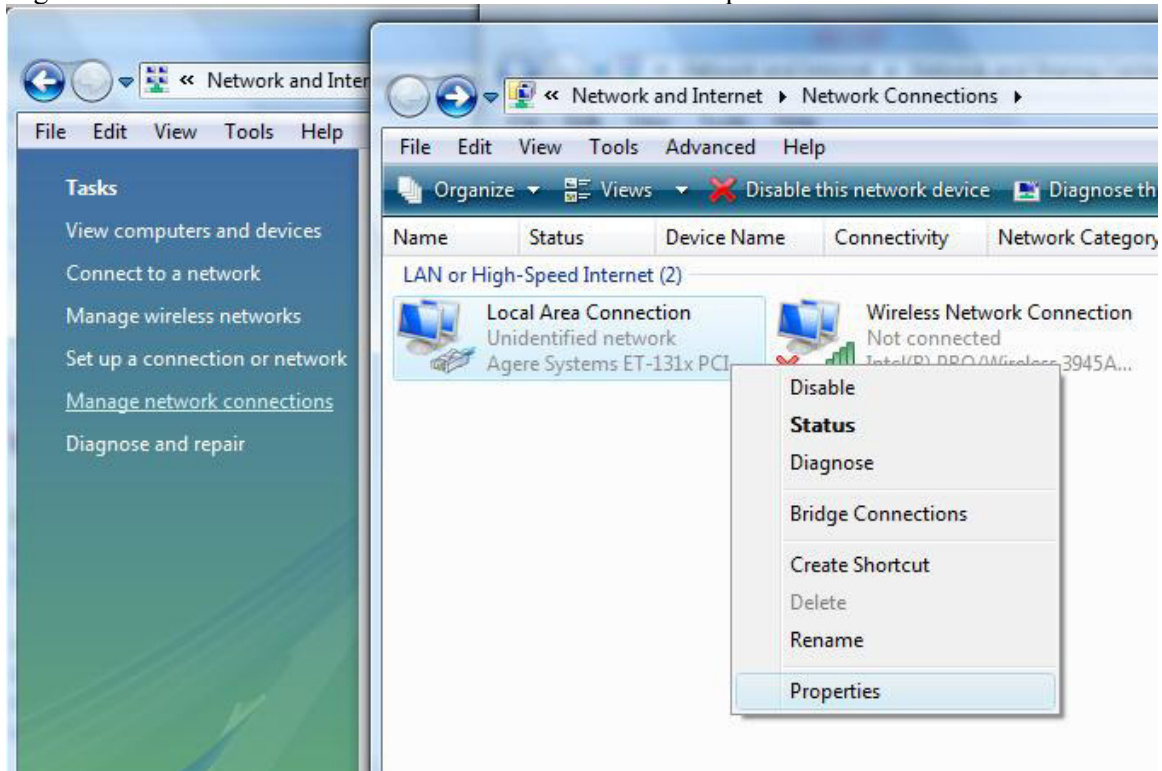
Go to the Control Panel and select “View network status and tasks”.



Select “Manage network connections”



Right Click on the “Local Area Connections” and select “Properties”



It is also recommended to disable all other Network connections. Highlight the other Network Connections (like Wireless) select “Connectivity” and Disable.

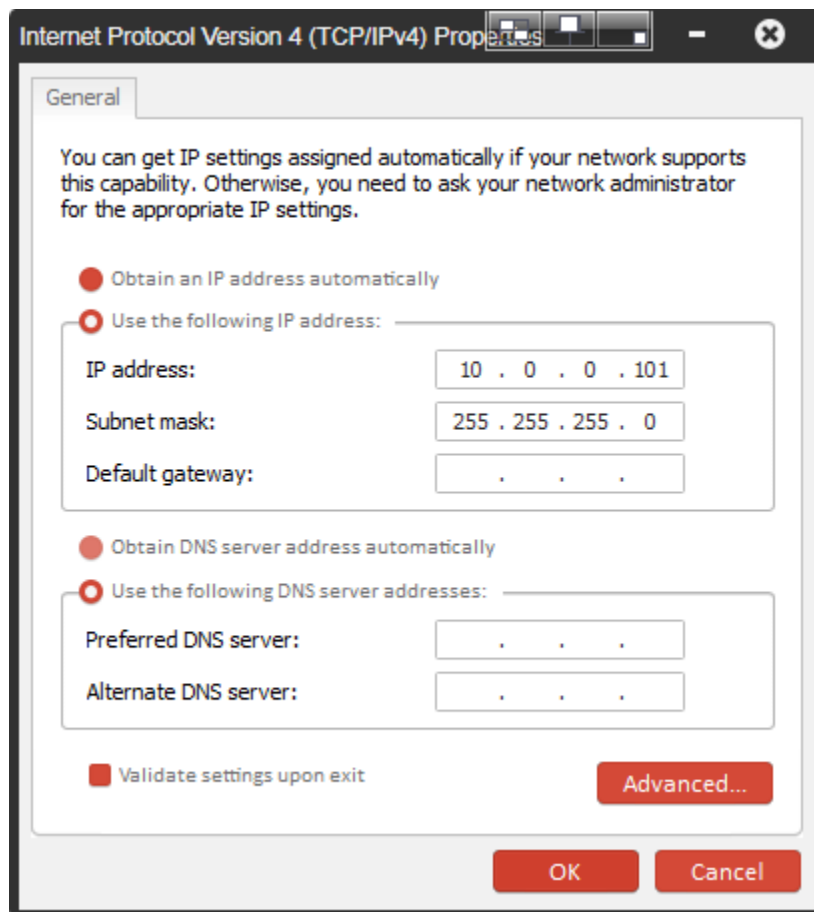
Highlight the “Internet Protocol Version 4 (TCP/IP)” and Click on Properties button.

Use following IP address:

IP address        10.0.0.101

Subnet Mask    255.0.0.0

Press OK to accept entries.

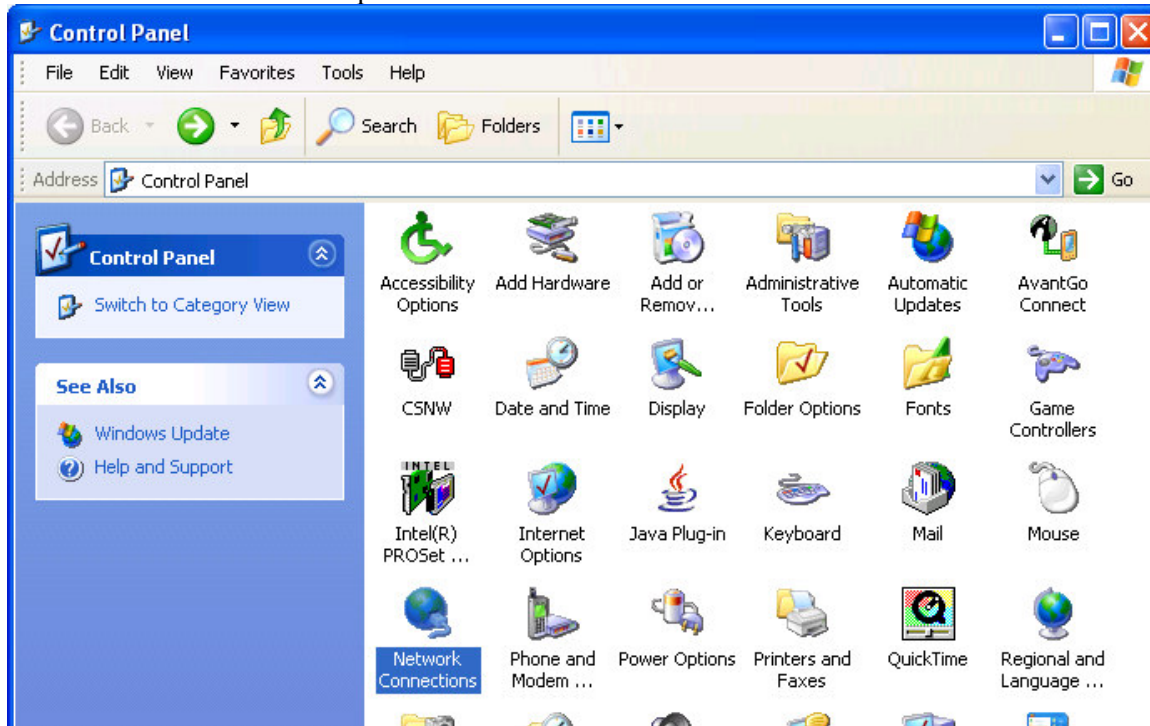




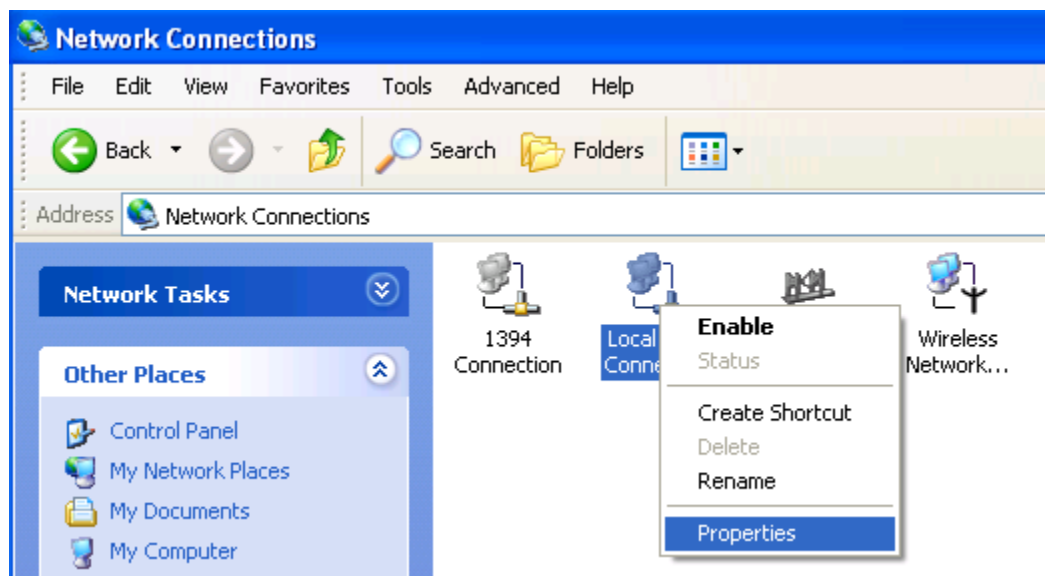
## 7.2 Windows XP Ethernet setup

With Windows XP computer setup in classic mode, the Ethernet setup is done by the following procedure:

Go to the Control Panel and open the Network Connections.



Right Click on the Local Area Connection Icon and select properties.



Scroll Down to the Internet Protocol TCP/IP selection and click on this icon.

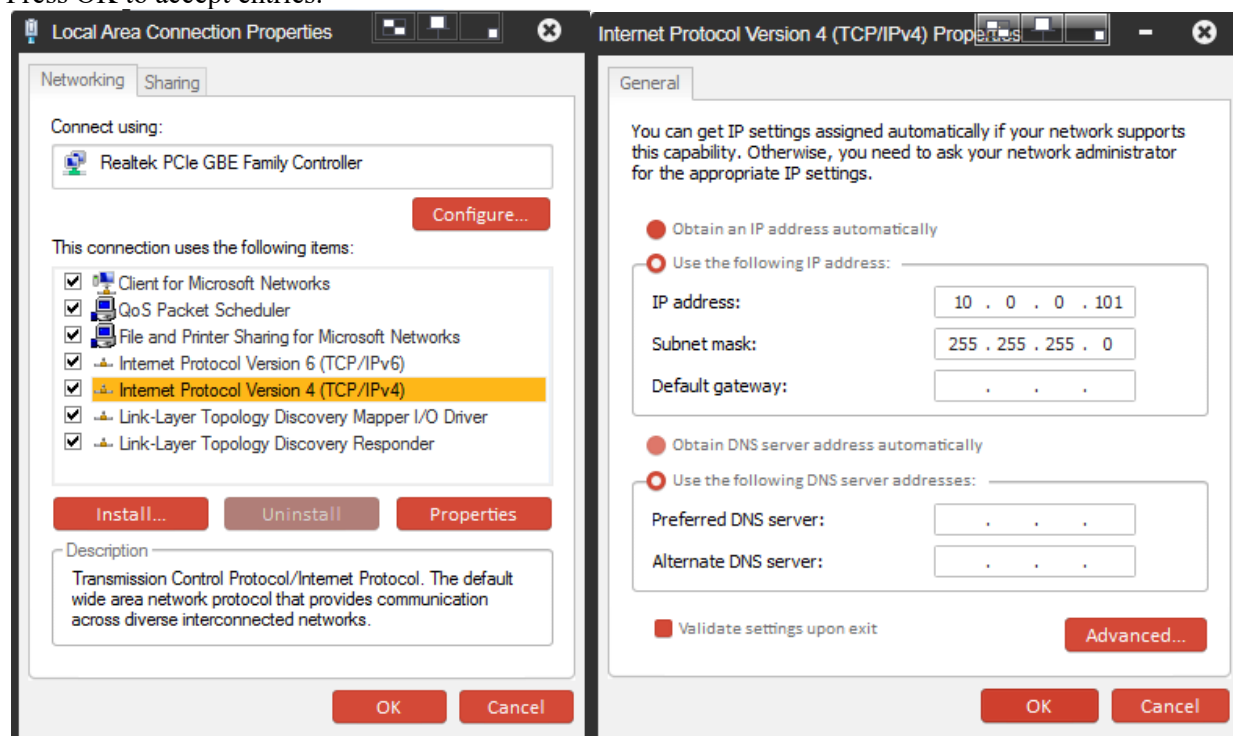
Click on Properties button.

Use following IP address:

IP address 10.0.0.101

Subnet Mask 219.0.0.0

Press OK to accept entries.



It is sometimes necessary to reboot the computer to have the new address take effect.

If the PORTABLE BD3 unit was previously communicating with a computer with a different address, then the PORTABLE BD3 unit must be reset (power off then on) for the unit to communicate to the new address.

With Windows XP there is an additional Authentication Tab. The Authentication must be disabled to operate with the PORTABLE BD3 unit.

### 7.3 Windows 2000 Ethernet setup

With Windows 2000 computer this can be done by the following procedure:

Right Click on My Network Places and select Properties.



Figure 2.1 Network Properties

Right Click on an icon that corresponds to your network card and select Properties.

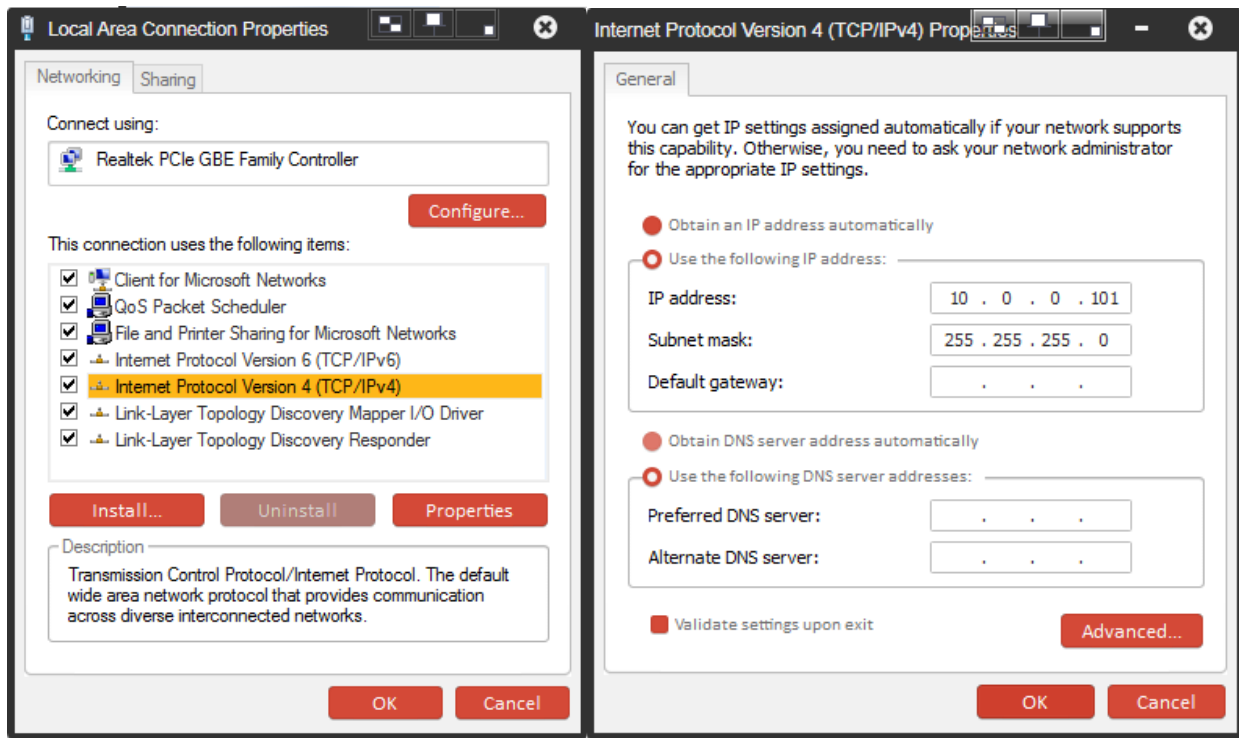


Figure 2.2 IP configuration

Select Internet Protocol (TCP/IP) and click on Properties button.

Use following IP address:

IP address 10.0.0.101

Subnet Mask 219.0.0.0

Press OK to accept entries.

It is sometimes necessary to reboot the computer to have the new address take effect.

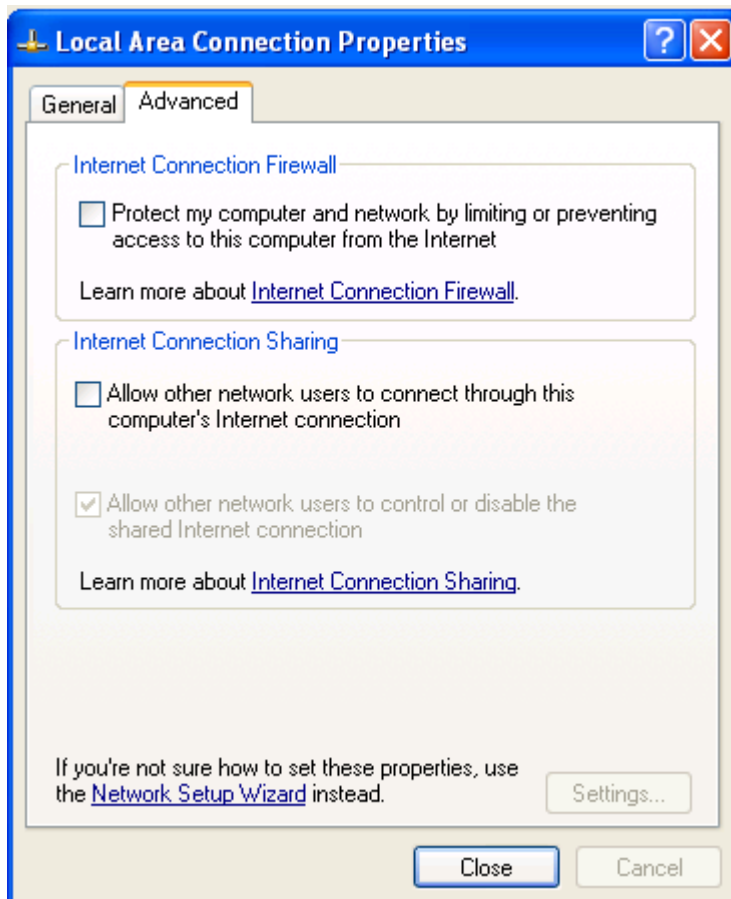
If the PORTABLE BD3 unit was previously communicating with a computer with a different address, then the PORTABLE BD3 unit must be reset (power off then on) for the unit to communicate to the new address.

## 7.4 Firewall

It is important to disable all Firewalls on the computer. Third party firewall from Norton, McAfee or other companies can completely disable the operation of the PORTABLE BD3 unit. Typically the Firewall will allow the “ping” command to operate, but will block all other commands and messages.

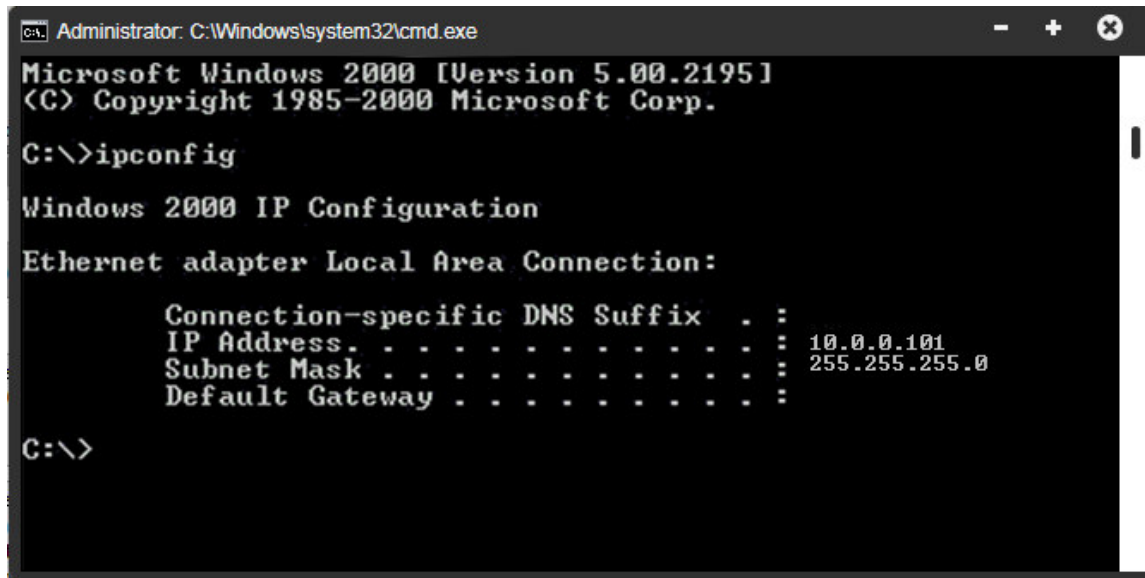
There is a built in Firewall with Windows XP. This should be disabled. Go to the Advanced Menu of the Local Area Properties and disable the Firewall.

Typical Firewalls will ask if the program should be “blocked”, always select “Unblock this program” if asked.



## 7.5 TCP/IP Verification

To verify that the IP address is correct, select “Start”, then “Run”, then type in “CMD”. This starts the command prompt in Windows (This is similar to the old DOS command prompt). Type the command “ipconfig”. The current ip address 10.0.0.101 should be shown.



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . .               : 10.0.0.101
    Subnet Mask . . . . .             : 255.255.255.0
    Default Gateway . . . . .         : 

C:\>
```

Viewing the Network Tab at the bottom of the GeoTest program can also check the IP address.

The Network Tab shows the current IP address detected by the GeoTest program.

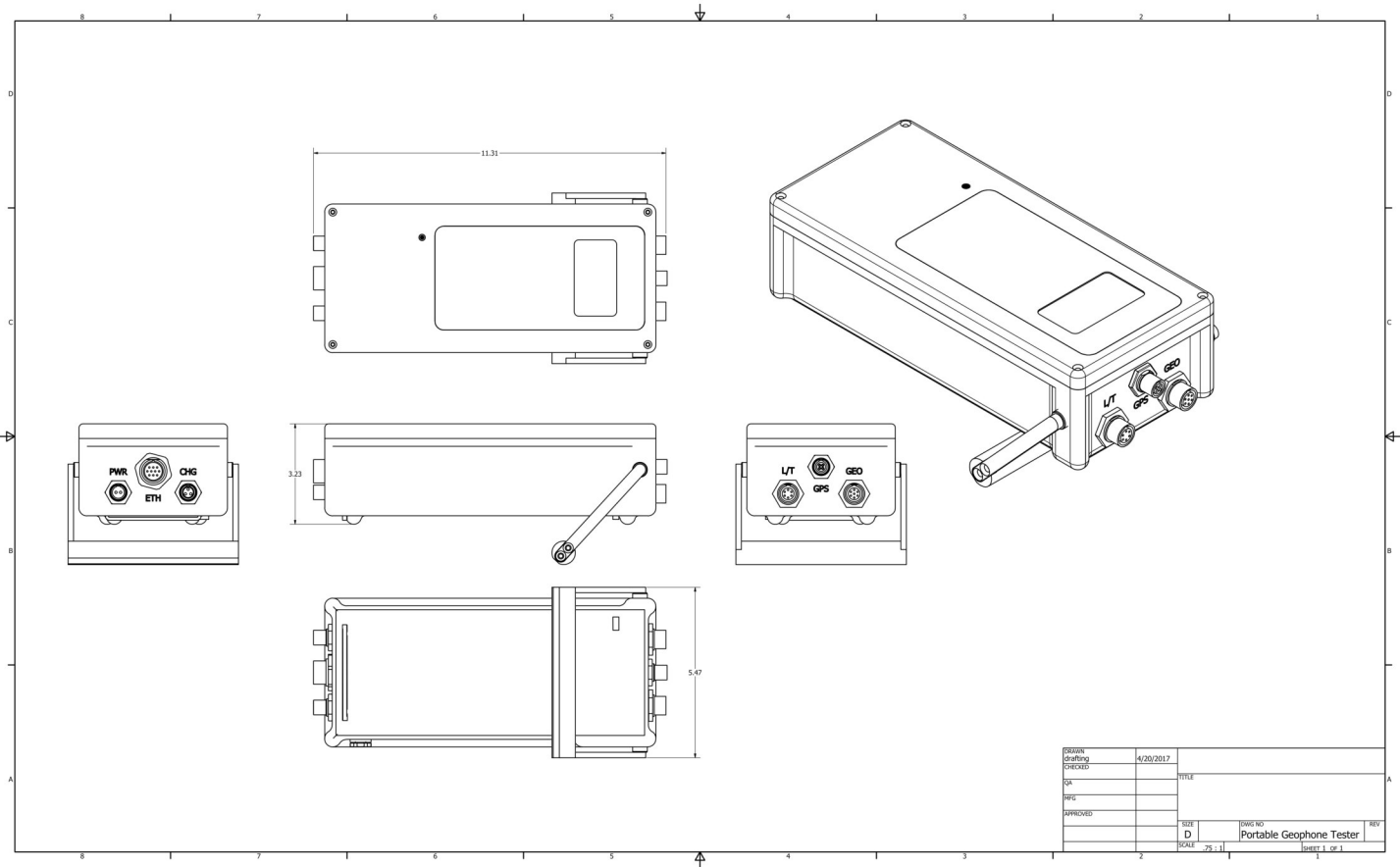
## 8 Specifications and Options

### 8.1 Options

The PORTABLE BD3 unit has several options

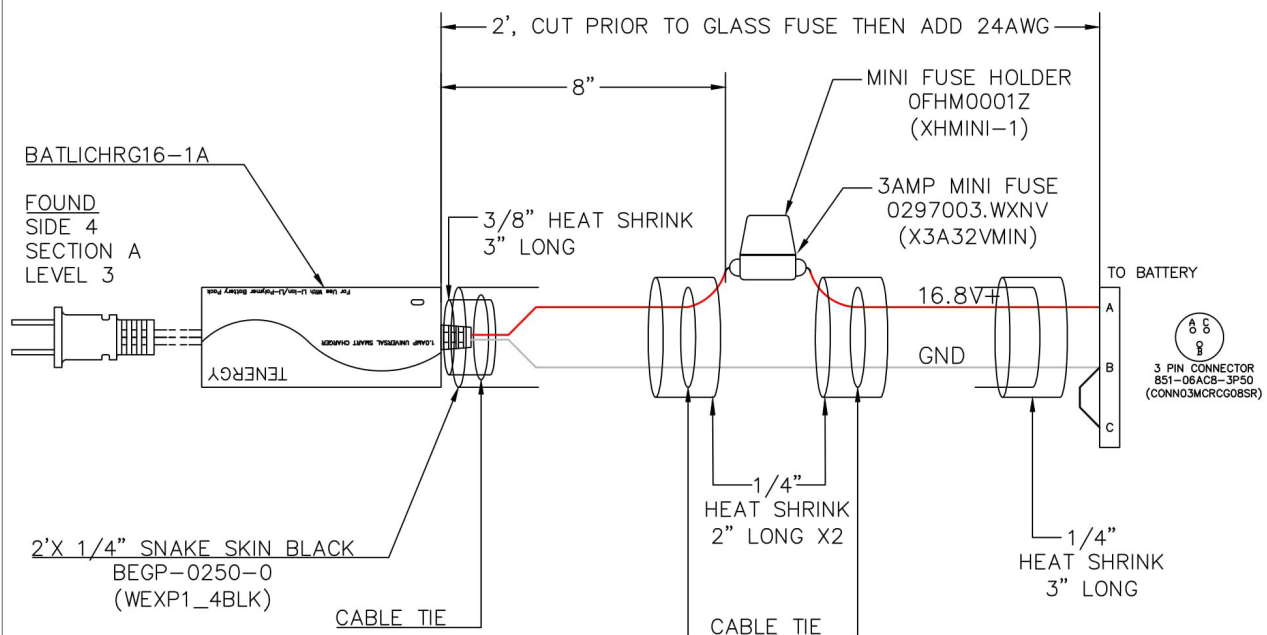
- Compact Flash – 8 Gbyte standard. The Flash card is used for
  - Buffering of data- Temporary storage of data until data can be sent over network. Amount of storage required depends on the speed of acquisition and the speed of the network
  - Storage of data while not connected to network. The Flash card can be used to store data while the unit is not connected to the network, later this data can be downloaded to the computer.
- GPS option – The GPS option is used for
  - Position information – When valid position data is available from the GPS receiver the position information is stored along with the data.
  - Timing – The GPS receiver can be used to stored precise time of the data collection
  - Oscillator adjustment- the internal oscillator of the PORTABLE BD3 unit can be adjusted to match the GPS clock.
- Analog Cables
  - The PORTABLE BD3 unit has a 19 pin connector for the analog inputs. Various analog cable options are available for the end user.
- Power and Ethernet Switch Box
  - This option allows multiple boxes to be connected over the Ethernet cable
  - This option can also be used between boxes to increase the maximum distance between boxes. The standard specification for transmission of data over CAT5 cable is 100 meters.
- Wireless Ethernet Option
  - Wireless Work group bridges and Wireless access points can be used to transmit the data from the PORTABLE BD3 unit to the host computer
  - High Gain antenna are available to increase the range of the Wireless network

9 Schematics





REVISION	DESCRIPTION	DATE
2	CHANGED SHRINK DIAMETER IN 1 PLACE	5-20-14



AUTHOR CHRISTOPHER D.	4-10-14	Seismic Source Co. 2391 E. Coleman Rd. Ponca City, OK 74604	SeismicSource.com (580)762-8233
CHECKED			
QA			
MFG			
APPROVED			
...			
		SSC PN CHR1A14DC-2	REV 2
		SCALE	PAGE 1 OF 1

NOTES:  
CUT OF EXISTING FUSE AND ALLIGATOR CLIPS  
PULL BLACK AND RED WIRE APART  
ONLY CUT RED WIRE TO MAKE ROOM FOR FUSE  
CUT FUSE HOLDER EACH END 1.5 INCHES



POWER



A CLEAR  
B BLACK

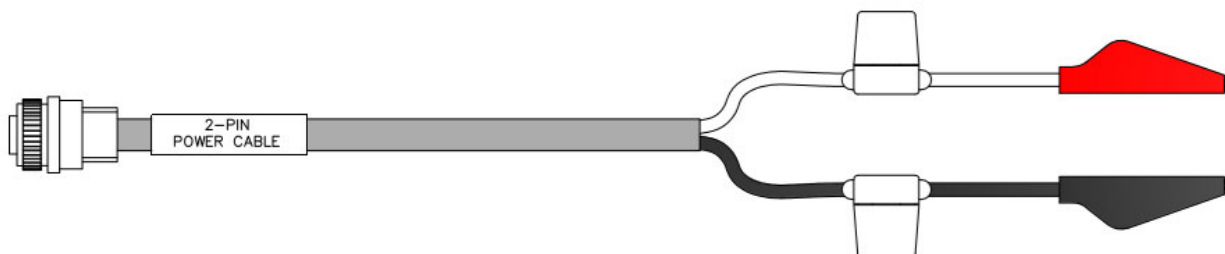
+ 12 VOLT  
GND

MINI-FUSE HOLDER  
F1057-ND  
5-AMP MINI FUSE  
576-0297005.WXNV

ALLIGATOR CLIP  
860-4341  
W/LARGE RED BOOT  
860-4455

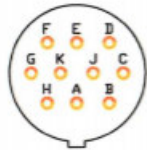
MINI-FUSE HOLDER  
F1057-ND  
5-AMP MINI FUSE  
576-0297005.WXNV

ALLIGATOR CLIP  
860-4341  
W/LARGE BLACK BOOT  
860-4460

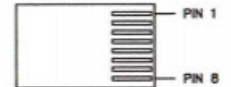
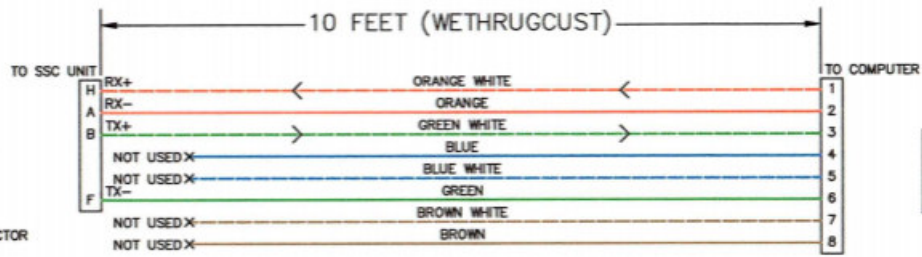


BILL OF MATERIALS		
QTY	PART #	DESC.
1	851-06ACB-2S50	2-SOCKET FEMALE CABLE CONN.
2	F1057-ND	MINI FUSE HOLDER
2	576-0297005.WXNV	5-AMP MINI FUSE
10 FT.	8762	2-COND. CABLE 20 AWG
2	860-4341	LARGE ALLIGATOR CLIPS
1	860-4455	LARGE RED BOOT
1	860-4460	LARGE BLACK BOOT
0'-2"	WSKTUBE1_4	1/4" SHRINK TUBE
0'-6"	WSKTUBE1_8	1/8" SHRINK TUBE

DESIGN	07/31/2009	Seismic Source Co.
CHECKED		2391 E. Coleman Rd.
BY		Ponca City, OK 74604
APPROVED		(580)762-8633 www.seismicsource.com
TITLE		
2-PIN POWER CABLE		
SIZE		1/2"PP-1
SCALE		
SHEET 1 OF 1		

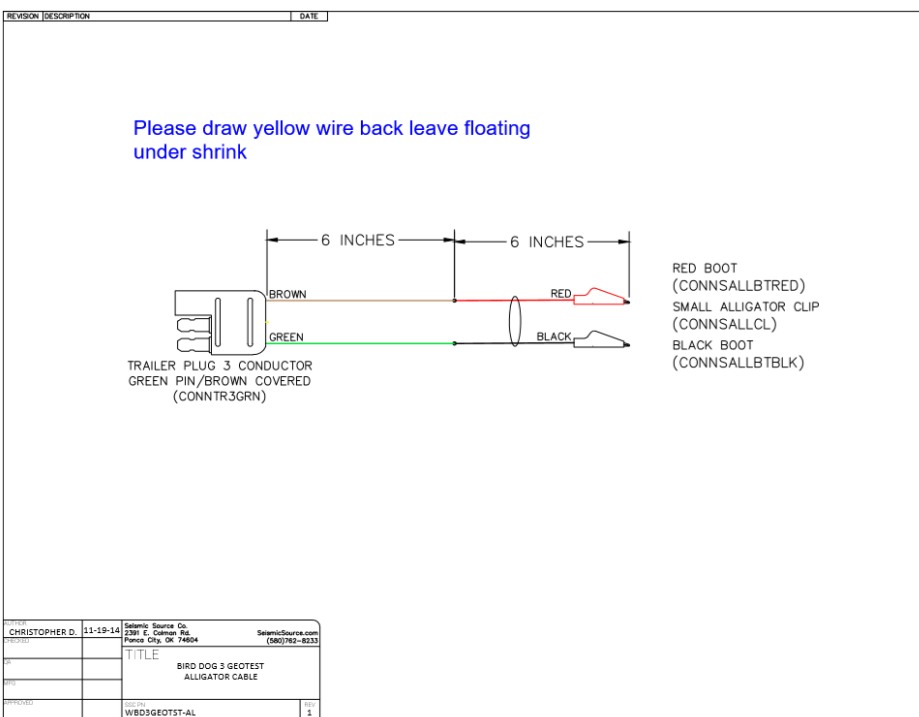
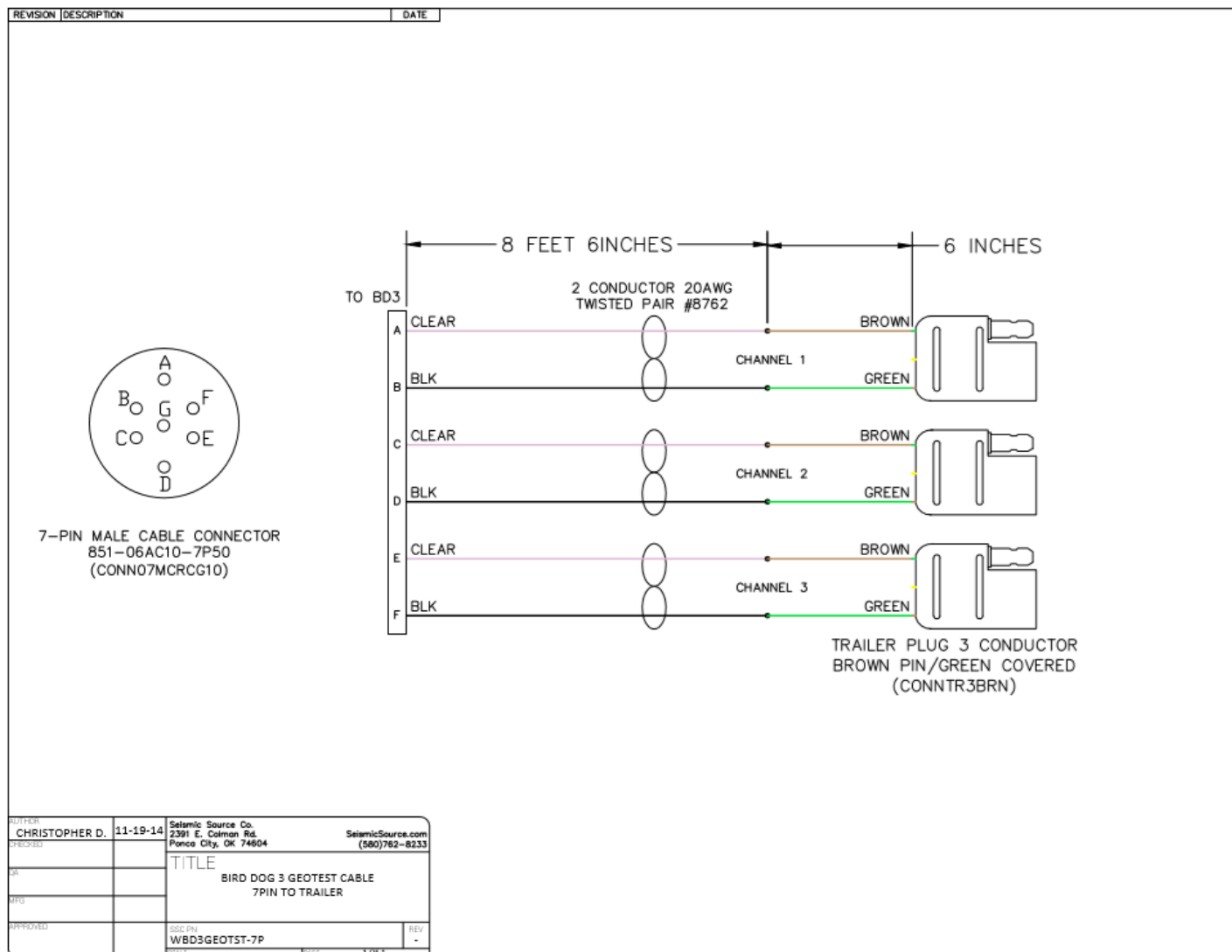


10-PIN MALE CABLE CONNECTOR  
851-06AC12-10P50  
(CONN10MCRG12SR)



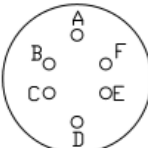
BOTTOM VIEW  
RJ45 CONNECTOR  
510-7119  
(CONN RJ45CRMPEUL)

AUTHOR CHRISTOPHER D.	DATE 1-29-18	DATE 10-30-13	NOTES PART NUMBER FROM WBB3DTAG-1 TO WBB3PROG-1
APPROVED BY <i>K&amp;B</i>	DATE 8/2/17	DATE 10-30-13	NOTES LENGTH FROM 3FEET TO 6FEET
DESCRIPTION STANDARD 10PIN ETHERNET DATA CABLE	DATE 6-2-14	DATE 10-30-13	NOTES PART NUMBER FROM WBB3PROG-1 TO W10EDC-1
PART NUMBER W10EDC-1	DATE 8-31-16	DATE 1-29-18	NOTES LENGTH FROM 6FT TO 10FEET
LOGIC/CHANGE/REV ORIGINATOR/REV Pinner City, MO 63104	PAGE 1 OF 1	REV 5	NOTES INCLUDED ALL WIRES IN RJ45 CONNECTOR FOR STRENGTH AND APPLIED COSMETIC CHANGES



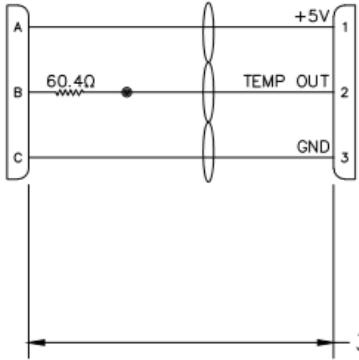
REVISION	DESCRIPTION	DATE

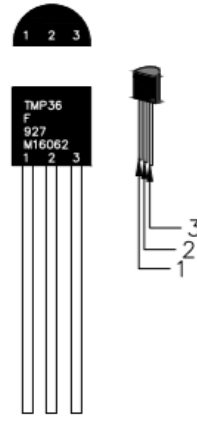


6-PIN MALE CONNECTOR  
851-06AC10-6P50  
(CONN06MCRG10)

TO BIRD DOG



3 METERS W18GRAY03SHLD



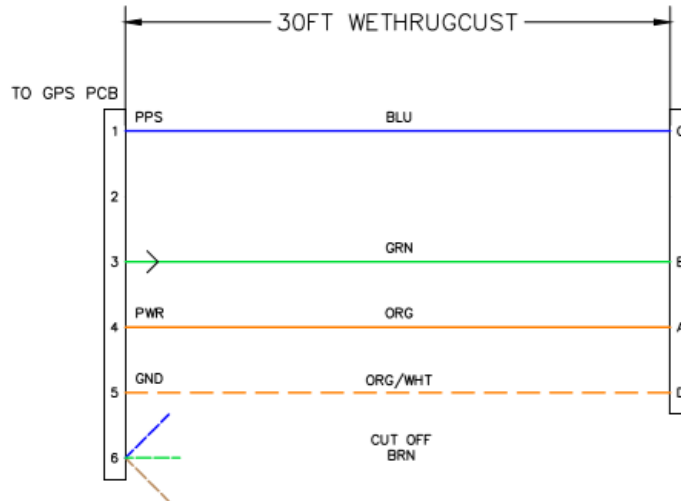
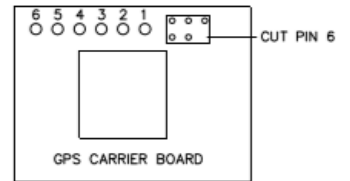
SENSOR TEMP 2.7/5.5 TO-92-3  
TMP36FT9  
(IC-TMP36GT9)

USE THE WATER PROOF HEAT SHRINK AROUND  
THE TEMPERATURE SENSOR TO PROTECT IT

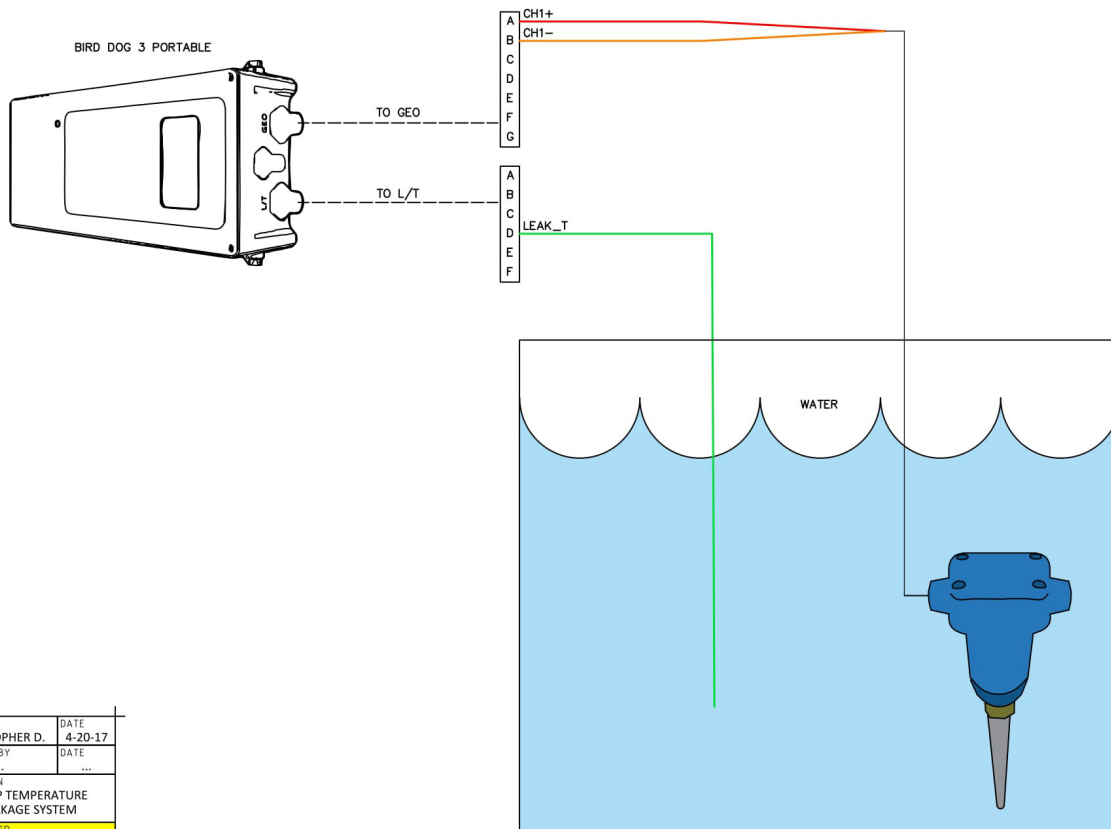
AUTHOR	5-17-16	Seismic Source Co. 2391 E. Colman Rd. Ponca City, OK 74604	SeismicSource.com (580)762-8233
CHECKED		<p><b>TITLE</b></p> <p>TEMPERATURE SENSOR CABLE</p>	
QA			
MFG			
APPROVED		SSC PN WBD3TMP5NS-1	REV -
SCALE		PAGE	1 OF 1

REVISION	DESCRIPTION	DATE
2	CHANGED THE PN FROM FGSSCGPS-2-DAQ3-3	12-19-17



4-PIN MALE CONNECTOR  
(CONN04MCRG0BSR)

AUTHOR	CHRISTOPHER D.	12-5-13	Seismic Source Co. 2391 E. Colman Rd. Panola City, OK 74604	SeismicSource.com (580)762-8233
CHECKED			TITLE	
QA			SSC GPS V2 FOR DAQ LINK 3-3	
MFG				
APPROVED			SSC PN FGSSCGPS4P30	REV 2
SCALE		PAGE	1 OF 1	



AUTHOR	DATE
CHRISTOPHER D.	4-20-17
APPROVED BY	DATE
...	...
DESCRIPTION	
BD3-P TEMPERATURE LEAKAGE SYSTEM	
PART NUMBER	
...	

SEDASOURCE.COM (480)762-4033 Phoenix, AZ 85044	PAGE	REV	DATE	NOTES
	1 OF 1	1	...	...