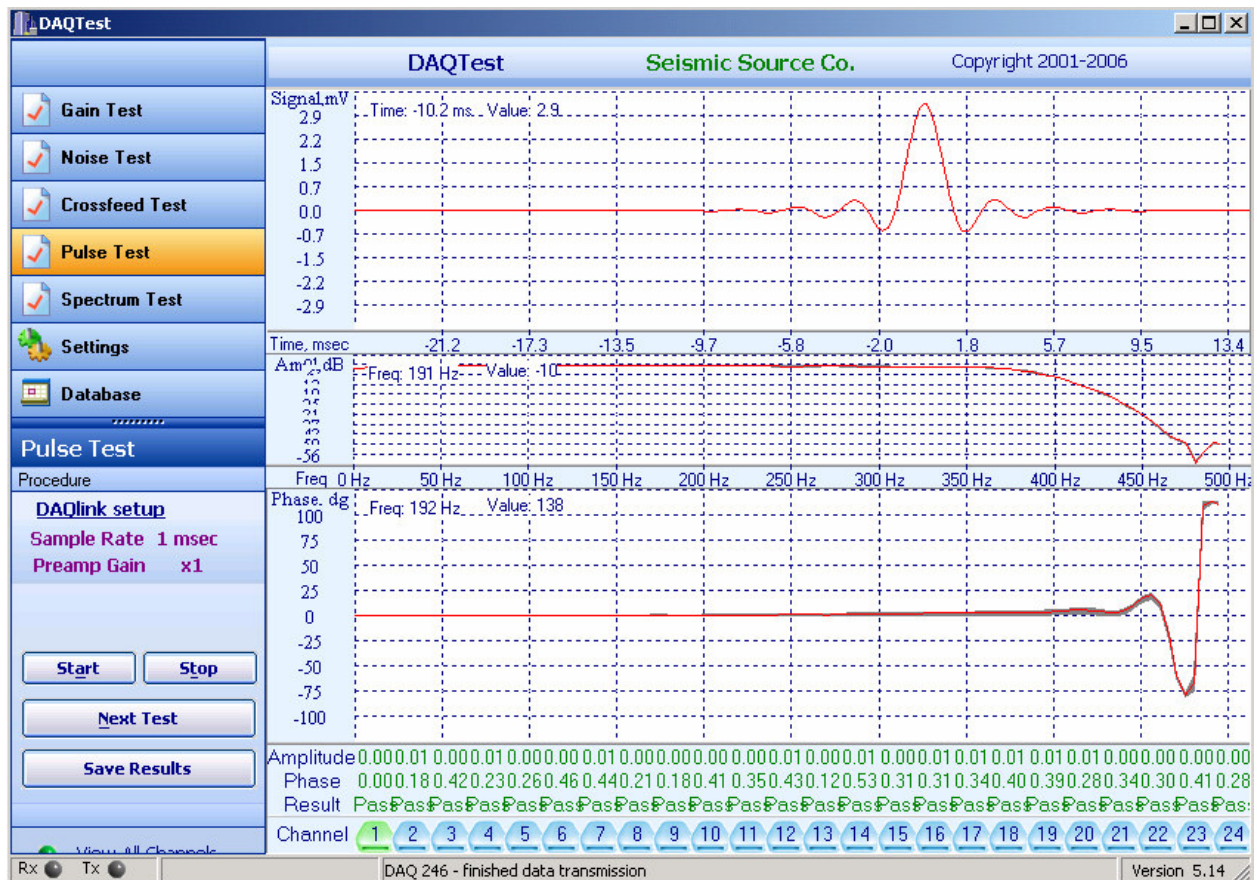




DAQLink Instrument Test System



User's Manual

DAQLink Instrument Test User's Manual

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1 Introduction

1.1 System Description

The DAQlink Instrument Test system is designed to operate with the DAQlink II seismic acquisition units. The DAQlink Instrument Test System includes the following:

DAQlink Instrument Test Box
DAQTest Software CD
DAQlink Instrument Test Manual



The DAQlink Instrument Test Box allows the input channels of the DAQlink to be connected to various analog inputs. All of the Odd channels are wired to one input and all of the even channels are wired to a second input. Switches and BNC connectors on the front panel of the Instrument Test box allow the “odd” and “even” channels to be connected to the following inputs:

1. Internal Oscillator - The DAQlink II unit has a single output which can be used for testing. The BNC labeled “Int. Osc. Output” is connected to the DAQlink II’s analog output signal. This BNC connector can be connected to an Oscilloscope to monitor the output.
2. Switches Select the input of the Even and Odd channels. The row on the left of the box selects the internal DAQlink oscillator or the External/GND inputs.
3. The two Switches on the right, select if the input is “GND” or the External Oscillator.
4. The External Oscillator BNC inputs. These two inputs allow an external oscillator to be used to test the DAQlink unit. Both switches must be pointed to the External oscillator input to enable this connection.

The DAQtest program uses the DAQlink's internal oscillator and the DAQlink Instrument Test Box to perform tests of the analog input channels. The Following Tests are performed

1. Gain Test – Tests gain accuracy of all channels
2. Noise Test - Tests equivalent input noise (RMS) of all channels
3. Crossfeed – Tests crossfeed from “Odd” channels to “Even” channels, and Even channels to Odd Channels
4. Pulse – Performs Pulse test of system and displays Frequency and Phase information
5. Spectrum – Performs Frequency and Phase information from a swept sine wave input.

2 Installation

The DAQlink Instrument Test system uses the DAQtest software and the DAQlink Instrument Test Box to Test the Analog inputs on the DAQlink II system.

See the DAQlink II manual on setup and installation instruction for the DAQlink II and the Computer's Ethernet setup.

3 Cable Connections

3.1 DAQLink Cable Connections

1. Connect DAQ Link to computer with patch cable provided
2. Connect 11-18 VDC supply to DAQ Link cable (polarity does not matter). **Note: 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.**
3. Connect the DAQlink Instrument Test Cable to the 55 pin Analog input on the DAQlink II unit

4 Configuring The DAQtest Program

4.1 DAQLink Setup

Connect and power up DAQLink unit. Start the DAQtest program by double clicking on DAQtest.exe file in Windows Explorer.

First Go to the Settings – Device Menu.

If no unit serial numbers are displayed in the window click Auto Detect. All DAQLink units connected to computer should be automatically found and displayed.

Make sure the unit is enabled. A check mark by the serial number shows that the unit is enabled. Just left click the small box next to the serial number to enable it.

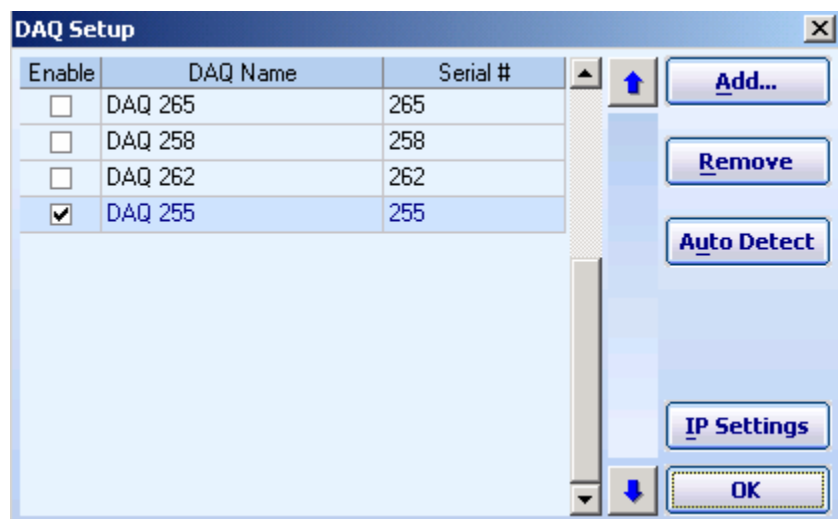


Figure 4.1 Device setup

4.1.1 IP settings

Each DAQLink unit should have a unique IP address. The IP settings selection allows viewing and editing of the current IP setting for the unit.

For the IP address shown, the 192 defines a class C network. With class C networks the first 3 octets must be the same for all units. This means that the first three entries (192.168.0) must be the same for the units to communicate. The last octet is a number between 0-255. The number 0 and the number 255 are reserved and should not be used for a DAQLink IP address. Only the numbers 1-254 should be used. The computer's IP address should also be unique; it cannot have the same IP address as a DAQLink unit.

The Net Mask should be the same for all units. All bits that are not 0 in the net mask have to match. 255.255.255.0 mask is shown which means the first 3 bytes (octet) have to match.

Use DHCP server to configure IP configuration – When checked, the DHCP server does the IP configuration automatically. The DHCP server supplies an IP address to any host that asks for it. Recommend always using manual address when possible, because it's easier to troubleshoot in case of a problem.

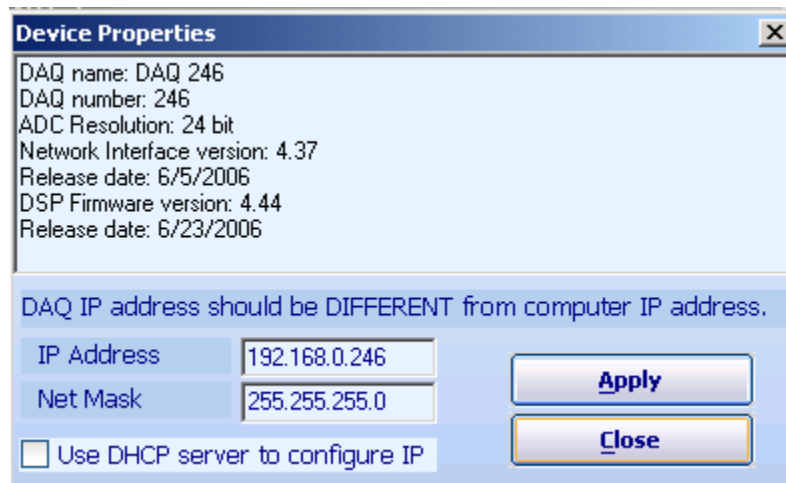
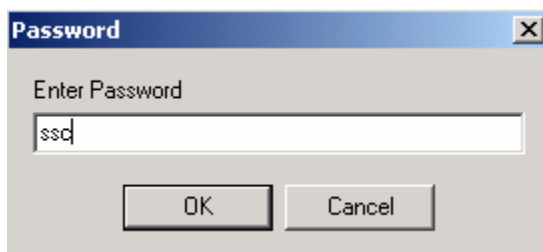


Figure 4.1.3 Device IP selections

When changing the IP address a password must be entered.

Use "ssc" for the password.



4.2 Number of Channels

Enter the number of Channels of the DAQlink to be tested. (1-24)
and the R26 value (10000)



The screenshot shows a 'Settings' dialog box with a 'Hardware' tab. Inside the tab, there is a 'Device' button. Below it, the 'Number of channels' is set to '24 Channels' in a dropdown menu. At the bottom, the 'R26 Value' is set to '10000' in a text input field.

Settings
Hardware
<u>D</u> evice
Number of channels
24 Channels
R26 Value 10000

5 Program Operation

After Selecting the DAQlink unit and the number of channels, press the “Clear All” button at the bottom of the screen. This will clear all of the previous test results.

5.1 Threshold Tolerances

Before beginning the tests the “Threshold Tolerances” for each test must be entered. Select Settings and enter the tolerances for each test.

For a standard DAQlink the following entries are normally used

Settings		
Hardware		
<u>Device</u>		
Number of channels		
24 Channels		
R26 Value 10000		
Save and Upload		
Threshold Tolerance		
<u>Gain Test</u>		
Gain Error	1.0	%
<u>Noise Test</u>		
Threshold	1.0	uV
<u>Crossfeed Test</u>		
Threshold	80.0	dB
<u>Pulse Test</u>		
Amplitude	1.0	%
Phase	1.0	deg
<u>Spectr Test</u>		
Amplitude	1.0	%
Phase	1.0	deg

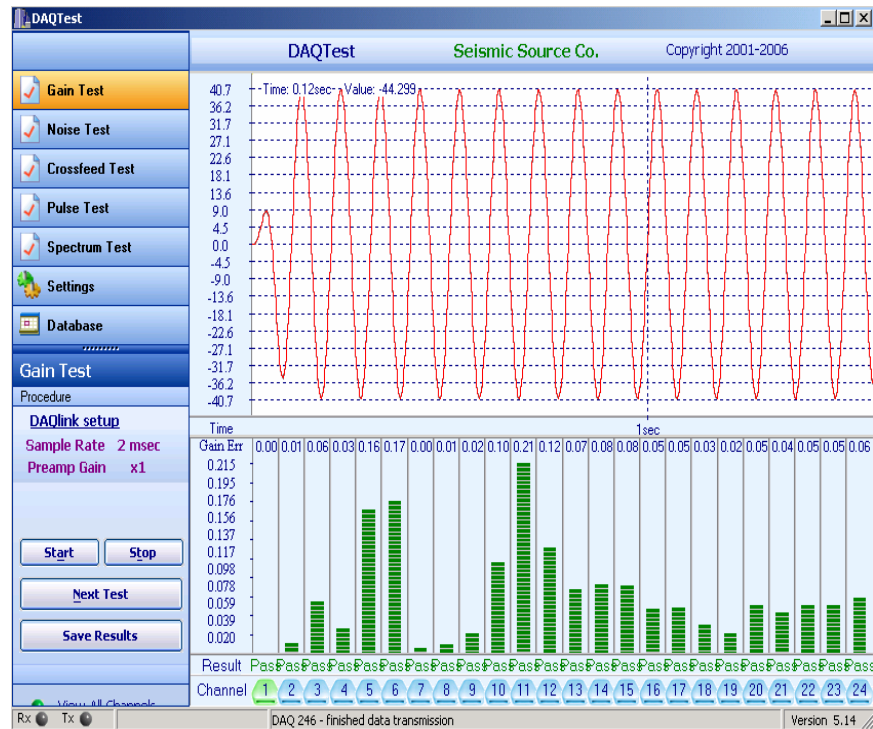
5.2 Gain Test

Select internal oscillator on both even and odd channels on the Instrument Test Box.



Highlight the “Gain Test” button.

Press Start



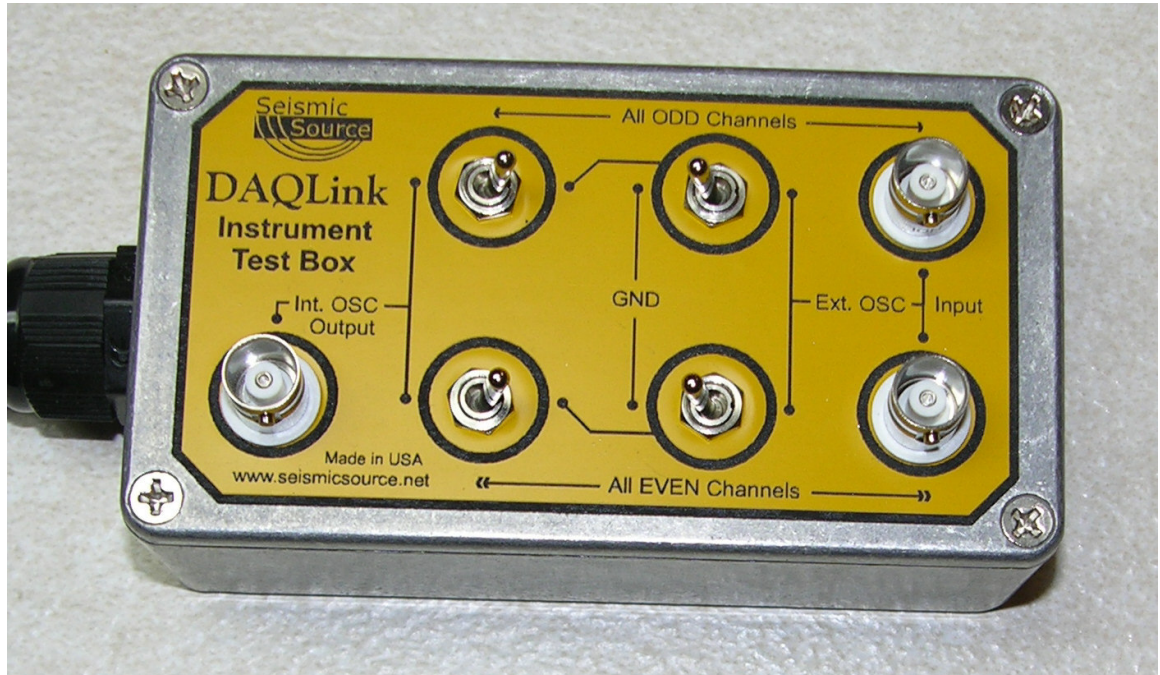
The system outputs a fixed sine wave signal to all channels.

The tests are performed at 2 msec sampling with a X1 preamp gain.

The graphs show the error for each channel. Each channel can be clicked at the bottom to become the reference channels, and all other channels are compared to the reference.

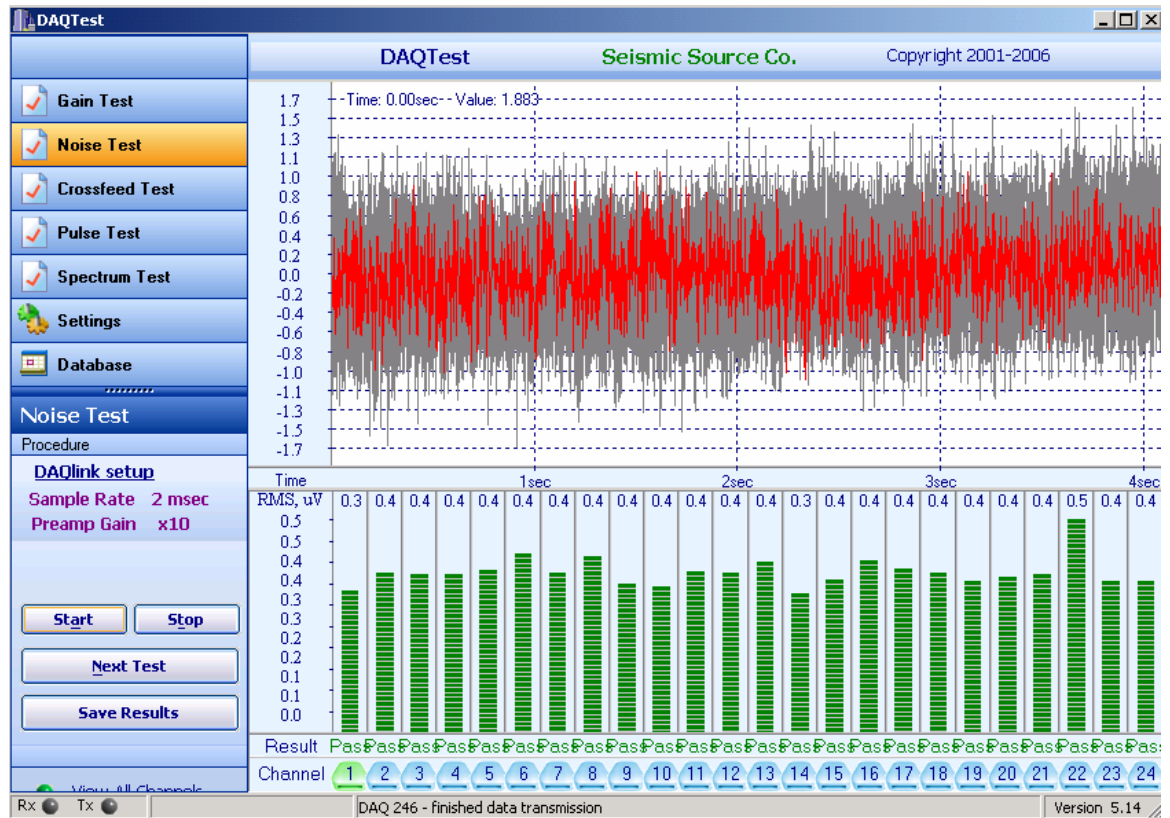
5.3 Noise Test

Select external oscillator and GND on both even and odd channels on the Instrument Test Box.



Highlight the “Noise Test” button.

Press Start



The system connects all inputs together to measure the equivalent input noise of each channel.

A 2 msec sample rate with a x10 preamp gain is used.

Normal noise on a 24 Channel DAQlink should be less than 1 micovolt. Typical value is 0.4 microvolts.

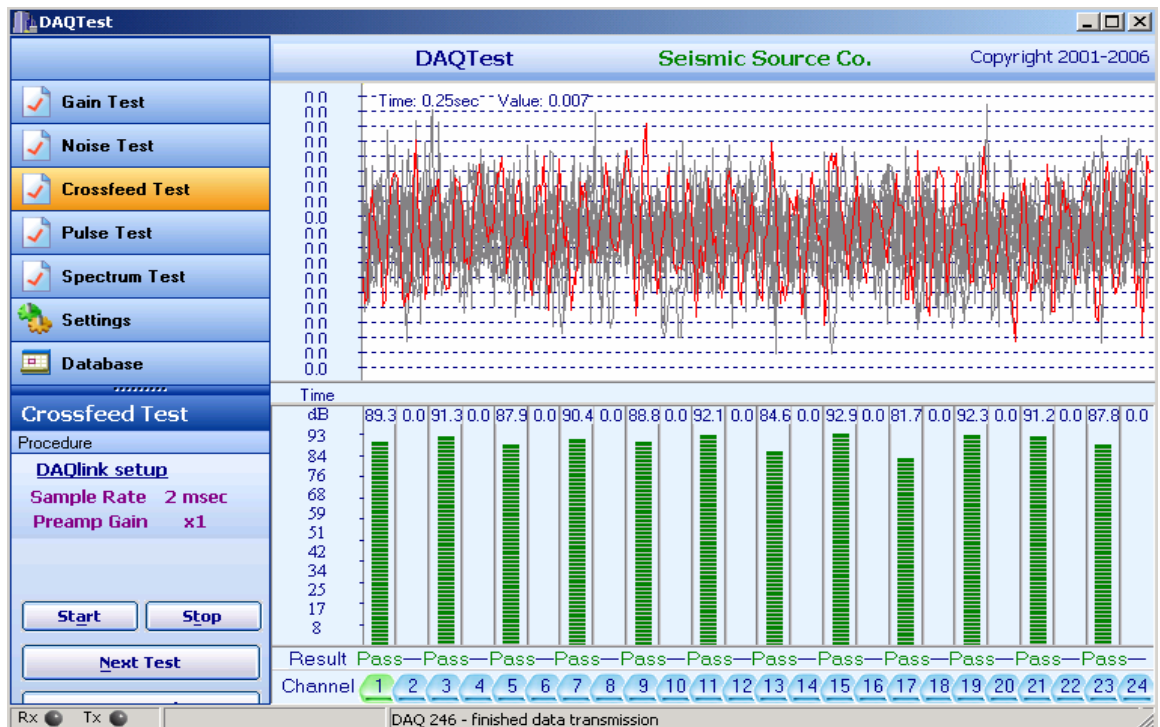
5.4 Crossfeed Test

Select internal oscillator on even channels on the Instrument Test Box, and external oscillator/ GND on odd channels.



Highlight the “Crossfeed Test” button, and “Odd” Channels

Press Start



Select internal oscillator on odd channels on the Instrument Test Box, and external oscillator/ GND on even channels.



Highlight the “Crossfeed Test” button, and “even” Channels

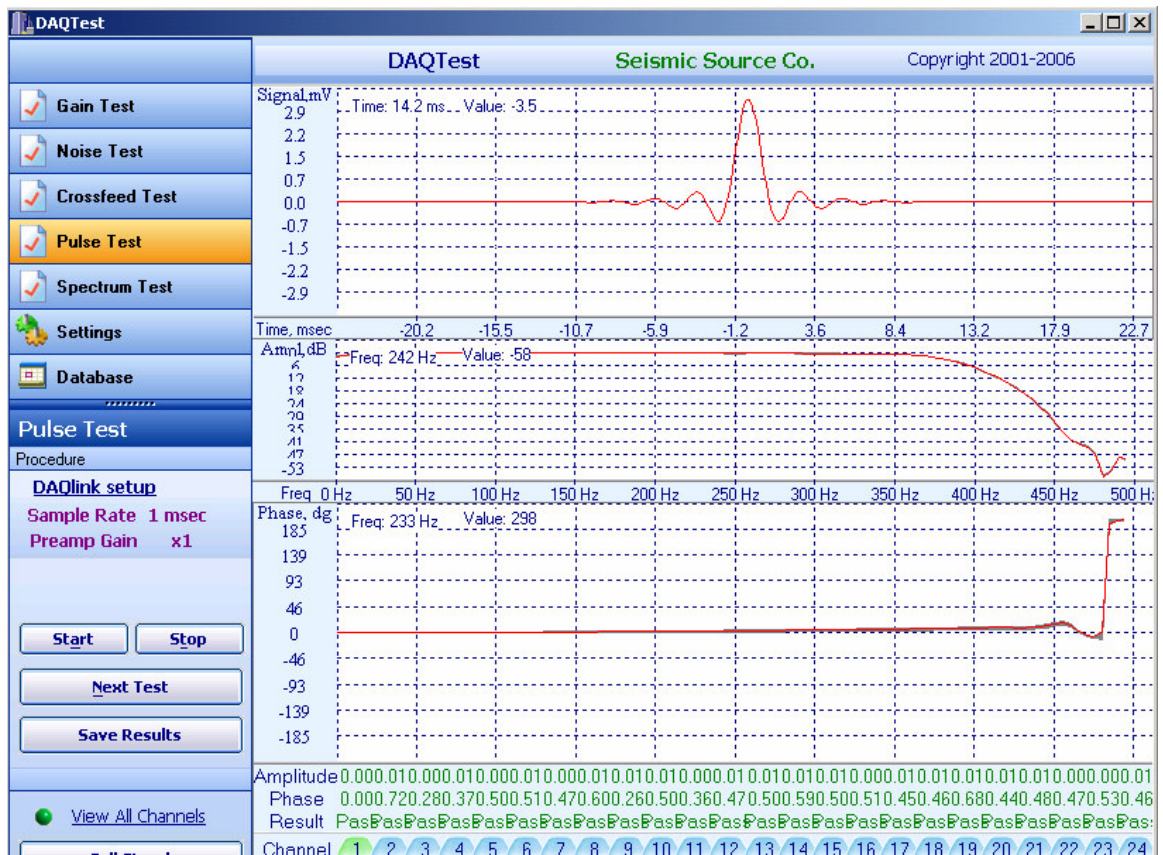
Press Start

5.5 Pulse Test

Select internal oscillator on both even and odd channels on the Instrument Test Box.

Highlight the “Pulse Test” button.

Press Start

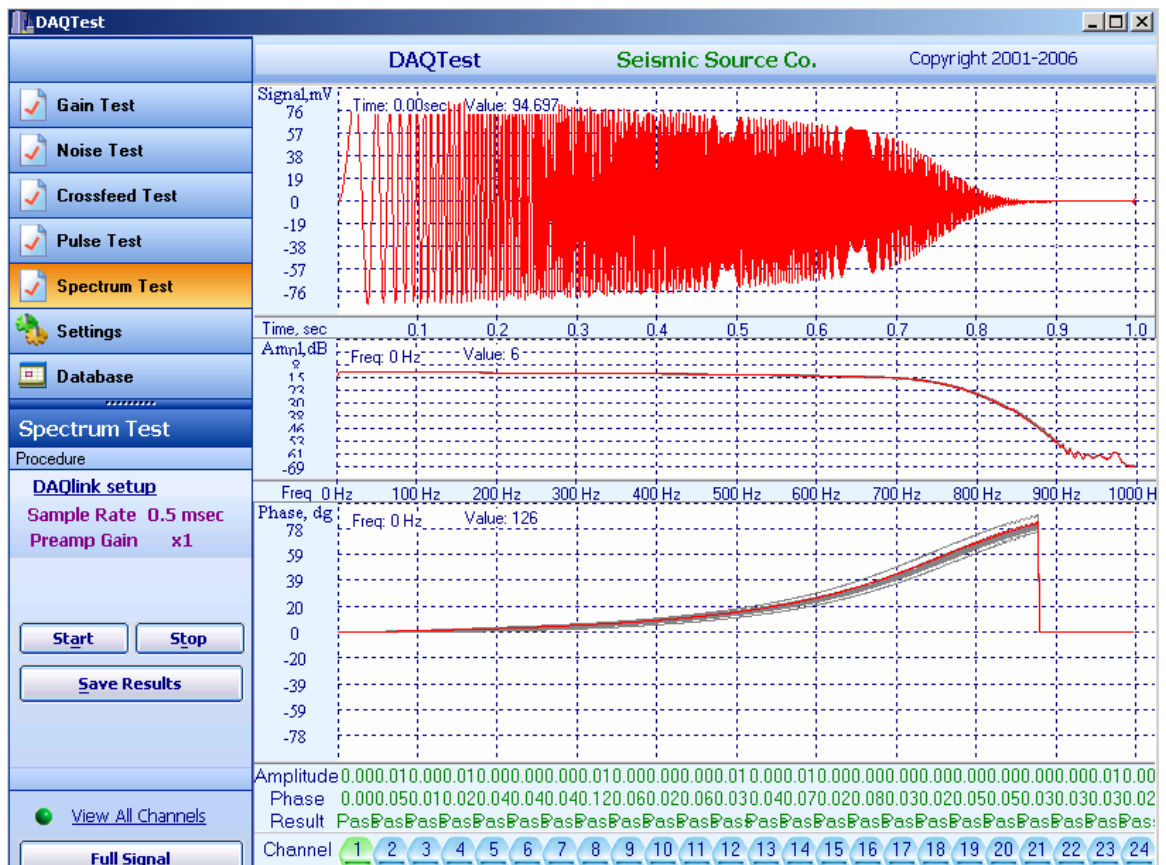


5.5 Spectrum Test

Select internal oscillator on both even and odd channels on the Instrument Test Box.

Highlight the “Spectrum Test” button.

Press Start



5.6 Save Results

After all tests are performed, the data can then be saved to the database. Press the “Save Results” button.

6 Database

6.1 Database

Select the Database to view the Stored data.

DAQTest

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Gain Test

Noise Test

Crossfeed Test

Pulse Test

Spectrum Test

Settings

Database

Record Store

Comment

Serial #

DateTime

258

9/18/2006 11:31:48 A

262

9/18/2006 11:36:44 A

255

9/18/2006 11:41:31 A

Delete Record

Save Layout

Restore Layout

Export to File

DAQ Number 258 Serial Num 258 Record Date 9/18/2006 11:31:48 AM

Gain Test

Tolerance 3 %

Gain Error %

1 2 3 4 5 6 7 8 9 10 11 12

0.00 0.01 0.02 0.01 0.00 0.01 0.00 0.00 0.00 0.02 0.01 0.01

13 14 15 16 17 18 19 20 21 22 23 24

0.02 0.01 0.01 0.02 0.01 0.01 0.03 0.02 0.03 0.00 0.00 0.01

Noise Test

Threshold 3 uV

Noise uV

1 2 3 4 5 6 7 8 9 10 11 12

0.4 0.4 0.5 0.4 0.4 0.5 0.6 0.4 0.5 0.4 0.5 0.3

13 14 15 16 17 18 19 20 21 22 23 24

0.31 0.37 0.38 0.40 0.38 0.40 0.47 0.48 0.46 0.37 0.39 0.38

Crossfeed Test

Threshold 80 dB

Crossfeed dB

1 2 3 4 5 6 7 8 9 10 11 12

90 87 88 90 88 86 84 89 85 91 91 90

13 14 15 16 17 18 19 20 21 22 23 24

90 90 90 86 90 88 91 87 88 87 89 90

Pulse Test

Tolerance ATF 5 % Tolerance Ph 5 %

Amplitude Error %

1 2 3 4 5 6 7 8 9 10 11 12

0.00 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01

13 14 15 16 17 18 19 20 21 22 23 24

0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.00 0.01 0.01

Phase Error %

1 2 3 4 5 6 7 8 9 10 11 12

0.00 0.53 0.74 0.66 0.70 0.51 0.69 0.94 1.14 0.68 0.81 0.95

13 14 15 16 17 18 19 20 21 22 23 24

0.28 0.49 0.79 0.24 1.04 0.57 0.49 0.55 0.99 0.96 0.66 0.82

Spectr Test

Tolerance ATF 5 % Tolerance Ph 5 %

Amplitude Error %

1 2 3 4 5 6 7 8 9 10 11 12

0.00 0.01 0.01 0.01 0.00 0.00 0.01 0.02 0.01 0.02 0.01 0.01

13 14 15 16 17 18 19 20 21 22 23 24

0.00 0.00 0.00 0.01 0.01 0.01 0.02 0.02 0.02 0.01 0.02 0.01

Phase Error %

1 2 3 4 5 6 7 8 9 10 11 12

0.00 0.04 0.02 0.06 0.02 0.02 0.09 0.16 0.11 0.04 0.11 0.10

13 14 15 16 17 18 19 20 21 22 23 24

0.01 0.05 0.03 0.04 0.04 0.01 0.11 0.09 0.15 0.11 0.08 0.11

Rx Tx

Start 6 Windows Explorer SSC - Microsoft Outlook DAQTest - Message (DAQLINK_Instrument... DAQ Test

Version 5.14 10:15 PM