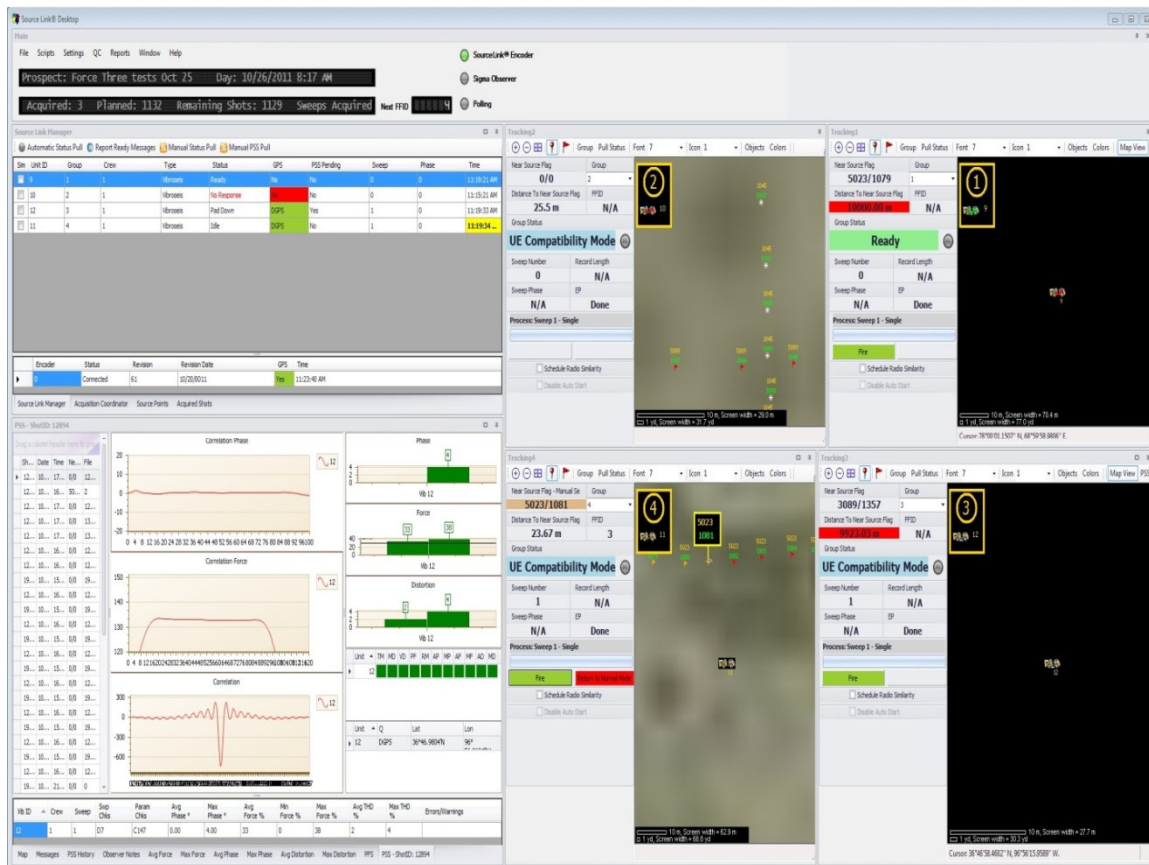




Universal Encoder II SourceLink Software



User's Manual



Universal Encoder II User Manual

SourceLink System User's Manual

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1 Introduction

1.1 System Description

SourceLink software has been designed to work with the Universal Encoder II to provide a complete solution for the demands of the 21st century Land Seismic acquisition system.

The system provides a real time Source Driven acquisition for all types of Land Source Seismic Source devices. Multiple source types can be used on the same prospect, the system allows seamless integration between the multiple sources. The source positions from the multiple sources can be simultaneously viewed and controlled.

The VHF radios use a TDMA type communication scheme for all radio telemetry. This technology allows multiple groups to operate on the same frequency without any radio collisions. It assists crews to maximize production and eliminate unnecessary “dead time” between VP’s.

The basic System consists of the following:

- Universal Encoder II – (UE2) – The UE2 provides the interface between the SourceLink Software and the VHF radios. Multiple reference signals are available for simultaneously acquiring multiple fleets of vibrators.
- VHF radio – standard Digital or analog VHF radios can be used with the system to provide excellent telemetry over the large area. Because of the GPS timing synchronization of the system, additional radio repeaters can be added to cover the entire prospect without changing the basic timing of the system.
- Central Computer with the SourceLink software
- GPS timing module

1.2 Computer Requirements

The SourceLink Software requires a high resolution screen to operate. Multiple High resolution screens are recommended for the SourceLink/UE2 system.

Minimum Computer requirements:

- 16.4" Screen or larger
- Intel Core i7 i7-2630QM 2 GHz or equivalent
- 1920 x 1080 Full HD Display
- 4 GB RAM
- Genuine Windows 7 Professional

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SourceLink™ software

- Specifically designed to maximize production with Continuous Recording Systems like iSeis Sigma, OYO GSR, Fairfield Node, Sercel Unite and all other systems.

- Uses GPS time synchronization - synchronizes sources with the Recording systems clock - no sample skew.

- System provides Simultaneous Control and QC of all sources on the project:

- Multiple Vibrator Groups
- Multiple Dynamite Groups
- Multiple AWD Groups
- Air Gun boats

- Easy to use Graphical Map Interface:

- Provides complete control
- Automatically finds Group COG
- Selects near flag
- Fires the shot

- Real-Time Group Status:

- Distance to selected flag
- Sweep/Ready status
- EP Number of VP
- Error conditions

- Supports all Simultaneous Vibroseis Methods:

- Slip Sweep (Shell)
- HFVS (ExxonMobil)
- ZenSeis (ConocoPhillips)
- ISS and DSSS (BP)
- Combination of above methods



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Real-Time QC:

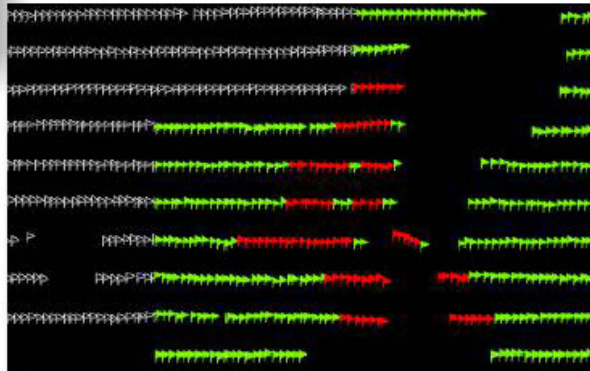
- Real-Time Graphical QC of Source performance
- Classical Display of Vibrator performance:
- Correlation Phase
- Correlation Force
- Distortion
- Vibrator Error Limits



Real-Time Statistics:

- Line Graph shows Vibrator Performance for last 100 sweeps
- Easy to see any Vibrator problems

- PSS Status can also be displayed graphically on MAP
- Out of specification shots and missing shots are easily identified
- For Dynamite operation different Uphole times are shown in different colors to show variance of Uphole time graphically



- Statistical Analysis of PSS data
- Summarizes Vibrator performance
- Shows number of errors and percent
- Each Vibrator statistics are shown for easy comparison

2 SourceLink UE2 Setup

2.1 SourceLink UE2 Setup



2.1.1 Cable Connections

- Connect UE2 to computer with patch cable provided
- Connect 11-18 VDC supply to UE2 cable
- **Note: The UE2's Battery LED's will show the status of the battery voltage,**
 - **Green Flash – battery voltage is above 12 volts**
 - **Amber Flash – battery voltage is between 10 and 12 volts**
 - **Red Flash – battery voltage is below 10 volts**
- Connect the Radio cable to the UE2
- Connect GPS unit to the UE2
- Connect the AUX outputs of the UE2 to an external recorder if required

2.1.2 Computer Setup

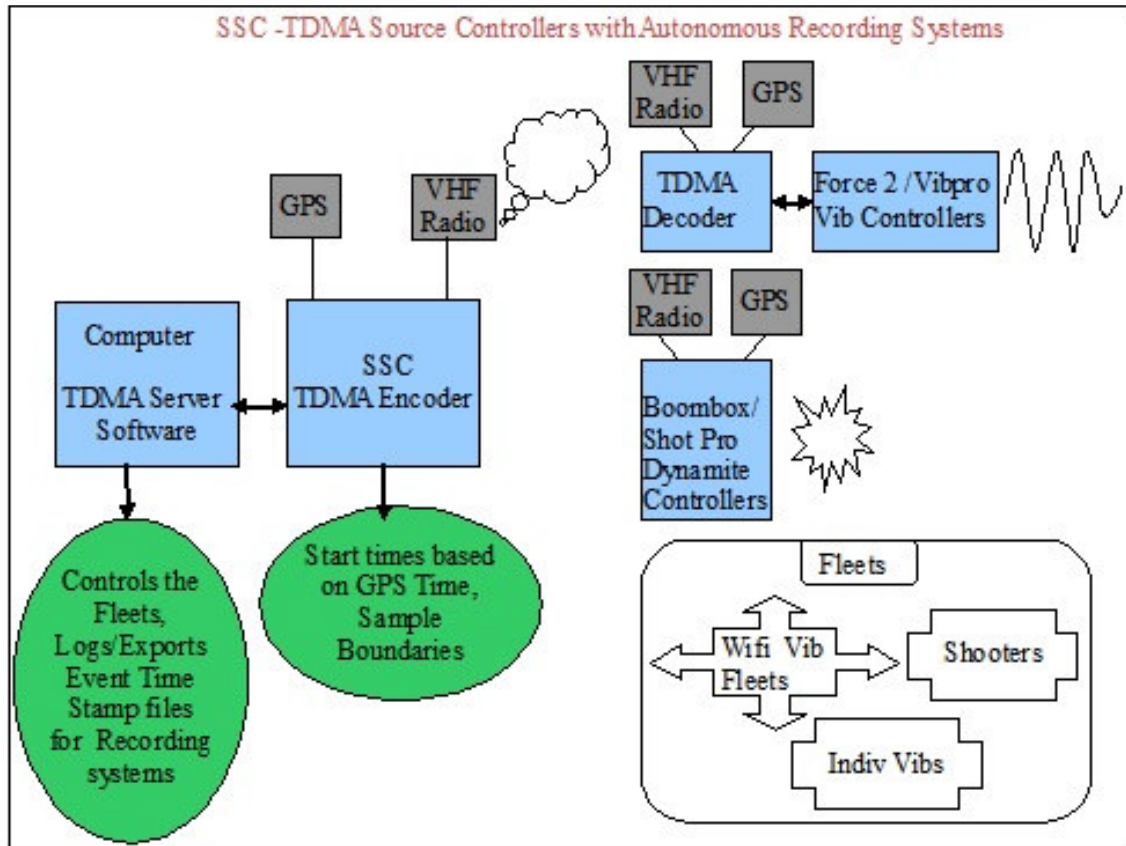
- Connect the Computer to UE2 Ethernet port, make sure the Computer LAN Network is set to static IP address in 10.x.x.x network (like 10.0.0.101, make sure the Computer IP address is different from TDMA Encoder's IP address). If the Computer needs to be set in different network for any other reason, make sure to configure UE-2 to that IP network using DAQflash software. Please refer Section 3 of this manual for Ethernet setup information.
- **Software Installation:** Install SourceLink software.

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2.1.3 UE2 GPS Setup

The GPS unit used with the UE2 requires an accurate pulse per second (PPS) and RS232 serial data. The GGA and GSA NMEA serial strings are required for proper operation. The UE2 is setup to receive the data a 19.2 K baud.

The following diagram shows basic configuration:



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2.2 Radio Telemetry Modes – TDMA and UE Mode

The SourceLink/UE2 can operate in two different radio telemetry modes. Either TDMA mode or UE mode can be selected. The two different modes are selected using the Encoder Settings menu. Default mode is TDMA and is not shown in the Tracking Maps, When the UE mode is selected it is shown in the Tracking maps.

2.2.1 UE Radio Telemetry Mode

This radio telemetry mode is compatible with older control system like thee Force Two and Boom Box units. In this mode, there is no automatic radio collision avoidance between different source groups or between the Encoder and the Decoder. UE2 sends an “A3 type” start code and the Decoder units receive this “start code” and starts the decoder. After the shot or sweep is completed, the decoders automatically send back a QC packet of data called “PSS” for vibroseis or “PFS” for dynamite.

No GPS unit is required for this mode, the Start timing is based on the reception of the VHF radio signal. Zero Time adjust and radio similarity adjust entries must be made to align the starts of the Encoder and Decoder Units

2.2.2 TDMA Radio Telemetry Mode

The TDMA radio telemetry mode is all based on GPS timing; all units must have their internal clock synchronized to GPS time. This mode requires the newer TDMA, Force III or Boom Box III Decoder units. Older control system like thee Force Two and Boom Box units will not operate in the TDMA mode. In this mode, the SourceLink software controls the radio telemetry and avoids any radio collision avoidance between different source groups or between the Encoder and the Decoder.

The Radio start codes are all based on GPS time. The UE2 system sends to the decoders the GPS time of the start. The Decoders receive this “Start” time and automatically starts the Decoders at the appropriate time. This digital GPS start time allows Digital Radios or multiple repeaters to be added to the telemetry path and not affect the radio start timing.

The SourceLink software constantly polls the decoder units for their status. Status information includes “not ready –moving”, “Pad Down – Ready”, and “PSS available”. The SourceLink receives the status information from each group and acts on this information based on the rules defined in the Acquisition Methods Menu.

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2.3 Master/Slave/Sigma Modes

The SourceLink/UE2 can operate in either Master or Slave Modes. In Master Mode, all operation is controlled by the SourceLink/UE2 system. In Slave Mode, a separate “Master Recorder” controls the operation and the SourceLink/UE2 monitors the Master system and responds and monitors the master recording systems operation.

2.3.1 Sigma Master Mode

When the Sigma recording system is selected, many of the selections and operation are moved to the Observer software. All of the Source Points, Receiver points, Processes and other critical entries are entered only in the Observer program and are then automatically transferred to the SourceLink software. When a shot is fired with the SourceLink software, the Shot information is transferred to the Observer software. The Observer software uses the Shot information and finds the “active Sigma spread” and saves the information in the Acquired shot log.

The Sigma Observer software and the SourceLink software work harmoniously together and provide a complete Source Driven acquisition package.

2.3.2 Master –Stand-Alone Mode

The Master standalone mode allows the SourceLink to operate with complete control of the Sources. Multiple Source groups can be controlled and the acquired shots, and Observer log provide complete documentation of the operation.

2.3.3 Slave Modes

Various Slave Modes are available with the SourceLink/UE2 system. The UE2 can either start on an external hardware pulse or can be started via radio. In Slave Mode, the start Message is received from the UE2 and sent to the SourceLink software. The SourceLink/UE2 does not send out the start codes in the Slave Mode. The system only monitors the operation and uses the acquired PSS and PFS to monitor the crew’s performance.

When the master recorder is using the RTI (Recording Truck Interface) feature, the FFID and other critical information can be included in the start codes. This information is received by the UE2 and passed to the SourceLink program. With some Mater Recording systems the FFID is not available, and the SourceLink’s FFID number must be manually synchronized to the master recording system. The SourceLink allows the FFID value to be manually changed to allow synchronization to the master recording system.

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2.4 Installing and starting SourceLink

2.4.1 SourceLink Quick Start Guide

- 1) Set Fixed IP address on Computer
 - a) Follow instruction in IP setup instruction of the manual
 - b) Fixed address of 10.0.0.101 should be used
- 2) Setup Hardware
 - a) Connect Ethernet patch cable from UE2 unit to the Computer
 - b) Connect DC power to Radio Power cable connector on UE2 unit (11 to 18 VDC)
 - c) Connect AUX inputs to Recording system
- 3) Install SourceLink software
 - a) Insert CD to your hard drive.
 - b) After Installation is complete then start the SourceLink software

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There are many different selections that must be setup in the SourceLink and Sigma Observer (optional) software.

The following is the minimum required to get started:

- **Load Survey Source points** – use the Script menu “Survey Wizard” in all modes except Sigma. With used with the Sigma Observer software, the scripts are loaded via the Observer software.
- **Process** – The process must be setup. The process of the Dynamite, Vibroseis, Weight Drop, or other Source parameter must be setup. This process will be used to determine how each Source group will operate.
- **Groups** – Number of Group Windows and assignment of unit numbers for each group must be setup. The process must be assigned for each group.
- **Observer Shot Point relation file.** When using the Sigma Observer system the active receiver for each Shot Point must be setup. When using the SPS type files, this process will be done automatically.
- **Load User Profile** – The multiple windows can be configured in many different combinations. It is suggested to “import” one of the default user profiles. Single Group and Dual Group Default profiles are included in the install disk.

The following must be setup before operating the system:

- Set fixed IP address on computer
- Setup Prospect
- Load Survey Data
- Setup Process – Vibrator , Dynamite, or Weight Drop
- Setup Groups – ID numbers, Crew 3, start code

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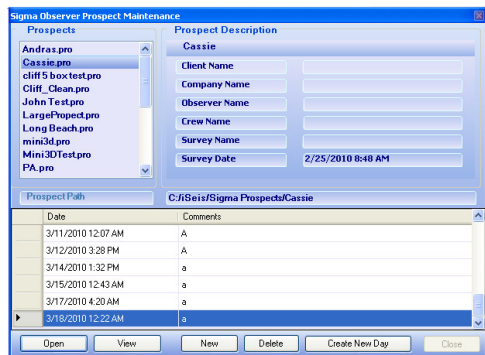
2.4.2 Installing the Application

The SourceLink is delivered in an install shield format. Click on Setup.exe and follow the instruction. After installation, you will find a Desktop shortcut and a SourceLink entry in the Start Menu.

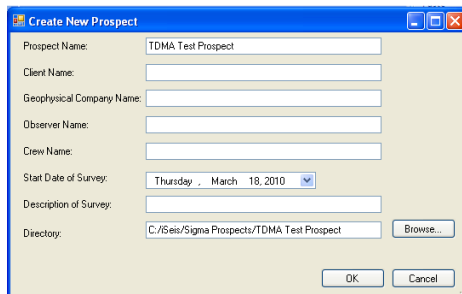
Important! Before installing the SourceLink, please make sure that the previous version is uninstalled. You can uninstall the program from the Control Panel Add/Remove programs option. Find the SourceLink in the list and click Change/Remove and follow the instructions.

2.4.3 Starting the Application

The SourceLink application can be started from the Start menu. Find the TDMA menu in the All Programs and click on SourceLink. Upon startup, the SourceLink shows the Welcome screen, where you can choose to open existing prospects or to create a new one.



To create new prospect, Click on the “New” button to create a new prospect.

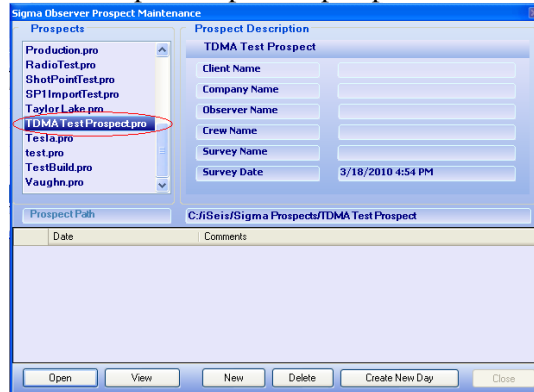


Fill in the Prospect Name field, which is mandatory, and the rest of them as optional information. The Prospect Name is the identifier that the application will refer to in respect of this prospect. Click OK when finished entering the data.

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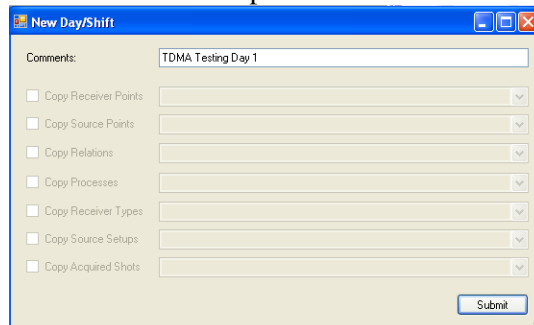
Find the newly created prospect in the list of prospects (left hand side) and click on it. The Prospect description window will update with the information for the selected prospect, and the list box in the bottom of the screen will display the days/shifts that were used for this prospect. Since this prospect is new, there is no Day/Shift information available.

Click on Open to open the prospect.



The New Day/Shift window will open if 24 hour passed since the last Day/Shift entry. If this window does appear, then type your comment. We will cover the Day/Shift management and its relevance at a later stage of this document.

Click on Submit to open the main window.



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2.5 SourceLink Overview

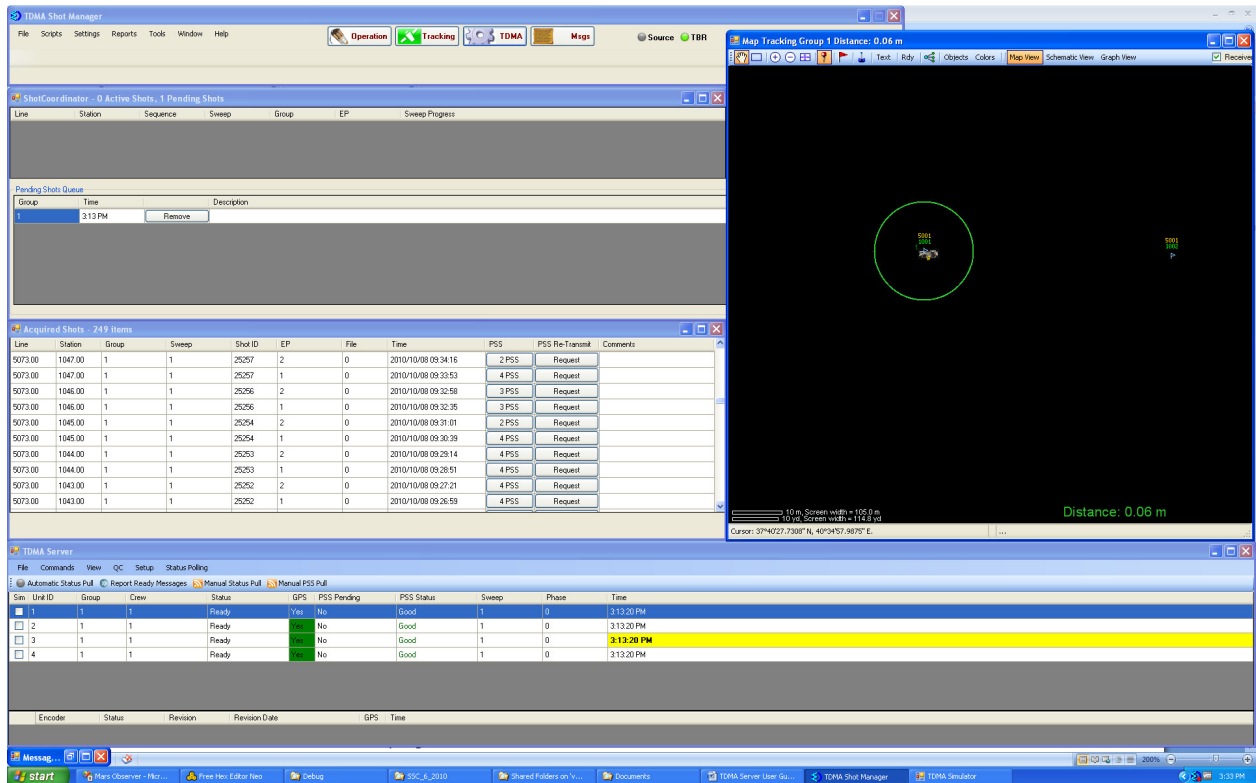


Figure 1

The SourceLink program consists of distinctive families of windows:

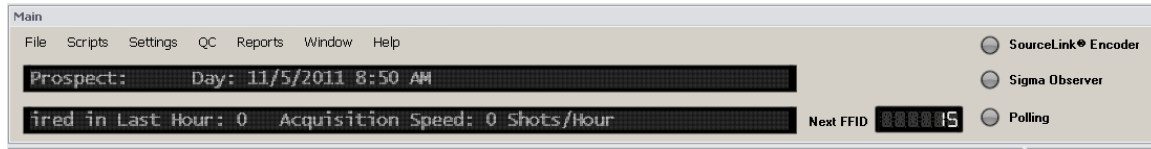
- Data Acquisition
- Group Management
- Vibrator Group Tracking Map

The Data Acquisition related windows are the following:

- Acquired Shots – Displays and manages the acquired source points
- The TDMA Group Manager window is called the SourceLink. It displays and manages the groups and individual vibrators that are used for this prospect.
- The Map tracking the vibrator groups display the source and receiver points that were imported for this prospect, as well as the vibrator or impulsive sources with their GPS location, and the group's COG and the distance from the closest source point.

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2.5.1 SourceLink Toolbar



The toolbar contains a main menu system as well as three Button

SourceLink Encoder button: Shows status of the UE2.

- LED OFF – no connection
- LED RED – UE2 connected but UE2 clock has not been set (No GPS)
- LED GREEN – UE2 connected and ready

Sigma Observer

- LED OFF – Sigma Observer software not connected
- LED GREEN – Sigma Observer software is connected

Polling

- LED OFF – radio status polling is off
- LED GREEN – radio status polling is enabled

Next FFID – displays the next FFID that will be used

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A single tracking Map can be used for multiple groups. This is setup using the tracking Map selection in the settings menu. Use the “Group” pull down menu to view the status of the other groups. When a new Group is ready the Tracking map will automatically switch to the active group.

Right clicking on the map will pull up the following menu.



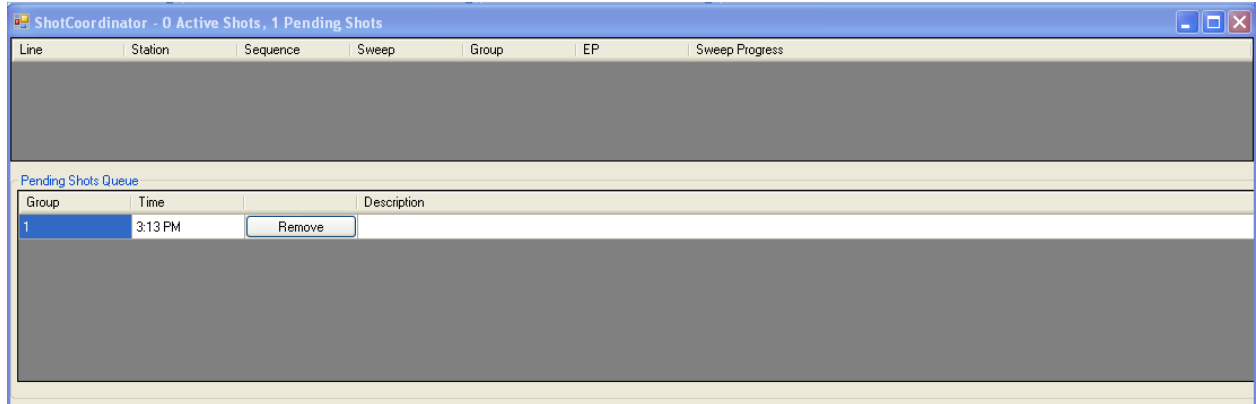
Right clicking on a Source Flag allows any Source point to be fired.

If the Shot has already been shot or the spread is not active, a warning message will appear. The user can override the warning and fire the shot.

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2.5.3 Acquisition Coordinator

Acquisition Coordinator



The shot coordinator is the display for the currently acquiring and the pending (ready to shoot) source points. Depending on the acquisition type there could be multiple shot points being acquired simultaneously.

The Pending Shots Queue can have one or more source points ready to shoot.

Active (currently acquiring shot) column description:

Line: Source Point Line

Station: Source Point Station

Sequence: Required shot sequence number from the recording system

Sweep: The Sweep ID of the active sweep





Group: The ID of the source group that is used for this acquisition

EP: Shows the progress of shot point

Sweep Progress: Shows the progress of the current sweep

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2.5.4 SourceLink Manager

Sim	Unit ID	Group	Crew	Type	Status	GPS	PSS Pending	Sweep	Phase	Time
	9	1	1	Vibroseis	Ready	No	No	0	0	11:19:21 AM
	10	2	1	Vibroseis	No Response	No	No	0	0	11:15:21 AM
	12	3	1	Vibroseis	Pad Down	DGPS	Yes	1	0	11:19:33 AM
	11	4	1	Vibroseis	Idle	DGPS	No	1	0	11:19:34 ...

Column Description:

Sim: Checkbox that allows the user to specify a vibrator for radio similarity the next time it is sweeping

Group: The assigned group for the vibrator

Crew: The assigned crew number for the vibrator

Status:

Ready: Vibrator has pad down and ready to shoot

No Response: A vibrator did not respond to last status pull. This could be a radio problem.

Pad Up: Vibrator has its pad up

Sweeping: Vibrator is sweeping

Idle: Vibrator is Idle; SourceLink is waiting for status message

GPS: Shows if the TDMA decoder has GPS lock

PSS Pending: Indicates that there is a PSS message waiting to be transmitted from the vibrator

PSS Status: Shows the error and warning indicators from the last PSS message. For detailed information on the vibrator PSS check the Source Control program.

Sweep: Shows the ID of the sweep being used

Phase: Shows the phase of the sweep being used

Time: The time of the last message received from the vibrator. Yellow represents the last vibrator that received a message. Grey represents the vibrator that was asked to send status back.

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2.5.5 Acquired Shot Window

In the Acquired Shot Information window, the observer can inspect the position, time and sweep information, as well as the PSS data. If a PSS message requires re-transmission, the user can click on the Request button and the PSS delivery gets automatically scheduled and delivered. The delta time between sweeps helps identify bottle-neck or any other sub-optimal issues that slow down data production.

Line	Station	Group	Sweep	Shot ID	EP	FFID	Time	ΔTime	Void	PSS	PSS Re-Transmit
5250.00	2260.00	1	1	81010	1	4338	2011/06/22 17:14:25	00:03:19	<input checked="" type="checkbox"/>	4 PSS	Request
5250.00	2259.00	1	1	81009	1	4337	2011/06/22 17:11:06	00:01:05	<input type="checkbox"/>	4 PSS	Request
5250.00	2258.00	1	1	81008	1	4336	2011/06/22 17:10:01	00:02:15	<input type="checkbox"/>	4 PSS	Request
5250.00	2257.00	1	1	81007	1	4335	2011/06/22 17:07:46	00:12:38	<input type="checkbox"/>	4 PSS	Request
5245.00	2257.00	1	1	81006	1	4334	2011/06/22 16:55:08	00:00:58	<input type="checkbox"/>	4 PSS	Request
5245.00	2258.00	1	1	81005	1	4333	2011/06/22 16:54:12	00:00:54	<input type="checkbox"/>	4 PSS	Request
5245.00	2259.00	1	1	81004	1	4332	2011/06/22 16:53:18	00:01:34	<input type="checkbox"/>	4 PSS	Request
5245.00	2260.00	1	1	81003	1	4331	2011/06/22 16:51:44	00:03:44	<input type="checkbox"/>	4 PSS	Request
5245.00	2261.00	1	1	81002	1	4330	2011/06/22 16:48:00	00:00:53	<input type="checkbox"/>	4 PSS	Request
5245.00	2262.00	1	1	81001	1	4329	2011/06/22 16:47:07	00:01:03	<input type="checkbox"/>	4 PSS	Request
5245.00	2263.00	1	1	81000	1	4328	2011/06/22 16:46:04	00:01:14	<input type="checkbox"/>	4 PSS	Request
5245.00	2264.00	1	1	80999	1	4327	2011/06/22 16:44:50	00:01:25	<input type="checkbox"/>	4 PSS	Request
5245.00	2265.00	1	1	80998	1	4326	2011/06/22 16:43:25	00:01:50	<input type="checkbox"/>	4 PSS	Request
5245.00	2266.00	1	1	80997	1	4325	2011/06/22 16:41:27	00:01:15	<input type="checkbox"/>	4 PSS	Request
5245.00	2267.00	1	1	80996	1	4324	2011/06/22 16:40:12	00:01:04	<input type="checkbox"/>	4 PSS	Request
5245.00	2268.00	1	1	80995	1	4323	2011/06/22 16:39:00	00:00:07	<input type="checkbox"/>	4 PSS	Request
5245.00	2269.00	1	1	80994	1	4322	2011/06/22 16:31:01	00:01:08	<input type="checkbox"/>	4 PSS	Request
5245.00	2270.00	1	1	80993	1	4321	2011/06/22 16:29:53	00:02:20	<input type="checkbox"/>	4 PSS	Request
5245.00	2271.00	1	1	80992	1	4320	2011/06/22 16:27:33	00:01:01	<input type="checkbox"/>	4 PSS	Request

Line: Source Point Line

Station: Source Point Station

Group: The ID of the source group that was used for this acquisition

Sweep: Identifier of the sweep that was used to acquire this point

Shot ID: Identifier of the shot that ties the signature data with the acquired point

EP: Energy Point index

File: Field File Number associated with the sweep

Time: Exact time of the acquisition of the sweep

Delta Time: Time lag between sweeps

Void: Marks a Shot ID and FFID combination as invalid, or “void”

PSS: Shows the number of Post Service. Status from the vibrators involved in the acquisition. By clicking on this button, detailed information will be shown about each vibrator’s PSS information.

Request: Re-requests the PSS information for the given shot

Comments: User and system generated comments for the sweep. This can be edited by clicking on the field and typing in the box.

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2.5.6 PSS Displays

Various plots and reports can be selected to display the recent PSS and PFS data.

SourceLink will display vibrator performance information, when it is available, from the PSS data. This data and display may also be called from the Acquired Shot window.

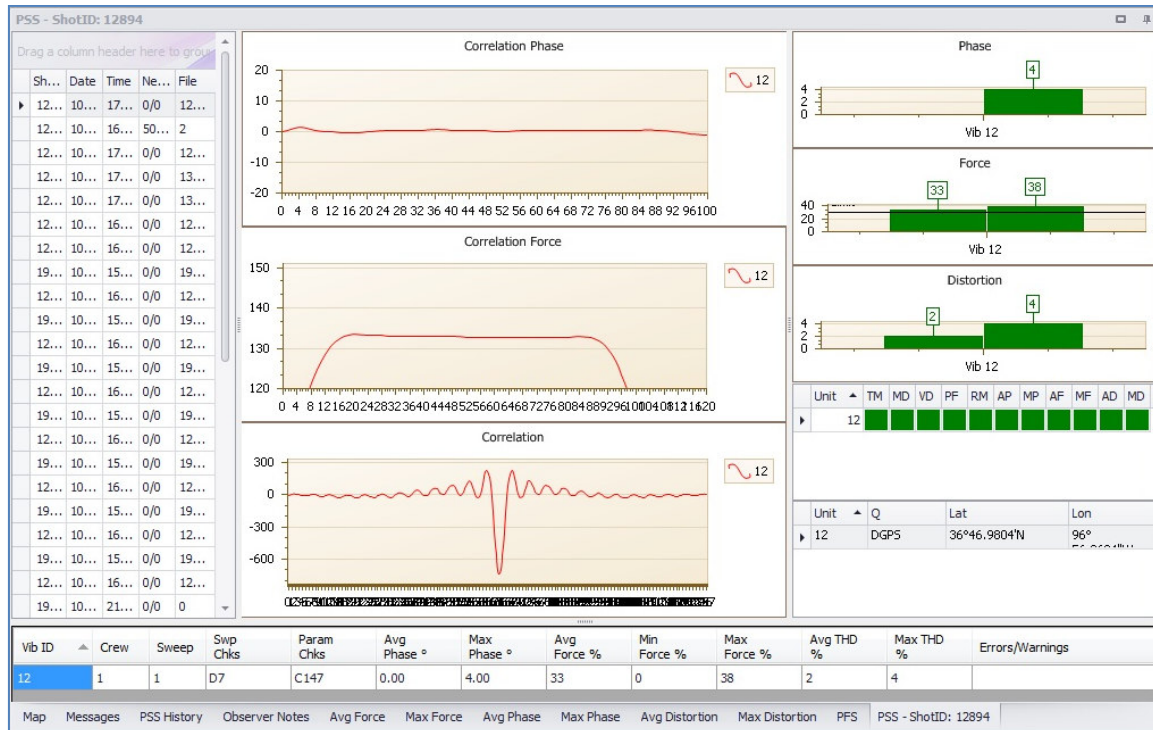


Figure 2.5.6.1 Example Display of PSS Data for One Vibrator

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When the user selects a PSS from the list in the Acquired Shot window, the vibrator position's from that PSS are displayed on the map.



Figure 2.5.6.2 Display Locating Vibrators on Map

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Figure 2.5.6.2 Display of PSS Data for Four Vibrators (All units good)

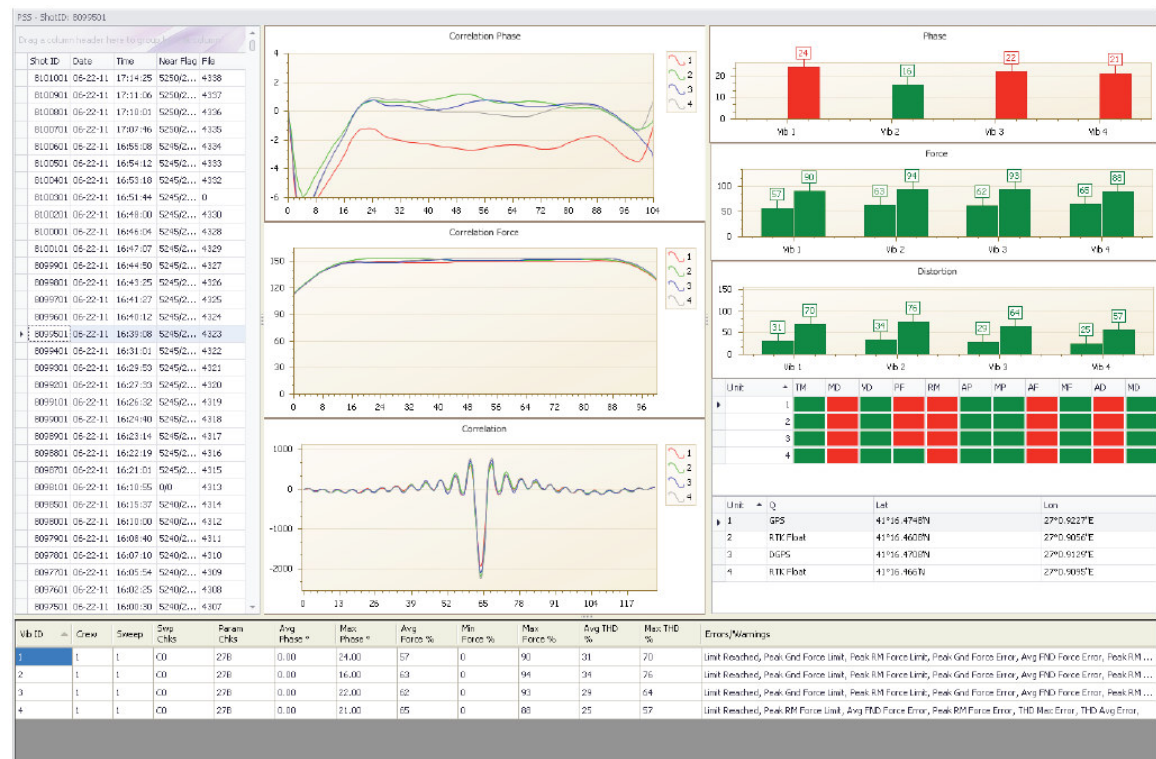


Figure 2.5.6.3 Display of PSS Data for Four Vibrators (One unit good)

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2.5.7 PSS Historical Display

PSS information is also displayed in historical diagrams. Each one shows the last 30 minutes of values for each vibrator along with the limits. The information includes Average and Maximum Force, Average and Maximum Phase, and Average and Maximum Distortion.

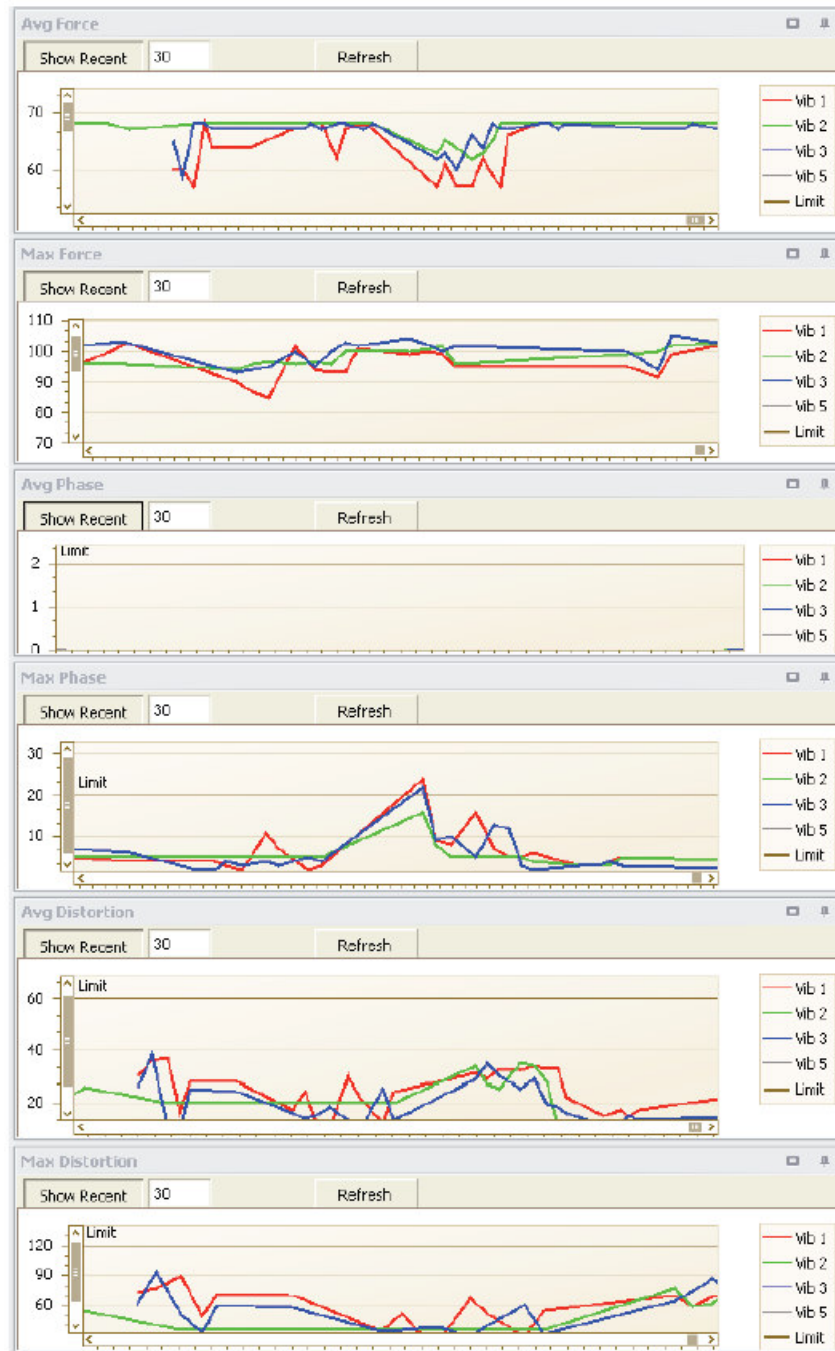


Figure 2.5.7.1 Example Display of PSS Historical Data

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2.5.8 PSS Map Display

On the map, PSS information is displayed for each source point. If gray, the point has not been acquired. If green, the point has been acquired and everything was within the set specifications. However if the point is red, then a PSS error was detected, or else one or more of the vibrators was out of spec.

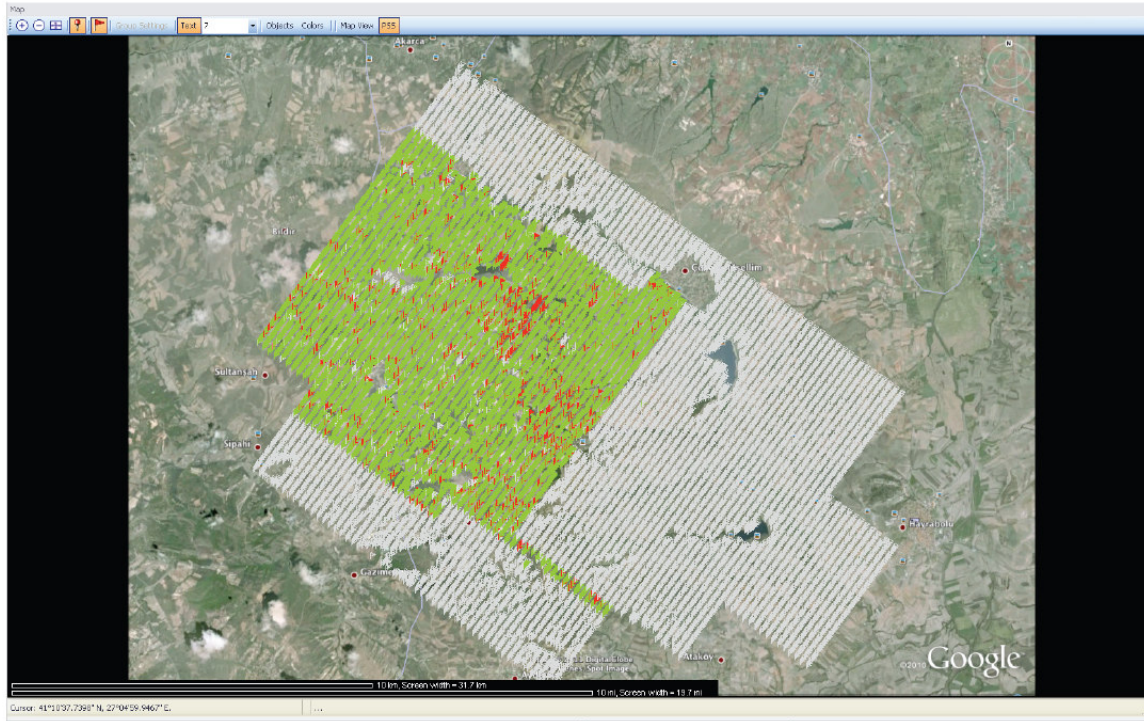


Figure 2.5.8.1 Map View of PSS Data

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The user can select a source point and inspect its PSS status. Status is displayed for all the vibroseis units that were involved with the acquisition of that point, and the errors reported for the vibrators at that station.

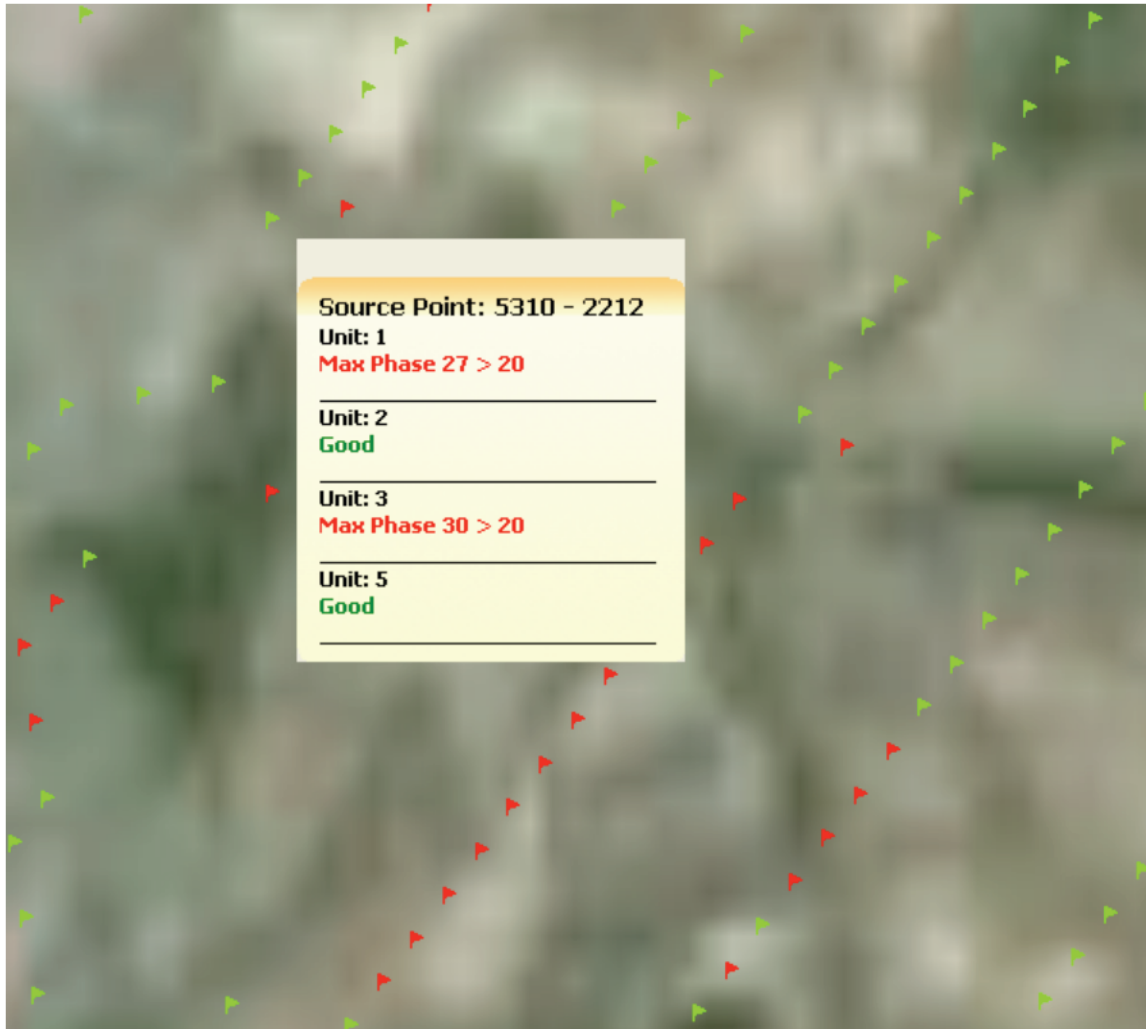


Figure 2.5.8.2 Detail of PSS Data showing errors

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2.5.9 PFS Displays

When a dynamite shot is acquired, the screen automatically switches to the PFS display. The basic PFS display shows the Uphole waveform from the uphole geophone. The QC data from the shot is also displayed.

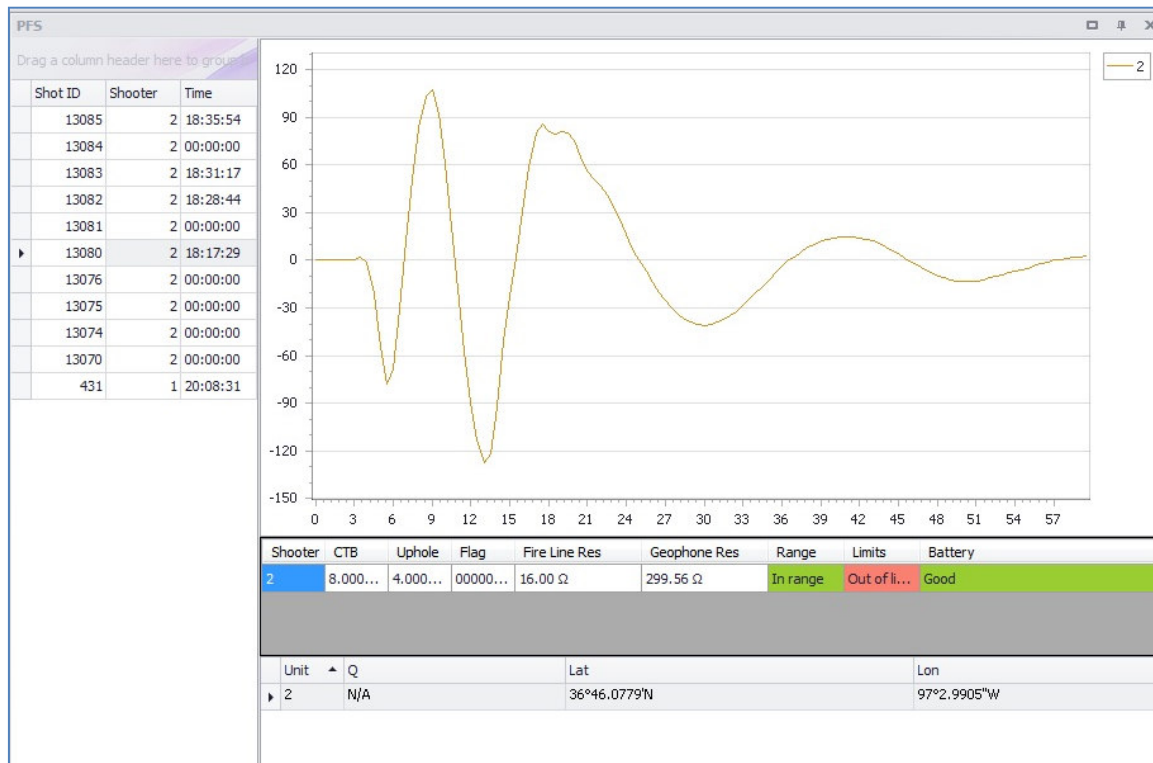


Figure 2.5.9.1 Example Display of PFS Data

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2.6 SourceLink Examples

2.6.1 Dynamite Acquisition Example

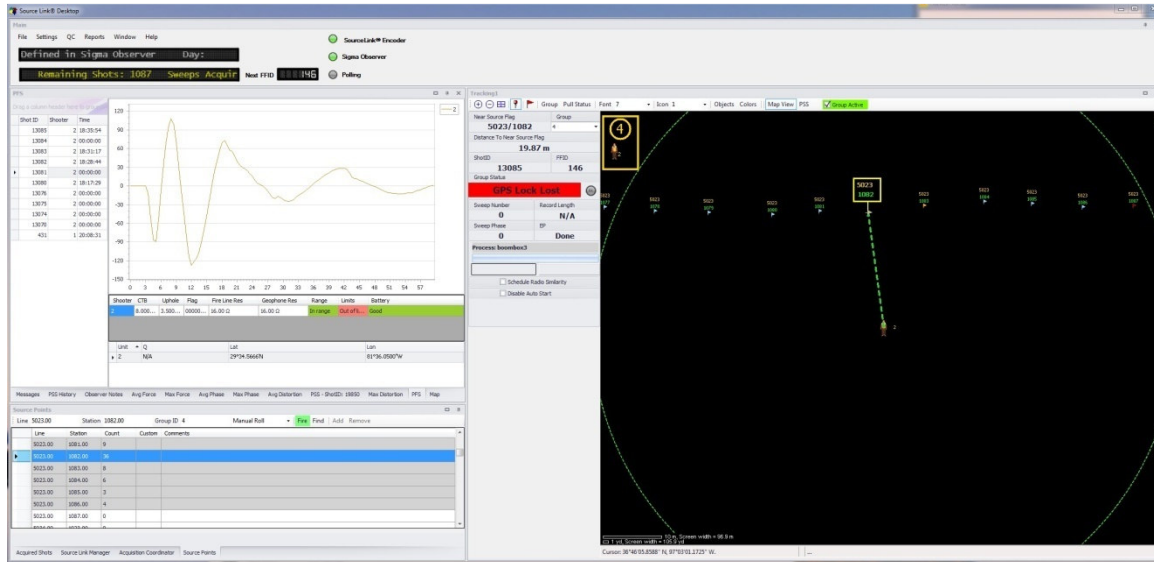


Figure 2.6.1.1 – Successful Dynamite Data Acquisition

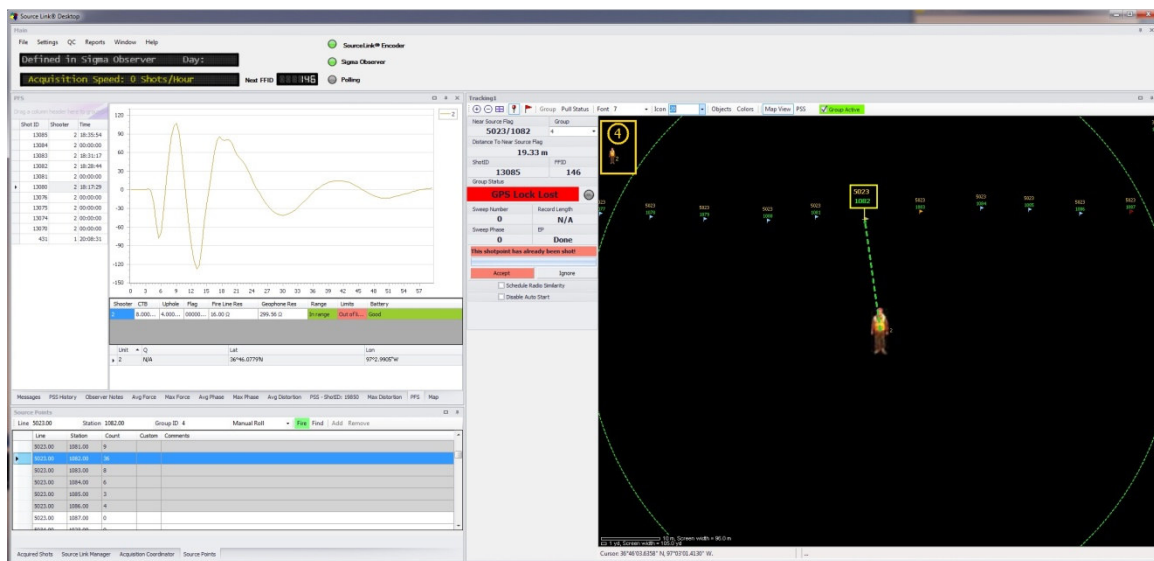


Figure 2.6.1.2 – Dynamite Data Acquisition with Warnings

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2.6.2 Multiple Vibrator Fleet Acquisition Example

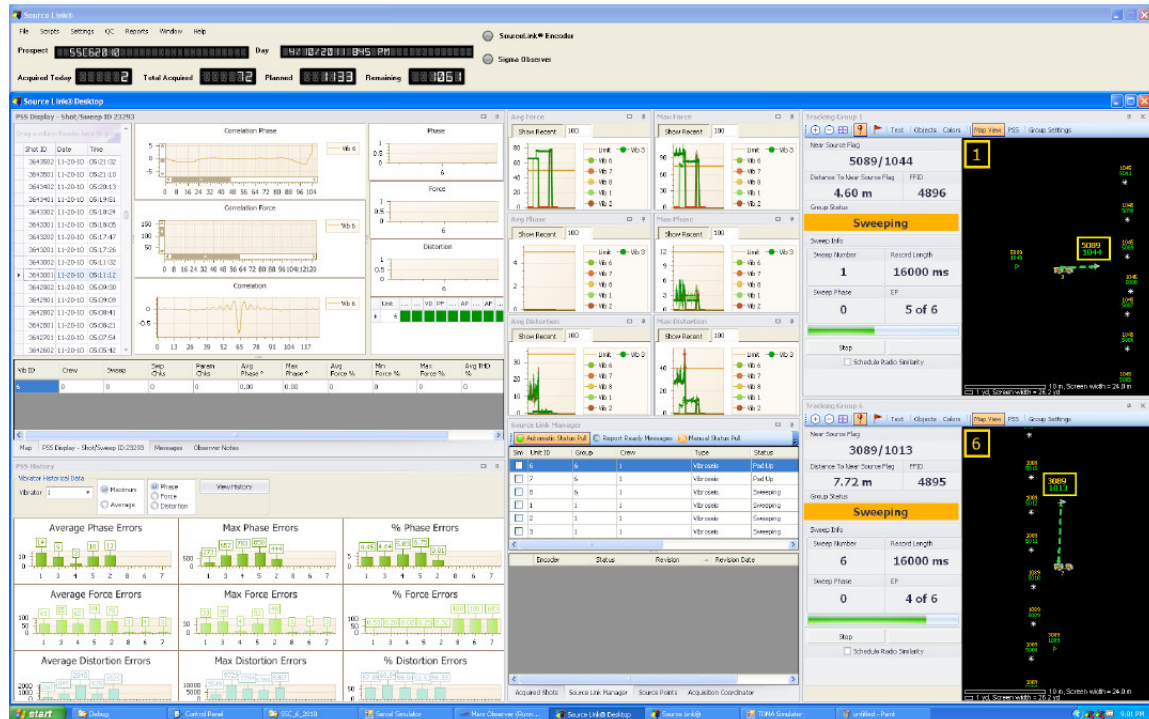


Figure 2.6.2.1 – Two Vibrator Fleets Simultaneously Acquiring Data

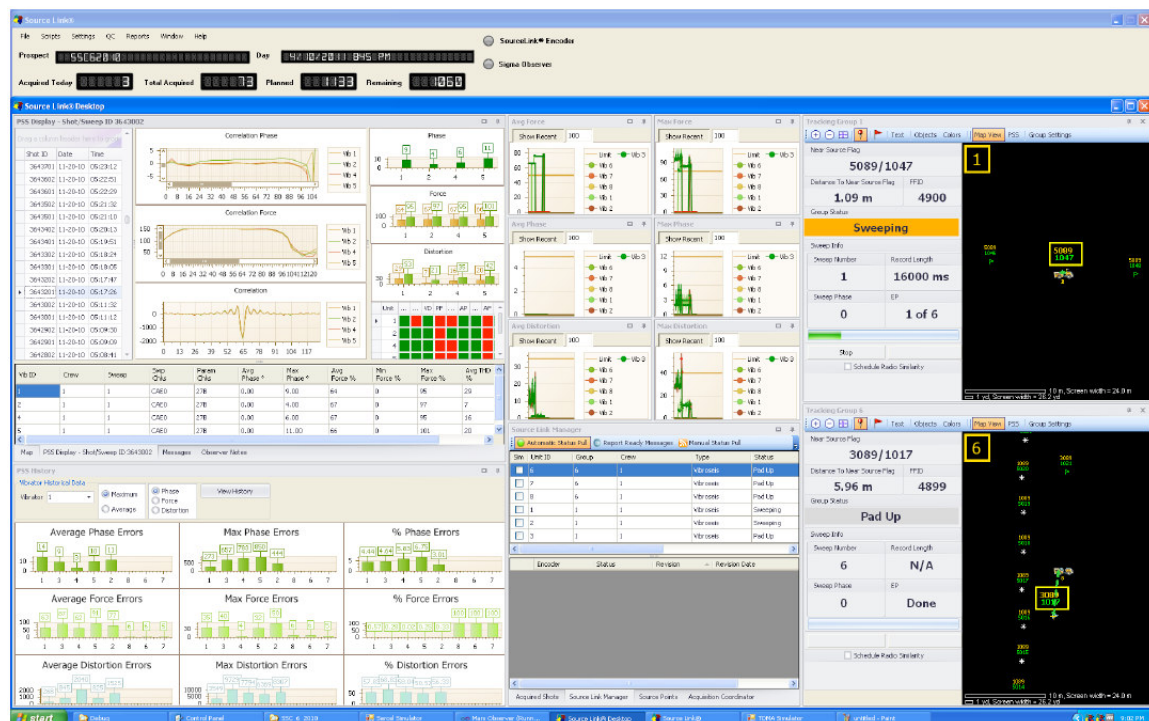


Figure 2.6.2.2 – Two Vibrator Fleets, One Moving and One Acquiring Data

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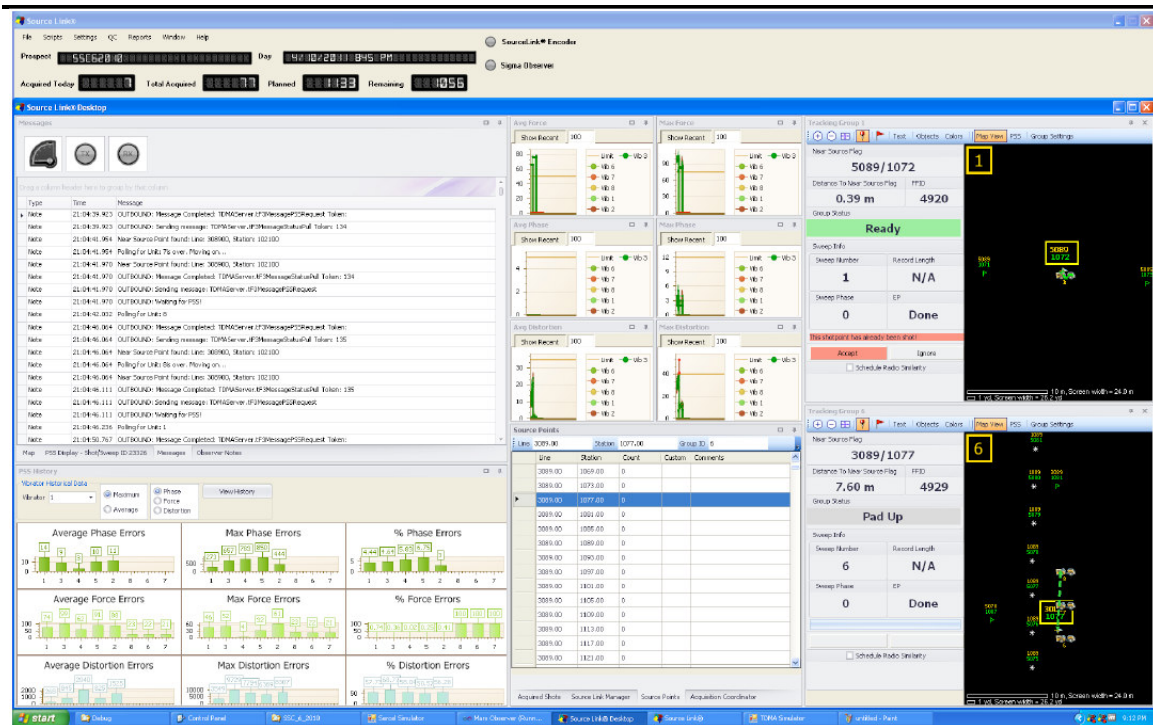


Figure 2.6.2.3 – Two Vibrator Fleets, Fleet #1 has a Re-Occupied Source Point Warning

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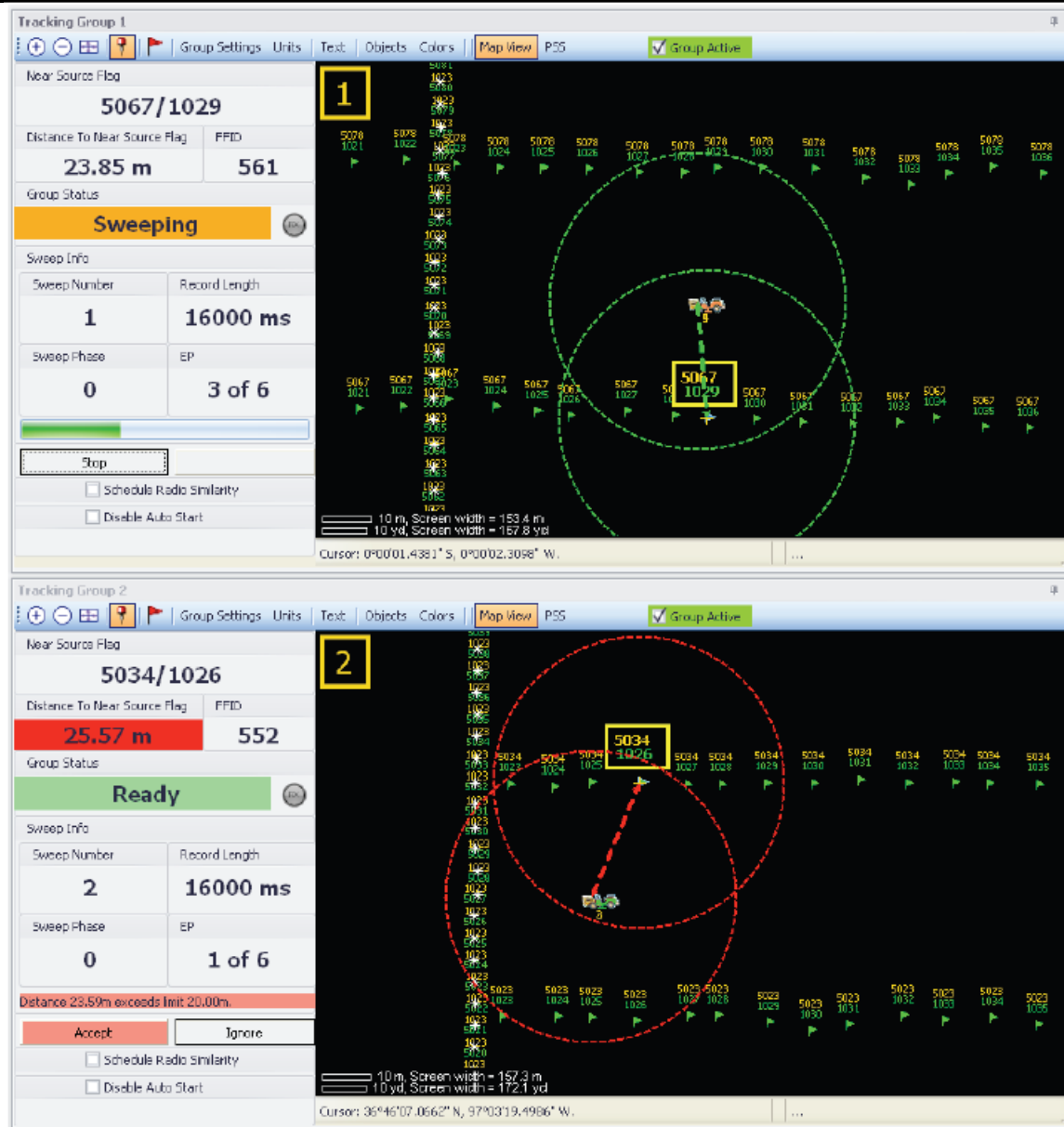


Figure 2.6.2.4 – Two Vibrator Fleets, One Acquiring Data, but Fleet #2 has a Possible Location Warning

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2.6.3 Source Map

Zoomed-out display of project survey overlaid on Google Earth display.

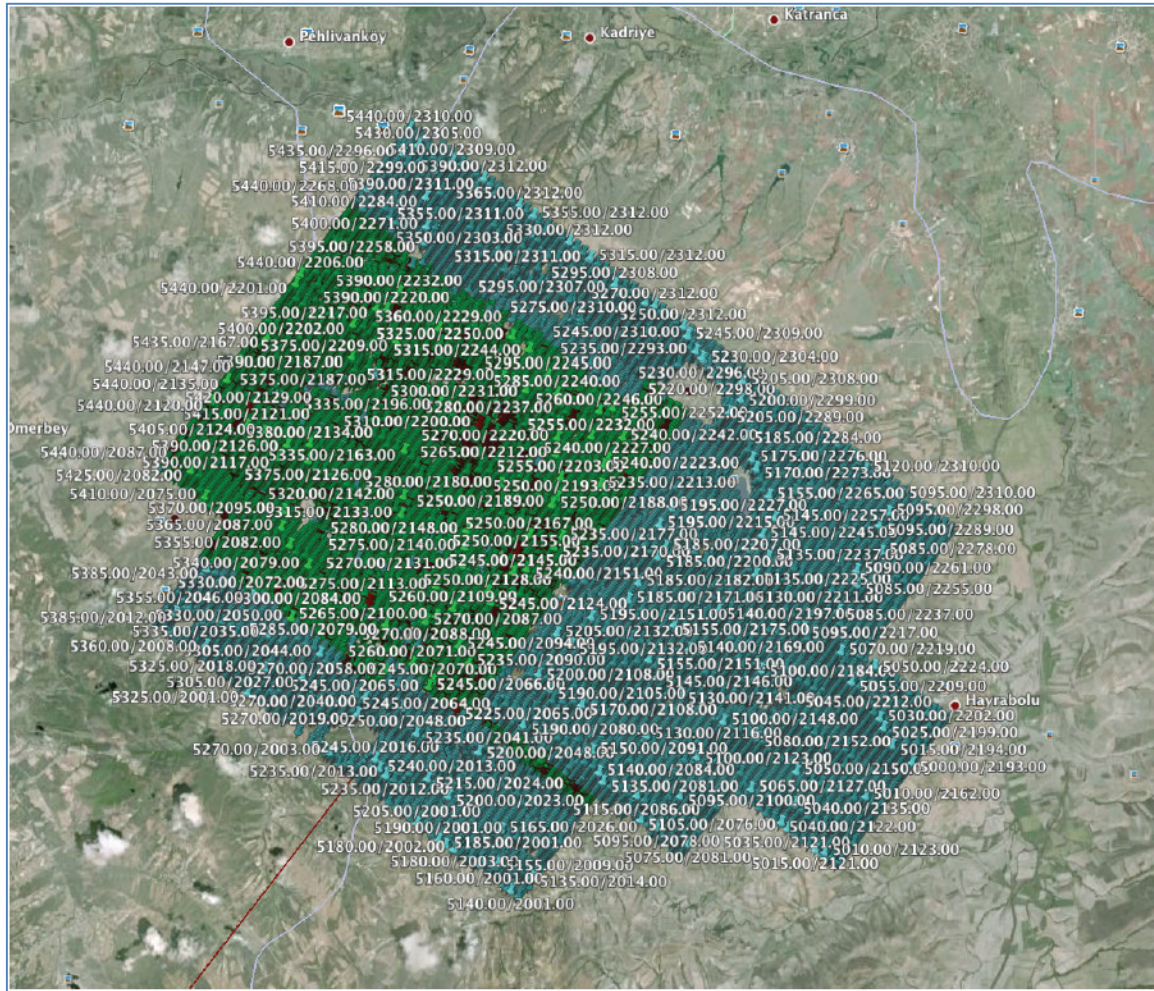


Figure 2.6.3.1 – Survey Example with Google Earth Bitmap

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Snail-trail information helps crewmembers to visualize drive-arounds and vibrator paths.



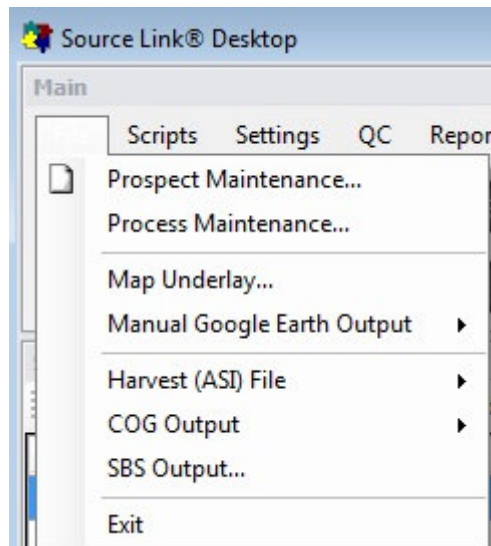
Figure 2.6.3.3 – Example of vibrator trails on Google Map Display.

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3 SourceLink Menus

3.1 File menu

The file menu has the following selections:



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3.1.1 Prospect Maintenance

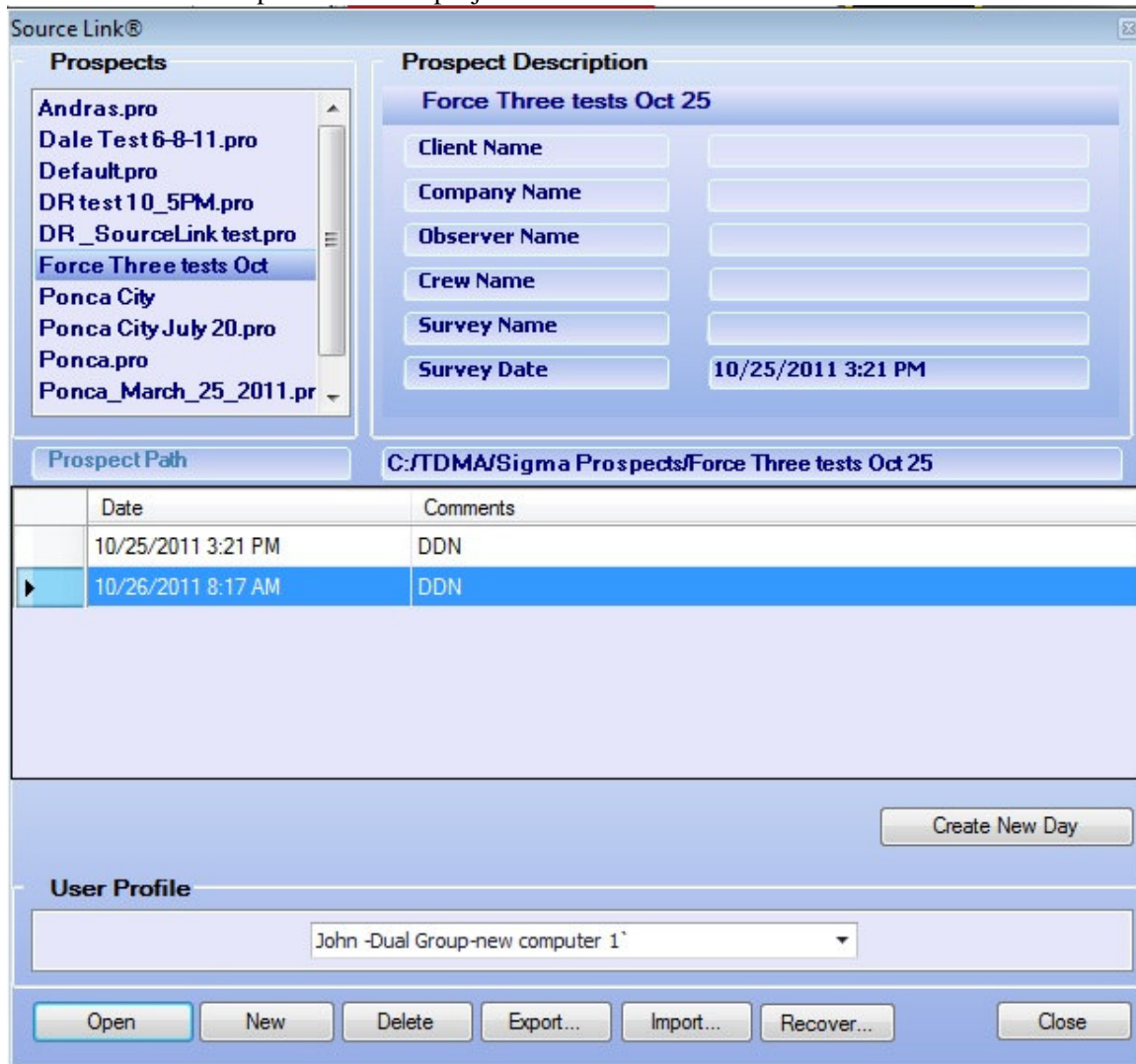
The Prospect maintenance menu allows various prospects to be loaded and saved from disk.

Start a new project.

When the SourceLink software starts, you can start a new project or continue using an existing project.

The CD comes with a demo project that can be viewed.

For the first operation a new project will need to be created:



Source Link®

Prospects

- Andras.pro
- Dale Test 6-8-11.pro
- Default.pro
- DR test 10_5PM.pro
- DR_SourceLink test.pro
- Force Three tests Oct**
- Ponca City
- Ponca City July 20.pro
- Ponca.pro
- Ponca_March_25_2011.pr

Prospect Description

Force Three tests Oct 25

Client Name:

Company Name:

Observer Name:

Crew Name:

Survey Name:

Survey Date:

Prospect Path

	Date	Comments
	10/25/2011 3:21 PM	DDN
▶	10/26/2011 8:17 AM	DDN

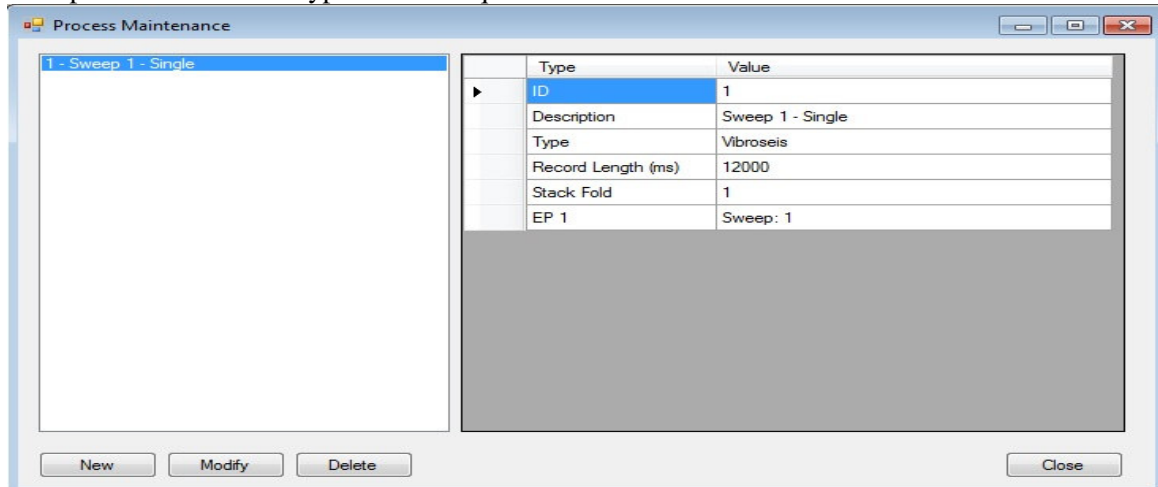
User Profile

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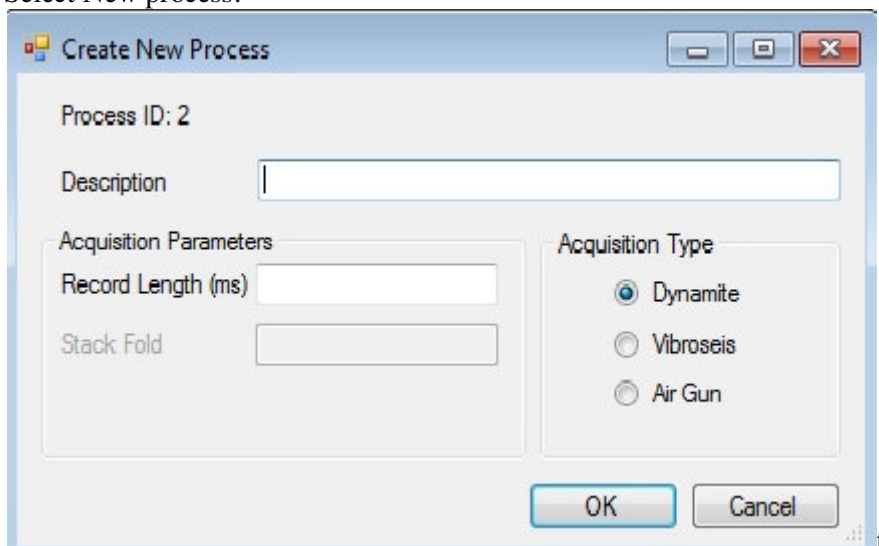
3.1.2 Process Menu

The Process menu must be first setup to use the SourceLink software.

Each process defines the type of land acquisition:

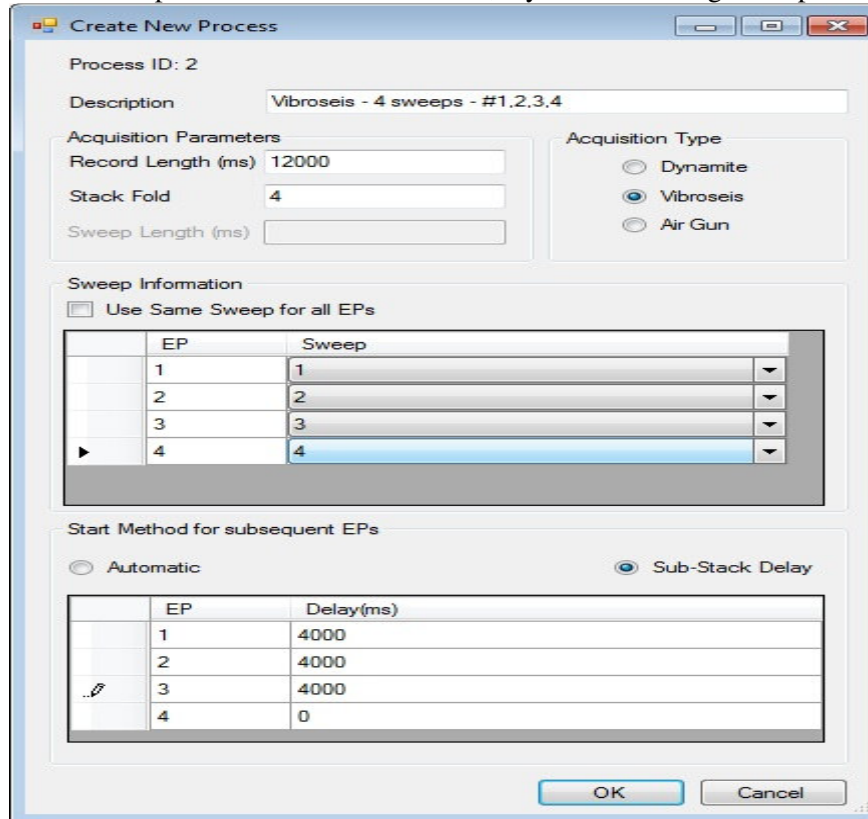


Select New process:



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Define New process – Select if Vibroseis, Dynamite or Weight Drop:



Create New Process

Process ID: 2

Description: Vibroseis - 4 sweeps - #1,2,3,4

Acquisition Parameters

Record Length (ms): 12000

Stack Fold: 4

Sweep Length (ms):

Acquisition Type

☐ Dynamite

☒ Vibroseis

☐ Air Gun

Sweep Information

☐ Use Same Sweep for all EPs

EP	Sweep
1	1
2	2
3	3
4	4

Start Method for subsequent EPs

☐ Automatic

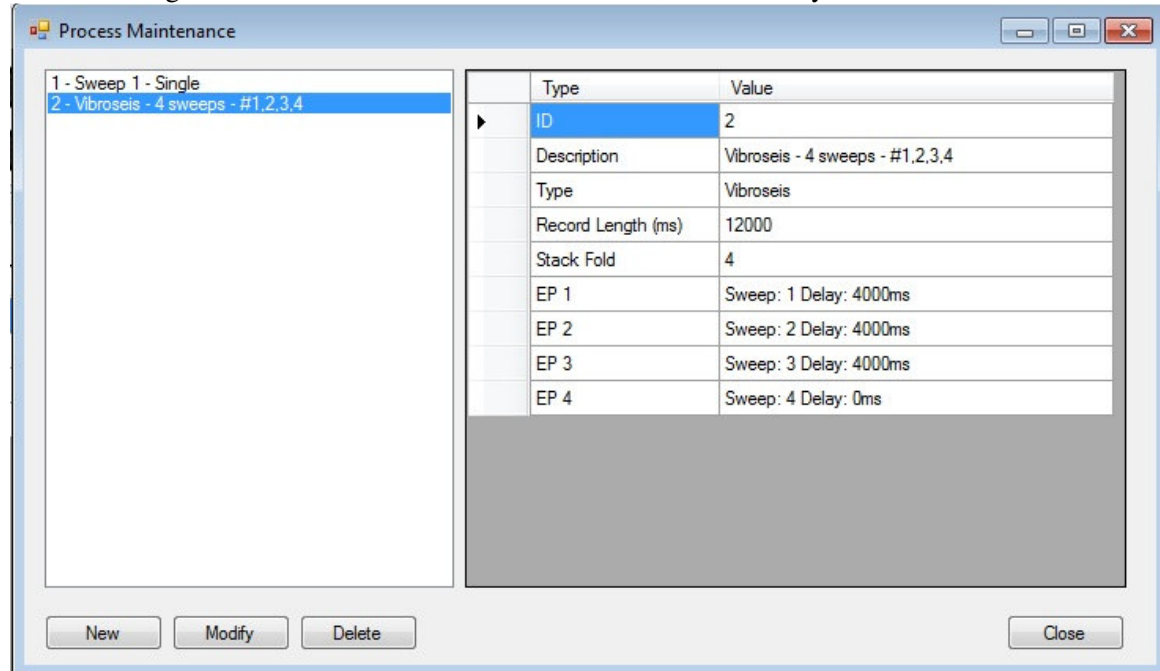
☒ Sub-Stack Delay

EP	Delay(ms)
1	4000
2	4000
3	4000
4	0

OK Cancel

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After Defining the various Processes have been defined, the summary can be viewed:

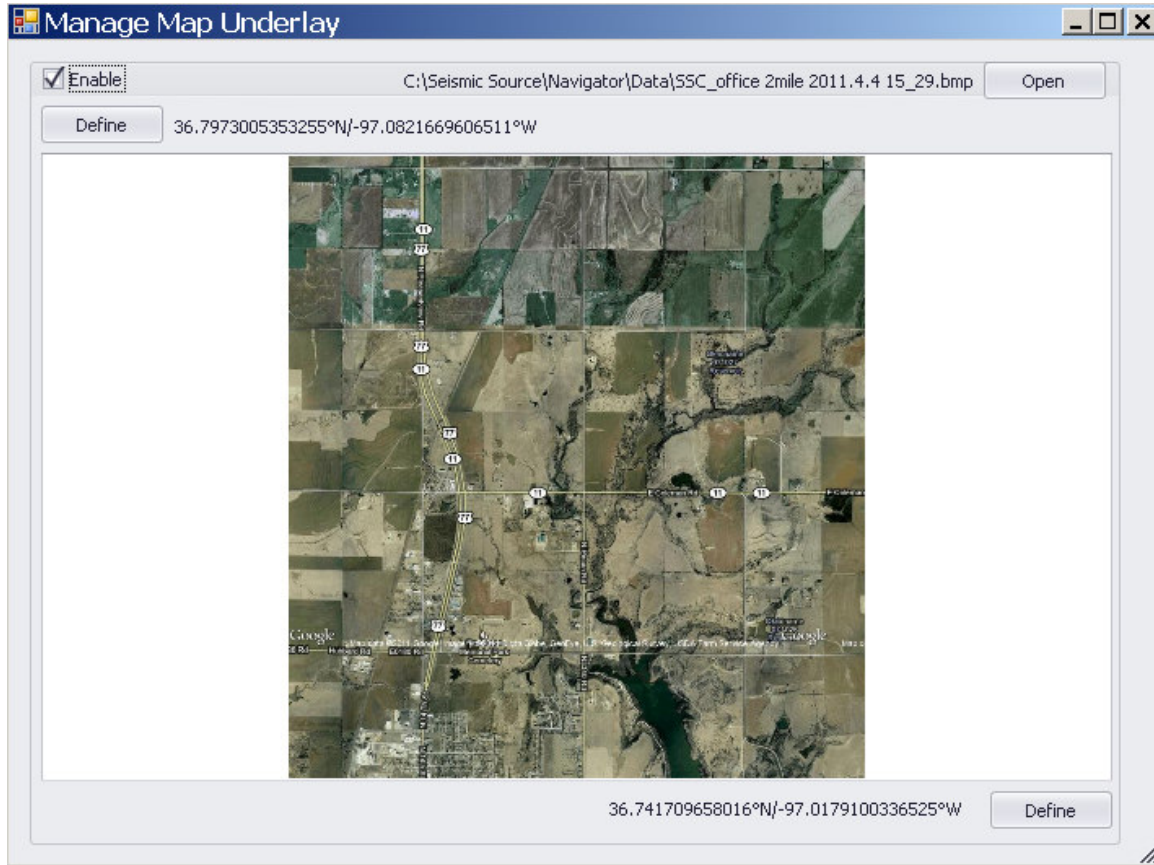


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3.1.3 Map Underlay

A map underlay can be used as a background. A BMP map or a Tiff type map image can be used. The map must be tagged correctly with the correct coordinates.

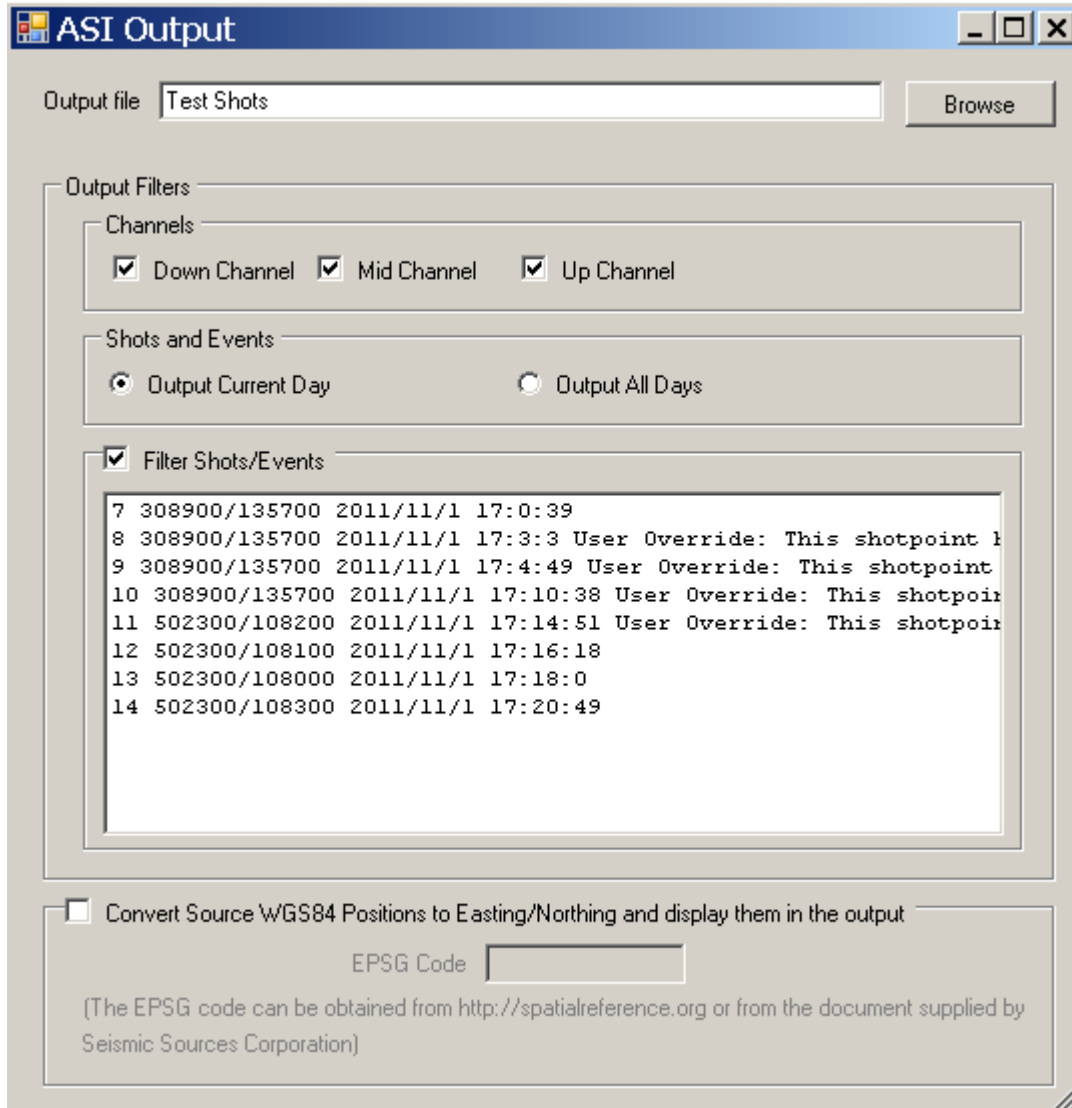
The Seismic Source “Navigator” software can be used to obtain maps in the correct format.



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3.1.5 Harvest (ASI) File Output

The Harvest file “Acquired Shot Information” file (ASI). The ASI files are used with the Sigma Recording system and other Seismic source and ISEIS software. The ASI file includes the exact GPS time of each shot and can be used to download the Source Signature data from the Source Decoder units.



The screenshot shows the 'ASI Output' dialog box. It has a title bar with standard window controls. Below the title bar, there is a text field for 'Output file' containing 'Test Shots' and a 'Browse' button. The main area is divided into three sections: 'Output Filters', 'Shots and Events', and a section for converting WGS84 positions. The 'Output Filters' section has a 'Channels' subsection with three checked checkboxes: 'Down Channel', 'Mid Channel', and 'Up Channel'. The 'Shots and Events' section has two radio buttons: 'Output Current Day' (selected) and 'Output All Days'. The third section has a checked checkbox for 'Filter Shots/Events' and a text area displaying a list of shot data. At the bottom, there is an unchecked checkbox for 'Convert Source WGS84 Positions to Easting/Northing and display them in the output', followed by an 'EPSG Code' text field and a note about where to obtain the EPSG code.

Output file:

Output Filters

Channels

☒ Down Channel ☒ Mid Channel ☒ Up Channel

Shots and Events

☒ Output Current Day ☐ Output All Days

☒ Filter Shots/Events

```

7 308900/135700 2011/11/1 17:0:39
8 308900/135700 2011/11/1 17:3:3 User Override: This shotpoint 1
9 308900/135700 2011/11/1 17:4:49 User Override: This shotpoint
10 308900/135700 2011/11/1 17:10:38 User Override: This shotpoint
11 502300/108200 2011/11/1 17:14:51 User Override: This shotpoint
12 502300/108100 2011/11/1 17:16:18
13 502300/108000 2011/11/1 17:18:0
14 502300/108300 2011/11/1 17:20:49

```

☐ Convert Source WGS84 Positions to Easting/Northing and display them in the output

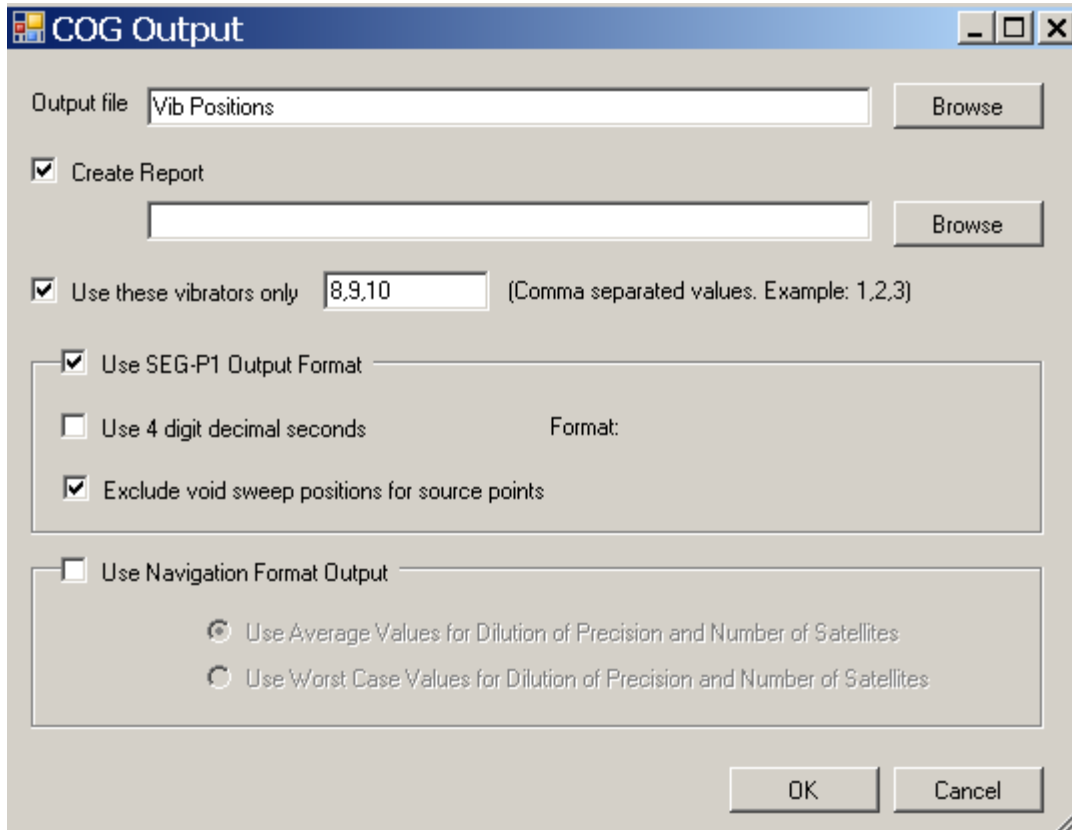
EPSG Code

(The EPSG code can be obtained from <http://spatialreference.org> or from the document supplied by Seismic Sources Corporation)

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3.1.6 “Center of Gravity” COG Output

The Center of Gravity or COG is the average GPS position for a given Shot point. For a single sweep Vibrator Group, then it is the average position of all of the vibrators in the group. When the project requires multiple sweeps at the same source point, then all of the positions for all of the sweeps are averaged together.



The image shows a Windows-style dialog box titled "COG Output". It contains several configuration options for generating COG output files. The "Output file" field is set to "Vib Positions" with a "Browse" button. The "Create Report" checkbox is checked, with an empty text field and a "Browse" button below it. The "Use these vibrators only" checkbox is checked, with a text field containing "8,9,10" and a note "(Comma separated values. Example: 1,2,3)". The "Use SEG-P1 Output Format" checkbox is checked, and the "Use 4 digit decimal seconds" checkbox is unchecked. The "Exclude void sweep positions for source points" checkbox is checked. The "Use Navigation Format Output" checkbox is unchecked, and it contains two radio button options: "Use Average Values for Dilution of Precision and Number of Satellites" (selected) and "Use Worst Case Values for Dilution of Precision and Number of Satellites". The dialog has "OK" and "Cancel" buttons at the bottom right.

COG Output

Output file: Vib Positions [Browse]

☒ Create Report [Browse]

☒ Use these vibrators only: 8,9,10 (Comma separated values. Example: 1,2,3)

☒ Use SEG-P1 Output Format

☐ Use 4 digit decimal seconds Format:

☒ Exclude void sweep positions for source points

☐ Use Navigation Format Output

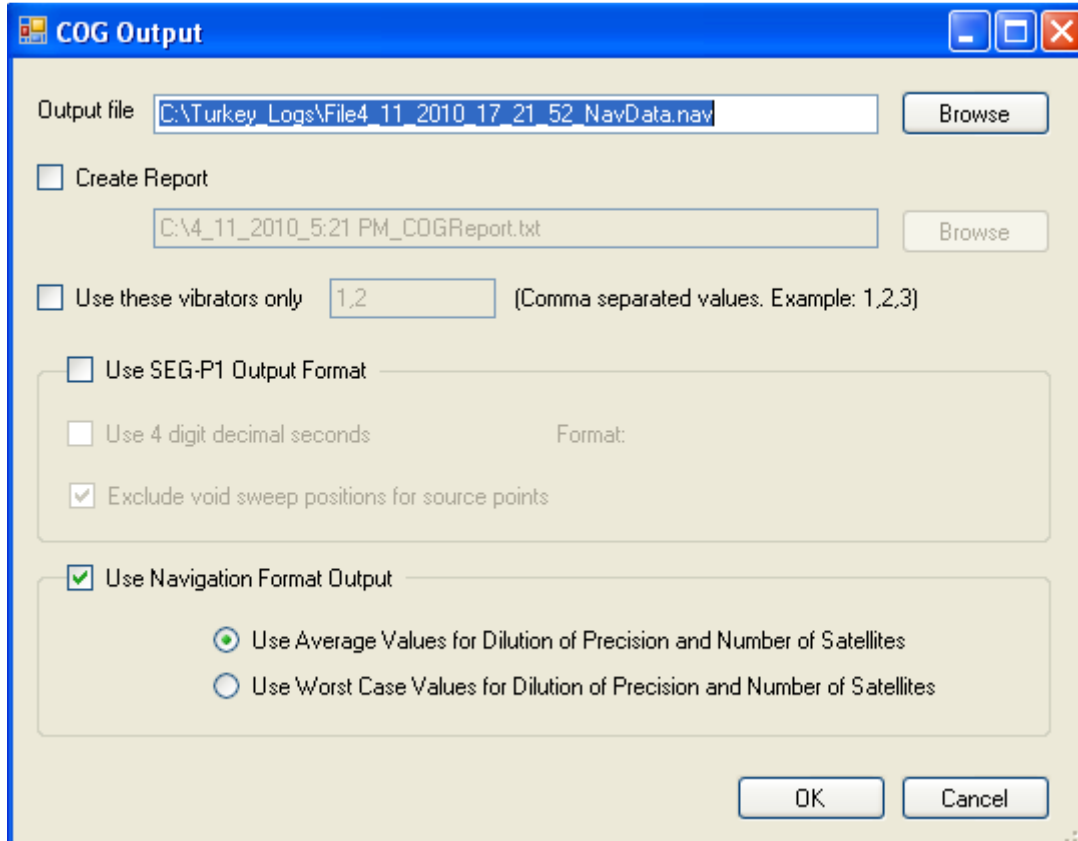
☒ Use Average Values for Dilution of Precision and Number of Satellites

☐ Use Worst Case Values for Dilution of Precision and Number of Satellites

[OK] [Cancel]

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COG Output: Outputs all acquired shots and the vibrator position related files, including unfiltered raw shots, void shot filtered and statistical calculations for each VP. For the file format, see Appendix A.



Output file: Enter or browse for the file location and enter the name and the extension. Extension will be automatically added based on the output type

Create Report: Enter or browse for the file location and enter the name and the extension. This is for diagnostic purposes only, not for production use!

Use these vibrators only: Comma separated list of vibrators to use for the COG calculation. Use this option if one or more vibrators have different (higher) resolution GPS and you want to filter out the rest of the units.

Use SEG-P1 Output Format: If this option is checked, the COG information will be output in a standard SEG-P1 format.

Use 4 digit decimal seconds: If checked, the decimal seconds in the SEG-P1 format will use 4 decimal digits instead of the standard 2.

Exclude void sweep positions for source points: If checked, the SEG-P1 file will not contain the shots that were re-acquired. (Only the latest information will be shown).

Use Navigation Format Output: If this option is checked, three files will be output with different levels of filtering, averaging, and statistical information.

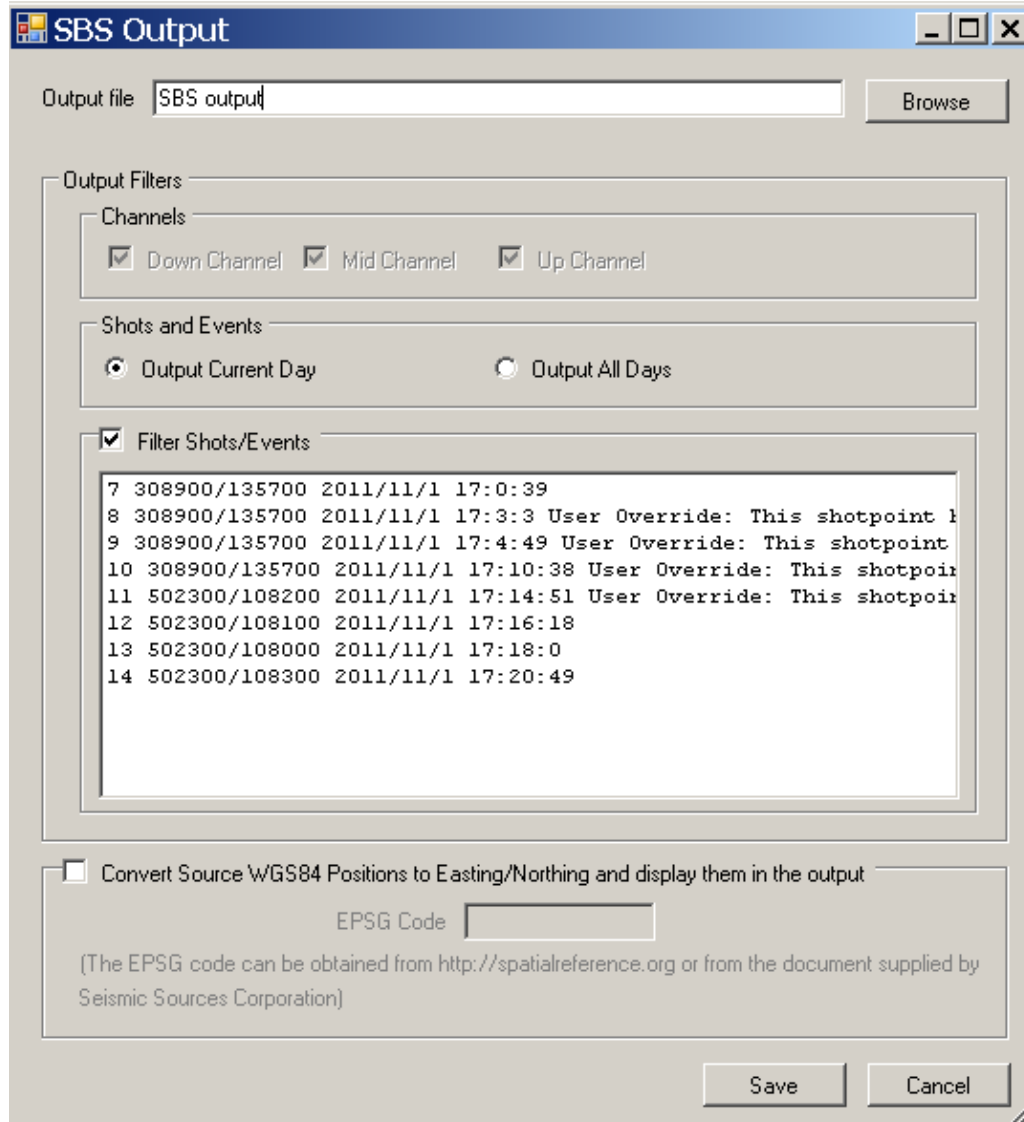
Use Average Values for Dilution of Precision and Number of Satellites: If selected, an average will be calculated for each Energy Point, based on the information from each vibrator that took place in the sweep.

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Use Worst Case Values for Dilution of Precision and Number of Satellites: If selected, the worst case scenario will be displayed for each Energy Point, based on the information from each vibrator that took place in the sweep.

3.1.7 SBS Output

The SBS output files are used with the Fairfield Node Recording system. The SBS file include the exact GPS time of each shot and can be used to supply all of the source information to the Fairfield Node seismic system.



SBS Output

Output file:

Output Filters

Channels

☒ Down Channel ☒ Mid Channel ☒ Up Channel

Shots and Events

☒ Output Current Day ☐ Output All Days

☒ Filter Shots/Events

```

7 308900/135700 2011/11/1 17:0:39
8 308900/135700 2011/11/1 17:3:3 User Override: This shotpoint
9 308900/135700 2011/11/1 17:4:49 User Override: This shotpoint
10 308900/135700 2011/11/1 17:10:38 User Override: This shotpoint
11 502300/108200 2011/11/1 17:14:51 User Override: This shotpoint
12 502300/108100 2011/11/1 17:16:18
13 502300/108000 2011/11/1 17:18:0
14 502300/108300 2011/11/1 17:20:49

```

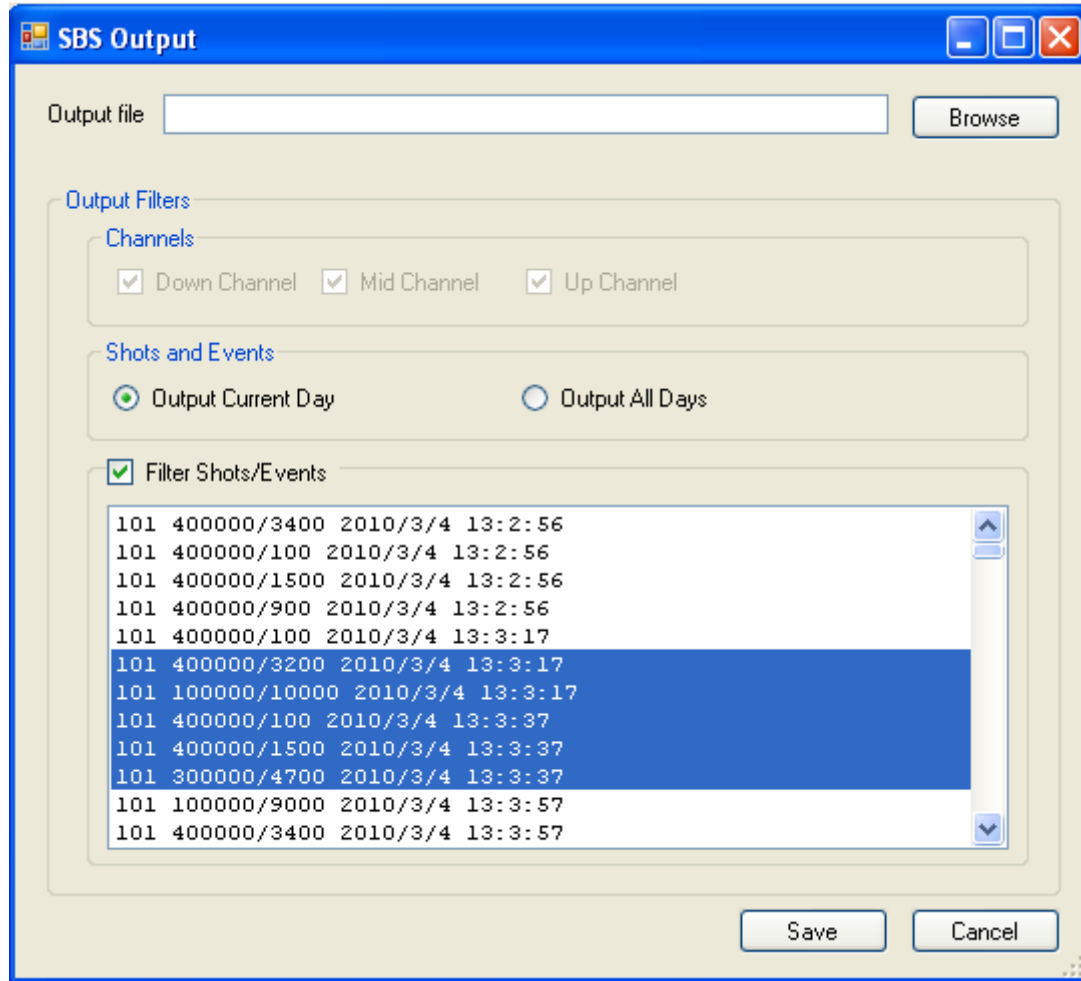
☐ Convert Source WGS84 Positions to Easting/Northing and display them in the output

EPSG Code:

(The EPSG code can be obtained from <http://spatialreference.org> or from the document supplied by Seismic Sources Corporation)

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SBS Output: Outputs the acquired shots related information in the Concept Systems Shot by Shot (SBS) format. For the file format, see Appendix B.



SBS Output

Output file

Output Filters

Channels

☒ Down Channel ☒ Mid Channel ☒ Up Channel

Shots and Events

☒ Output Current Day ☐ Output All Days

☒ Filter Shots/Events

101 400000/3400 2010/3/4 13:2:56
 101 400000/100 2010/3/4 13:2:56
 101 400000/1500 2010/3/4 13:2:56
 101 400000/900 2010/3/4 13:2:56
 101 400000/100 2010/3/4 13:3:17
 101 400000/3200 2010/3/4 13:3:17
 101 100000/10000 2010/3/4 13:3:17
 101 400000/100 2010/3/4 13:3:37
 101 400000/1500 2010/3/4 13:3:37
 101 300000/4700 2010/3/4 13:3:37
 101 100000/9000 2010/3/4 13:3:57
 101 400000/3400 2010/3/4 13:3:57

Output file: Enter or browse for the file location and enter the name and the extension. Extension will be automatically added to the file name if the operator browses for the vibrator.

Filter Shots/Events: Allows outputting all the shots or selected ones only

Save: Saves the SBS file into the Output file location

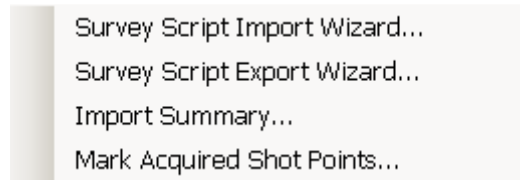
3.1.8 Exit

Exit: Gracefully quits the application and saves off the window positions

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3.2 Scripts menu

Scripts Menu



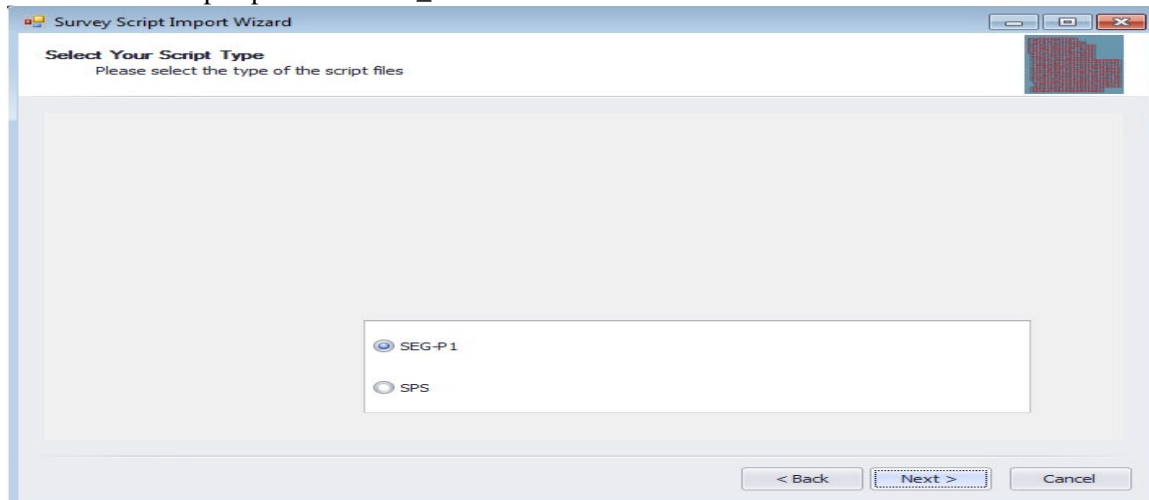
3.2.1 Survey Import Wizard

Survey Wizard

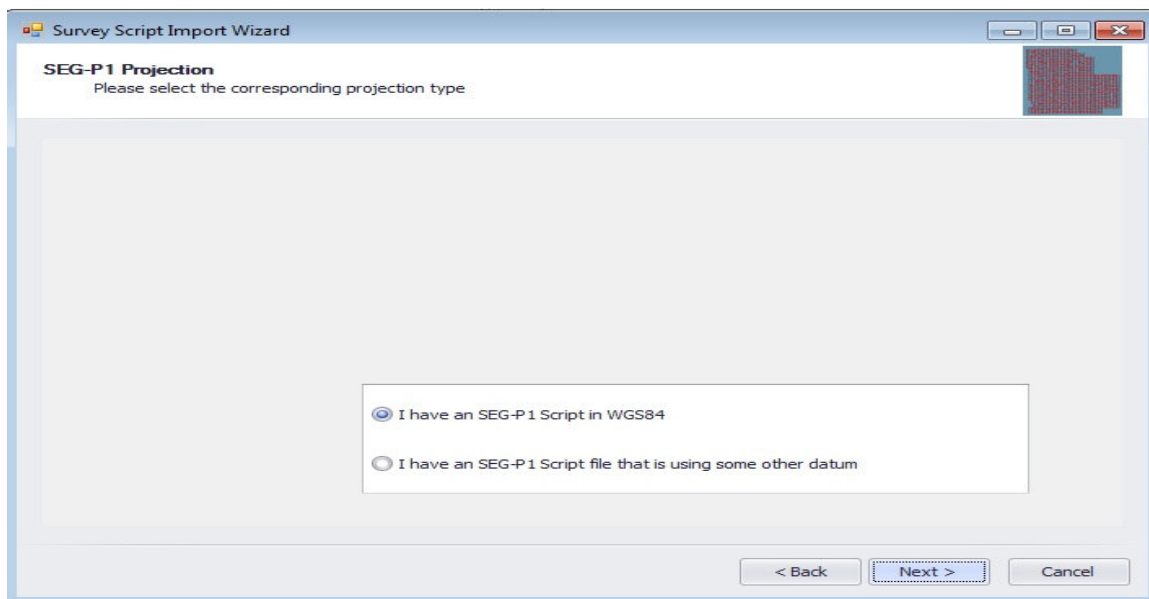


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Select if pre-plot is in SEG_P1 or SPS format.

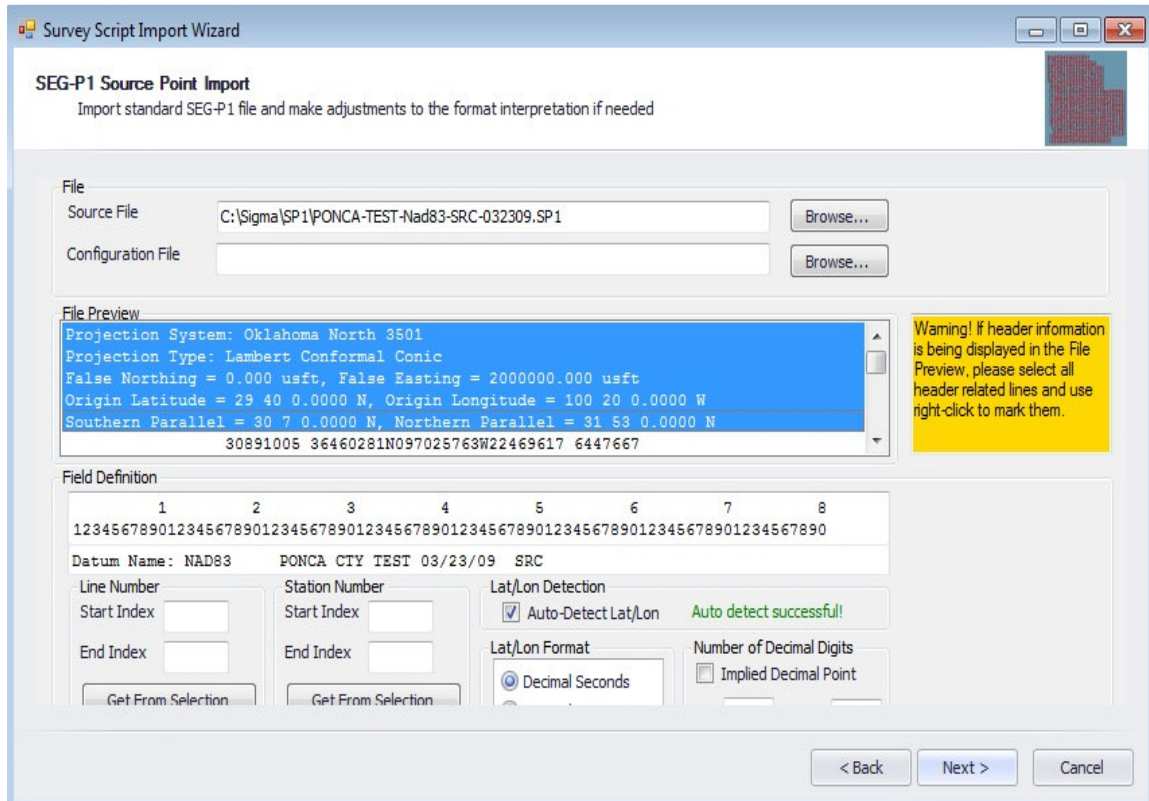


When in SEG-P1 select coordinate system of the Pre-plot file



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If the Preplot file has a header, then it must be marked by selecting this data with the cursor and then pressing the right mouse button.



Survey Script Import Wizard

SEG-P1 Source Point Import
Import standard SEG-P1 file and make adjustments to the format interpretation if needed

File

Source File: C:\Sigma\SP1\PONCA-TEST-Nad83-SRC-032309.SP1 Browse...

Configuration File: Browse...

File Preview

```

Projection System: Oklahoma North 3501
Projection Type: Lambert Conformal Conic
False Northing = 0.000 usft, False Easting = 2000000.000 usft
Origin Latitude = 29 40 0.0000 N, Origin Longitude = 100 20 0.0000 W
Southern Parallel = 30 7 0.0000 N, Northern Parallel = 31 53 0.0000 N
30891005 36460281N097025763W22469617 6447667
  
```

Warning! If header information is being displayed in the File Preview, please select all header related lines and use right-click to mark them.

Field Definition

1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890							

Datum Name: NAD83 PONCA CTY TEST 03/23/09 SRC

Line Number Station Number Lat/Lon Detection

Start Index Start Index ☒ Auto-Detect Lat/Lon Auto detect successful!

End Index End Index Lat/Lon Format Number of Decimal Digits

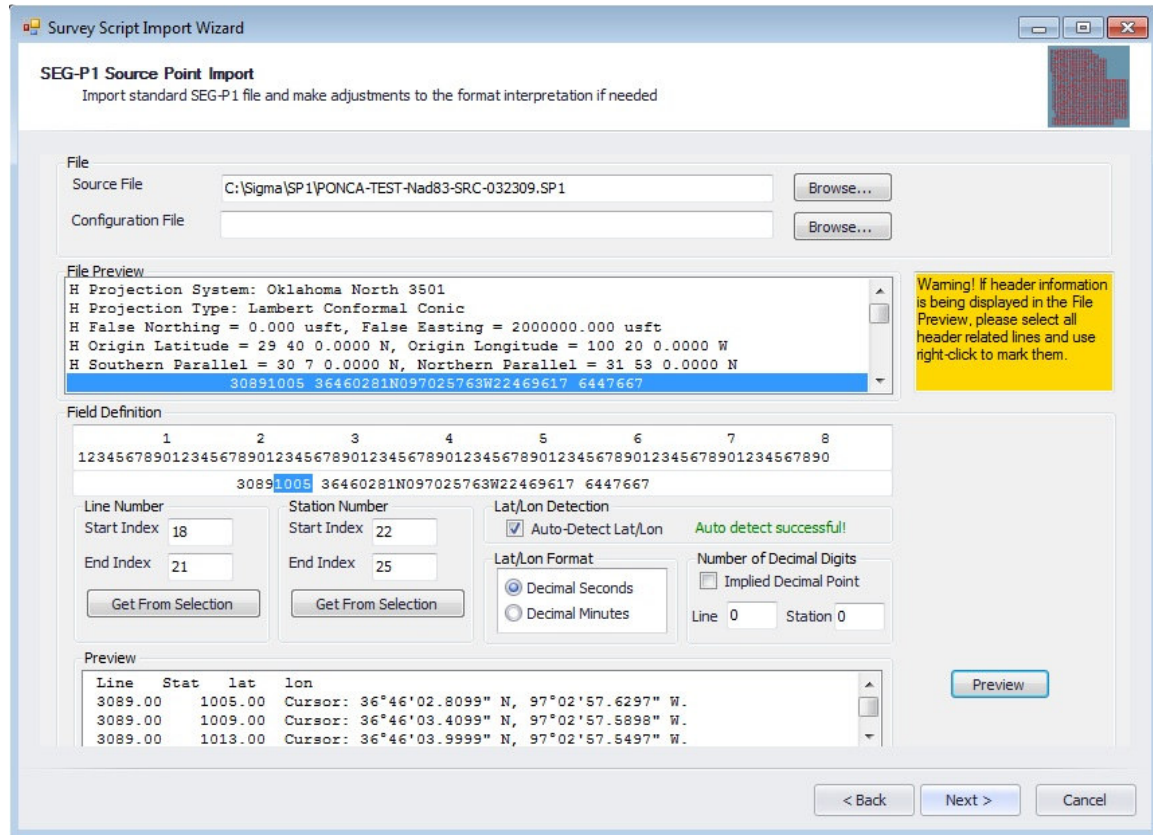
☐ Decimal Seconds ☐ Implied Decimal Point

Get From Selection Get From Selection

< Back Next > Cancel

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After the header has been marked, the Columns for the Source Line and Station must be selected. Highlight the columns to be used and click the appropriate box. Manual entry of the columns can also be performed. After selecting the columns, press the “preview” button to see the first few Source Points.



Browse for the SP1 file and the configuration file if it exists already. The configuration file is automatically generated after importing and it contains the setup information that was used at the time of the import.

After selecting the sp1 file, its content will be displayed in the File Preview section of the window. The first line of the file will also appear in the Field definition section. The content of this field definition window can be changed by selecting an item in the File Preview list. The purpose of the Field Definition is to be able to customize the sp1 file import.

Line Number definition: Highlight the section on the field definition that represents the line number and click on the Get From Selection button. The start and end index of the highlighted text will show up in the entry fields for the Line Number.

Station Number definition: Highlight the section on the field definition that represents the station number and click on the Get From Selection button. The start and end index of the highlighted text will show up in the entry fields for the Station Number.

The location of the latitude and longitude information is automated. If the location of the latitude and longitude was detected, Auto Detect Successful message will be displayed in the color green. Otherwise the input window will be modified to display the detail information for the latitude and longitude information.

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SP1 Receiver File Import

File

Receiver File: C:\Seis\SP1\Swath Production Survey Data\Swath CSV\WGS84\Spring 506 Src 80 Browse...

Configuration File: Browse...

File Preview

506101	118121496W	33484187N
506102	118121402W	33484188N
506103	118121306W	33484191N
506104	118121211W	33484191N
506105	118121115W	33484191N
506106	118121020W	33484191N

Warning! If header information is being displayed in the File Preview, please select all header related lines and use right-click to mark them.

Field Definition

1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890							
506101	118121496W	33484187N					

Line Number: Start Index 13, End Index 15, Get From Selection

Station Number: Start Index 16, End Index 18, Get From Selection

Lat/Lon Detection: ☐ Auto Detect Lat/Lon Auto detect successful

Lat/Lon Format: ☒ Decimal Seconds ☐ Decimal Minutes

Number of Decimal Digits: Line 0, Station 0, ☐ Implied Decimal Point

Lat Degrees: Start Index 31, End Index 32, Get From Selection

Lat Minutes: Start Index 33, End Index 34, Get From Selection

Lat Seconds: Start Index 35, End Index 36, Get From Selection

Lat Decimal Seconds: Start Index 37, End Index 38, Get From Selection

Lat Hemisphere: Start Index 39, End Index 39, Get From Selection

Lon Degrees: Start Index 20, End Index 22, Get From Selection

Lon Minutes: Start Index 23, End Index 24, Get From Selection

Lon Seconds: Start Index 25, End Index 26, Get From Selection

Lon Decimal Seconds: Start Index 27, End Index 28, Get From Selection

Lon Hemisphere: Start Index 29, End Index 29, Get From Selection

Preview

Preview

Import Skip

Select the appropriate section for the latitude and longitude degrees, minutes, seconds and decimal seconds in a similar fashion as the Line and Station numbers were selected.

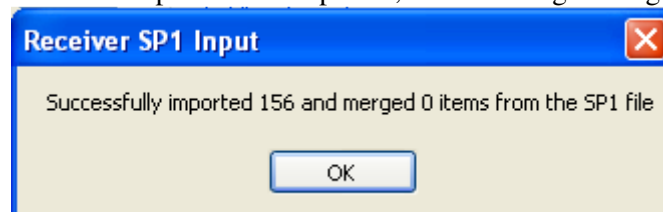
After all fields are filled correctly, check the results in the Preview list by clicking the Preview button.

Preview

Line	Stat	lat	lon
506.00	101.00	Cursor: 33°48'41.8699" N, 118°12'14.9598" W.	
506.00	102.00	Cursor: 33°48'41.8799" N, 118°12'14.0198" W.	
506.00	103.00	Cursor: 33°48'41.9099" N, 118°12'13.0597" W.	

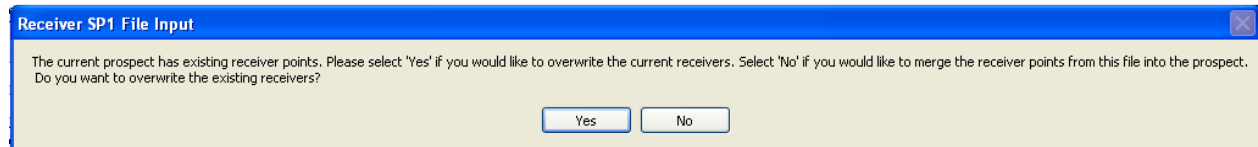
Preview

When satisfied with the outcome in the preview window, hit Import to process the sp1 file. If there are no source or receiver points in the sp1 file, the following message will be displayed.



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If there are points in the prospect already, the following message will be displayed.



Choosing **Yes** will allow the software to proceed and clean the previous points and import the new ones. Hitting **No** will merge the new points with the existing ones.

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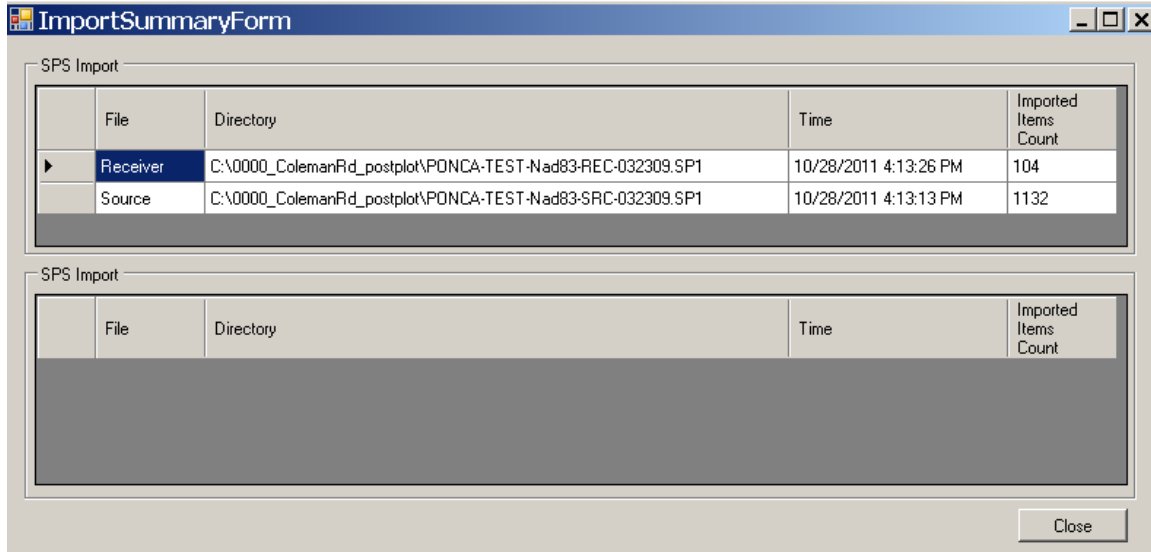
3.2.2 Survey Script Export Wizard

After the points have been loaded, the survey can be exported to a SEG-Y file with WGS84 coordinates. This is useful for use with other SSC products.

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3.2.3 Import Summary

Import Summary: Displays the files of the last import and the details



The screenshot shows a window titled "ImportSummaryForm" with a tab labeled "SPS Import". The window contains two tables. The top table has the following data:

	File	Directory	Time	Imported Items Count
▶	Receiver	C:\0000_ColemanRd_postplot\PONCA-TEST-Nad83-REC-032309.SP1	10/28/2011 4:13:26 PM	104
	Source	C:\0000_ColemanRd_postplot\PONCA-TEST-Nad83-SRC-032309.SP1	10/28/2011 4:13:13 PM	1132

The bottom table is empty and has the same headers. A "Close" button is located at the bottom right of the window.

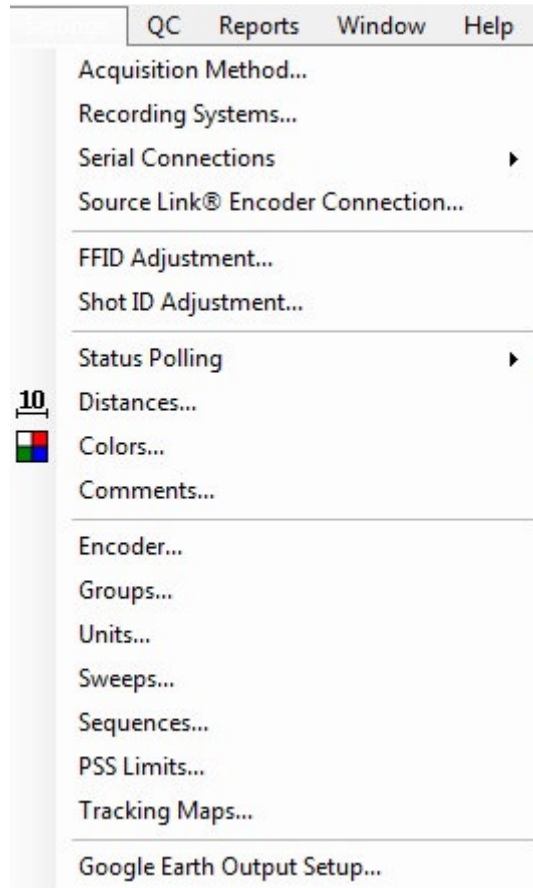
3.2.4 Mark Acquired Shots

Allows the user to manually mark a shot as acquired

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3.3 Settings menu

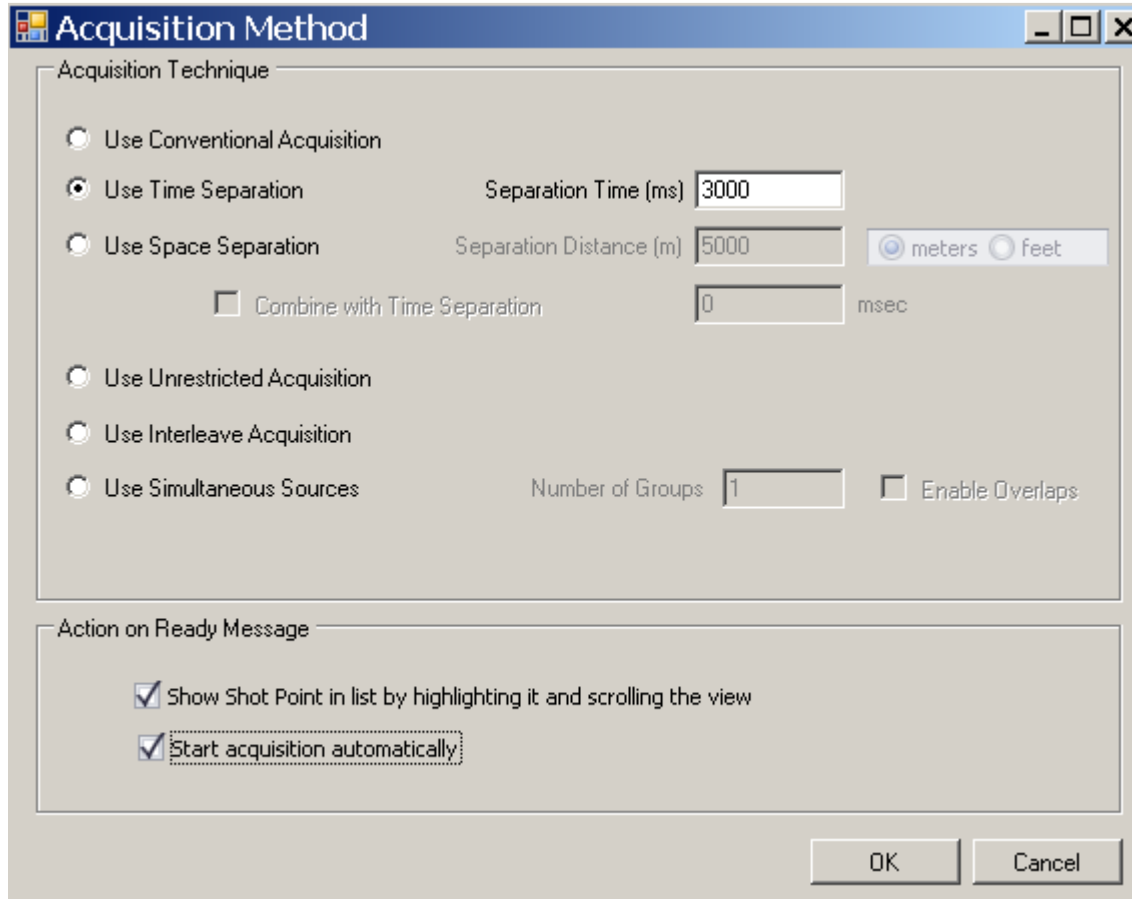
The settings menu has the following settings



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3.3.1 Acquisition Methods

The Acquisition methods menu



The Acquisition Method dialog box is a standard Windows-style window with a title bar and standard window controls. It is divided into two main sections: 'Acquisition Technique' and 'Action on Ready Message'. The 'Acquisition Technique' section contains several radio buttons for selecting an acquisition method. 'Use Time Separation' is selected. To its right is a text box for 'Separation Time (ms)' with the value '3000'. Below 'Use Time Separation' is a checkbox for 'Combine with Time Separation' which is unchecked. To its right is a text box for 'Separation Distance (m)' with the value '5000'. To the right of this text box are two radio buttons for units: 'meters' (selected) and 'feet'. Below 'Combine with Time Separation' is a text box for 'msec' with the value '0'. Below 'Use Time Separation' are three more radio buttons: 'Use Unrestricted Acquisition', 'Use Interleave Acquisition', and 'Use Simultaneous Sources'. To the right of 'Use Simultaneous Sources' is a text box for 'Number of Groups' with the value '1' and a checkbox for 'Enable Overlaps' which is unchecked. The 'Action on Ready Message' section contains two checked checkboxes: 'Show Shot Point in list by highlighting it and scrolling the view' and 'Start acquisition automatically'. At the bottom right are 'OK' and 'Cancel' buttons.

Acquisition Method

Acquisition Technique

☐ Use Conventional Acquisition

☒ Use Time Separation Separation Time (ms) 3000

☐ Use Space Separation Separation Distance (m) 5000 ☒ meters ☐ feet

☐ Combine with Time Separation 0 msec

☐ Use Unrestricted Acquisition

☐ Use Interleave Acquisition

☐ Use Simultaneous Sources Number of Groups 1 ☐ Enable Overlaps

Action on Ready Message

☒ Show Shot Point in list by highlighting it and scrolling the view

☒ Start acquisition automatically

OK Cancel

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3.3.2 SourceLink Recording System Settings

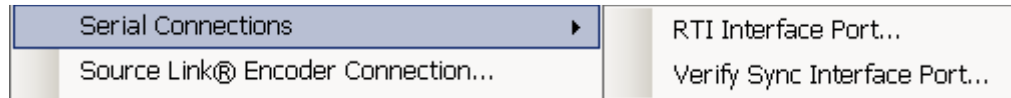
The Recording system settings determine how the SourceLink UE2 system operates. In some applications, the SourceLink must be a slave to a master control system. Other applications like the Sigma Recording system, the information is shared with another application like “Sigma Observer” software.



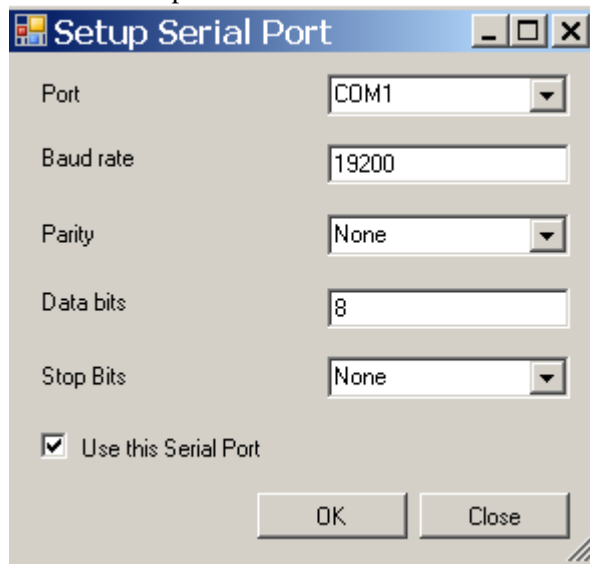
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3.3.3 Serial Connections

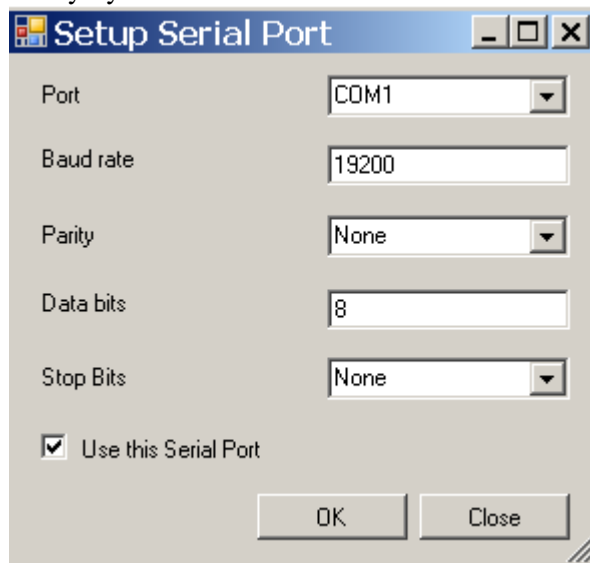
The Serial connection menu



RTI Interface port



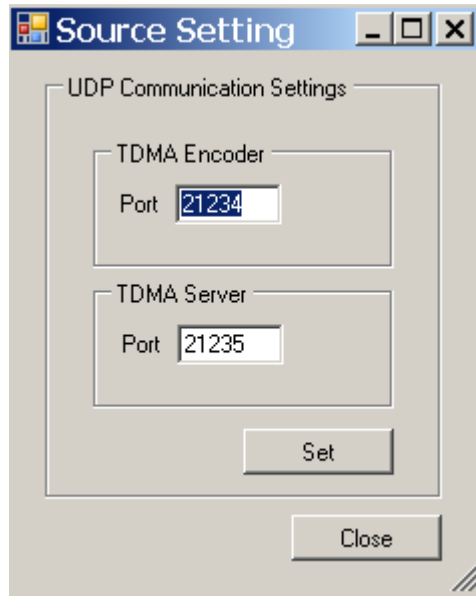
Verify Sync Interface



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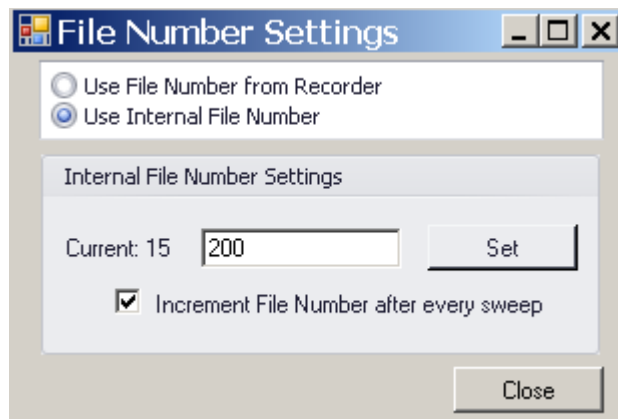
3.3.4 SourceLink Encoder Connection

This window sets up the Interface to the UE2 unit. Use this menu to initialize the Ethernet port settings used for the UE2 connections.



3.3.5 FFID Adjustment

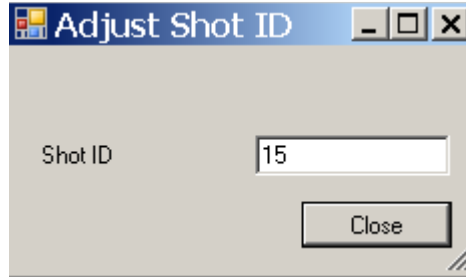
Use this menu to reset the FFID setting. This is often required when starting a new prospect or synchronizing the FFID settings to a Master recorder.



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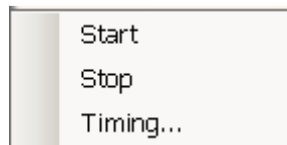
3.3.6 Shot ID Adjustment

This menu is used to change the Shot ID. The Shot ID is used to maintain the PSS and PFS data base.



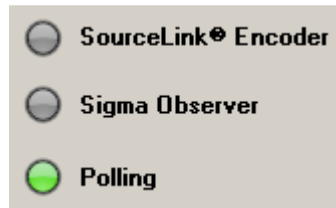
3.3.7 Status Polling

The basic Start and Stop of the polling can be done with this Menu selection or with the Desktop toolbar Icon.

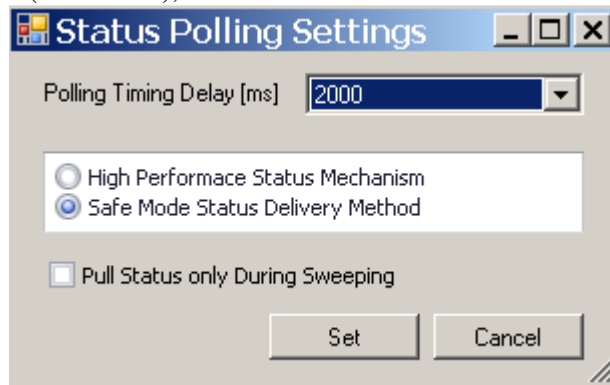


The Polling Icon at the top of the screen shows the status of the Polling control. Green is polling enabled, and off is no polling

Left click this Icon to switch from Polling On to Polling Off



The polling timing selects the delay between polling request. For older non-TDMA operation ("UE mode), select 2000 minimum in safe mode.

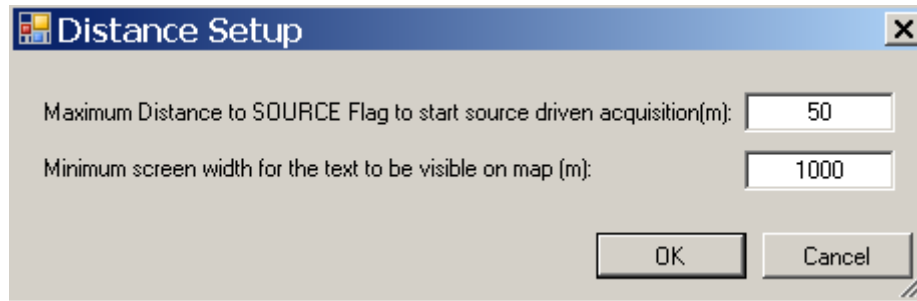


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3.3.8 Distances

The Distance Menu select allowable distances for the Source Driven operation, and also provides an entry for viewing text.

When zoomed out of the prospect the Text for the Flag numbers becomes unreadable and should be disabled. This entry allows automatically disabling or enabling the text with the various Zoom levels.



3.3.9 Colors

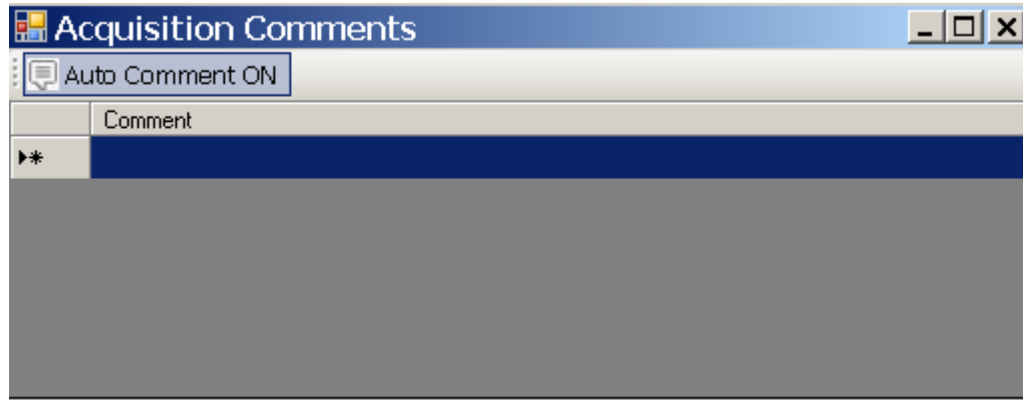
This entry allows user selectable colors for the various Map Icons



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3.3.10 Comments

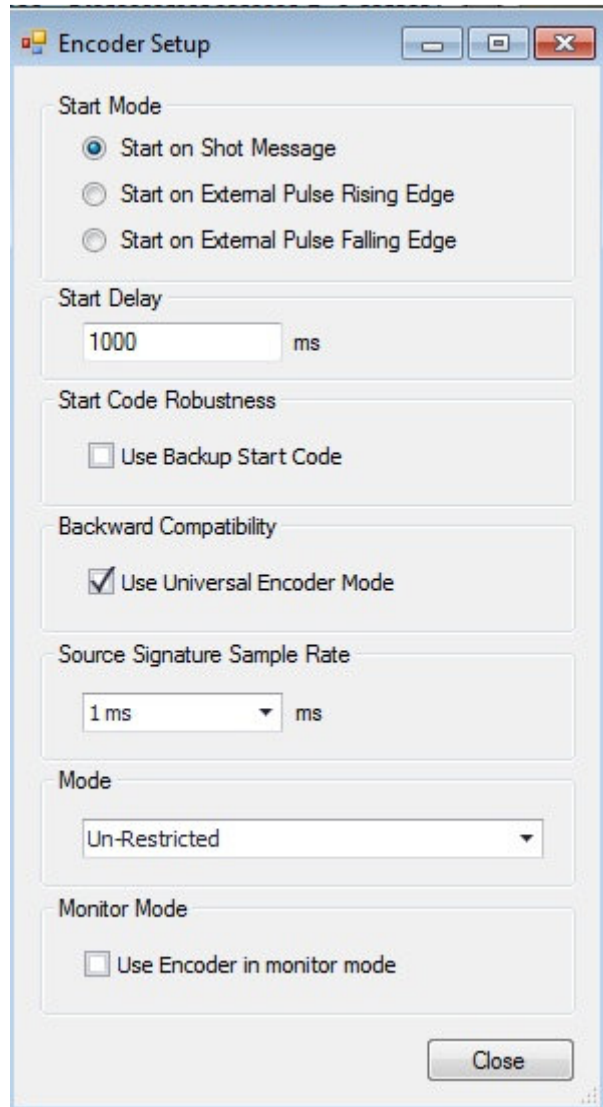
Menu selection allows comment to be added



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3.3.11 Encoder

The UE2 encoder must be setup for correct operation



The image shows a Windows-style dialog box titled "Encoder Setup". It contains several configuration sections:

- Start Mode:** Three radio buttons. "Start on Shot Message" is selected.
- Start Delay:** A text box containing "1000" followed by "ms".
- Start Code Robustness:** A checkbox labeled "Use Backup Start Code" which is unchecked.
- Backward Compatibility:** A checkbox labeled "Use Universal Encoder Mode" which is checked.
- Source Signature Sample Rate:** A dropdown menu showing "1 ms" followed by "ms".
- Mode:** A dropdown menu showing "Un-Restricted".
- Monitor Mode:** A checkbox labeled "Use Encoder in monitor mode" which is unchecked.

A "Close" button is located at the bottom right of the dialog box.

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3.3.12 SourceLink Group Maintenance

The SourceLink Group Maintenance

Group Maintenance

GroupID	Encoder	Aux	Crew	Start Code	Source Type	Lead Vib	Process	Sims	GPS	Units
1	Default	1	1	0	VibroSeis	Not Specified	1-Sweep 1 - Single	Off	All Units	9
2	Default	2	1	0	VibroSeis	Not Specified	1-Sweep 1 - Single	Off	All Units	10
3	Default	3	1	0	VibroSeis	Not Specified	1-Sweep 1 - Single	Off	All Units	12
4	Default	4	1	0	VibroSeis	Not Specified	1-Sweep 1 - Single	Off	All Units	11

Add
Modify
Delete
Close

Add/Modify Group

Basic Settings

Group ID
Crew Number
Start Code
Units
Source Type
Process
Encoder
Aux Channel

☐ Use only lead vib for ready message

Lead Vibrator

Similarity Settings

☐ Automatic Similarities

Every

Special Settings

☐ Use Single GPS Unit

Vibrator with GPS
Inline Offset [m]
Azimuth [degrees]

Wi-Fi Grouping

☐ Use Wi-Fi Grouping

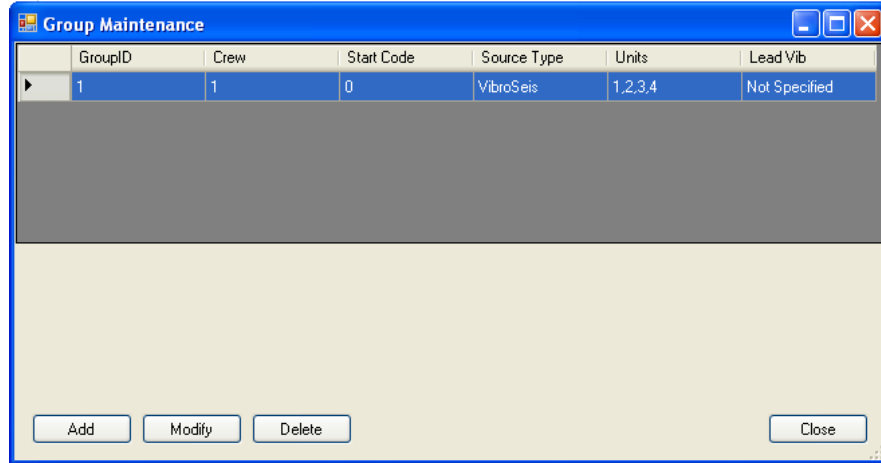
Wi-Fi Group ID

Setup Wi-Fi in Decoders

OK
Cancel

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Groups: Sets up the grouping information



Column description:

Group ID: Identifier of the group

Crew: Crew identifier for the group

Start Code: Start code that will be used for the group

Source Type: Type of source for this group. Selections are Dynamite, Vibroseis or Weight Drop

Units: Comma separated list of units that are associated with this group

Lead Vib: Specifies which vibrator determines when the group is ready. Not specified means that all vibrators have to report Ready before the acquisition starts

Button description:

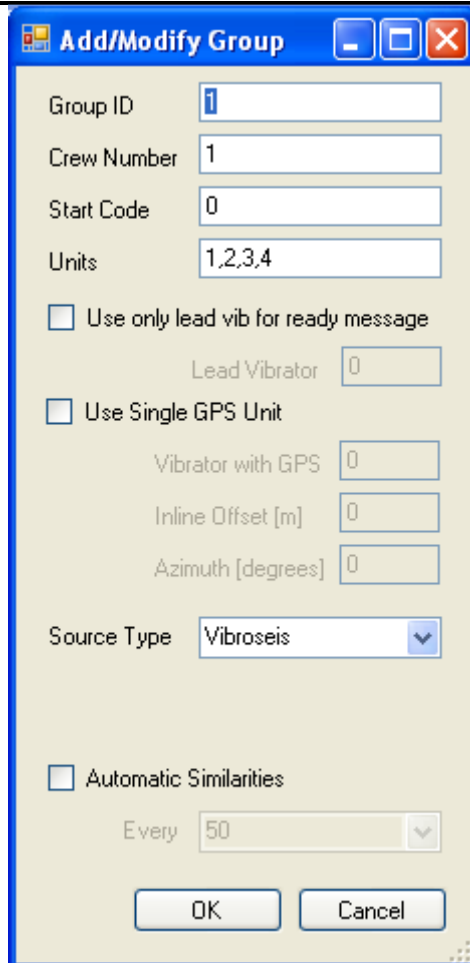
Add: Adds a new vibrator group to the list

Modify: Modifies the highlighted group

Delete: Deletes the highlighted group

Close: Returns to the previous menu

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Group ID: Group number

Crew Number: Crew number for the group

Start Code: Start code to be used for the group

Units: Comma separated list of the units for the group

Use Only Lead Vib for Ready Message: Single vibrator number to specify which vibrator should determine when the group is ready. If unchecked, all vibrators will have to report ready before the TDMA Server sends the ready message to the OYO system.

Use Single GPS Unit: When checked, only the GPS coordinate from the specified unit will be used to calculate the position of the group. This is used when only the lead vibrator has the high precision GPS. Inline offset and azimuth can be applied to adjust the position to the middle of the Vib array. The azimuth can be changed at any time; the azimuth used for each acquired sweep is stored in the database.

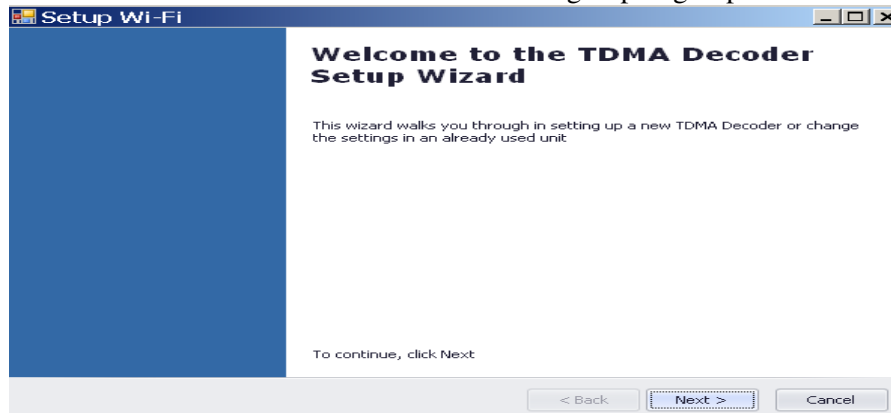
Source Type: Specifies the type of the group

Automatic Similarities: If checked, the TDMA system automatically runs radio similarity tests on the group's vibrators in the specified intervals.

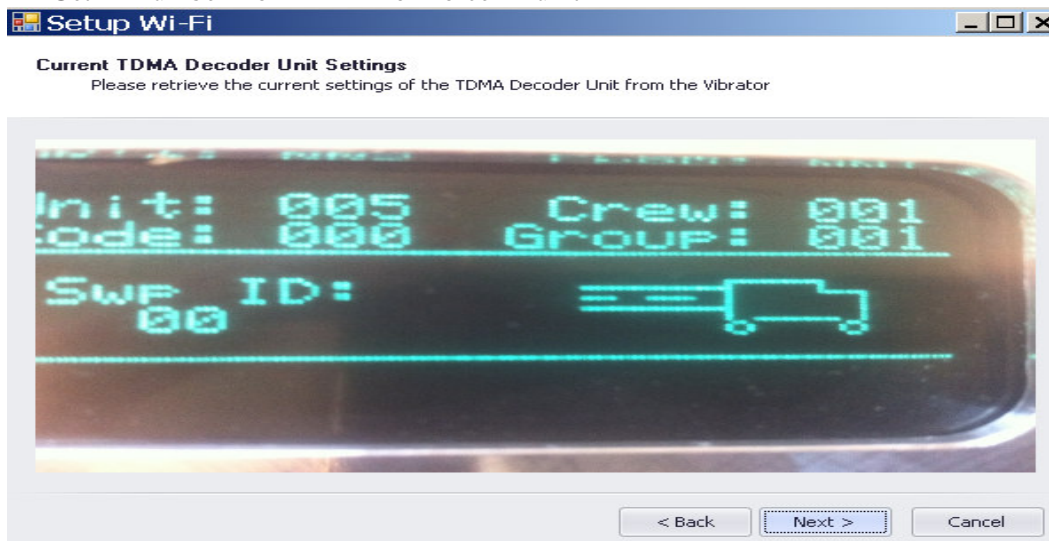
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3.3.13 Units – TDMA Setup Wizard

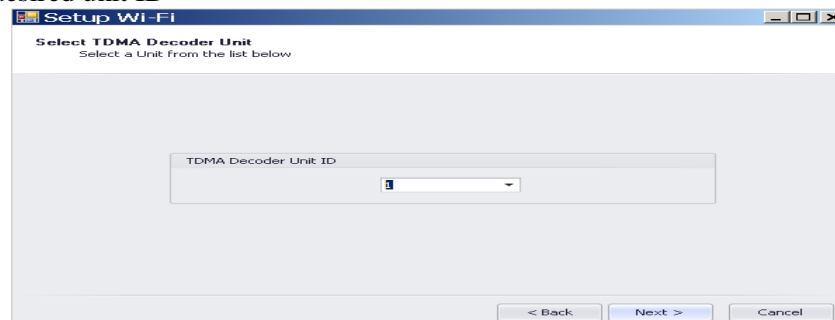
Use this selection to move the Vibrator units from group to group



Get ID number from TDMA or Force III unit



Set desired unit ID




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3.3.14 Sweeps

This selection allows entry of the sweep parameters in the Encoder and the Decoder units.

After entering the correct sweep parameters, then select the groups or units to send the sweeps to.

The Force III uses an “A3” radio protocol for sweep parameters, while the Force II uses the “Force II” radio protocol for the sweep parameters. Select if the sweeps will be transmitted to Force II or Force III units.



Sweep#	Start Freq [Hz]	End Freq [Hz]	Sweep Length [s]	Sweep Type	Constant	Taper Type	Start Taper [s]	End Taper [s]	Phase [°]	Status
1	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
2	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
3	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
4	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
5	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
6	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
7	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
8	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
9	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
10	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
11	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
12	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
13	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
14	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
15	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed
16	10	80	8	dB/Hz	0.2	Cosine	0.5	0.5	0	Changed

Actions

Selected Sweep

Copy to all Sweeps

Transmit

☒ Apply to All Groups

Force 2

Force 2

Force 3

Group 2

☒ Encoder

☒ Unit 1

☒ Unit 2

☒ Unit 3

☒ Unit 4

☒ Unit 8

☒ Unit 10

Toggle Selection

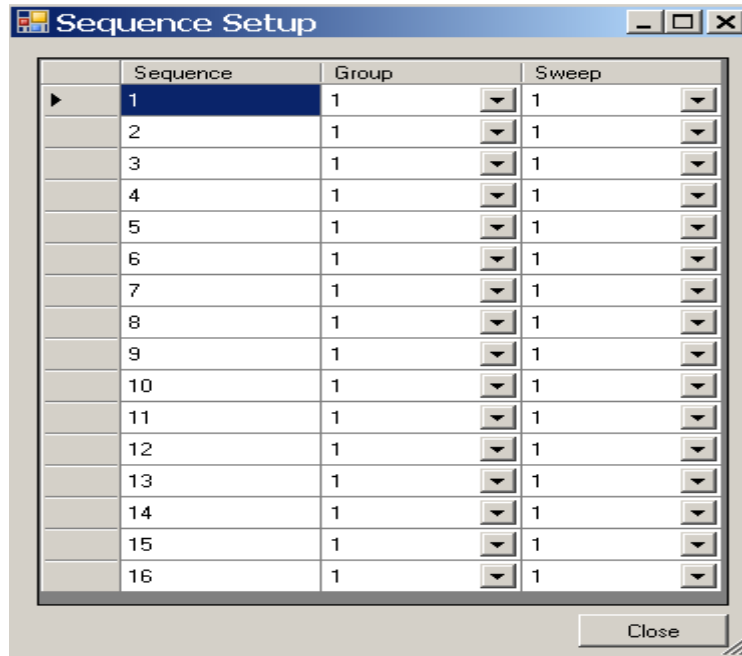
Send

Verify

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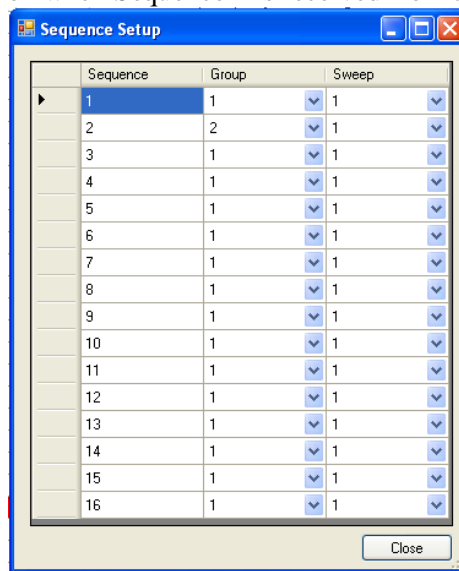
3.3.15 Sequences

The RTI interface selects Sequences and not sweep numbers. These sequences need to be defined for correct operation



Sweeps: Shows the sequence setup

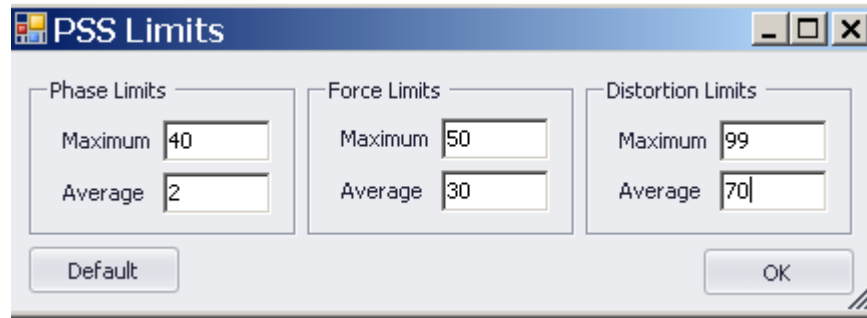
The sequence setting associates a group with a sweep number. For example: The OYO system specifies the SDN-A uses Sequence 1. The user needs to setup in the TDMA Server's Sequence Setup window what group and sweep number needs to be used for production when Sequence 1 is received from the FMC.



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3.3.16 PSS Limits

Set the PSS limits. This will be the settings used by the SourceLink software to flag the errors.

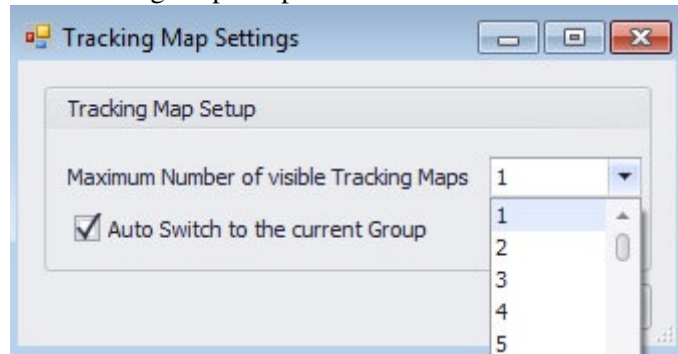
A screenshot of the 'PSS Limits' dialog box. The dialog has a title bar with the text 'PSS Limits' and standard window controls. It contains three grouped sections: 'Phase Limits', 'Force Limits', and 'Distortion Limits'. Each section has two input fields: 'Maximum' and 'Average'. The 'Phase Limits' section has values 40 and 2. The 'Force Limits' section has values 50 and 30. The 'Distortion Limits' section has values 99 and 70. At the bottom left is a 'Default' button, and at the bottom right is an 'OK' button.

Category	Maximum	Average
Phase Limits	40	2
Force Limits	50	30
Distortion Limits	99	70

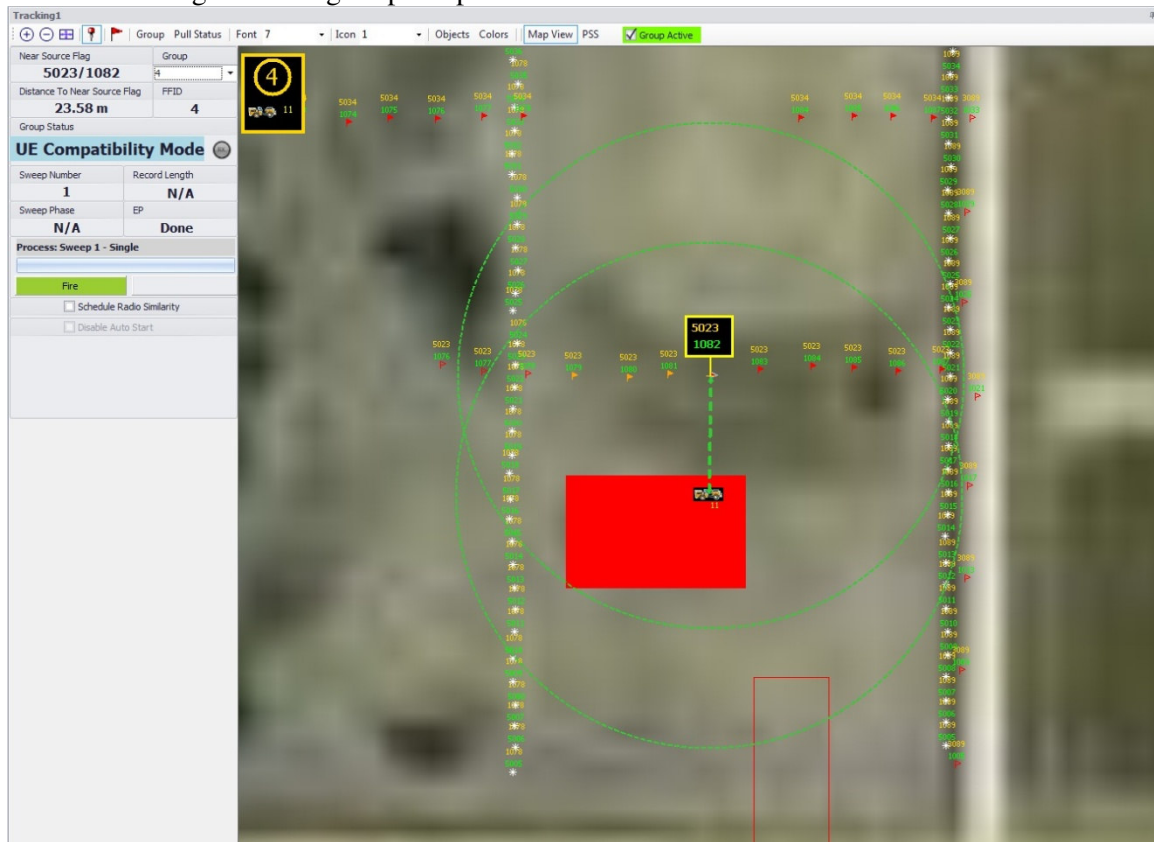
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3.3.17 Tracking Maps

The Tracking Map setup

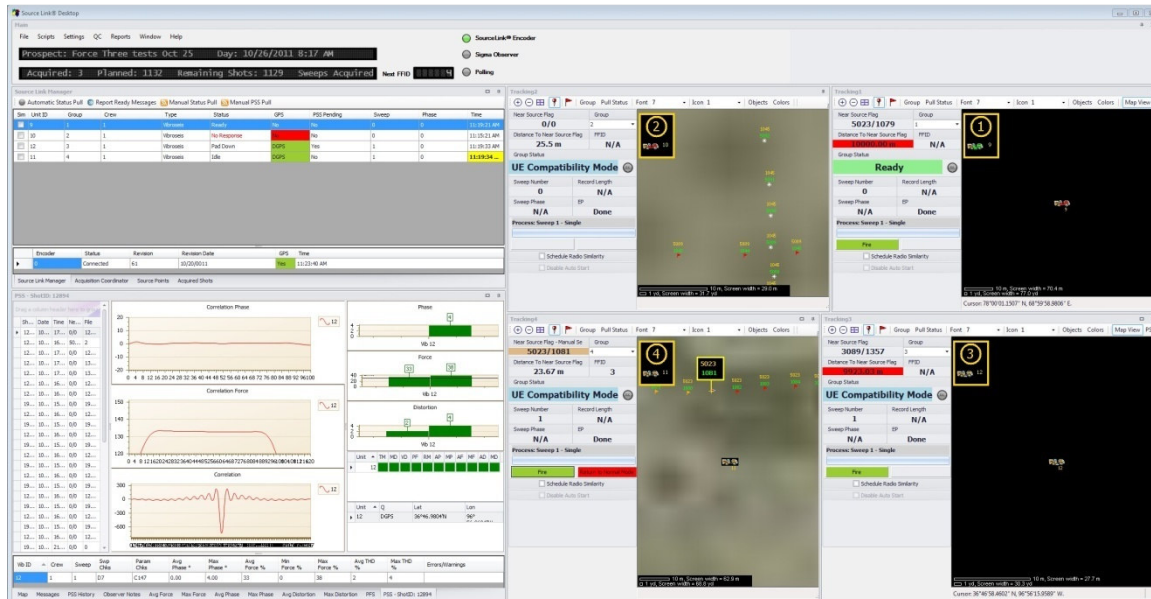


The Single Tracking Map setup



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Four Tracking Maps setup



3.3.18 Google Earth Output Setup

Automatic Updates on Google Earth can be enabled. Select the items to be refreshed on the Google Earth Map.

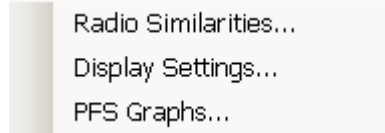


The screenshot shows the 'GoogleMapSettings' dialog box. It has two main sections: 'Source Points' and 'Vibrators'. In the 'Source Points' section, there are three radio buttons: 'Output Every Time Source Points Status Change' (selected), 'Output Every 5 minutes', and 'Disable Source Point Output'. Below these are two more radio buttons: 'Show Source Point Shot Status' (selected) and 'Show PSS Status'. In the 'Vibrators' section, there are three radio buttons: 'Output Every Time GPS Position Received' (selected), 'Output Every 5 minutes', and 'Disable GPS Position Output'. There are 'Browse' buttons next to the input fields for 'Source Points' and 'Vibrators'. A 'Close' button is at the bottom right.

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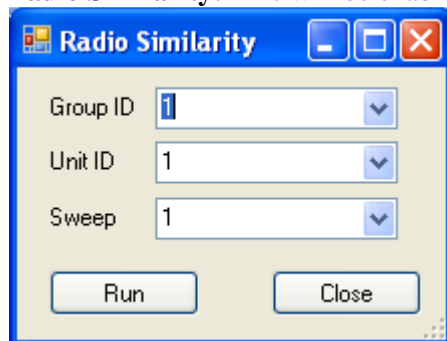
3.4 QC menu

The Process menu must be first setup to use the SourceLink software



3.4.1 Radio Similarities

Radio Similarity: This will be enabled if the TDMA server is not polling for status

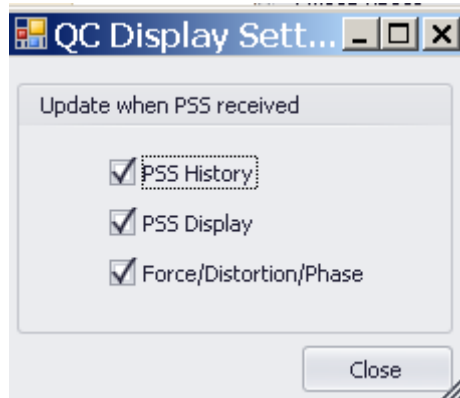


Select the Group for which the similarity test needs to be executed. Select the unit within the group and select the sweep number.

Run button: Sends the similarity test with the sweep to the selected vibrator.

3.4.2 Display Settings

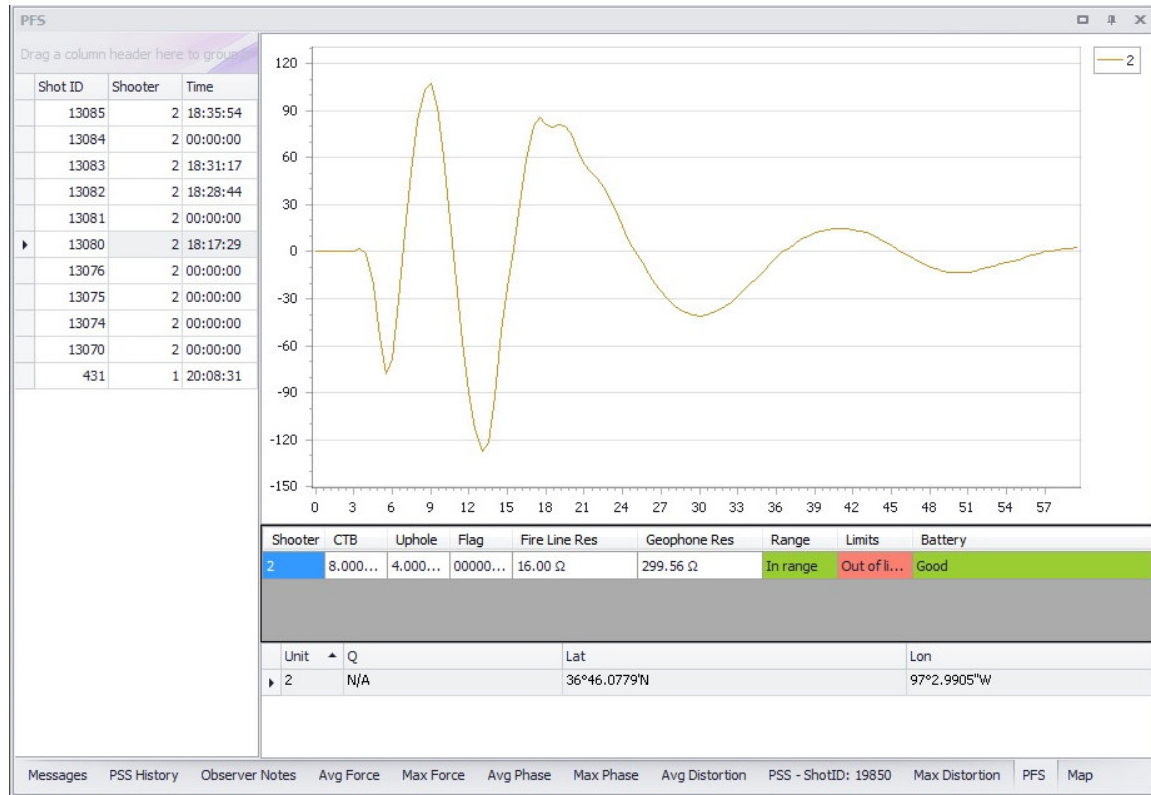
Menu selects the windows that will be updated when the PSS is received



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3.4.3 PFS Graphs

Allows viewing of the PFS data:



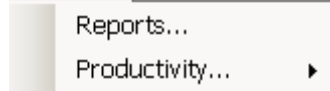
Items shown in the PFS window include:

- Uphole Geophone Signal (Time Domain Display)
- Shooter Number
- Confirmation Time Break Delay
- Uphole Time
- Flag (Source Point Number)
- Firing Line and Uphole Geophone Resistances
- Range Flag
- Limits Flag
- And shooting pack Battery Voltage

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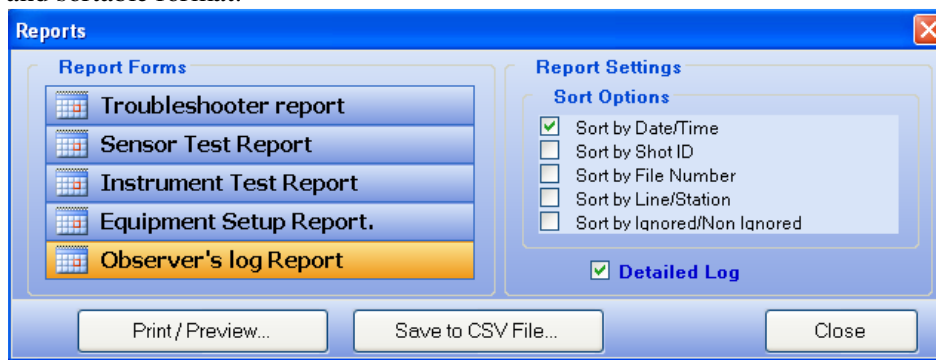
3.5 Reports menu

The Report menu allows various reports to be generated



3.5.1 Reports

Reports: Offers multiple ways to output the acquired shots related information in a human readable and sortable format.



At this point, only the Observer's log Report is relevant to the TDMA Observer. You can choose the sorting type on the right hand. Make sure you check the Detailed Log checkbox before running the report. There are two options to deliver the reports.

Print/Preview: Allows the user to view and print the report

Save to CSV File: Saves the report into a comma separated file, which is a standard input format for spread sheets.

Note: Some of the columns of the Observer report are not applicable for the OYO slave mode.

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Print Preview - Oblog Mar 19 2010 2:42:02

Zoom 100% Page 1

Sigma Observer's log Report Friday Mar 19 2010 2:42 PM Page - 1

File#	Status	Line	Station	EP	ShotID	Date	Time	Ch	Proc	RecLen	SR	SRC Type	Spread
737	Acquired4000	9	1	101		Mar 4 2010	13:02:56	0	Andras	8000	2000	Vibroseis	
736	Acquired4000	15	1	101		Mar 4 2010	13:02:56	0	Andras	8000	2000	Vibroseis	
734	Acquired4000	34	1	101		Mar 4 2010	13:02:56	0	Andras	8000	2000	Vibroseis	
735	Acquired4000	1	1	101		Mar 4 2010	13:02:56	0	Andras	8000	2000	Vibroseis	
741	Acquired1000	100	1	101		Mar 4 2010	13:03:17	0	Andras	8000	2000	Vibroseis	
739	Acquired4000	32	1	101		Mar 4 2010	13:03:17	0	Andras	8000	2000	Vibroseis	
738	Acquired4000	1	1	101		Mar 4 2010	13:03:17	0	Andras	8000	2000	Vibroseis	
742	Acquired4000	1	1	101		Mar 4 2010	13:03:37	0	Andras	8000	2000	Vibroseis	
743	Acquired4000	15	1	101		Mar 4 2010	13:03:37	0	Andras	8000	2000	Vibroseis	
744	Acquired3000	47	1	101		Mar 4 2010	13:03:37	0	Andras	8000	2000	Vibroseis	
748	Acquired1000	96	1	101		Mar 4 2010	13:03:57	0	Andras	8000	2000	Vibroseis	
749	Acquired4000	1	1	101		Mar 4 2010	13:03:57	0	Andras	8000	2000	Vibroseis	
746	Acquired1000	90	1	101		Mar 4 2010	13:03:57	0	Andras	8000	2000	Vibroseis	
747	Acquired4000	34	1	101		Mar 4 2010	13:03:57	0	Andras	8000	2000	Vibroseis	
753	Acquired3000	58	1	101		Mar 4 2010	13:04:21	0	Andras	8000	2000	Vibroseis	
751	Acquired1000	100	1	101		Mar 4 2010	13:04:21	0	Andras	8000	2000	Vibroseis	
752	Acquired4000	1	1	101		Mar 4 2010	13:04:21	0	Andras	8000	2000	Vibroseis	
750	Acquired1000	90	1	101		Mar 4 2010	13:04:21	0	Andras	8000	2000	Vibroseis	
754	Acquired4000	1	1	101		Mar 4 2010	13:04:43	0	Andras	8000	2000	Vibroseis	
756	Acquired4000	1	1	101		Mar 4 2010	13:04:43	0	Andras	8000	2000	Vibroseis	
761	Acquired4000	33	1	101		Mar 4 2010	13:05:03	0	Andras	8000	2000	Vibroseis	
758	Acquired4000	1	1	101		Mar 4 2010	13:05:03	0	Andras	8000	2000	Vibroseis	
760	Acquired2000	73	1	101		Mar 4 2010	13:05:03	0	Andras	8000	2000	Vibroseis	
764	Acquired4000	35	1	101		Mar 4 2010	13:05:24	0	Andras	8000	2000	Vibroseis	
763	Acquired4000	13	1	101		Mar 4 2010	13:05:24	0	Andras	8000	2000	Vibroseis	
765	Acquired1000	95	1	101		Mar 4 2010	13:05:24	0	Andras	8000	2000	Vibroseis	
762	Acquired3000	44	1	101		Mar 4 2010	13:05:24	0	Andras	8000	2000	Vibroseis	
766	Acquired4000	1	1	101		Mar 4 2010	13:05:45	0	Andras	8000	2000	Vibroseis	
768	Acquired4000	37	1	101		Mar 4 2010	13:05:45	0	Andras	8000	2000	Vibroseis	
767	Acquired1000	93	1	101		Mar 4 2010	13:05:45	0	Andras	8000	2000	Vibroseis	
770	Acquired3000	53	1	101		Mar 4 2010	13:06:06	0	Andras	8000	2000	Vibroseis	
771	Acquired1000	100	1	101		Mar 4 2010	13:06:06	0	Andras	8000	2000	Vibroseis	
772	Acquired1000	97	1	101		Mar 4 2010	13:06:06	0	Andras	8000	2000	Vibroseis	
774	Acquired4000	1	1	101		Mar 4 2010	13:06:26	0	Andras	8000	2000	Vibroseis	
776	Acquired4000	1	1	101		Mar 4 2010	13:06:26	0	Andras	8000	2000	Vibroseis	
780	Acquired4000	1	1	101		Mar 4 2010	13:06:48	0	Andras	8000	2000	Vibroseis	
779	Acquired3000	49	1	101		Mar 4 2010	13:06:48	0	Andras	8000	2000	Vibroseis	
778	Acquired2000	74	1	101		Mar 4 2010	13:06:48	0	Andras	8000	2000	Vibroseis	
784	Acquired4000	24	1	101		Mar 4 2010	13:07:09	0	Andras	8000	2000	Vibroseis	
783	Acquired4000	17	1	101		Mar 4 2010	13:07:09	0	Andras	8000	2000	Vibroseis	
782	Acquired4000	1	1	101		Mar 4 2010	13:07:09	0	Andras	8000	2000	Vibroseis	
785	Acquired4000	38	1	101		Mar 4 2010	13:07:09	0	Andras	8000	2000	Vibroseis	
787	Acquired4000	1	1	101		Mar 4 2010	13:07:31	0	Andras	8000	2000	Vibroseis	
786	Acquired2000	77	1	101		Mar 4 2010	13:07:31	0	Andras	8000	2000	Vibroseis	
788	Acquired3000	62	1	101		Mar 4 2010	13:07:31	0	Andras	8000	2000	Vibroseis	
790	Acquired3000	39	1	101		Mar 4 2010	13:07:52	0	Andras	8000	2000	Vibroseis	
791	Acquired4000	20	1	101		Mar 4 2010	13:07:52	0	Andras	8000	2000	Vibroseis	
793	Acquired4000	15	1	101		Mar 4 2010	13:07:52	0	Andras	8000	2000	Vibroseis	
792	Acquired4000	12	1	101		Mar 4 2010	13:07:52	0	Andras	8000	2000	Vibroseis	

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3.5.2 Acquisition Performance Display

Productivity Reports can be shown for the day's production.

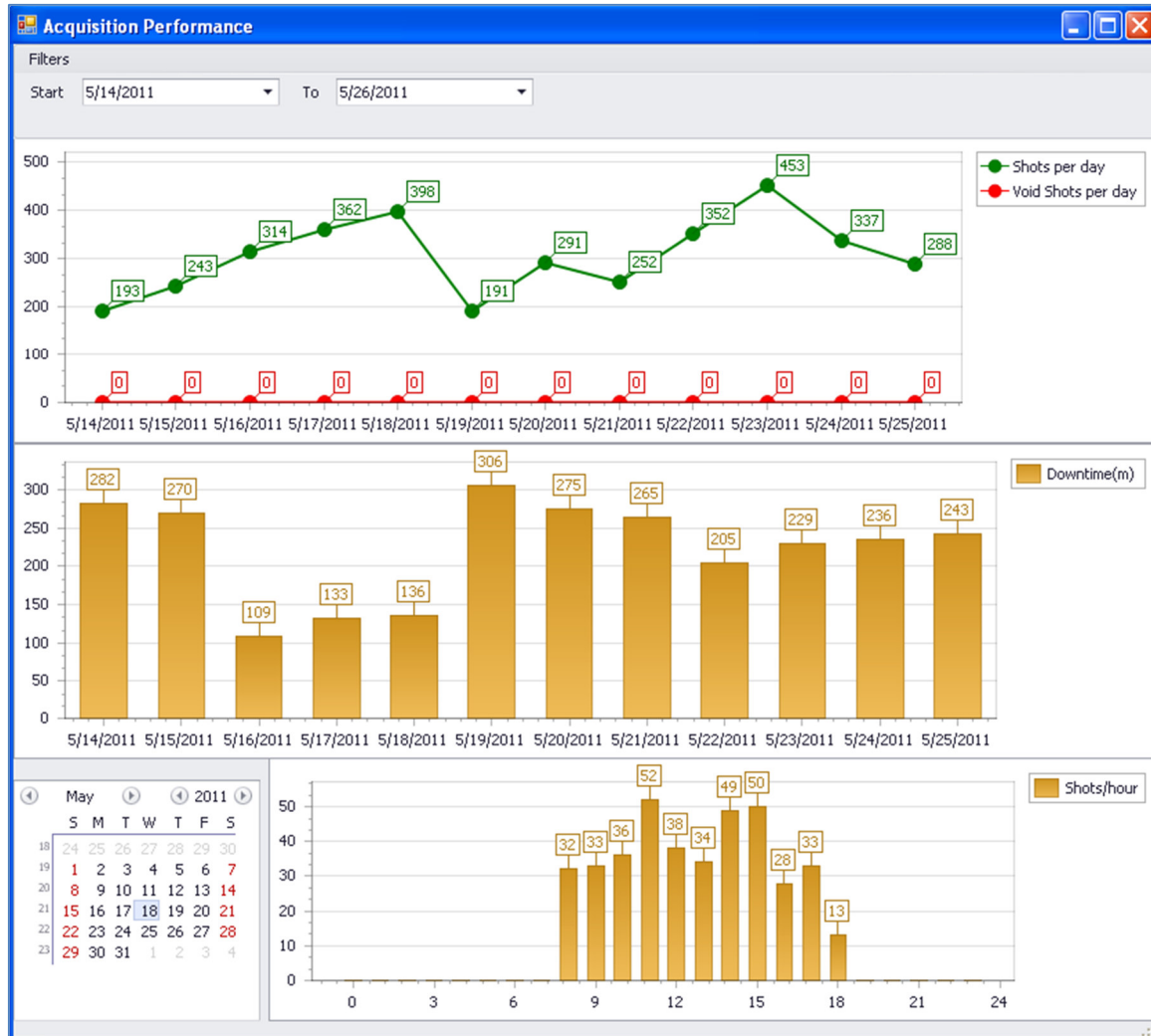


Figure 3.5.2.1 Productivity Report for May, 2011

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Here is another example of production performance in SourceLink. The top panel shows the acquired source points for each day of the project. The middle section shows the time spent on detours. It makes it easy to see how the production is affected by the drive-arounds. The bottom panel is the hourly breakdown of the production for the day the user selects in the left hand calendar.

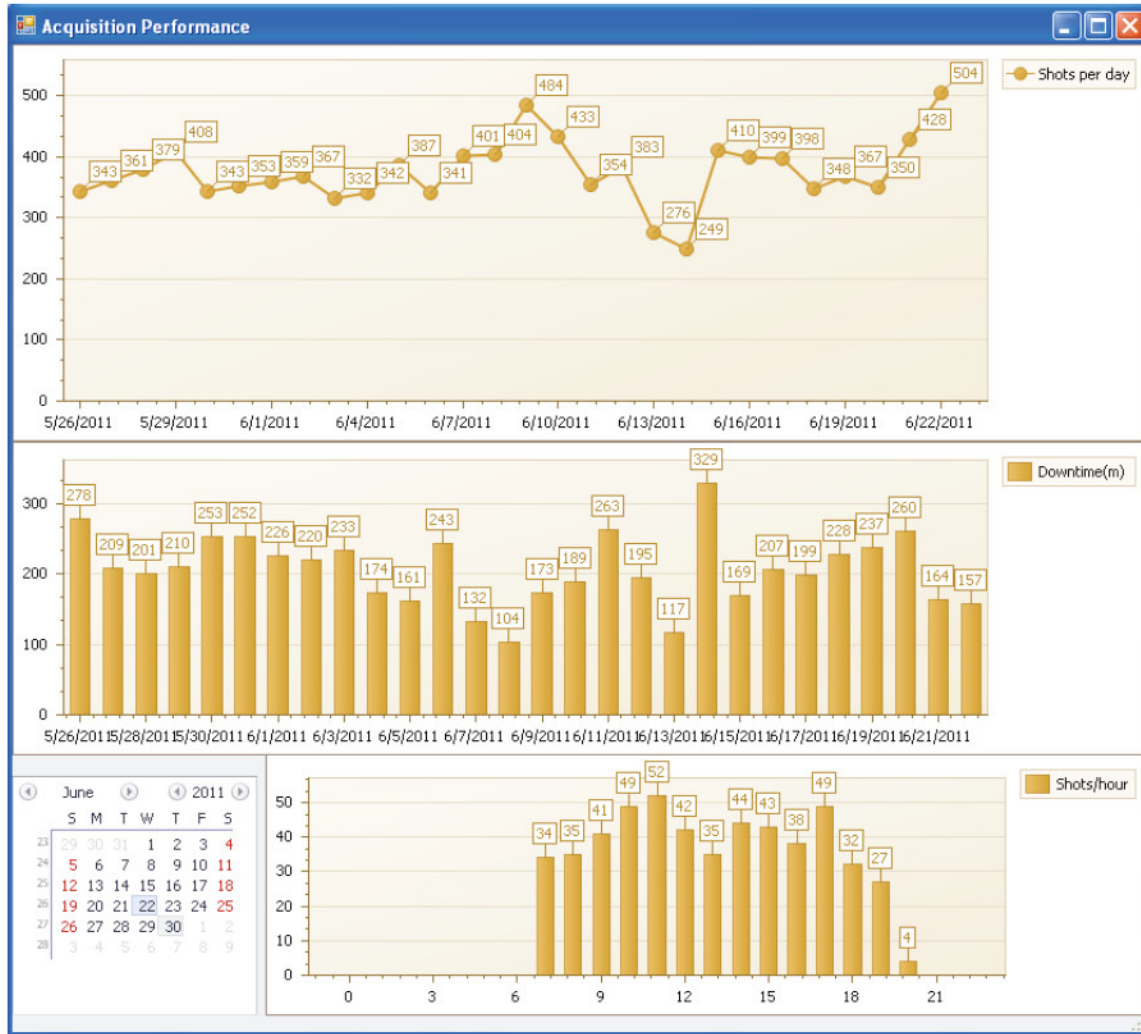


Figure 3.5.2.2 Productivity Report for June, 2011

Universal Encoder II User Manual

3.6 Windows menu

The Process menu must be first setup to use the SourceLink software



3.6.1 Windows Docking Manager

Various screens are available with the SourceLink program. These screens can be disabled or enabled with this menu.

Window Manager			
Window	Visible	Docked	
▶ Acquired Shots	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Acquisition Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Avg Distortion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Avg Force	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Avg Phase	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Main	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Map	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Max Distortion	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Max Force	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Max Phase	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Messages	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Observer Notes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
PFS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
PSS - ShotID: 13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
PSS History	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Source Link Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Source Points	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Tracking1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Tracking2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

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3.6.2 Default View

The Screen setup can be defined by the individual user. This selection provides a default view for a 1920 x 1200 pixel screen.

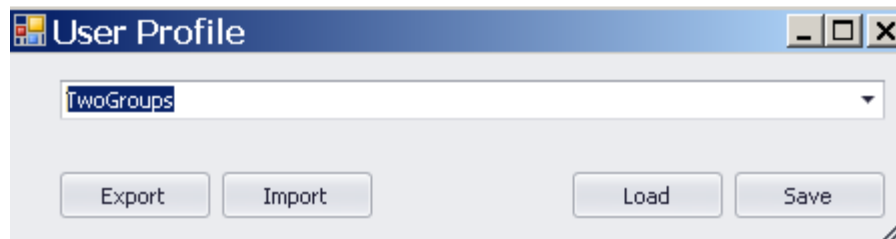
3.6.3 Manage User Profiles

The Screens can be setup by various users. This menu provides a simple way to save and restore different screen views.

Once the screens are setup, then the user can either “Save” or “Export” this setup.

After Exporting the Screen setup, this exported file can be imported on another computer to provide the same view.

This menu is useful for restoring the menus to correct view, if they are accidentally changed by a novice operator.



3.6.4 Restore Factory Settings

The menu is used to restore default settings to the SourceLink software

3.6.5 Help Menu

This option displays the version information of the application. The Main version represents the revision level of the software. The first part is the major revision, the second is the minor revision, the third is the major build number and the last part is the minor build number. For bug fixes the minor build number will change. If the changes are more significant, the major build number will be incremented. If there are new features introduced, the minor revision number will change, while if there are significant additions to the software, the major revision number will be incremented.

Universal Encoder II User Manual

4 Force II/TDMA & Force III

4.1 Force II/TDMA Initial Setup

Decoder Hardware and Cable Connections

- Connect the TDMA unit to the Power, Radio, Force2, and GPS cables.
- Connect the Force II unit to Vibrator Connector panel.
- Make sure the Radio is connected to TDMA and not Force II unit!!

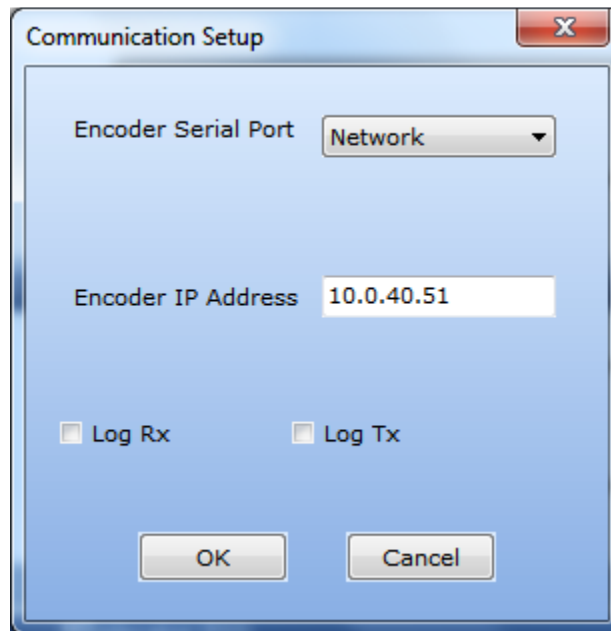
SourceLink Software controls all the prospect maintenance, fleet assignments, SP1/SPS script import, Shot logs. Currently Source Control software is used to set vibrator sweep table and vibrator parameters, all other setup will be carried on using SourceLink software.

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4.2 Source Control

Open Source Control Software (For complete description refer Force2 Manual)

Make sure Setup->Comm Settings option is set to “Network” with the IP Address of the UE2 Encoder.



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4.2.1 Source Control Sweep and Parameter Entry

The UE2 parameters can be checked or changed if needed using Parameters->Encoder Parameters option



The **Encoder Parameters** dialog box is used to configure the UE2 parameters. It features a title bar with standard window controls and a checkbox for **Enable Critical Parameters**. The dialog is organized into three main sections: **Delays**, **Recorder Interface**, and **Radio Interface**.

Delays Section:

- Zero Time Adjust:** 1040 usec
- Start Delay:** 2000 msec
- Similarity Delay:** 3600 usec
- Repeater Delay:** 0 usec

Recorder Interface Section:

- Recorder Type:** Sercel (Serial 9600)
- Remote Fire:** High/Open
- Recorder Start:** None
- Time Break Active:** High
- Time Break Type:** Non-ISO

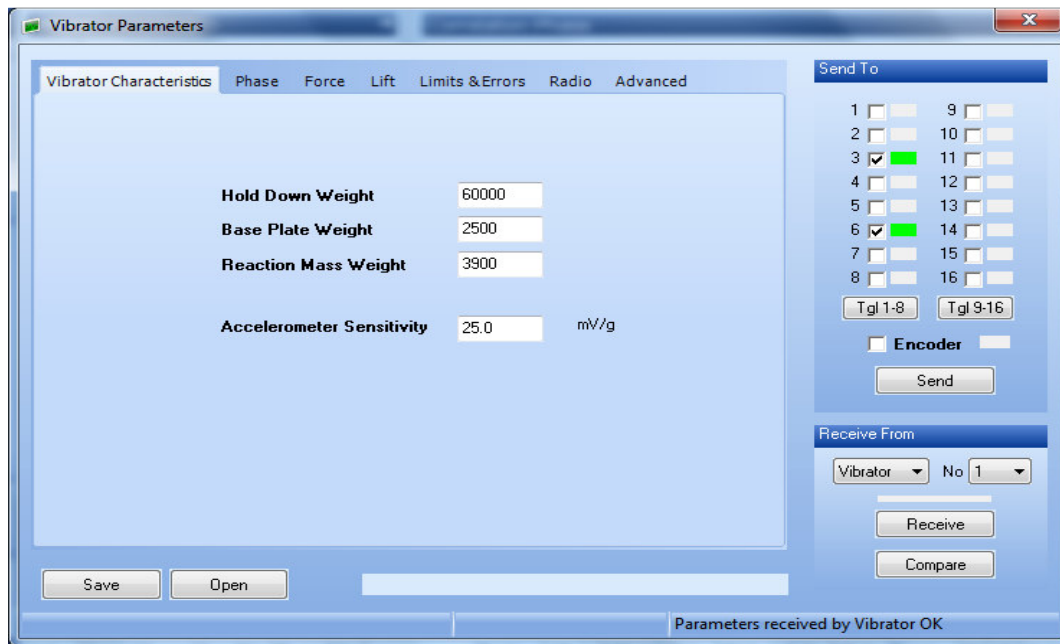
Radio Interface Section:

- Speaker Polarity:** Normal
- Microphone Polarity:** Normal

On the right side of the dialog, there are buttons for **Send**, **Receive**, **Compare**, **Save**, and **Open**. At the bottom, there is a status bar showing **[Range 1000 - 3430 msec]** and **Received by Encoder**.

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Send the required parameters to Force II/TDMA Vibrator units, by selecting parameters->Vibrator Parameters option.



Vibrator Parameters

Send To

1	<input type="checkbox"/>	9	<input type="checkbox"/>
2	<input type="checkbox"/>	10	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	11	<input type="checkbox"/>
4	<input type="checkbox"/>	12	<input type="checkbox"/>
5	<input type="checkbox"/>	13	<input type="checkbox"/>
6	<input checked="" type="checkbox"/>	14	<input type="checkbox"/>
7	<input type="checkbox"/>	15	<input type="checkbox"/>
8	<input type="checkbox"/>	16	<input type="checkbox"/>

Tgl 1-8 Tgl 9-16

☐ Encoder

Send

Receive From

Vibrator No 1

Receive

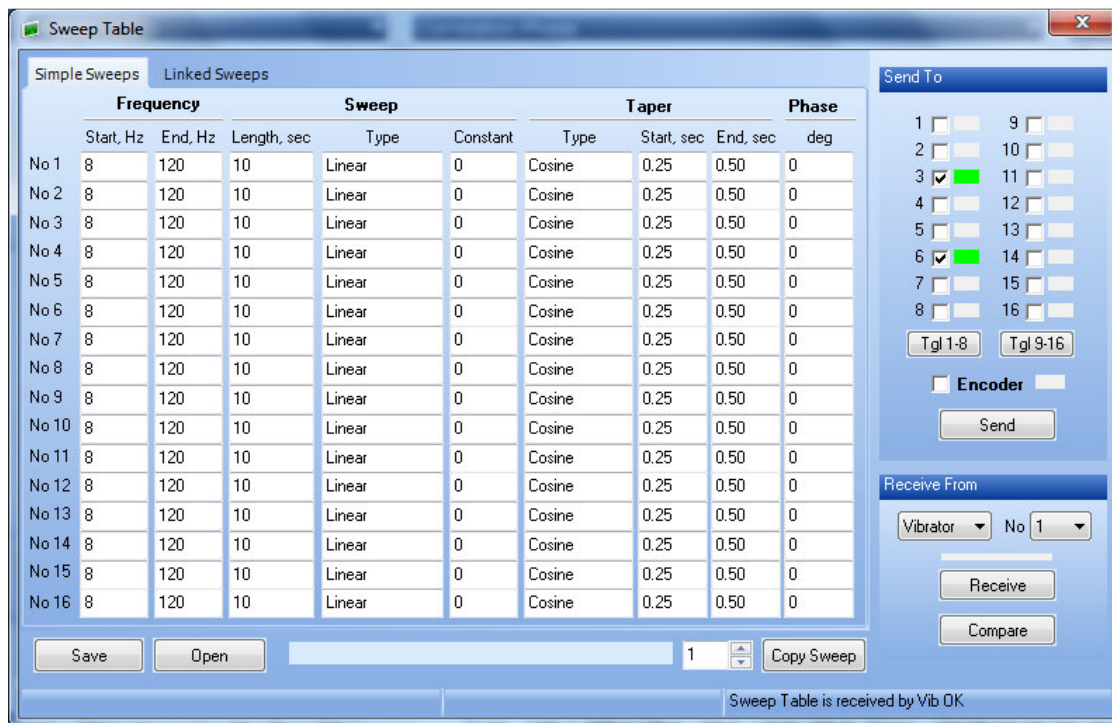
Compare

Save Open

Parameters received by Vibrator OK

Hold Down Weight: 60000
Base Plate Weight: 2500
Reaction Mass Weight: 3900
Accelerometer Sensitivity: 25.0 mV/g

Send the Sweep table to Force II/TDMA Vibrator units by selecting Parameters->Sweep Table.



Sweep Table

Simple Sweeps Linked Sweeps

	Frequency		Length, sec	Sweep		Taper			Phase deg
	Start, Hz	End, Hz		Type	Constant	Type	Start, sec	End, sec	
No 1	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 2	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 3	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 4	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 5	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 6	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 7	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 8	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 9	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 10	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 11	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 12	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 13	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 14	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 15	8	120	10	Linear	0	Cosine	0.25	0.50	0
No 16	8	120	10	Linear	0	Cosine	0.25	0.50	0

Save Open

1 Copy Sweep

Sweep Table is received by Vib OK

Send To

1	<input type="checkbox"/>	9	<input type="checkbox"/>
2	<input type="checkbox"/>	10	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	11	<input type="checkbox"/>
4	<input type="checkbox"/>	12	<input type="checkbox"/>
5	<input type="checkbox"/>	13	<input type="checkbox"/>
6	<input checked="" type="checkbox"/>	14	<input type="checkbox"/>
7	<input type="checkbox"/>	15	<input type="checkbox"/>
8	<input type="checkbox"/>	16	<input type="checkbox"/>

Tgl 1-8 Tgl 9-16

☐ Encoder

Send

Receive From

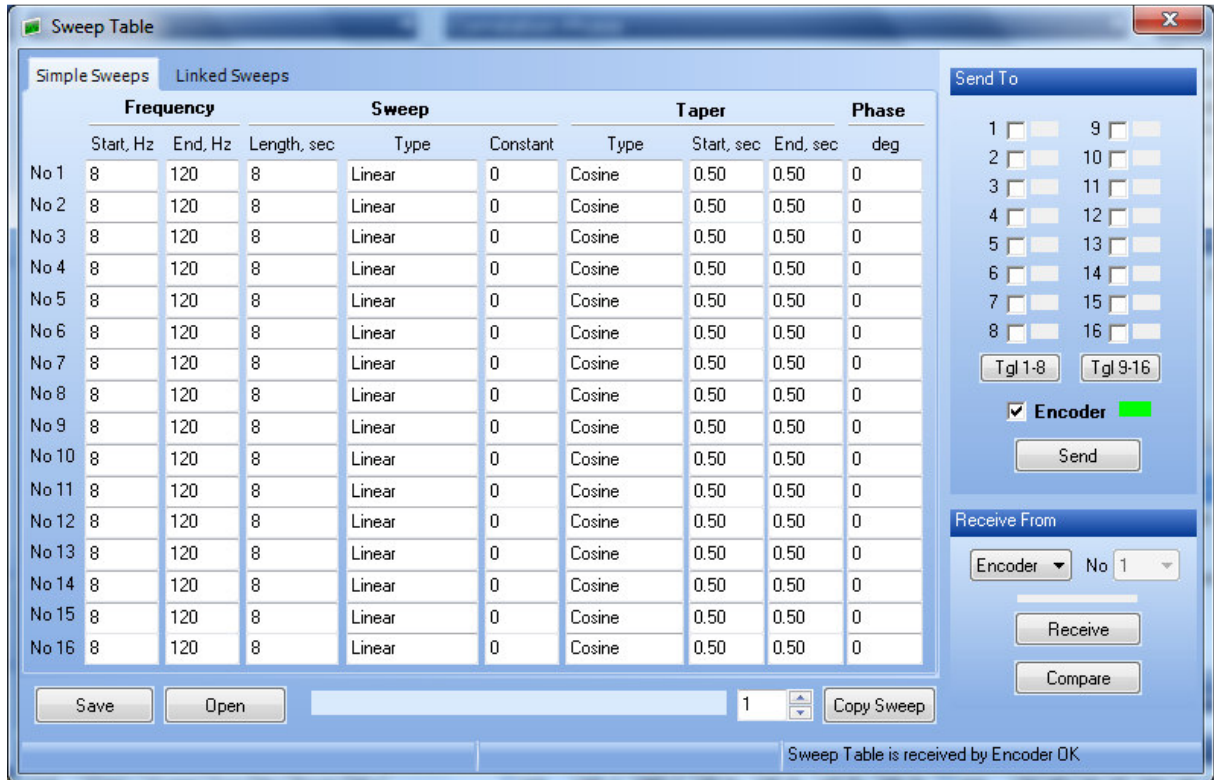
Vibrator No 1

Receive

Compare

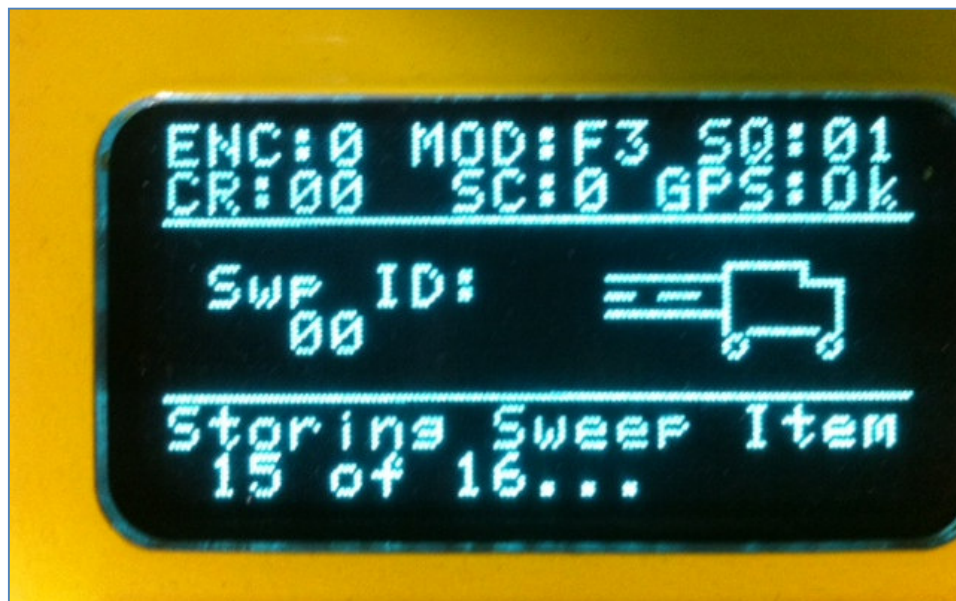
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Send the Sweep table to the Encoder by selecting Parameters->Sweep Table and choosing the Encoder option. **Note:** the encoder will take longer time duration to Store the Sweep table. Make sure the process is complete.



The screenshot shows the 'Sweep Table' window with the 'Simple Sweeps' tab selected. The table contains 16 rows of sweep data. The 'Send To' section on the right has the 'Encoder' checkbox checked. The 'Receive From' section shows 'Encoder' selected in the dropdown and 'No 1' in the adjacent dropdown. The status bar at the bottom indicates 'Sweep Table is received by Encoder OK'.

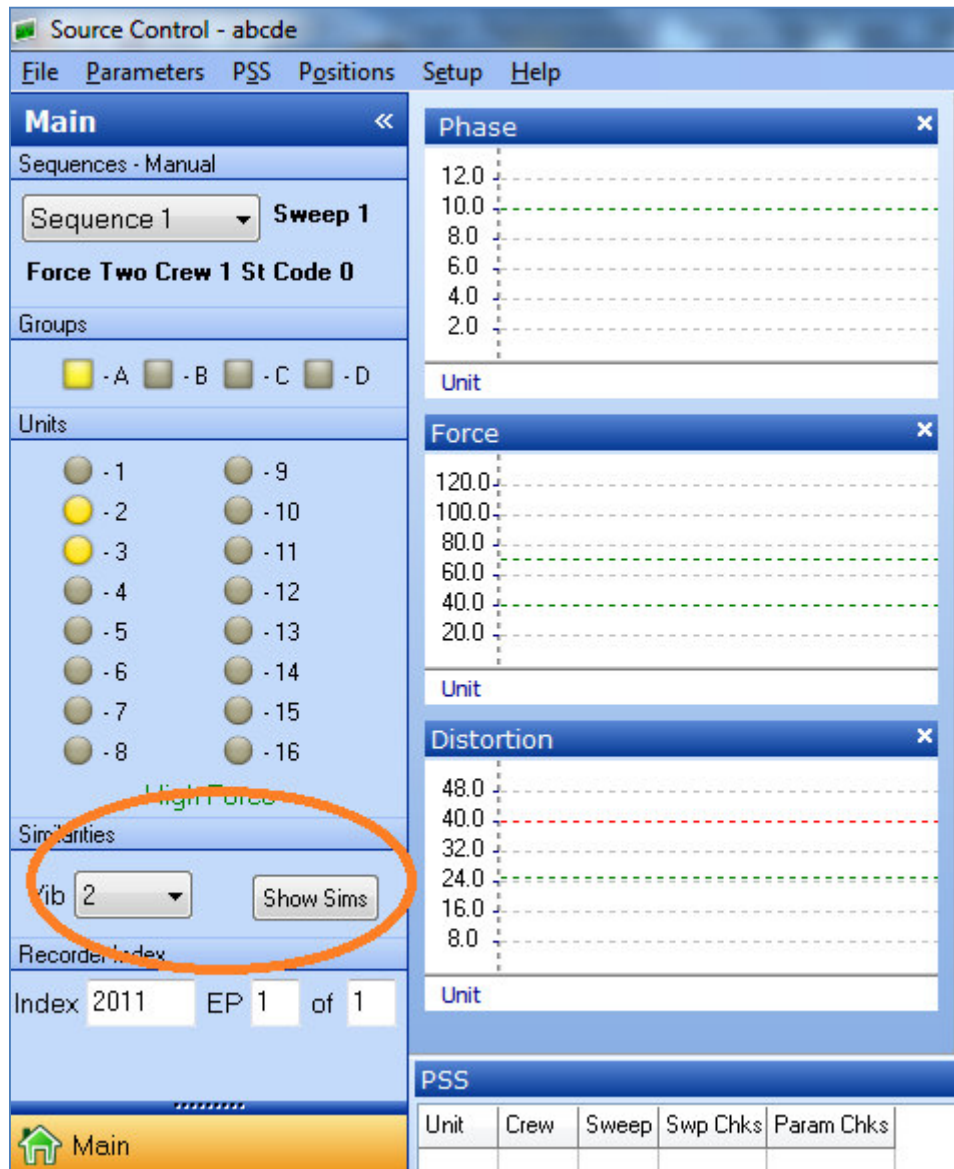
	Frequency		Length, sec	Sweep		Taper		Phase	
	Start, Hz	End, Hz		Type	Constant	Type	Start, sec		End, sec
No 1	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 2	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 3	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 4	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 5	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 6	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 7	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 8	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 9	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 10	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 11	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 12	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 13	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 14	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 15	8	120	8	Linear	0	Cosine	0.50	0.50	0
No 16	8	120	8	Linear	0	Cosine	0.50	0.50	0



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4.2.2 Source Control Radio Similarity

Select a valid vibrator ID number (any number) in Similarities section even when similarity is rarely used (this will allow a Similarity display if SourceLink initiates a Vibrator Similarity any time later).



The screenshot shows the 'Source Control - abcde' application window. The 'Main' tab is active, displaying various control panels. The 'Similarities' section is highlighted with a red circle. It contains a 'Vib' dropdown menu set to '2' and a 'Show Sims' button. The 'Units' section shows a grid of 16 buttons labeled -1 through -16, with -1 through -8 in the first column and -9 through -16 in the second column. The 'Recorder Index' section shows 'Index 2011', 'EP 1', and 'of 1'. The 'PSS' section at the bottom right contains a table with columns: Unit, Crew, Sweep, Swp Chks, and Param Chks.

Unit	Crew	Sweep	Swp Chks	Param Chks

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4.2.3 Source Control – Changing Unit ID or Crew ID

Changing Unit IDs/Crew ID Using Source Control Software

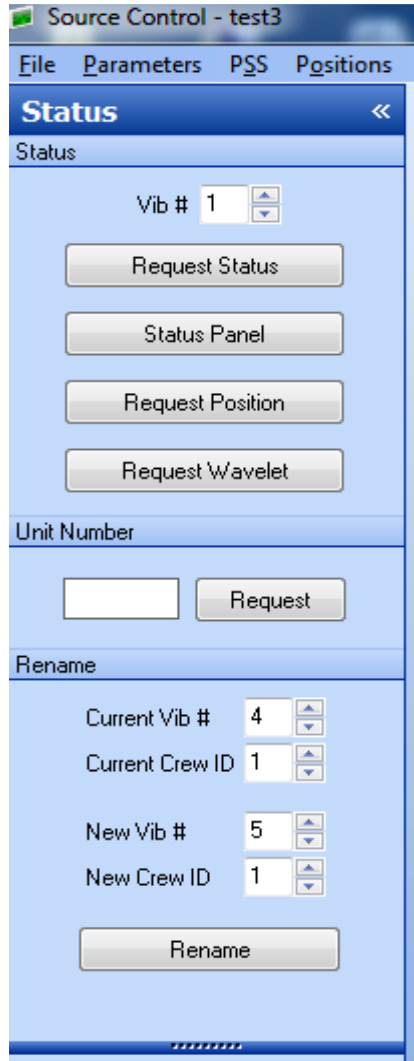
Open Source Control software in the Computer connected to the UE2.

Make sure the UE2 is communicating with Source Control Software. (Encoder OK in the bottom tab).

Make sure the Encoder and Decoder (to be modified) are connected to radio. If there are multiple units with same unit IDs, turn off all the remaining decoders.

Note the current Unit ID/Crew ID.

Then select, set the current and desired new Unit ID/Crew ID and send Status->Rename



Source Control - test3

File Parameters PSS Positions

Status <<

Status

Vib # 1

Request Status

Status Panel

Request Position

Request Wavelet

Unit Number

Request

Rename

Current Vib # 4

Current Crew ID 1

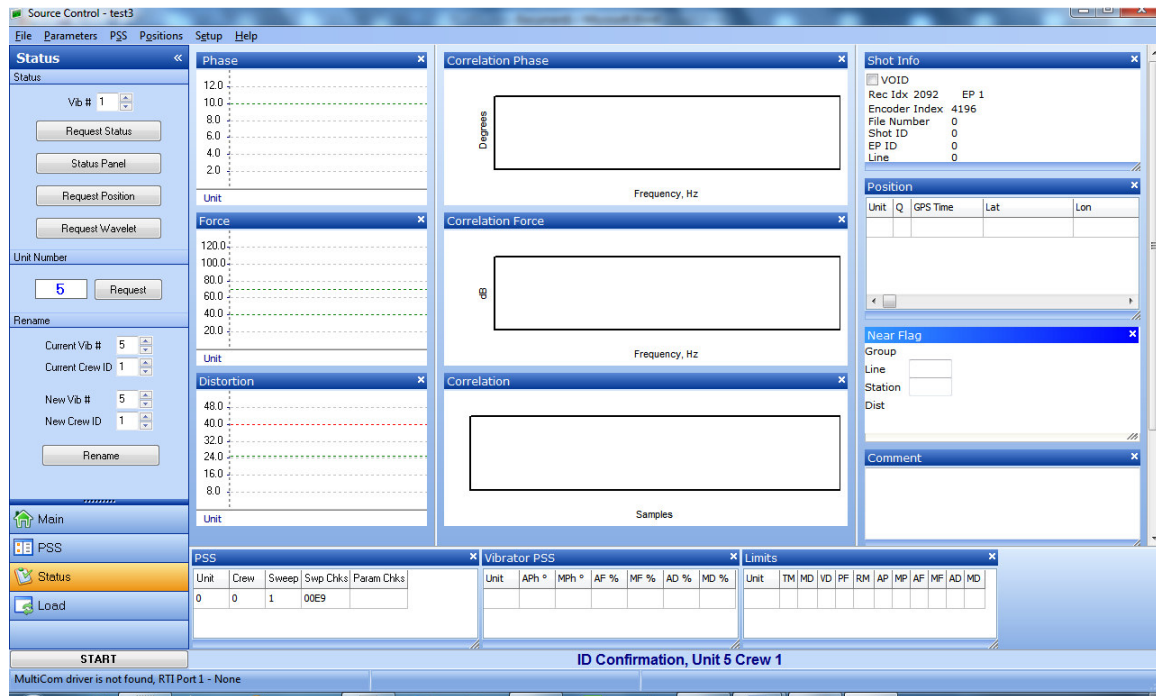
New Vib # 5

New Crew ID 1

Rename

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A confirmation message can be seen at the bottom panel



Both TDMA decoders and Force2 IDs can be changed this way.
Check the display of the TDMA decoder and force2. Make sure the unit ID and Crew IDs match.

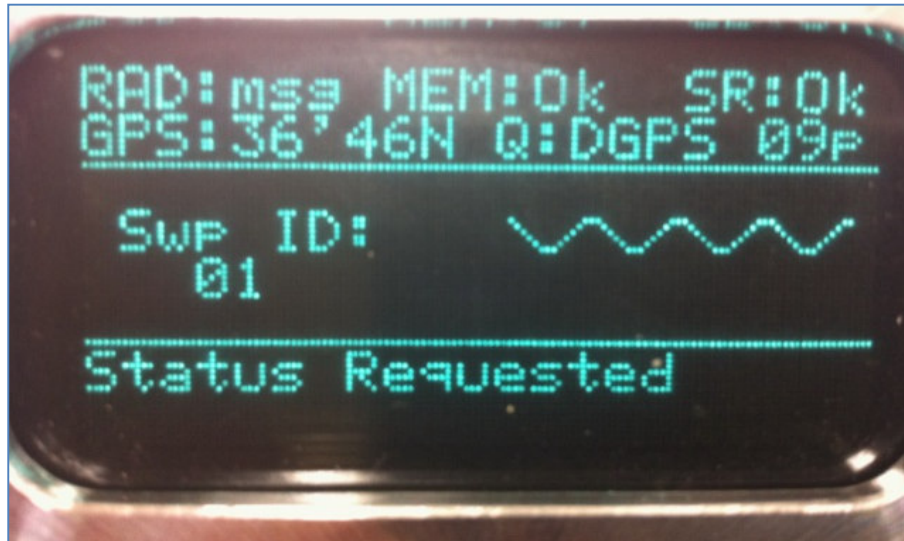
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4.3 Force II/TDMA setup

Make sure the Force2 unit is connected properly and boot the Force II system (refer Force II Manual)

Make sure all the TDMA Cables are connected and TDMA Case properly grounded.

The TDMA display will show a self status check after few seconds. Make sure the Memory (MEM) and Serial Connections (SR) are displayed “OK”. Check the GPS connectivity displayed: with coordinates, quality of GPS, Number of Satellites, PPS (‘p’). The Radio Status (RAD) will be “idle” (‘idl’) normally, and whenever any valid radio messages go through the radio channel this will display “Message” (‘msg’). The description of the current activity in that particular unit will be displayed at the bottom window.



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5 Boom Box Operation

5.1 Boom Box Operation

5.1.1 Setup in Boom Box Decoder

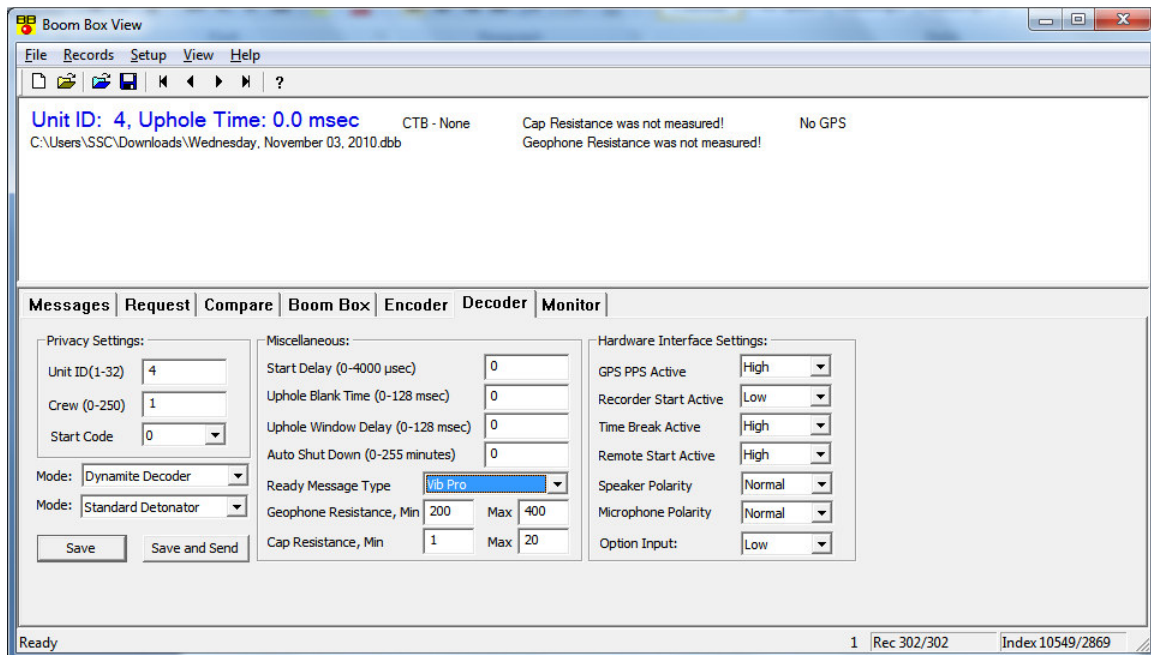
For Operation with UE-II, the boom box needs to be set in the VIBPRO mode.

To achieve this, Please connect the Boom Box to a computer using the Boom Box programming cable.

Make sure to select the Setup->Comport and correct com port.

Select the Boom Box tab and press the Online Check button. The Top half window will display that the Unit # is connected.

Now select the Decoder tab and make sure the Ready Message type is set to “VIBPRO” and “Save and Send” to the Decoder.



The screenshot shows the 'Boom Box View' software window. The 'Decoder' tab is selected in the bottom navigation bar. The main display area shows the following information:

- Unit ID: 4, Uphole Time: 0.0 msec
- CTB - None
- Cap Resistance was not measured!
- No GPS
- Geophone Resistance was not measured!

The 'Decoder' tab settings are as follows:

Category	Setting	Value
Privacy Settings:	Unit ID (1-32)	4
	Crew (0-250)	1
	Start Code	0
Miscellaneous:	Start Delay (0-4000 usec)	0
	Uphole Blank Time (0-128 msec)	0
	Uphole Window Delay (0-128 msec)	0
	Auto Shut Down (0-255 minutes)	0
Ready Message Type:	Ready Message Type	Vib Pro
	Geophone Resistance, Min	200
	Geophone Resistance, Max	400
	Cap Resistance, Min	1
Hardware Interface Settings:	GPS PPS Active	High
	Recorder Start Active	Low
	Time Break Active	High
	Remote Start Active	High
	Speaker Polarity	Normal
Option Input:	Microphone Polarity	Normal
	Option Input	Low

Buttons at the bottom: Save, Save and Send.

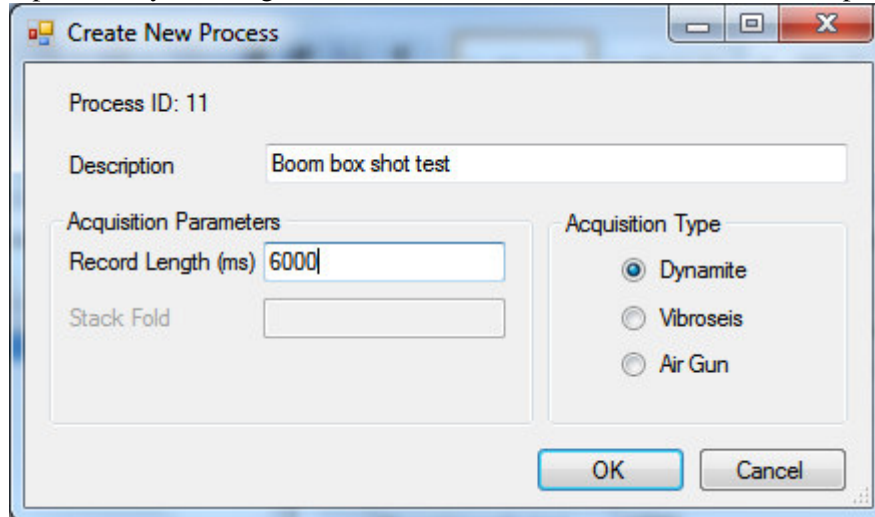
Status bar: Ready, 1 Rec 302/302, Index 10549/2869.

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5.1.2 Boom Box Setup in SourceLink Software

Process Setup

Set a process, by selecting File->Process maintenance and create a “New” process



The "Create New Process" dialog box is shown. It has a title bar with a standard Windows icon and window controls. The main area contains the following fields and options:

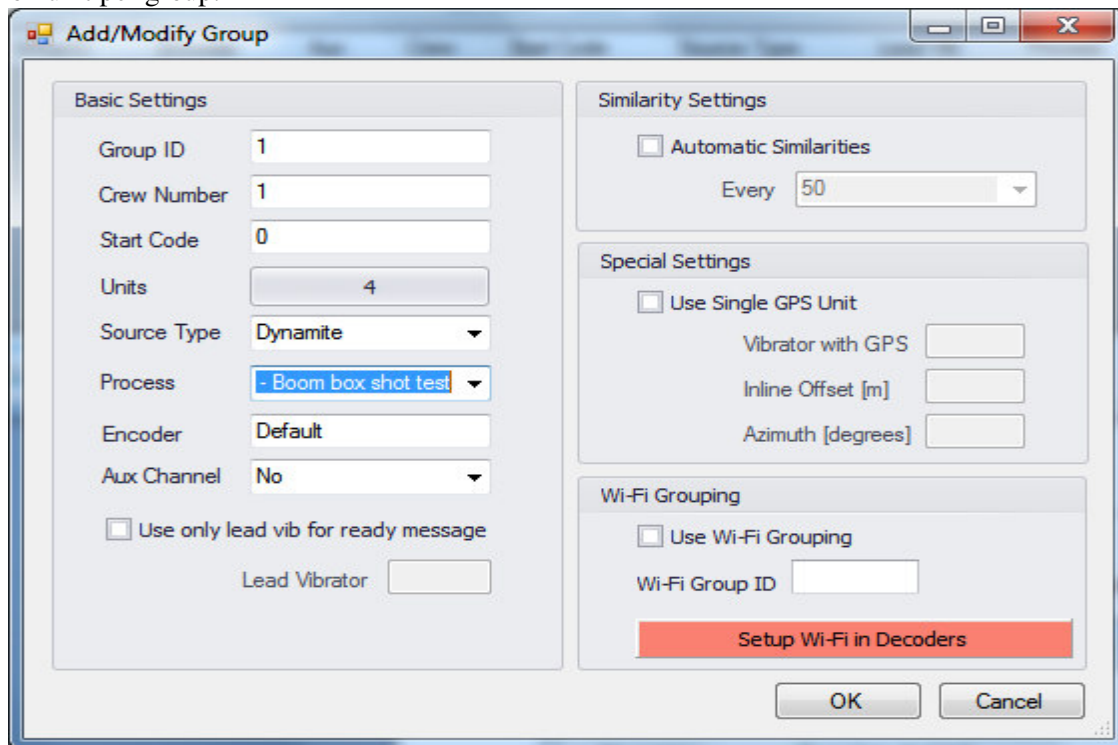
- Process ID:** 11
- Description:** Boom box shot test
- Acquisition Parameters:**
 - Record Length (ms):** 6000
 - Stack Fold:** (empty field)
- Acquisition Type:**
 - ☒ Dynamite
 - ☐ Vibroseis
 - ☐ Air Gun

At the bottom right are "OK" and "Cancel" buttons.

Specify the required Record length in milliseconds and Acquisition type to be “Dynamite”

Group Setup

Select Settings->Group->Add and set a new group with Unit ID assigned as one Boom Box unit per group.



The "Add/Modify Group" dialog box is shown. It has a title bar with a standard Windows icon and window controls. The main area is divided into several sections:

- Basic Settings:**
 - Group ID:** 1
 - Crew Number:** 1
 - Start Code:** 0
 - Units:** 4
 - Source Type:** Dynamite
 - Process:** - Boom box shot test
 - Encoder:** Default
 - Aux Channel:** No
 - ☐ Use only lead vib for ready message
 - Lead Vibrator:** (empty field)
- Similarity Settings:**
 - ☐ Automatic Similarities
 - Every:** 50
- Special Settings:**
 - ☐ Use Single GPS Unit
 - Vibrator with GPS:** (empty field)
 - Inline Offset [m]:** (empty field)
 - Azimuth [degrees]:** (empty field)
- Wi-Fi Grouping:**
 - ☐ Use Wi-Fi Grouping
 - Wi-Fi Group ID:** (empty field)
 - Setup Wi-Fi in Decoders** (red button)

At the bottom right are "OK" and "Cancel" buttons.

Also set the process to the previously created process for dynamite.

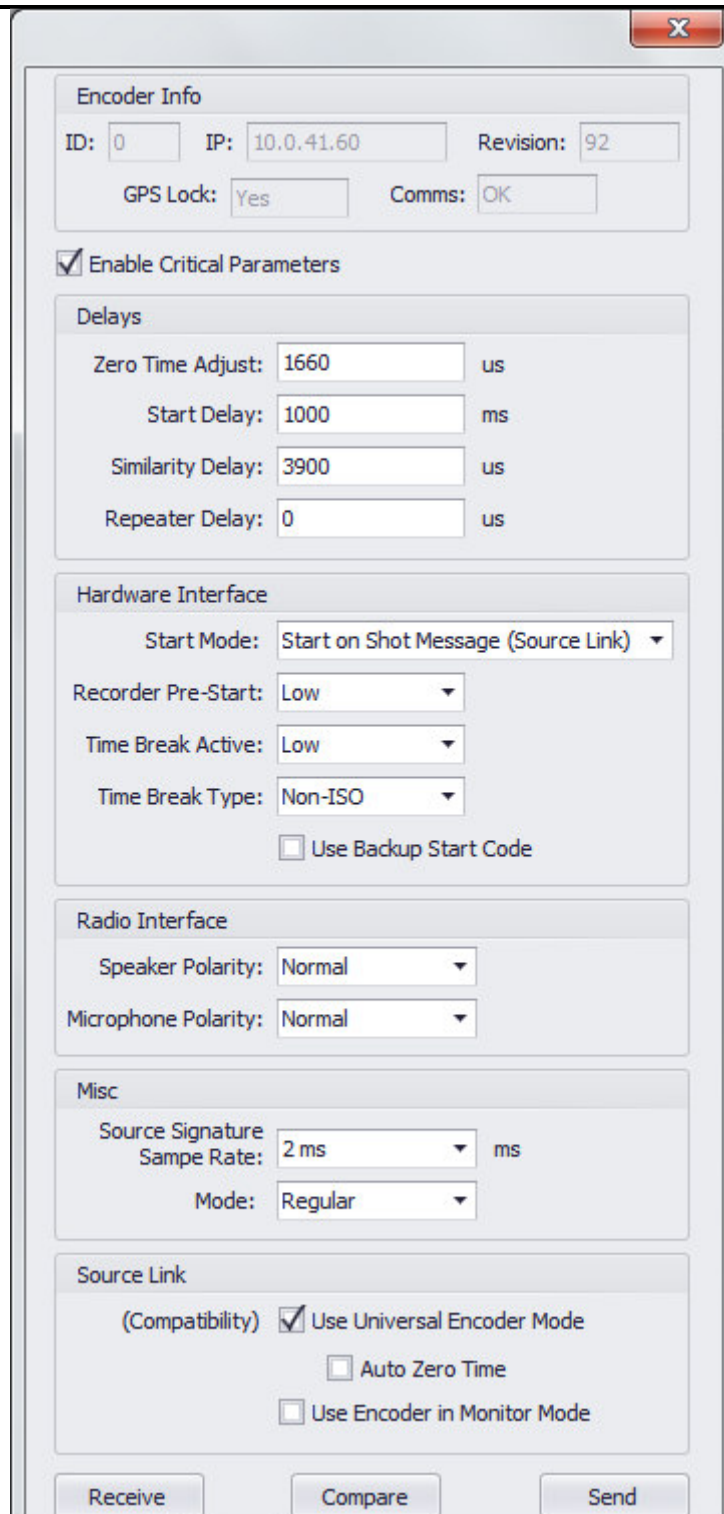
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Encoder Settings

Select Settings->Encoder

The zero times, radio polarity and other settings can be configured using this option. Press the Send button after completing the changes.

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The screenshot shows the Universal Encoder II configuration window. It contains several sections for setting parameters:

- Encoder Info:** ID: 0, IP: 10.0.41.60, Revision: 92, GPS Lock: Yes, Comms: OK.
- Enable Critical Parameters:** Checked.
- Delays:** Zero Time Adjust: 1660 us, Start Delay: 1000 ms, Similarity Delay: 3900 us, Repeater Delay: 0 us.
- Hardware Interface:** Start Mode: Start on Shot Message (Source Link), Recorder Pre-Start: Low, Time Break Active: Low, Time Break Type: Non-ISO, Use Backup Start Code: Unchecked.
- Radio Interface:** Speaker Polarity: Normal, Microphone Polarity: Normal.
- Misc:** Source Signature: 2 ms, Sample Rate: 2 ms, Mode: Regular.
- Source Link:** (Compatibility) Use Universal Encoder Mode: Checked, Auto Zero Time: Unchecked, Use Encoder in Monitor Mode: Unchecked.

At the bottom are three buttons: Receive, Compare, and Send.

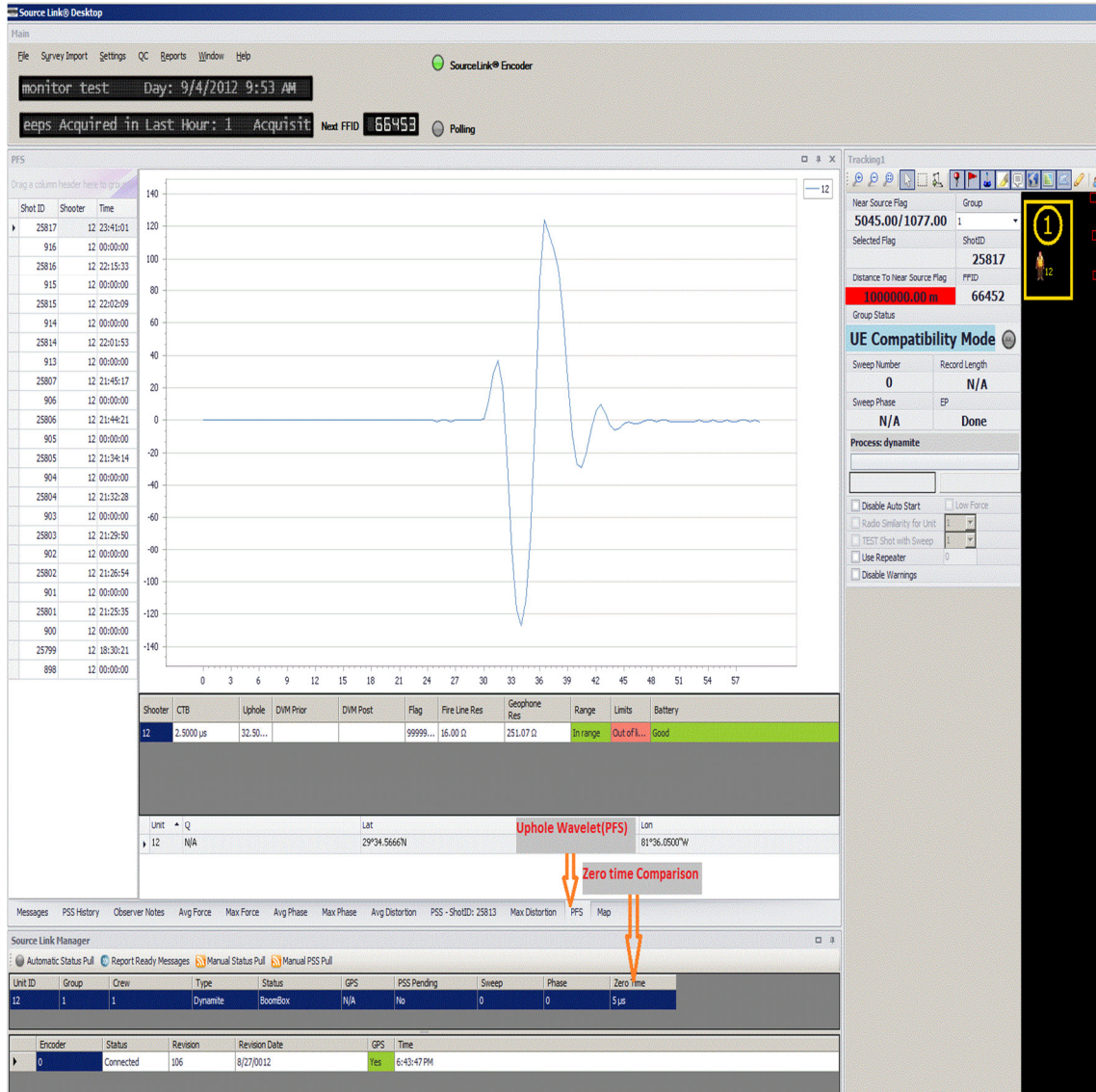
5.1.3 Setting Zero time and analyzing Uphole wavelet in SourceLink

The most accurate way is to use a Scope and Compare the UE2 and Boombox Time Break pulse.

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An alternative and slightly less accurate option is to just use the Zero time time value displayed in SourceLink ->SourceLink Manager window -> Unit number ->”Zero time” column. This should be closer to Zero (around +/- 10 us).

Eg: If the Zero time Diff in Source Link Manger is “+100 us”. Then Goto settings->Encoder and subtract 100 from the current Zero time Adjust value. This will bring the Time breaks closer



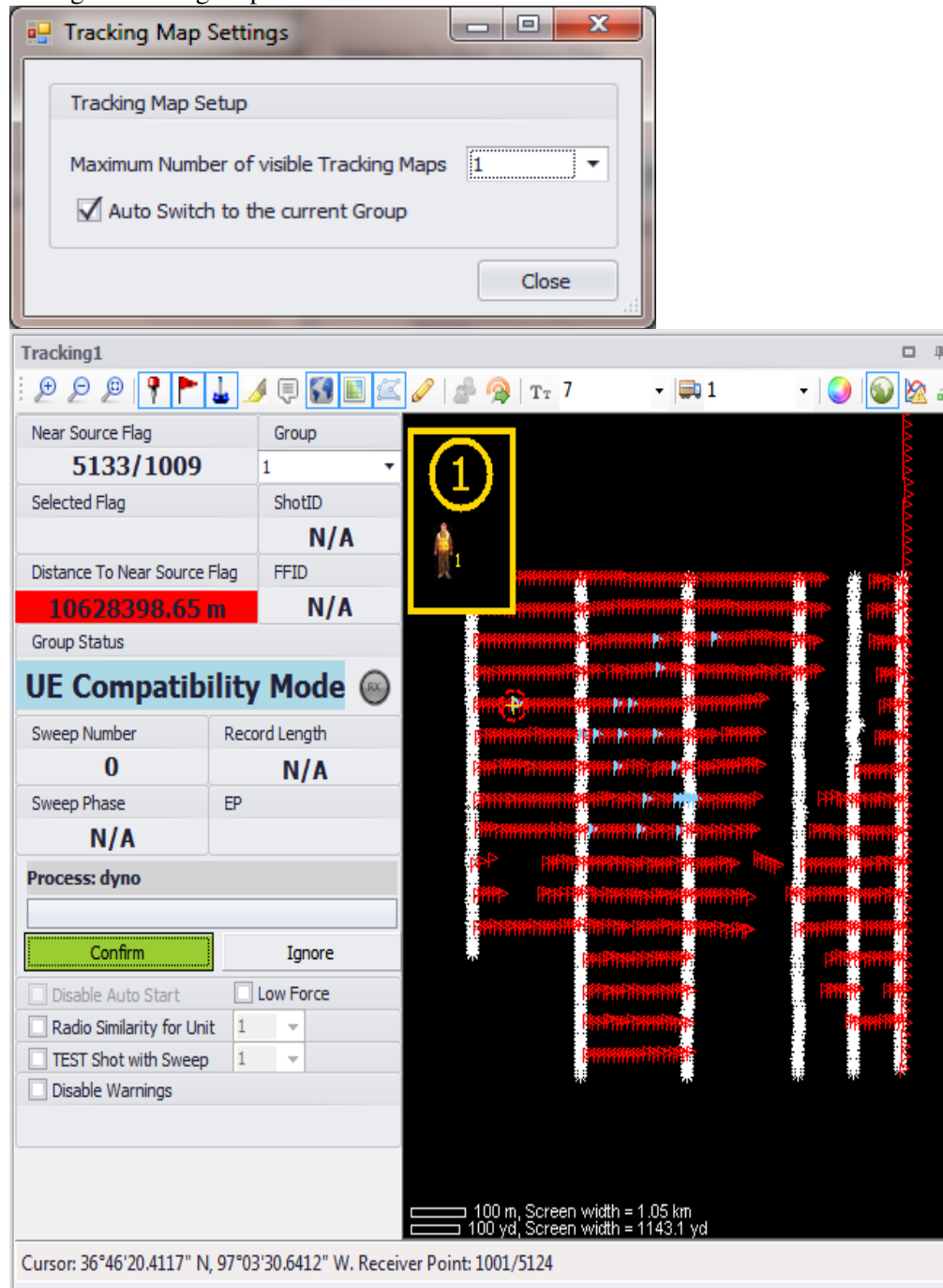
The PFS tab in SourceLink displays all the uphole,CTB,GPS information as displayed above

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5.1.4 SourceLink Tracking Map setup :

You can have multiple tracking window open (One window per Shooter) or Just have one master window open and SourceLink will automatically switch to that Shooter's Map when a "Ready" tone is sent from that Shooter.

Settings->tracking maps:



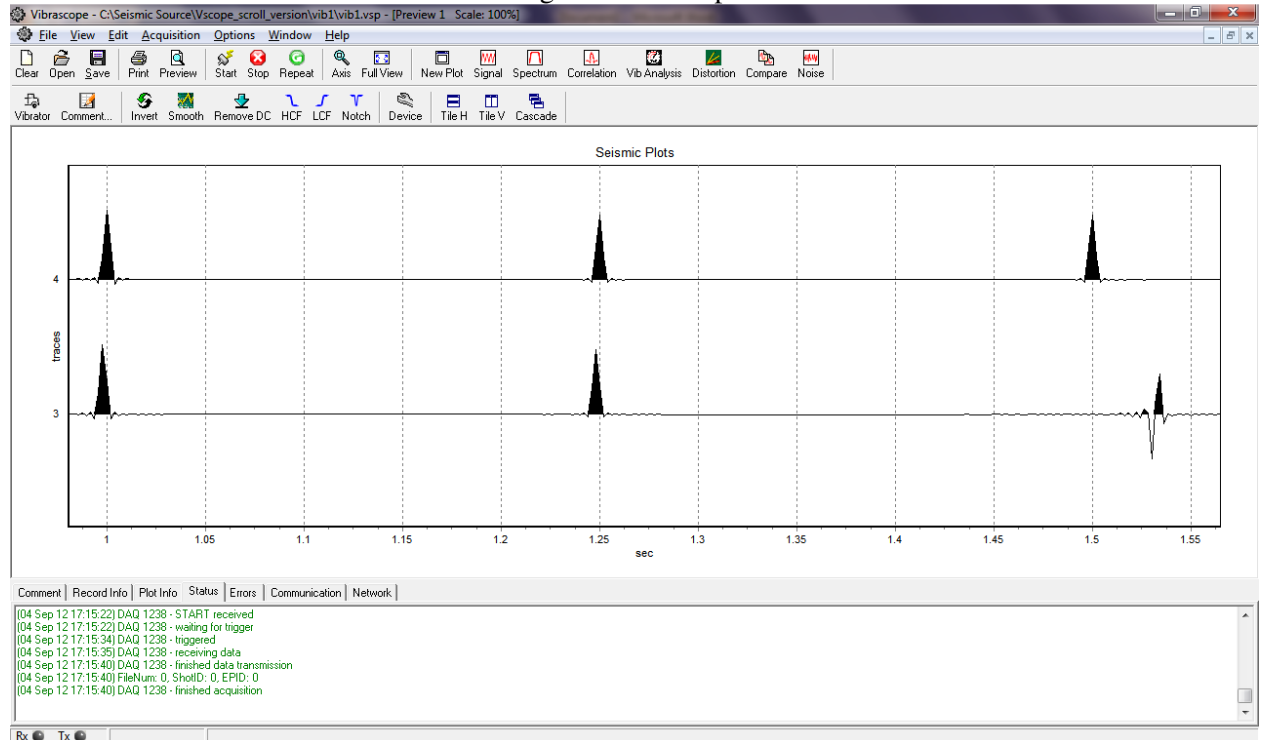
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5.1.5 Analog Pulse and Uphole output:

The **Radio Ref** output will Output Pulses at 1, 1.25 and 1.5 seconds from Time break.

The **Radio Sim** output will Output Time Break ,CTB,Uphole from the Boombox corresponding to the 1,1.25,1.5s references .Any minor adjustments for the 1 s pulse between encoder and decoder can be achieved by adjusting the similarity delay value.

Shown below is a record from recorder storing at a 2ms sample rate.



5.1.6 SEG-Y Uphole Storage:

For each dynamite shot a backup SEG-Y file is stored in UE-II flash card with the GPS Time, Source Point information of the shot and the Uphole Wavelet.

Universal Encoder II User Manual

6 Weight Drop Operation

6.1 Basic Configuration

6.1.1 Hardware Configuration:

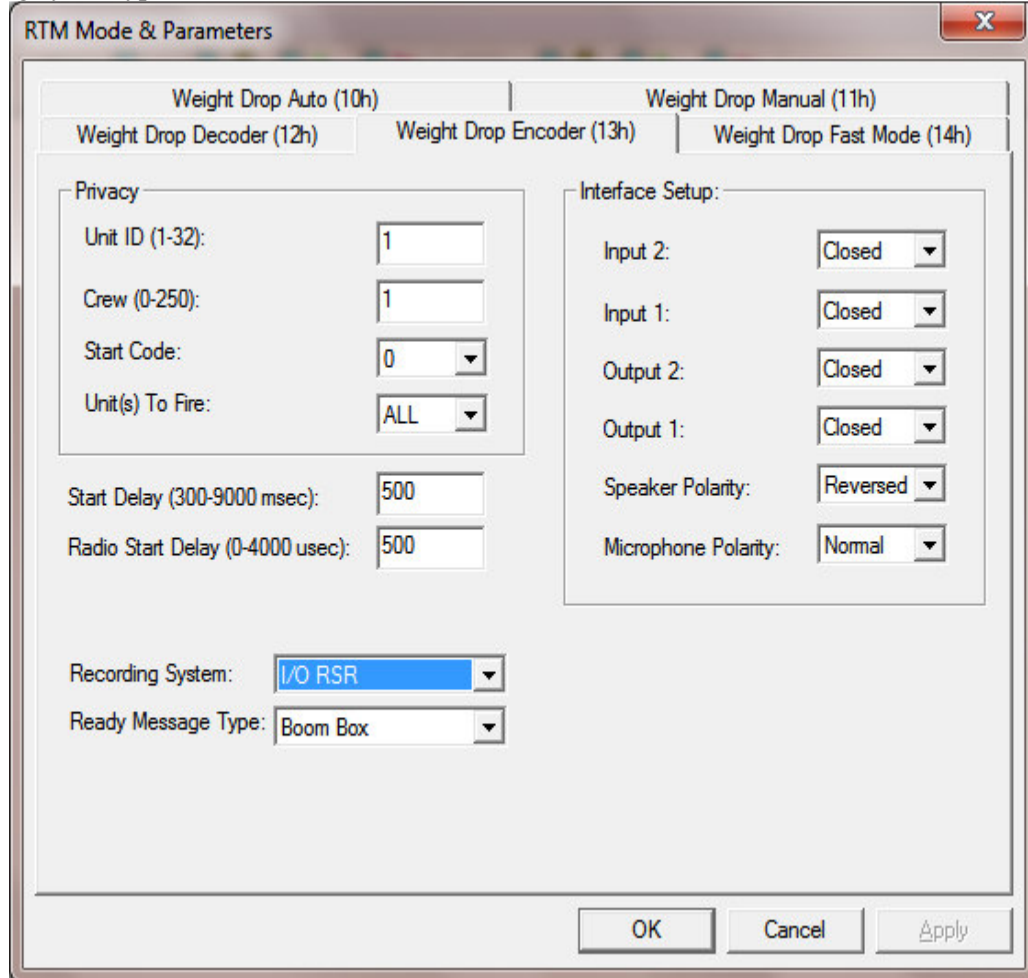
Connect the RTM Encoder to radio. The UE2 should be connected to RTM Encoder using the 25 pin and 9 pin cable.



Universal Encoder II User Manual

6.1.2 Setup for RTM Encoder:

Using RTM software set the RTM Encoder to standard configuration. Make sure the Recording system type is selected as shown below



RTM Mode & Parameters

Weight Drop Auto (10h) | Weight Drop Manual (11h)
 Weight Drop Decoder (12h) | **Weight Drop Encoder (13h)** | Weight Drop Fast Mode (14h)

Privacy

Unit ID (1-32): 1
 Crew (0-250): 1
 Start Code: 0
 Unit(s) To Fire: ALL

Start Delay (300-9000 msec): 500
 Radio Start Delay (0-4000 usec): 500

Interface Setup:

Input 2: Closed
 Input 1: Closed
 Output 2: Closed
 Output 1: Closed
 Speaker Polarity: Reversed
 Microphone Polarity: Normal

Recording System: I/O RSR
 Ready Message Type: Boom Box

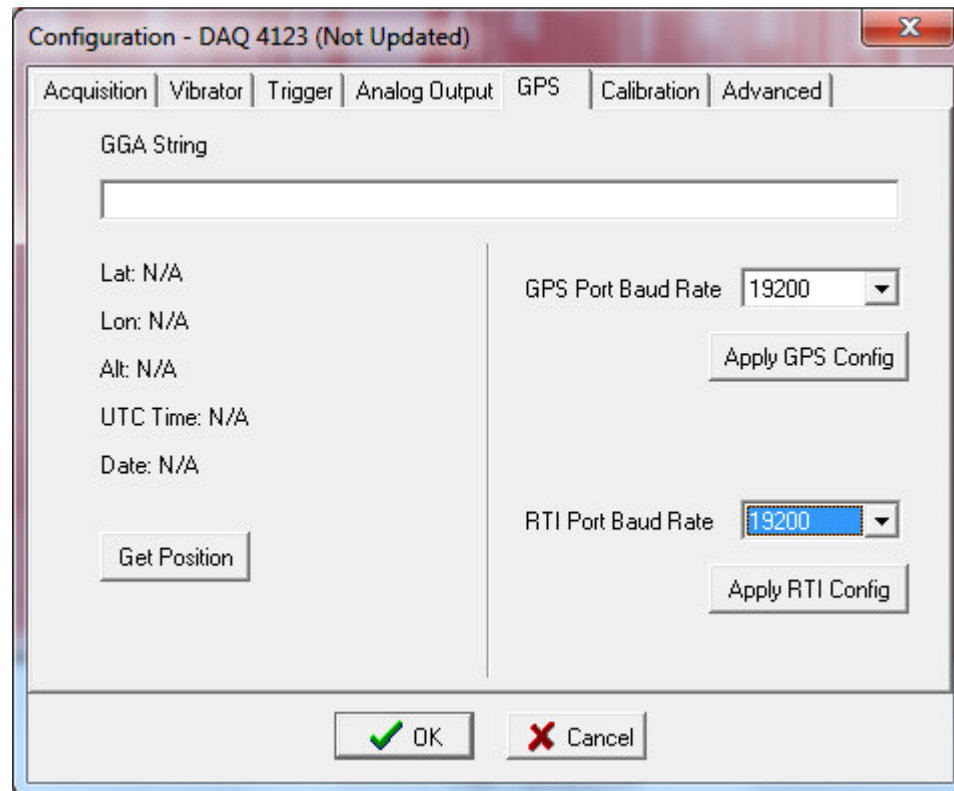
OK Cancel Apply

Universal Encoder II User Manual

6.1.3 Setup for UE2 hardware:

Set the baud rate of the RTI port in UE2 to 19200, in many cases this could be set to 57600 by default.

The configuration can be done using Vscope software.

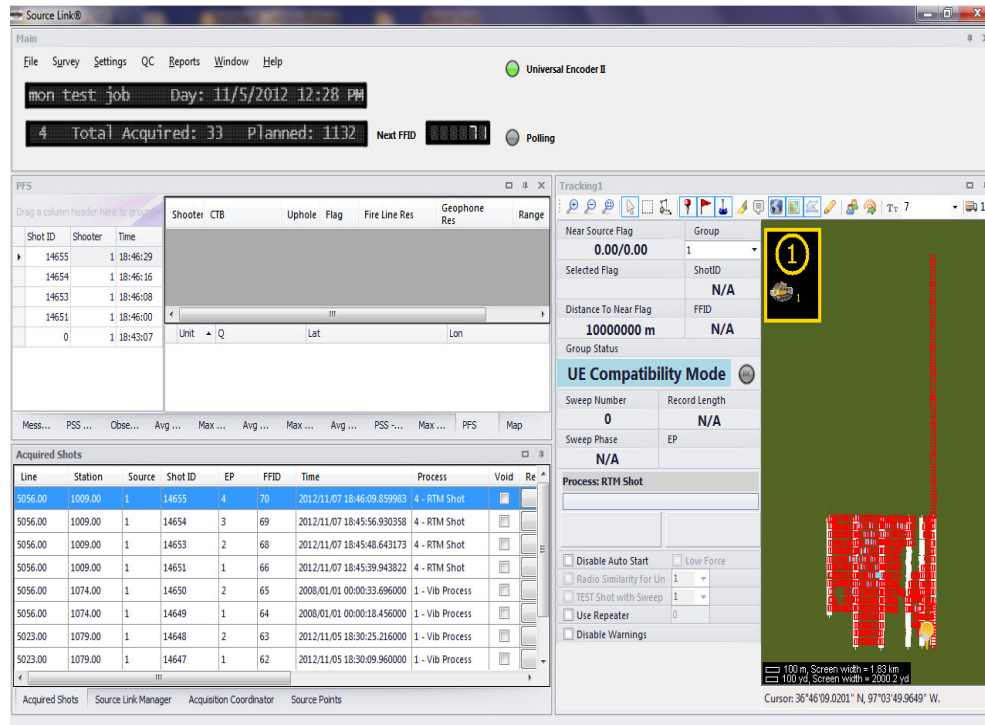


Universal Encoder II User Manual

6.2 SourceLink Software in Weightdrop Operation

SourceLink Software can be used as a Standalone Shooting System with Weightdrops. Which allows for the following:

- Import Sp1/SPS file or add Source Points manually
- Find Nearest Source point automatically
- Store the GPS time of the Event
- Store all QC information
- Export Reports and Map files.



The screenshot displays the SourceLink software interface. The top menu bar includes File, Survey, Settings, QC, Reports, Window, and Help. The main status bar shows 'mon test job', 'Day: 11/5/2012 12:28 PM', '4 Total Acquired: 33', 'Planned: 1132', 'Next FFD', and 'Polling'.

The interface is divided into several panes:

- PFS Pane:** Contains a table with columns: Shot ID, Shooter, Time, Shooter, CTB, Uphole, Flag, Fire Line Res, Geophone Res, and Range. The table lists several shots with their respective IDs and times.
- Tracking1 Pane:** Displays tracking information including 'Near Source Flag' (0.00/0.00), 'Selected Flag' (ShotID N/A), 'Distance To Near Flag' (10000000 m), 'Group Status' (UE Compatibility Mode), 'Sweep Number' (0), 'Record Length' (N/A), 'Sweep Phase' (N/A), and 'Process: RTH Shot'.
- Acquired Shots Table:** A detailed table listing acquired shots with columns: Line, Station, Source, Shot ID, EP, FFD, Time, Process, Void, and Re. The table shows a list of shots with their line numbers, station IDs, source IDs, shot IDs, event points (EP), FFD values, times, and processing status.
- Map View:** A map showing the location of the shots. A red line indicates the path of the shots. A yellow circle with the number 1 is visible on the map.

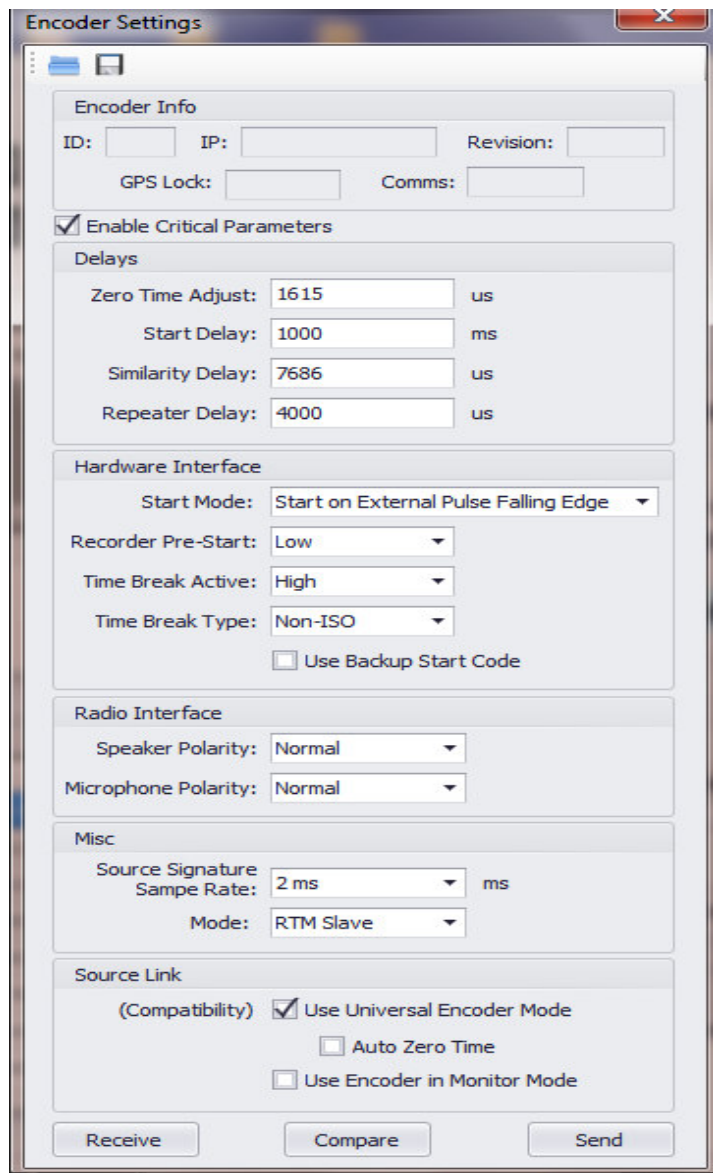
The bottom status bar shows 'Acquired Shots', 'Source Link Manager', 'Acquisition Coordinator', and 'Source Points'.

Universal Encoder II User Manual

6.2.1 Setting RTM task in SourceLink Software:

Encoder Settings:

Settings->Encoder settings and select the mode to “RTM Slave” mode. The Start mode should set to “Start on Falling Edge”.



The image shows the 'Encoder Settings' dialog box in the SourceLink software. The dialog is organized into several sections:

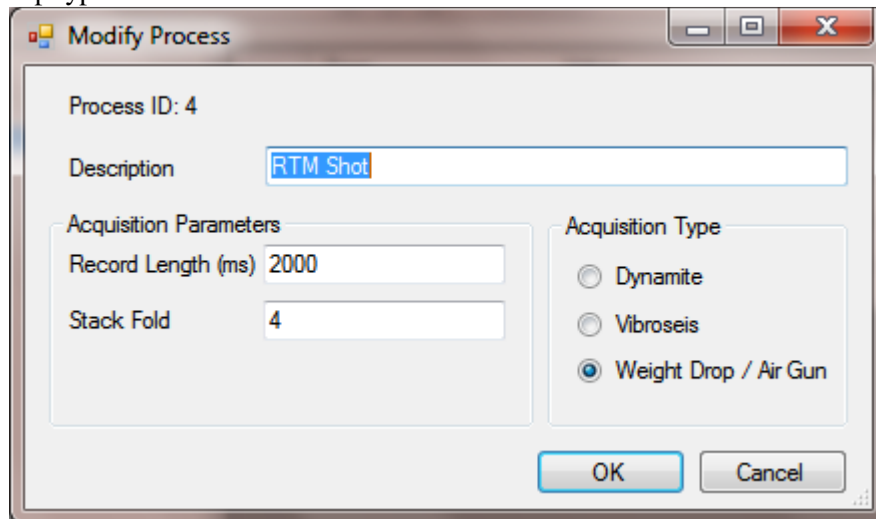
- Encoder Info:** Contains fields for ID, IP, Revision, GPS Lock, and Comms.
- Enable Critical Parameters:** A checked checkbox.
- Delays:** Contains four delay settings:
 - Zero Time Adjust: 1615 us
 - Start Delay: 1000 ms
 - Similarity Delay: 7686 us
 - Repeater Delay: 4000 us
- Hardware Interface:** Contains:
 - Start Mode: Start on External Pulse Falling Edge (dropdown)
 - Recorder Pre-Start: Low (dropdown)
 - Time Break Active: High (dropdown)
 - Time Break Type: Non-ISO (dropdown)
 - Use Backup Start Code: unchecked checkbox
- Radio Interface:** Contains:
 - Speaker Polarity: Normal (dropdown)
 - Microphone Polarity: Normal (dropdown)
- Misc:** Contains:
 - Source Signature Sample Rate: 2 ms (dropdown)
 - Mode: RTM Slave (dropdown)
- Source Link:** Contains:
 - (Compatibility) Use Universal Encoder Mode: checked checkbox
 - Auto Zero Time: unchecked checkbox
 - Use Encoder in Monitor Mode: unchecked checkbox

At the bottom of the dialog are three buttons: Receive, Compare, and Send.

Universal Encoder II User Manual

Process Setup:

In SourceLink Software, Select File->Process maintenance and create a new process as a Weightdrop type.



Modify Process

Process ID: 4

Description:

Acquisition Parameters

Record Length (ms)

Stack Fold

Acquisition Type

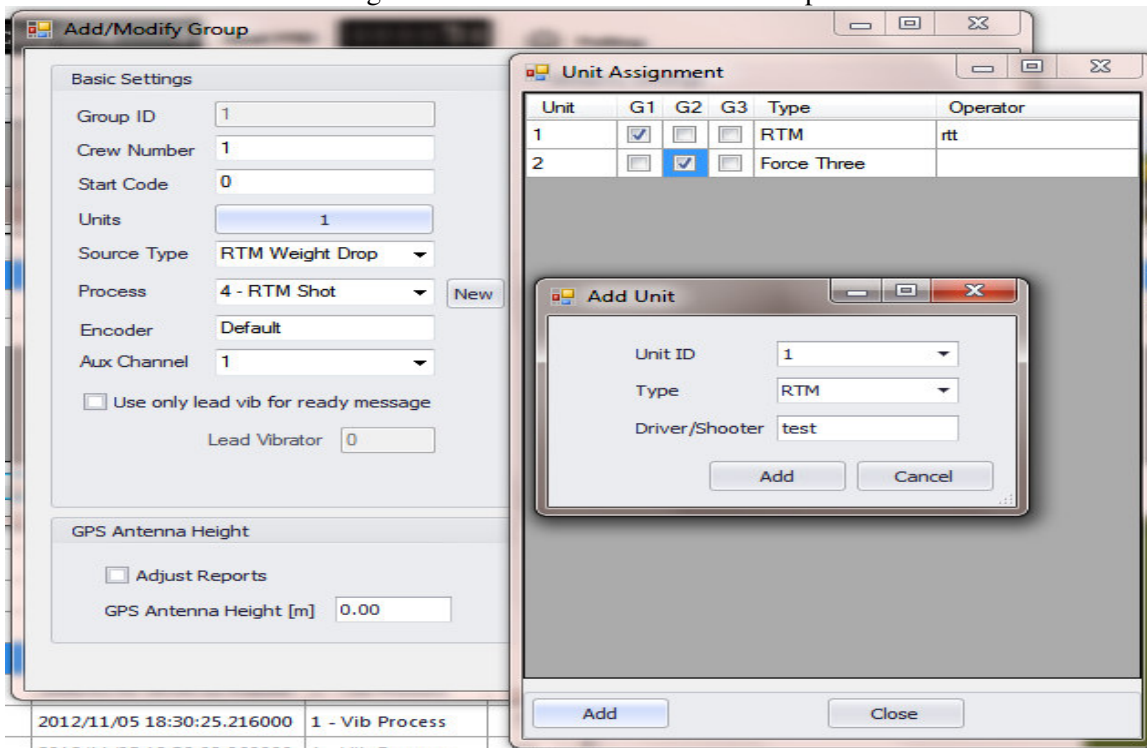
☐ Dynamite

☐ Vibroseis

☒ Weight Drop / Air Gun

Group Setup:

Select Settings->Group Settings and Set all the possible RTM decoder in the Group to the “Units” field and assign the Process to the process defined before.



Add/Modify Group

Basic Settings

Group ID

Crew Number

Start Code

Units

Source Type

Process

Encoder

Aux Channel

☐ Use only lead vib for ready message

Lead Vibrator

GPS Antenna Height

☐ Adjust Reports

GPS Antenna Height [m]

Unit Assignment

Unit	G1	G2	G3	Type	Operator
1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	RTM	rtt
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Force Three	

Add Unit

Unit ID

Type

Driver/Shooter

Universal Encoder II User Manual

6.2.2 SourceLink Weightdrop Operation Sequence

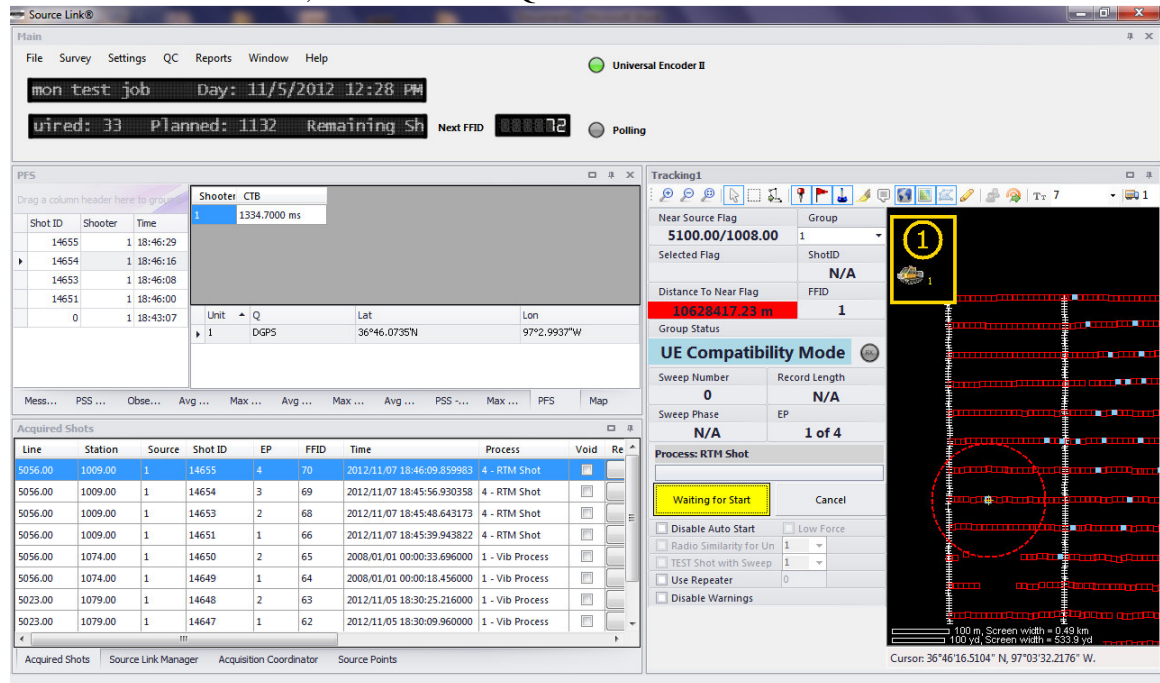
Shot points:

Import the SP1/SPS files using the Script import wizard.

Line/Stations can also be added manually(Right Click on the Map and Add Source Flags)

Manual Shot Selection mode:

In this mode user can Highlight and Fire a specific Line/Station .Once the fire button is pressed, SourceLink will wait for the start intimation from the Weightdrop units thorough radio.After each hit the GPS time of the shot ,Line/Station and QC information will be stored.



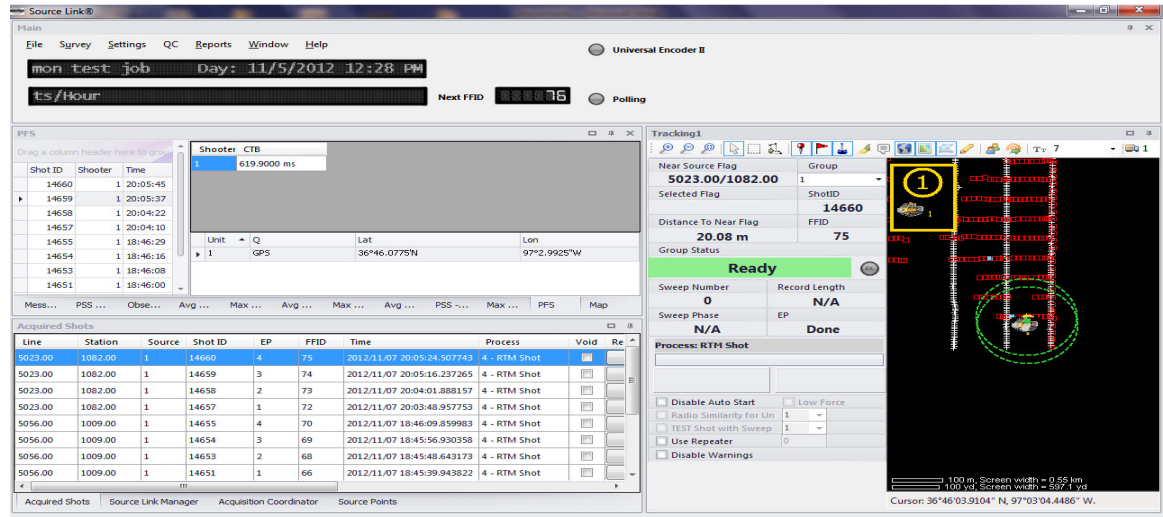
The screenshot displays the SourceLink software interface. The main window shows a map with a grid of points. A yellow circle highlights a specific point on the map. The 'Tracking1' panel on the right shows the 'Near Source Flag' as 5100.00/1008.00, 'Selected Flag' as N/A, and 'Distance To Near Flag' as 10628417.23 m. The 'UE Compatibility Mode' panel shows 'Sweep Number' as 0, 'Record Length' as N/A, and 'Sweep Phase' as N/A. The 'Process: RTM Shot' panel shows 'Waiting for Start' and 'Cancel' buttons. The 'Acquired Shots' table at the bottom lists various shots with columns for Line, Station, Source, Shot ID, EP, FFID, Time, Process, and Void.

Line	Station	Source	Shot ID	EP	FFID	Time	Process	Void	Re
5056.00	1009.00	1	14655	4	70	2012/11/07 18:46:09.859883	4 - RTM Shot		
5056.00	1009.00	1	14654	3	69	2012/11/07 18:45:56.930358	4 - RTM Shot		
5056.00	1009.00	1	14653	2	68	2012/11/07 18:45:48.643173	4 - RTM Shot		
5056.00	1009.00	1	14651	1	66	2012/11/07 18:45:39.943822	4 - RTM Shot		
5056.00	1074.00	1	14650	2	65	2008/01/01 00:00:33.696000	1 - Vib Process		
5056.00	1074.00	1	14649	1	64	2008/01/01 00:00:18.456000	1 - Vib Process		
5023.00	1079.00	1	14648	2	63	2012/11/05 18:30:25.216000	1 - Vib Process		
5023.00	1079.00	1	14647	1	62	2012/11/05 18:30:09.960000	1 - Vib Process		

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Automatic Shot Selection mode:

In this mode SourceLink will pick the nearest Line and Station based on the GPS position information from the weightdrop sent through radio. The Tolerance distance can be adjusted using Settings->Distances.



SourceLink®

Main

File Survey Settings QC Reports Window Help

mon test job Day: 11/5/2012 12:28 PM

Next FFID 76

Polling

PFS

Drag a column header here to group

Shot ID	Shooter	Time
14660	1	20:05:45
14659	1	20:05:37
14658	1	20:04:22
14657	1	20:04:10
14655	1	18:46:29
14654	1	18:46:16
14653	1	18:46:08
14651	1	18:46:00

Shooter: CTB

619.9000 ms

Unit Q Lat Lon

GPS 36°46.0775N 97°2.9925W

Tracking1

Near Source Flag 5023.00/1082.00

Selected Flag 14660

Distance To Near Flag 20.08 m

FFID 75

Group Status Ready

Sweep Number 0

Record Length N/A

Sweep Phase N/A

EP Done

Process: RTM Shot

Disable Auto Start Low Force

Radio Similarity for Un 1

TEST Shot with Sweep 1

Use Repeater 0

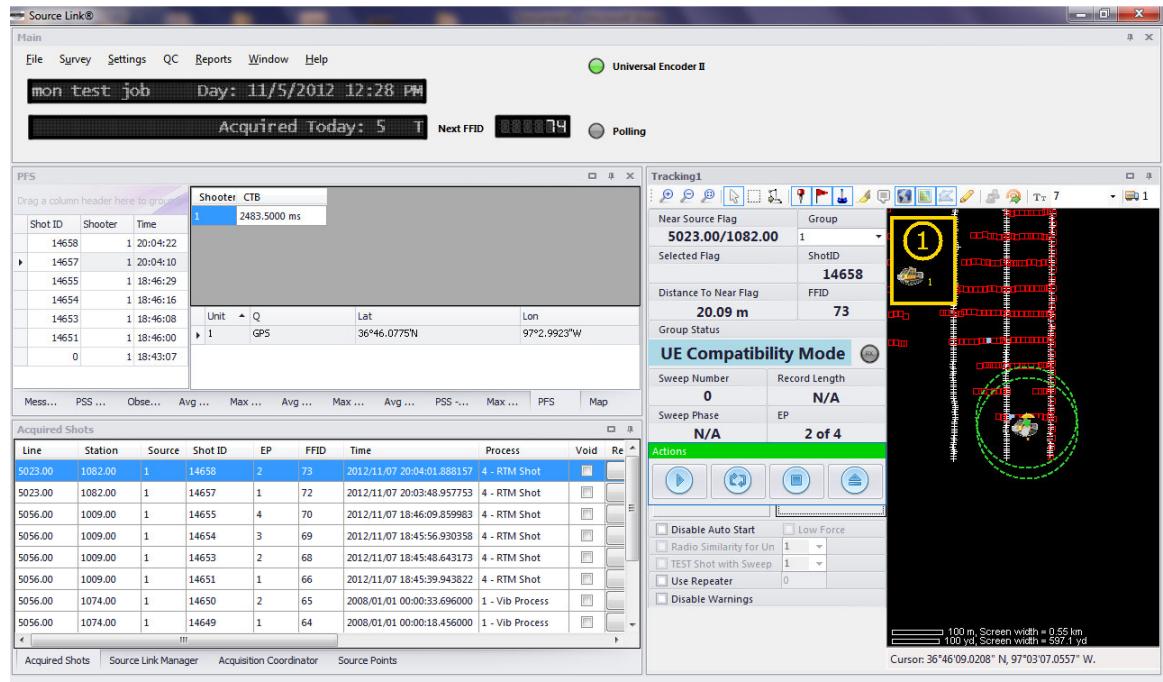
Disable Warnings

Map

100 m, Screen width = 0.55 km

100 yd, Screen width = 597.1 yd

Cursor: 36°46'03.9104" N, 97°03'04.4486" W



SourceLink®

Main

File Survey Settings QC Reports Window Help

mon test job Day: 11/5/2012 12:28 PM

Acquired Today: 5

Next FFID 74

Polling

PFS

Drag a column header here to group

Shot ID	Shooter	Time
14658	1	20:04:22
14657	1	20:04:10
14655	1	18:46:29
14654	1	18:46:16
14653	1	18:46:08
14651	1	18:46:00
0	1	18:43:07

Shooter: CTB

2483.5000 ms

Unit Q Lat Lon

GPS 36°46.0775N 97°2.9923W

Tracking1

Near Source Flag 5023.00/1082.00

Selected Flag 14658

Distance To Near Flag 20.09 m

FFID 73

Group Status UE Compatibility Mode

Sweep Number 0

Record Length N/A

Sweep Phase N/A

EP 2 of 4

Process: RTM Shot

Disable Auto Start Low Force

Radio Similarity for Un 1

TEST Shot with Sweep 1

Use Repeater 0

Disable Warnings

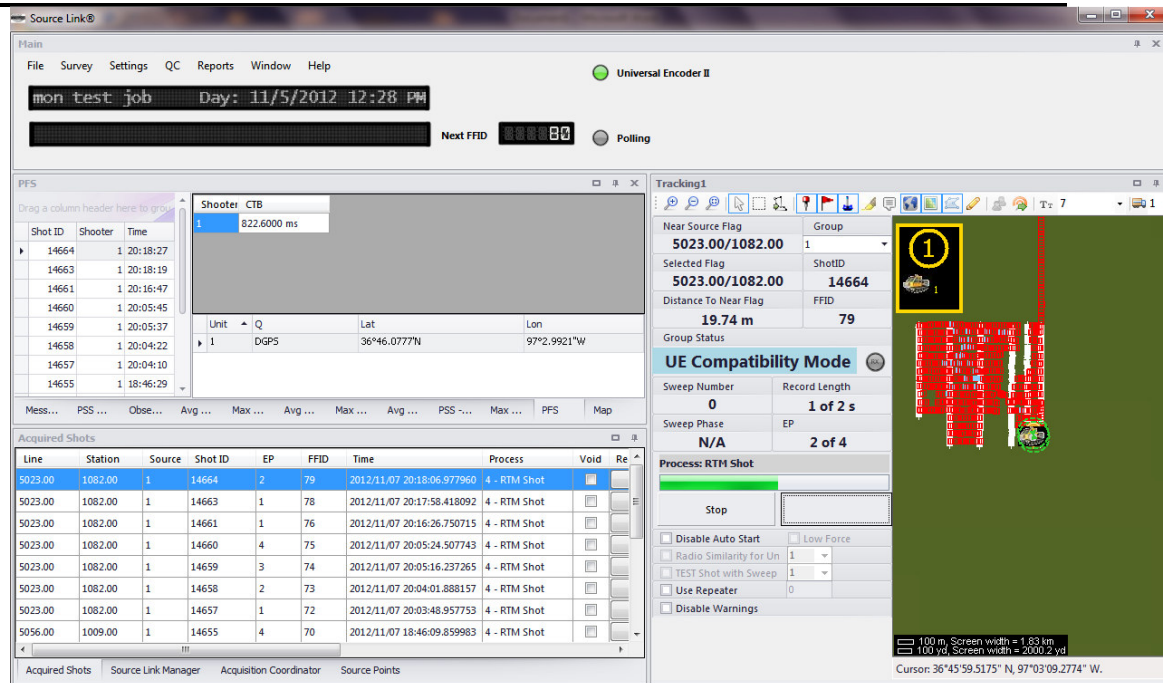
Map

100 m, Screen width = 0.55 km

100 yd, Screen width = 597.1 yd

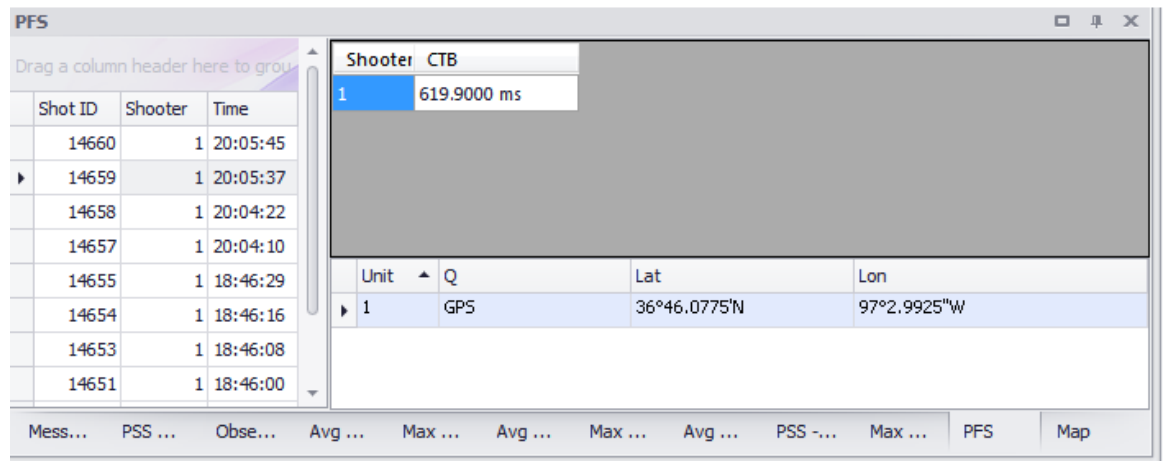
Cursor: 36°46'09.0208" N, 97°03'07.0557" W

Universal Encoder II User Manual



QC Information (PFS report):

After each shot the PFS report containing the Mechanical Delay and GPS position values will be stored.



RTM Shot timing:

Weight drop event's GPS time will be stored in both in SourceLink and in the UE-II flash card as a backup.

The timing of the Actual Weight drop event can be obtained from the Time Break time in UE-II, by offsetting to - 20 milliseconds.

$$T_{event} = T_{timebreak} - 20ms$$

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7 UE2/Force III support software

7.1 Data Collector – TDMA/Force III signature downloads

DATA DOWNLOAD (Using Data Collector Software):

Ethernet Setup (Important!!) Make sure the laptop used for data download has the Ethernet setup configured. The laptop needs to have the Ethernet setup in 10.x.x.x network and firewall disabled.

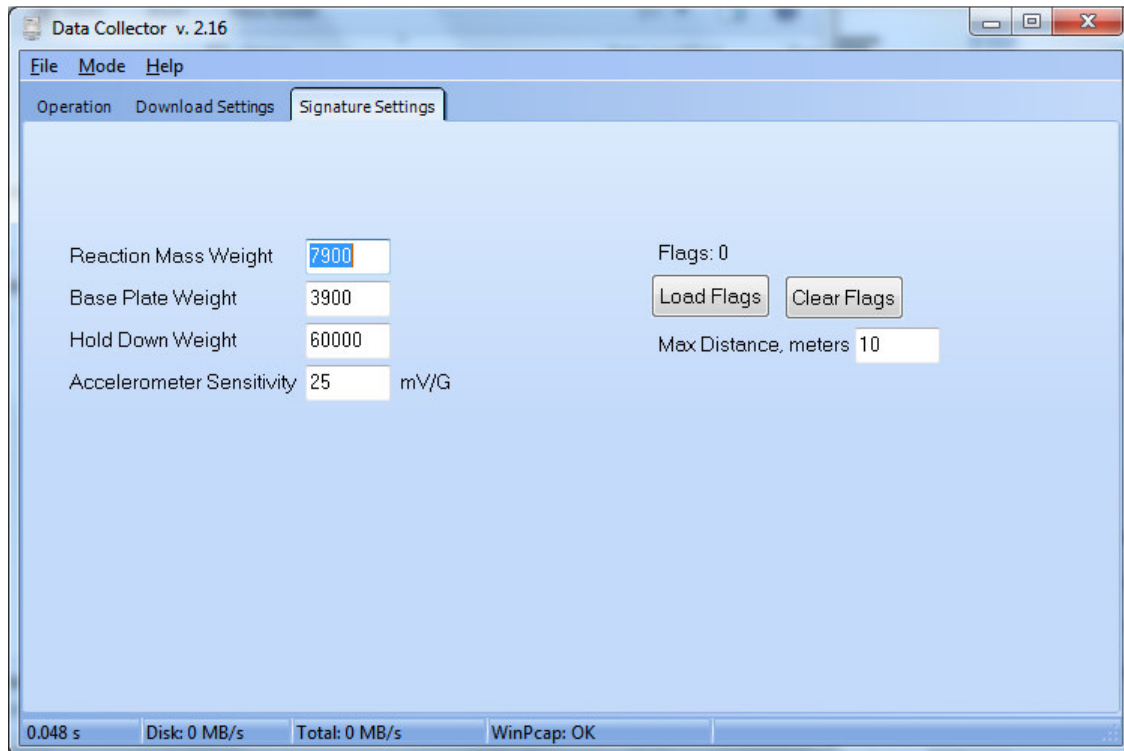
Data Download process:

Open Data Collector Software.

Before connecting the Ethernet cable to the TDMA Encoder/Decoder from the computer, assign the setup information in the Data Collector Software.

Signature Settings:

Select the Signature Settings tab and assign the Reaction mass, base plate and hold down weights based on the vibrators used.

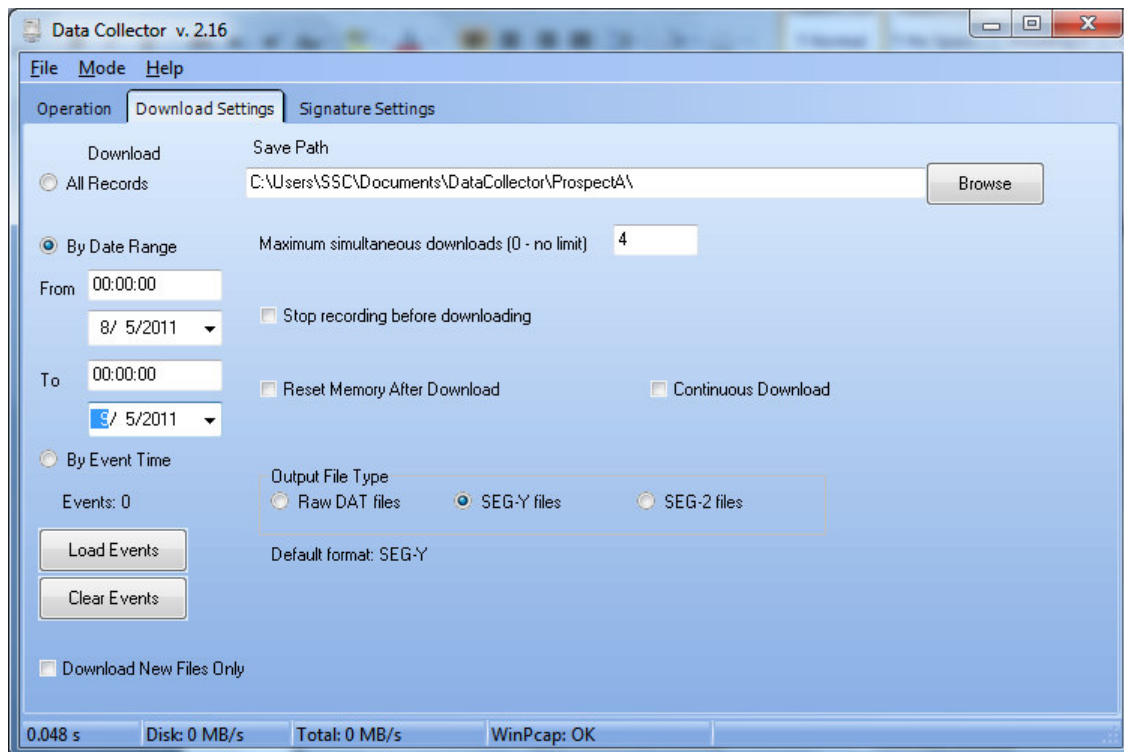


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Download Settings:

Select the download settings tab.

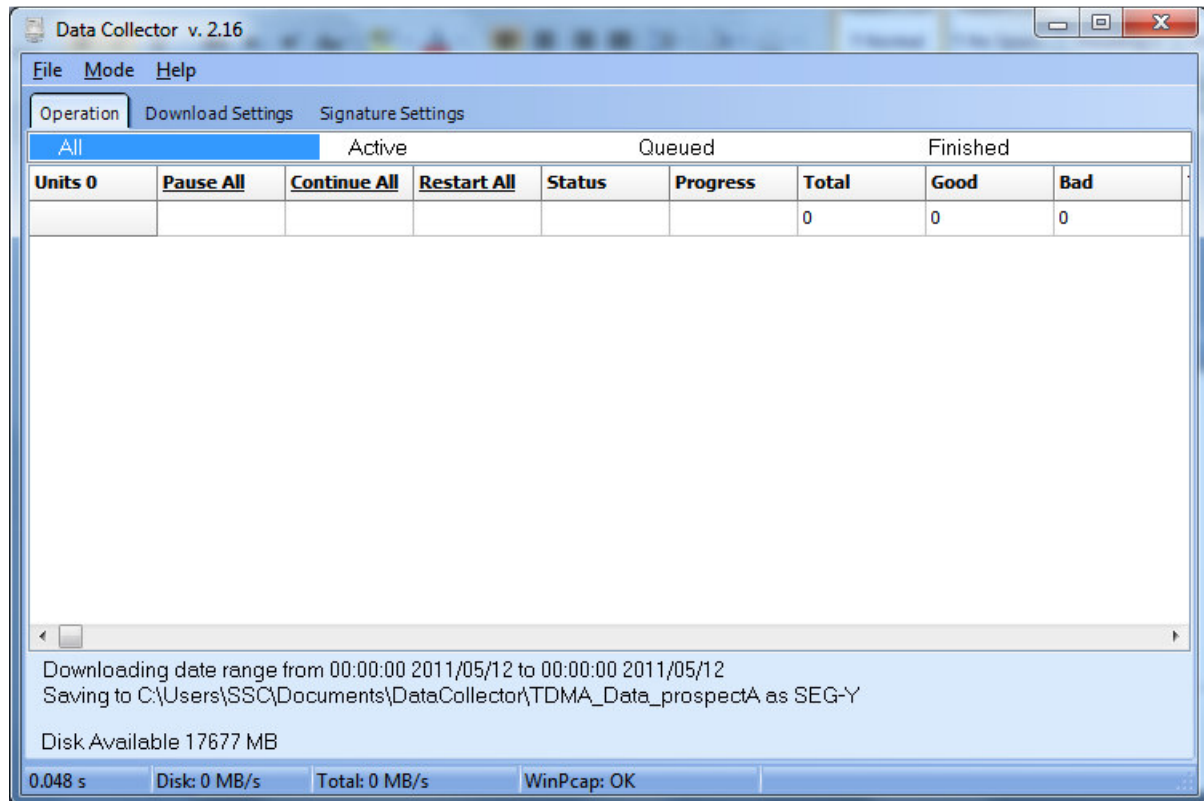
1. Choose the File download location, by clicking the “Browse” option in save path.
2. It is preferable to uncheck the “reset memory after download” and “Download new files only”.
3. To download all records over a given time window, select the “By Date Range” option and choose the Start /End dates and times for download. Note: The times are in UTC time zone.
4. The SourceLink software can provide an “ASI” file. This file describes the times for the given shots. Using by Event Time option to use the ASI file downloads.



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Download Operation:

1. Connect the Laptop to the TDMA unit and open the operation tab, make sure the Unit number (eg.4012) shows up in the “Units” column .If not check the Ethernet connection again.



2. After the Unit number shows up in the “Units” Column, press the” Restart All” Button.
3. Now the Progress will show a progress bar displaying the % of data downloaded. If the unit # of the connected unit is displayed on the “Units” Section but the progress didn’t go through after the “restart” download. Check the date & download settings.
4. Check the Status and progress. When the download process is complete, the “Total” and “Good” columns will reflect the number of records downloaded.
5. Downloaded files can be located at the Folder location specified in the “Download Settings”.
6. The files are organized with Folder:”...\..\YEAR_MONTH_DAY\UNIT_NUMBER”
7. Channel Assignment:
The SEG-Y records downloaded from the TDMA has the following traces.

Decoder:

- Trace 1: Reaction mass
- Trace 2: Base Plate
- Trace 3: True Reference
- Trace 4: Time Break
- Trace 5: Ground Force

Encoder:

- Trace 1: Digital True reference

8. Format TDMA/UE-II Flash Card (Using Sigma-setup software):

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7.2 Sigma Setup – Formatting or resetting signature data

The signature data in the UE2, TDMA decoders or Force III electronics is stored on a CF card in the unit.

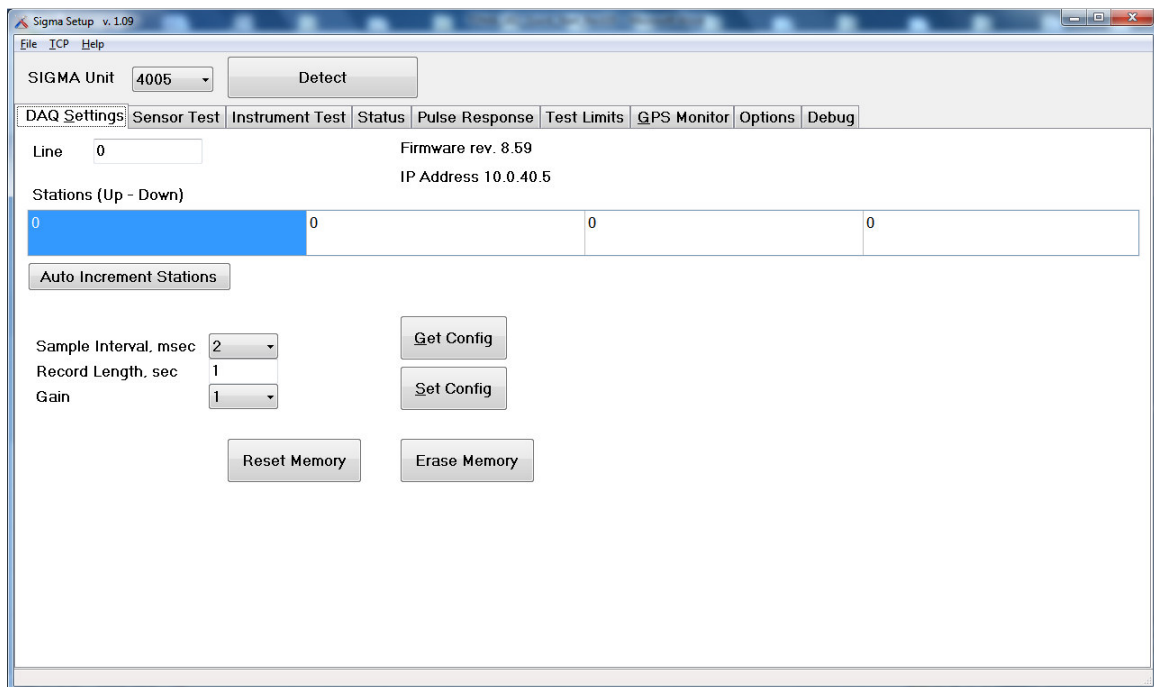
This CF card can be reset or erased. The Erase function is the same as formatting the CF card.

Normally the Formatting or Resetting is not required.

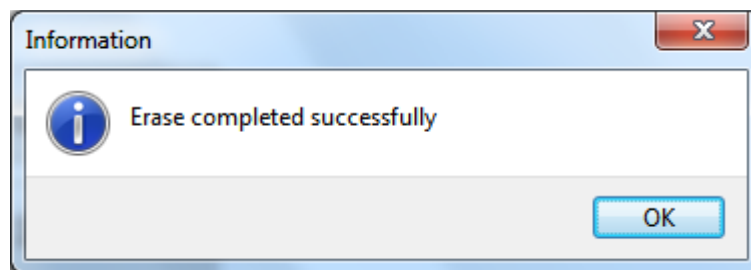
To Format or Reset the CF card. Connect the TDMA unit (encoder/decoder) to the computer using an Ethernet cable and open Sigma Setup Software.

The following screen will appear. With the Box number appearing in the Sigma Unit field (e.g. 4005 below)

If the Box number does not appear in the window, then double-check the network settings.



Once the Box ID is detected, press the “Erase Memory” button, and select “OK”, and within a few seconds the following confirmation window will appear:



Now reboot the TDMA/UE-II unit.

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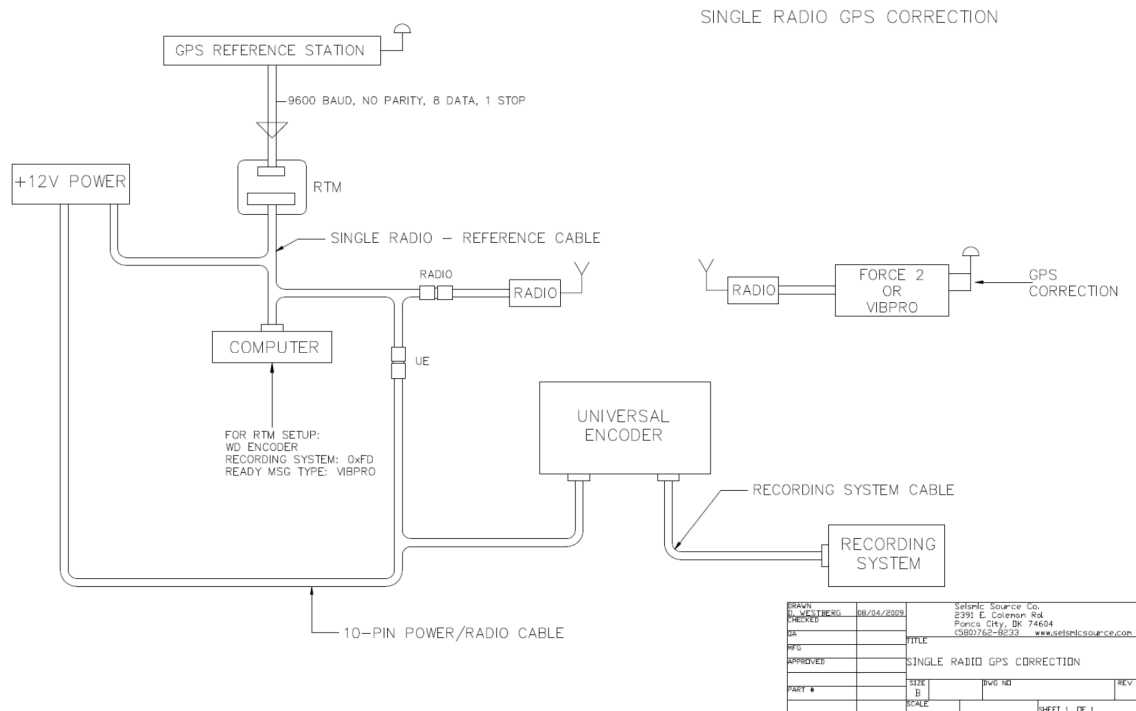
8 SSC GPS Corrections in Single Radio Mode

8.1 Requirements:

- Minimum firmware levels:
 - Force Two Communication Board Hitachi – 2.17 or later.
 - Force III DSP firmware - 14.62 or later
 - RTM firmware – 2.1.1.35C or later.
- RTM with 9-pin connector.
- GPS reference station capable to transmit correction data at 9600 BAUD.
- Single Radio Mode will work with Force 2, Force III or VibPro decoders.

8.2 Operation:

The RTM is connected to the GPS reference station through the 9-pin port. The Universal Encoder (1 and II) radio connector is connected to the RTM radio connector below labeled UE. The RTM cable is connected directly to the radio.



The RTM unit listens to the Universal Encoder sending radio data and waits for a radio start code without similarity enabled. Then the RTM waits approximately 1.5 seconds after the start code and sends the correction twice on the radio. The RTM unit will turn on the middle led when it sends out a correction on the radio. The Force Two receives the correction and sends the data out the GPS port to the GPS receiver.

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Note: In some situations, the RTM may send short data transmissions that do not contain GPS reference station data. If this happens, the GPS receivers in the vibs will not go into the differential mode. This could be caused by improper keyboard entries, no GPS reference station data, etc. The transmissions with no data will be about ½ second long. If the GPS reference station data is being transmitted, the transmissions will be about 1 second long or longer. It may be necessary to listen to the transmission using a second radio to estimate how long the transmissions are. On some ratios, one can tell by looking at the transmit indicator on the front of the radio.

RTM setup:

1. BB Hammer Encoder mode
2. Recording System Type hex value - FD
3. Ready Message Type – VibPro
4. Microphone polarity will have to be determined by the user which works best.

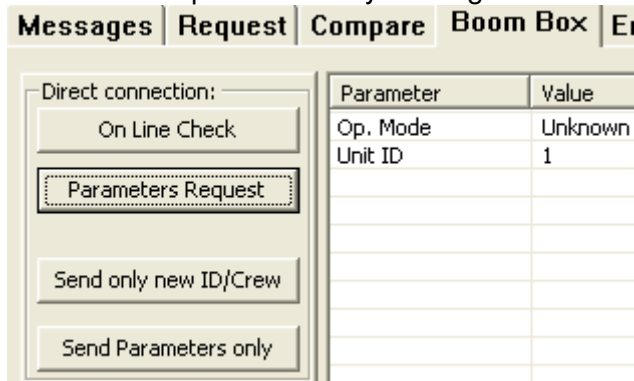
8.3 Changing the RTM Configuration Settings:

To change program settings on the RTM, use the BBview program from the Seismic Source Company. Read below how to change the radio polarity.

1. Connect computer to the RTM unit through the “Computer” 9-pin port on the 25-pin RTM cable.
2. Power up the RTM unit up.
3. Start BBview.
4. Select the Boom Box tab, in the lower part of the BBview window.

Note: If there is no Boom Box tab visible, do these steps:

 - a. Click on View at the top of the BBview window.
 - b. Move the cursor to the words “Advanced Tabs” and a window with a list of options should appear.
 - c. Click on the Boom Box item
 - d. Repeat steps a through c, clicking on the Encoder item.
 - e. You may repeat until all items are checked, but only Boom Box and Encoder will be used in this procedure.
 - f. When the desired Advanced Tabs have been selected, exit the BBview program and restart it. After doing this, the selected tabs should be visible.
5. Download the parameters by clicking on the Parameters Request button.



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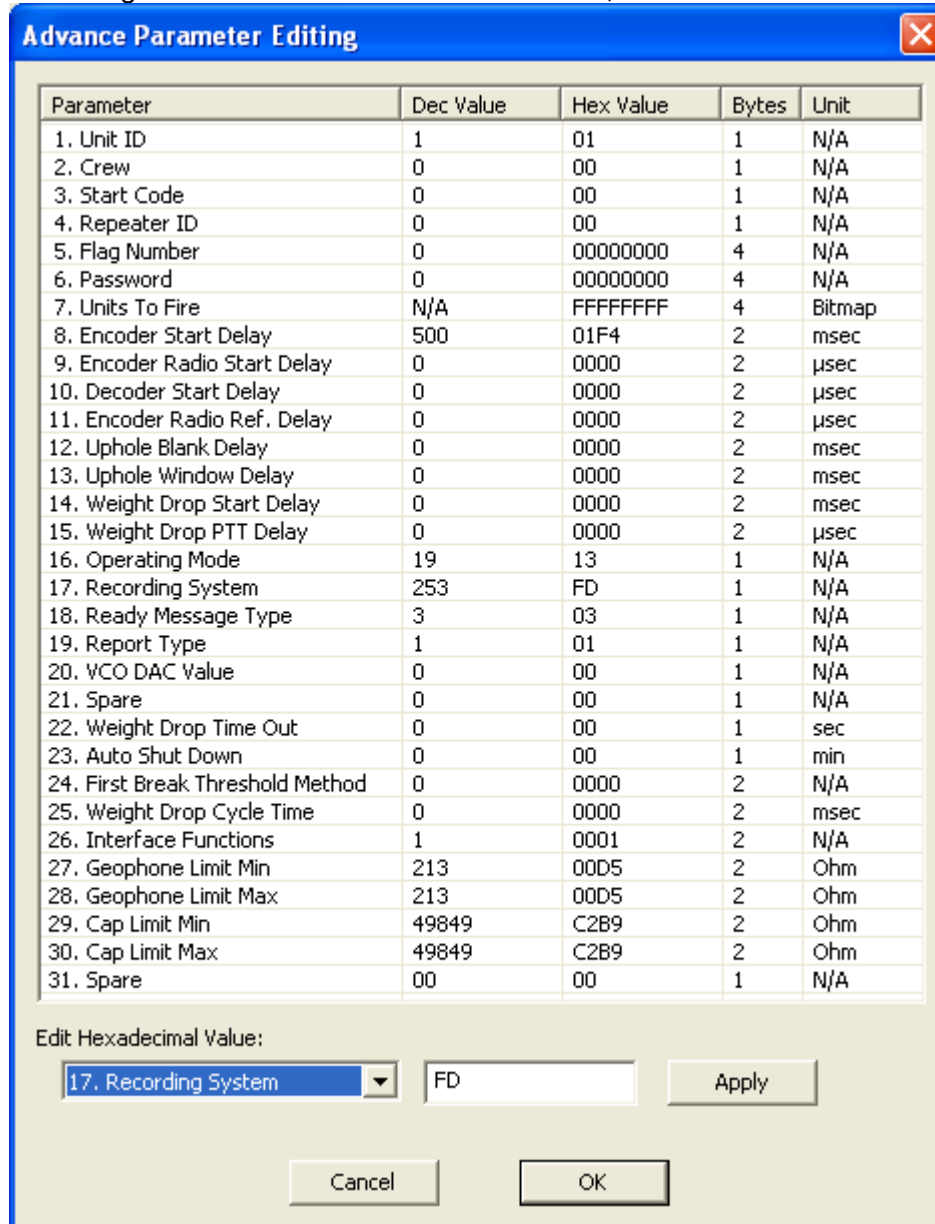
6. Select the Encoder tab.
7. Set the Mode to BB Hammer Encoder.
8. Set Microphone Polarity as necessary for the Force 2 to receive the information.
(Note: With some radios, if Microphone Polarity is set to the wrong value, the decoders' GPS receivers will not go into the differential mode at all or they may intermittently go into the differential mode. Some radios work best with the Normal selection. Some radios work best with the Reverse selection.)

Messages	Request	Compare	Boom Box	Encoder	Decoder	WDC	Master	Monitor	Spy
<div> <div> Privacy Settings: Unit ID(1-32) <input type="text" value="1"/> Crew (0-250) <input type="text" value="0"/> Start Code <input type="text" value="0"/> Units to Fire <input type="text" value="All"/> </div> <div> Timing Settings: Start Delay (500-10000 msec) <input type="text" value="500"/> Radio Start Delay (0-4000 µsec) <input type="text" value="0"/> Radio Ref. Delay (0-4000 µsec) <input type="text" value="0"/> </div> <div> Hardware Interface Settings: GPS PPS Active <input type="text" value="Low"/> Recorder Start Active <input type="text" value="Low"/> Time Break Active <input type="text" value="Low"/> Remote Start Active <input type="text" value="Low"/> Speaker Polarity <input type="text" value="Normal"/> Microphone Polarity <input type="text" value="Reversed"/> </div> </div> <div> <div> Interface: Recording system: <input type="text" value="Sercel"/> Ready Message: <input type="text" value="Vib Pro"/> </div> <div> Mode: <input type="text" value="BB Hammer Encoder"/> <input type="button" value="Save"/> <input type="button" value="Save and Send"/> </div> </div>									

9. Click on Save.
10. Click on the Boom Box Tab.
11. Click on Setup, at the top of the BBview window and then click on Advanced Parameter Editor.
12. In the left "Edit Hexadecimal Value" window near the bottom of the Advanced Parameters Editing window, Select 17. Recording System.

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13. In the right "Edit Hexadecimal Value" window, Enter FD.



Advance Parameter Editing

Parameter	Dec Value	Hex Value	Bytes	Unit
1. Unit ID	1	01	1	N/A
2. Crew	0	00	1	N/A
3. Start Code	0	00	1	N/A
4. Repeater ID	0	00	1	N/A
5. Flag Number	0	00000000	4	N/A
6. Password	0	00000000	4	N/A
7. Units To Fire	N/A	FFFFFFFF	4	Bitmap
8. Encoder Start Delay	500	01F4	2	msec
9. Encoder Radio Start Delay	0	0000	2	µsec
10. Decoder Start Delay	0	0000	2	µsec
11. Encoder Radio Ref. Delay	0	0000	2	µsec
12. Uphole Blank Delay	0	0000	2	msec
13. Uphole Window Delay	0	0000	2	msec
14. Weight Drop Start Delay	0	0000	2	msec
15. Weight Drop PTT Delay	0	0000	2	µsec
16. Operating Mode	19	13	1	N/A
17. Recording System	253	FD	1	N/A
18. Ready Message Type	3	03	1	N/A
19. Report Type	1	01	1	N/A
20. VCO DAC Value	0	00	1	N/A
21. Spare	0	00	1	N/A
22. Weight Drop Time Out	0	00	1	sec
23. Auto Shut Down	0	00	1	min
24. First Break Threshold Method	0	0000	2	N/A
25. Weight Drop Cycle Time	0	0000	2	msec
26. Interface Functions	1	0001	2	N/A
27. Geophone Limit Min	213	00D5	2	Ohm
28. Geophone Limit Max	213	00D5	2	Ohm
29. Cap Limit Min	49849	C2B9	2	Ohm
30. Cap Limit Max	49849	C2B9	2	Ohm
31. Spare	00	00	1	N/A

Edit Hexadecimal Value:

17. Recording System

14. Click on Apply and then OK.

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15. Click on Send Parameters only.

Messages	Request	Compare	Boom Box	Enc
Direct connection:				
On Line Check				
Parameters Request				
Send only new ID/Crew				
Send Parameters only				
		Parameter	Value	
		Op. Mode	Unknown	
		Unit ID	1	

16. The new microphone polarity is now in the RTM.

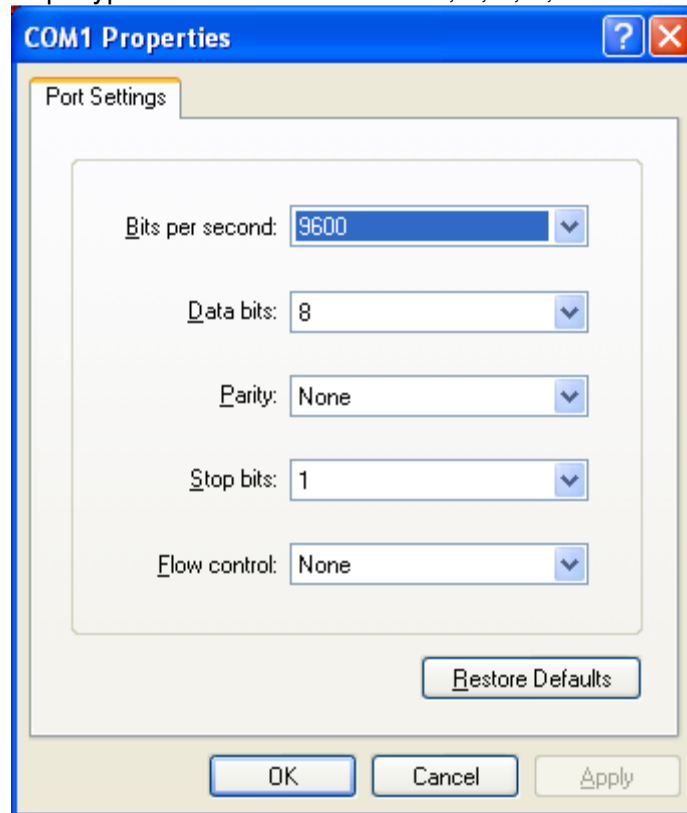
8.4 NovAtel GPS Receiver Setup Notes:

1. NovAtel programs such as CDU or GPSOLUTIONS4 can be used to program, troubleshoot, and check the status of NovAtel GPS receivers. These programs are available from the NovAtel web site or on software CDs typically supplied with NovAtel receivers.
2. The following procedures describe using HyperTerminal, a program supplied with Windows XP and older operating systems. HyperTerminal is usually found in the Start/All Programs/Accessories/Communications window. HyperTerminal can be used to program a NovAtel receiver as a reference station or rover (vib unit).
3. The commands listed below are the same commands that should be used if using a NovAtel program.
4. NovAtel recommends doing a FRESET (Factory Reset) when changing a receiver from rover to reference station or from reference station to rover.
5. After a FRESET the NovAtel receiver must reload the almanac. This may take up to 15 minutes after satellite reception is established, before it can start functioning as a rover or as a reference station.

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8.5 NovAtel Reference Station Setup:

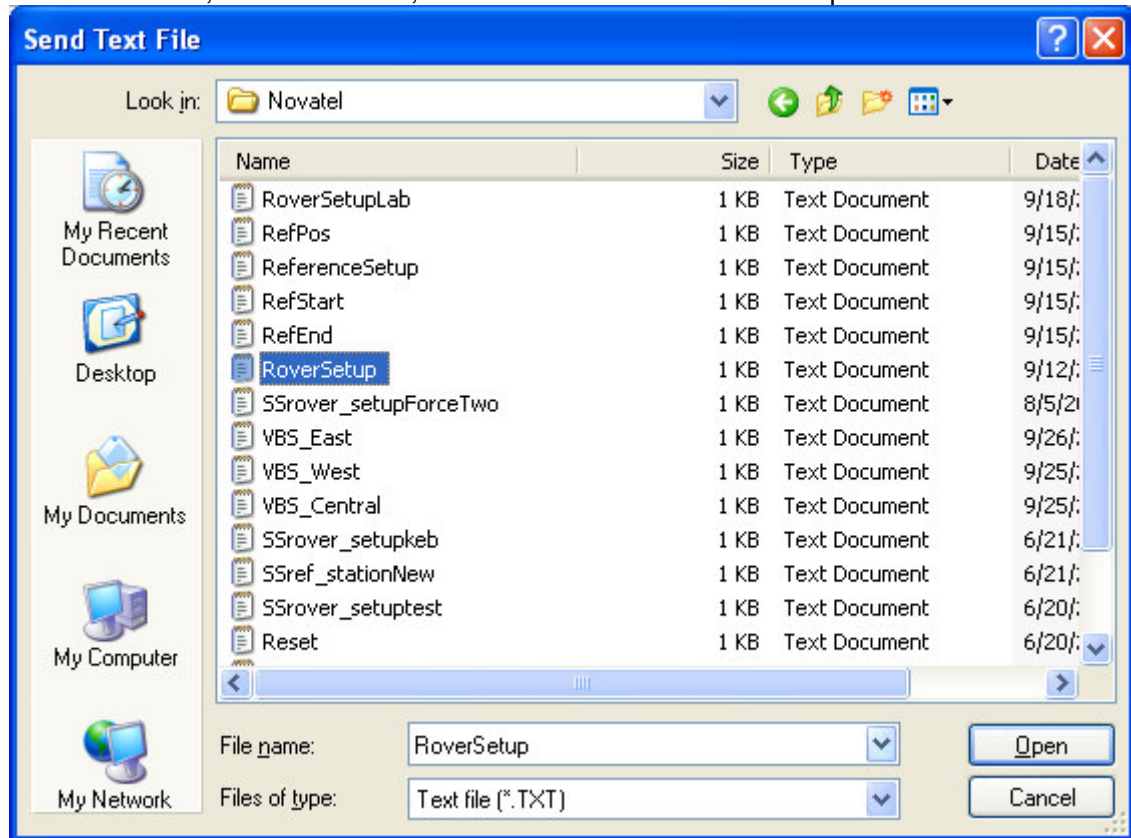
1. Start up Hyperterminal in 9600 BAUD, n, 8, 1, no handshaking.



2. Connect computer to COM2 on the Novatel receiver with a null-modem cable.

Universal Encoder II User Manual

3. Select Transfer, Send Text File, and then select ReferenceSetup.TXT.



4. Click on Open and the file will be sent to the GPS receiver.
5. The Novatel GPS receiver is ready for operation on COM1.

The commands that should be sent to the NovAtel GPS receiver in step 4, above, to program it as a Reference Station should be:

```
unlogall
Interfacemode com2 none rtdm
Fix position 36.72131955 -97.10404113 305.9976
Log com2 rtdm1 ontime 5
Saveconfig
```

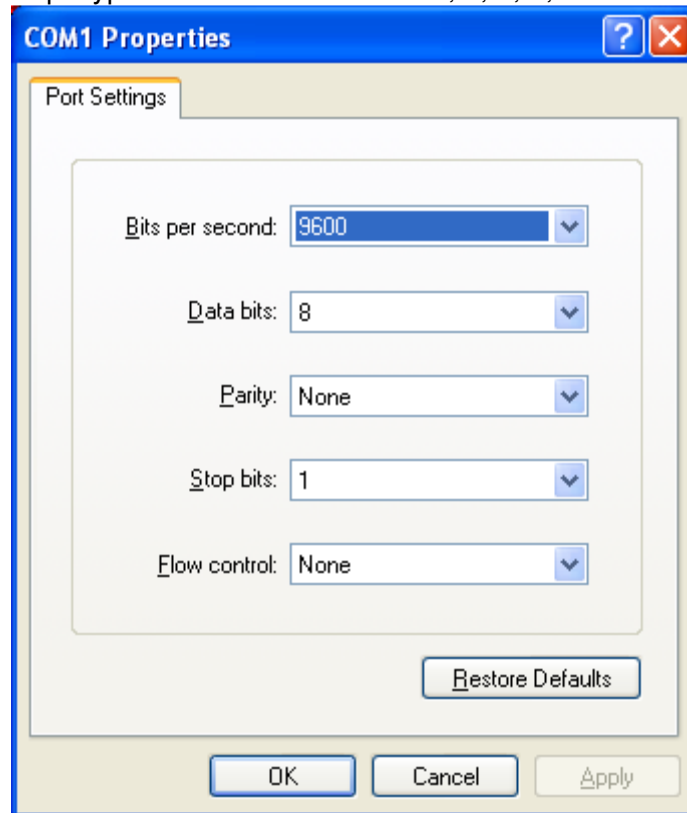
Note: The latitude, longitude, and altitude values entered into the Fix position line, above, must match the actual position of the GPS antenna.

Connect the RTM to Reference Station cable to the RTM 9-pin connector and the Novatel GPS Reference Station COM2.

Universal Encoder II User Manual

8.6 NovAtel Rover (Vib) Setup:

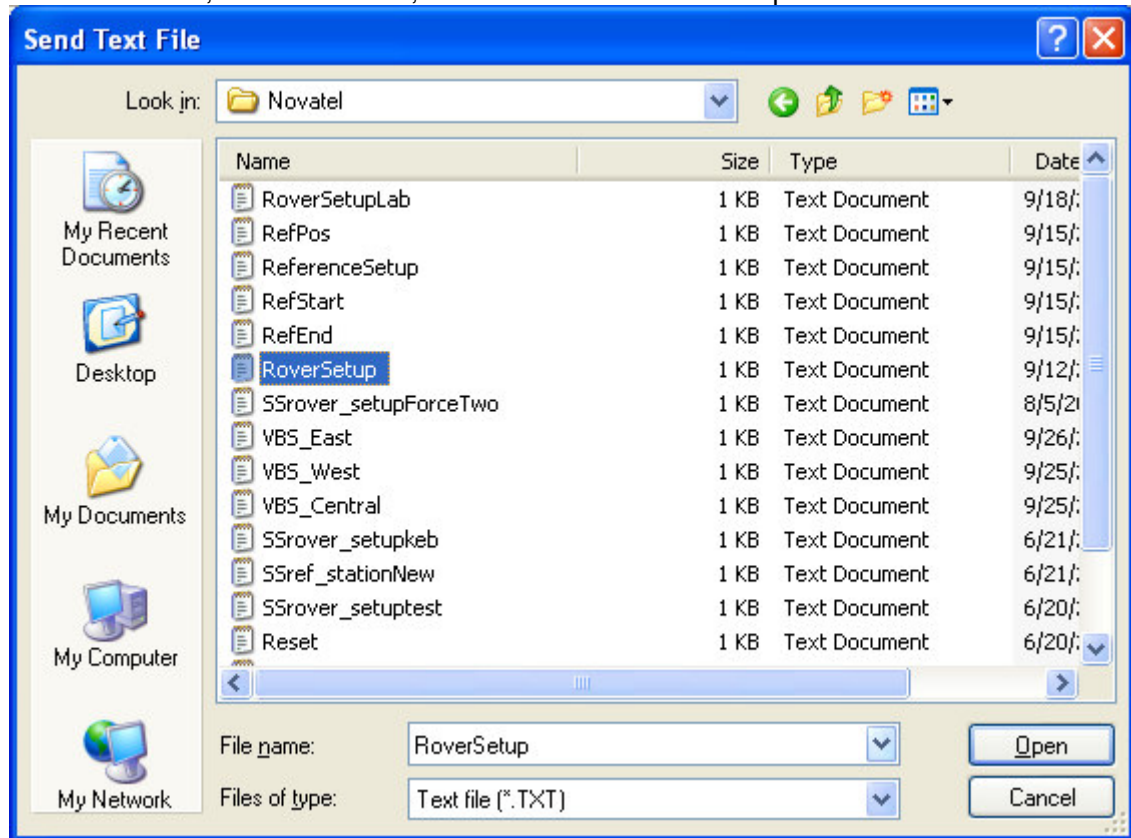
1. Start up Hyperterminal in 9600 BAUD, n, 8, 1, no handshaking.



2. Connect computer to COM2 on the Novatel receiver with a null-modem cable.

Universal Encoder II User Manual

3. Select Transfer, Send Text File, and then select RoverSetup.TXT.



4. Click on Open and the file will be sent to the GPS receiver.
5. The Novatel GPS receiver is ready for operation on COM1.

The commands that should be sent to the NovAtel GPS receiver in step 4, above, to program it to be a Rover (Vib, etc.) should be:

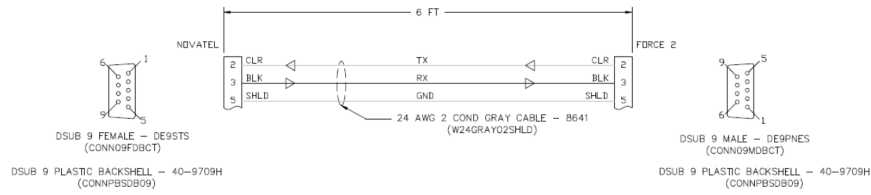
```
Unlogall
fix none
Interfacemode com1 rctm novatel
com com1 19200,n,8,1
log com1 gpgga ontime 1.0
log com1 gprmc ontime 1.0
log com1 gpgsa ontime 5.0
dgpstimeout 500
saveconfig
```

Connect the WF2NV3-2 cable from the Novatel GPS receiver COM1 to the Force Two GPS 9-pin on the small end of the unit.

There was a Force Two hardware modification to make it possible for the Force Two to send GPS correction data to the GPS receiver. The wire connected to pin 2 of the GPS port was replaced with a wire going to the backplane, Modem A23.

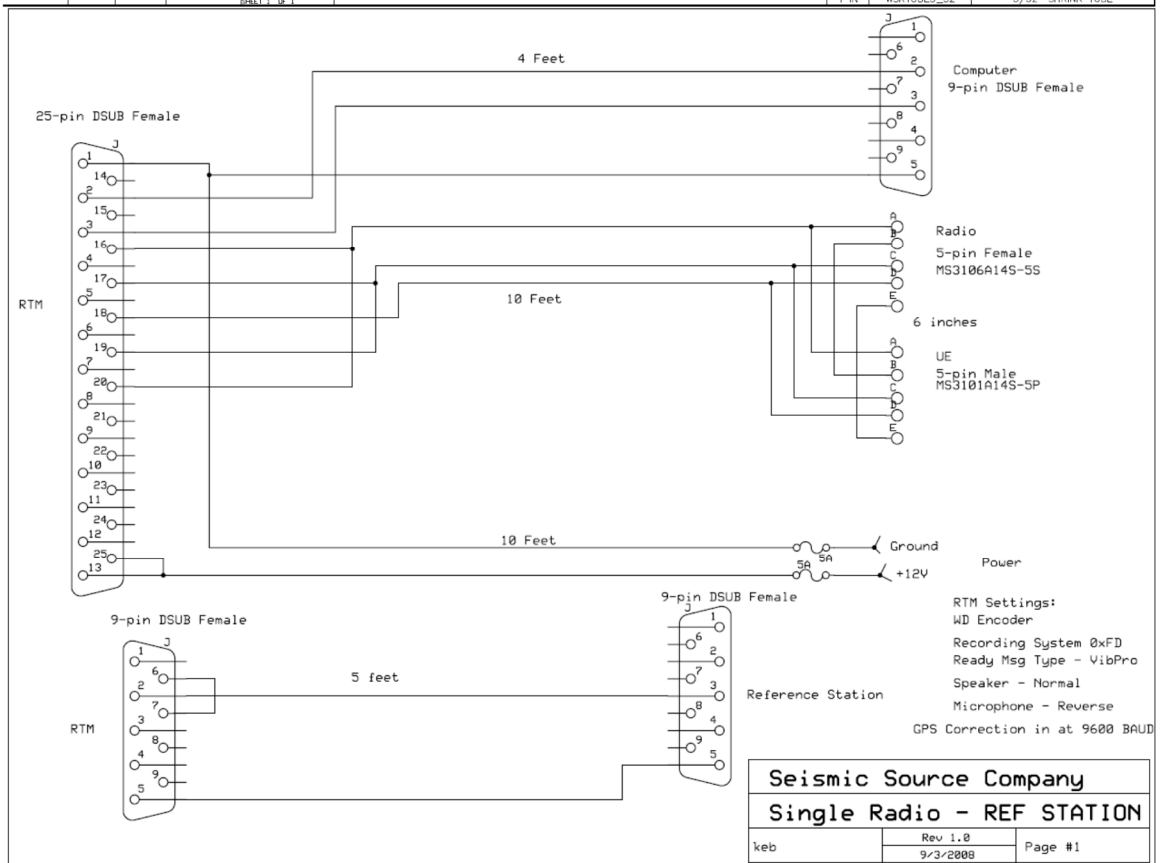
Universal Encoder II User Manual

REV	DESCRIPTION	DATE
1	CREATED	02/29/2012



DESIGN	02/29/2012	Seismic Source Co.
REVISED		2391 E. Coleman Rd.
SA		Parma, OH 44134
REVISED		(580)762-8533
REVISED		www.seismic-source.com
TITLE	FORCE 2 TO NOVATEL PROPAK V3	
SCALE	1" = 1'	
DATE	02/29/2012	
BY	WFEZNV3-2	
REV		
SCALE		

QTY	PART #	DESC
1	CONN09FDBCT	DSUB 9 FEMALE
1	CONN09MDBCT	DSUB 9 MALE
2	CONNPSDB09	DSUB 9 PLASTIC BACKSHELL
72 IN	W24GRAY02SHLD	24 AWG 2- COND GRAY CABLE
1 IN	WSKTUBE3_32	3/32" SHRINK TUBE



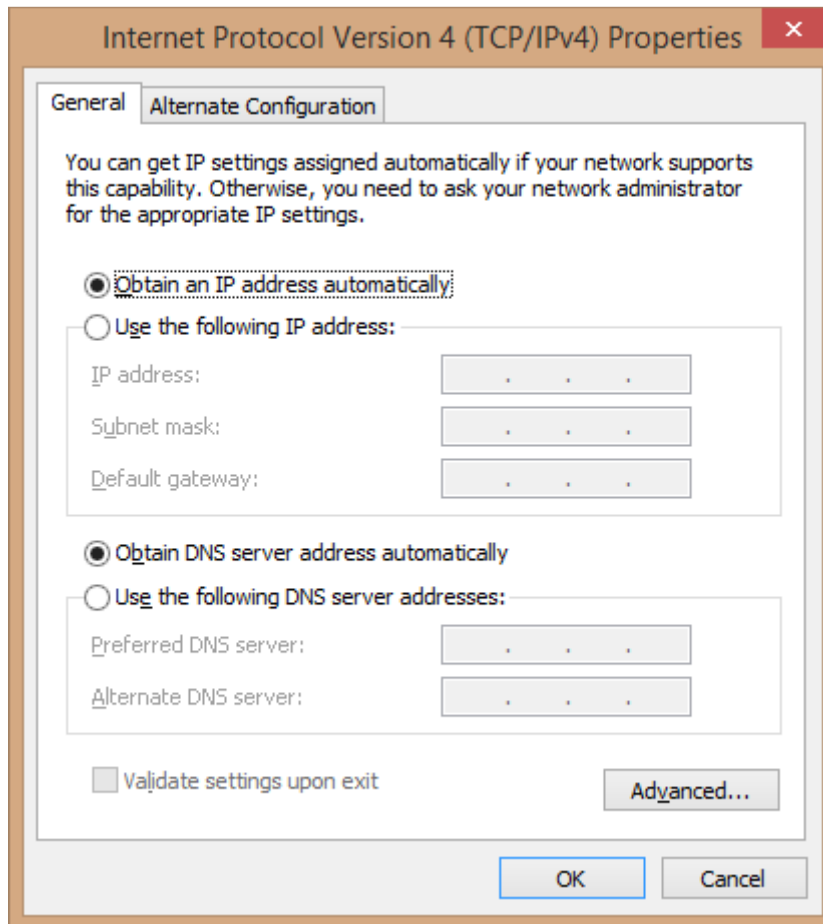
Universal Encoder II User Manual

8.7 Setting up the Trimble BX982

Base (Reference Station/UE) and Rover (decoders)

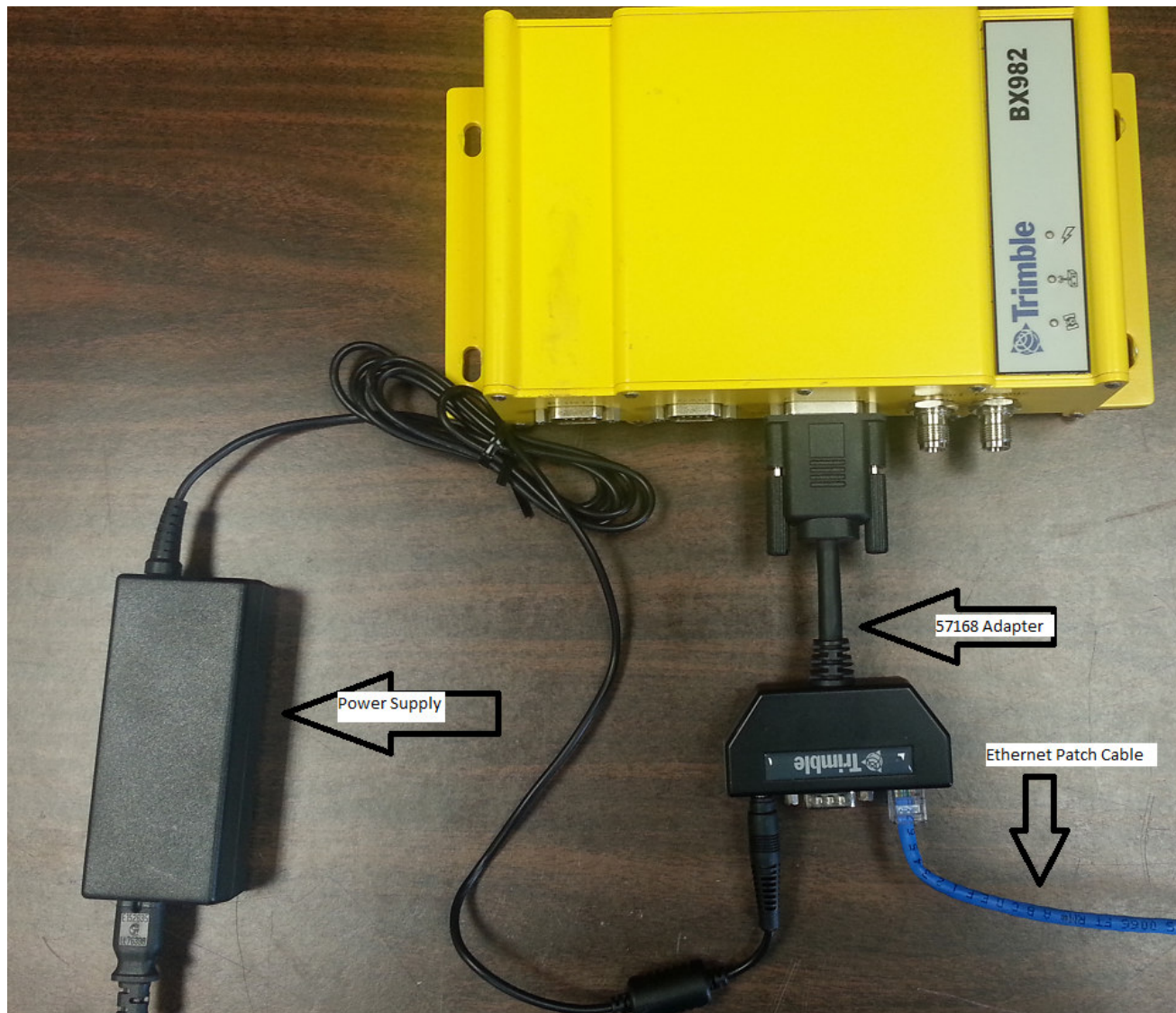
This section contains the information to setup the Trimble BX982 GPS receiver as a RTCM reference station and setup the serial ports to send out RTCM corrections to the RTM2 and NMEA strings to the Universal Encoder II.

The computer Ethernet adapter, Internet Protocol Version 4 (TCP/IPv4) has to be set to 'Obtain an IP address automatically'



Universal Encoder II User Manual

Connect the Trimble 57168 adapter to the BX982 26-pin HDSUB. Connect the power supply to the adapter. Connect the Ethernet patch cable to the adapter and to the computer.



Universal Encoder II User Manual

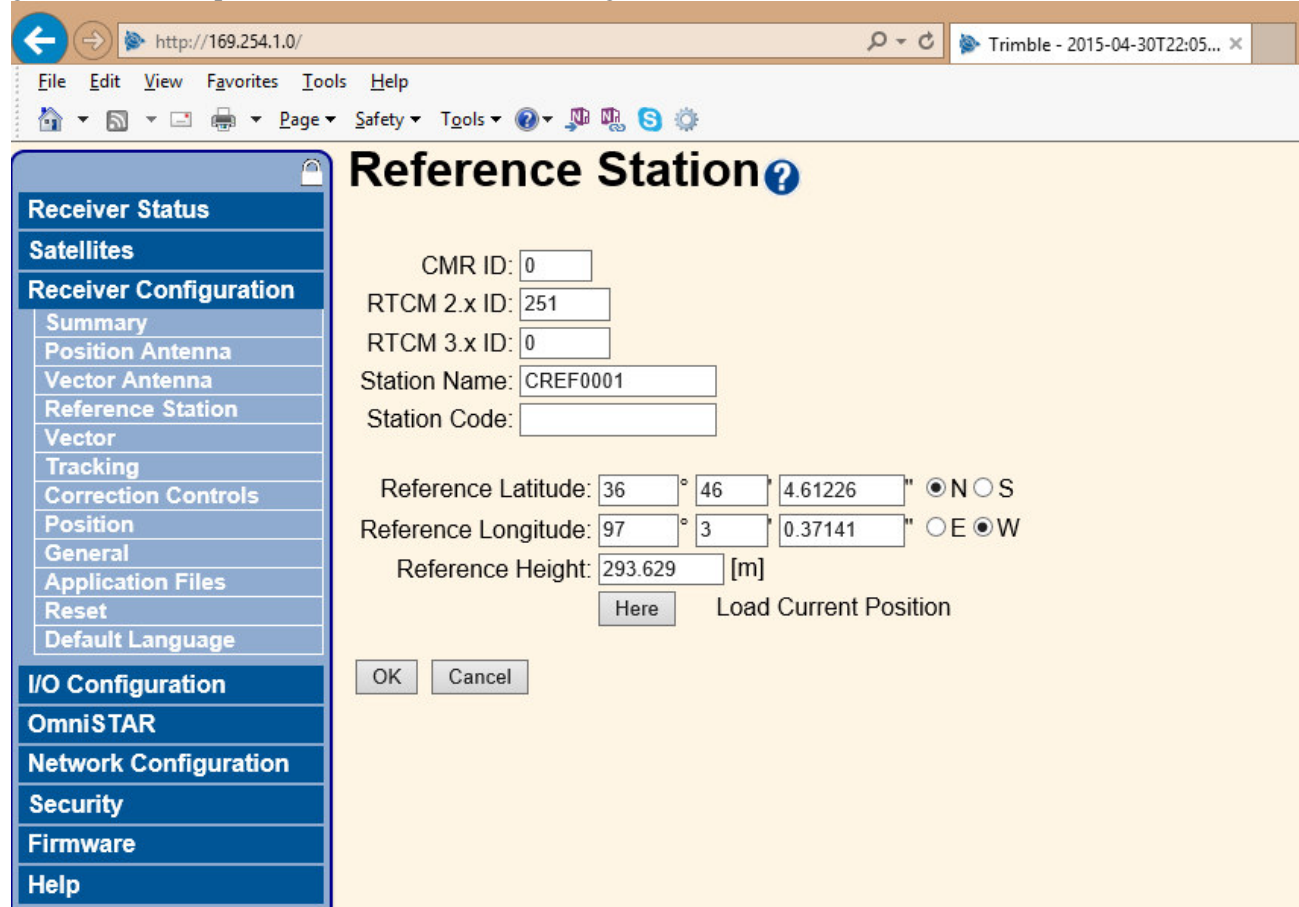
Open up a web browser and enter '169.254.1.0'. Press Enter.

Username: admin

Password: password



To change the Reference position, click on Receiver Configuration and then Reference Station.



Universal Encoder II User Manual

Enter the Reference Latitude, N/S, Reference Longitude, E/W and the Reference Height. Then click on OK.

Most GPS receivers calculate and send the position in WGS84 coordinate system. The Reference position is generally in the WGS84 coordinate system.

The new Reference position is now in the BX982.

Universal Encoder II User Manual

Tracking menu.

🔒

Receiver Status

Satellites

Receiver Configuration

Summary

Position Antenna

Vector Antenna

Reference Station

Vector

Tracking

Correction Controls

Position

General

Application Files

Reset

Default Language

I/O Configuration

OmniSTAR

Network Configuration

Security

Firmware

Help

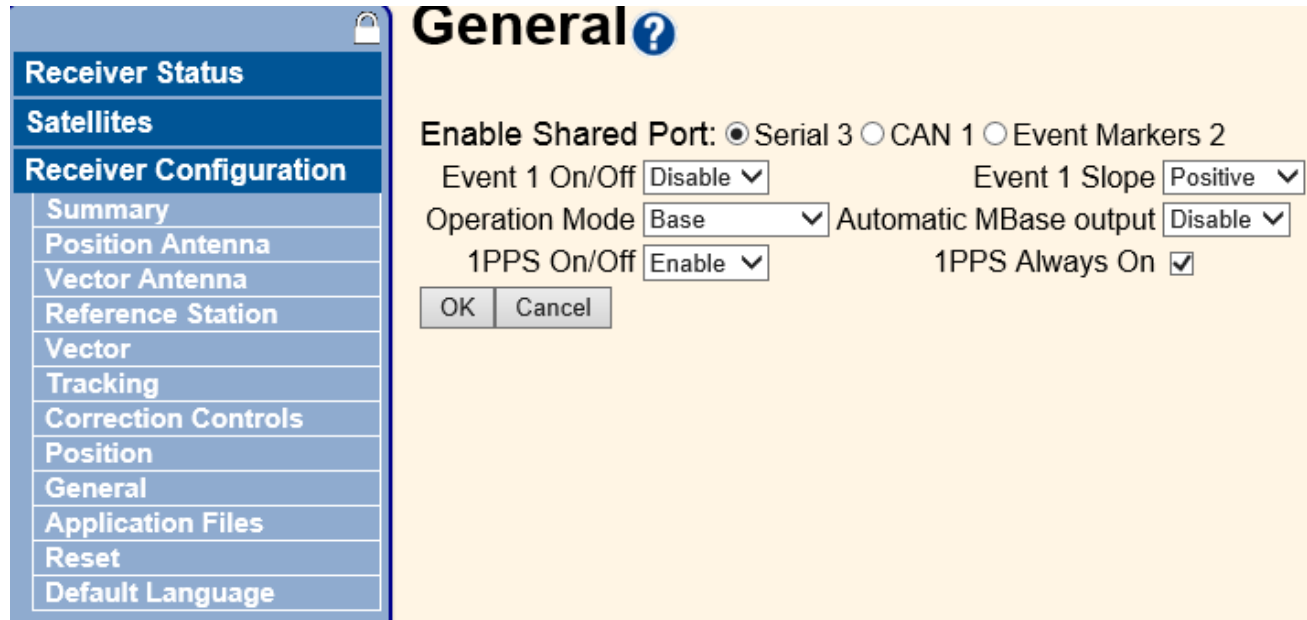
Tracking?

Elevation Mask °
Everest™ ▾
Clock Steering ▾

Type	Signal	Enable	Options
GPS	L1 - C/A	<input checked="" type="checkbox"/>	
GPS	L2E	<input checked="" type="checkbox"/>	<input type="button" value="L2C and L2E"/> ▾
GPS	L2C	<input checked="" type="checkbox"/>	<input type="button" value="CM + CL"/> ▾
GPS	L5	<input type="checkbox"/>	
SBAS	L1 - C/A	<input checked="" type="checkbox"/>	
SBAS	L5	<input type="checkbox"/>	
GLONASS	L1 - C/A	<input checked="" type="checkbox"/>	
GLONASS	L1P	<input checked="" type="checkbox"/>	
GLONASS	L2 - C/A	<input checked="" type="checkbox"/>	<input type="button" value="L2 - C/A(M) Only"/> ▾
GLONASS	L3	<input type="checkbox"/>	
QZSS	L1 - C/A	<input checked="" type="checkbox"/>	
QZSS	L1 - SAIF	<input checked="" type="checkbox"/>	
QZSS	L2C	<input checked="" type="checkbox"/>	
QZSS	L5	<input checked="" type="checkbox"/>	

Universal Encoder II User Manual

The PPS has to be turned on. Click on Receiver Configuration and then General.

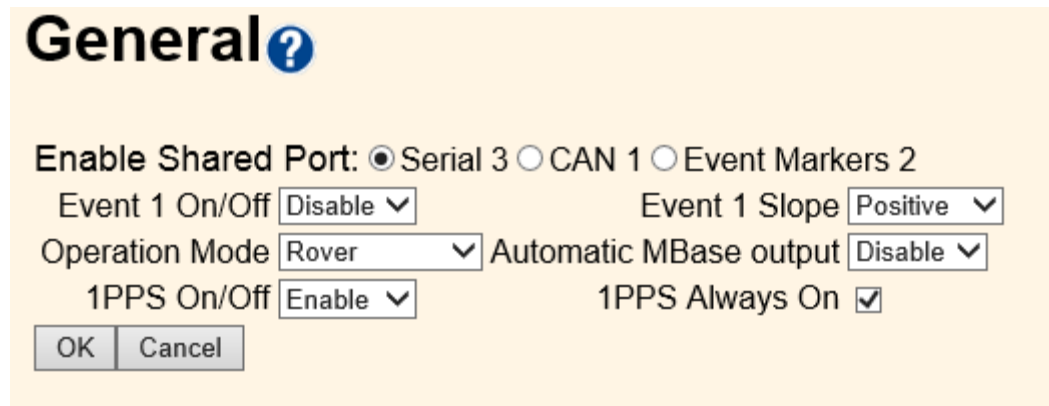


The screenshot shows the software interface. On the left is a vertical menu with the following items: Receiver Status, Satellites, Receiver Configuration (highlighted), Summary, Position Antenna, Vector Antenna, Reference Station, Vector, Tracking, Correction Controls, Position, General, Application Files, Reset, and Default Language. To the right of the menu is the 'General' settings window. The window title is 'General' with a question mark icon. It contains the following settings:

- Enable Shared Port: ☒ Serial 3 ☐ CAN 1 ☐ Event Markers 2
- Event 1 On/Off: Event 1 Slope:
- Operation Mode: Automatic MBase output:
- 1PPS On/Off: 1PPS Always On: ☒

At the bottom of the window are 'OK' and 'Cancel' buttons.

Reference Station setup above. Decoder (vibrator truck, backpack, etc.) setup below.



This screenshot shows the 'General' settings window for a decoder. The settings are as follows:

- Enable Shared Port: ☒ Serial 3 ☐ CAN 1 ☐ Event Markers 2
- Event 1 On/Off: Event 1 Slope:
- Operation Mode: Automatic MBase output:
- 1PPS On/Off: 1PPS Always On: ☒

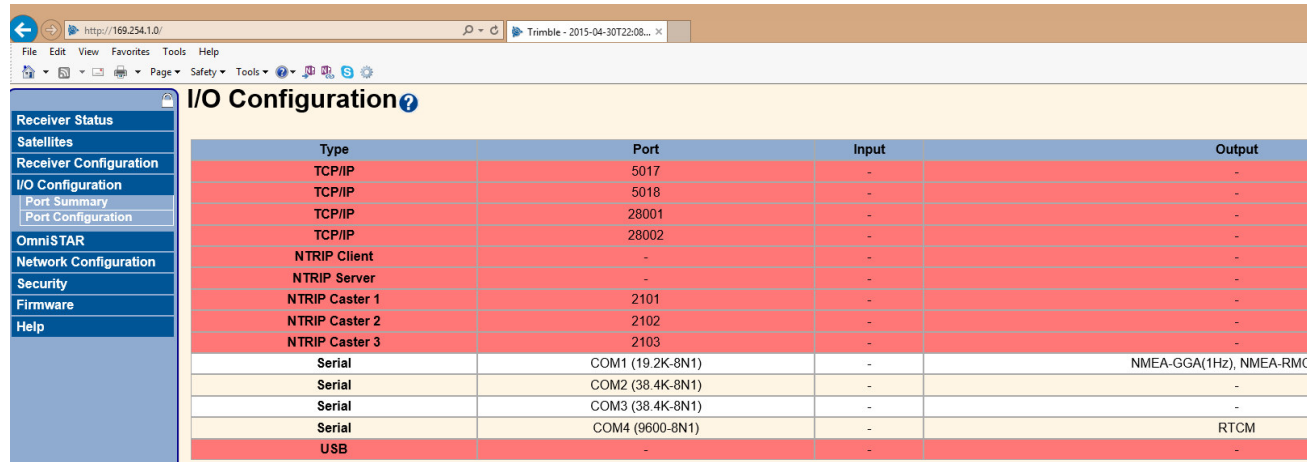
'OK' and 'Cancel' buttons are at the bottom.

Enable 1PPS On/Off and 1PPS always on.

When using as a reference station have the Operation Mode in Base. If being used in a vibrator or backpack use Rover.

Universal Encoder II User Manual

Set up the serial ports. Click on I/O Configuration.

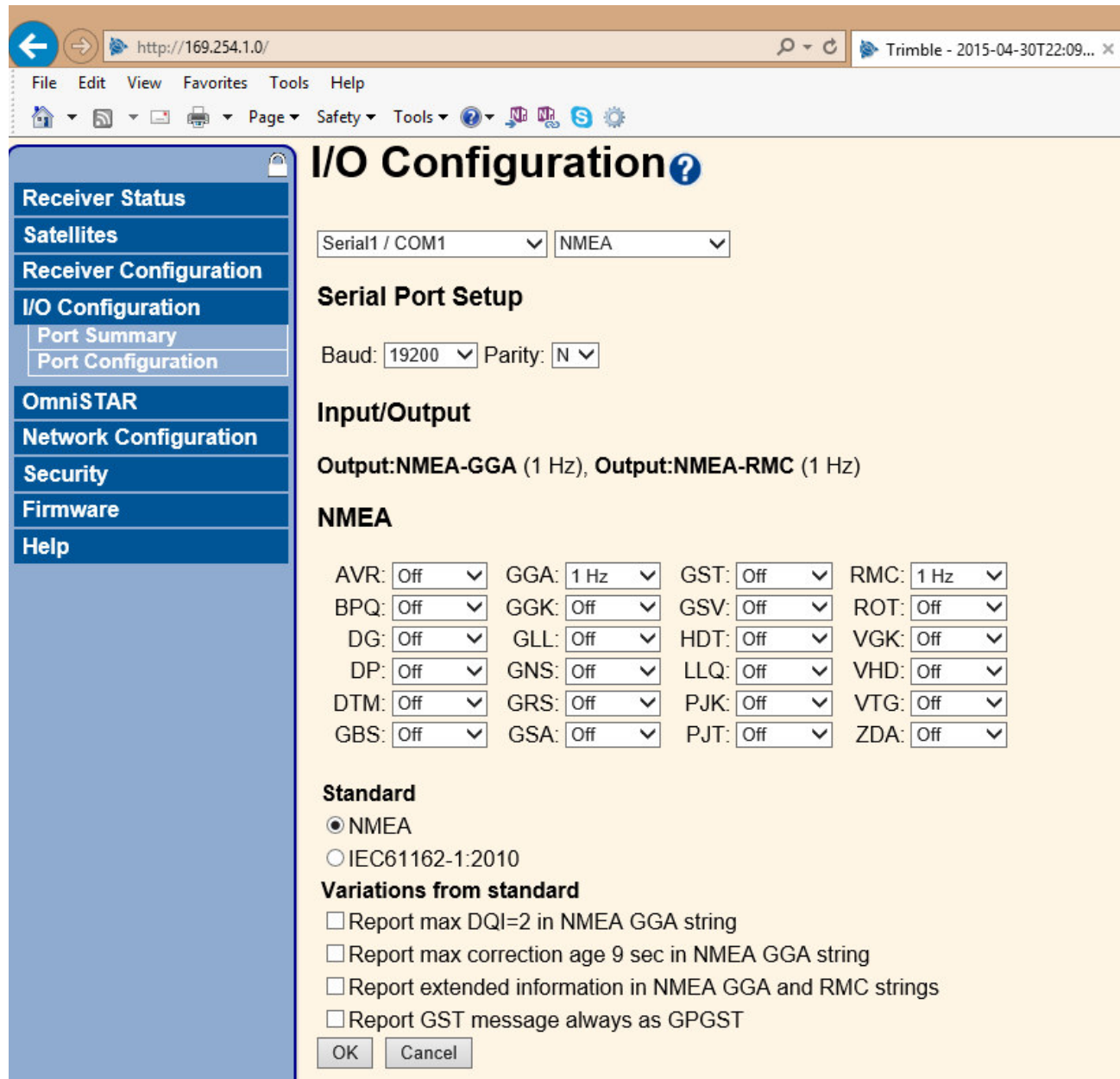


The screenshot shows a web browser window with the URL <http://169.254.1.0/>. The page title is "I/O Configuration". On the left is a navigation menu with the following items: Receiver Status, Satellites, Receiver Configuration, I/O Configuration (selected), Port Summary, Port Configuration, OmniSTAR, Network Configuration, Security, Firmware, and Help. The main content area displays a table with the following data:

Type	Port	Input	Output
TCP/IP	5017	-	-
TCP/IP	5018	-	-
TCP/IP	28001	-	-
TCP/IP	28002	-	-
NTRIP Client	-	-	-
NTRIP Server	-	-	-
NTRIP Caster 1	2101	-	-
NTRIP Caster 2	2102	-	-
NTRIP Caster 3	2103	-	-
Serial	COM1 (19.2K-8N1)	-	NMEA-GGA(1Hz), NMEA-RMC
Serial	COM2 (38.4K-8N1)	-	-
Serial	COM3 (38.4K-8N1)	-	-
Serial	COM4 (9600-8N1)	-	RTCM
USB	-	-	-

Universal Encoder II User Manual

Click on Serial by COM1. Setup COM1 as below for UE and then click on OK.



The screenshot shows a web browser window with the URL `http://169.254.1.0/`. The browser's address bar and menu bar are visible. The main content area is titled "I/O Configuration?" and contains the following sections:

- Receiver Status**
- Satellites**
- Receiver Configuration**
- I/O Configuration** (selected)
 - Port Summary
 - Port Configuration
- OmniSTAR**
- Network Configuration**
- Security**
- Firmware**
- Help**

The **I/O Configuration** section includes the following settings:

- Serial Port Setup**
 - Serial1 / COM1 (dropdown)
 - NMEA (dropdown)
 - Baud: 19200 (dropdown)
 - Parity: N (dropdown)
- Input/Output**
 - Output: NMEA-GGA (1 Hz), Output: NMEA-RMC (1 Hz)
- NMEA**

AVR: Off	GGA: 1 Hz	GST: Off	RMC: 1 Hz
BPQ: Off	GGK: Off	GSV: Off	ROT: Off
DG: Off	GLL: Off	HDT: Off	VGK: Off
DP: Off	GNS: Off	LLQ: Off	VHD: Off
DTM: Off	GRS: Off	PJK: Off	VTG: Off
GBS: Off	GSA: Off	PJT: Off	ZDA: Off
- Standard**
 - ☒ NMEA
 - ☐ IEC61162-1:2010
- Variations from standard**
 - ☐ Report max DQI=2 in NMEA GGA string
 - ☐ Report max correction age 9 sec in NMEA GGA string
 - ☐ Report extended information in NMEA GGA and RMC strings
 - ☐ Report GST message always as GPGST
- Buttons**
 - OK
 - Cancel

Universal Encoder II User Manual

Setup COM1 as below for Force2, Force III, Boom Box 3, RTM3, VibPro HD, UE2 and then click on OK.

I/O Configuration ?

Serial1 / COM1 ▼ NMEA ▼

Serial Port Setup

Baud: 19200 ▼ Parity: N ▼

Input/Output

Output:NMEA-GGA (1 Hz), Output:NMEA-GSA (5 Sec.), Output:NMEA-RMC (1 Hz)

NMEA

AVR: Off ▼	GGA: 1 Hz ▼	GST: Off ▼	RMC: 1 Hz ▼
BPQ: Off ▼	GGK: Off ▼	GSV: Off ▼	ROT: Off ▼
DG: Off ▼	GLL: Off ▼	HDT: Off ▼	VGK: Off ▼
DP: Off ▼	GNS: Off ▼	LLQ: Off ▼	VHD: Off ▼
DTM: Off ▼	GRS: Off ▼	PJK: Off ▼	VTG: Off ▼
GBS: Off ▼	GSA: 5 Sec. ▼	PJT: Off ▼	ZDA: Off ▼

Standard

- ☒ NMEA
☐ IEC61162-1:2010

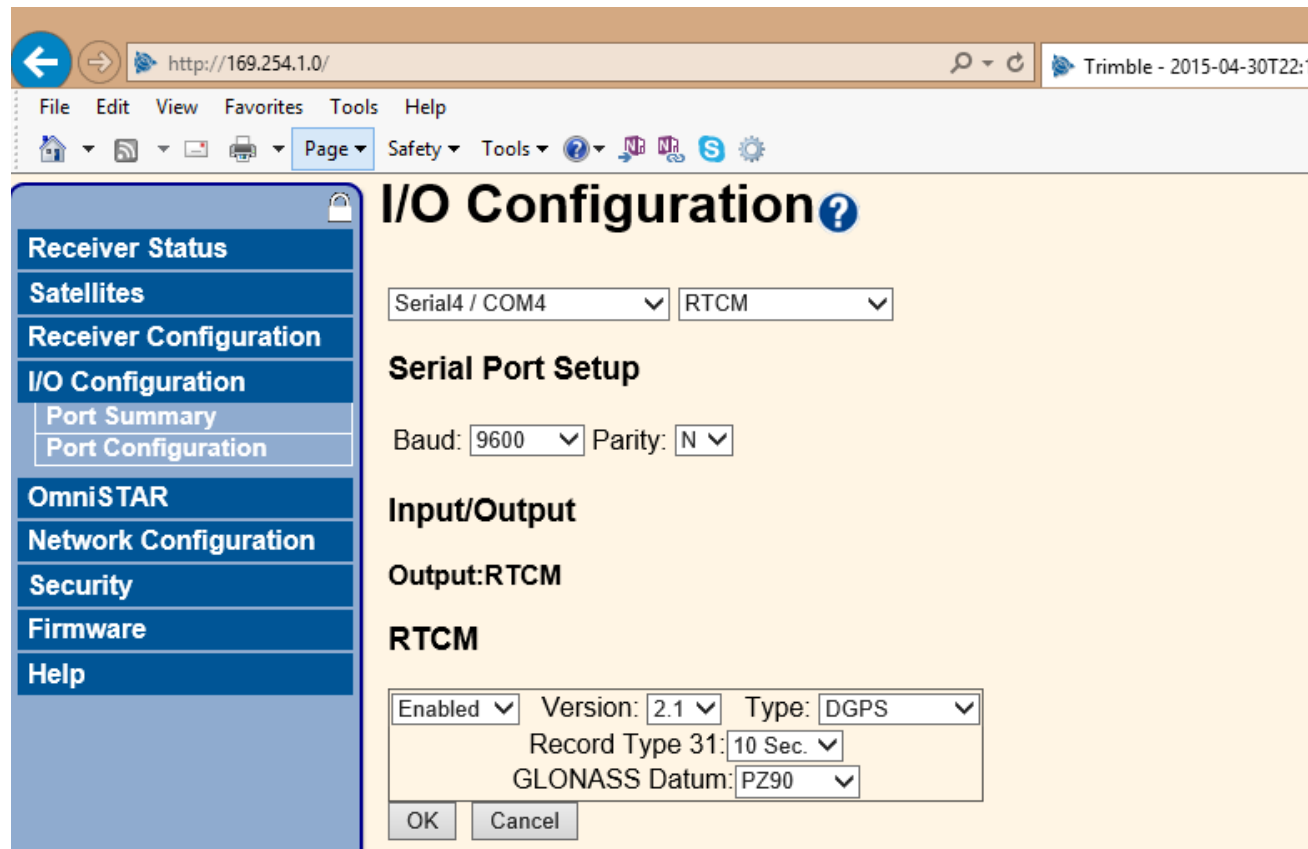
Variations from standard

- ☐ Report max DQI=2 in NMEA GGA string
☐ Report max correction age 9 sec in NMEA GGA string
☐ Report extended information in NMEA GGA and RMC strings
☐ Report GST message always as GPGST

OK Cancel

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Click on Serial by COM4. Setup COM4 as below for the RTCM Reference Station and then click on OK.



I/O Configuration?

Serial4 / COM4 RTCM

Serial Port Setup

Baud: 9600 Parity: N

Input/Output

Output: RTCM

RTCM

Enabled Version: 2.1 Type: DGPS

Record Type 31: 10 Sec.

GLONASS Datum: PZ90

OK Cancel

The Trimble BX982 is ready to send NMEA strings out COM1 and RTCM corrections out COM4. Connect to the UE2 and the RTM2.

Universal Encoder II User Manual

Newer BX982 firmware will look like below. The Type changes from DGPS to DGNSS.

🔒

Receiver Status

Satellites

Receiver Configuration

I/O Configuration

Port Summary

Port Configuration

OmniSTAR

Network Configuration

Security

Firmware

Help

I/O Configuration ?

Serial4 / COM4 ▼

RTCM ▼

Serial Port Setup

Baud: 9600 ▼ Parity: N ▼

Input/Output

Output:RTCM

RTCM

Enabled ▼

Version: 2.1 ▼

Type: DGNSS ▼

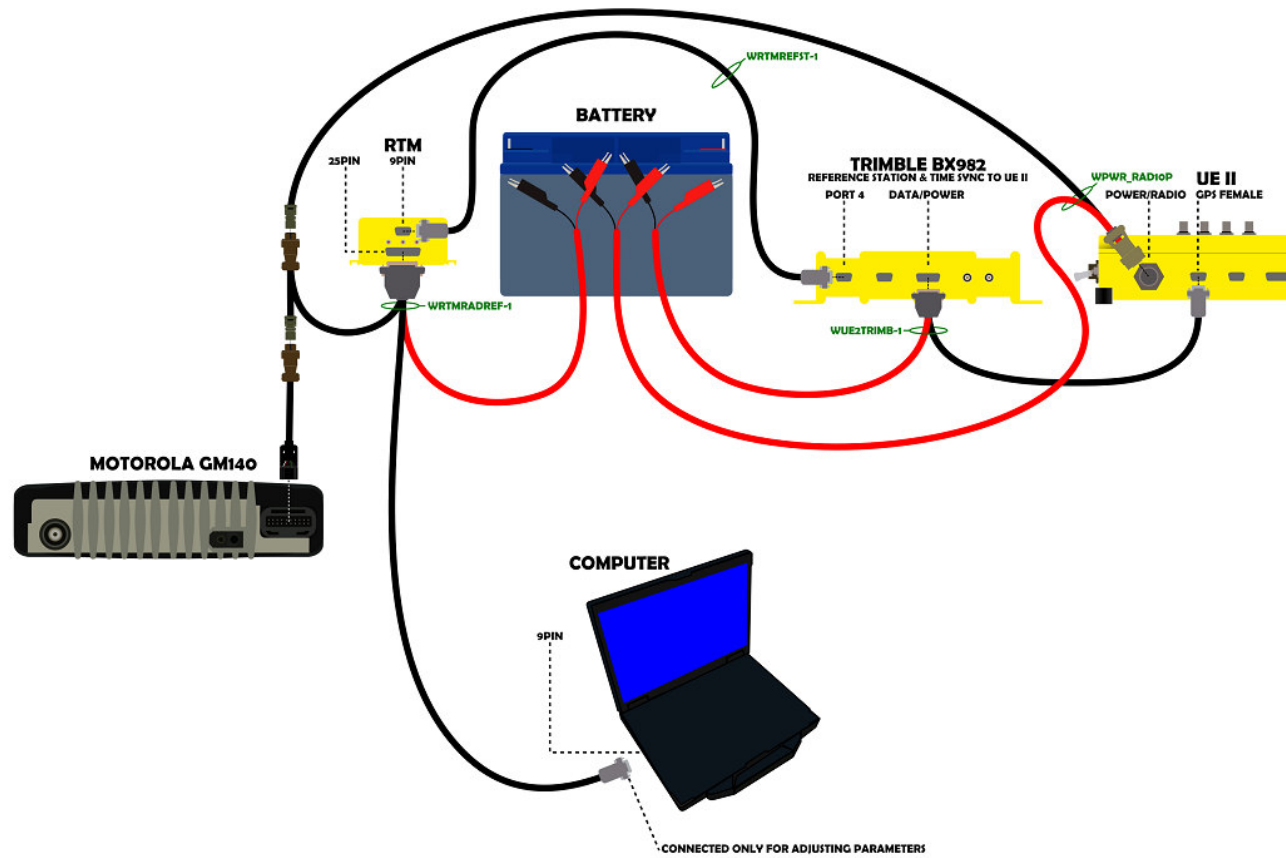
Record Type 31: 10 Sec. ▼

GLONASS Datum: PZ90 ▼

OK

Cancel

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The above diagram shows how the Trimble BX982 is cabled to the UE2 and RTM2 for single radio GPS corrections.

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9 Ethernet Setup

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

IP Address SET to FIXED IP ADDRESS – 10.0.0.99

All Firewalls Disabled

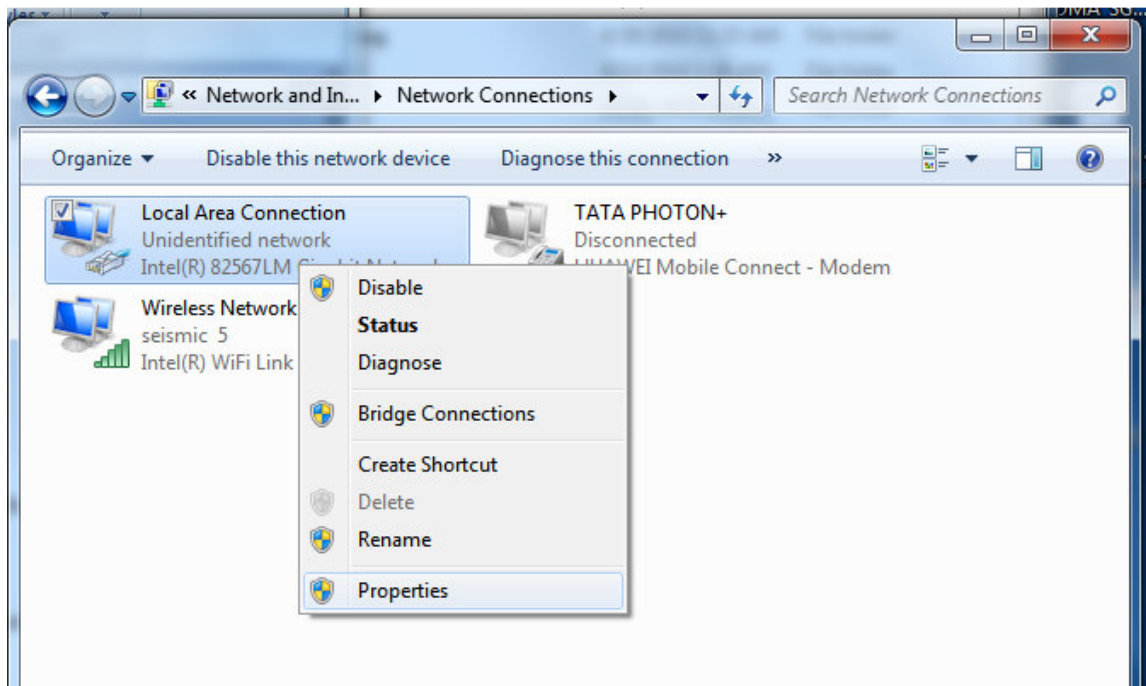
9.1 Windows 7 Ethernet Setup

Make sure the Computer IP address is in 10.x.x.x network (eg.10.0.0.99) and all firewalls disabled.

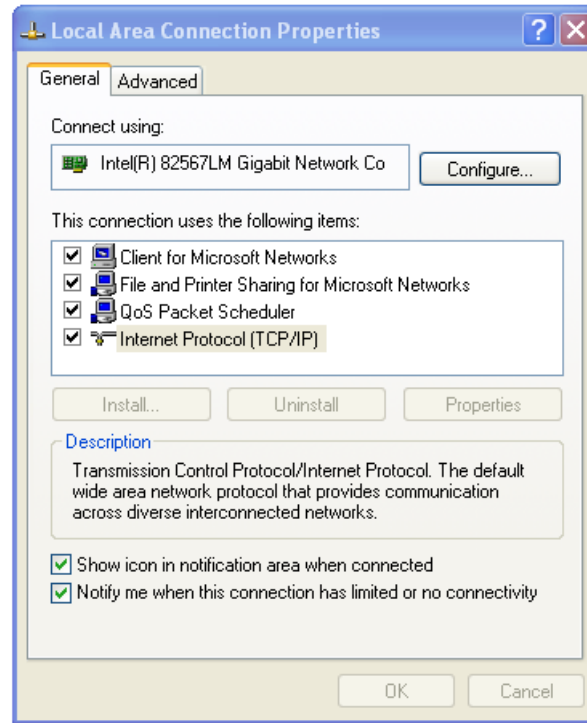
If computer has not been setup for this IP address:

Go to the Network Connections in Control panel.

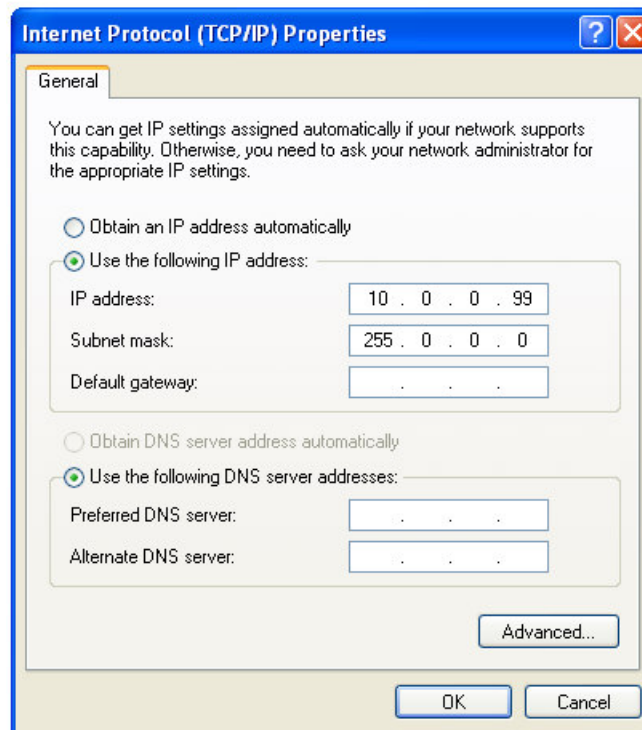
For Windows 7 : Go to Start->Control Panel->Network and Internet->View Network Status and tasks->Change adapter settings->Local Area Network->Right click and select properties



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Select Internet Protocol Version 4 ->Properties and set
Use following IP-> IP address: 10.0.0.99, Subnet Mask: 255.0.0.0



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Computer Firewall:

To program the TDMA, all firewalls needs to be turned off.

Start->Control Panel-> System and Security->Windows Firewall and turn it off. This is very important as the firewall will block the communication.

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

If the UE2 unit was previously communicating with a computer with a different address, then the UE2 unit must be reset (power off then on) for the unit to communicate to the new address.

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9.2 Windows VISTA Ethernet Setup

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

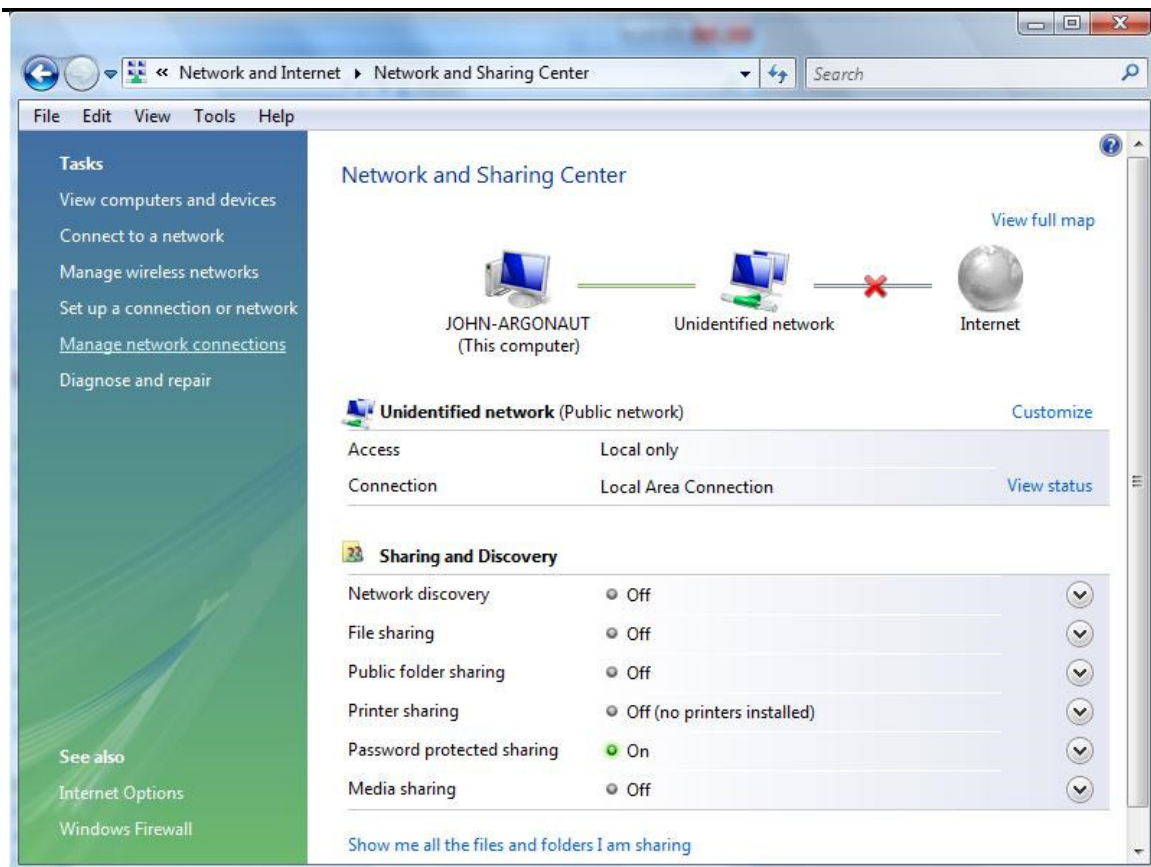
With Windows Vista computer, the Ethernet setup is done by the following procedure:

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



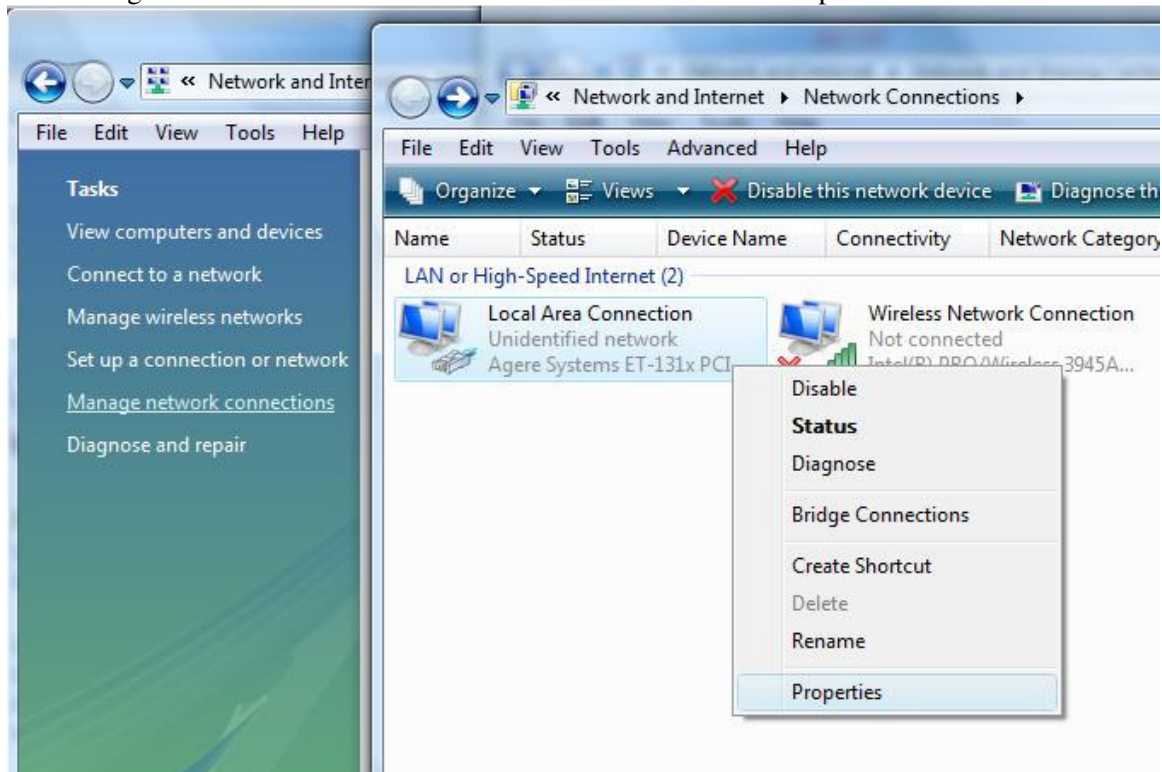
Select “Manage network connections”

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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.

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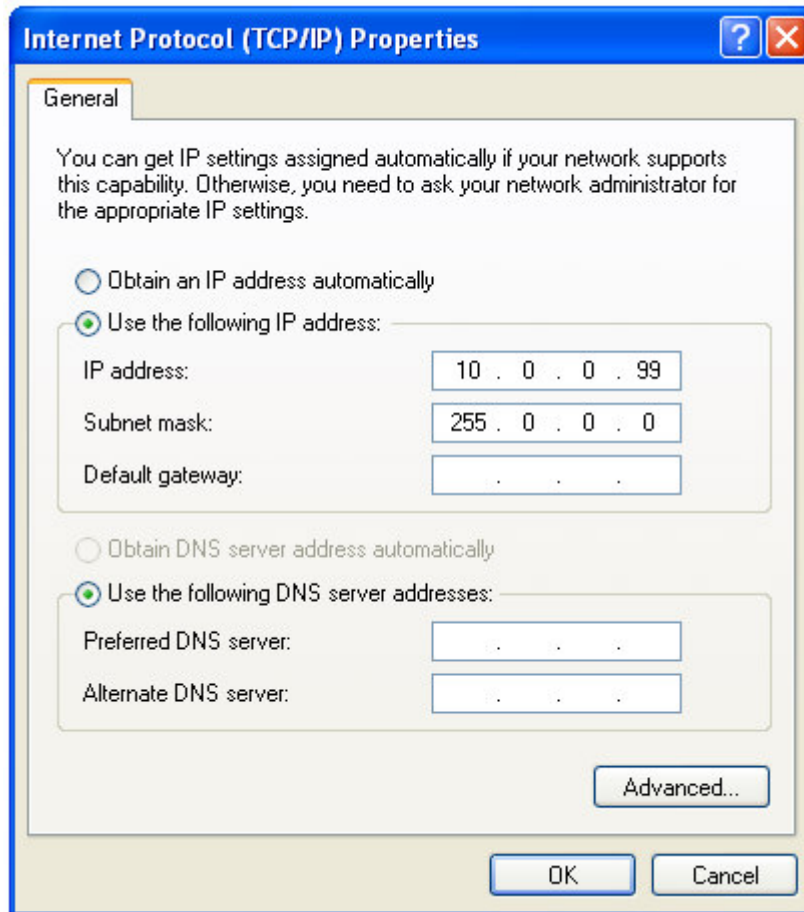
Highlight the “Internet Protocol Version 4 (TCP/IP)” and Click on Properties button.

Use following IP address:

IP address 10.0.0.99

Subnet Mask 255.0.0.0

Press OK to accept entries.



Internet Protocol (TCP/IP) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 10 . 0 . 0 . 99

Subnet mask: 255 . 0 . 0 . 0

Default gateway: . . .

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

Advanced...

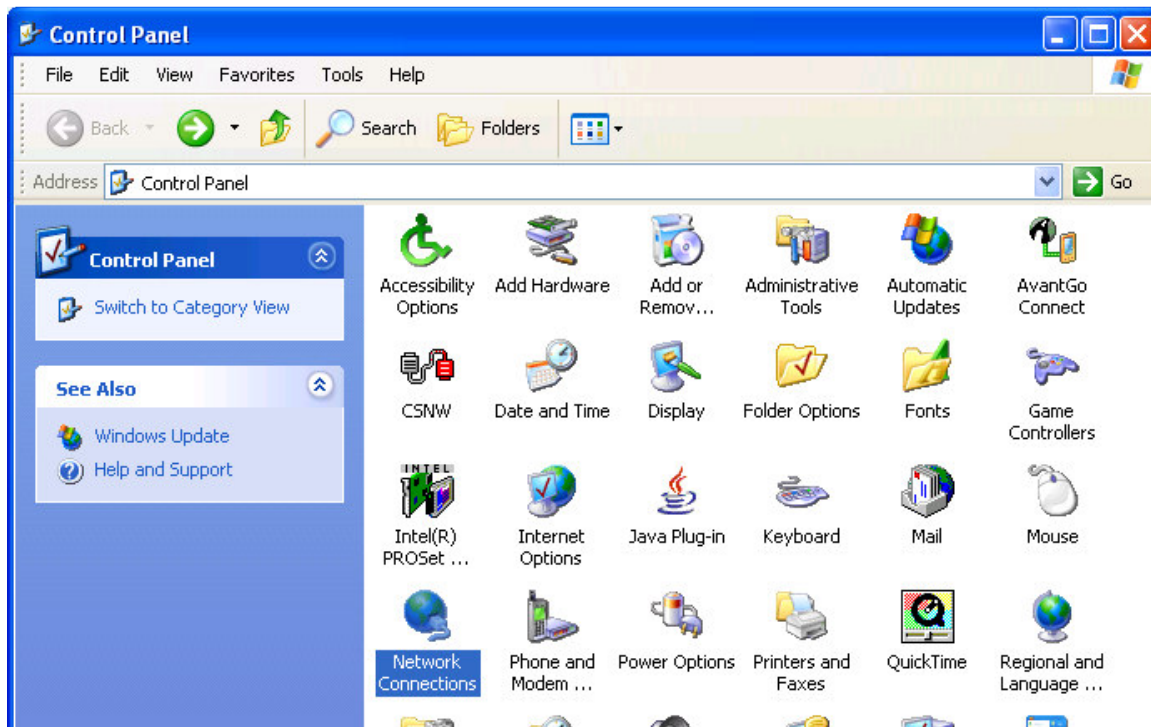
OK Cancel

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9.3 Windows XP Ethernet setup

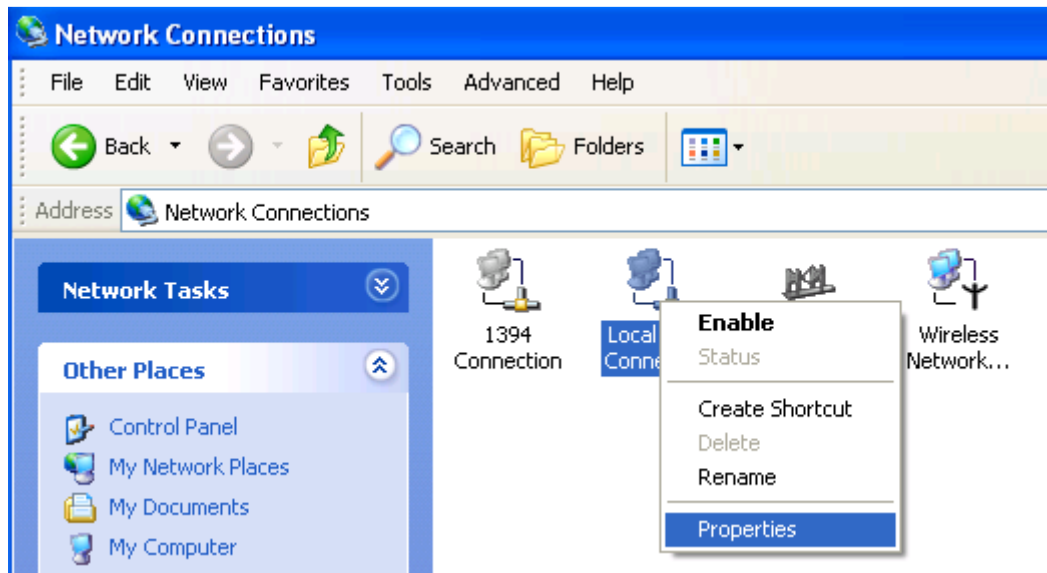
With Windows XP computer setup in classic mode, the Ethernet setup is done by the following procedure:

Go to the Control Panel and open the Network Connections.



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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.

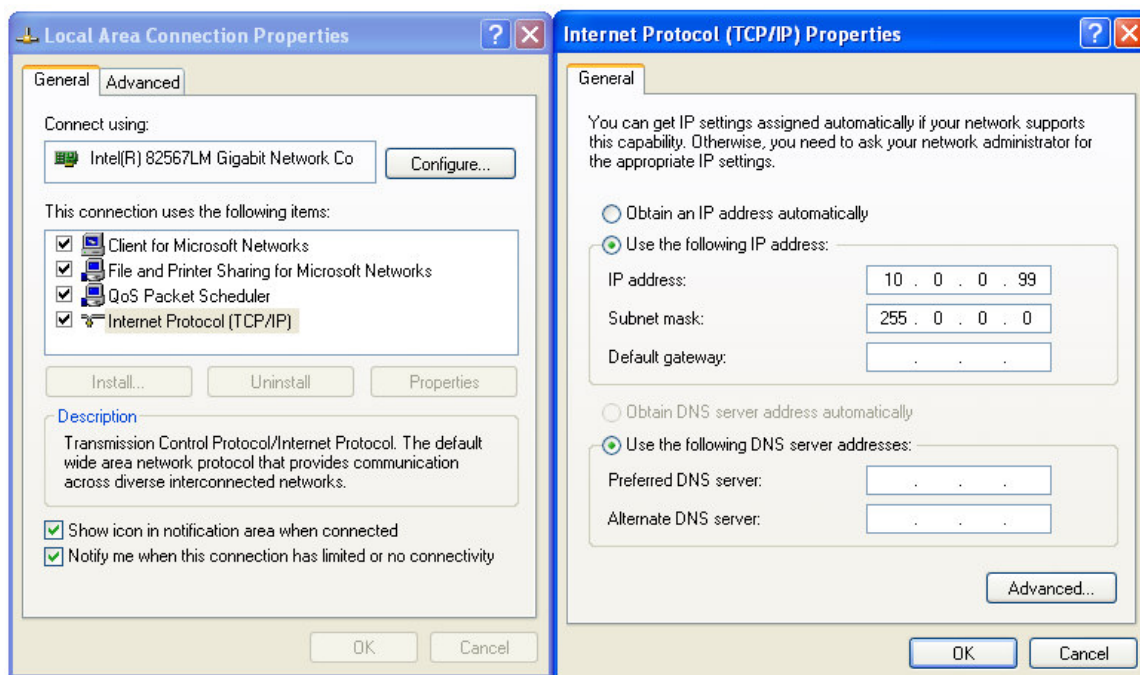
Click on Properties button.

Use following IP address:

IP address 10.0.0.99

Subnet Mask 255.0.0.0

Press OK to accept entries.



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

If the UE2 unit was previously communicating with a computer with a different address, then the UE2 unit must be reset (power off then on) for the unit to communicate to the new address.

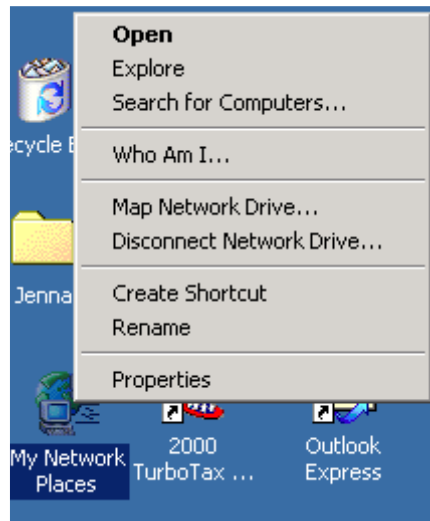
With Windows XP there is an additional Authentication Tab. The Authentication must be disabled to operate with the DAQlink unit.

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9.4 Windows 2000 Ethernet Setup

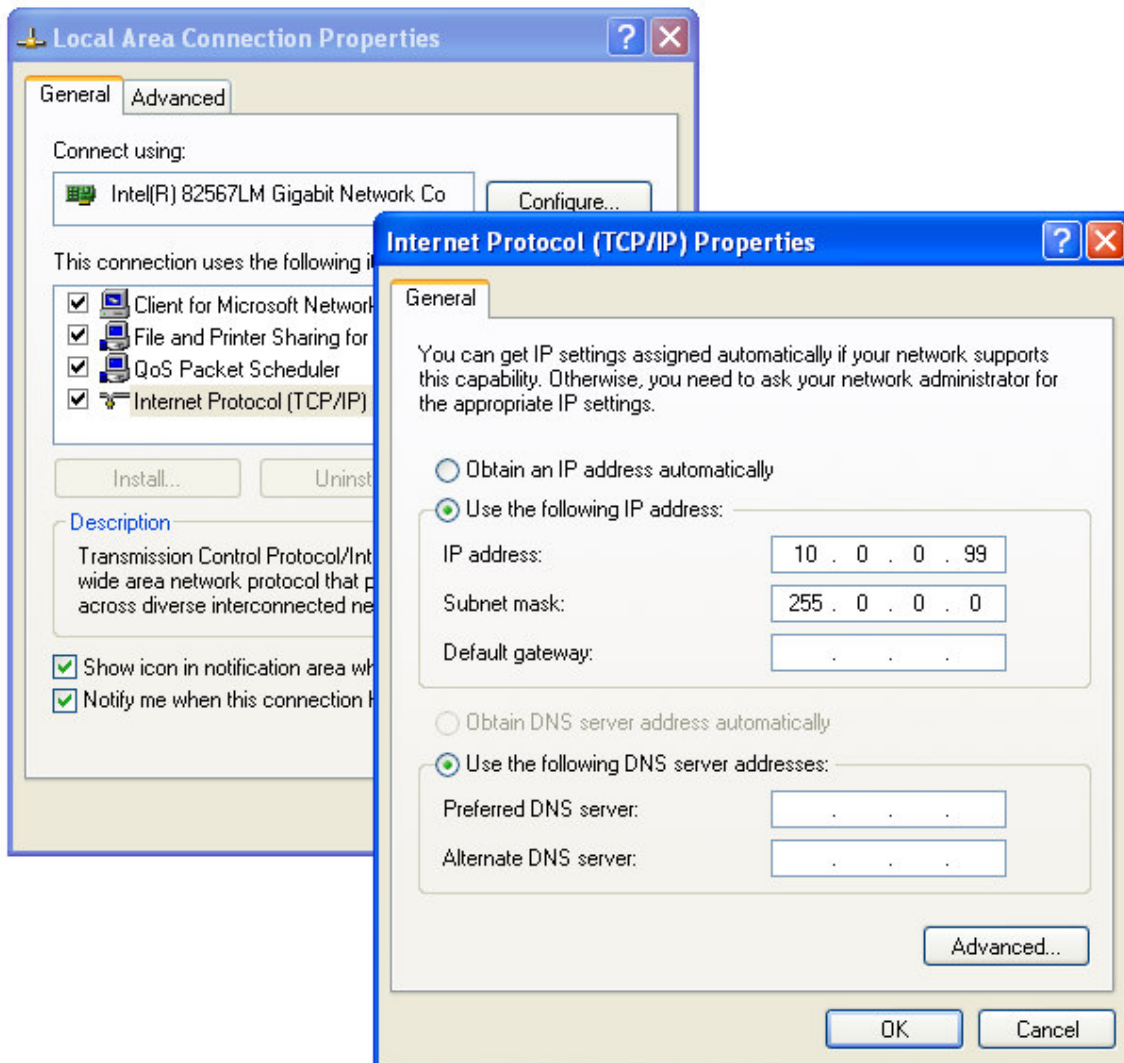
With Windows 2000 computer this can be done by the following procedure:

Right Click on My Network Places and select Properties.



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

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In this example, the current IP address “10.0.0.99”, and the Subnet Mask is “255.0.0.0”.

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

Use following IP address:

IP address 10.0.0.99

Subnet Mask 255.0.0.0

Press OK to accept entries.

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

If the UE2 unit was previously communicating with a computer with a different address, then the UE2 unit must be reset (power off then on) for the unit to communicate to the new address.

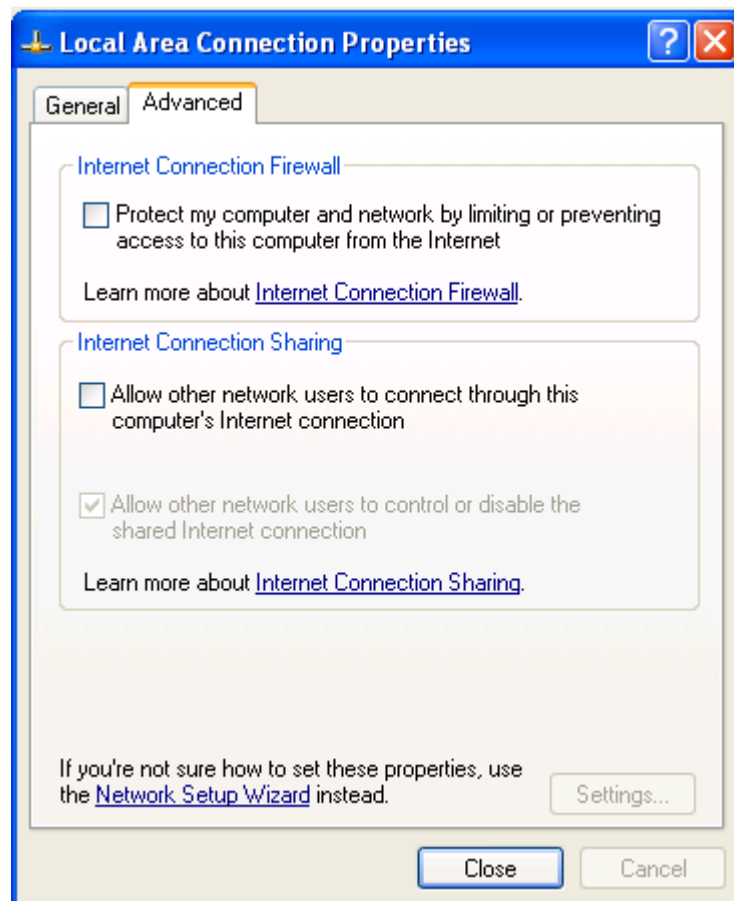
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9.5 Firewall

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 UE2 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.



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9.6 WinPcap

All Ethernet communication is actually done using the WinPcap driver.

This driver must be loaded correctly or none of the Ethernet message will work.

WinPcap Installation:

Only do the below instructions if WinPcap is not installed on the computer.

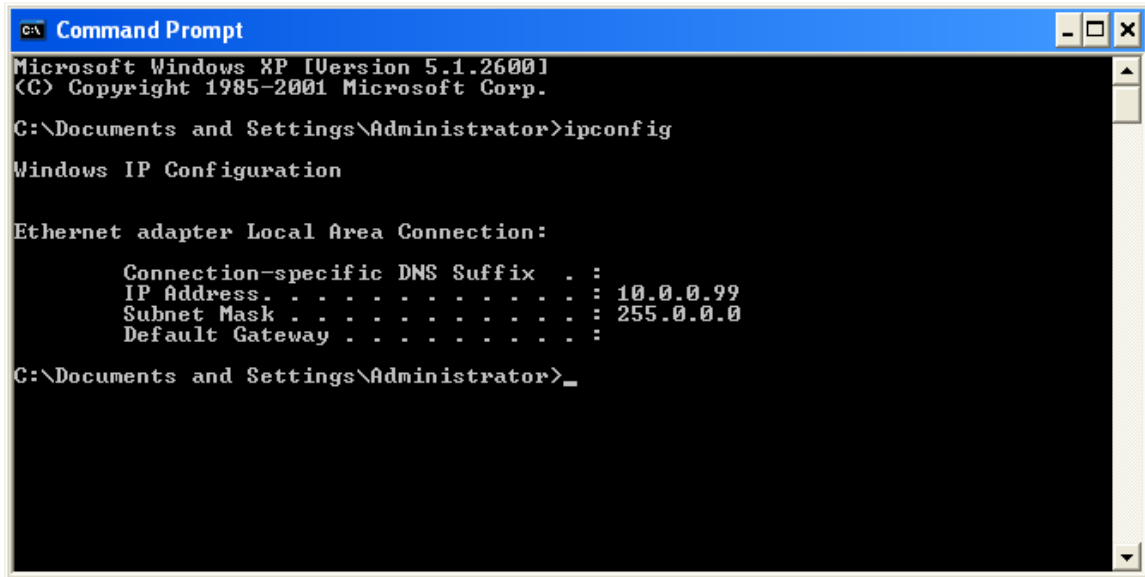
Download and install WinPcap to the computer following the link below:

<http://www.winpcap.org/install/default.htm>

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9.7 TCP/IP Address 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”.



```

C:\ Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Administrator>ipconfig

Windows IP Configuration

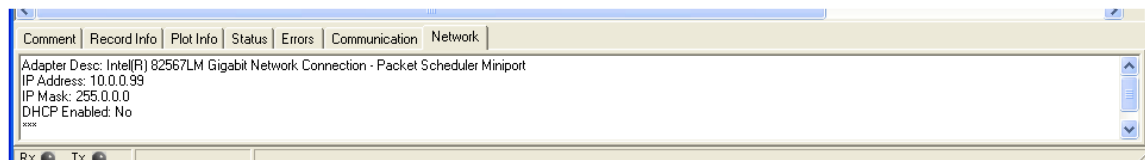
Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . .               : 10.0.0.99
    Subnet Mask . . . . .             : 255.0.0.0
    Default Gateway . . . . .         : 

C:\Documents and Settings\Administrator>
  
```

In this example, the current IP address “10.0.0.99”, and the Subnet Mask is “255.0.0.0”.

Viewing the Network Tab at the bottom of the VScope program can also check the IP address. The Network Tab shows the current IP address and Subnet Mask as detected by the VScope program.



```

Comment | Record Info | Plot Info | Status | Errors | Communication | Network
Adapter Desc: Intel(R) 82567LM Gigabit Network Connection - Packet Scheduler Miniport
IP Address: 10.0.0.99
IP Mask: 255.0.0.0
DHCP Enabled: No
  
```

In this example, the current IP address “10.0.0.99”, and the Subnet Mask is “255.0.0.0”.

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10 Universal Encoder II Specifications

SPECIFICATIONS

GENERAL

Number of sweeps in library	64 standard, custom or linked
Sweep resolution	24-bit
Sample rate	0.25 msec
Vibrator Signature recording (HFVS™)	Standard
Timing synchronization	Set by GPS time or VHF radio message
Meshed Wireless Radio	Available
External storage	USB Flash
Built-in Ethernet speed	100 Mbit

SIZE AND POWER

Universal Encoder-II	
Size	325x242x66 mm (12.8x9.5x2.6")
Weight	3.6 kg (8 lbs)
Power Input	9-36VDC
Force-III	
Size	406x2304x152 mm (16x12x6")
Weight	10 kg (22 lbs)
Power Input	9-36VDC

SOFTWARE

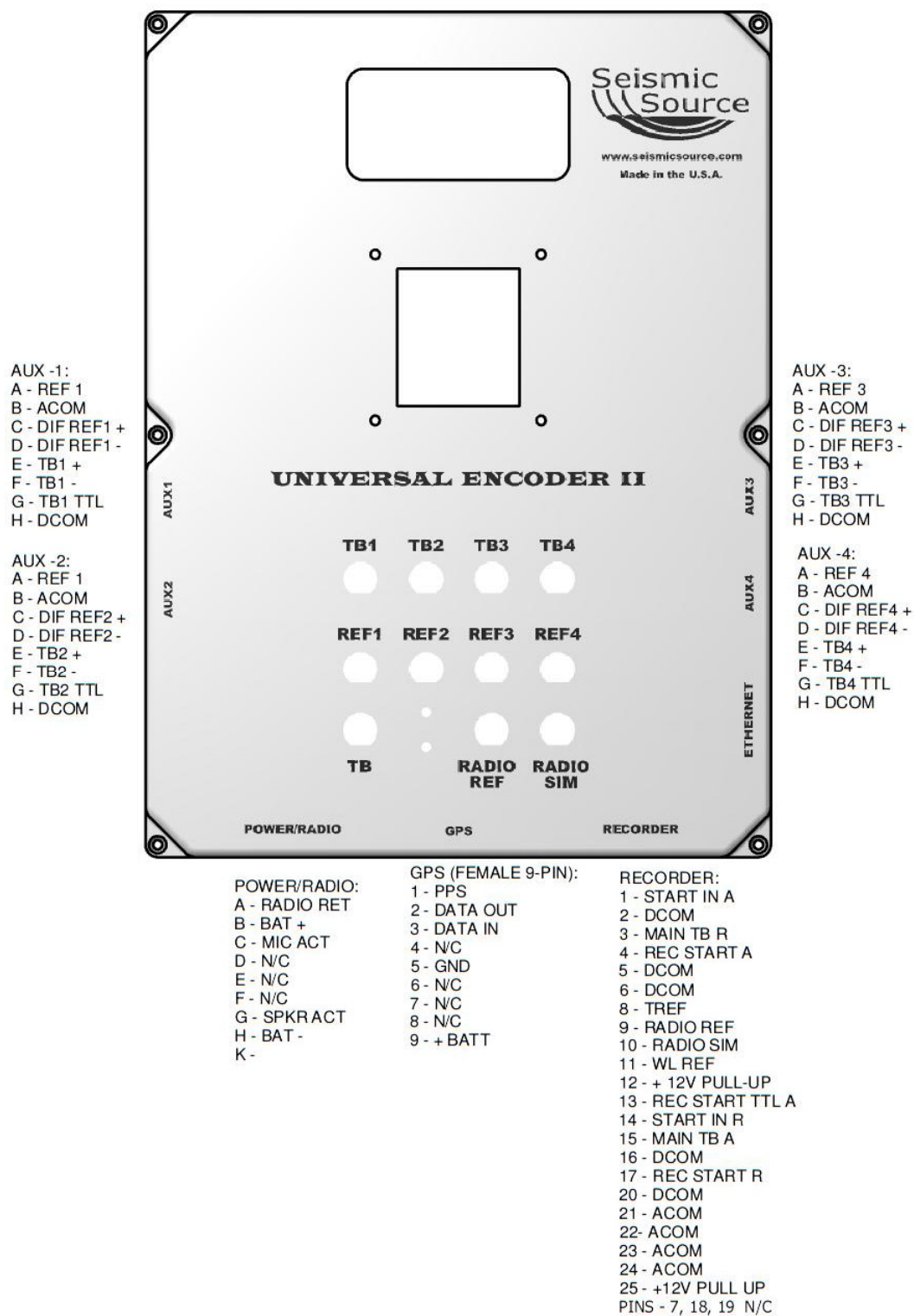
Platform	Windows XP, Windows 7 32-bit, 64-bit
Software Framework	Microsoft .Net 4.0
I/O	Ethernet, USB, Serial
Supported Survey Input Standards	SEG-P1, SPS
Supported Output Standards	SPS, SEG-P1, SBS
Maximum number of Groups	256
Maximum number of Vibrators or Shooters	256
Maximum number of Simultaneous Sweeps	64
Supported Recording systems:	
In Stand Alone mode:	
- All GPS synchronized nodal recording systems, such as Sigma, Z-Land, GSR, Unite, etc.	
- All GPS synchronized cable based continuous recording systems, such as 408/428 in microseismic mode	
In Slave mode:	
- RTI interface: OYO, ARAM	
- OVC and SGD Interface: Sercel	

Note: Specifications subject to change without notice.

11 Schematics

11.1 UE2 Front Panel

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11.2 Connector wiring

Aux signals Voltage

True Reference is +/- 2.5 volts.

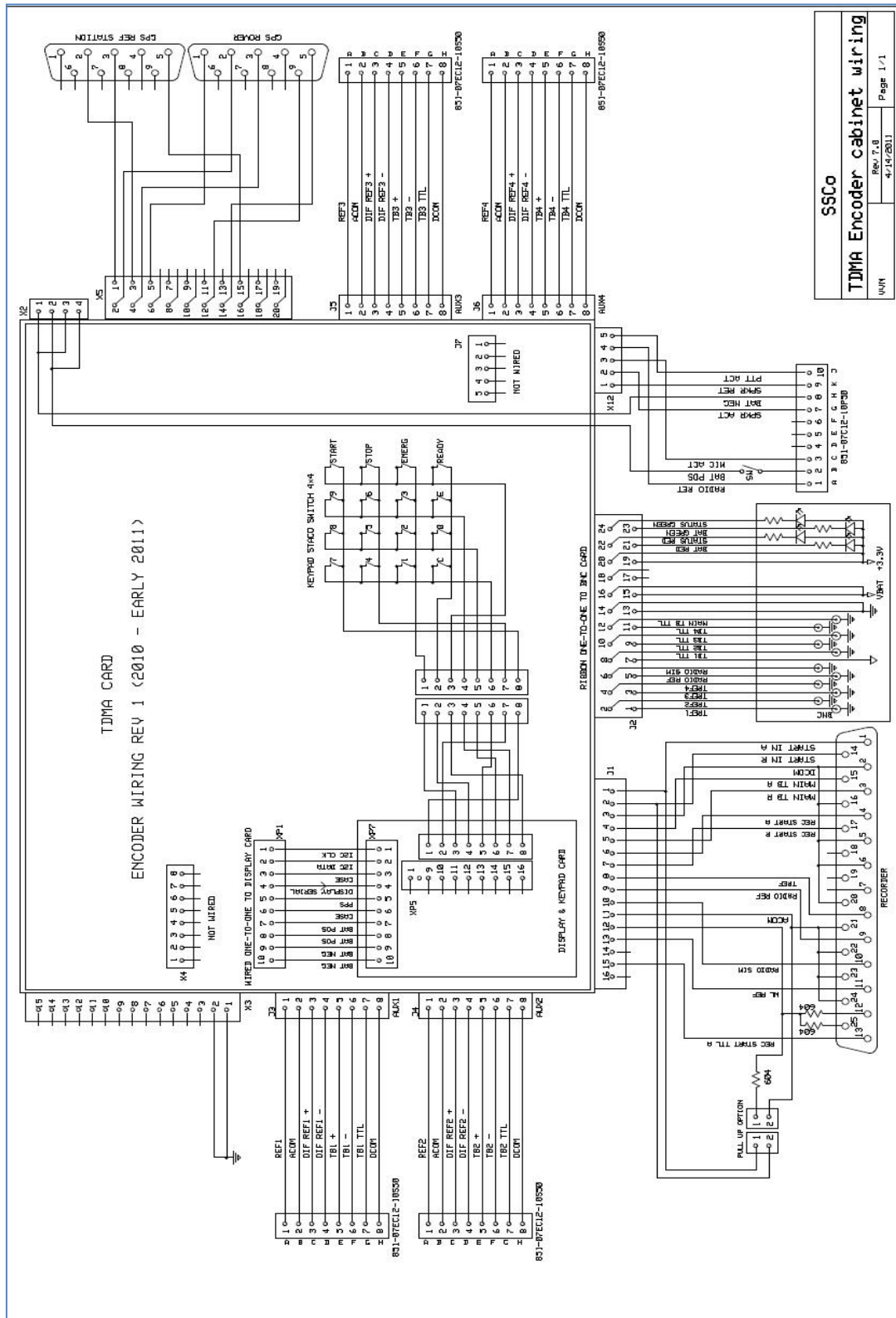
Time Break TTL is + 5 volts.

Time Break is + 200 millivolts

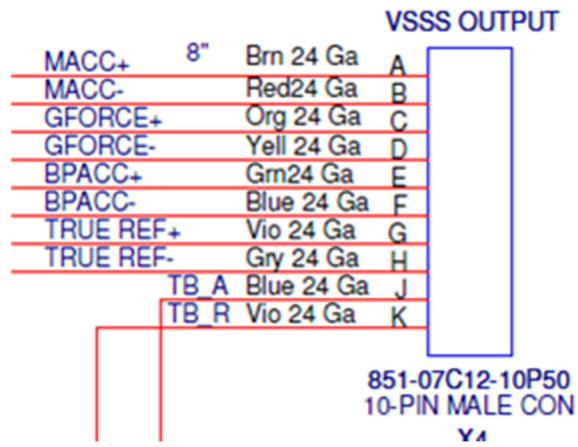
Differential True Reference is +/- 200 millivolts

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11.3 UE2 Panel Wiring

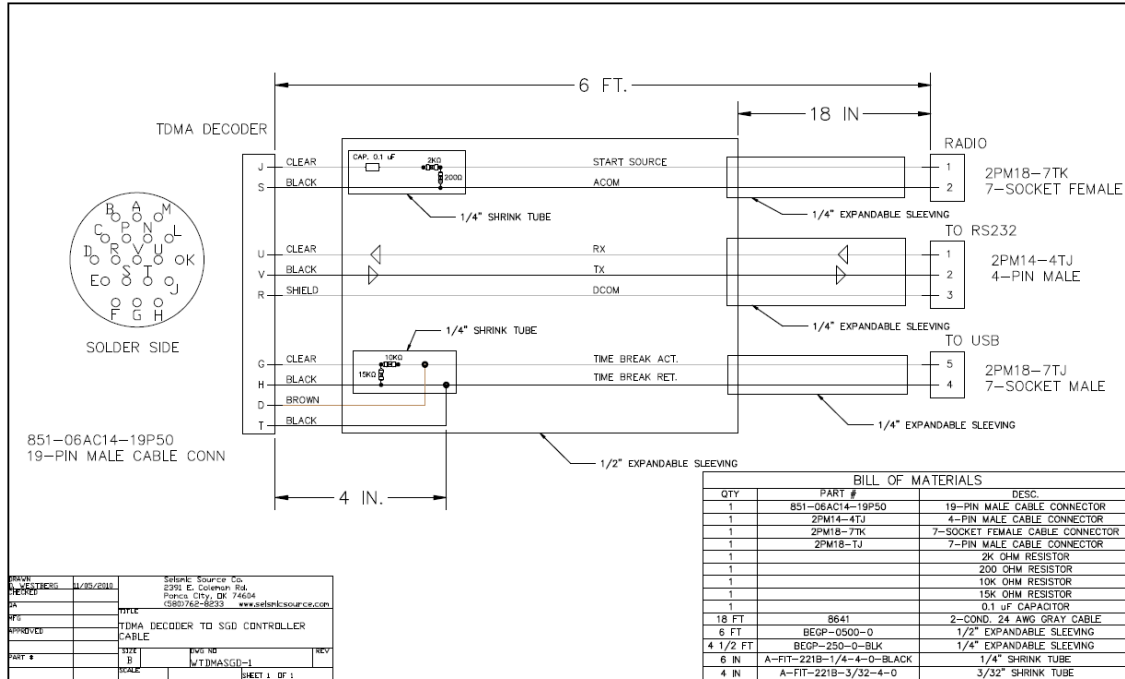


11.4 VSSS Output -TDMA



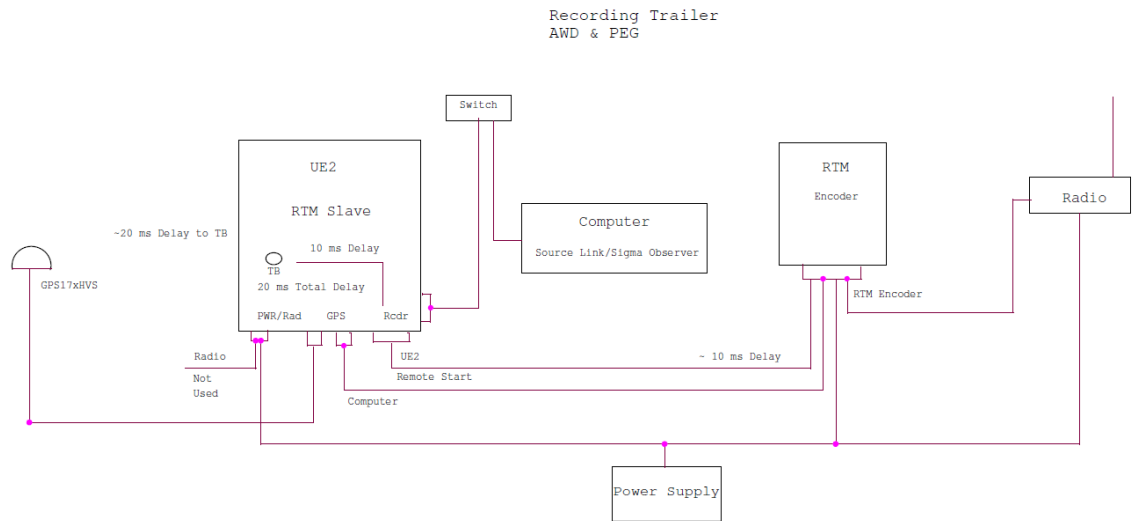
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11.5 TDMA to SGD Controller

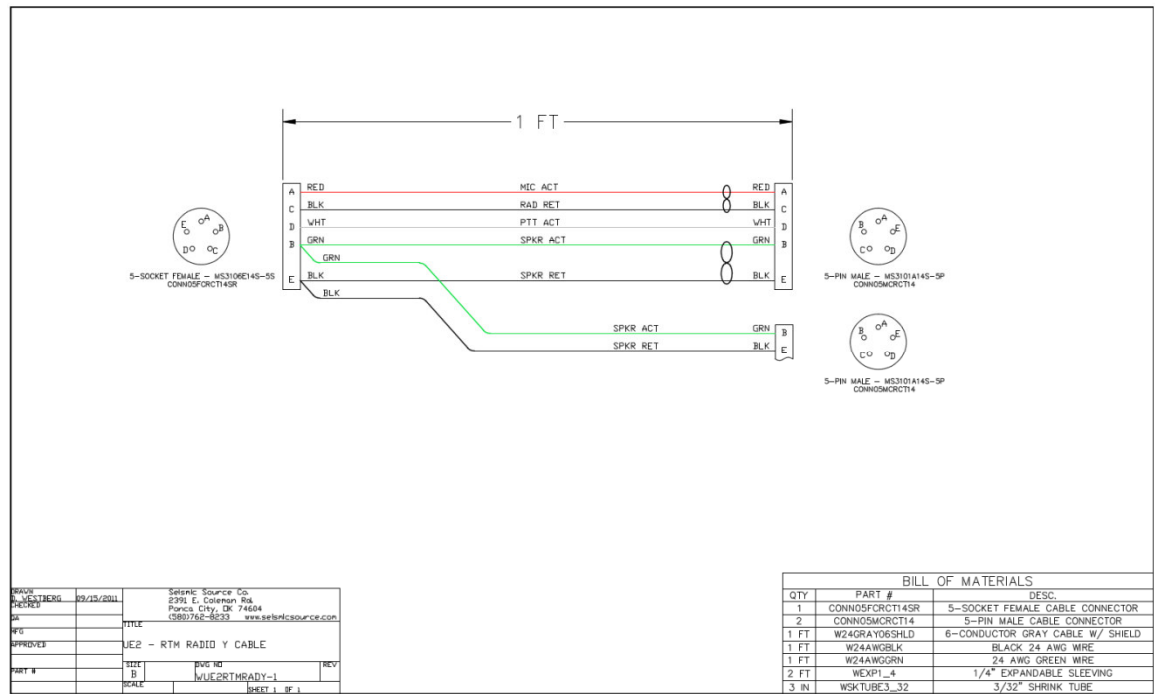


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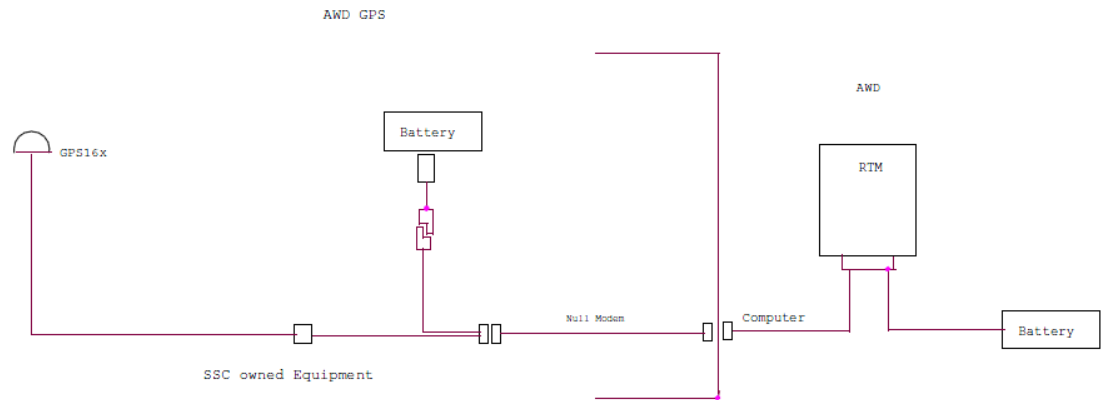
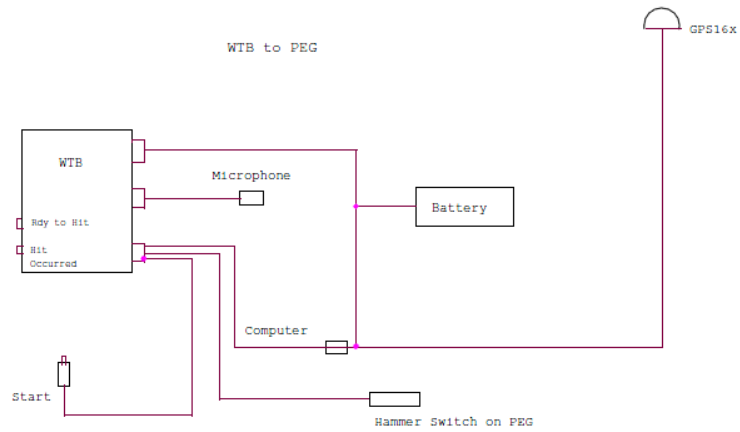
11.6 RTM UE2 AWD interface



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12 Appendix

12.1 Appendix A – COG File Format

Navigation File (.NAV file) Format:

Column 1: ShotPoint Line and ShotPointStation number combined

Column 2: ShotDate

Column 3: ShotTime

Column 4: Latitude in decimal degrees

Column 5: Longitude in decimal degrees

Column 6: Elevation

Column 7: Root Mean Square of HDOP

Column 8: Standard Deviation of the Latitude

Column 9: Standard Deviation of the Longitude

Column 10: Standard Deviation of the Elevation

If using the Average values option:

Column 11: Mean Averageof HDOP

Column 12: Mean Averageof PDOP

Column 13: Mean Averageof VDOP

Column 14: Mean Averageof Satellites

Column 15: Mean Averageof GPS Quality

Column 16: Mean Averageof Correction Age

If using the worst case option:

Column 11: WorstCase value of HDOP

Column 12: WorstCase value of PDOP

Column 13: WorstCase value of VDOP

Column 14: WorstCase value of Number of Satellites

Column 15: WorstCase value of GPS Quality

Column 16: WorstCase value of CorrectionAge

Column 17: Number of ignored positions

Example line:

50811046,10/08/2010,07:44:37.1, 37.70973458, 40.60930424, 747.2, 0.6400,0.0000000000293403,0.0000000002147039, 0.03, 0.8, 0.0, 0.0, 10, 1.5, 0

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NAV_RAW File:

Column 1: ShotPoint Line and ShotPointStation number combined

Column 2: Energy Point Index or Sweep Index (in other words)

Column 3: Vibrator ID

Column 4: ShotDate

Column 5: ShotTime

Column 6: Latitude in decimal degrees

Column 7: Longitude in decimal degrees

Column 8: Elevation

Column 9: Not Used, always 0

Column 10: Not Used, always 0

Column 11: Not Used, always 0

Column 12: Not Used, always 0

Column 13: HDOP

Column 14: PDOP

Column 15: VDOP

Column 16: Satellites

Column 17: Quality

Column 18: Correction Age

Example line:

50891033,01,01,10/08/2010,07:04:43.2, 37.71343333, 40.60245333, 749.76, 1.2,0,0,0 0.0, 0.0, 9, 5, 100

NAV_FILTERED File:

Column 1: ShotPoint Line and ShotPointStation number combined

Column 2: Energy Point Index or Sweep Index (in other words)

Column 3: Vibrator ID

Column 4: ShotDate

Column 5: ShotTime

Column 6: Latitude in decimal degrees

Column 7: Longitude in decimal degrees

Column 8: Elevation

Column 9: Not Used, always 0

Column 10: Not Used, always 0

Column 11: Not Used, always 0

Column 12: Not Used, always 0

Column 13: HDOP

Column 14: PDOP

Column 15: VDOP

Column 16: Satellites

Column 17: Quality

Column 18: Correction Age

Example line:

50891033,01,01,10/08/2010,07:04:43.2, 37.71343333, 40.60245333, 749.76, 1.2,0,0,0 0.0, 0.0, 9, 5, 100

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12.2 Appendix B – SBS File Format

SBS File Format:

shotpoint<T>epoch time<T>ascii time<T>ascii date<T>easting [status]<T>northing
[status]<T>depth [status]<T>line name<CR>

where<T> is a tab character. The file is in DOS format (just a CR at end of end line).

Example line:

1000.0 1267734651.96800000 20:30:51.975078 03/04/2010 0.0 [OK] 0.0 [OK] 0.0 [OK] 100.0

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12.3 Appendix C – SEG-P1 Format

Record ID cols 01 - 01 (character)

The character "H" in this position indicates a header record. The position is blank for all other records and ignored by most loaders.

Line Name/Number cols 02 - 17 (character)

The seismic line name or number is a 16 character alpha-numeric identifier. Spaces are acceptable but often cause trouble in some application software.

Shot Point Number cols 18 - 25 (integer)

The shot point or station number is an integer variable. This field must contain a non-blank number from one to 8 digits in length. Negative numbers are acceptable, but some loaders cannot handle them.

Reshoot code cols 26 - 26 (character)

The reshoot code is a single character (A,B,C etc) most commonly used to indicate a second or third shot at the same shot point number. It is used less frequently in contemporary data acquisition and only seldom used for marine data.

Latitude degrees cols 27 - 28 (integer)

The value of latitude in degrees for the seismic station (may vary from 0 to 90 degrees north or south of the equator)

Latitude minutes cols 29 - 30 (integer)

The portion of the latitude coordinate in minutes of arc (may vary from 0 to 60). Note that this field may be zero or contain blanks, as may any other integer field in this format.

Latitude seconds cols 31 - 34 (integer)

The portion of latitude in seconds of arc. This is a 4 digit field and is commonly written with an implied decimal between the first two and the second two digits, which represents the value of seconds to the nearest 100th of a second. The format specification does allow a decimal in the field, but this is seldom used since it reduces precision. (may vary from 0 to 6000 which represents a value of 0 to 60.00 seconds).

Hemisphere N/S cols 35 - 35 (character)

A single character designating the northern (positive) or southern (negative) hemisphere.

Longitude degrees cols 36 - 38 (integer)

The value of longitude in degrees for the seismic station (may vary from 0 to 180 degrees east or west of Greenwich). Note that this is a three digit field as compared to the 2 digit field for latitude.

Longitude minutes cols 39 - 40 (integer)

The portion of the longitude coordinate in minutes of arc (may vary from 0 to 60).

Longitude seconds cols 41 - 44 (integer)

The portion of longitude in seconds of arc. This is a 4 digit field and is commonly written with an implied decimal as noted above to represent the value of seconds to the nearest 100th of a second.

Hemisphere E/W cols 45 - 45 (character)

A single character designating the eastern (positive) or western (negative) hemisphere

X coordinate cols 46 - 53 (integer)

The X coordinate of the station based on the local Cartesian coordinate system. This value may be in feet or meters, and may be positive or negative. Note that SEG-P1 has no provision for defining the local coordinate system or its transformation to lat/long coordinates. These details should appear in the header if required.

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Y coordinate cols 54 - 61 (integer)

The Y coordinate of the station based on the local coordinate system. This value may also be positive or negative, but must be in the same units and same coordinate system as the X coordinate. (Note that an F8.1 floating point value is also legal, but seldom used, in this and the previous field).

Station Elevation cols 62 - 66 (integer)

The station elevation in feet or meters above (or below) datum. Datum is usually sea level unless otherwise specified in the header. Note that this field is often used for water depth in marine shooting. (An F5.1 floating point field is also legal).

Misc Items cols 67 - 80 (integers)

There are five additional numeric fields defined in the format for use in specifying time, date and other items related to field operations. They are seldom used in data exchange files and the fields usually appear as blanks or zeros. For details on these items see the above SEG reference.

Example line:

500109 35270646N099402058W15018889 168