M-Freq AwcpLink

Version 1.0.05 Users Guide

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1 Introduction

Congratulations on your purchase of ASL Environmental Sciences Inc. Multi-Frequency Acoustic Water Column Profiling sonar (Multi-Freq AWCP).

This manual is provided as a guide for the operation of the Multi-Frequency software.

The following is a summary of the functions performed by Multi-Frequency:

- The software provides a graphical user interface to operate your Multi-Freq AWCP from a PC.
- The software communicates with the Multi-Freq AWCP via RS232 communications protocol.
- Programs the Multi-Freq AWCP units parameters and deploys the unit.
- The program can retrieve the units parameters and display status and available data storage capacity.
- If the unit is programmed to transmit data over the RS232 the program acquires the data and stores it in files on the PC's hard disk. The program has the ability to display the real time data in both text and graphical form as it is transmitted by the Multi-Freq AWCP unit to the PC.
- The program can retrieve data that is stored on the Multi-Freq AWCP's Compact FLASH (CF) memory over the RS232 port. Note that this is not a recommended method of data retrieval except for relatively small amounts of data as this can take several of hours if there are several MB of data. See the section on data retrieval.
- The program can set the Multi-Freq AWCP unit's internal date and time clock.
- The program can plot data files that have been retrieved from the units CF or the real time data files that were created by MfAwcpLink while monitoring in real time mode. Both individual profiles and series of profiles plotted as an echogram are available.
- The program can decode and export the profiles to formats compatible with other analysis and display programs.

2 Minimum System Requirements

The following list describes the minimum system requirements recommended for hardware and software you need to run MfAwcpLink software. The program may run on machines with less resources.

- A Windows PC with an 1 GHz Pentium or higher processor, with at least 512 MB of RAM and at least 5 MB of free disk space for the software.
- 1024x768 SVGA
- Windows 2000/XP/VISTA
- Sufficient free disk space is required to up load the data from a unit's compact FLASH disk and/or real time data.
- 1 RS232 port
- A USB-RS232 is provided with your unit for computers that do not have a RS232 port.

3 Installation

3.1 Program Installation

The software is provided in a self extracting and executing WinZIP file named as follows:

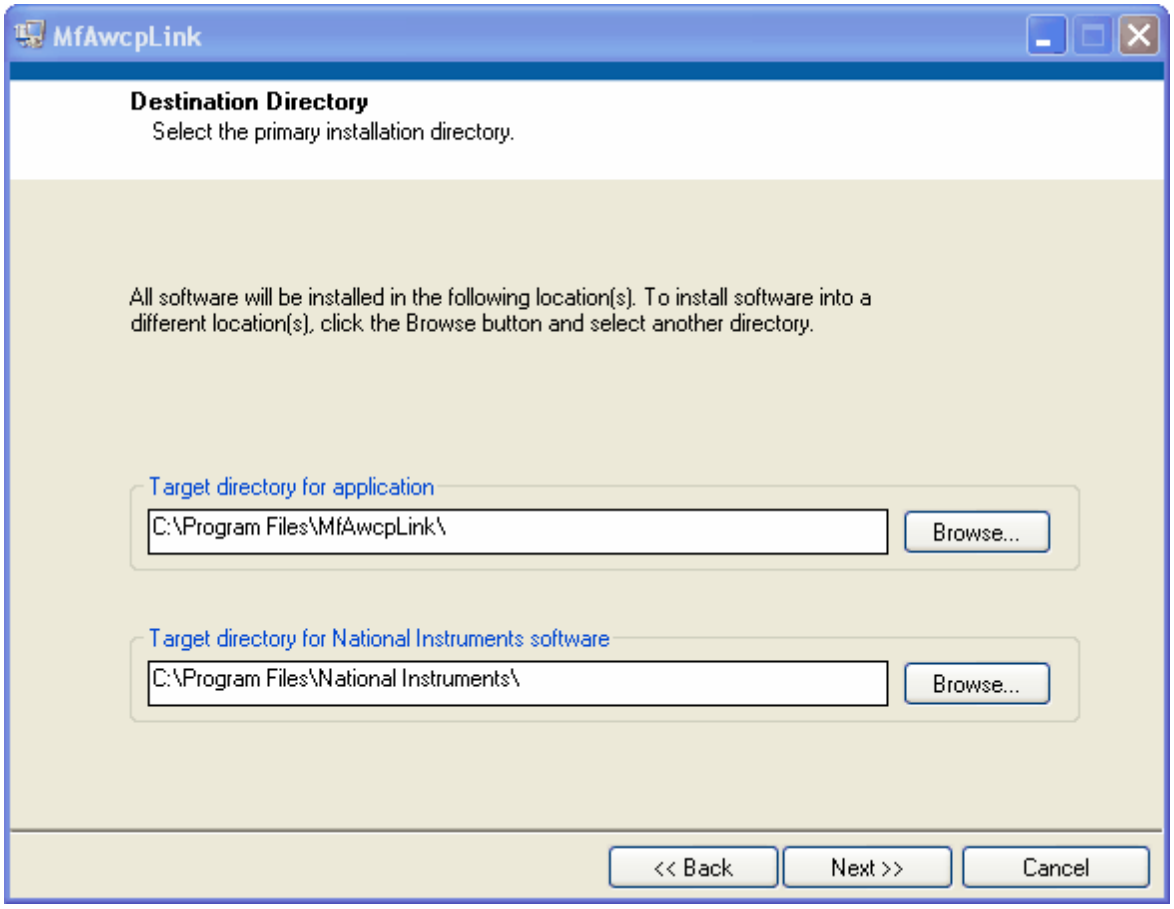
MfAwcpLink_A_B_CC_YYYYMMDD.exe

Where:

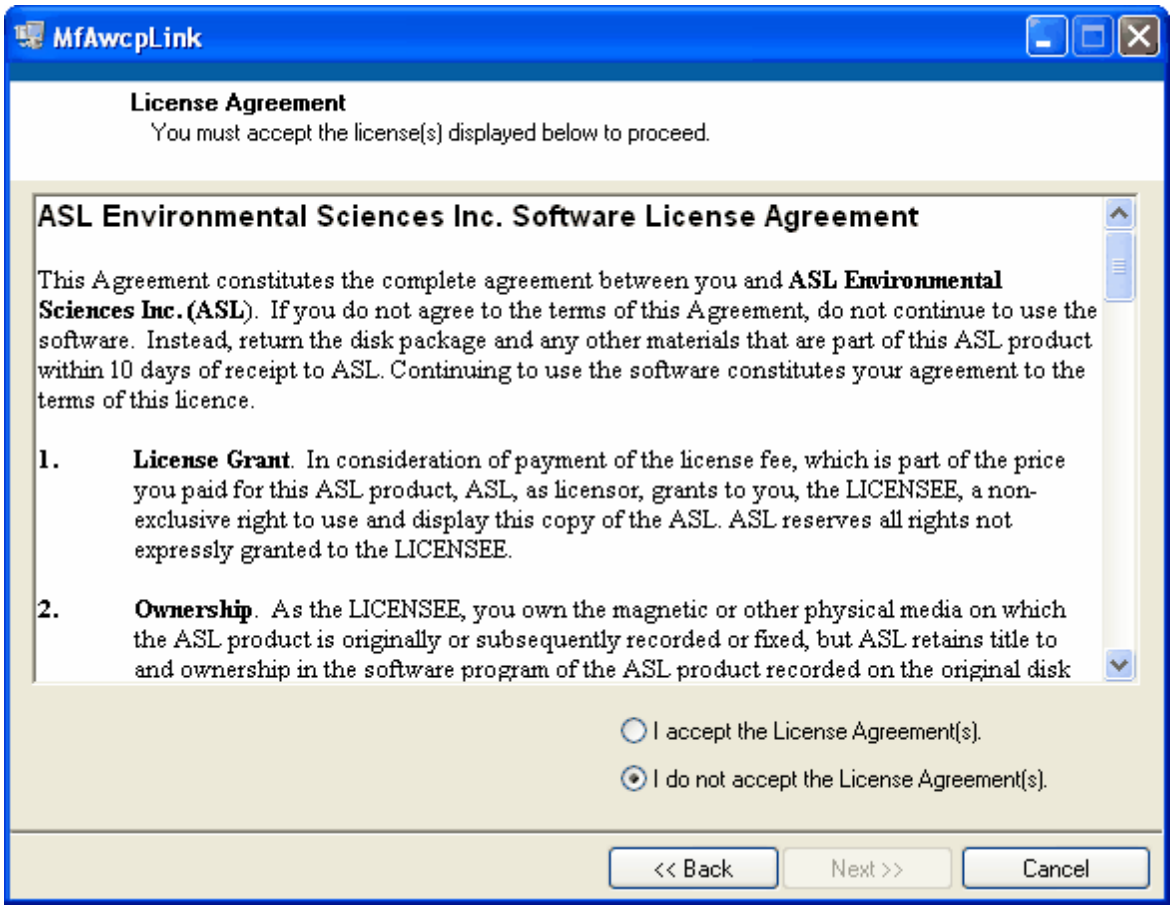
A - is the software's Major version number
B - is the software's Minor version number
CC - is the software's Sub Minor version number
YYYYMMDD is the software build date.

This file can be found on the CD-ROM provided with your instrument or via Internet download.

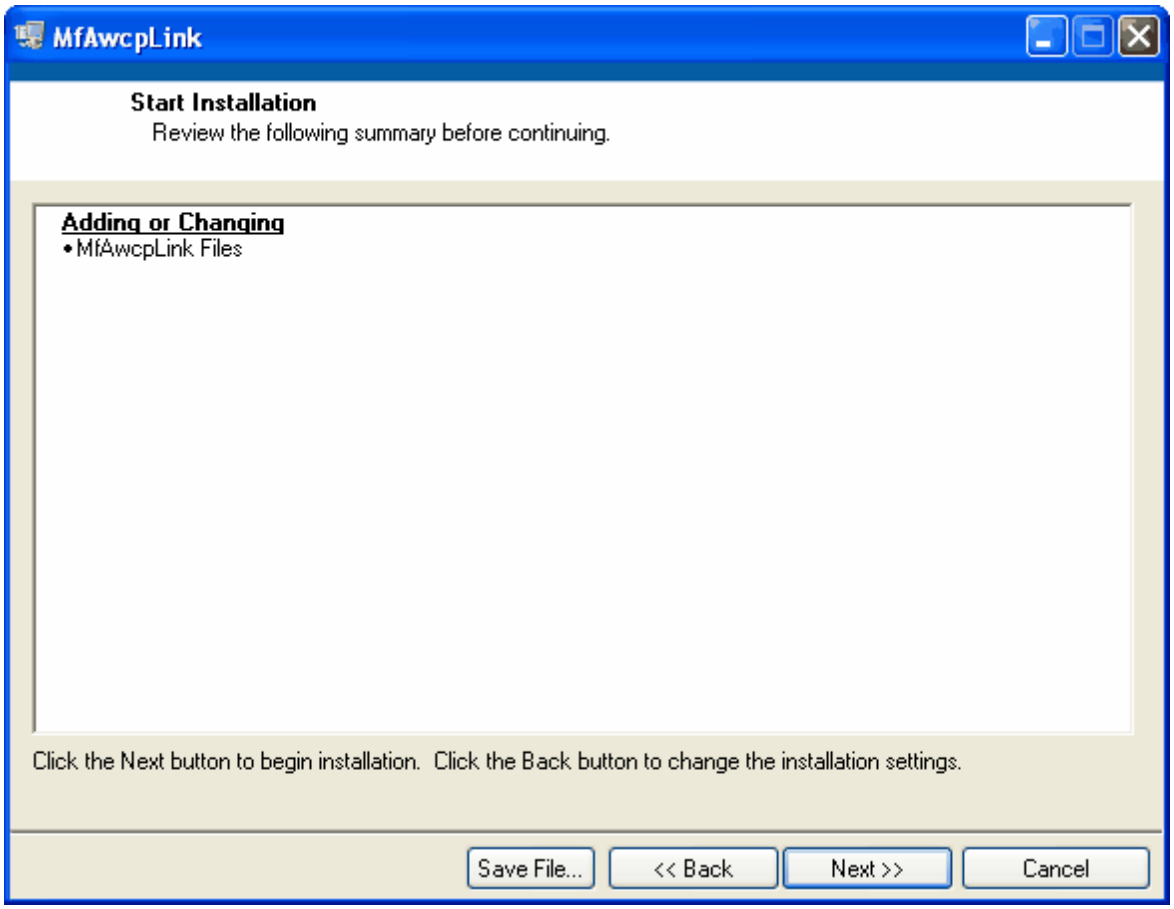
Click on the MfAwcpLink_A_B_CC_YYYYMMDD.exe to begin the installation.



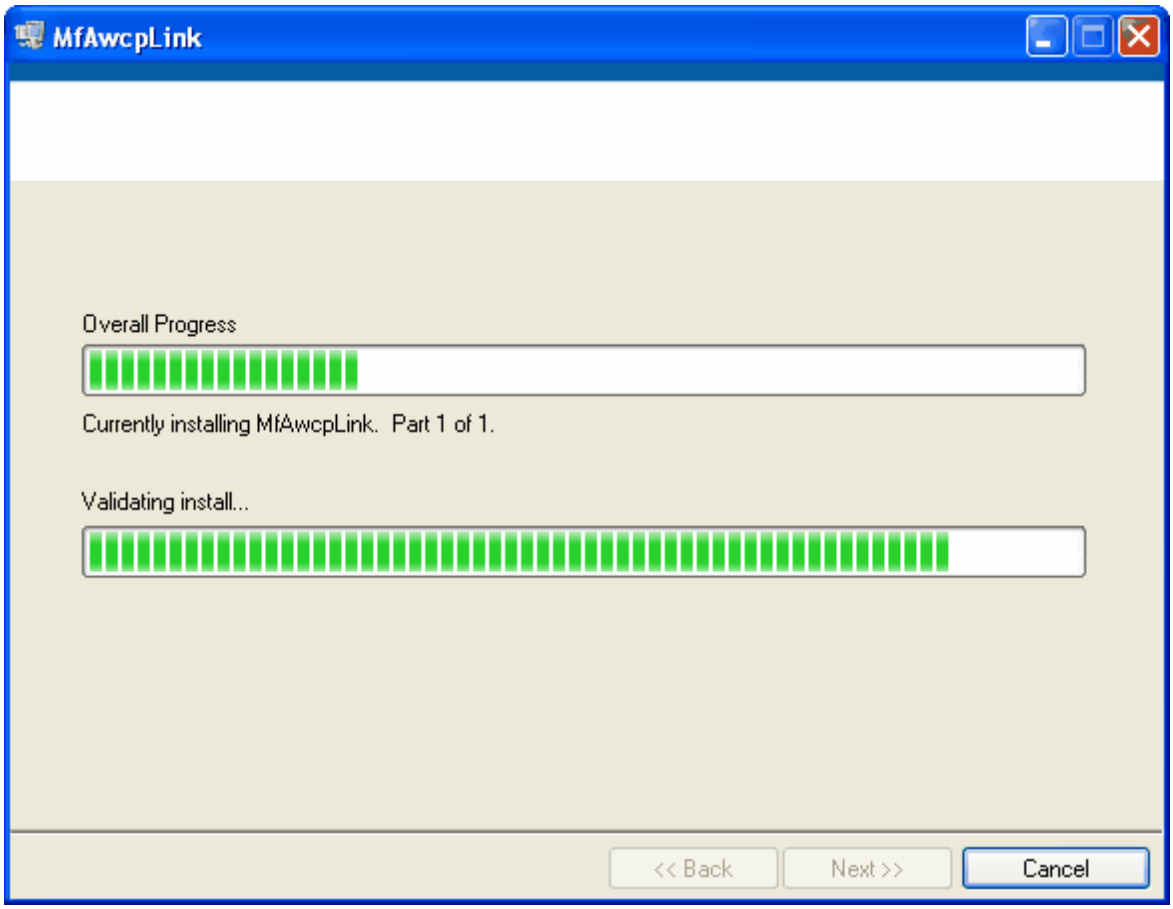
Click Next.

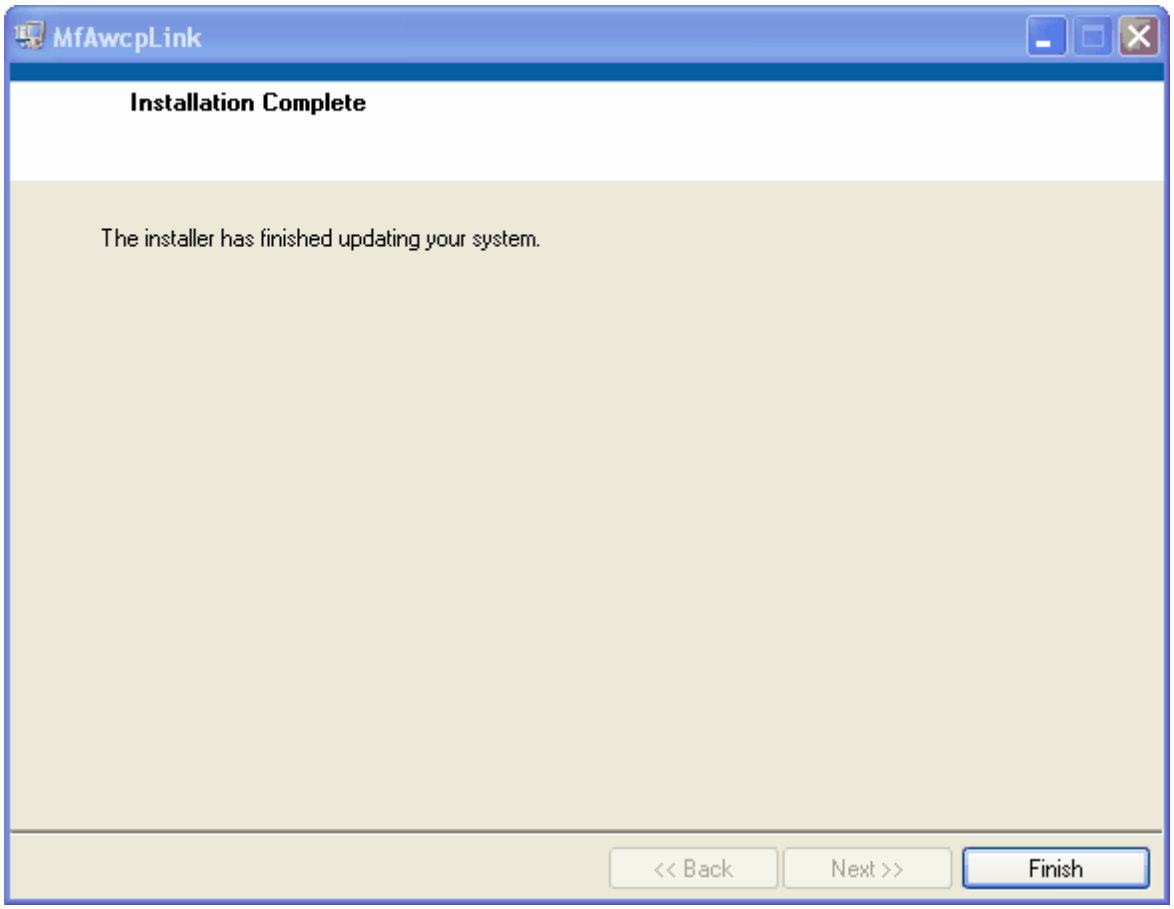


Click I accept and then the Next button.



Click Next.





Click Finish to complete the installation.

Start the program by selecting it on the Start->All Programs->MfAwcpLink->MfAwcpLink menu.

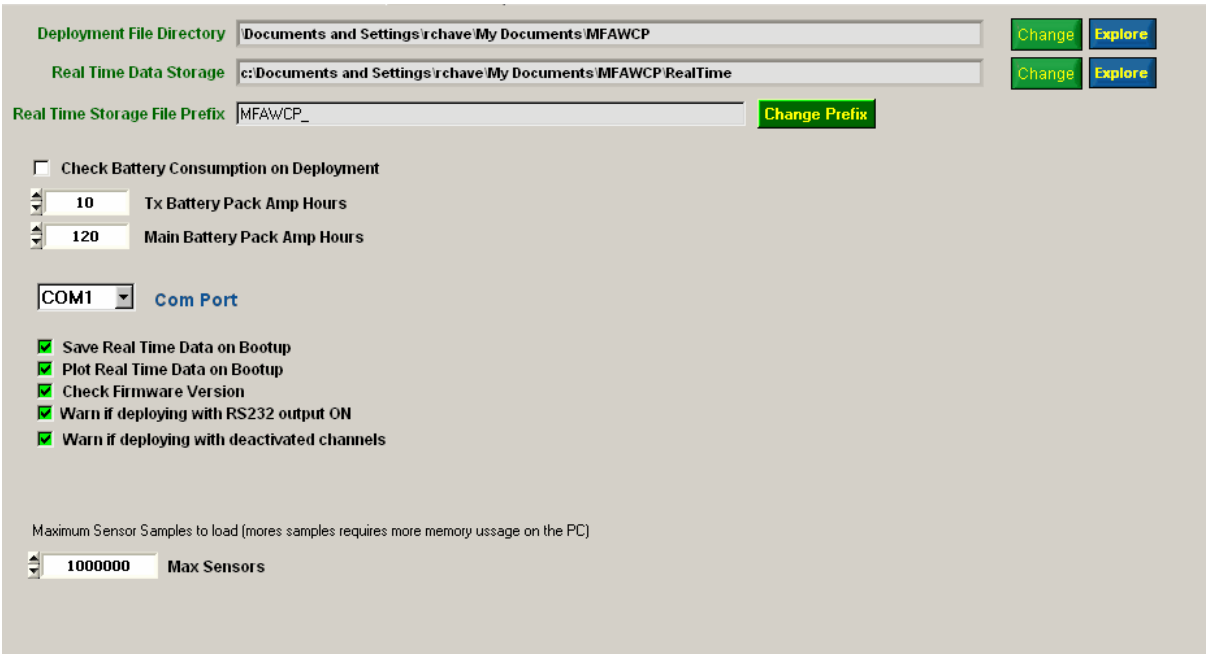
The first function when running the program is to set the correct COM port in the Preferences tab.

3.2 Setting Up MfAwcpLink Communications

After installation connect your Multi-Freq AWCP to the PC's serial port.

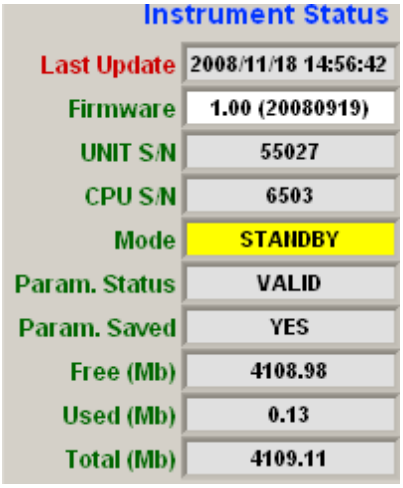
Start MfAwcpLink.

Go to the preferences panel and select the correct COM port.



Check your connection by going to the Multi-Freq AWCP tab and click on the

command button. This will end Multi-Freq AWCP deployment if it is deployed and return status information.



3.3 Setting Up Terminal Emulation Communications

A terminal emulator called Motocross is included with this software package. The purpose of the emulator is to gain direct RS232 communications to the unit. This can be useful for trouble shooting communications problems.

Follow the instruction found in the Terminal Emulator Command Button section for setting up the Motocross Terminal Emulator communications settings.

The terminal emulator can be used to for trouble shooting functions.

4 Theory of Operation

The Multi-Freq AWCP software system consists of two software packages, the Multi-Freq AWCP Firmware that controls and operates the unit and the MfAwcpLink PC based software used to program the Multi-Freq AWCP and monitor the unit during real time data acquisition. The two software packages communicate with each other over a RS232 serial interface.

A third software package called Motocross is included in the installation. This is a terminal emulator program that allows the users to communicate with the Multi-Freq AWCP with the keyboard for special operations or just to check communications.

The Multi-Freq AWCP transmits a pulse of sound, digitizes the returning signals and stores the data to solid state memory or CF, transmits the data to a PC over RS232 or both. The Multi-Freq AWCP has the capability of averaging the returns both spatially and in time. It has the capability of digitizing the returns at 64000, 40000 or 20000 samples per second.

The Multi-Freq AWCP has the capability of acquiring data from 1 to 4 different transducers depending on the unit's configuration. The number of frequencies is configured at the factory based on the clients selection.

Data can be stored on a CF ranging in size from 16 MB to 16 GB and/or transmitted to a PC in real-time via RS232.

The Multi-Freq AWCP stores operating parameters, configuration and auxiliary sensor coefficient parameters in internal non-volatile memory that remains intact after power off/on cycles. Configuration and coefficient information is typically set by the manufacturer and remains the same for any type of deployment. Operating parameters are set by the end-user and are programmed to the instrument when it is deployed.

The Multi-Freq AWCP unit is capable of running a number of different operating parameters over selected periods of time. These periods of time are called phases. Each phase is defined by a start time and duration. When the duration of one phase is complete the instrument switches to the next phase. If a unit is on the last phase it continues to collect data using the operating parameters of this phase until either the unit runs out of battery power or the CF is full.

Phases and their parameters are described in more detail in a section below.

When the unit is equipped with more then one frequency the data is collected sequentially and then stored to CF and/or transmitted over the RS232 link. The data from each frequency is stored in RAM to minimize the time between the acquisition of data at each frequency.

4.1 Phases

The Multi-Freq AWCP has the capability of acquiring data with specific data acquisition parameters for specific for intervals of time: these intervals of time are called "Phases". The Multi-Freq AWCP has the capability of being programmed to use up to 12 Phases. When a Phase is complete the unit moves on to the next Phase and collects data with the parameters for that Phase. When the final Phase is complete the unit continues collecting data with its parameters until the CF is filled or the battery is exhausted. The Multi-Freq AWCP has three different types of Phases: Normal, Sleep and Repeat.

A Normal Phase is a Phase with normal parameters. A Sleep Phase is a Phase in which no data collection is performed, this can be useful to save energy for period where no data is required. A Sleep phase can not be programmed as final phase. A Repeat Phase is a special phase that causes the unit to reset the start date of the first phase to the current date and time, thus repeating the sequence of phases. Only the final phase can be a Repeat phase.

The start date and time of the first phase is determined by the acquisition start date which is set by the end user. The end date of the first phase is its start date/time plus its "Duration Time:. The "Start Date" for the next phase is the start date of the previous phase plus the duration of the previous phase.

For example:

Phase 1 start date: 2008/01/01 12:00:00
Duration: 2 days

Phase 2 start date: 2008/01/03 12:00:00

4.2 Time Intervals and Data Acquisition

The Multi-Freq AWCP is driven by a one second clock chip that wakes the CPU from a low power sleep mode. This clock guarantees that data is acquired on even time intervals and conserve battery power by putting the CPU into a low power sleep mode when there is nothing to be done. On each second interval the CPU wakes up, determines if its time for a phase change and/or determines if it is time to acquire data. When finished it goes back to sleep and is then reawakened on the next second to repeat the sequence.

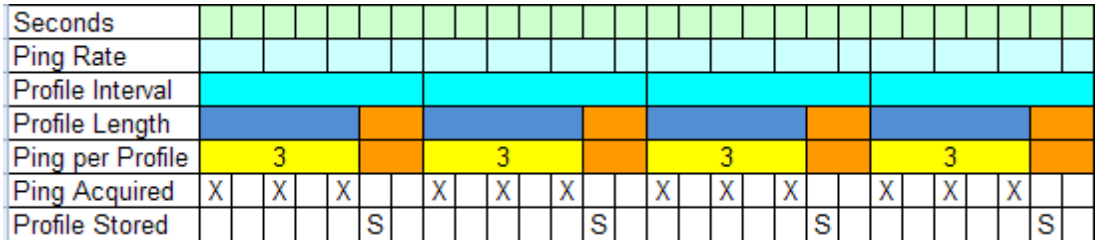
When the unit is in a data acquisition phase (see definition of phases), it keeps a number of software counters to determine when it is time to acquire Profiles of data. A Profile is a number of averaged pings at the same frequency. The averaging can be both in time (series of pings) and/or spatially averaged in range. A Ping is the transmission of an acoustic pulse and the digitization of the return for each frequency channel; the channels are sampled sequentially; once digitization for one channel is completed, the transmission for the next occurs. If the unit contains N frequency channels then it will produce N profiles.

If the unit is busy performing a function that takes longer than a one second to complete, such as computing and/or storing large quantities of data, the unit keeps track of the missed wakeup calls (one second intervals) so it can resume the timed intervals described below.

Based on the one second time interval, there are 3 periods to keep track of for acquisition of profile data. They are the Ping Rate, the Profile Interval and the Profile Length.

The Profile Interval is the interval of time for which to start acquiring and averaging pings for each available frequency. The start of the Profile Interval is always the start of the Ping Rate regardless of where the Ping Rate counter was for the previous Profile (i.e. the Ping Rate reset to 0) . Pings are only acquired when they fall on a Ping Rate and the Ping Rate falls within the Profile Length. The Pings that are acquired within the Profile Length are averaged in time by summing the acquired digital values at the same index position for each channel in the data array. These summed up values are defined as bins. A set of these bins are called a Profile. A Profile can also consist of one or more Pings that have been averaged spatially in range. For example, averaging of all the samples that fall within one meter bins. Single Pings that are stored with no averaging in either time or space are also called Profiles once they are stored. These can be acquired by setting the Profile Interval to 1 second and the Range Averaging to 1.

Once the number of Profile Length is reached, the profile is stored to CF and/or sent to a PC via RS232. Below is a table illustrating a Ping Rate of two seconds, a Profile Interval of 7 seconds, and a Profile Length of 5 seconds or with 3 pings (the figure applies to an instrument with any number of installed frequency channels since all frequencies are sampled on each ping).



The user has the option of having the Sum of Squares (for the computation of Standard Deviation (STD)) computed for each bin and stored with the Profile. For this option to be available, the Profiles must consist of more than one averaged ping and/or the pings must have been spatially averaged in range. The storage of the sum of squares costs six bytes per bin plus the 2 bytes for the bin.

The storage/transmission of the profile may take longer then the free period after the Profile Length depending on the amount of data to be stored. If this is the case then the Profile Interval is extended to fulfill the storage/computational requirements. This may cause uneven Profile Intervals and the instrument will flag these profiles as over-runs. The software gives the user an estimate of the amount of time it should take to process the profile and whether over runs are likely.

If acquisition/processing and storage time take longer than one second the processing for a profile must be complete at least a full second before the start of the next profile or an over run occurs.

Even if there is enough time between the Profile Intervals to perform all the required storage and computational functions there may be an impact on the energy requirements of the unit since it is not going to sleep while performing those functions. The user must choose parameters to balance the storage and power requirements with the desired data requirements.

Continuous storage of pings with no averaging is available but will consume the CF storage relatively quickly depending on the number of samples required for each profile, the size of the CF the length of the deployment.

4.3 Internal Data Storage

The Multi-Freq AWCP unit stores data on Compact FLASH (CF). The units are capable of accepting CF up to 16 Gigabyte; larger units are yet to be tested. Certain standards of CF are required for proper

operation. Larger CF's may become available in the future.

The Multi-Freq AWCP unit on power up creates a data directory called DATA. As data is stored to the CF the unit creates sub-directories using the current year and month. The names of these subdirectories are YYYYMM where YYYY is the year and MM is the month. Any data file created for that year and that month will reside in this subdirectory.

There are 4 types of files created in the directories; XML, LOG, DPL and data files for which the file type is set to the phase number. For example, type .001 is data created from phase 1, .002 from phase 2 through .012 for phase 12.

The XML files are created when the unit is deployed. All parameters including operating mode and instrument coefficients are stored in a XML format in these files. These files are suitable for future processing programs to read. An example file name is "07011212.XML".

The DPL files are created when the unit is deployed. These files contain deployment parameters in a more user readable format for reference. An example file name is "07011212.DPL".

The LOG files are created when a unit writes a message to indicate a boot up, phase change or error. These message are in a ASCII readable form for user reference. An example file name is "20070112. LOG". Note only one log file is created per day.

4.4 Terminal Emulator

A terminal emulator called Motocross is included with this software package. The purpose of the emulator is to allow direct RS232 communications to the unit. This can be useful for trouble shooting communications problems.

The Terminal Emulator and MfAwcpLink cannot run at the same time. When the Terminal Emulator is run from the MfAwcpLink software, the MfAwcpLink is suspended and the emulator software starts up and takes over the serial port.

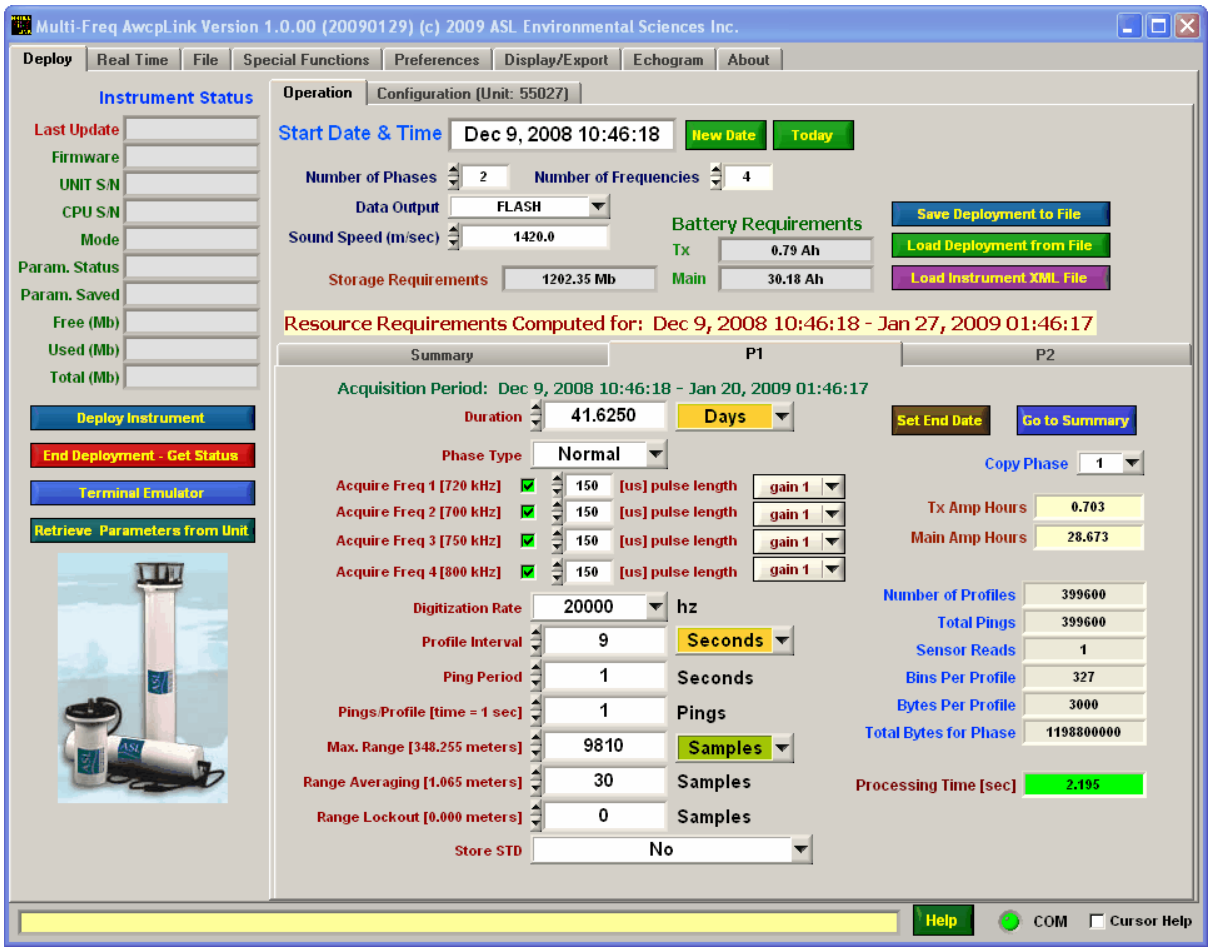
**** When the Terminal Emulator is first invoked it must be programmed with the correct RS232 COM port in the preferences menu. This is described section Terminal Emulator Command Button.

5 MfAwcpLink

This section describes the operation of the MfAwcpLink software.

5.1 Overview

The MfAwcpLink software consists of a number of tabs as shown below.



The tab labeled 'Deploy' contains a number of command buttons and sub tabs used to program the unit.

The tab labeled 'Real Time' displays real time data sent over the RS232 port to the PC if the unit has been programmed to send the data over the RS232.

The tab labeled 'File' is used to retrieve data stored on the unit's CF, remove files from the CF and to format the CF.

The tab labeled 'Special Functions' provides specialized functions such as setting the unit's date/time clock.

The tab labeled 'Preferences' is used to set some program parameters for MfAwcpLink.

The tab labeled 'Display/Export' is used to display and export data files retrieved from the unit either from the units CF or files created by 'MfAwcpLink' when data is sent to it in real-time by the unit.

The tab labeled 'Echogram' is used to display data files retrieved from the unit's CF or files created by 'MfAwcpLink' when data is sent to it in real-time by the unit in as an.

The tab labeled 'About' shows program and contact information.

5.1.1 Help

At the bottom of the main tab is the 

command button. Click on the button to get the program help.

5.1.2 Communications Indicator

At the bottom of the main panel is and indicator that is GREEN if the PC's communications port was successfully opened 

. If the communications port is not present or used by another program it is RED 

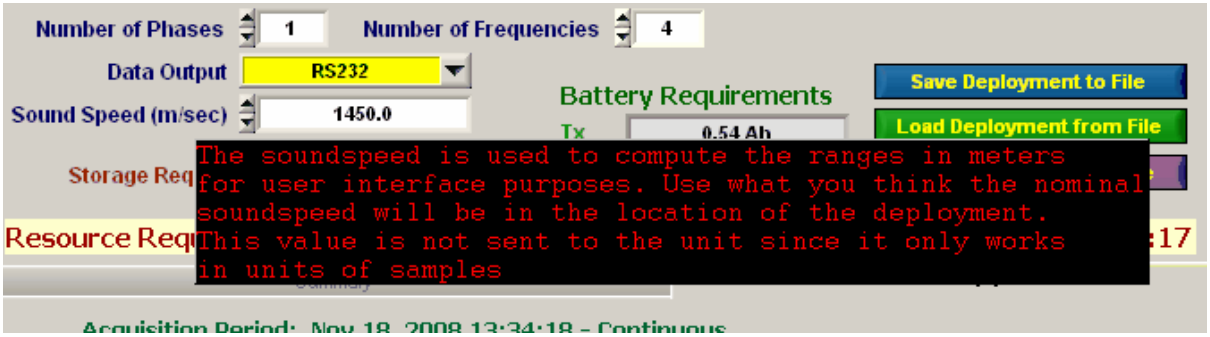
. If the indicator is RED then you must terminate any program that is using the port or change the port setting in the Preferences Panel.

5.1.3 Cursor Help

The 

check box is used to enable or disable Cursor Help. If enabled 

the program provides some information on the controls and indicators that the cursor is focused on.



In the example above the cursor is focused on the Ping Processing Time. Note that the cursor must be focused on the panel and controls that it hovers above.

5.2 PC Files and Directories

When MfAwcpLink starts it creates the following directories if they do not already exist. The location of these directories can be changed by the user if desired. The 'account' is the login account of the user.

c:\Documents and Settings\account\My Documents\MFAWCP\Deployments
c:\Documents and Settings\account\My Documents\MFAWCP\Realtime
c:\Documents and Settings\account\My Documents\MFAWCP\DownLoad
c:\Documents and Settings\account\My Documents\MFAWCP\Parameters
c:\Documents and Settings\account\My Documents\MFAWCP\Configuration

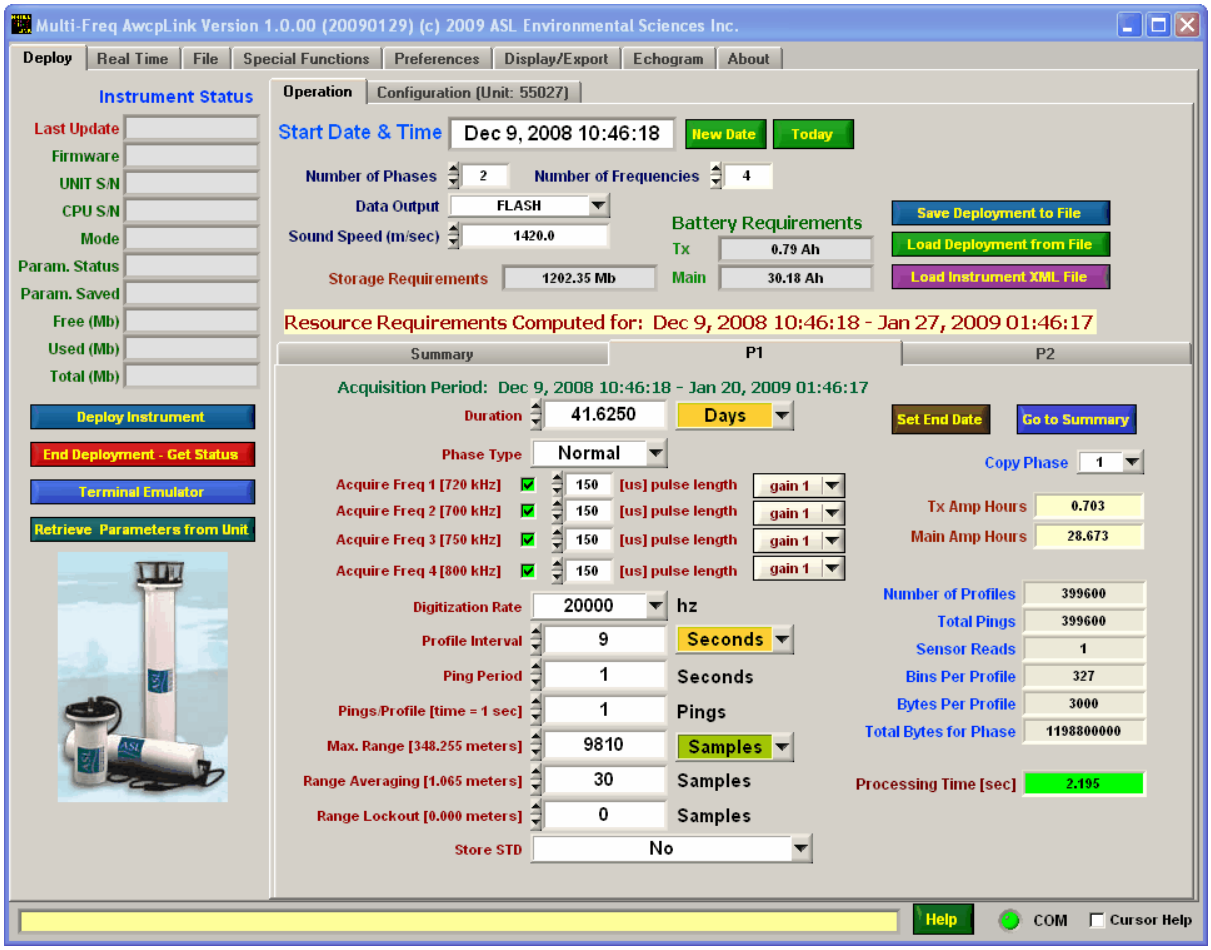
Whenever the MfAwcpLink deploys an instrument a deployment file is written to c:\Documents and Settings\account\My Documents\My Multi-Freq AWCP\Deployments. These files contain information

about the deployment.

If the real time data is being transmitted to the PC from the Multi-Freq AWCP, it is stored in the c:\Documents and Settings\account\My Documents\My Multi-Freq AWCP\Realtime directory.

5.3 Deploy Tab

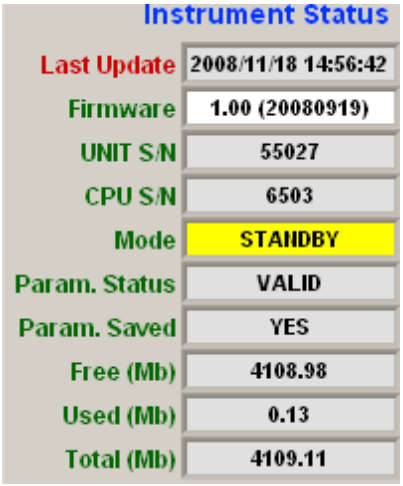
The main purpose of the Deploy tab is to select the instrument's operating mode parameters. The tab contains a number of sub-tabs for parameter settings and command buttons for deploying the instrument, terminating the deployment, entering the terminal emulator and other functions.



5.3.1 Instrument Status Indicators

The Deploy tab contains a number of instrument status indicators. These show status information sent up by the unit when it is either deployed or a deployment is terminated. Below is an example of the status indicators after a deployment is terminated and or it was already terminated and the 

command button is clicked.

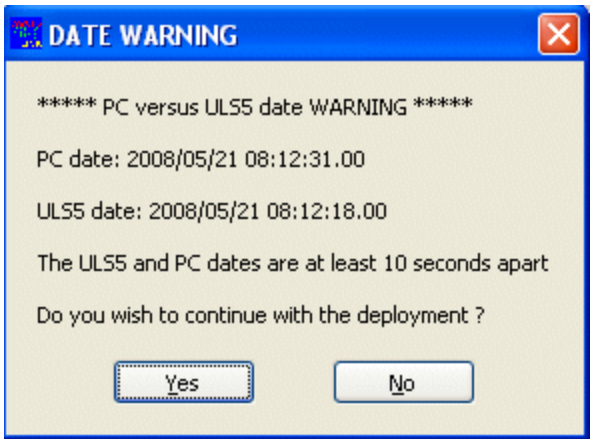


The Last Update indicator shows the date/time of the status information. The Version is the Multi-Freq AWCP units firmware version numbers. The UNIT S/N is the serial number assigned to the unit by the manufacturer. The CPU S/N is the serial number of the Multi-Freq AWCP's CPU. The Mode indicator will either indicate "STANDBY" or "DEPLOYED". The Param. Status indicator shows the status of the configuration parameters as checked by the firmware. The Param. Saved indicator shows whether or not the configuration parameters are saved to the internal non-volatile memory contained within the CPU (note this is not the CF memory). The Free (MB), Used (Mb) and Total (Mb) show the amount of used, free and total memory on the CF.

5.3.2 Deploy Instrument Command Button

The 

command button causes MfAwcpLink to deploy the instrument with the specified operating parameters. When this button is pressed MfAwcpLink retrieves the date/time from the unit and checks it against the date/time of the PC. If there is a difference of more than 10 seconds a warning popup is displayed.



If this is not a problem then click on Yes. For example the unit's date and time may have been set from a different clock source such as a wrist watch.

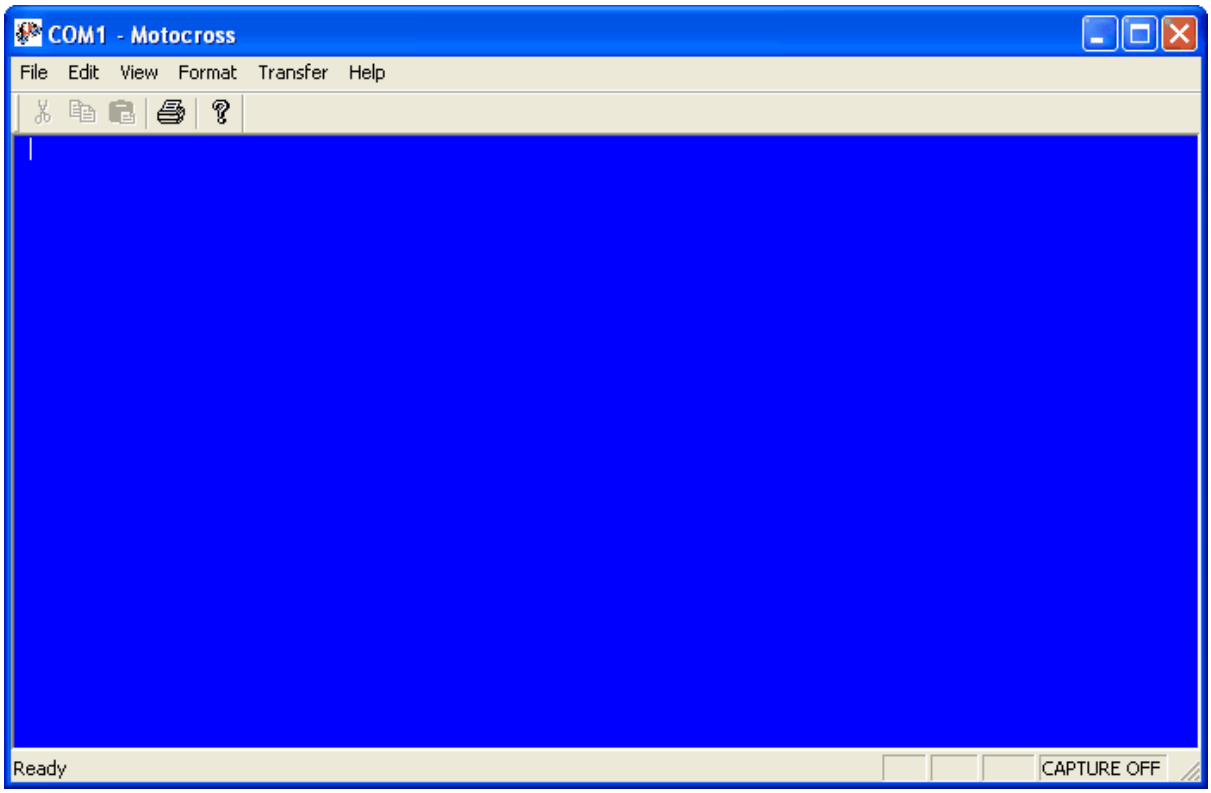
***** It is recommended that deployment dates/times be kept in a log book *******,

The figure below shows the status information after a successful deployment.

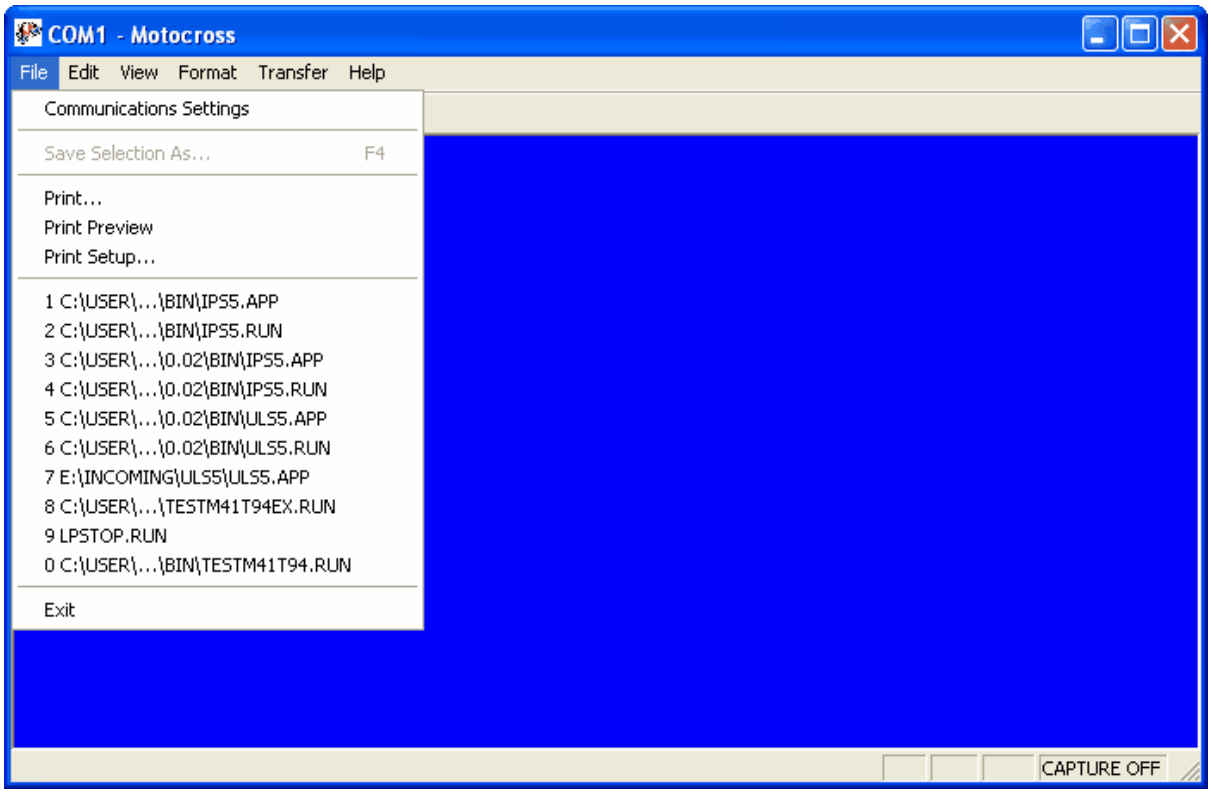
5.3.3 Terminal Emulator Command Button

The 

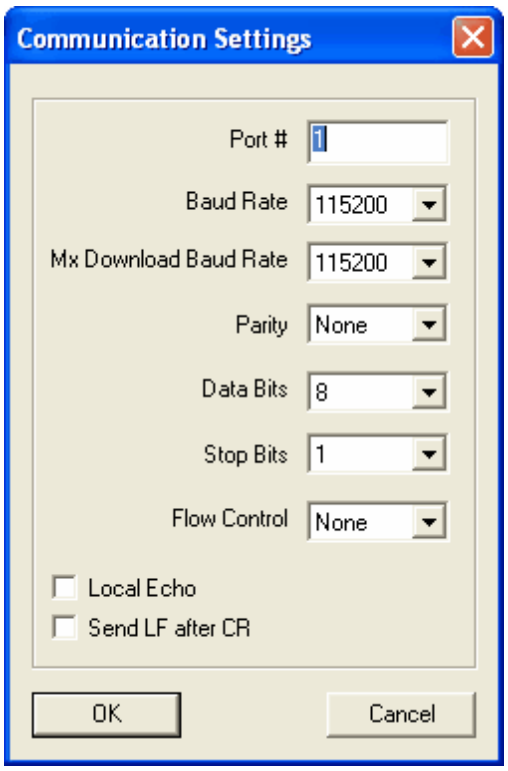
command button causes MfAwcpLink to launch the Motocross terminal emulator program that is installed with MfAwcpLink. MfAwcpLink closes its connection to the RS232 port before it launches Motocross because only one program can access a serial port at one time. The MfAwcpLink interface disappears and the Motocross interface appears as shown below.



Note in the top left hand corner of the window "COM1 - Motocross" this indicates that the Motocross program is linked to RS232 communications port 1. If this is not the correct port and/or this is the first time Motocross has been launched then the COM port must be set up in the preferences menu. To do so click on the File pull down menu.

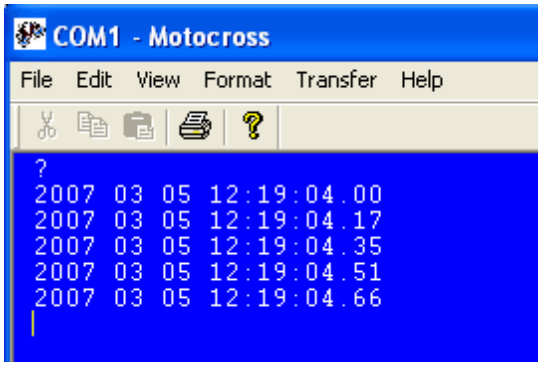


Select "Communications Settings".



Enter the correct port number. The rest of the settings must be set as shown above.

If the unit is not deployed then the pressing the "Enter" key on the keyboard will cause the Firmware to display the date and time.



If the unit is deployed you can end the deployment manually by continually pressing the 's' key.

Functions that can be performed in the Motocross Terminal Emulator are described in later sections.

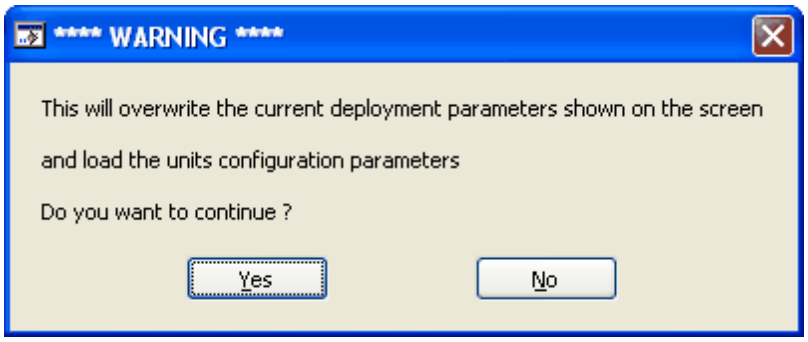
To exit the program and return to "MfAwcpLink" click on the  button in the top right hand corner.

5.3.4 Retrieve Parameters from Unit Command Button

Then 

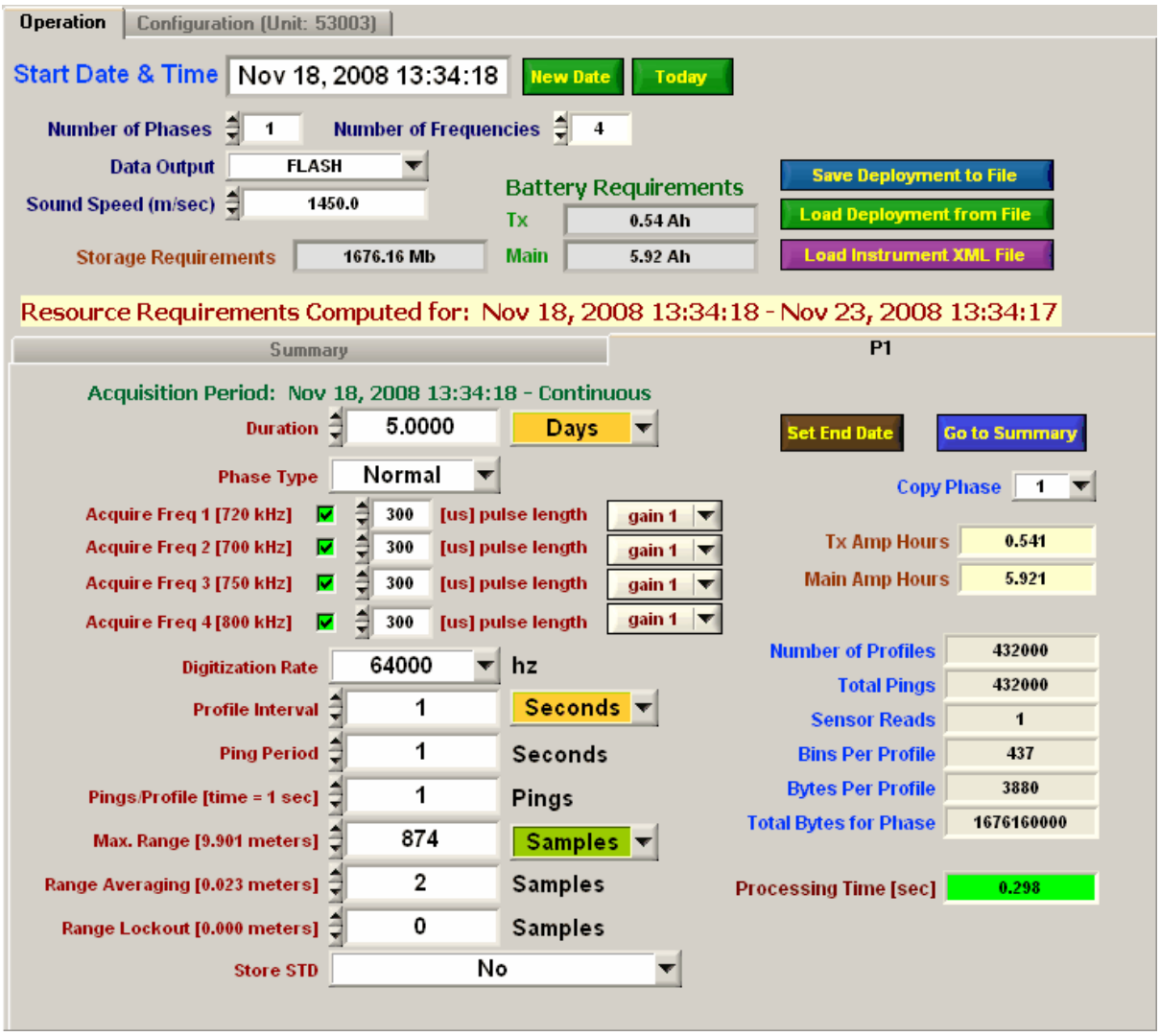
command button causes the MfAwcpLink to retrieve both Operational Parameter and Configuration Parameters from the unit and replace those currently displayed by MfAwcpLink.

A warning is issued first.

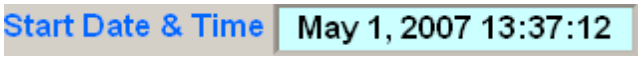


5.3.5 Operation Tab

The Operation sub tab on the Multi-Freq AWCP tab is used to set the operational parameters for the deployment of the Multi-Freq AWCP unit. This tab contains a number of controls, indicators and sub tabs.



5.3.5.1 Acquisition Start Date

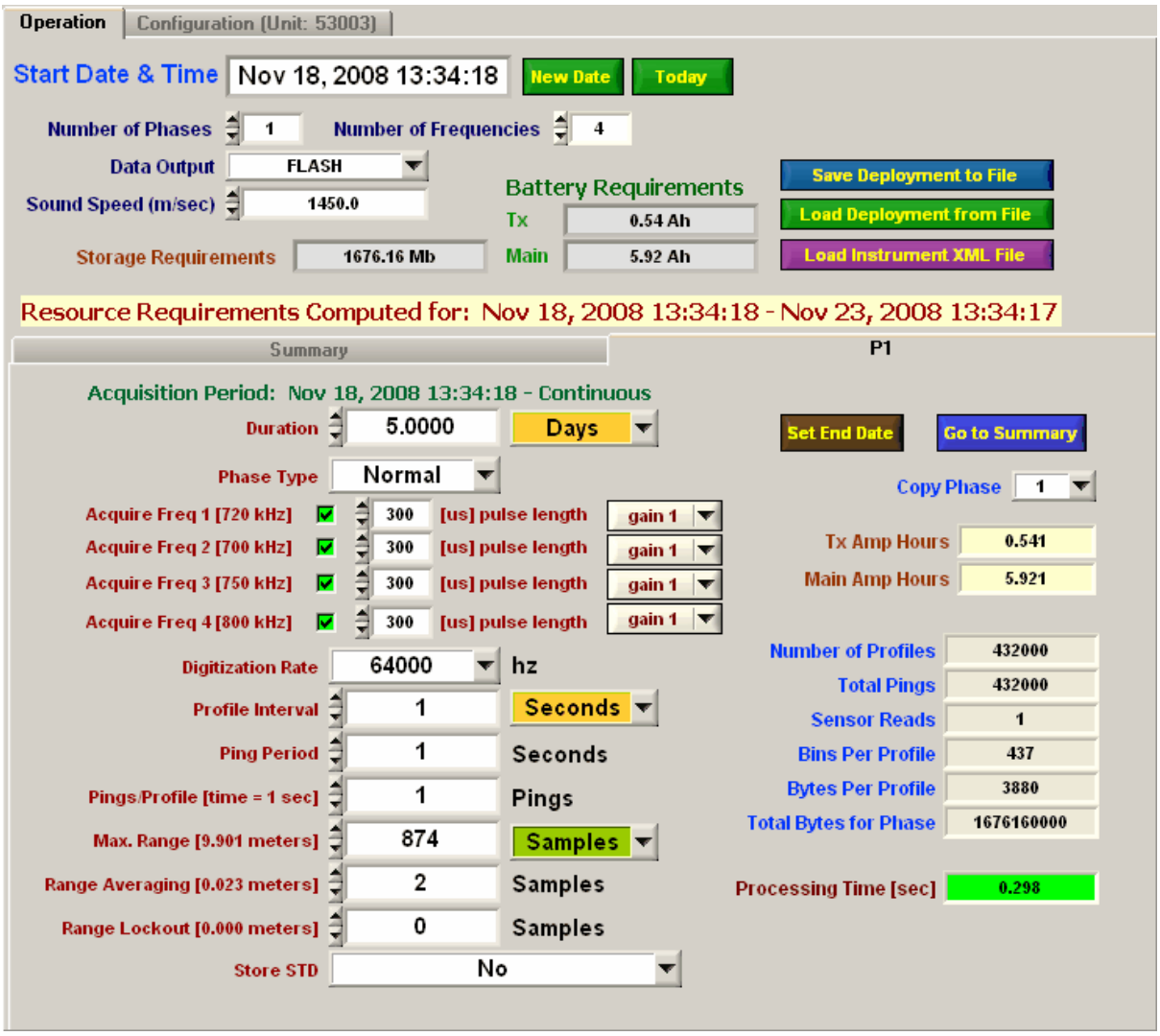
The  is the date and time of the start of the first phase. To set this date the user can click on the  command button to set the start date and time to the current date and time read from the PC's clock. To set the Acquisition Start Date to a different date click on the  command button.

Use this date panel to set the desired Start Date. Simply use the up or down arrows to set Month, Year, Hour, Minute and Second and click on the date. Double clicking on a day exits the panel with the new date or you can click on the OK button.

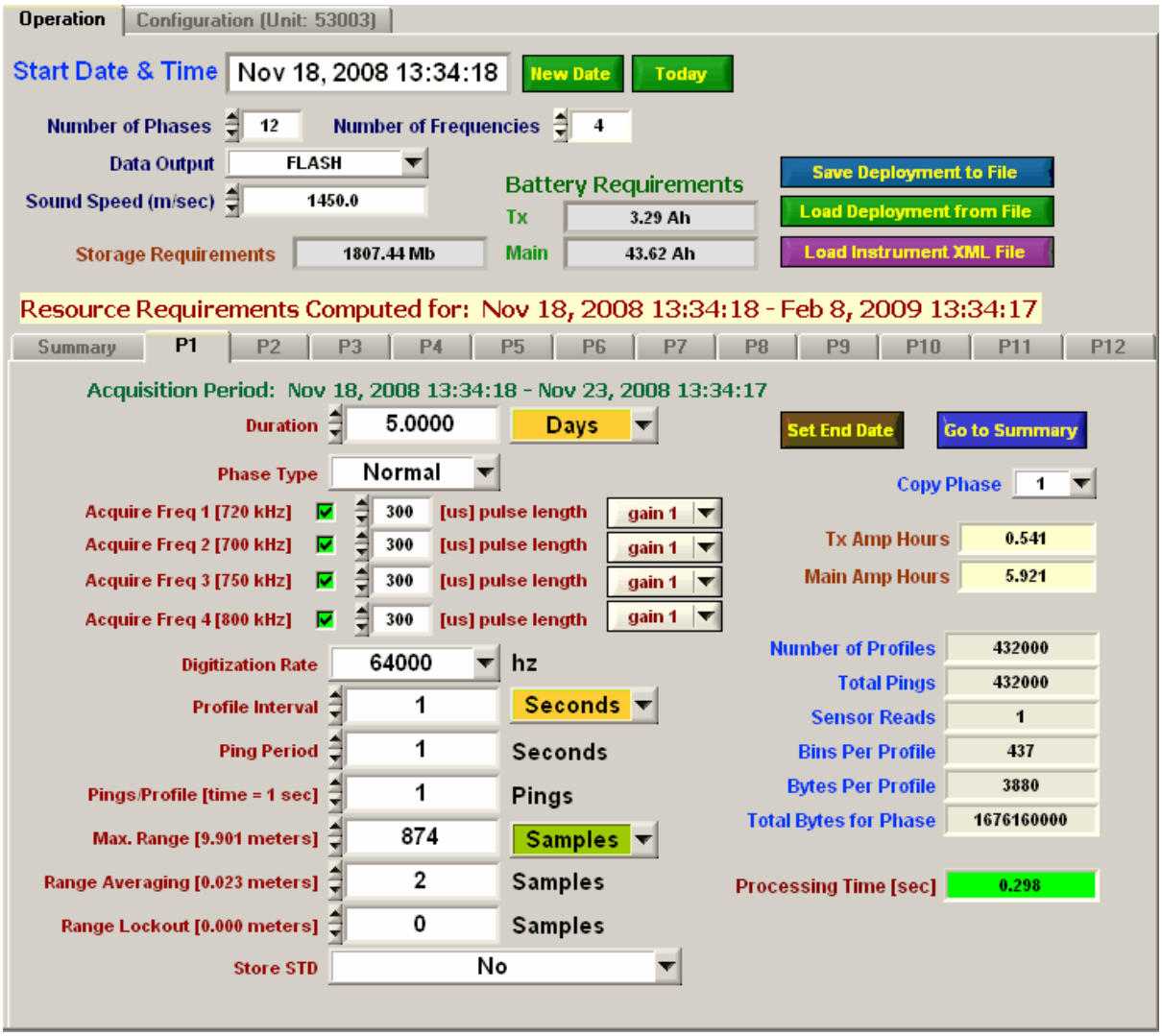
5.3.5.2 Number of Phases

The 

numeric control determines the number of phases to program. The example below shows the Operations tab with 1 phase.



The example below shows the Operation tab with 12 phases. Note the tabs P1, P2 .. P12. These tabs contain the settings for the individual phases. These are described in a later section.



5.3.5.3 Data Output

The Data Output selection control allows Three different selections.

*** Unless there is a PC connected to the unit for real time applications do not set the parameter for one of the RS232 output options as this uses more battery power.

5.3.5.3.1 Data Output FLASH

The Data Output FLASH selection causes the unit to store data only to the CF memory.

5.3.5.3.2 Data Output FLASH & RS232

The Data Output FLASH & RS232 selection causes the unit to store data to Compact FLASH and send it over the RS232 serial port.

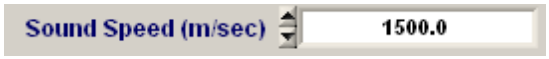
5.3.5.3.3 Data Output RS232

The Data Output RS232 selection causes the unit send it over the RS232 serial port and not to store it to Compact FLASH.

A warning is given about this setting because data is not stored to CF in this setting. The control is set to YELLOW as a warning.

Typically this setting is used for real time applications where it is not required that the data be written to the internal CF.

5.3.5.4 Sound Speed

The 

numeric control is the sound speed used to compute values such as the number of samples to collect for a particular Range setting, the number of samples to ignore for the Lock Out etc.

Make sure the sound speed that is selected is valid for the area where the instrument will be deployed. Users should use a nominal value to make sure the unit will sample enough of the water column regardless of water temperature.

If the sound speed is set to a value less than 1400 m/s or greater than 1650 m/s the value is shown in RED to warn the user that the sound speed being used may be invalid.

Invalid sound speeds might be used when doing tests in air.

5.3.5.5 Storage Requirements

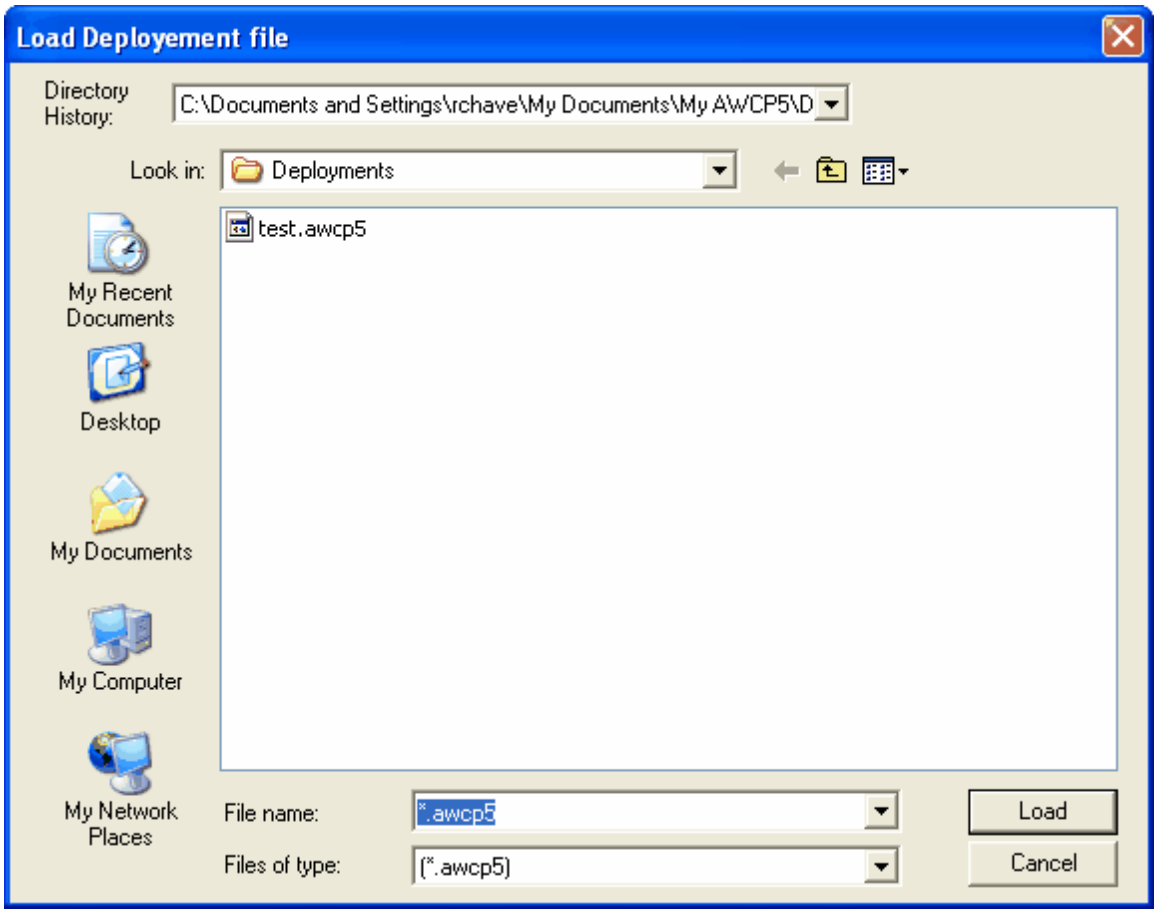
The storage requirements numeric indicator 

shows the number of MB required for the storage of data for all the specified phases. Note that this value should be less than or equal to the size of the installed Compact FLASH (listed in the status panel).

5.3.5.6 Save Deployment to File

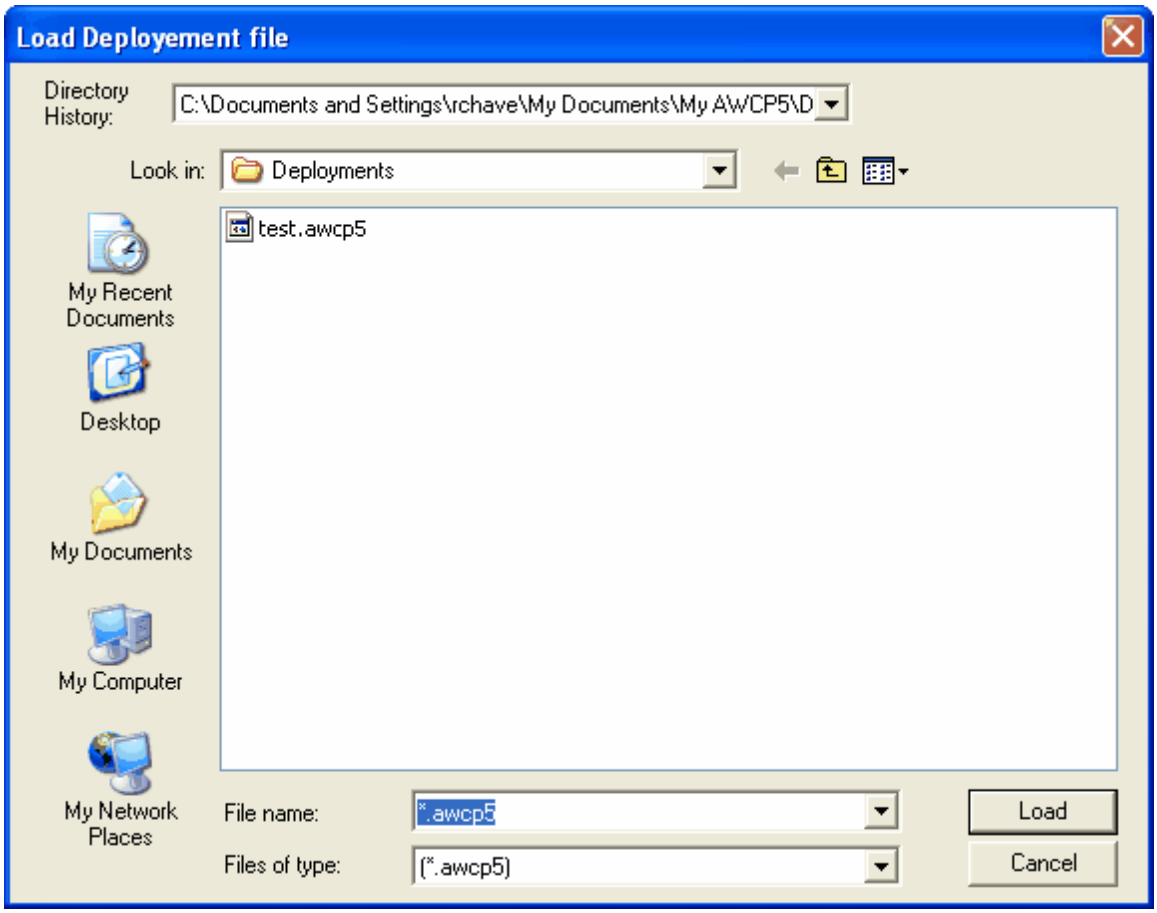
The 

command button is used to the save the deployment parameters to a file on the PC. A file select popup panel is shown for the user to select a storage directory and set a file name.



5.3.5.7 Load Deployment from File

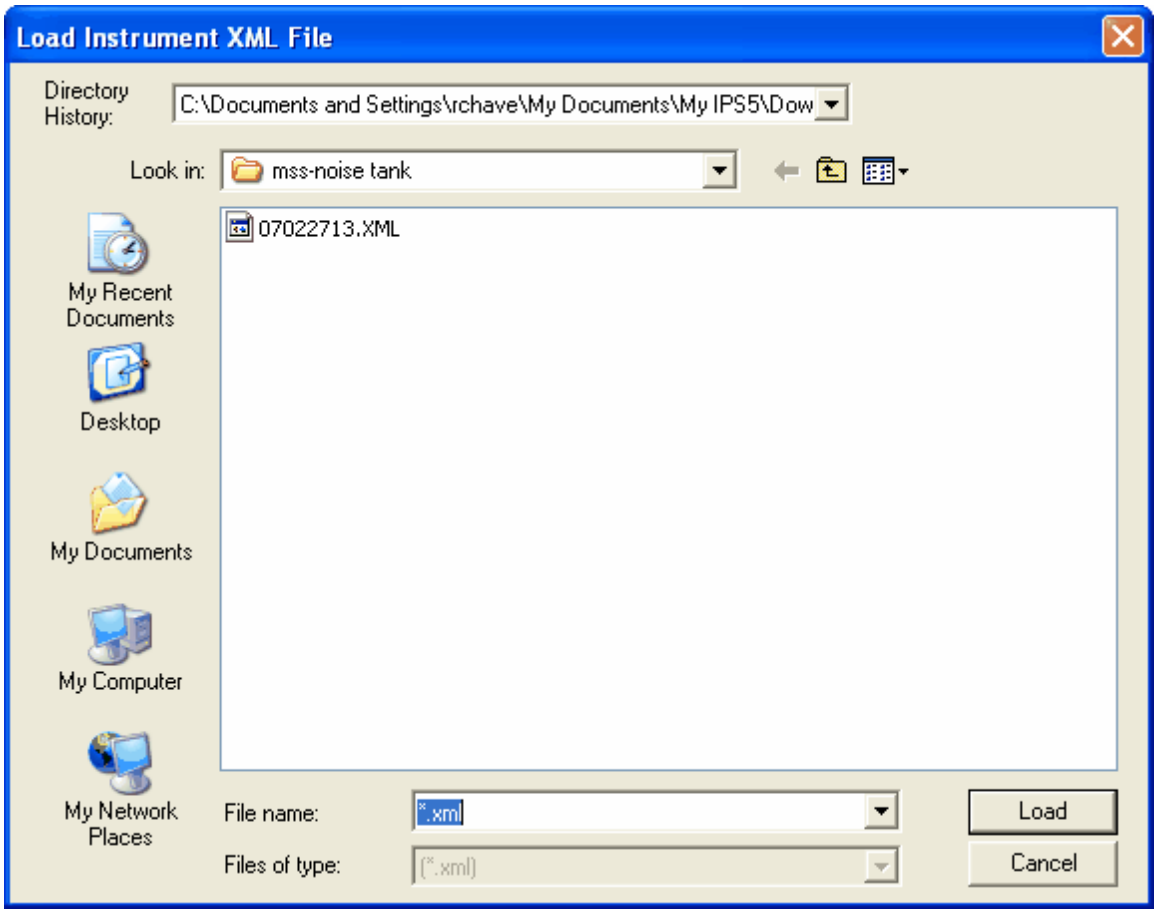
The **Load Deployment from File** command button is used to the load a deployment from a file on the PC. A file select popup panel is shown for the user to select a storage directory and file.



5.3.5.8 Load Instrument XML File

The **Load Instrument XML File** command button is used to load an instrument's deployment XML file created by an Multi-Freq AWCP unit. These files are created by the instruments when they are deployed and contain the operational parameters as well as the instrument configuration parameters. Using this command button will cause the operational parameters and configuration parameters to be replaced by the contents of the file that is loaded.

When the button is clicked a file select popup appears as shown below.



5.3.5.9 Summary Tab

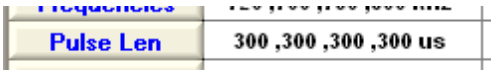
The Summary Tab consists of a screen with all the phase values displayed in one table. Up to four phases can be viewed at one time with a scroll slide at the bottom; slide to left or right to view other phases. The example below shows the Summary Tab for a deployment with three phases.

Summary | P1 | P2 | P3

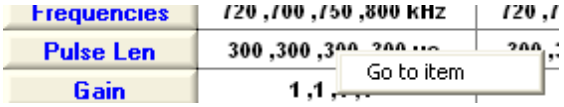
	Phase 1	Phase 2	Phase 3	
Start Date	Nov 18, 2008 13:34:18	Nov 23, 2008 13:34:18	Nov 30, 2008 13:34:18	Continue to end of FLASH
Duration	5.0000 days	7.0000 days	7.0000 days	For resource calculations
Phase type	Normal	Normal	Normal	
Frequencies	720 ,700 ,750 ,800 kHz	720 ,700 ,750 ,800 kHz	720 ,700 ,750 ,800 kHz	
Pulse Len	300 ,300 ,300 ,300 us	300 ,300 ,300 ,300 us	300 ,300 ,300 ,300 us	
Gain	1 ,1 ,1 ,1	1 ,1 ,1 ,1	1 ,1 ,1 ,1	
DigRate	64 kHz (0.0113 m/smpl)	40 kHz (0.0181 m/smpl)	40 kHz (0.0181 m/smpl)	
Base Ping Perioc	1 sec	1 sec	1 sec	
Profile Interval	1 sec	1.00 minutes	1.00 minutes	
Pings/Profile	1 pings	15 pings	15 pings	
Range Avg.	0.023 m [2 smpl]	0.997 m [55 smpl]	0.997 m [55 smpl]	
Range	9.901 m [874 smpl]	99.688 m [5500 smpl]	99.688 m [5500 smpl]	
Lock Out	0.000 m [0 smpl]	0.000 m [0 smpl]	0.000 m [0 smpl]	
STD	Not Stored	Not Stored	Not Stored	
Mega Bytes	1676.2 Mb	11.9 Mb	11.9 Mb	
Main Battery	5.9 AH	3.4 AH	3.4 AH	
Tx Battery	0.5 AH	0.2 AH	0.2 AH	

The values in these tables can not be changed here. There is a quick way to get to the tab value parameter you may wish to change.

Select the item you want to change by clicking on it. For example the Pulse Len on Phase 1.



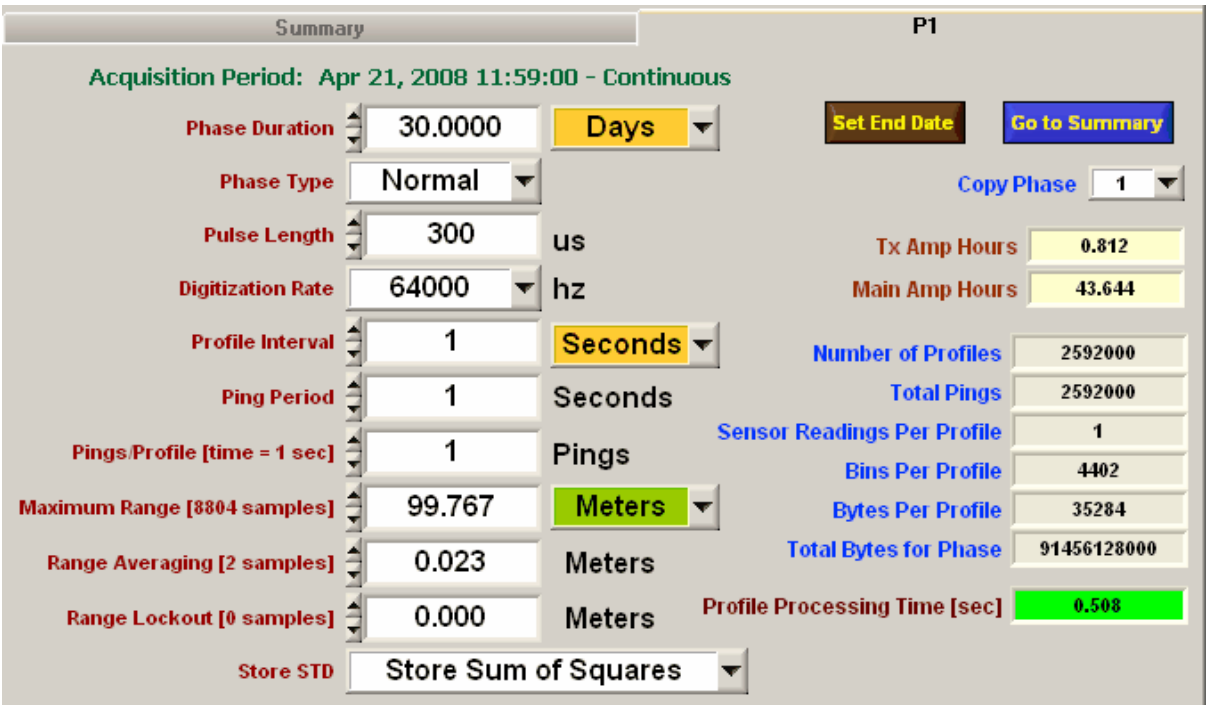
Now right click on the item. This will bring up a menu "Go To Item".



Select the "Go to item" and the program will switch to the Phase and the item you wish to change.

5.3.5.10 Phase Tabs

In this section we describe the Phase Tabs and their parameters. A Phase Tab is a tab corresponding to a tab containing the parameters for one phase. A phase is a period of time to acquire data using a particular set of parameters. The Multi-Freq AWCP unit has the capability of using up to 12 phases as well as using a special repeat phase to repeat a sequence of phases. Below is an example of a Phase Tab.

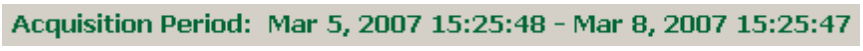


5.3.5.10.1 Phase Period

At the top of each phase tab is the acquisition period.

If there is only one phase it shows the start date and then "Continuous".

If there is more than one phase: For phase 1 this period is from the Acquisition Start date to an end date computed by the phase duration.

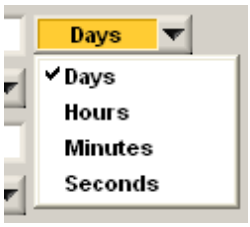


If the phase is greater than 1 then this period is from the end of the previous phase to an end date computed by the phase duration.

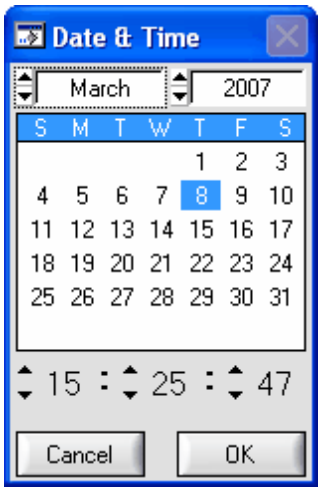
5.3.5.10.2 Duration

There are a couple of ways to enter the duration of the phase. The user can enter the number of days, hours, minutes or seconds specified by the two controls shown below.

The type of time being entered is selected by the control to the right.



A second way is to click on the  command button. The causes a popup date selection control to appear.



Use this date panel to set the desired End Date. Simply use the up or down arrows to set Month, Year, Hour, Minute and Second and click on the date. Double clicking on a day exits the panel with the new date or you can click on the OK button.

Note that if a date earlier than the Start Date is selected the new date is ignored.

There are a number of controls on this panel to change the values of the data.

Click on the month control to change the month. Click on the year control to enter a year or use the arrows to increment or decrement the year.

Click on the day values to change the date.

For the hour, minute and second controls either click on the up down arrows to change the values or select the value and enter it using the numeric keys.

5.3.5.10.3 Phase Type

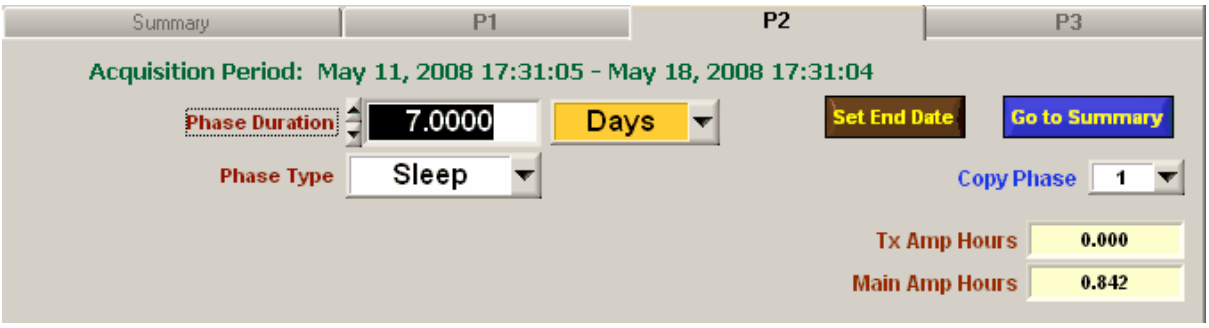
The  sets the type of phase. There are three phase types of phases, Normal, Sleep and Repeat.

5.3.5.10.3.1 Normal Phase

A 'Normal' phase is a phase with normal parameters for data acquisition for the specified period.

5.3.5.10.3.2 Sleep Phase

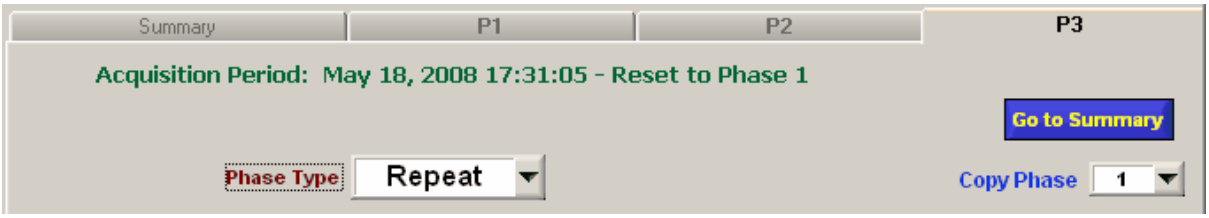
A sleep phase is a phase where the instrument will not collect any data for the period of the phase. Below is an example of a sleep phase.



A sleep phase can not be the final phase. MfAwcpLink will not allow programming of the unit if it is.

5.3.5.10.3.3 Repeat Phase

A repeat phase is a phase which switches back to the first phase. Below is an example of a repeat phase.

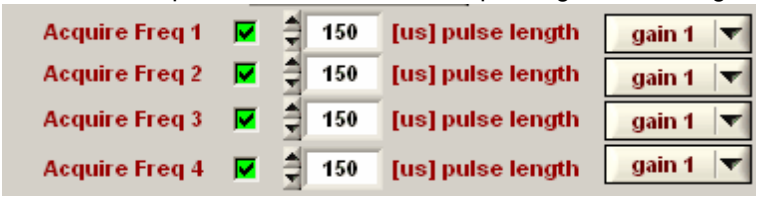


This is accomplished by resetting the Acquisition Start Date to the start date of the repeat phase and then resetting all the start dates of the other phases.

5.3.5.10.4 Frequency-Pulse Length-Gain Select

The controls below the Phase Type allow the user to select which frequencies to acquire and the pulse length and gain to use for each frequency.

There can be up to 4 sets of indicators depending on the configuration of the instrument.



If the instrument has been detected then the actual frequencies detected in the instrument is shown.

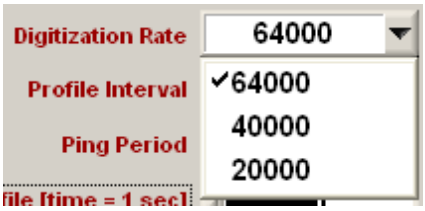
Check or uncheck the checkbox's to enable or disable the acquisition of the specific frequencies.

Each frequency can have its own specific pulse length.

Each frequency can have its own specific gain of 1,2,3 or 4.

5.3.5.10.5 Digitization Rate

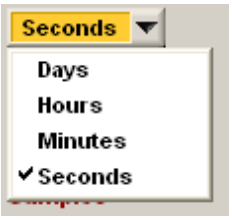
The Digitization Rate is the rate at which the received signal is digitized. Three rates are available: 64 kHz, 40kHz and 20 KHz.



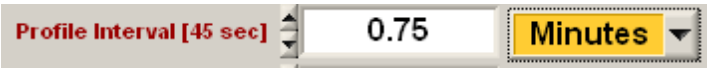
5.3.5.10.6 Profile Interval

The Profile Interval is the length of time between the collection of profiles. Two controls are used to set the Profile Interval as shown below.

The interval can be entered in several different time types.



Below is an example of the 45 seconds shown in Minutes.



5.3.5.10.7 Ping Period

The Ping Period is the number of seconds between pings.

.

5.3.5.10.8 Pings per Profile

The Pings per Profile is the number of pings for time averaging for each profile.

The label to the left of the control shows the same value in seconds.

Note that increasing the Pings per Profile to a period longer than the current Profile Interval causes the Profile Interval to be increased.

5.3.5.10.9 Max. Range

The Maximum Range sets the maximum range from which samples are digitized. The Maximum Range is set using two controls shown below.

It consists of a numeric control to set the value.

The type control located to the right is used to set the type. Two types are available.

Note that the Maximum Range must be a multiple of the Range Averaging setting. When a non-multiple is entered the Maximum Range is recalculated to be a multiple of Range Averaging from the Range Lockout.

Below is the example above shown in meters.

When the units are set to Meters, the distance that is being sampled is calculated using the Sound Speed and Digitization Rate.

For:

R = Distance in Meters
D = Digitization Rate
S = Sound Speed
N = Number of Samples

R = N/D* (S/2);

5.3.5.10.10 Range Averaging

Range Averaging is the spatial averaging of echoes over Range. For example, if the Maximum Range is 100 meters the echoes could be averaged into 100 one meter bins. The Range Averaging is set using two controls shown below.

It consists of a numeric control to set the value and a type control to set the type to display. Two types are available.

Below is the .997 meter averaging. The number of samples is shown in the label to the left of the control.

Note that the 

control is used to set the type for Max. Range and Range Lockout.

When the units are set to Meters, the distance that is being averaged is calculated using the Sound Speed and Digitization Rate.

For:

R = Averaging Distance
D = Digitization Rate
S = Sound Speed
N = Number of Samples

R = N/D* (S/2);

5.3.5.10.11 Range Lockout

The Range Lockout sets the lockout time from the start of the transmission during which the digitized data is not stored or transmitted to the PC. The Range Lockout is set using two controls shown below.

It consists of a numeric control to set the value.

The type control located to the right of the Max. Range control is used to set the type. Two types are available.

Below is the example above shown in samples.

When the units are set to Meters, the distance that is being is calculated using the Sound Speed and Digitization Rate.

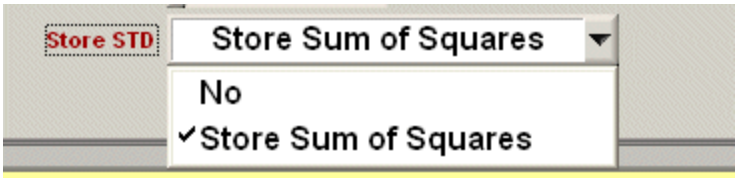
For:

R = Range Lockout Distance in Meters
D = Digitization Rate
S = Sound Speed
N = Number of Samples

R = N/D* (S/2);

5.3.5.10.12 Compute and Store Standard Deviation

The Store Sum of Squares for computation of Standard Deviation (STD) pull down sets the option to store enough information to compute the STD for each profile to CF and/or transmit it to the PC. There are two options as shown below.

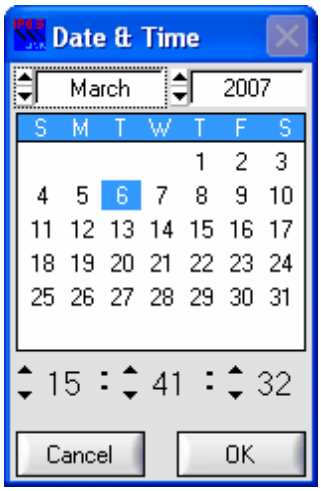


Value	Bytes Per Bin	
No	0	Only the averaged bins are stored
Store Sum of Squares	6	Sum of squares are stored as a long integer with a 2 byte overflow word.

5.3.5.10.13 Set End Date

The 

command button allows the user to set the end date of the phase using the date/time selection popup.



5.3.5.10.14 Go To Summary Button

The Go to Summary command button causes the program to flip to the Phase Summary tab.

Summary | P1 | P2 | P3

	Phase 1	Phase 2	Phase 3	
Start Date	Nov 18, 2008 13:34:18	Nov 23, 2008 13:34:18	Nov 30, 2008 13:34:18	Continue to end of FLASH
Duration	5.0000 days	7.0000 days	7.0000 days	For resource calculations
Phase type	Normal	Normal	Normal	
Frequencies	720 ,700 ,750 ,800 kHz	720 ,700 ,750 ,800 kHz	720 ,700 ,750 ,800 kHz	
Pulse Len	300 ,300 ,300 ,300 us	300 ,300 ,300 ,300 us	300 ,300 ,300 ,300 us	
Gain	1 ,1 ,1 ,1	1 ,1 ,1 ,1	1 ,1 ,1 ,1	
DigRate	64 kHz (0.0113 m/smpl)	40 kHz (0.0181 m/smpl)	40 kHz (0.0181 m/smpl)	
Base Ping Perioc	1 sec	1 sec	1 sec	
Profile Interval	1 sec	1.00 minutes	1.00 minutes	
Pings/Profile	1 pings	15 pings	15 pings	
Range Avg.	0.023 m [2 smpl]	0.997 m [55 smpl]	0.997 m [55 smpl]	
Range	9.901 m [874 smpl]	99.688 m [5500 smpl]	99.688 m [5500 smpl]	
Lock Out	0.000 m [0 smpl]	0.000 m [0 smpl]	0.000 m [0 smpl]	
STD	Not Stored	Not Stored	Not Stored	
Mega Bytes	1676.2 Mb	11.9 Mb	11.9 Mb	
Main Battery	5.9 AH	3.4 AH	3.4 AH	
Tx Battery	0.5 AH	0.2 AH	0.2 AH	

5.3.5.10.15 Copy Phase

The Copy Phase 1 pull down allows the user to copy the parameters in other phases. If you have a number of similar phases this speeds up the setup time.

Below is an example of the pull down when 5 phases are available.

5.3.5.10.16 Tx Amp Hours

The 

indicator shows the number of amp hours required to execute the phase.

5.3.5.10.17 Main Amp Hours

The 

indicator shows the number of Amp Hours required for acquiring, processing and storing the profiles for the current phase.

5.3.5.10.18 Phase Statistics

A number of indicators shows some statistics for the phase.

Number of Profiles - The total number of profiles for the phase.

Total Pings - The total number of pings for the phase.

Sensor Readings Per Profile - The number of auxiliary sensor readings (temperature, tilt etc.) within each profile for the phase.

Bins Per Profile - The number of bins for each profile.

Bytes Per Profile - Bytes required for the storage of one profile.

Total Bytes for Phase - The number of bytes required to store all the profiles that will be acquired by the phase.

5.3.5.10.19 Profile Processing Time

The 

is the estimated amount of time required to process a profile, where processing means data acquisition, storage to CF and/or transmission over RS232.

When the control is GREEN it is estimated that there should be plenty of time available to process the profiles with no over runs. An over run means that there is insufficient time to process a profile before the next profile is due to be acquired.

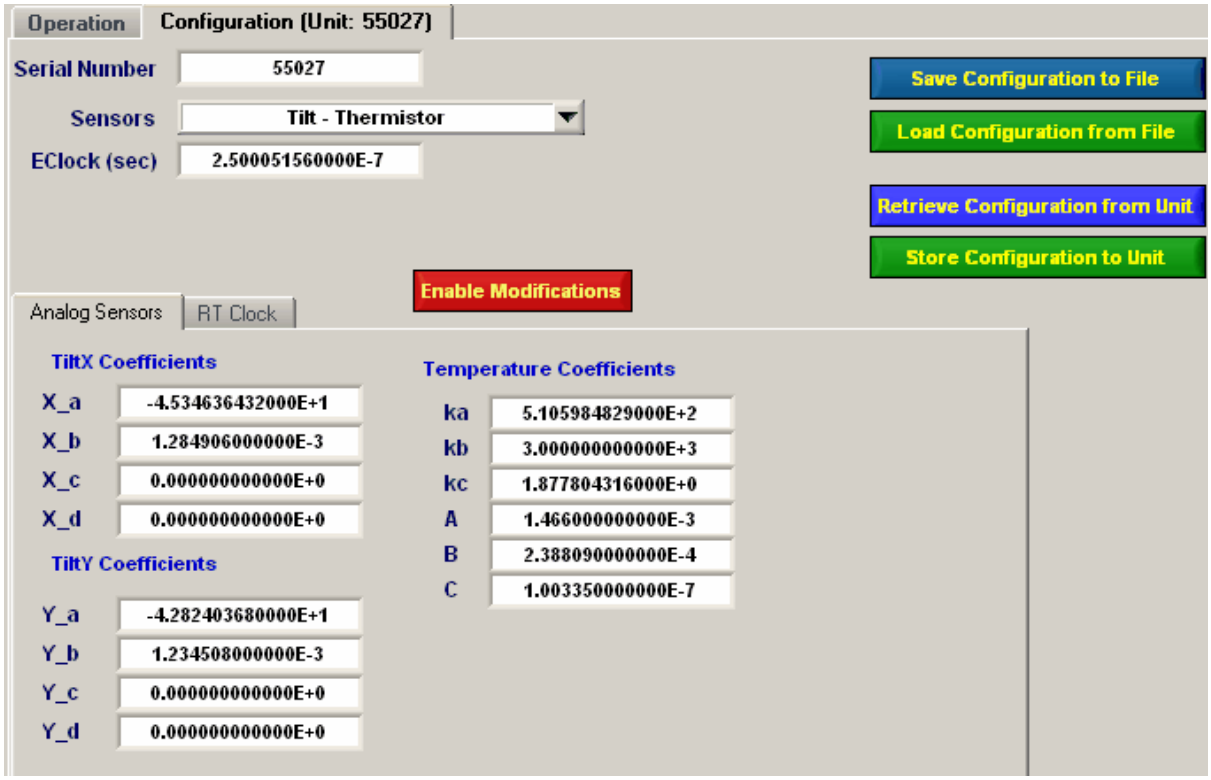
If the control is YELLOW then some profile overruns may occur especially during a change in data storage files. A new file is created every hour on the unit.

If the control is RED then it is very likely that some data overruns will occur.

Overruns cause the start of the following profiles to shift in time and cause loss of data.

5.3.6 Configuration Tab

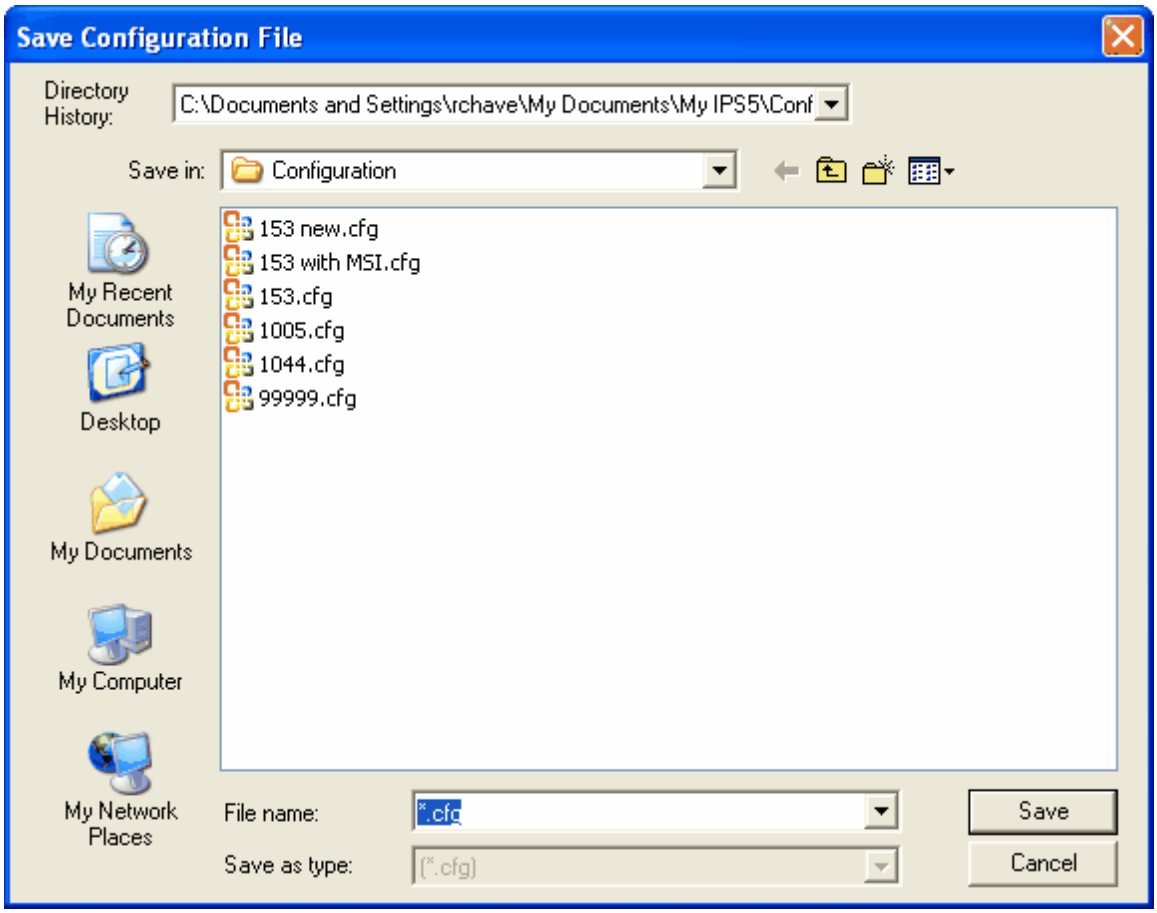
The Configuration sub tab is where configuration parameters for specific Multi-Freq AWCP units can be viewed, changed and stored to the unit. These values are typically set in the instrument at the factory but may require some changes by the end-user for reasons such as changes or additions of sensors.



Note the number of the Configuration Tab (55027) is the same as the Serial Number

5.3.6.1 Save Configuration to File

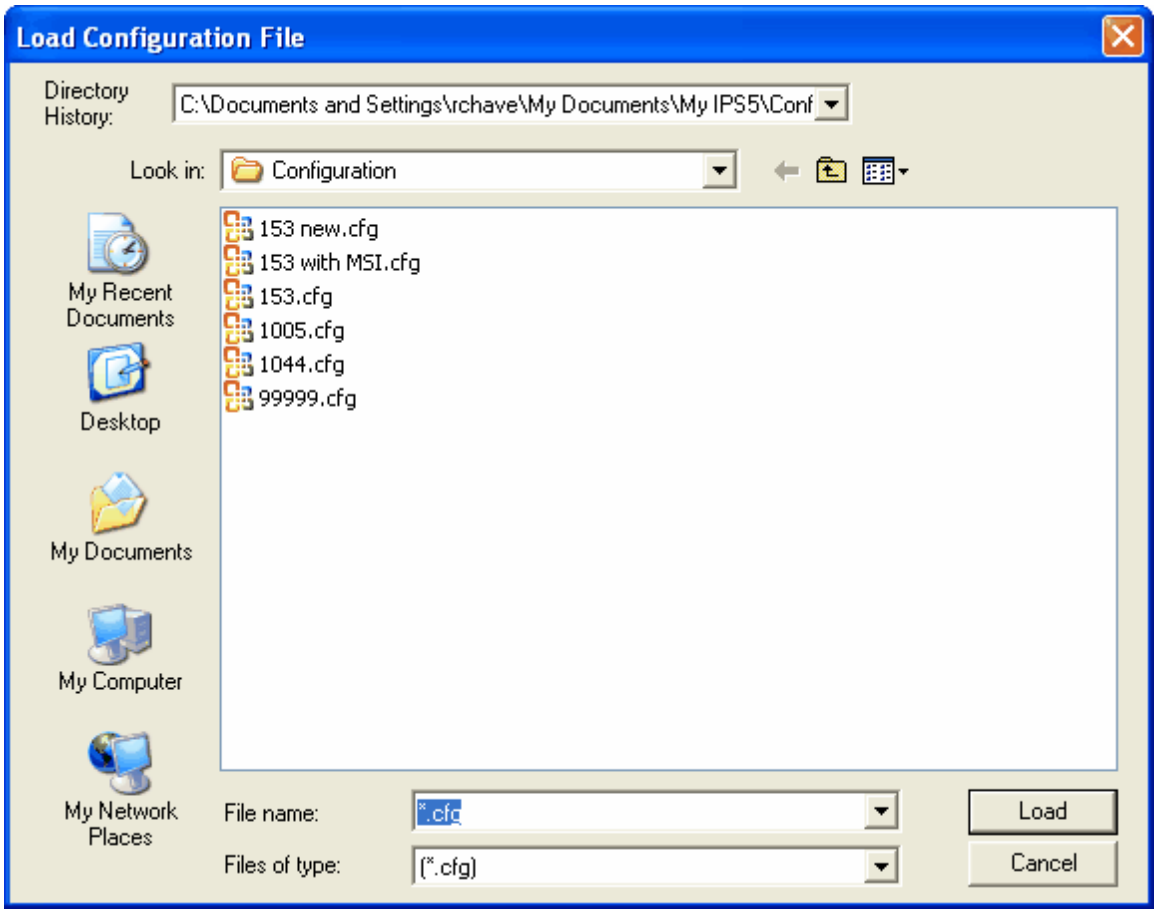
The Save Configuration to File command button is used to save configuration information to a file. When clicked, a file selection popup appears.



Enter a file name and then click on the Save button.

5.3.6.2 Load Configuration from File

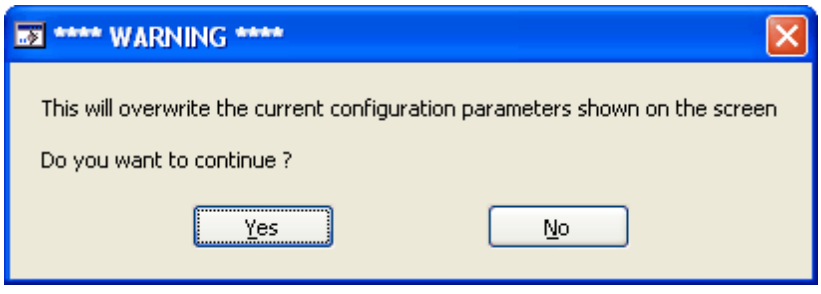
The Load Configuration from File command button is used to load a configuration from a configuration file. A file select popup appears.



The configuration is loaded and displayed on the Configuration tab.

5.3.6.3 Retrieve Configuration from Unit

The **Retrieve Configuration from Unit** command button is used to retrieve configuration parameters from a unit. Note that the unit must be in STANDBY mode for this function to work. Click on the button to start the process and a warning message appears.



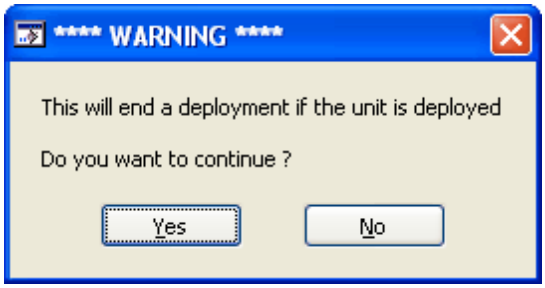
Click Yes to continue.

5.3.6.4 Store Configuration to Unit

The **Store Configuration to Unit** command button is used to program the configuration information to the unit.

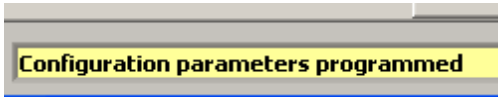
*** Great care should be taken when making these changes as wrong configuration parameters will cause problems in future data processing.

When the button is clicked a warning message appears.



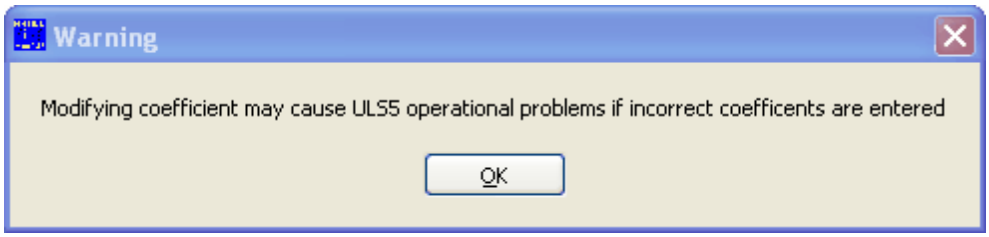
Click yes to continue.

If the programming is successful a message in the yellow status bar at the bottom of the main panel will appear as follows:

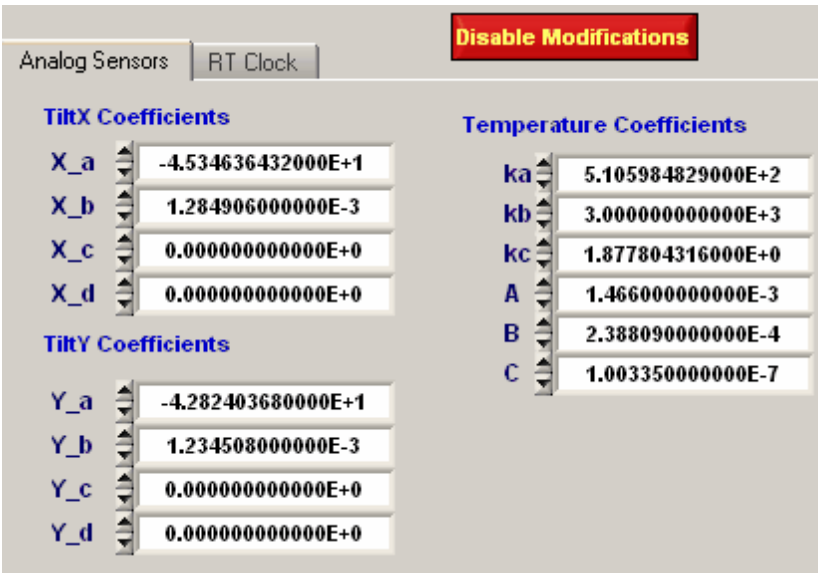


5.3.6.5 Enable Modifications

The Enable Modifications command button is used to enable the modification of all parameters found on the Configuration tab.
A message will appear.



Note the addition of decrement and increment arrows on the numeric controls.



The command button changes to "Disable Modifications" to disable modifications.

*** DO NOT CHANGE PARAMETERS UNLESS INSTRUCTED TO BY THE MANUFACTURER ***

5.3.6.6 Serial Number

The Serial Number is the Multi-Freq AWCP the serial number for which the configuration parameters are designed for. Attempting to program these configuration parameters to another unit will not work.

5.3.6.7 Sensors

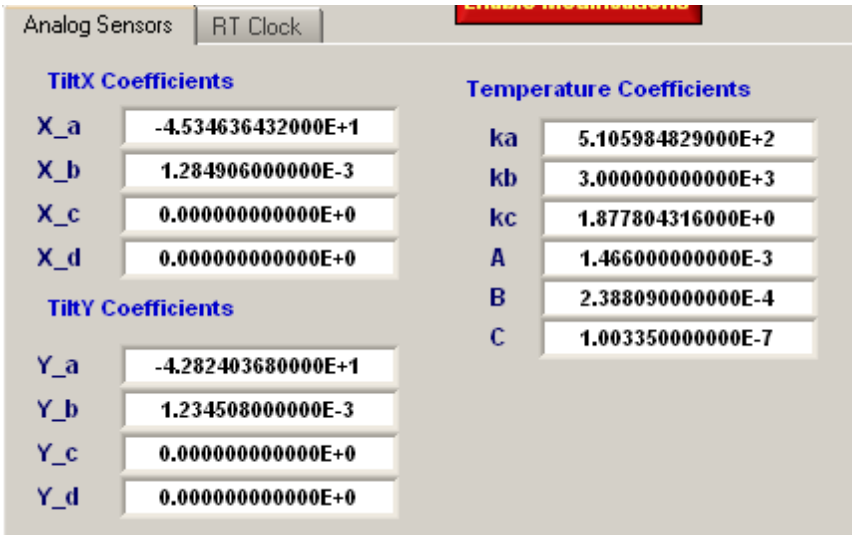
The Sensors pull down control shows the sensors that are installed in the unit.

5.3.6.8 E-Clock

The clock that runs the CPU is used for driving counters and timers for the measurement of some sensor parameters. The clock is divided down by 4 and that period is used in the measurements. The nominal value for the E-Clock should be 1/4000000 or 0.00000025. The value input to this control is the actual measure period.

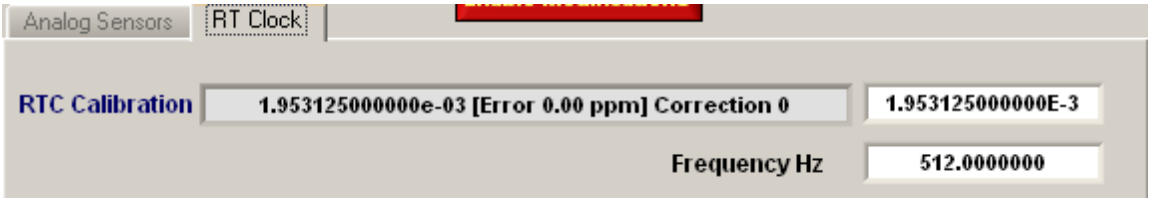
5.3.6.9 Analog Sensors Tab

The Analog Sensor tab is a tab that contains the coefficients for the analog sensors to convert sensor raw counts to engineering units. These values are provided by the manufacturer and should never be changed unless instructed to by the manufacturer.



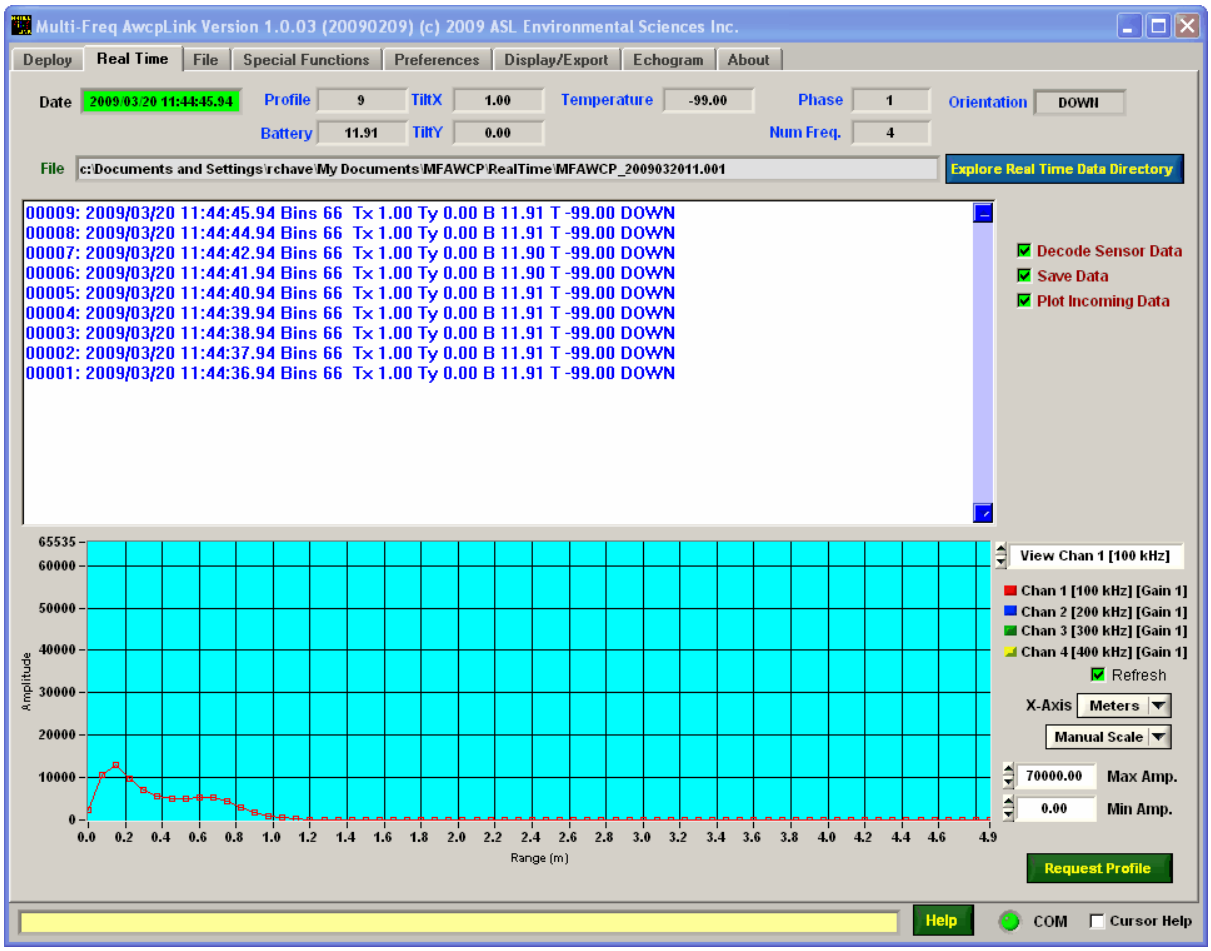
5.3.6.10 RT Clock Tab

The RT Clock tab contains a calibration parameter for the units Real Time Clock. These values are provided by the manufacturer and should never be changed unless instructed to by the manufacturer.



5.4 Real Time Tab

If the Multi-Freq AWCP unit is programmed to upload target and profile data over the RS232 port, the Real Time tab displays and plots the data as it is received.



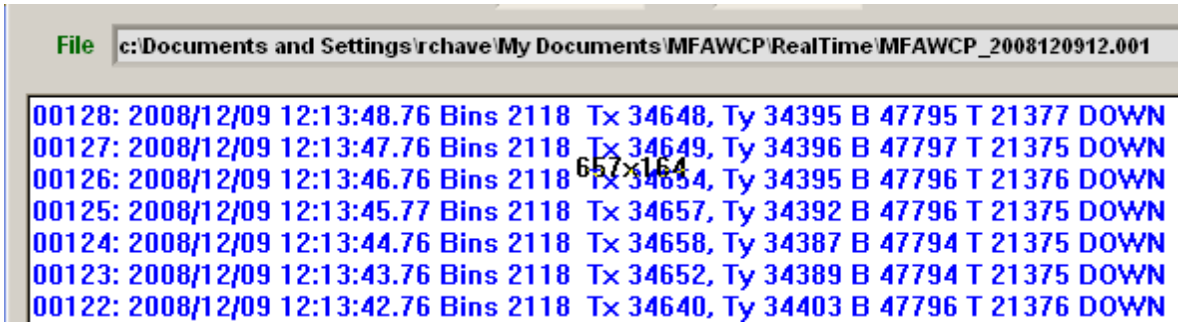
The panel above shows the headers as the data is acquired and plots it if the 

checkbox is enabled.

The 

checkbox enables or disables the decoding of sensor data for display as the data comes in.

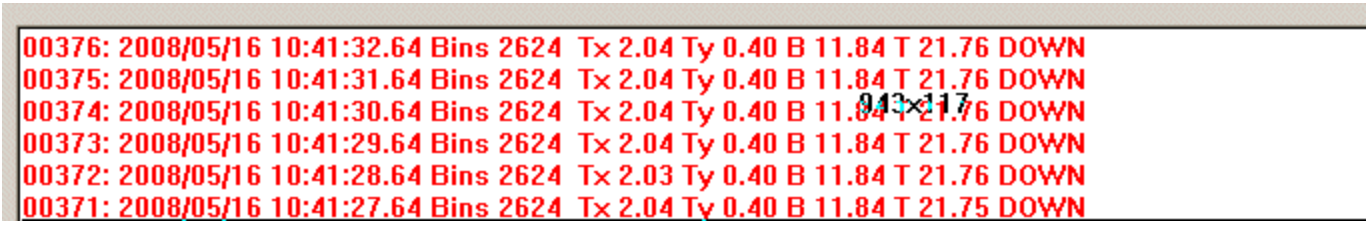
Below is an example of the headers with raw sensor data.



The 

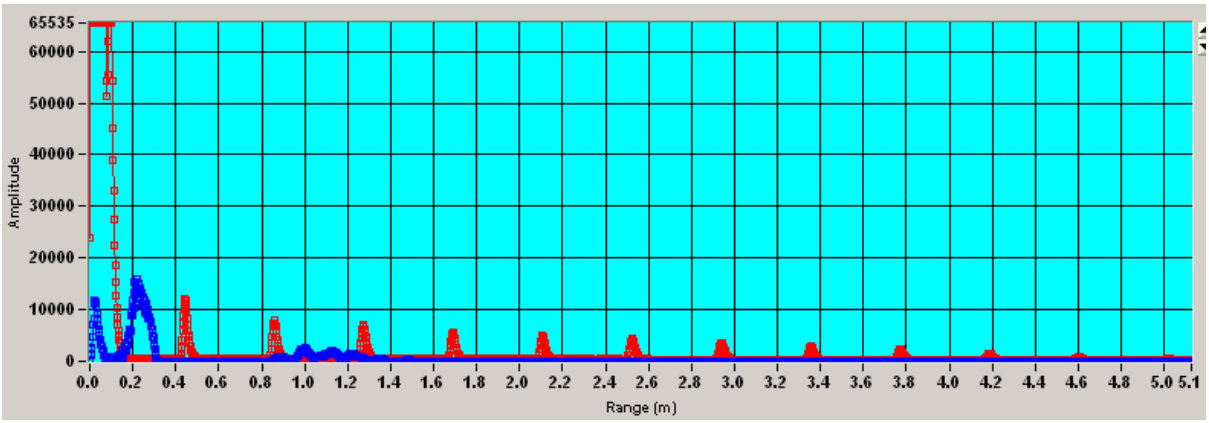
checkbox enables or disables the saving of the profile data as it comes in.

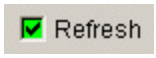
If data is not saved the header information is shown in RED.



The 

control allows the user to select which frequencies to display for each profile. All frequencies can be shown at once.



The 

checkbox enables or disables the refresh of the graph for every new profile that comes in.

The 

pulls down is used to sent the x-axis to meters or 

(bins).

The 

pull down selector allows the user to auto-scale or manually scale the y-axis.

If manual scale is chosen the 

numeric controls are used to select the axis range.

Note that the header information for each profile is shown as the profiles are received.

Note the Battery control shows the battery voltage. The Orientation indicates if the unit is point up or on its side "DOWN".

The file being written is shown and a command button allows you to explore the data directory.

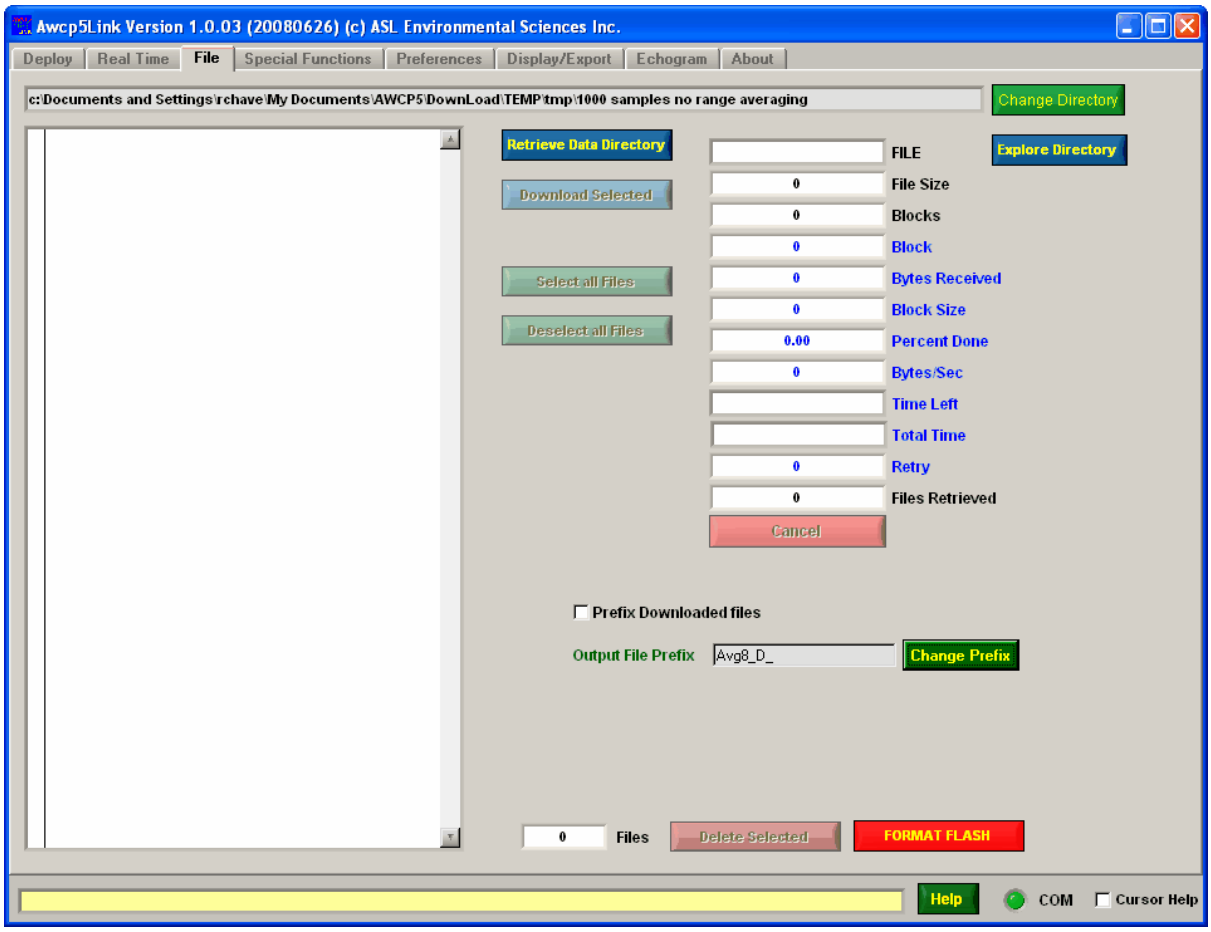
5.4.1 Request Profile Command

The 

command button sends the #PG command to the unit requesting a profile of data. The unit must not be deployed for this command to work.

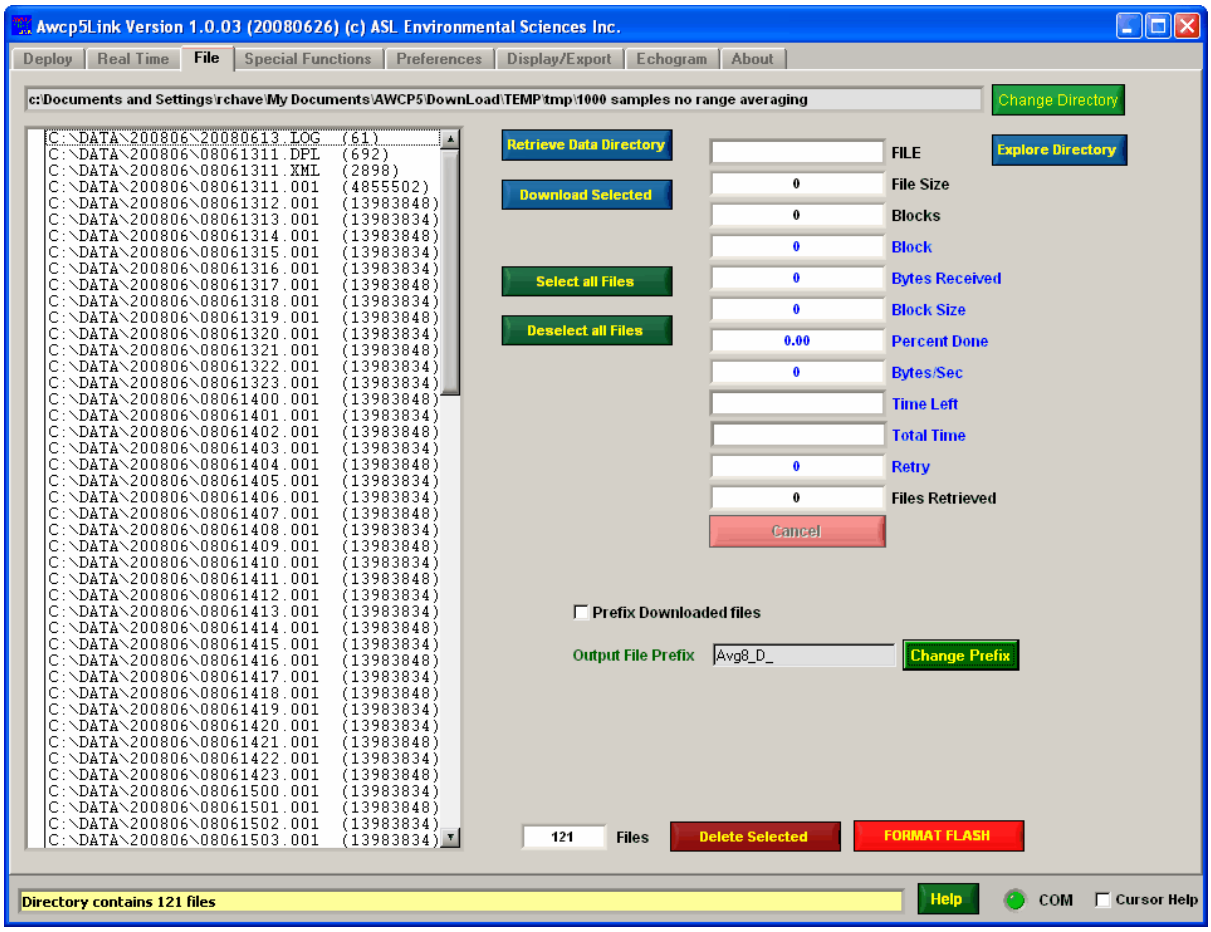
5.5 File Tab

The File tab is used to retrieve data from the units memory (CF) , delete specific files from the CF and to format the CF.



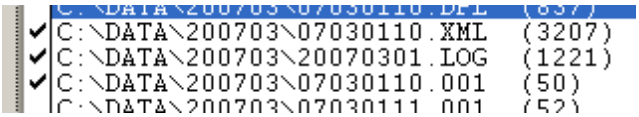
5.5.1 Retrieve Data Directory

The Retrieve Data Directory command button is used to retrieve the directory of files in the Multi-Freq AWCP unit. The unit must be in STANDBY mode for this operation to work.



5.5.2 Selecting Files to Download or Delete

Files must be selected for download or delete. The are selected by clicking on the column to the left of the file name which produces a check mark to the left of the file name.



All files can be selected by clicking on the Select all Files command button or deselect ed by clicking on the Deselect all Files command button.

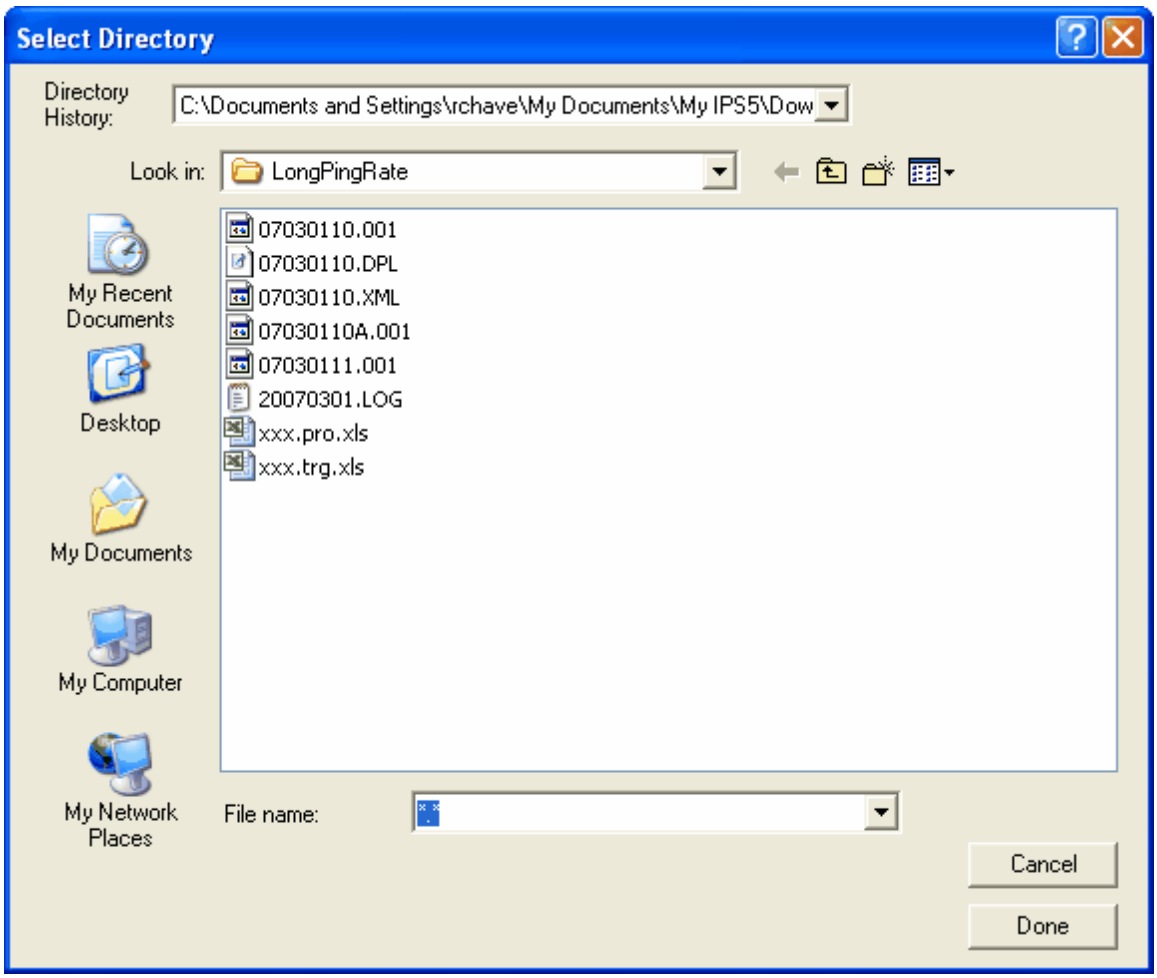
5.5.3 Download Directory

The download directory is the location that files will be stored as they are retrieved from the unit. Note that the directory structure in the unit is not maintained.

5.5.4 Changing the Download Directory

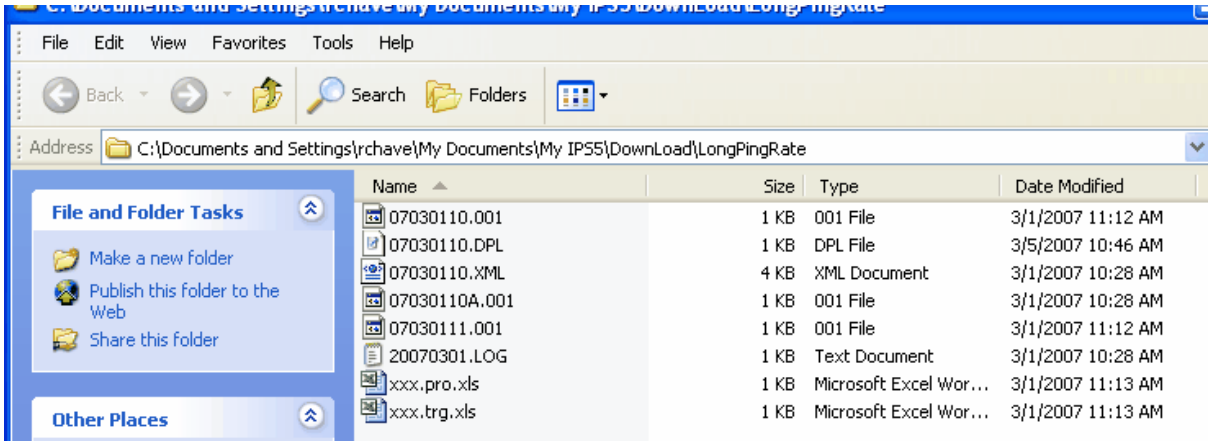
To Change the Download Directory click on the Change Directory command button.

A directory selection/creation popup appears.



5.5.5 Explore Download Directory

The Explore Directory command button causes the program to launch Windows Explorer with the contents of the Download Directory.

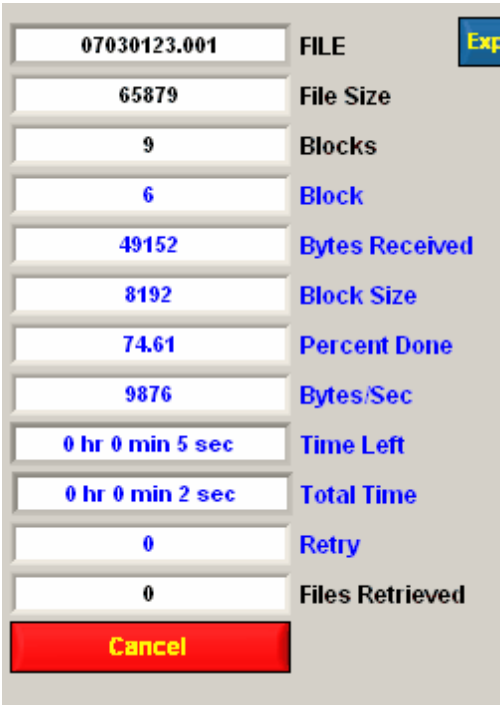


5.5.6 Downloading Files

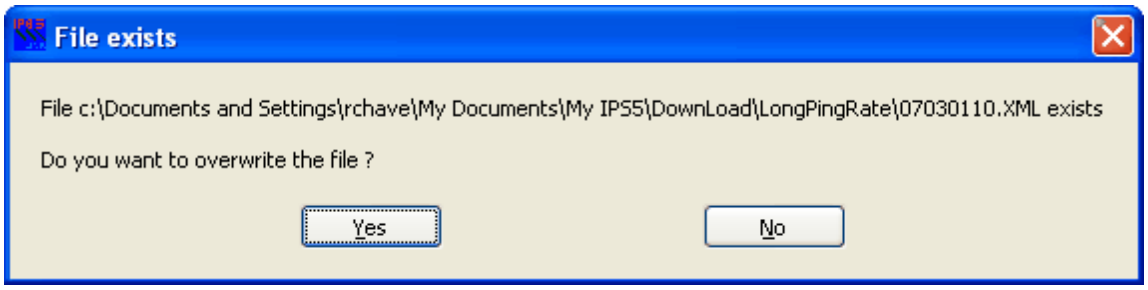
To download the selected files, click on the 

command button.

Information on the download indicators shows the progress of the download. A Cancel button is provided to cancel the download.



If a file already exists on the PC with the same name then the program displays a warning popup.



5.5.7 Prefix Download Files

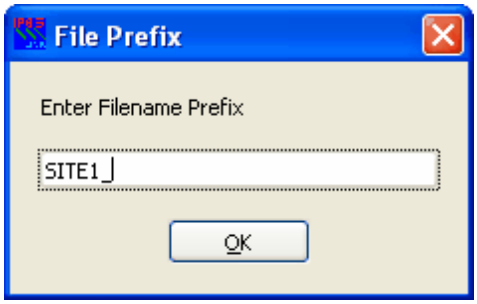
Files on the unit are of the form YYMMDDHH.PPP where YY is the year, MM is the month, DD is the day, HH is the hour and PPP is the phase the data was collected with. There is an option to prefix the name of these files with a user selected prefix. For example, you may wish to prefix all the file names with SITE1_. To do this enable the prefix by clicking on the 

to enable it 

.

Change the prefix to your selection by clicking on the 

command button.

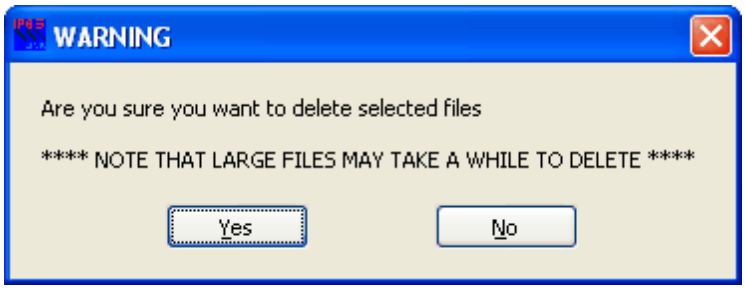


Download files will now have the SITE1_ prefix added to the file names.

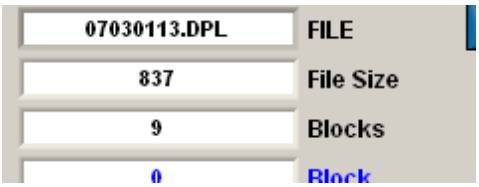
5.5.8 Deleting Selected Files

To delete selected files click on the 

command button. A popup warning comes up.



The files are deleted. These are shown in some of the indicators.



*** Formatting the CF is preferable to deleting files and quicker.

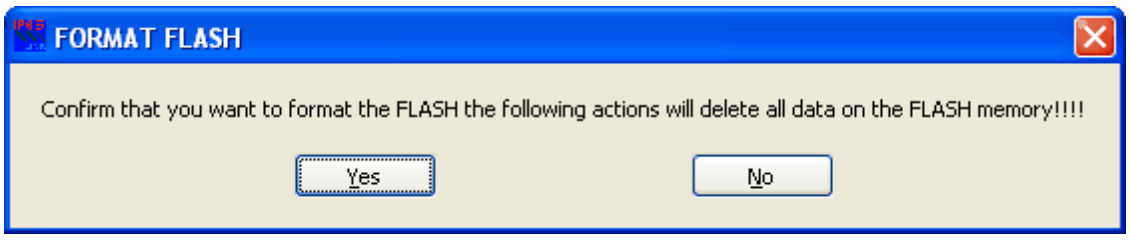
5.5.9 Formatting the CF

Another way to remove all the data on the CF is to format it. This is a better way to remove all data as it start the CF fresh in case any type of file corruption has occurred. As well, the file delete function does not delete sub directories so it is possible to have a number of sub directories with no files remaining after al the files within them have been deleted.

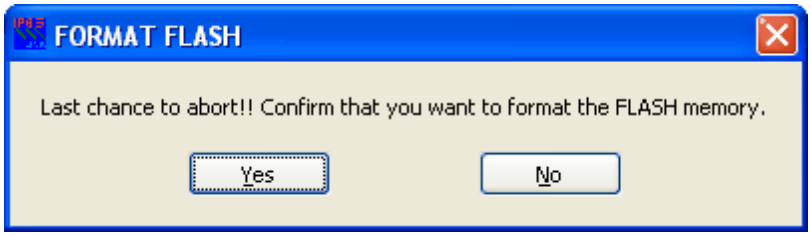
Click on the 

command button.

A warning message comes up.

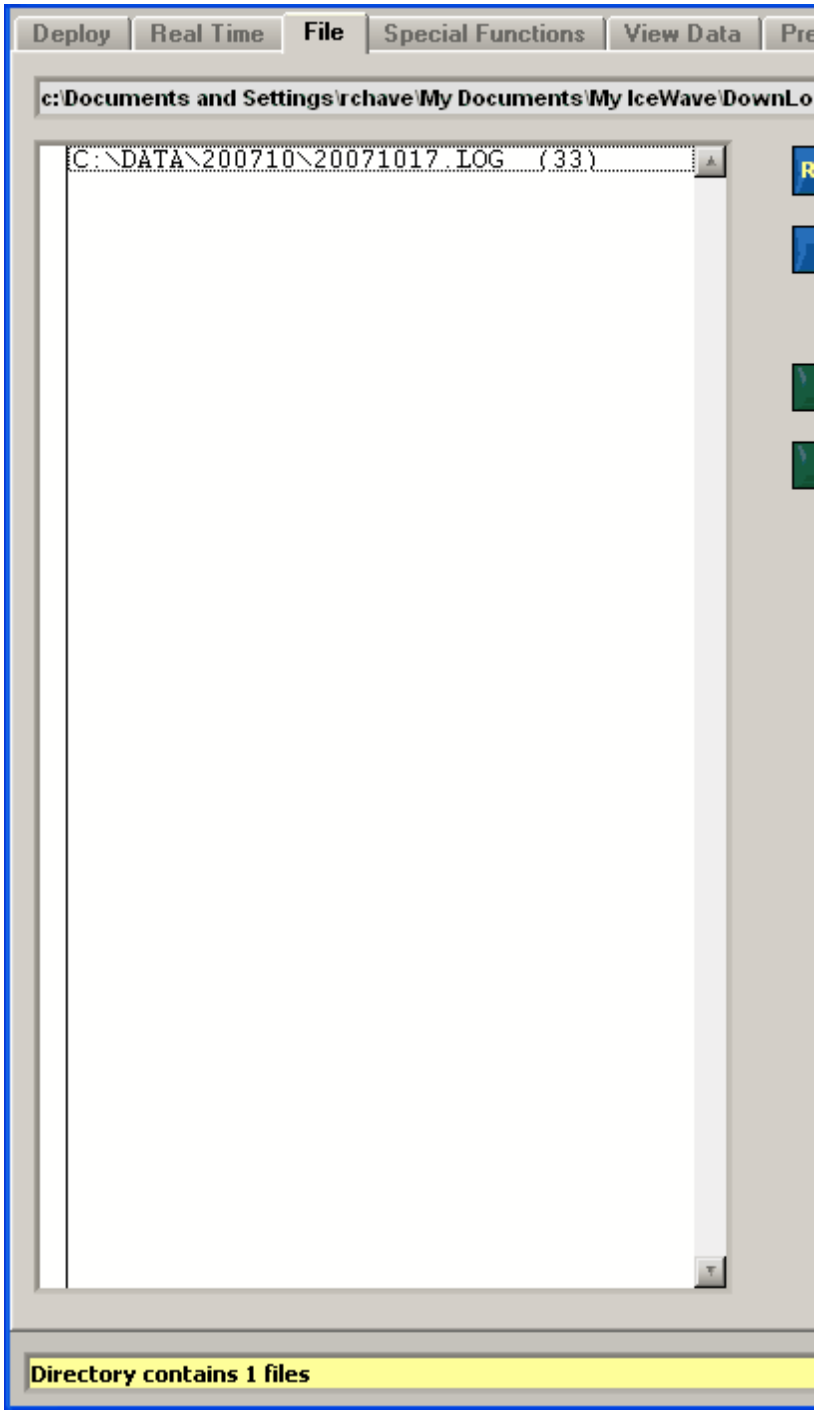


The formatting of the CF is a critical function. It is performed by placing the CPU in the unit under a DOS like O/S called PicoDOS and then executing a format c: command. When the c:> prompt is detected a second warning is provided to allow the user to abort the formatting.



Click Yes to start the format processing which can take several seconds depending on the size of the CF.

As a test the unit will write a log file to the CF.

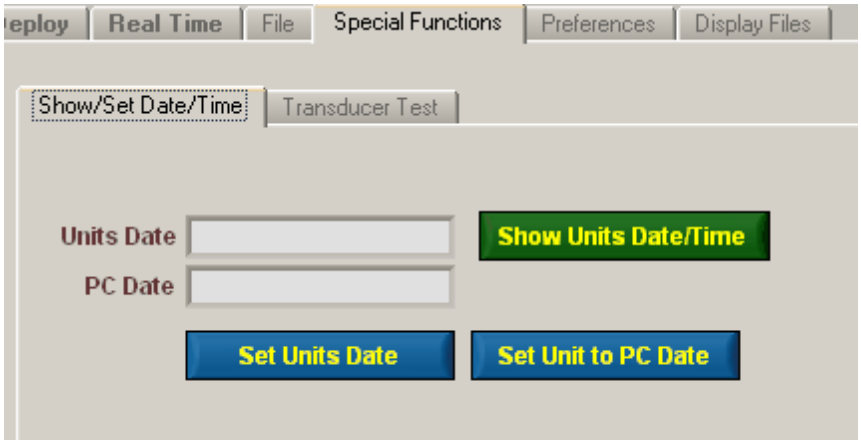


*** Warning ***

If this command fails it is possible that the unit has remained in its PICO DOS operating system. If this is the case you must enter the terminal emulator and enter "Reset".

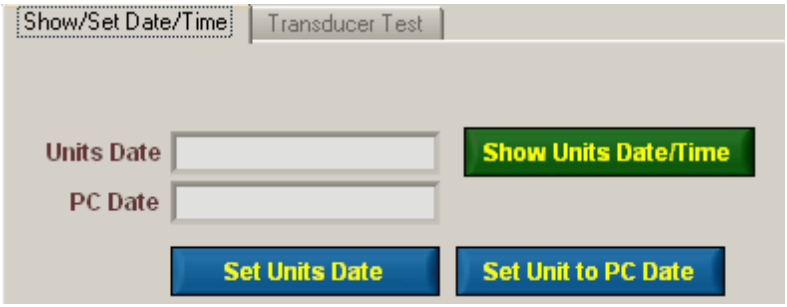
5.6 Special Functions Tab

The special functions tab contains special functions for setting up the unit.



5.6.1 Date/Time

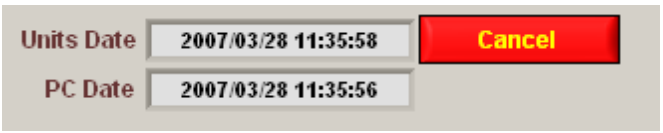
The Show/Set Date/Time tab is used to view or set the units date and time.



5.6.1.1 Show Units Date Time

The 

command button is to display the units date and time as well as the PC date and time. Note the unit must be in STANDBY mode for this command to work.



Click on the 

to terminate the displaying of the data and time.

5.6.1.2 Set Unit to PC Date

The 

command button causes MfAwcpLink to set the units date and time to the PC's date and time.

Once the unit is programmed the program starts showing the units date and time and the PC's data and time.

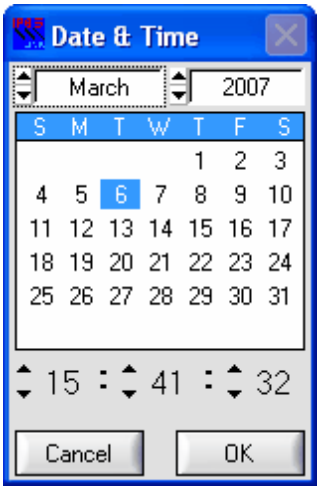
Click on the 

to terminate the displaying of the data and time.

5.6.1.3 Set Units Date

Use the 

command button to set the units date and time from another clock. A date/time popup appears.



Set the date and time to a desired value and then click ok when the time appears on the clock.

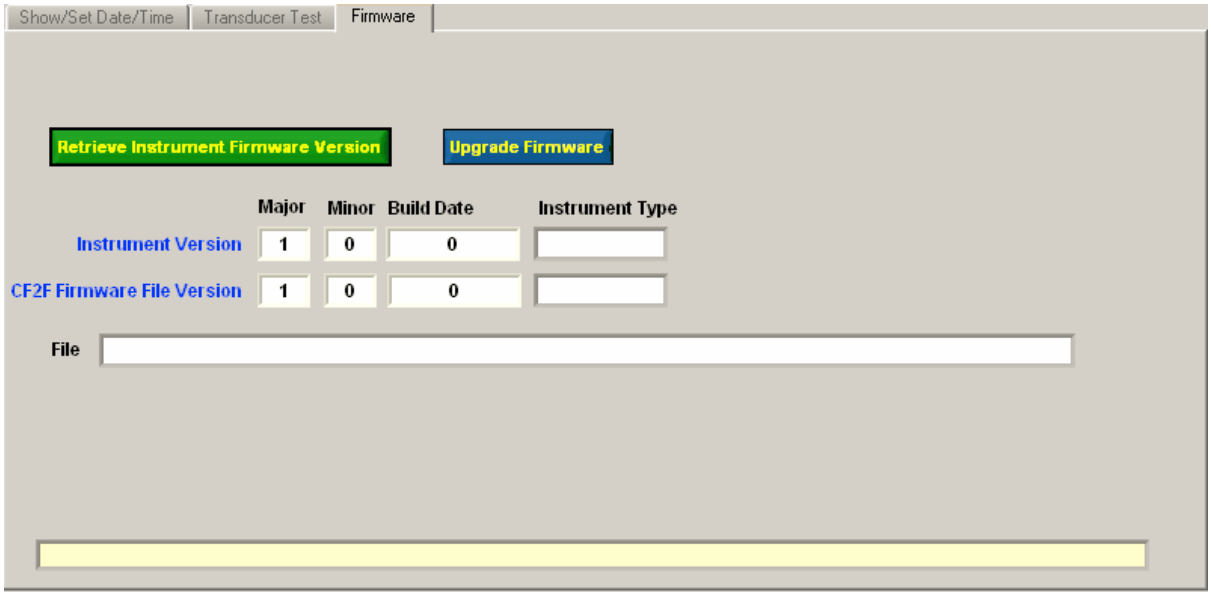
Once the unit is programmed the program starts showing the units date and time and the PC's data and time.

Click on the 

to terminate the displaying of the data and time.

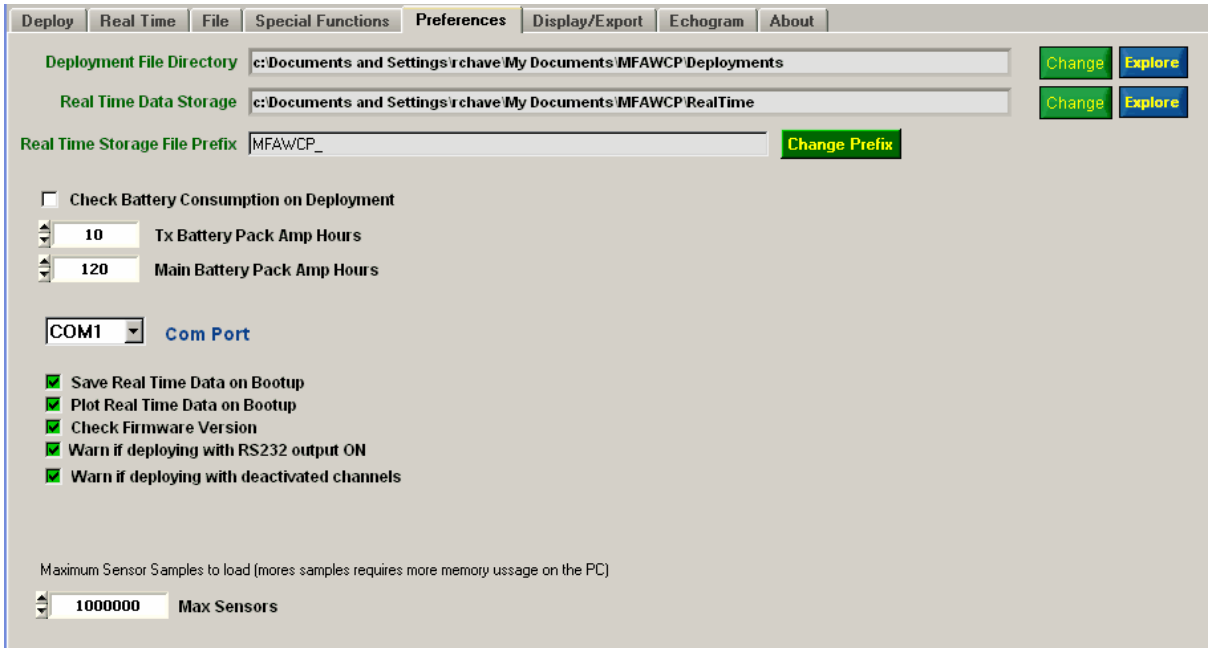
5.6.2 Firmware

The Firmware tab is used to perform firmware upgrades. Instructions for using this panel are in the Firmware Upgrades section.



5.7 Preferences Tab

The preferences tab is used to set up some parameters specific to the MfAwcpLink program. These values are remembered between invocations of the program.



5.7.1 Deployment File Directory

These indicators display and set the location of deployment files. Deployment files are files written by MfAwcpLink when an instrument is deployed.

The current deployment file directory is shown in a text box.

To change the location click on the 

command button to the right of the text box.

A directory select popup appears.

5.7.2 Real Time Data Storage Directory

These indicators display and set the location of real time data files as they are created by MfAwcpLink from the data received from the unit.

The name of the directory is shown in a text box.

To change the location click on the 

command button to the right of the text box.

A directory select popup appears.

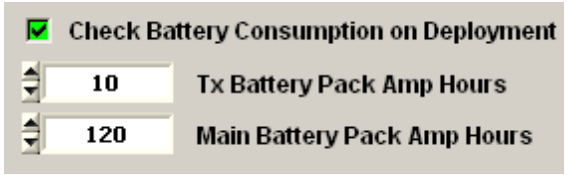
5.7.3 Real Time Storage File Prefix

As files are stored to Real Time Data Directory they are prefixed by a user selectable prefix.

To change the prefix click on the 

command button.

5.7.4 Check Battery Consumption on Deployment



The controls are used to set battery capacities and a flag to check the estimated battery consumption based on the selected phase parameters.

5.7.5 COM Port

The RS232 communications port for communicating with the Multi-Freq AWCP is set here.

Up to 16 different ports can be selected. Once a port is selected the program tries to open the port. If an error occurs a popup message is displayed.

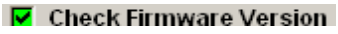
5.7.6 Save Real Time On Boot Up

Enable this check box if you want MfAwcpLink to automatically save real time data when it boots up.

5.7.7 Plot Real Time On Boot Up

Enable this check box to have MfAwcpLink to plot real time data automatically when it boots up.

5.7.8 Check Firmware Version

The 

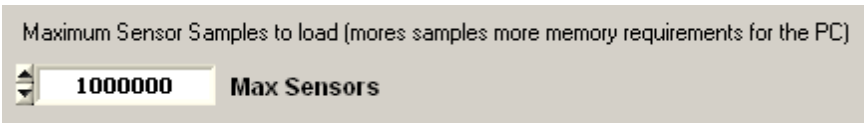
control enables or disables the checking of the firmware version when deploying an instrument for firmware upgrades.

5.7.9 Warn if deploying with RS232 output on

The 

control enables or disables the checking of RS232 on when deploying the instrument.

5.7.10 Maximum Sensor Samples to load

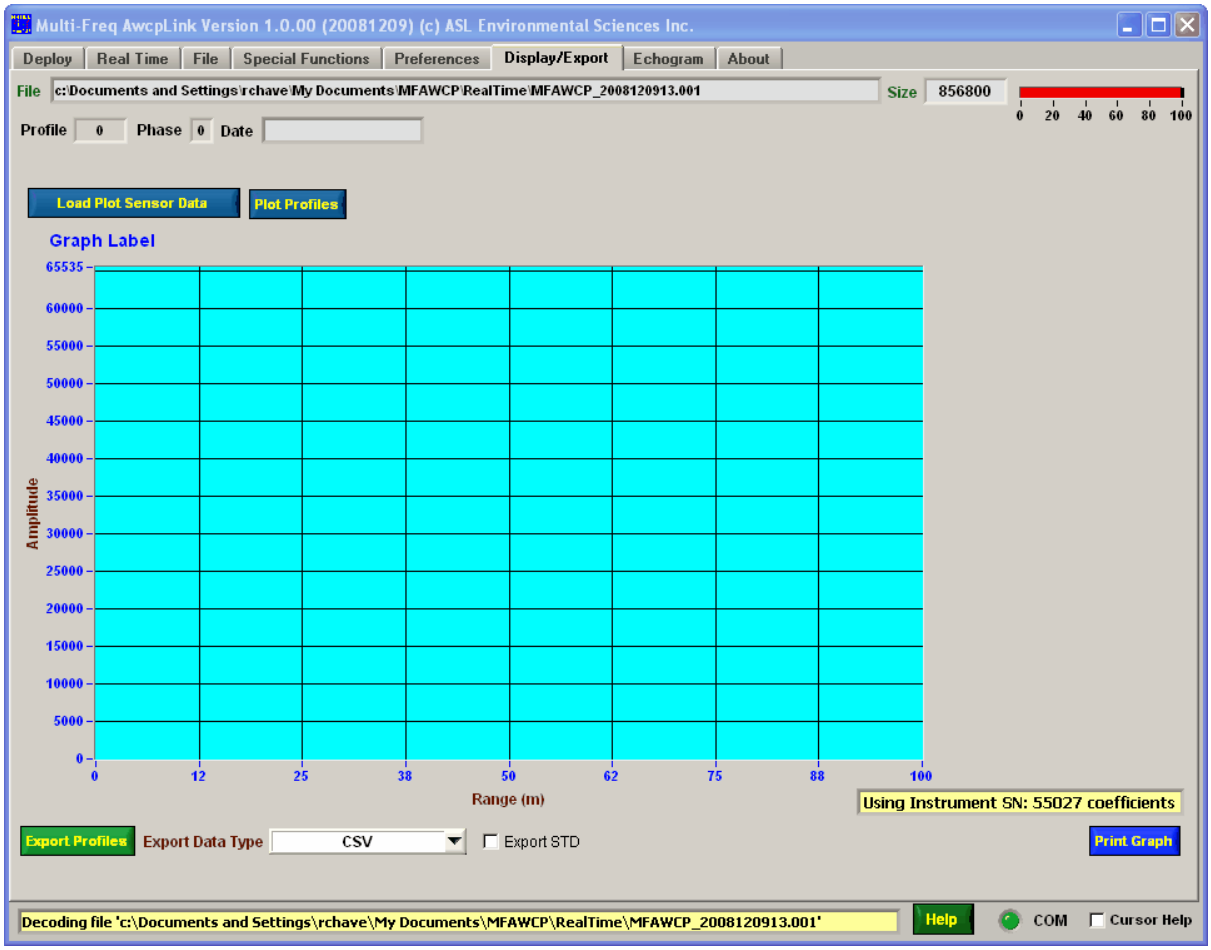


Max Sensors limits the number of samples and sensors that are loaded into memory when loading files in the Display tab. If the limit is reached then the program stops loading data and displays it. Since there is no limit on the number of files to load these controls limit the amount of memory that is used in the plotting to avoid lockup due to too much memory being used.

5.8 Display/Export Files

The Display/Export tab is used to display data files retrieved from the unit and/or stored by MfAwcpLink when it stores real time data. The controls on this tab can display sensor and profile data. There is also an option for converting profile and sensor data to an ASCII compatible format.

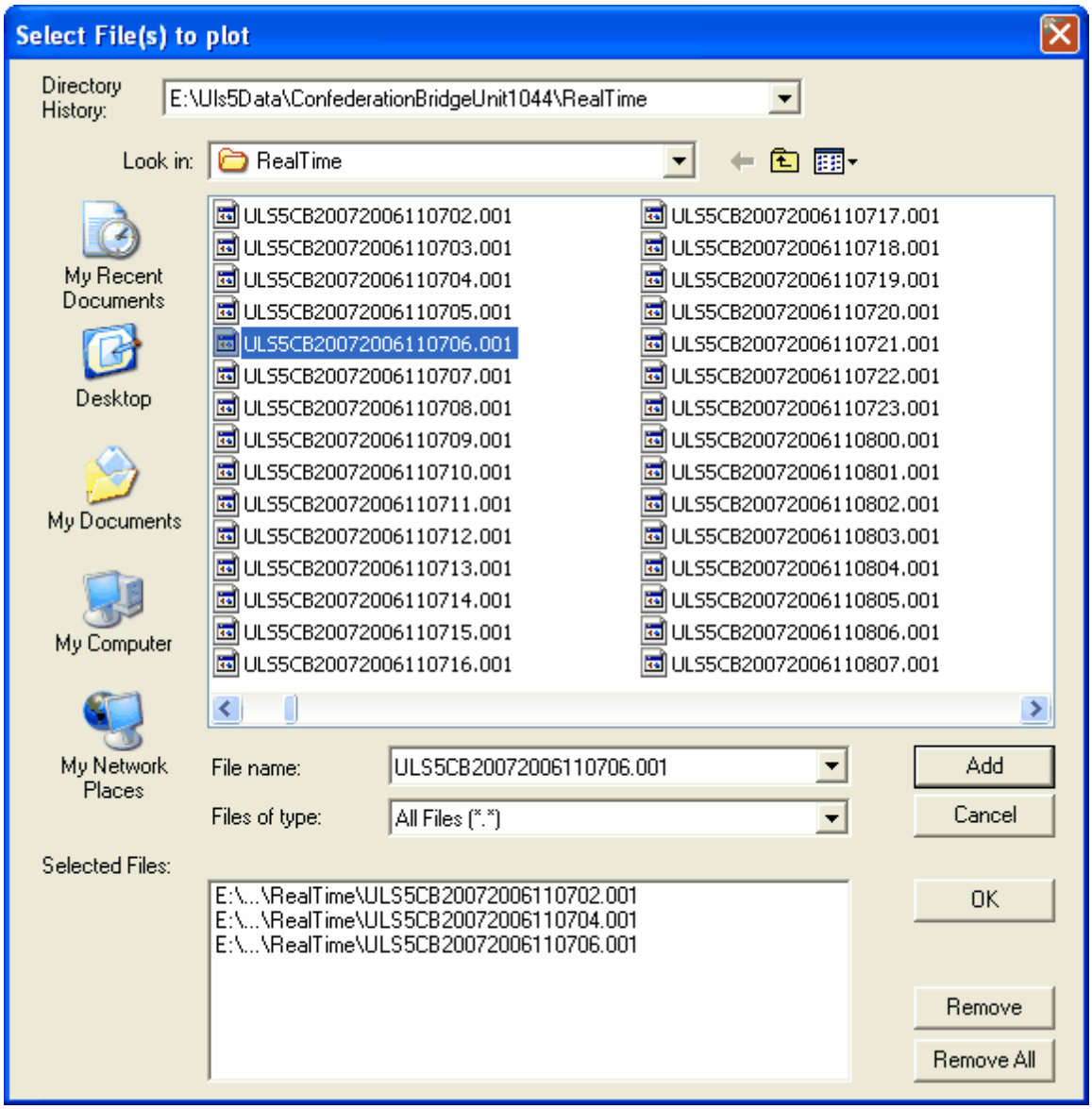
**** NOTE that computation of range scales is based on the Sound Speed found in the Configuration Tab .

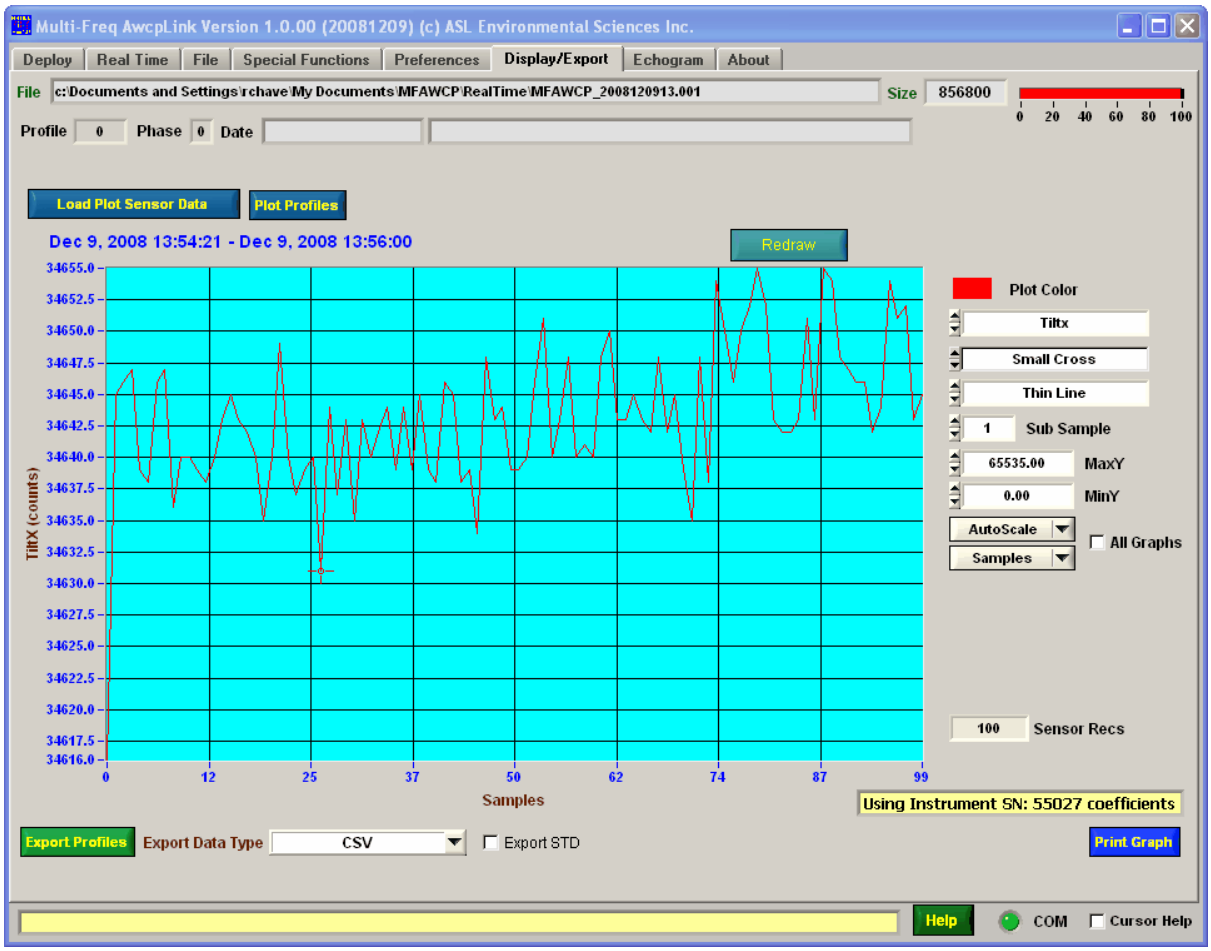


5.8.1 Load Plot Sensor Data

The 

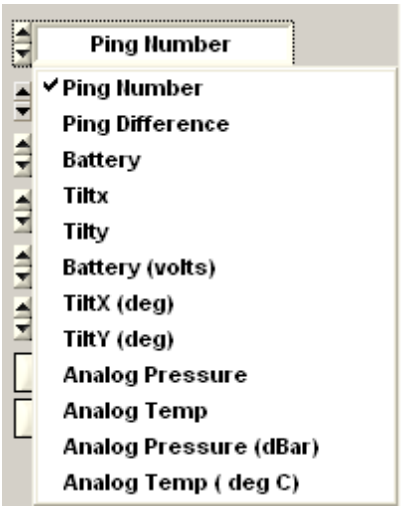
command button is used to load data into memory for display on the graph. The maximum amount of data that can be loaded is set in the Preferences tab. A popup file select control appears, select the files then click on the Ok button.





5.8.1.1 Selecting Data to Plot

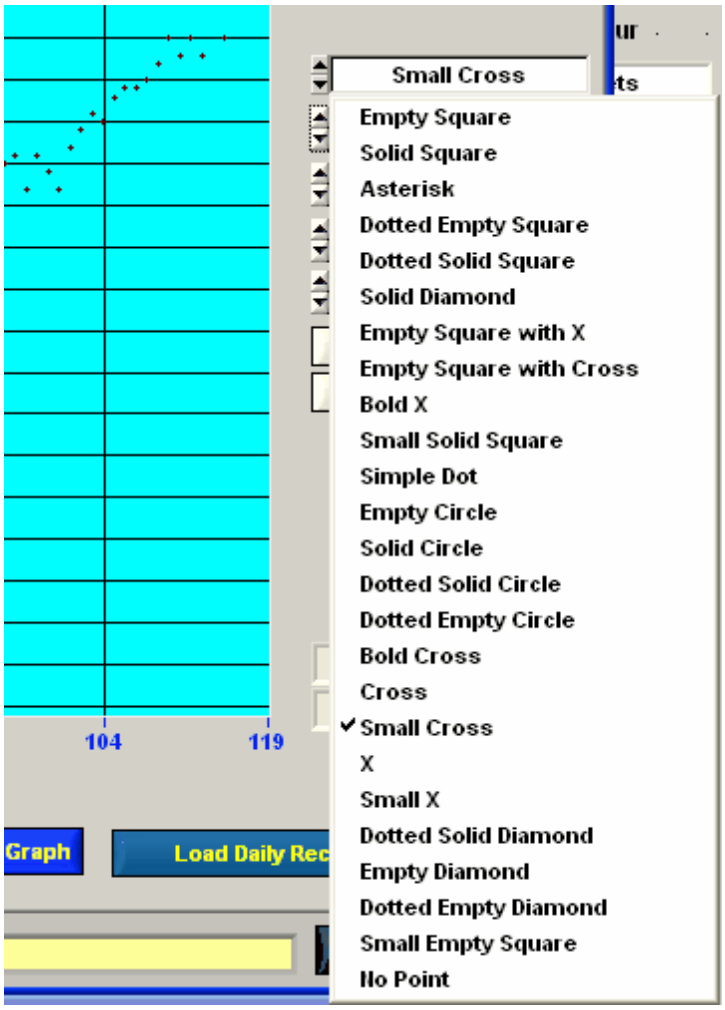
The user can select the data to plot using the data selection pull down menu command button.



Ping Number	Plot the ping number. This is the ping counter tagged to all data
Ping Difference	This is the successive difference between pings. Used to check for missing pings.
Battery	Plot the battery in A/D counts.
Tiltx	Plot the Tilt X in A/D counts
Tilty	Plot the Tilt Y in A/D counts
Battery (volts)	Plot the battery converted to volts
TiltX (deg)	Plot the Tilt X converted to engineering units (*)
TiltY (deg)	Plot the Tilt Y converted to engineering units (*)
Analog Pressure	Plot the Analog Pressure in A/D counts.
Analog Temp	Plot the Analog Temperature in A/D counts
Analog Pressure (dBar)	Plot the Analog Pressure converted to engineering units (*)
Analog Temp (deg C)	Plot the Analog Temperature converted to engineering units (*)
(*)	Using calibration parameter found in the Configuration Tab (NOTE UNIT MUST CONTAIN THE SPECIFIC HARDWARE FOR VALID VALUES)

5.8.1.2 Symbol Type

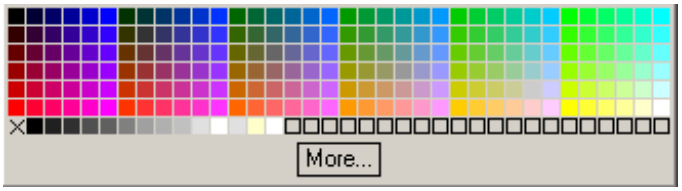
The user can select the symbol type to use in the plots. These are used if the plot type is either a scatter plot or connected point plot.



5.8.1.3 Plot Color

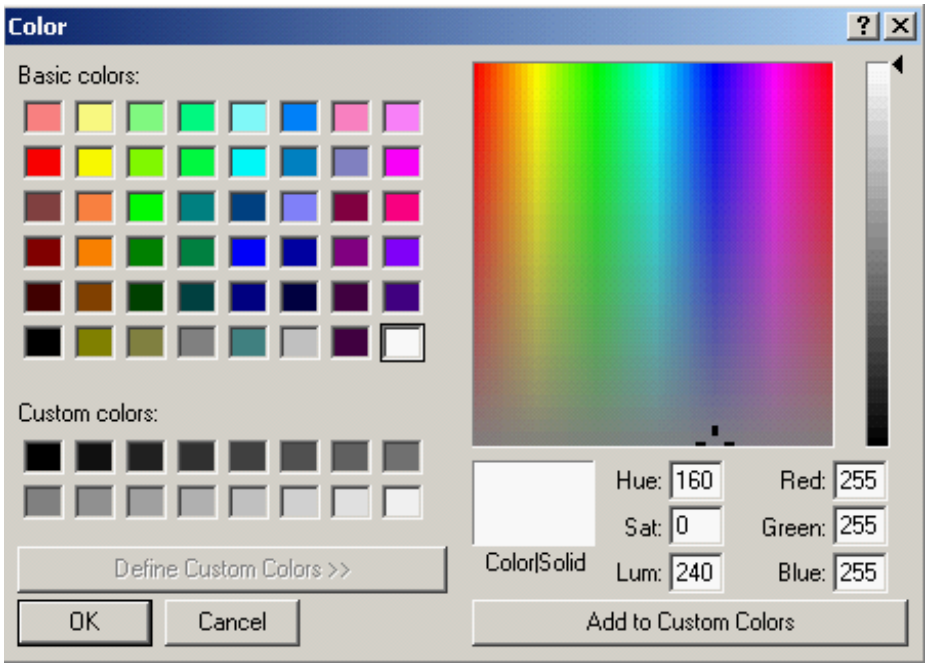
The 

color control allows the operator to set the line color. Click on the control to set the color.



Clicking the 

button in the color popup allows the operator to select a wider range of colors.

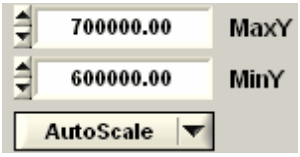


5.8.1.4 Plot Type

Select the plot type using the pull down selector below the symbol type pull down.

5.8.1.5 Y Axis Scaling

Scaling of the Y Axis is done using the following controls.



If AutoScale is used then MaxY and MinY is ignored and the graph is auto scaled.

To use the MaxY and MinY scales set the scale pull down button to 

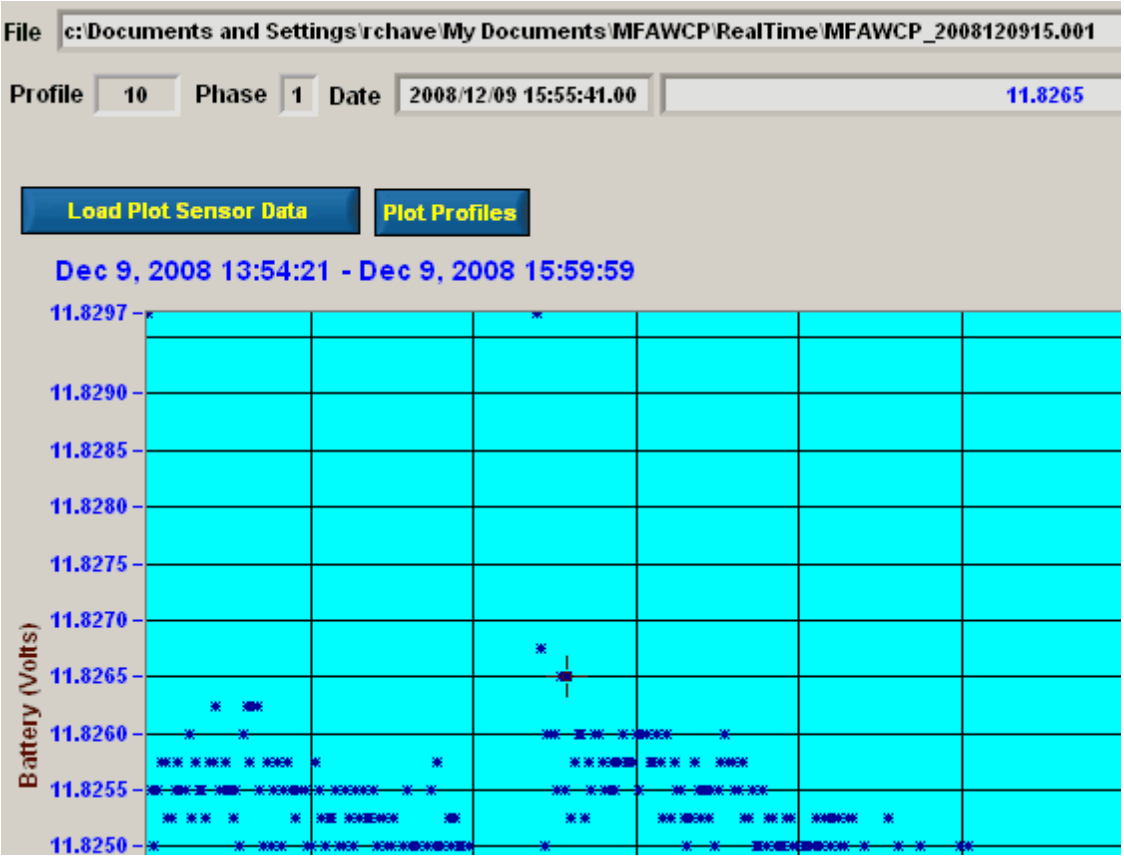
.

5.8.1.6 X Axis Scaling

The X Axis can be set to display date/time and or sample numbers using the X Scale pull down control.

5.8.1.7 Displaying Data Point Values

When a lift click of the mouse with the cursor near a data point causes it to snap to that point and displays its date/time, ping number and data value.

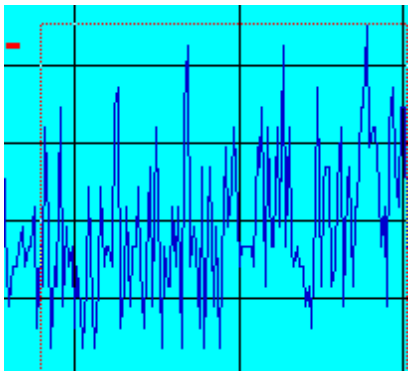


The example above shows the cursor snapped to profile 264 tilt x data at a value of -.8141.

5.8.1.8 Zoom

To zoom on a section of the graph, press the keyboard Ctrl key and left mouse button down at the same time.

A box will appear in the graph as you move the mouse to select an area to zoom in on.



5.8.1.9 Sub Sample

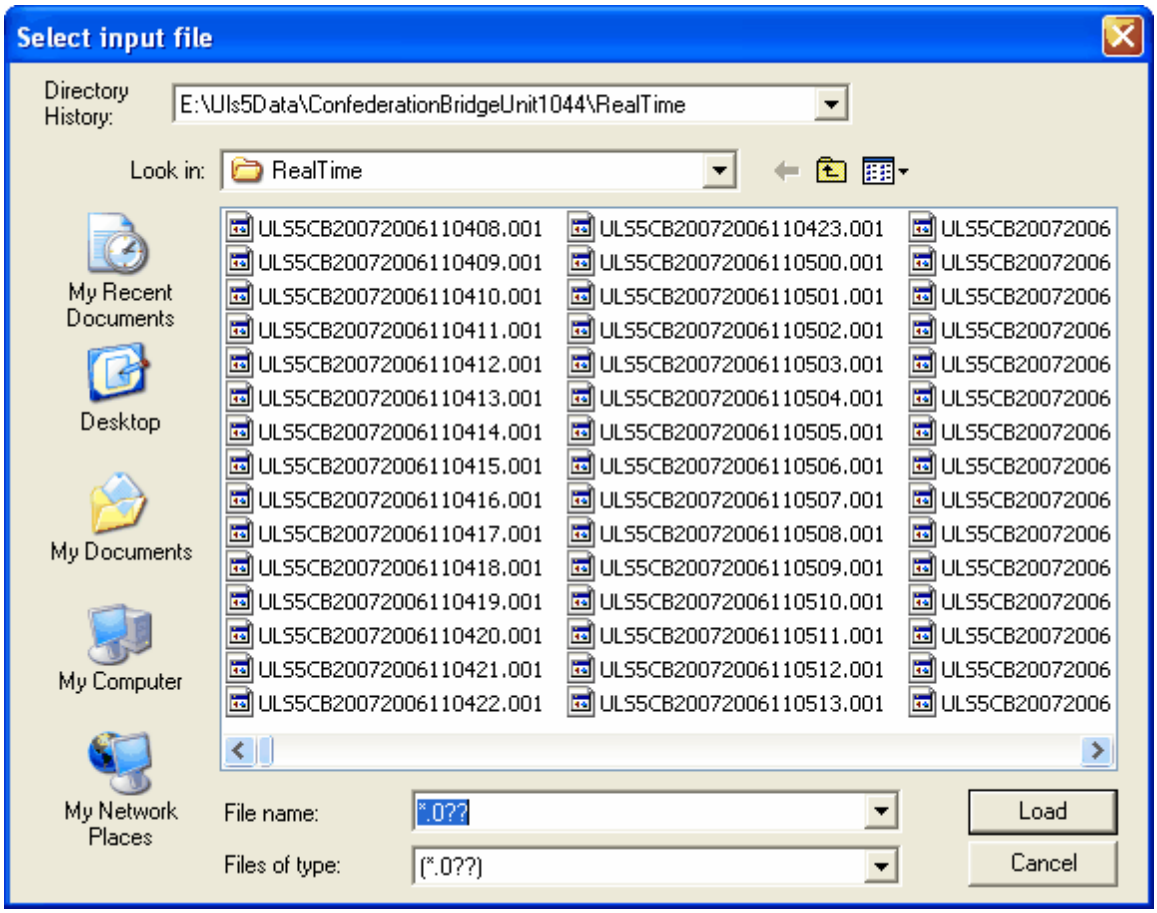
The 

is used to reduce the amount of data that is displayed if multi day amounts of data have been loaded.

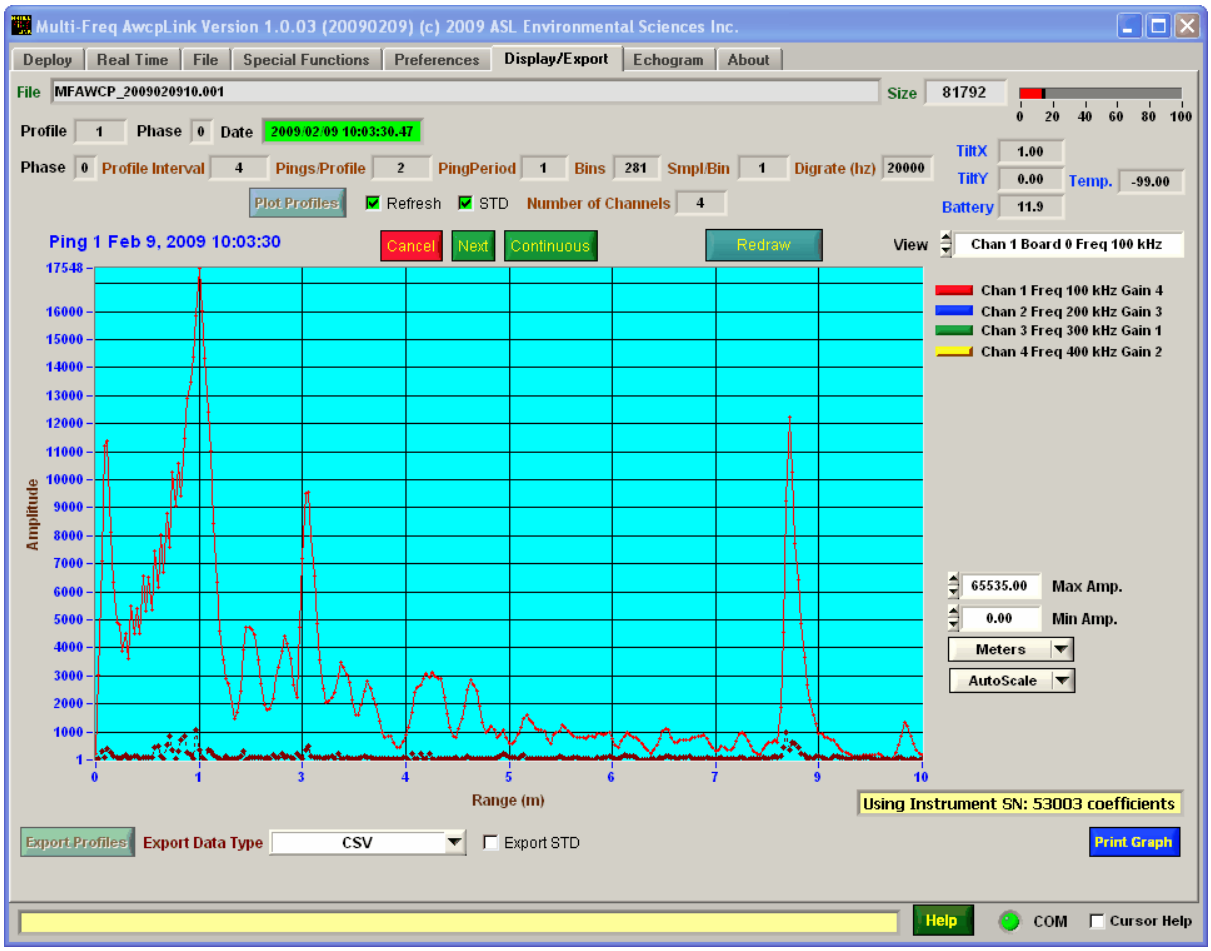
5.8.2 Plot Profiles

The 

command button is used to plot the profiles in a data file. A file select popup appears. Select the data file to plot.



The first profile is plotted.



To plot the next profile in the data file click on the 

command button. To move quickly through the profiles click on the 

command button. A 

command button appears that will stop the program from the continuous reading and display of the profiles.

Sensor data that is contained in the profile is displayed.

Note that if the Date is shaded green the Sensor data is from the current profile being displayed.

The graph is auto scaled if the 

scale select pull down shows "AutoScale". If it is set to "Manual Scale" use the 

numeric controls to set the scale.

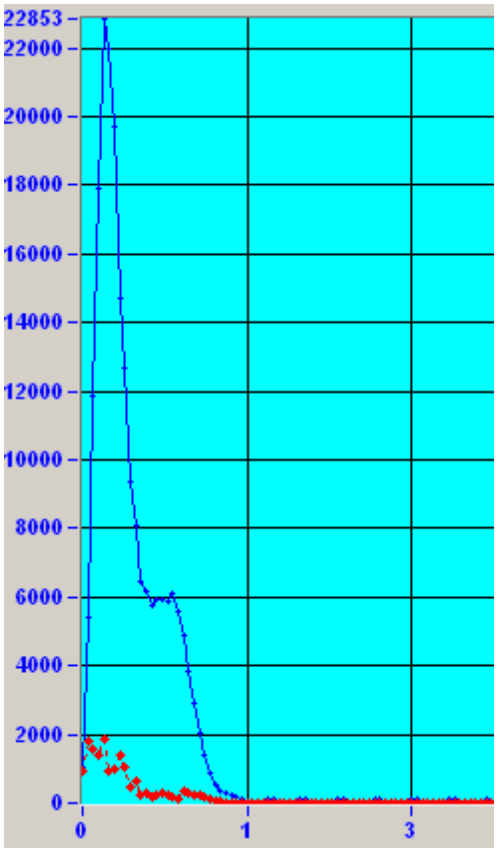
The x-axis scale can be set to 

or 

.

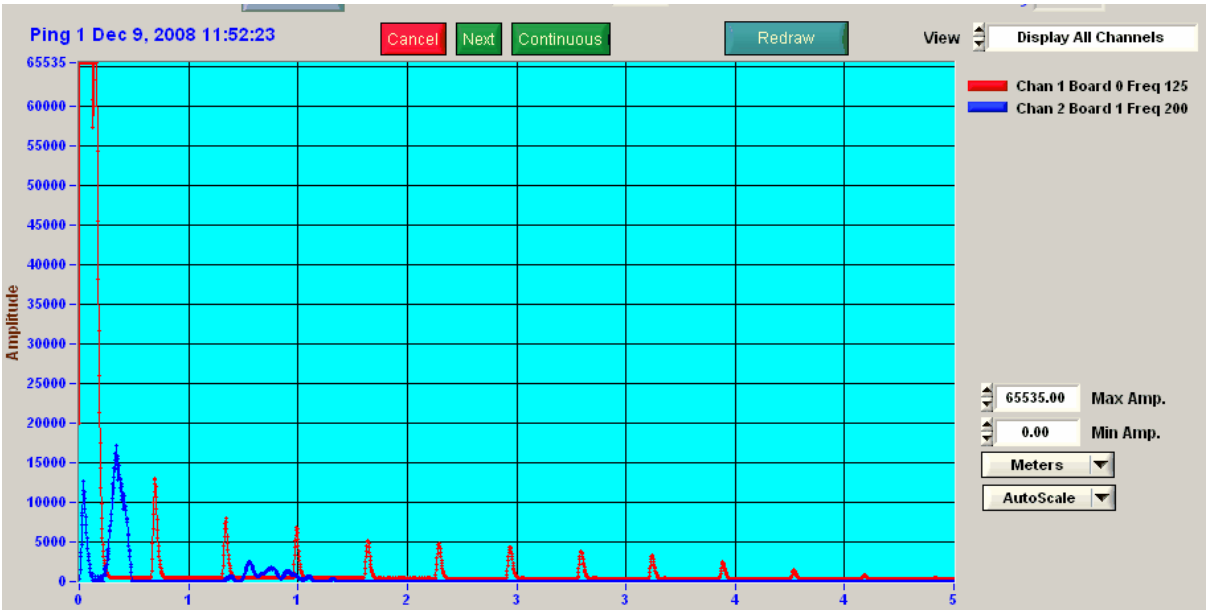
When the Cancel button is clicked the program closes the file.

If the Standard Deviation has been stored with the data then it will be plotted in RED if the STD check box is on.



You can select which frequency to view with the frequency select pull down.

Below is an example that shows the data from 2 channels.



5.8.3 Print Graph

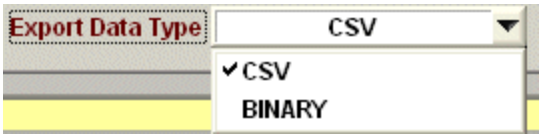
The graph can be printed to a local printer using the Print Graph command button.

5.8.4 Export Profiles

The Export Profiles is used to export target and profile data to text files that are compatible with spreadsheet programs such as Microsoft EXCEL.

To export the Standard Deviations instead of the Bin values set the Export STD to on ` Export STD .

There are a number of export formats which can be set by the Export Data Type pull down menu.



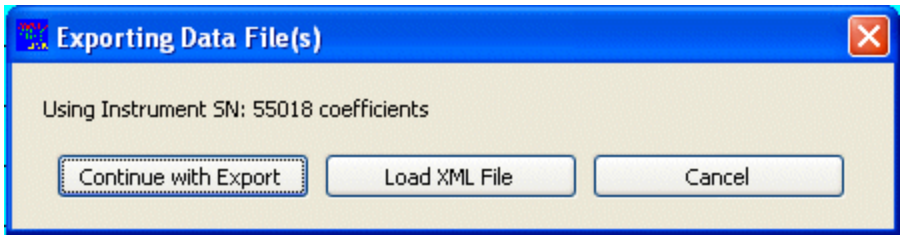
CSV format causes the program to export the data in Comma Delimited format (CSV) shown below is an example when read into Microsoft EXCEL.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Profile_number	Profile_date	Profile_time	Num_Chan	OutPut_Chan	OutPut_Board	OutPut_Fequency	StartIndex	Num_bins	Samples_Bin	Pulse_len	Digrate	SountSpeed	Range_start_m	Range_stop_m	Range_resolution_m	TiltX	TiltY	Bat	Gain	Temp	
1	12/9/2008	13:54:21	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.87	-0.36	11.83	1	20.78	20608
2	12/9/2008	13:54:22	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.83	-0.38	11.83	1	20.76	19904
3	12/9/2008	13:54:23	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.83	-0.38	11.83	1	20.75	20097
4	12/9/2008	13:54:24	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.83	-0.39	11.83	1	20.75	20352
5	12/9/2008	13:54:25	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.84	-0.38	11.83	1	20.75	27000
6	12/9/2008	13:54:26	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.84	-0.38	11.83	1	20.75	19904
7	12/9/2008	13:54:27	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.83	-0.38	11.83	1	20.74	20216
8	12/9/2008	13:54:28	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.83	-0.37	11.83	1	20.74	19611
9	12/9/2008	13:54:29	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.84	-0.38	11.83	1	20.74	19328
10	12/9/2008	13:54:30	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.84	-0.38	11.83	1	20.74	21230
11	12/9/2008	13:54:31	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.84	-0.38	11.83	1	20.74	20099
12	12/9/2008	13:54:32	2	1	0	125	0	2118	1	150	64000	1450	0	23.993	0.011	-0.84	-0.37	11.83	1	20.74	18684

The BINARY format produces two files. One is a .BIN file with the bins written out in consecutive 16 bit binary values. The header information is written to a .CSV file with the header information in the same format as in the .CSV output format. The header file is created with the same name but with .CSV appended to it. For example, if the output file is named "ProfileData.BIN", the header file is named "ProfileData.BIN.CSV"

To export click on the Export Profiles command button. An output file select popup appears for the user to select an output file name.

A popup panel will appear to confirm the Instrument Coefficients being used for the export.

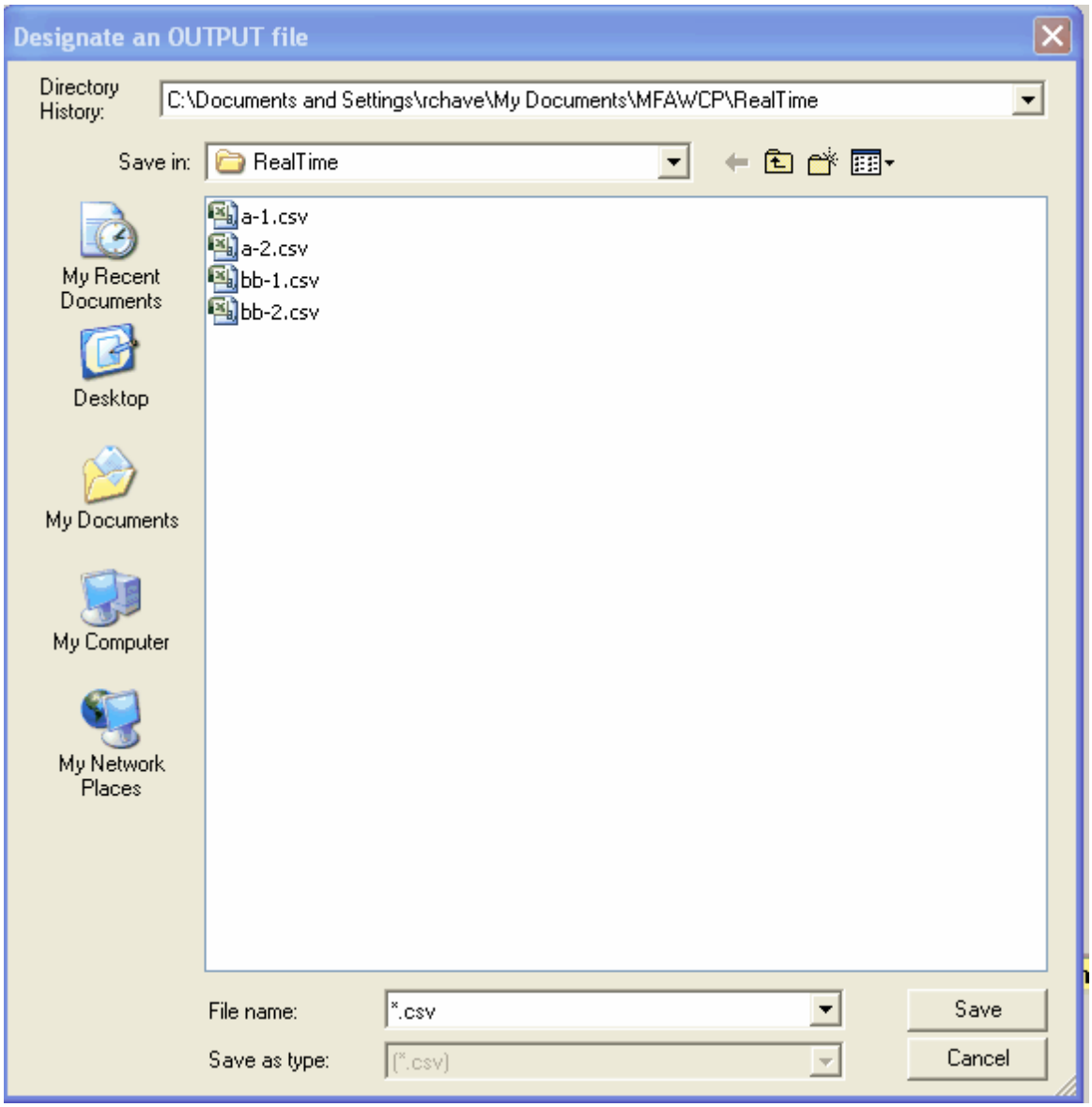


If this is not the correct set of coefficients then load an appropriate XML file that was retrieved from the instrument then click on the "Continue with Export" button.

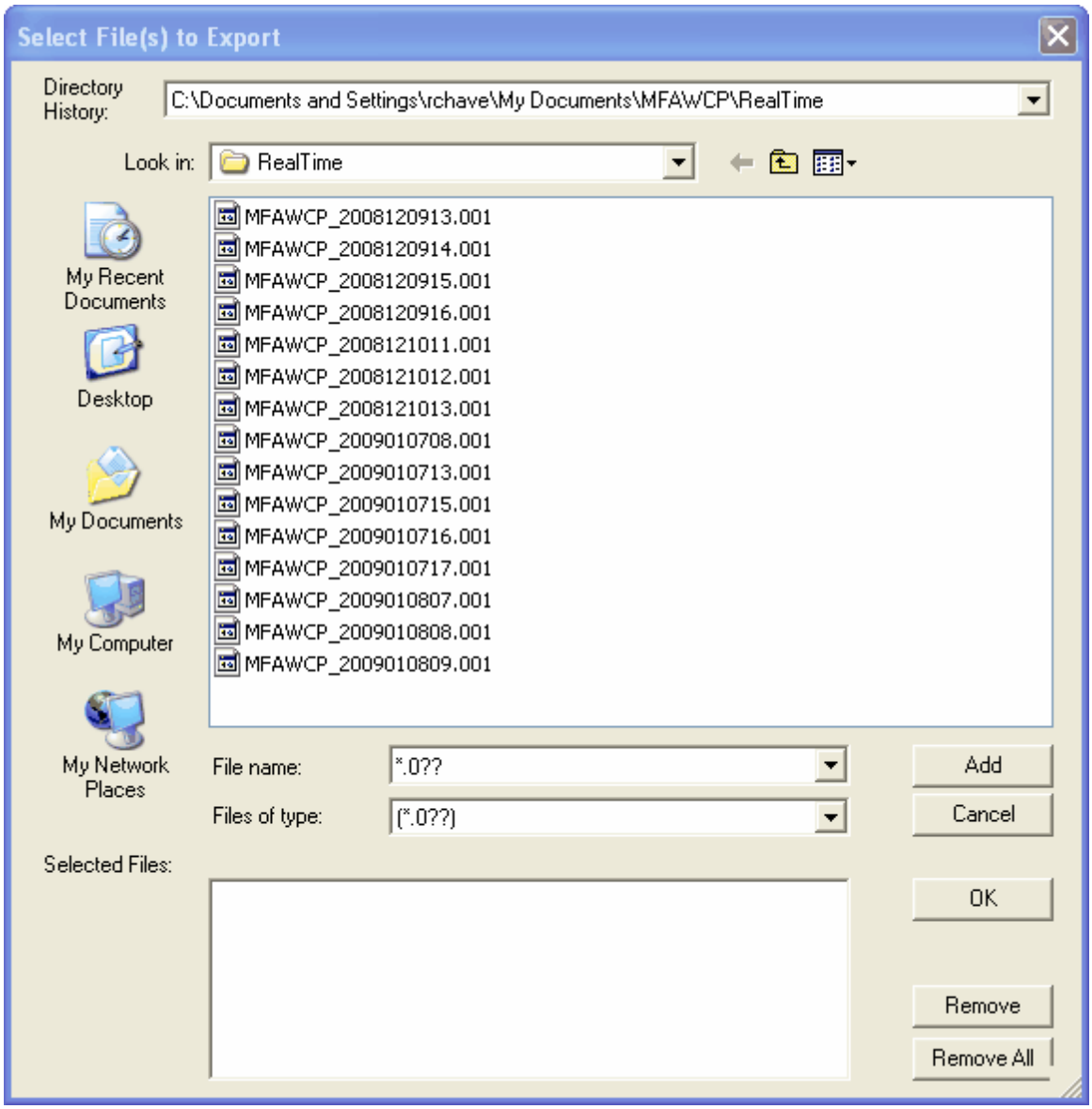
If the Instrument number coefficients are the correct ones then the program asks for either CSV or BIN files to create for the export.

NOTE: If you request a new file for example "XXX.CSV" the program will create N files of the form "XXX-1.CSV", XXX-2.CSV" etc. where N is the number of channels in the data file.

If you select an existing "XXX-N.CSV" data file you will be asked if you want to overwrite the file(s).



This is followed by a multi-file select popup for the user to select several files to export.



If you wish to export a specific phase then replace the file selection the phase number. For example to select only phase 2 change it to "*.002".

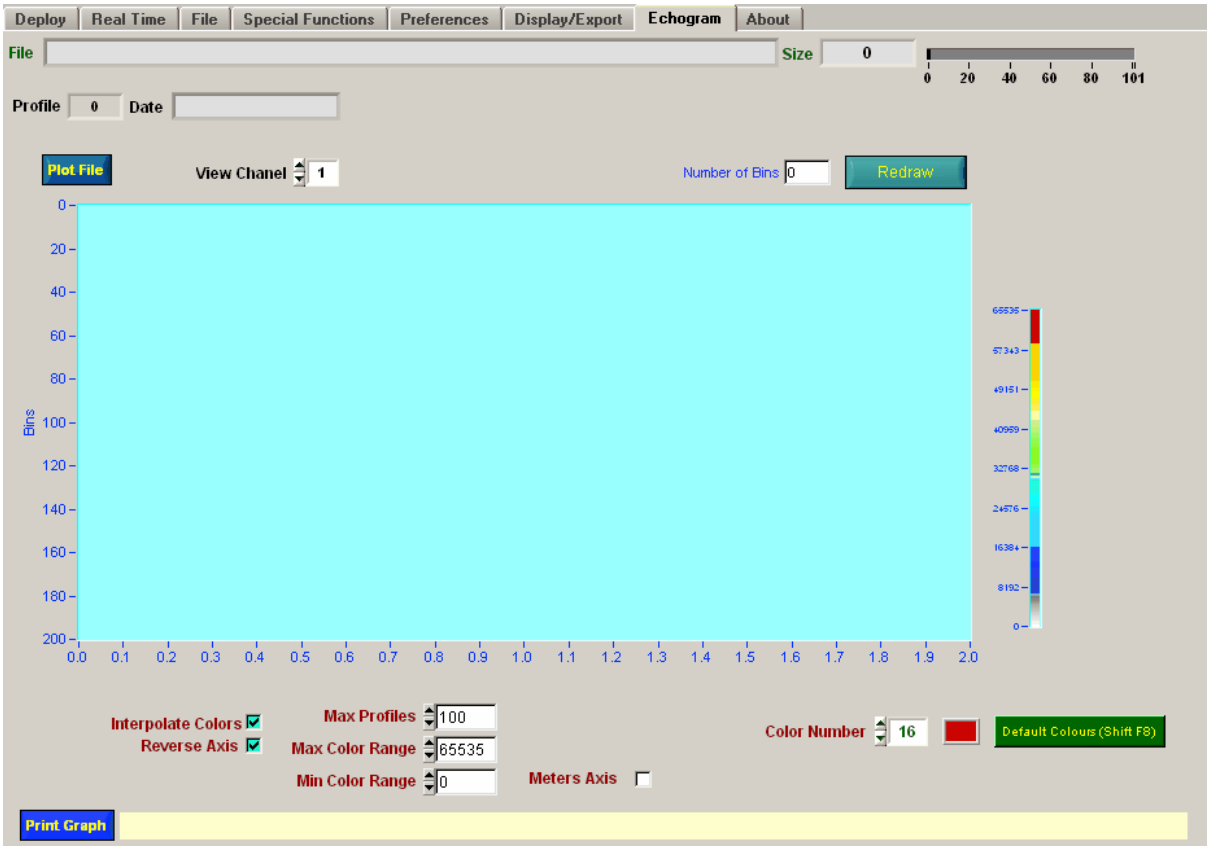
NOTE:

When exporting multiple phases at the same time it is possible to have profiles out of sequence with respect to the date and time. This can happen if a "Repeat Phase" was used. Data files are written to CF using the current year, month, day, hour and phase (08010112.001, 080112.002 etc). If the unit was collecting Phase 3 data then switches to Phase 1 via a repeat phase within the same hour then the Phase 1 hourly file will have later times then the Phase 3 hourly file. When the files are selected by the program they are selected in name order which which will cause the output file to have the out of sequence profiles. For the CSV files this can be fixed with Microsoft EXCEL by sorting on the date/time fields. At this point in time it requires external processing software to fix BINARY output data that has this problem.

5.9 Echogram

This tab allows the user to plot the profiles as an echo gram.

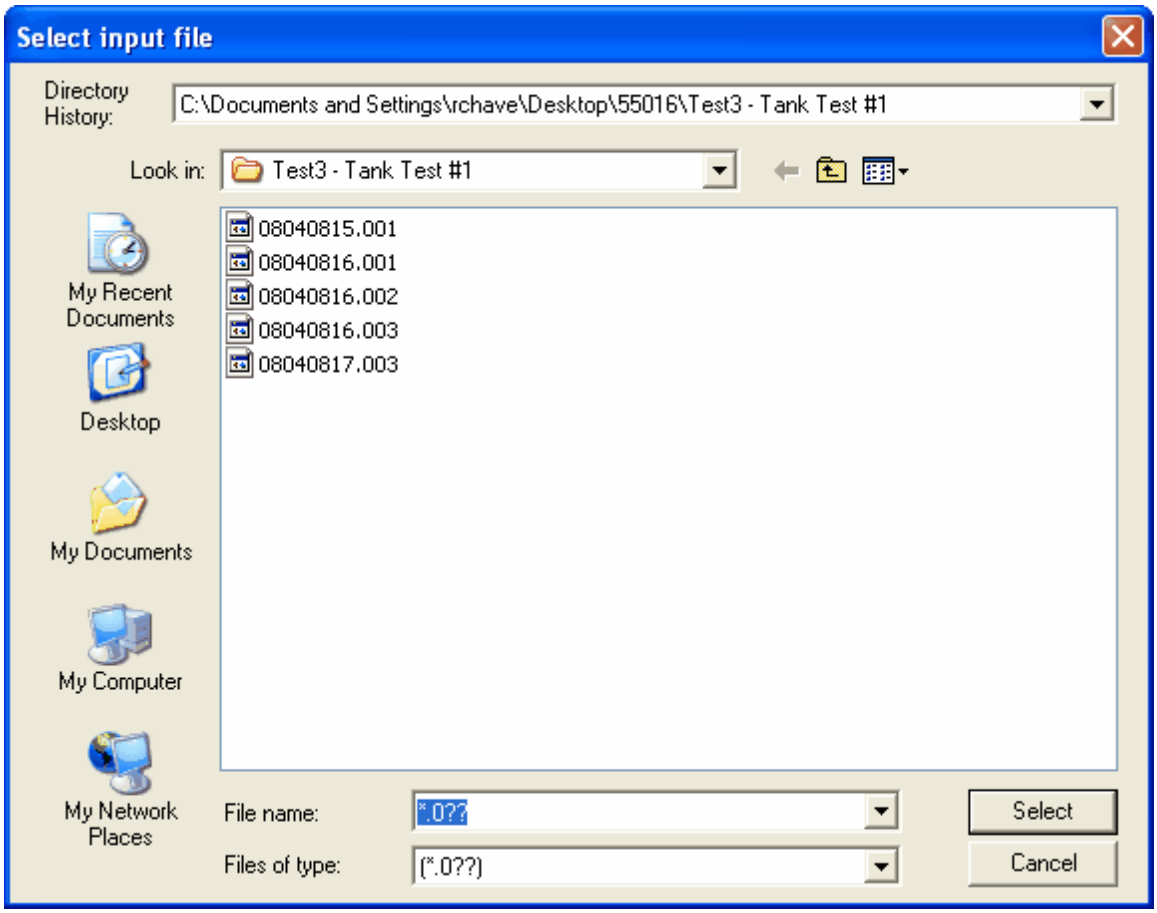
Note that this panel is only meant to allow the user a quick look at the data and is not sufficient for detailed analysis of the data.



5.9.1 Plot File

Before clicking on the Plot File command button select the channel (frequency) you wish to view using the View Channel 1.

Clicking on the Plot File command button causes the file select popup to appear. Select the file to plot.



5.9.2 Interpolate Colors

The Interpolate Colors the user to turn on or off the interpolation of color values.

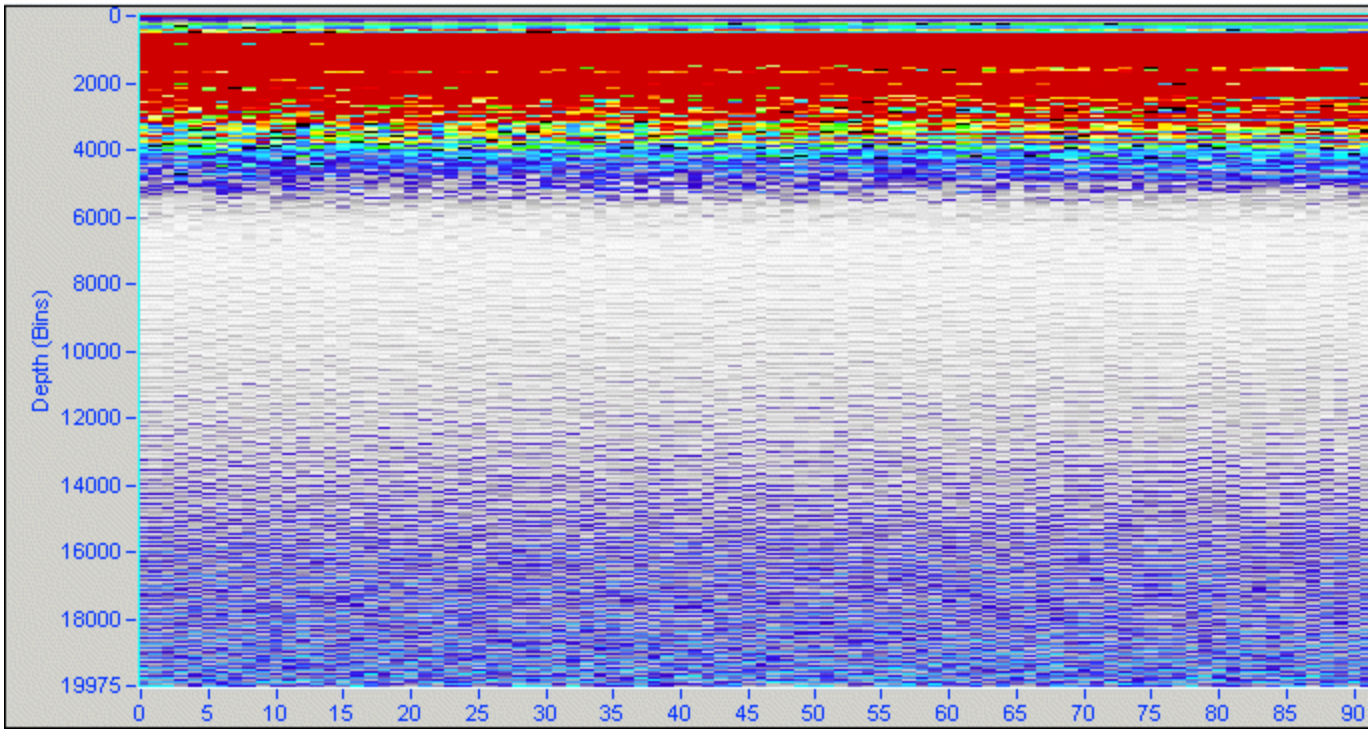
When Interpolate Colors is off, then the data value is assigned the color associated with the next higher Color Map data value.

When Interpolate Colors is on, then the data value is assigned a color computed using a weighted mean of the colors associated with the Color Map data values above and below the Z Array data value.

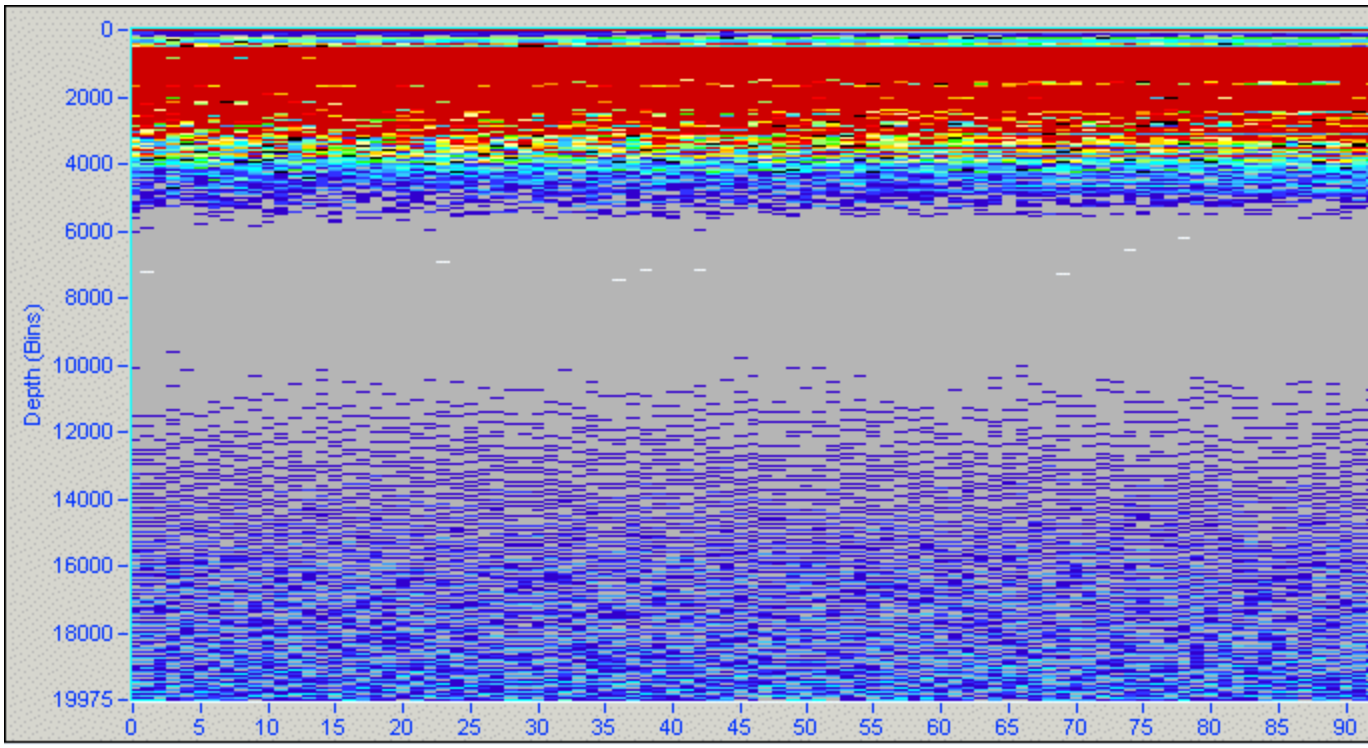
Regardless of the value of Interpolate Colors

- data values below the lowest Color Map data value are assigned the color of the lowest Color Map data value.

- data values above the highest Color Map data value are assigned the value passed in the Hi Color parameter.



Below is the same graph with color interpolation off.



5.9.3 Reverse Axis

This toggle reverses the Y axis of the graph.

5.9.4 Max. Profiles

The 

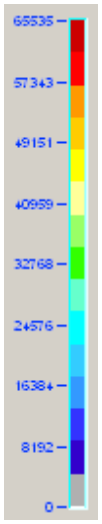
numeric control sets the maximum number of profiles that are loaded per plot. If the file contains more profiles then Max Profiles then the programs 

buttons are enabled so the user can load a new set of profiles by clicking Next or cancelling the plots by clicking Cancel. This value has minimum of 50 and a maximum of 10000.

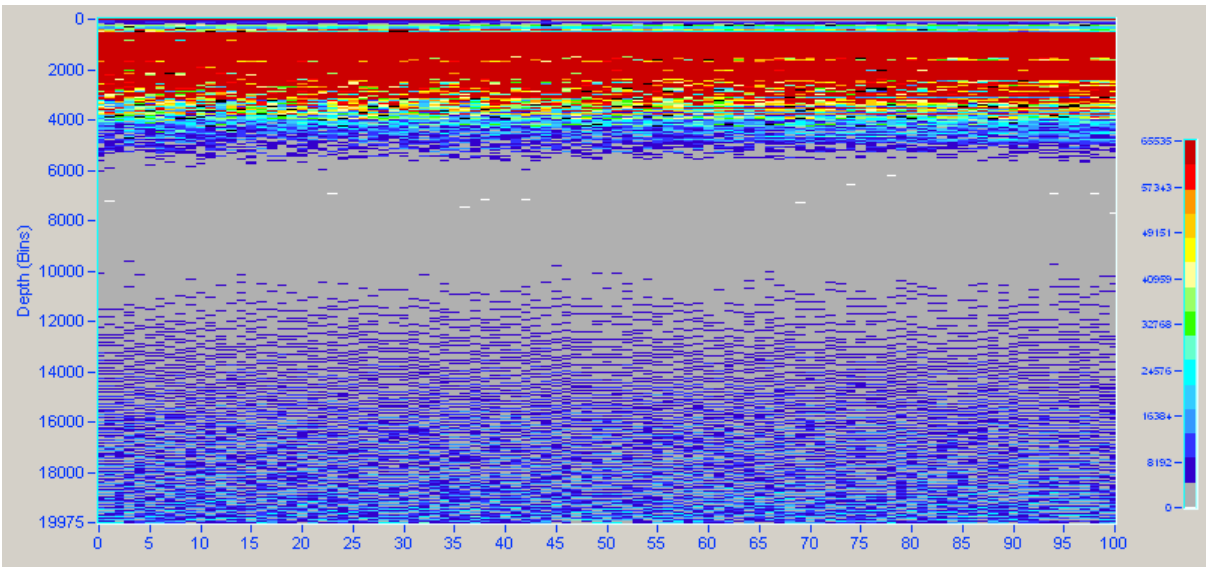
5.9.5 Color Range

Use the numeric controls shown below to set the min and max color ranges.

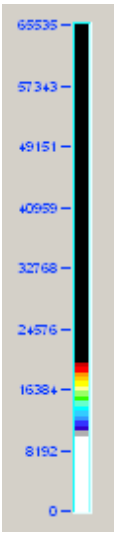
The Min Color Range and the Max Color Range are used to narrow the numerical range of the colors. For example the normal rainbow colors between 0 and 65535 is shown below:



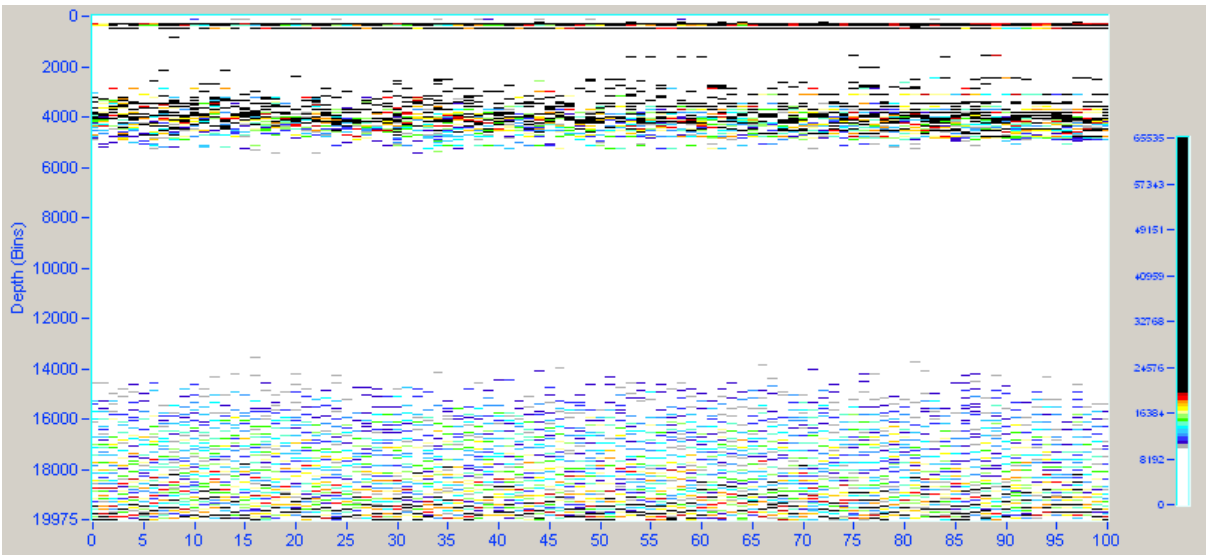
The graph plotted with this range is shown below.



If the minimum and maximum color ranges are set to 10000 and 20000 respectively then the color map appears as shown below.



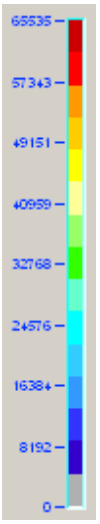
The same data plotted with this range is shown below:



5.9.6 Default colors

The 

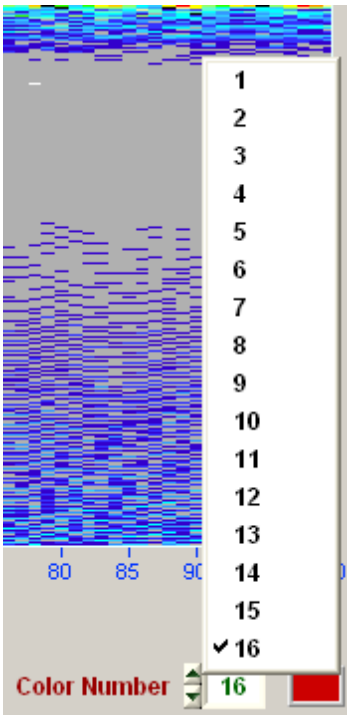
command button resets the colors to the program default.



5.9.7 Setting Colors

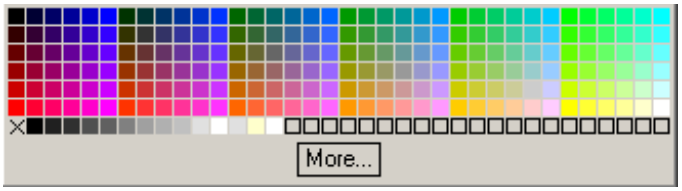
The numerical values for the 16 colors that make up the color range can be set by the user.

Select the color you wish to change by selecting the color number pull down control.



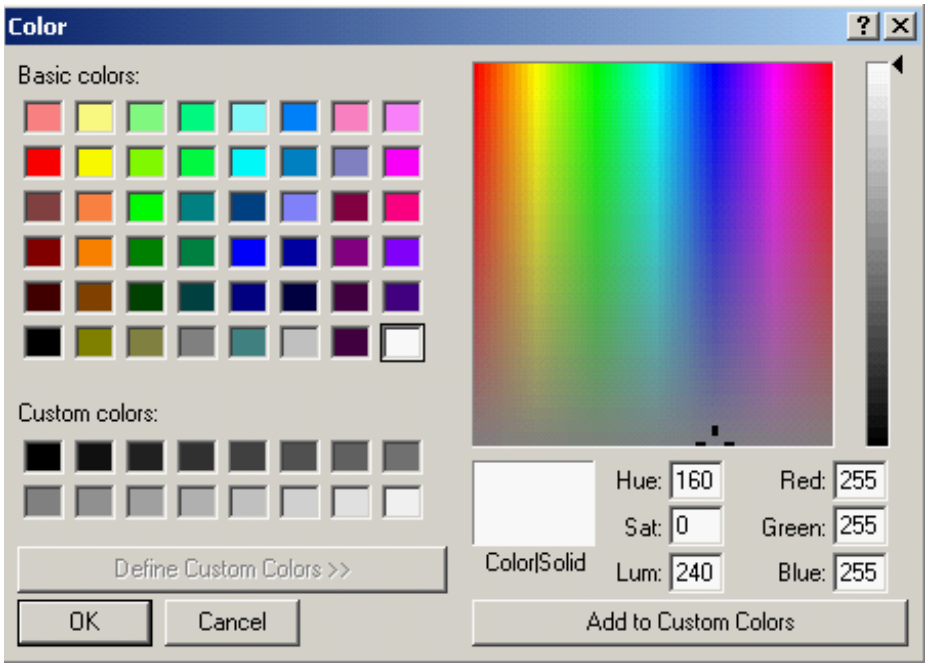
Select any of the 16 colors. The colors are numbered from 1 to 16.

To change the color click on the color control and select a color.



Clicking the 

button in the color popup allows the operator to select a wider range of colors.



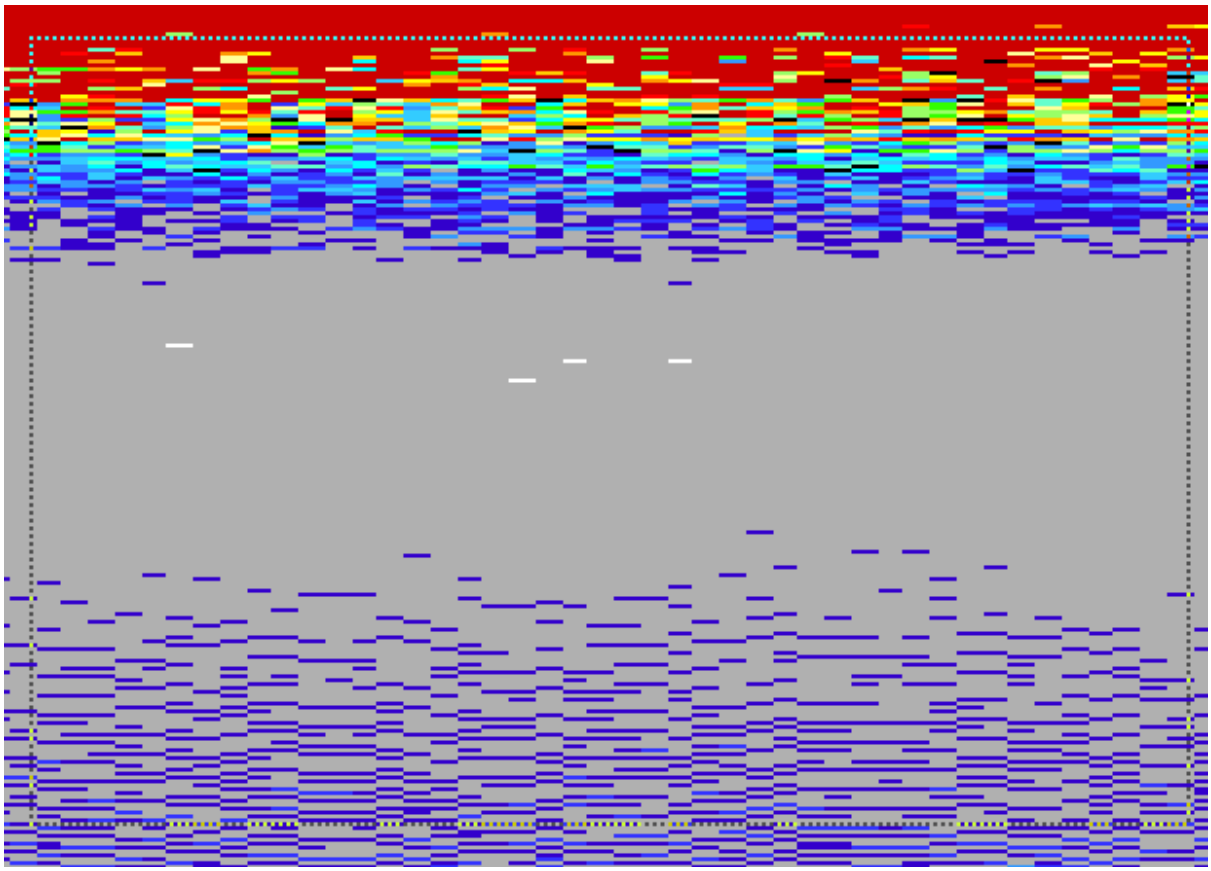
5.9.8 Meter Axis

The 

checkbox is used to change the y axis graph from bins to meters. The meters range is set using the user specified sound speed found in the deployment panel.

5.9.9 Zoom

The user may zoom in on sections of the echo gram by pressing the keyboard ctrl key and the mouse left button at the same time.
A zoom rectangle is formed by dragging the mouse. When the user lets go of the left mouse button the graph zooms on the rectangle.



To reset the graph to its original scale click on the 

command button.

5.9.10 Print Graph

Click on the 

command button to print the graph.

6 Upgrading the Units Firmware

There are two ways to upgrade the units firmware. One uses a user interface provided in the Special Functions Tab and the other is a manual mode which requires the use of the Motocross terminal emulator that is included with the software.

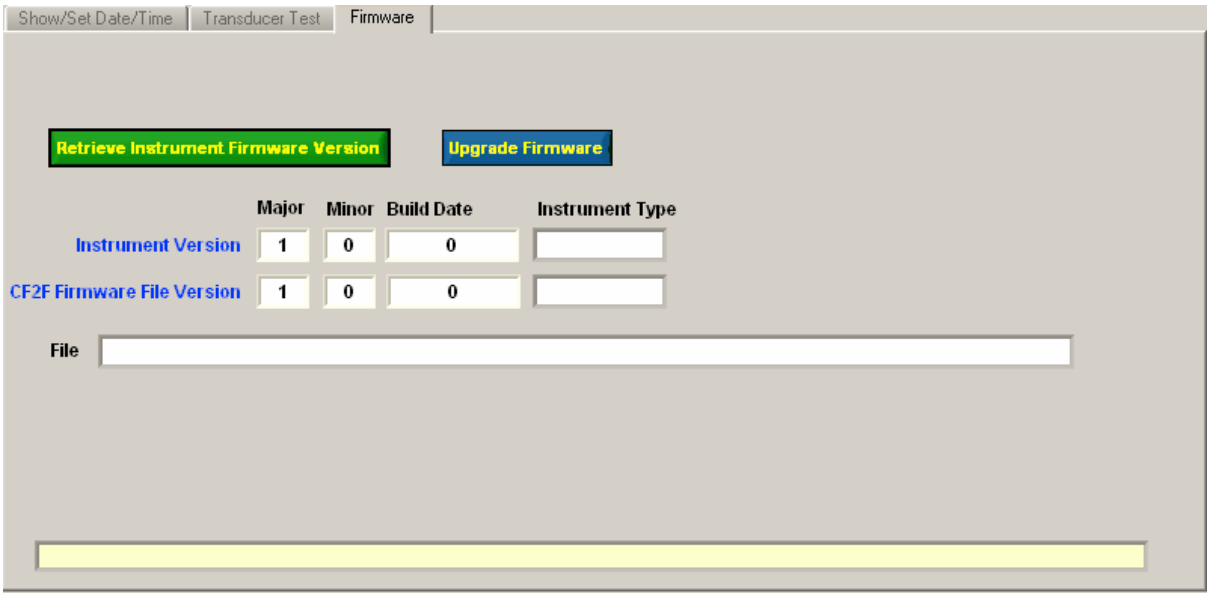
Before upgrading your firmware the following step is recommended to make sure the unit or the computer will not be interrupted by the loss of power during the upgrade procedure.

Make sure that the PC to unit communications is good by performing file transfers and programming with the PC you are going to do the upgrade with. Do not run other software when performing an upgrade. Performance issues have been found with some USB-RS232 adapters which make them unsuitable for upgrading units.

The Firmware Tab interface functions can be performed manually as described in section on Upgrading Firmware Manually.

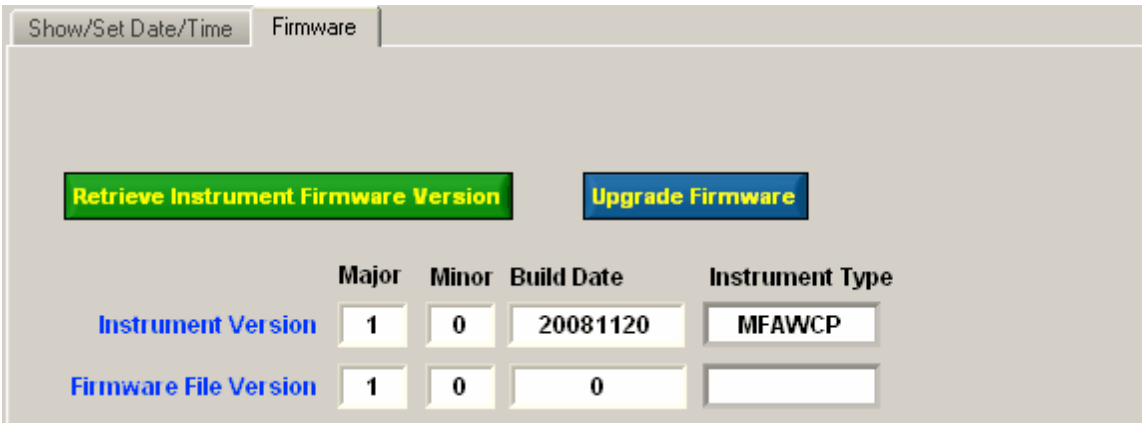
6.1 Firmware Tab

The Firmware tab is used to perform firmware upgrades.



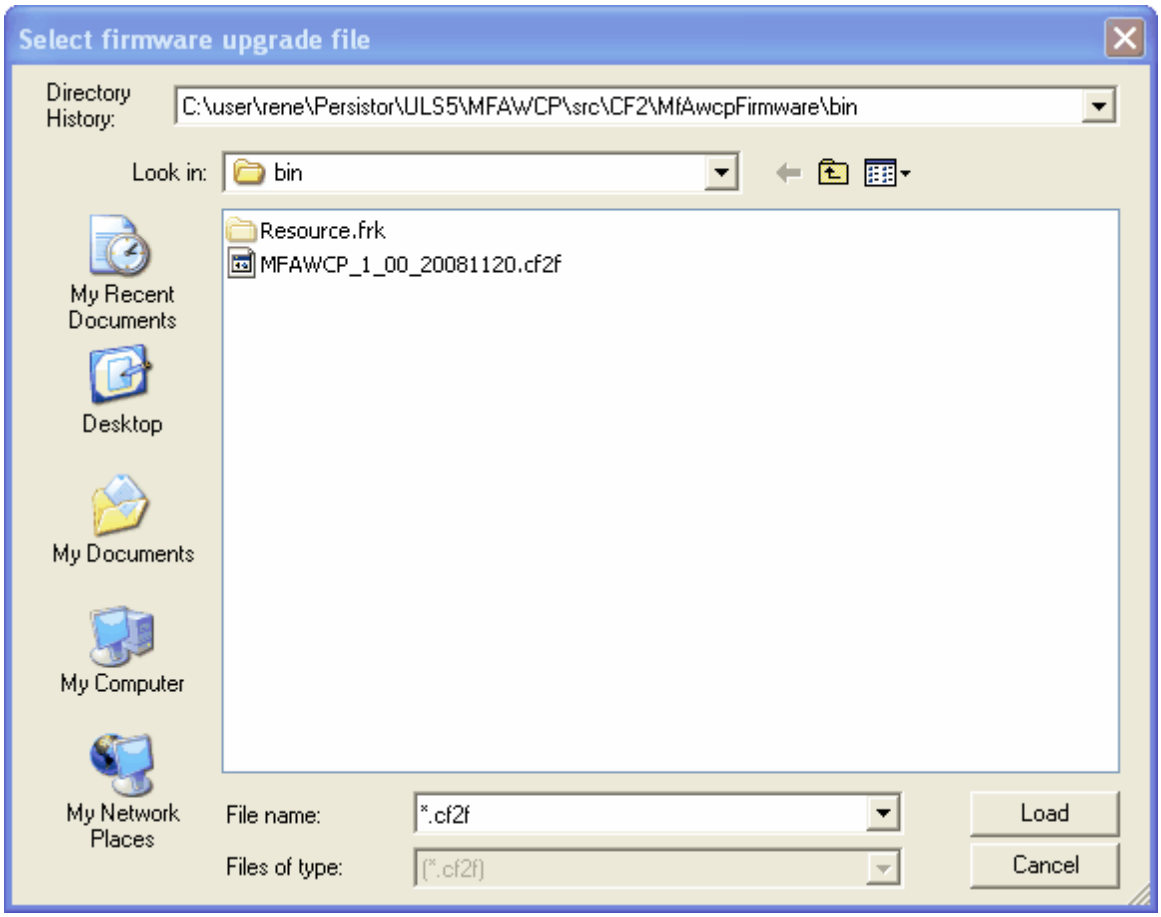
6.1.1 Retrieve Instrument Firmware Version

Clicking on  command button cause the program to send a request to the instrument for its firmware version.



6.1.2 Upgrade the MFAWCP Firmware

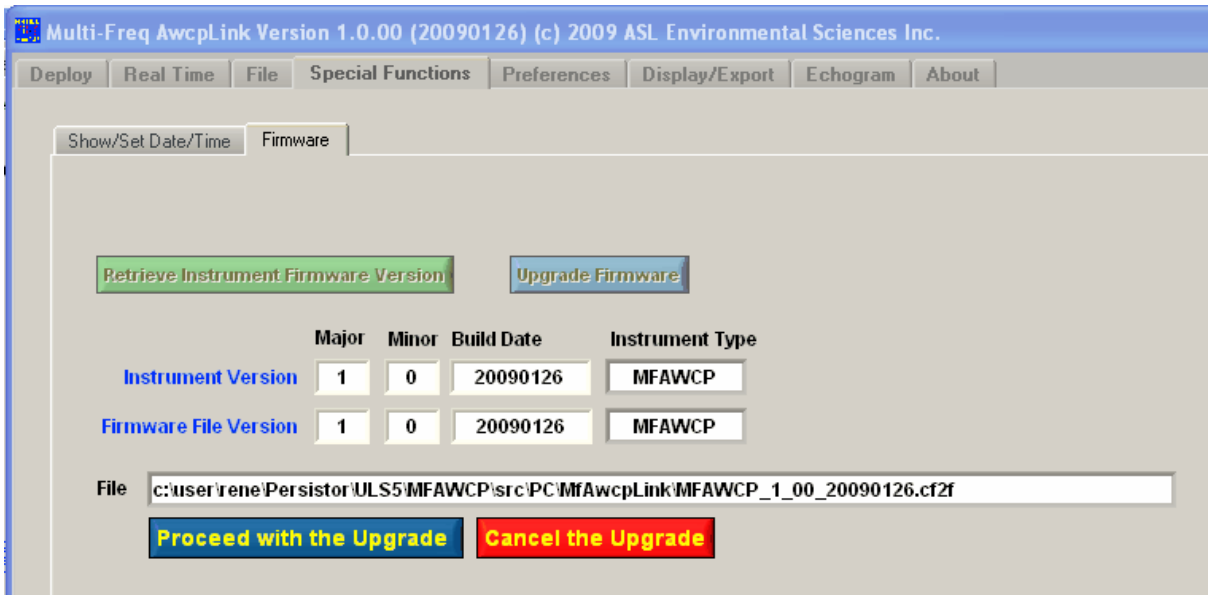
Clicking on the  command button opens a file selection box for the user to select a (*.cf2f) firmware file.



Select a cf2f file to upgrade the unit with.

Files are always named IPS5_x_zz_yyyymmdd.cf2f where:

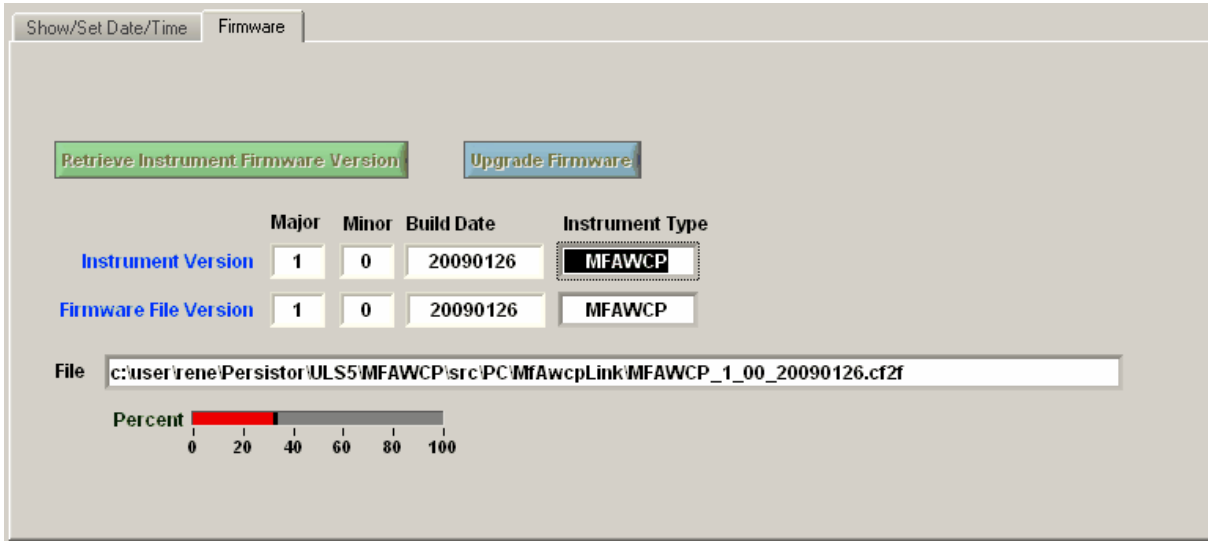
x - Firmware's major version number
zz - Firmware's minor version number
yyyy - Firmware's year
mm - Firmware's month
dd - Firmware's day



Note the firmware version of the file is now listed and there is the addition of **Proceed with the Upgrade** and **Cancel the Upgrade** command buttons.

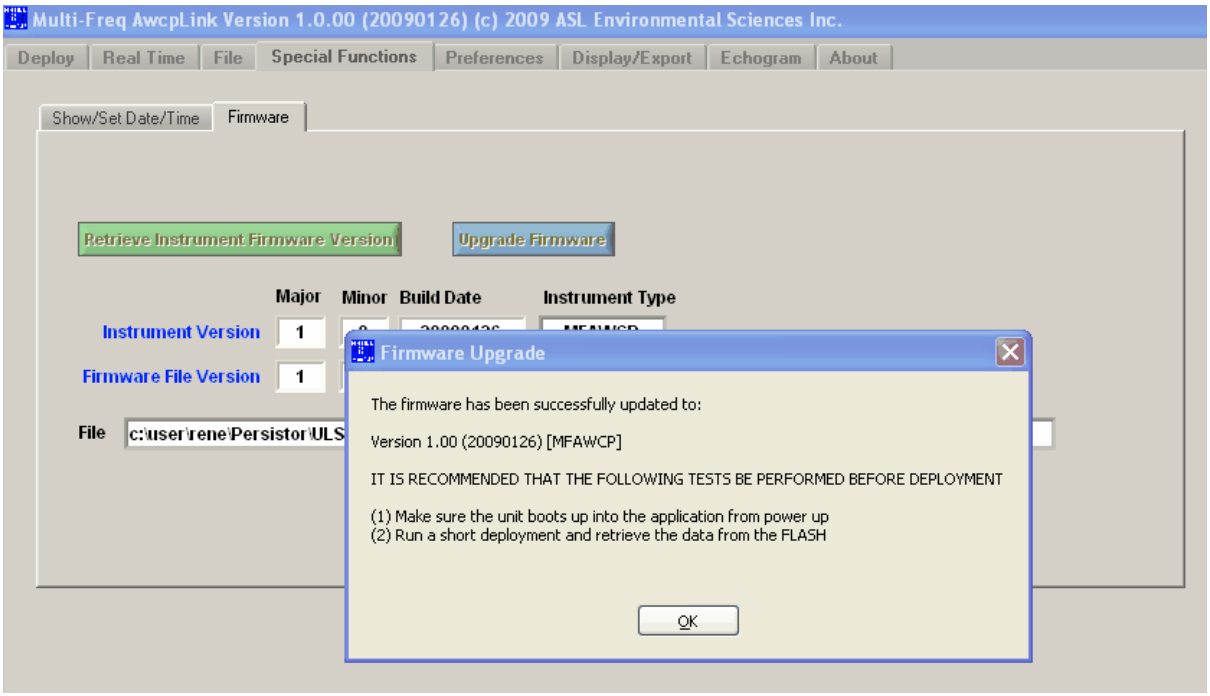
To cancel the upgrade click on the **Cancel the Upgrade** command buttons.

To continue click on the **Proceed with the Upgrade** command button.



A percentage done bar is displayed as the firmware is downloaded to the unit.

Below is an example of a successful upgrade.

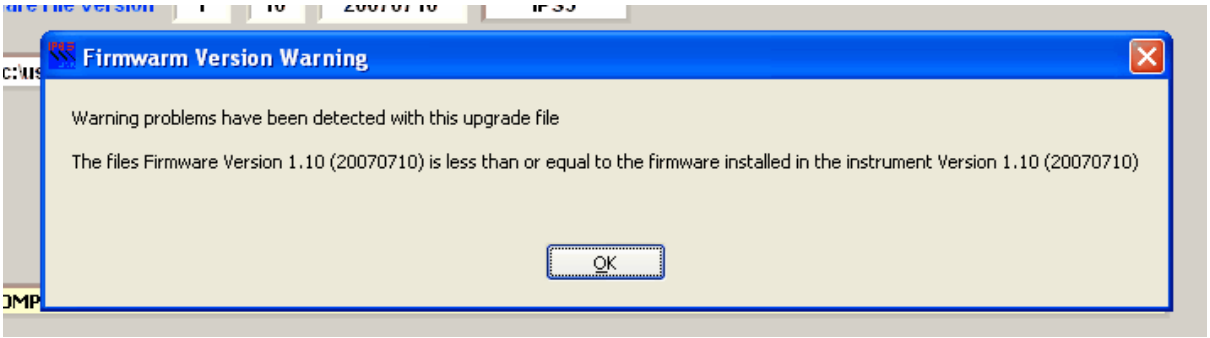


6.1.3 Firmware Upgrade Trouble Shooting

This section is used to trouble shoot potential problems that can occur.

6.1.3.1 Firmware Version Warning

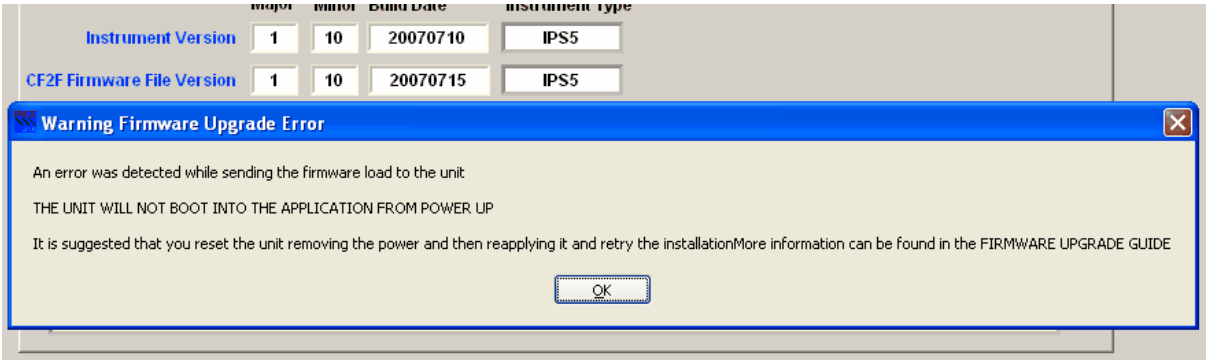
A firmware version warning is caused by trying to upgrade a unit with an older version of the firmware. This is only a warning and the software will let you do so.



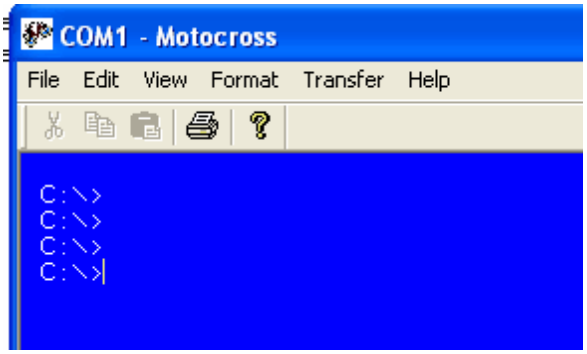
6.1.3.2 Firmware Upgrade Warning Aborted Upgrade

The following message will be caused if there is a communication error or the unit is rebooted during the download of the unit.

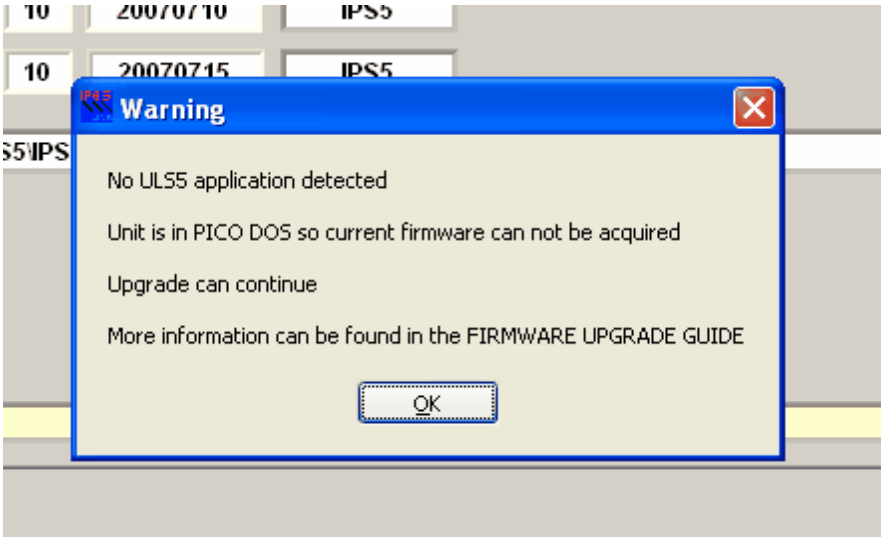
In this case the unit will not boot into the firmware as it is left in a state that boots it into its native Operating System PicoDOS.



Click on the OK button. Enter the terminal mode from the main tab by clicking on the Terminal Emulator command button.
Press the return key to confirm that you get a C:\> prompt. If it doesn't appear then reset the unit by removing and then reapplying the power.

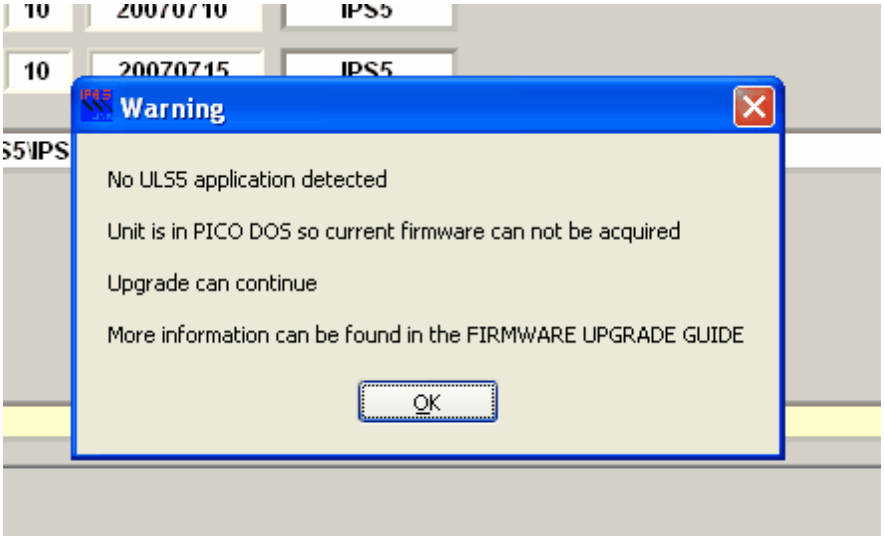


At this stage you can return to the Firmware Tab and retry the upgrade. NOTE: When you start the upgrade while the unit is in PicoDOS you will get a message that the upgrade procedure cannot confirm the units current firmware version.



6.1.3.3 Firmware Upgrade Warning Unit In PicoDOS

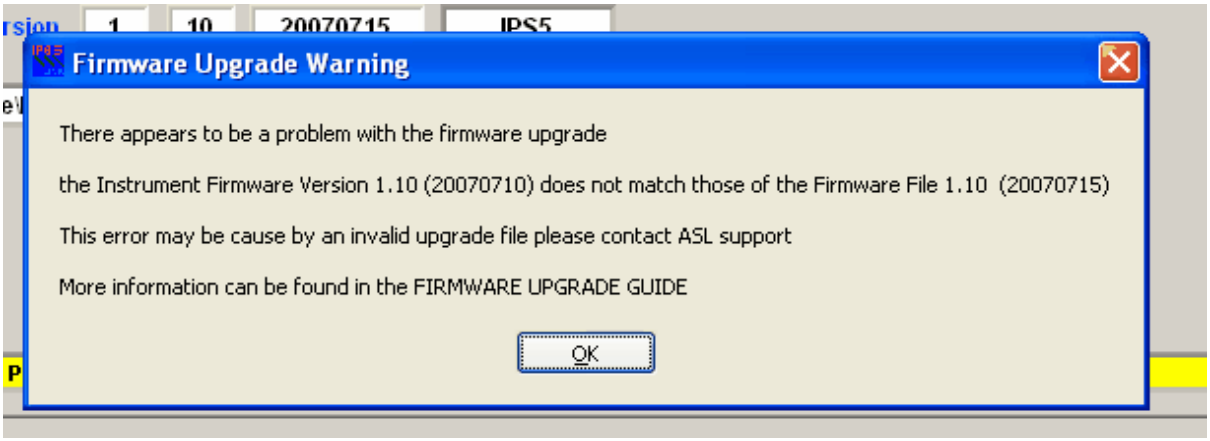
This warning appears if the unit for some reason such as a retry of the upgrade is in its native Operating System PicoDOS
When you start the upgrade while the unit is in PicoDOS you will get a message that the upgrade procedure cannot confirm the units current firmware version.



Click on the Ok button to continue and the file select option for the firmware file will appear and you can continue with the firmware upgrade.

6.1.3.4 Firmware Upgrade Warning Version Does Not Match

After the upgrade the software checks the firmware version of the unit against the firmware version of the firmware upgrade file. If it does not match then firmware upgrade file was not created correctly. Please contact ASL if you see this error.

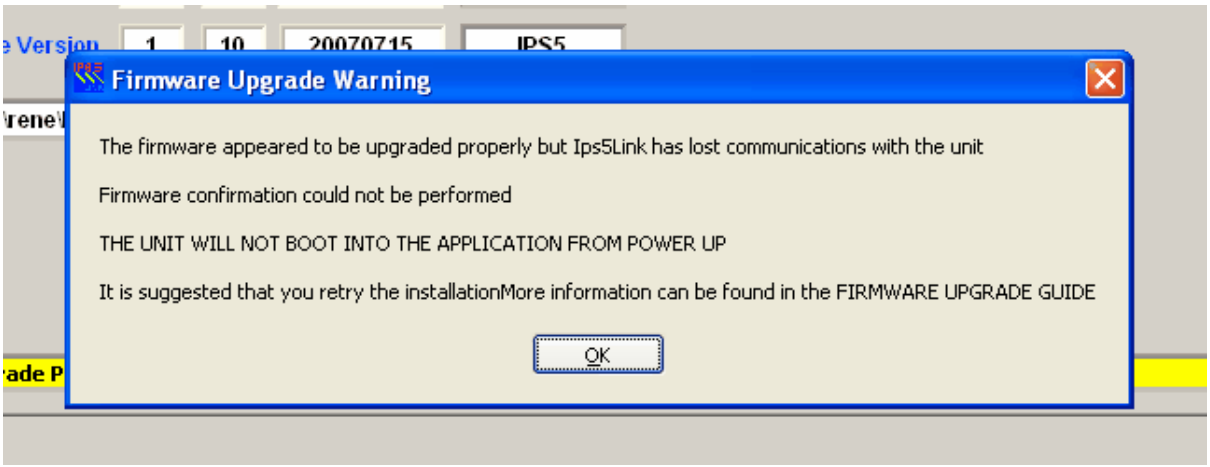


If the error does occur the unit will boot into the firmware from power up.

6.1.3.5 Firmware Upgrade Warning Lost Communications

If the warning shown below shows up then the upgrade procedure lost communications with the unit after it was booted into the application or the upgrade procedure could not detect the return to PicoDOS to set the unit to boot into the application from power up.

In either case it is possible the firmware was downloaded correctly but since the version could not be confirmed the unit will boot into PicoDOS on power up which is not desirable for any deployment.



7 Deployment Steps

7.1 Clear the FLASH Memory

Clear the CF if the space will be required for the deployment and/or the data has been recovered. The best way to clear all data is found in the Formatting the CF section.

7.2 Confirm Date/Time Clock

Confirm that the units date and time is correct see Special Functions section.

7.3 Confirm your parameters

Make sure you have the correct deployment parameters.

7.4 Inserting a New Compact FLASH card

If you are inserting a new CF card it is recommended that it be FORMATTED using MfAwcpLink.

Power down the unit.

Remove the old CF.

Insert the CF making sure it is properly seated.

Power the unit up.

End the deployment as the unit usually start up in DEPLOYED mode.

Format the CF using the instruction found in the Formatting the CF section.

It is recommended that you start a deployment and then stop it to make sure the unit wrote to the CF with no problem. Then either format the CF or delete the files.

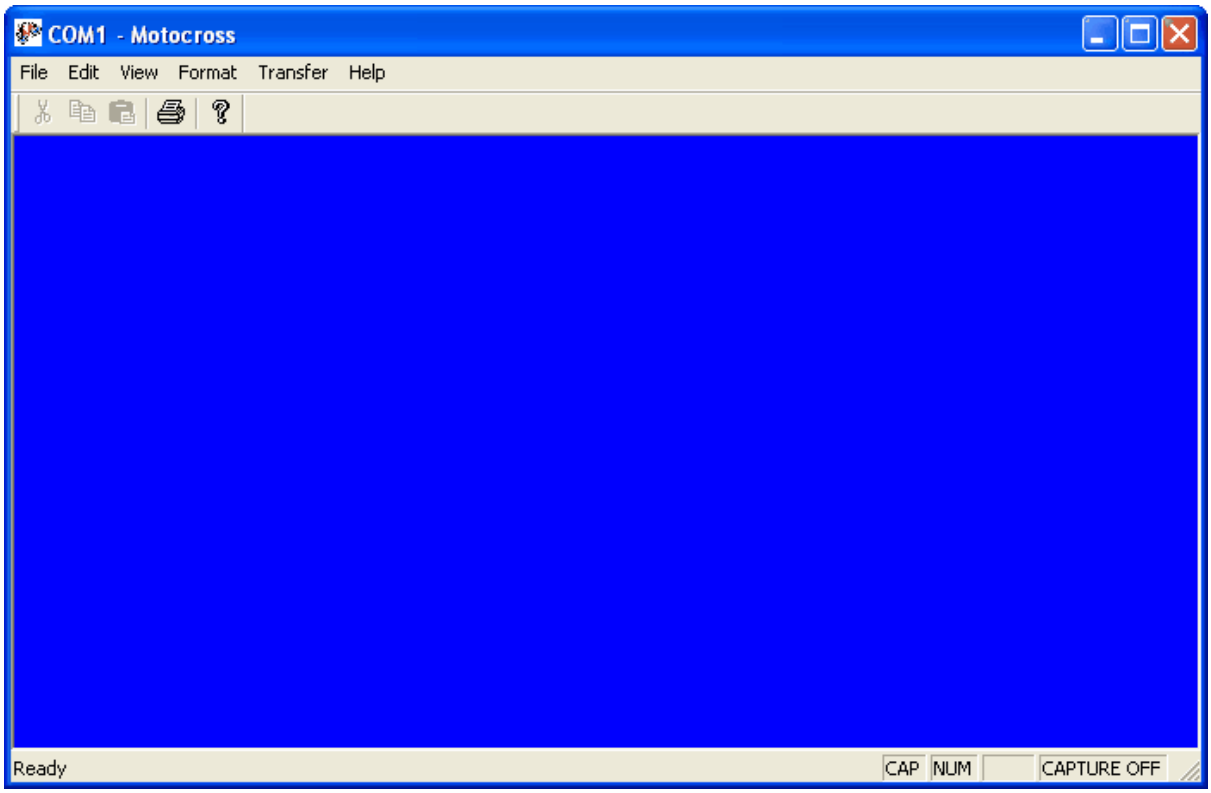
7.5 Confirming that a unit is running

7.5.1 Units connected to a cable without RS232 output

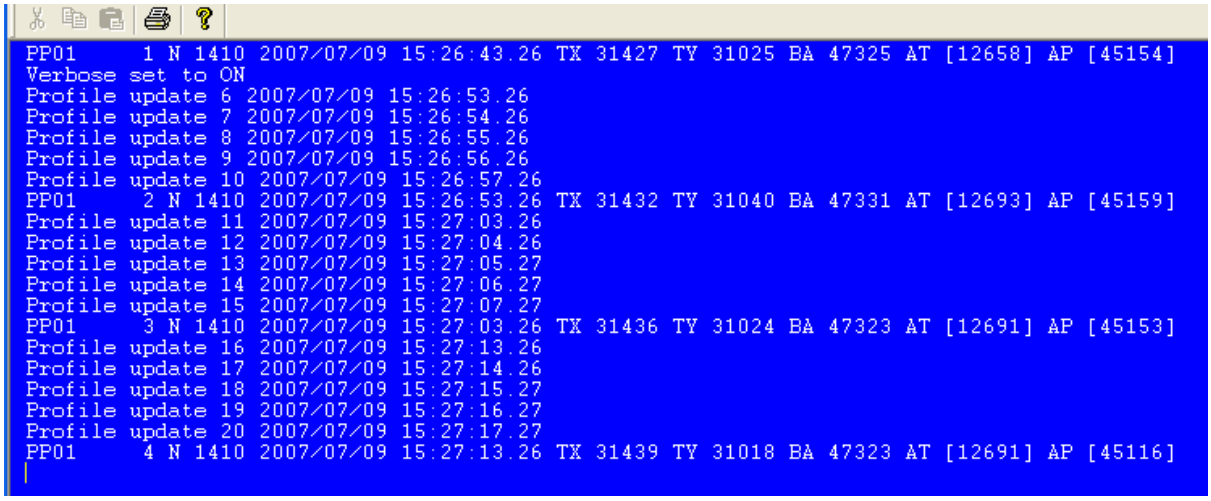
For units that are connected to a shore cable and not set to send RS232 data to the surface. A quick test can be performed to confirm operation after the deployment.

Enter terminal mode by clicking on the 

button to go into terminal mode.



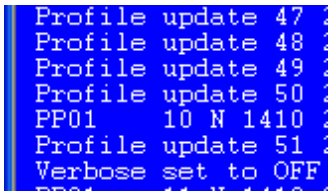
Press the 'v' key (lower case v) continuously until you see the message "Verbose set to ON"



Note that lines that appear. PP01 means the profile is for Phase 1 followed by the ping number etc.

** Do not leave the unit in this mode as it uses more battery power.

Press the 'V' key (upper case V) continuously until you see "Verbose set to OFF".



8 Data Retrieval

If you have filled a CF card with data it is not recommended to retrieve the data using the RS232 serial port connection as this will take many hours depending on the volume of data. The best option is to remove the CF and retrieve the data using a generally available CF reader. These readers are generally sold with the option to read many types of CF cards.

** Be sure to end the deployment and then power the unit down before removing the CF

The data retrieval using the serial port is documented in the File Tab section. This option is useful if there is just a small amount of data or the user just wants to retrieve a small subset of data.

9 Data Formats

The section describes output formats.

9.1 Real Time Profile Output Format

9.1.1 Packet Types

Profile Data sent over the RS232 is in two packet formats. These packets are a byte stream as described in the following two sections.

There are Packet Type 2 and Packet Type 3.

Any binary data in the payloads is in “Big-Endian” (Motorola) format byte order and needs to be converted to Intel PC’s which are little-Endian (Intel).

The packets are basically identical except that Packet Type 3 as a byte counter for the payload data that allows more than 65535 bytes to be sent out in one packet transmission. This is used for profiles that have a large bin counts and have the Sum of Squares data for averaged range and ping bins. The packet headers are in ASCII so there is no Endian conversion required (see below) for the packet information.

9.1.1.1 Packet Format Type 2

Field	Length	Type	Value	Value	Format	Comment
1	1	ASCII	\n	ASCII line	char	ASCII value 13

				feed		
2	1	ASCII	$	ASCII '$'	char	Packet header
3	1	ASCII	2	ASCII '2'	char	Packet header
4	4	ASCII	XXXX	packet counter	HEX 4 bytes	Unique packet counter in hex format
5	4	ASCII	XXXX	data type	HEX 4 bytes	The type of data in the payload
6	4	ASCII	XXXX	num bytes (N)	HEX 4 bytes	The number of bytes in the payload (N)
7	5	ASCII	BHEAD	ASCII "BHEAD"	5 characters	The character string "BHEAD"
8	1	ASCII	\r	ASCII carriage return	char	ASCII Value 25
9	N	binary		packet payload	char	Character buffer containing data structures
10	1	ASCII	$	ASCII '$'	char	Packet tail
11	1	ASCII	8	ASCII '8'	char	Packet tail
12	4	ASCII	XXXX	packet counter	HEX 4 bytes	Unique packet counter in hex format should be same as field 3
13	4	ASCII	XXXX	checksum	HEX 4 bytes	checksum of payload where checksum is the sum of the payload characters into unsigned short int
14	5	ASCII	BTAIL	ASCII "BTAIL"	5 characters	The character string "BTAIL"
15	1	ASCII	\n	ASCII line feed	char	ASCII value 13

9.1.1.2 Packet Format Type 3

Field	Length	Type	Value	Value	Format	Comment
1	1	ASCII	\n	ASCII line feed	char	ASCII value 13
2	1	ASCII	$	Character '$'	char	Packet header
3	1	ASCII	3	character '3	char	Packet header
4	4	ASCII	XXXX	packet counter	HEX 4 bytes	Unique packet counter in hex format
5	4	ASCII	XXXX	data type	HEX 4 bytes	The type of data in the payload
6	8	ASCII	XXXX XXXX	num bytes (N)	HEX 8 bytes	The number of bytes in the payload (N)
7	5	ASCII	BHEAD	ASCII "BHEAD"	5 characters	The character string "BHEAD"
8	1	ASCII	\r	ASCII carriage	char	ASCII Value 25

				return		
9	N	binary		packet payload	char	Character buffer containing data structures
10	1	ASCII	$	ASCII '$'	char	Packet tail
11	1	ASCII	8	ASCII '8'	char	Packet tail
12	4	ASCII	XXXX	packet counter	HEX 4 bytes	Unique packet counter in hex format should be same as field 3
13	4	ASCII	XXXX	checksum	HEX 4 bytes	checksum of payload where checksum is the sum of the payload characters into unsigned short int
14	5	ASCII	BTAIL	ASCII "BTAIL"	5 characters	The character string "BTAIL"
15	1	ASCII	\n	ASCII line feed	char	ASCII value 13

9.1.2 Data Type

Below is a table showing the data types.

Data Type Number	Description
0xBBAA	Profile Data
0xADDE	Message Packet

9.1.2.1 Profile Data

The profile byte stream is described below.

All data is in binary Big-Endian format				
Field	**Bytes**	**Name**	**Units**	**Comment**
1	2	Profile Number	n	Profile number
2	2	Instrument Serial Number		The instrument serial number
3	2	Profile Status	n	status
4	4	Profile Interval	n	seconds
5	2	Year	20YY	year
6	2	Month	1-12	month
7	2	Day	1-31	day
8	2	Hour	0-23	hour
9	2	Minute	0-59	minute
10	2	Second	0-59	seconds
11	2	Hundreds	0-99	hundreds of seconds
12	2	Digitization Rate	samples /sec	64000, 40000 or 20000
13	2	Lockout Index	N	The sample number samples skipped at the start of the profiling
14	2	Bins	N	number of bins
15	2	Range Samples per	N	range samples per bin

		Bin		
16	2	Ping Per Profile	N	number of pings per profile
17	2	Num Acquired Pings	N	should be the same as field 16
18	2	Ping Period	Seconds	Ping Period in seconds
19	2	First Ping		number of the first averaged ping
20	2	Last Ping		number of the last averaged ping
21	2	Sum of squares flag		1 = sum of squares computed and stored for computation of standard deviation
22	2	Data Error		Error number if an error occurred
23	1	Phase		Phase used to acquire this profile
24	1	Over run		1 if an over run occurred
25	1	Number of channels		1,2,3 or 4
26	1	Gain chan 1		gain 0, 1, 2, 3
27	1	Gain chan 2		gain 0, 1, 2, 3
28	1	Gain chan 3		gain 0, 1, 2, 3
29	1	Gain chan 4		gain 0, 1, 2, 3
30	1	Spare		spare
31	2	Pulse Length chan 1	uS	The pulse length for chan 1
32	2	Pulse Length chan 2	uS	The pulse length for chan 2
33	2	Pulse Length chan 3	uS	The pulse length for chan 3
34	2	Pulse Length chan 4	uS	The pulse length for chan 4
35	2	Board number for chan 1		The board the data came from for channel 1
36	2	Board number for chan 2		The board the data came from for channel 2
37	2	Board number for chan 3		The board the data came from for channel 3
38	2	Board number for chan 4		The board the data came from for channel 4
39	2	Board Frequency chan 1	Hz	The frequency for the channel 1
40	2	Board Frequency chan 2	Hz	The frequency for the channel 2
41	2	Board Frequency chan 3	Hz	The frequency for the channel 3
42	2	Board Frequency chan 4	Hz	The frequency for the channel 4
43	2	Tilt x	Counts	counts
44	2	Tilt y	Counts	counts
45	2	Battery	Counts	counts

46	2	Pressure	Counts	counts
47	2	Temperature	Counts	counts
48	2	AD channel 6	Counts	AD channel 6
49	2	AD channel 7	Counts	AD channel 7
50	Bins * 2	Data chan 1	Counts	Digitized 16 bit data
51	Bins * 4	Sum of Squares chan 1	Counts	Sum of Squares for each bin *** only there if field 21 is equal to 1
52	Bins * 2	Sum of Squares overflows ch1	Counts	Sum of Squares over flow for each bin *** only there if field 21 is equal to 1
53	Bins * 2	Data chan 2	Counts	Digitized 16 bit data (if available)
54	Bins * 4	Sum of Squares chan 2	Counts	Sum of Squares for each bin *** only there if field 21 is equal to 1
55	Bins * 2	Sum of Squares overflows ch2	Counts	Sum of Squares over flow for each bin *** only there if field 21 is equal to 1
56	Bins * 2	Data chan 3	Counts	Digitized 16 bit data (if available)
57	Bins * 4	Sum of Squares chan 3	Counts	Sum of Squares for each bin *** only there if field 21 is equal to 1
58	Bins * 2	Sum of Squares overflows ch3	Counts	Sum of Squares over flow for each bin *** only there if field 21 is equal to 1
59	Bins * 2	Data chan 4	Counts	Digitized 16 bit data (if available)
60	Bins * 4	Sum of Squares chan 4	Counts	Sum of Squares for each bin *** only there if field 21 is equal to 1
61	Bins * 2	Sum of Squares overflows ch4	Counts	Sum of Squares over flow for each bin *** only there if field 21 is equal to 1

9.1.2.2 Message Data

This section describes the message format from the unit.

Field	Bytes	Format	Name	Comment
1	2	binary	Number	Message Number
2	2	binary	value	Message Value
3	100	ASCII Null Terminated	message	Message text

9.1.3 Big Endian and Little Endian Formats

Binary data that is retrieved from the units are in Big Endian or Motorola format.

Below is a 'C' routine that is use for converting the binary data.

```
#ifndef _SWAPENDIAN_H
#define _SWAPENDIAN_H

// Macs and SGIs are Big-Endian; PCs are little endian
// returns TRUE if current machine is little endian
extern int IsLittleEndian(void);
```

```
/*****************************************************************************
  FUNCTION: SwapEndian
  PURPOSE: Swap the byte order of a structure
  EXAMPLE: float F=123.456;; SWAP_FLOAT(F);
*****************************************************************************/

#define SWAP_SHORT(Var)  Var = *(short*)         SwapEndian((void*)&Var, sizeof
(short))
#define SWAP_USHORT(Var) Var = *(unsigned short*)SwapEndian((void*)&Var, sizeof
(short))
#define SWAP_LONG(Var)   Var = *(long*)          SwapEndian((void*)&Var, sizeof(long))
#define SWAP_ULONG(Var)  Var = *(unsigned long*) SwapEndian((void*)&Var, sizeof(long))
#define SWAP_RGB(Var)    Var = *(int*)           SwapEndian((void*)&Var, 3)
#define SWAP_FLOAT(Var)  Var = *(float*)         SwapEndian((void*)&Var, sizeof
(float))
#define SWAP_DOUBLE(Var) Var = *(double*)        SwapEndian((void*)&Var, sizeof
(double))

extern void *SwapEndian(void* Addr, const int Nb);

#endif
static long _TestEndian=1;

int IsLittleEndian(void) {
       return *(char*)&_TestEndian;
}

/*****************************************************************************
  FUNCTION: SwapEndian
  PURPOSE: Swap the byte order of a structure
  EXAMPLE: float F=123.456;; SWAP_FLOAT(F);
*****************************************************************************/

void *SwapEndian(void* Addr, const int Nb) {
       static char Swapped[16];
       switch (Nb) {
              case 2:       Swapped[0]=*((char*)Addr+1);
                            Swapped[1]=*((char*)Addr  );
                            break;
              case 3:       // As far as I know, 3 is used only with RGB images
                            Swapped[0]=*((char*)Addr+2);
                            Swapped[1]=*((char*)Addr+1);
                            Swapped[2]=*((char*)Addr  );
                            break;
              case 4:       Swapped[0]=*((char*)Addr+3);
                            Swapped[1]=*((char*)Addr+2);
                            Swapped[2]=*((char*)Addr+1);
                            Swapped[3]=*((char*)Addr  );
                            break;
              case 8:       Swapped[0]=*((char*)Addr+7);
                            Swapped[1]=*((char*)Addr+6);
                            Swapped[2]=*((char*)Addr+5);
                            Swapped[3]=*((char*)Addr+4);
                            Swapped[4]=*((char*)Addr+3);
```

```
                        Swapped[5]=*((char*)Addr+2);
                        Swapped[6]=*((char*)Addr+1);
                        Swapped[7]=*((char*)Addr  );
                        break;
                case 16:Swapped[0]=*((char*)Addr+15);
                        Swapped[1]=*((char*)Addr+14);
                        Swapped[2]=*((char*)Addr+13);
                        Swapped[3]=*((char*)Addr+12);
                        Swapped[4]=*((char*)Addr+11);
                        Swapped[5]=*((char*)Addr+10);
                        Swapped[6]=*((char*)Addr+9);
                        Swapped[7]=*((char*)Addr+8);
                        Swapped[8]=*((char*)Addr+7);
                        Swapped[9]=*((char*)Addr+6);
                        Swapped[10]=*((char*)Addr+5);
                        Swapped[11]=*((char*)Addr+4);
                        Swapped[12]=*((char*)Addr+3);
                        Swapped[13]=*((char*)Addr+2);
                        Swapped[14]=*((char*)Addr+1);
                        Swapped[15]=*((char*)Addr  );
                        break;
        }
        return (void*)Swapped;
}
```

9.2 Exported Data File

The format of the exported files is described in section Export Profiles.

9.3 FLASH Data Format

Data on the CF is stored in binary “Big-Endian” (Motorola) format.

The data files consists of a profile flag followed by the profile.

Note that the FLAG is also in “Big-Endian” (Motorola) format.

FLAG binary 0xFB00
Profile
FLAG binary 0xFB00
Profile
... etc.

The profiles are in the same format as described in section Profile Data but are stored in the Intel Format.

9.4 Real Time Data Files

This section describes the format of the profiles as they are stored by MfAwcpLink when they are received.

The data is stored in "little-Endian" (Intel) binary format.

The data files consists of a profile flag followed by the profile.

FLAG binary 0xFA00
Profile
FLAG binary 0xFA00
Profile
... etc.

The profiles are in the same format as described in section Profile Data but are stored in the Intel Format.

10 Command Line Commands

The Multi-Freq AWCP firmware contains some commands to enable third party programming of the unit for real time applications. Only one phase is allowed for this type of operation.

Command line commands can be entered via the terminal emulator that comes with the MfAwcpLink or any other terminal emulator.

Entering a '?' (question mark without the quotes) gets the following listing of the commands.

```
-------------------------------------------------------------------------------------------------
Commands are composed of one or more characters followed by one or more
parameters on one line. Commands and parameters are separated by blanks.
Command or parameter letters enclosed with braces {} are optional.
Parameters enclosed with square braces [] are mandatory.
All addresses and values are expressed in base 16, Counts are in base 10.
COMMAND  PARAMETER(S)        DESCRIPTION
&G                           Deploy unit. then send ACK
&F                           Full duplex
&H                           Half duplex
&Pico                        Jump to PICO DOS
&Reset                       BIOS Reset
&V                           Show firmware version
dn                           Dump system variables and parameters single column
di                           Display directory on FLASH
ds                           Dump system variables only single column
dp                           Dump system parameters only single column
ee       [parameter]         Erase VEE parameter from VEEPROM memory         (CAUTION !!!)
es                           Show all VEE parameters                         (CAUTION !!!)
er                           Read system parameters from VEEPROM and show    (CAUTION !!!)
ed       [ERASE]             Erase all parameters in the VEEPROM except SYS. (CAUTION !!!)
ea       [NOAUTO, AUTO]      Enable or disable no auto deploy
```

```
#P1                          Show phase 1
#P1C  [y m d hr min sec]     Set  the real time clock date and time
#P1Dx                        Set  phase 1 digrate where x=0,1,2 0=64000 1=40000 2=20000
#P1Ex                        Set  phase 1 store standard deviations x=1=true x=0=false
#P1FxGy                      Set  phase 1 gain, x=freq(1,2,3,or 4), y=gain(1,2,3 or 4)
#P1FxP  {pulse_len}          Set  phase 1 gain, x=freq(1,2,3,or 4)
#P1Ox                        Set  phase 1 x=R (RS232 only) x=F (FLASH & RS232)
#P1PP   {ping_period}        Set  phase 1 ping period
#P1PI   {profile_interval}   Set  phase 1 profile interval
#P1PN   {ping_per_profile}   Set  phase 1 pings per profile
#P1PP   {ping_period}        Set  phase 1 ping period
#P1RA   {range_averaging}    Set  phase 1 range averaging
#P1RL   {range_lockout}      Set  phase 1 range lockout
#P1RS   {range_samples}      Set  phase 1 range samples
#P1S                         Sent unit to one phase, start date now, RS232 output, long duration
#P1U    [ASL]                Save parameters to VEEPROM ASL command line parameter required
#PI                          Initialize phase parameters (resets clock 1 second timer)
#PG                          Acquire and transmit one profile
```

10.1 Limitation of Command Line Operation

The command line operations only allows the programming of a single phase configuration.
These commands are intended for third party software for programming the unit for real time data acquisition.

Note that changed parameters using the # commands are not permanent until the #P1U command is used to store the parameters to the units non volatile memory (VEEPROM).

The main commands to use for operating the unit are:

&G and the #P1 commands.

10.2 Terminating a Data Acquisition

Once a data acquisition is started the unit goes into a low power mode. It is woken up on the second by a real time clock trigger. When it wakes it either acquires data or goes right back to sleep. Before going to sleep the unit checks to see if it should end data acquisition by looking for the character 's' on the RS232 port.

In the low power state and during data acquisition the serial port is shut down. This offers a very small window for the unit to see any 's' characters transmitted by the PC software so many 's' characters in sequence must be transmitted to accomplish the wake up.

To terminate a deployment and set the unit to standby mode enter a consecutive set of 's' characters.

Example:

ssssssss
Standby Mode

$20000aaaa003cBHEAD

Œv$80000077aBTAIL

NOTE: The unit will redeploy automatically after one hour unless the NO AUTO DEPLOY (EA command) has been enabled.

10.3 Deploy (&G)

Deploy the unit using the current parameters and then send an acknowledge message packet.

10.4 Full Duplex (&F)

Set unit to full duplex so characters entered are echoed.

Note the unit should normally be run in Half Duplex.

10.5 Half Duplex (&H)

Set unit to half duplex so characters entered are echoed.

Note the unit should normally be run in Half Duplex unless being manually controlled.

10.6 Enter PICO DOS (&pico)

Exit the application and enter the underlying Operation System PICO DOS.

Use with caution. Used for maintenance such as reformatting the FLASH.

To return to the applications type in 'APP'.

10.7 RESET UNIT (&reset)

Reset the unit.

The unit resets and boots into the application.

10.8 Print Version Information (&V)

Send the firmware Version.

Example:

&V

MFAWCP Version 1.00 (20090109)
Persistor CF2 SN:6503 BIOS:4.2 PicoDOS:4.2

10.9 Dump System and Parameter Variables (dn)

Dump all system variables and parameters including phases and coefficient values.

Example:

```
DN
Parameters - 2009 01 09 14:08:14.78
*Serial Number..... 55027
*CPU ..... 6503
*Parameter Version..... 1
*Configuration Version. 1
*Parameters Saved ..... YES
*Configuration Saved .. YES
*Duplex..... HALF
*Mode ..... STANDBY
*Valid Config..... YES
*CPU Speed ..... 14720
Number of boards... 2
Board 0 BoardFreq. 125
Board 1 BoardFreq. 200
SoundSpeed .... 1420.00
Output ..... RS232
ACQ Start Date .... 2009  1  9 13 17 21
NumPhases ..... 1
P01 Start Date .... 2008 12  9 10 46 18
P01 Duration(days). 41.6250
P01 Phase Type..... Normal
P01 PingPeriod ..... 1
P01 DigRate (hz).... 20000
P01 ProfileInterval. 9
P01 PingsPerProfile. 1
P01 RangeSamples.... 1991
P01 LockOutIndex.... 1
P01 RangeAvgSamples. 5
P01 StoreSTD..... 0
P01 F1 BoardFrequency.. 125
P01 F1 acquire..... 0
P01 F1 Gain..... 1
P01 F1 PulseLen ..... 150
P01 F2 BoardFrequency.. 200
P01 F2 acquire..... 1
P01 F2 Gain..... 1
P01 F2 PulseLen ..... 150
Coef Serial Number. 55027
Eclock (sec)..... 2.5000516e-07
Paros Installed ... NO
Gain Installed .... YES
```

```
Eclock Freq (hz) .. 3999917.51
RTC Period (sec)... 1.9531070e-03
RTC Frequency (hz). 512.004720
RTC PpmOffset (hz). 9.22
RTC Calibration.... -5
AG  X_a ..... -4.5346364e+01
AG  X_b ..... 1.2849060e-03
AG  X_c ..... 0.0000000e+00
AG  X_d ..... 0.0000000e+00
AG  Y_a ..... -4.2824037e+01
AG  Y_b ..... 1.2345080e-03
AG  Y_c ..... 0.0000000e+00
AG  Y_d ..... 0.0000000e+00
ANALOG Press m .... 4.3092200e+01
ANALOG Press b .... -1.7236900e+01
ANALOG Temp ka .... 5.1059848e+02
ANALOG Temp kb .... 3.0000000e+03
ANALOG Temp kc .... 1.8778043e+00
ANALOG Temp A ..... 1.4660000e-03
ANALOG Temp B ..... 2.3880900e-04
ANALOG Temp C ..... 1.0033500e-07
CurPhase ..... 0
CurPingModulus .... 0
CurPulseLen ..... 1
CurDigRate ..... 0
CurSamplesPerPing . 0
CurBins ..... 0
CurRngSmplPerBin .. 0
CurPhaLockOutIndex. 0
```

10.10 Display Stored File Names (di)

This command displays the files stored on the FLASH disk under the root directory \DATA.

```
Dir c:\DATA
C:\DATA\200901 <DIR>                    2009/01/07 08:29 AM
c:\DATA\200901\20090107.LOG          4048 2009/01/07 05:35 PM
c:\DATA\200901\09010708.001        419832 2009/01/07 08:30 AM
c:\DATA\200901\09010708.DPL          2114 2009/01/07 08:30 AM
c:\DATA\200901\09010708.XML          6122 2009/01/07 08:30 AM
c:\DATA\200901\09010716.DPL          5289 2009/01/07 04:59 PM
c:\DATA\200901\09010716.XML          6123 2009/01/07 04:59 PM
c:\DATA\200901\09010716.001       1620864 2009/01/07 04:59 PM
c:\DATA\200901\09010717.001      46234672 2009/01/07 06:00 PM
c:\DATA\200901\09010717.DPL          8513 2009/01/07 05:26 PM
c:\DATA\200901\09010717.XML          6123 2009/01/07 05:26 PM
c:\DATA\200901\09010718.001      72172800 2009/01/07 07:00 PM
c:\DATA\200901\09010719.001      72172800 2009/01/07 08:00 PM
c:\DATA\200901\09010720.001      72172800 2009/01/07 09:00 PM
c:\DATA\200901\09010721.001      72172800 2009/01/07 10:00 PM
c:\DATA\200901\09010722.001      72172800 2009/01/07 11:00 PM
c:\DATA\200901\09010723.001      72172800 2009/01/08 00:00 AM
c:\DATA\200901\09010800.001      72172800 2009/01/08 01:00 AM
c:\DATA\200901\09010801.001      72172800 2009/01/08 02:00 AM
c:\DATA\200901\09010802.001      72172800 2009/01/08 03:00 AM
c:\DATA\200901\09010803.001      72172800 2009/01/08 04:00 AM
```

```
c:\DATA\200901\09010804.001      72172800 2009/01/08 05:00 AM
c:\DATA\200901\09010805.001      72172800 2009/01/08 06:00 AM
c:\DATA\200901\09010806.001      72172800 2009/01/08 07:00 AM
c:\DATA\200901\09010807.001      30914016 2009/01/08 07:25 AM
c:\DATA\200901\20090108.LOG          1282 2009/01/08 11:59 AM
c:\DATA\200901\20090109.LOG          4592 2009/01/09 01:12 PM
c:\DATA\200901\09010907.DPL          1055 2009/01/09 07:41 AM
c:\DATA\200901\09010907.XML          6120 2009/01/09 07:41 AM
c:\DATA\200901\09010907.001           296 2009/01/09 07:41 AM
c:\DATA\200901\09010910.001          2872 2009/01/09 10:52 AM
c:\DATA\200901\09010911.001          3376 2009/01/09 11:28 AM
c:\DATA\200901\09010912.001         10128 2009/01/09 00:53 PM
c:\DATA\200901\09010913.001          2676 2009/01/09 01:07 PM
1 Directories 33 Files 993658 KB
Used 997120 KB Free 3015680 KB Total 4012800 KB
```

10.11 Dump System Variables (ds)

Dump system variables.

```
Parameters - 2009 01 09 13:13:10.08
*Serial Number......... 55027
*CPU .................. 6503
*Parameter Version..... 1
*Configuration Version. 1
*Parameters Saved ..... YES
*Configuration Saved .. YES
*Duplex................ HALF
*Mode ................. STANDBY
*Valid Config.......... YES
*CPU Speed ............ 14720
```

10.12 Dump System Parameters (dp)

Dump system parameters.

```
Number of boards... 2
Board 0 BoardFreq. 125
Board 1 BoardFreq. 200
SoundSpeed     .... 1420.00
Output ..... RS232
ACQ Start Date .... 2009  1  9 13 17 21
NumPhases ..... 1
P01 Start Date .... 2008 12  9 10 46 18
P01 Duration(days). 41.6250
P01 Phase Type..... Normal
P01 PingPeriod ..... 1
P01 DigRate (hz).... 20000
P01 ProfileInterval. 9
P01 PingsPerProfile. 1
P01 RangeSamples.... 1991
P01 LockOutIndex.... 1
P01 RangeAvgSamples. 5
P01 StoreSTD..... 0
P01 F1 BoardFrequency.. 125
P01 F1 acquire..... 0
P01 F1 Gain..... 1
```

P01 F1 PulseLen 150
P01 F2 BoardFrequency.. 200
P01 F2 acquire..... 1
P01 F2 Gain..... 1
P01 F2 PulseLen 150
Coef Serial Number. 55027
Eclock (sec)..... 2.5000516e-07
Paros Installed ... NO
Gain Installed .... YES
Eclock Freq (hz) .. 3999917.51
RTC Period (sec)... 1.9531070e-03
RTC Frequency (hz). 512.004720
RTC PpmOffset (hz). 9.22
RTC Calibration.... -5
AG X_a ..... -4.5346364e+01
AG X_b 1.2849060e-03
AG X_c ..... 0.0000000e+00
AG X_d ..... 0.0000000e+00
AG Y_a ..... -4.2824037e+01
AG Y_b 1.2345080e-03
AG Y_c ..... 0.0000000e+00
AG Y_d ..... 0.0000000e+00
ANALOG Press m .... 4.3092200e+01
ANALOG Press b .... -1.7236900e+01
ANALOG Temp ka .... 5.1059848e+02
ANALOG Temp kb .... 3.0000000e+03
ANALOG Temp kc .... 1.8778043e+00
ANALOG Temp A 1.4660000e-03
ANALOG Temp B 2.3880900e-04
ANALOG Temp C 1.0033500e-07
CurPhase 0
CurPingModulus 0
CurPulseLen 1
CurDigRate 0
CurSamplesPerPing . 0
CurBins 0
CurRngSmplPerBin .. 0
CurPhaLockOutIndex. 0

10.13 Erase VEEPROM Variables (ee)

ee [parameter]

Erase VEEPROM values

(DO NOT USE WITHOUT FACTORY AUTHORIZATION)

10.14 Display VEEPROM Variables (es)

Display the variables stored in the non volatile memory.

```
VEE has 904 bytes left
SYS.BAUD        = 115200
```

```
SYS.CLOCK       = 14720
PARAM_COEF      = (binary) 212 bytes
CONFIGVERSION   = (binary) 2 bytes
SERIALNUMBER    = (binary) 6 bytes
PARAM_CONFIG    = (binary) 272 bytes
PARAMVERSION    = (binary) 2 bytes
ASLHARDWARE     = (binary) 256 bytes
PARAM_PHASE     = (binary) 624 bytes
PARAM_HEAD      = (binary) 26 bytes
--
VEE has 904 bytes left
```

10.15 Enable or disable auto deployment (ea)

WARNING!

Do not enable NO AUTO DEPLOY unless your instrument is to be used for real time deployments where it is controlled by a PC or other computer system. This feature is useful for real time systems so the unit will only acquire data when requested to by the controlling system.

Units default to auto deployment on boot up or after one hour of inactivity on the communications port. This is to avoid no data being recorded if the user has forgotten to deploy the instrument.

The EA command allows the units auto deployment feature to be disabled. By default NO AUTO DEPLOY is disabled in the units.

ea [NOAUTO, AUTO]

display, enable or disable auto deployment.

** the unit NO AUTO DEPLOY should only be enabled for realtime operation with access to the units communications.

Examples no parameters:

EA

NO AUTO DEPLOY IS DISABLED

Example to enable NO AUTO DEPLOY

EA NOAUTO

NO AUTO DEPLOY IS ENABLED

Example to disable NO AUTO DEPLOY

EA AUTO

NO AUTO DEPLOY IS DISABLED

10.16 Read system variables form VEEPROM and display them (er)

Read the system variables from the non volatile memory and display them.

ES

Parameters - 2009 01 09 14:08:14.78
*Serial Number..... 55027
*CPU 6503
*Parameter Version..... 1
*Configuration Version. 1
*Parameters Saved ..... YES
*Configuration Saved .. YES
*Duplex..... HALF
*Mode ..... STANDBY
*Valid Config..... YES
*CPU Speed 14720
Number of boards... 2
Board 0 BoardFreq. 125
Board 1 BoardFreq. 200
SoundSpeed 1420.00
Output RS232
ACQ Start Date 2009 1 9 13 17 21
NumPhases 1
P01 Start Date 2008 12 9 10 46 18
P01 Duration(days). 41.6250
P01 Phase Type..... Normal
P01 PingPeriod 1
P01 DigRate (hz).... 20000
P01 ProfileInterval. 9
P01 PingsPerProfile. 1
P01 RangeSamples.... 1991
P01 LockOutIndex.... 1
P01 RangeAvgSamples. 5
P01 StoreSTD..... 0
P01 F1 BoardFrequency.. 125
P01 F1 acquire..... 0
P01 F1 Gain..... 1
P01 F1 PulseLen 150
P01 F2 BoardFrequency.. 200
P01 F2 acquire..... 1
P01 F2 Gain..... 1
P01 F2 PulseLen 150
Coef Serial Number. 55027
Eclock (sec)..... 2.5000516e-07

```
Paros Installed ... NO
Gain Installed .... YES
Eclock Freq (hz) .. 3999917.51
RTC Period (sec)... 1.9531070e-03
RTC Frequency (hz). 512.004720
RTC PpmOffset (hz). 9.22
RTC Calibration.... -5
AG  X_a ..... -4.5346364e+01
AG  X_b ..... 1.2849060e-03
AG  X_c ..... 0.0000000e+00
AG  X_d ..... 0.0000000e+00
AG  Y_a ..... -4.2824037e+01
AG  Y_b ..... 1.2345080e-03
AG  Y_c ..... 0.0000000e+00
AG  Y_d ..... 0.0000000e+00
ANALOG Press m .... 4.3092200e+01
ANALOG Press b .... -1.7236900e+01
ANALOG Temp ka .... 5.1059848e+02
ANALOG Temp kb .... 3.0000000e+03
ANALOG Temp kc .... 1.8778043e+00
ANALOG Temp A ..... 1.4660000e-03
ANALOG Temp B ..... 2.3880900e-04
ANALOG Temp C ..... 1.0033500e-07
CurPhase ..... 0
CurPingModulus .... 0
CurPulseLen ..... 1
CurDigRate ..... 0
CurSamplesPerPing . 0
CurBins ..... 0
CurRngSmplPerBin .. 0
CurPhaLockOutIndex. 0
```

10.17 Erase VEEPROM (ed)

ed [ERASE]

This command deletes non volatile memory except for some key values.

(DO NOT USE WITHOUT FACTORY AUTHORIZATION)

10.18 #P Commands

These commands are used to program one phase for real time operation.

Using any of these commands causes the firmware to do the following:

1. The number of phases is set to 1.

2. If the output is set to FLASH only then the output is reset to RS232 only.
3. The start date for data acquisition is set to now.

Commands are not case sensitive.

Some parameters are case sensitive.

Note that the description of some of these parameters that are modified with these command can be read in the user interface portion of this manual in the section that describes phase parameters.

10.18.1 Display Phase 1 (#p1)

Display the phase 1 parameters.

Example:

#p1

response:

```
^P1 ------------------------
^P1 startdate 2009  1  9 13 17 21
^P1 NumPhases 1
^P1 NumFrequencies   2
^P1 Phase Type       normal phase
^P1 Output    RS232 only
^P1 Duration 3596400
^P1 DigRate          20000
^P1 PingPeriod       1
^P1 ProfileInterval  9
^P1 PingsPerProfile  1
^P1 RangeSamples     1991
^P1 LockOutIndex     1
^P1 RangeAvgSamples  5
^P1 StoreSTD         0
^P1 freq 1 frequency        125
^P1 freq 1 acquire          0
^P1 freq 1 gain             1
^P1 freq 1 pulselen         150
^P1 freq 2 frequency        200
^P1 freq 2 acquire          1
^P1 freq 2 gain             1
^P1 freq 2 pulselen         150
```

10.18.2 Set Date/Time (#P1C y m d hr min sec)

Set the units real time clock.

#P1C y m d hr min sec

where:

y = year
m = month
d = day
hr = hour (24 hour)
min = minute
sec = second

Example:

```
#p1c 2009 1 1 12 45 0
^P1 clock set 2009  1  1 12 45  0
```

10.18.3 Set Digitization Rate (#p1Dx)

Set the digitization rate.

#P1Dx

where:

x = 0 64000 hz
x = 1 40000 hz
x = 2 20000 hz

Example:

```
#P1D1
^P1 DigRate          20000
```

10.18.4 Enable Display Storage of STD (#p1Ex)

Enable or disable the storage of standard deviation.

This value is automatically set back to false if both the range averaging and the ping per profile are both set to 1.

#P1Ex

where:

x = 0 disable
x = 1 enable

Example:

```
#P1E0
^P1 StoreStd         1
```

Note that enabling this options causes a much larger increase in the data volume that needs to be

It is reset to 0 if both the range averaging and pings per profile are 1.

10.18.5 Set Gain (p1fxGy)

Set the gain for specific frequency.

#P1FxGy

Set the gain y for frequency x where:

x = 1,2,3 or 4;
y = 1,2,3 or 4.

Example:

#P1F2G3 set frequency 2 to gain 3
^P1 freq 2 gain 3

10.18.6 Set Enable/Disable Frequency (p1fxEy)_2

Enable or disable the acquisition of a frequency.

#P1FxEy

Set the gain y for frequency x where:

x = 1,2,3 or 4;
y = 1,2,3 or 4.

Example:

#P1F1E0 Disable frequency 1
^P1 freq 1 acquire 0

NOTE: if all frequencies are disabled, frequency 1 is enabled.

10.18.7 Set Pulse Length (#P1FxP)

Set the pulse length for one of the frequencies.

#P1FxO [pulse length]

Where:

x = 1,2,3 or 4;

Example:

#P1F1P 150 Set the pulse length for frequency 1 to 150 cycles.
^P1 freq 1 pulselen 150

Minimum pulse length is 0 maximum pulse length is 1000

If no value for pulse length is entered then the current value is displayed.

10.18.8 Set Output Option

Set the output option to RS232 or RS232 and FLASH.

#P1Ox

Where x =R or F.

R = RS232 only.
F = RS232 and FLASH.

Example:

#P1OR
^P1 Output RS232 Only

10.18.9 Set Profile Interval (#P1PI)

Set the Profile Interval (seconds)

#P1PP [ping_period]

Example:

#P1PI 10
^P1 ProfileInterval 10

Changing this value may cause other values such as Ping Period. For example if the current Ping Period is 40 then entering a profile interval of 20 will change the Ping Period to a valid value of 20.

^P1 Warning 'ping period reset to profile interval'
^P1 PingPeriod 10

If no value in entered the current value is displayed.

10.18.10 Set Ping Period (#P1PP)

Set the Ping Period (seconds)

#P1PP [ping_period]

Example:

#P1PP 5
^P1 PingPeriod 5

The ping period can not be greater than the Profile Interval.

If no value in entered the current value is displayed.

10.18.11 Set Ping Per Profile (#P1PN)

Set the Pings per Profile (pings)

#P1PN [pings_per_profile]

Example:

#P1PN 2
^P1 PingPerProfile 2

If no value in entered the current value is displayed.

10.18.12 Set Range Averaging (#P1RA)

Set the Range Averaging (samples)

#P1RA [range_averaging]

Example:

#P1RA 2
^P1 RangeAvgSamples 2

Note that some parameters may be changed to accommodate other range settings.

^P1 Warning 'Some range parameters modified'
^P1 RangeSamples 1990
^P1 LockOutIndex 1
^P1 RangeAvgSamples 3

10.18.13 Set Range lockout (#P1RL)

Set the Range Lockout (samples)

#P1RA [range_lockout]

Example:

#P1RL 100
^P1 LockOutIndex 100

Note that some parameters may be changed to accommodate other range settings.

^P1 Warning 'Some range parameters modified'
^P1 RangeSamples 1990
^P1 LockOutIndex 1
^P1 RangeAvgSamples 3

10.18.14 Set Range Samples (#P1RS)

Set the Range Averaging (samples)

#P1RA [range_samples]

Example:

#P1RA 2000
^P1 RangeSamples 2000

Note that some parameters may be changed to accommodate other range settings.

^P1 Warning 'Some range parameters modified'
^P1 RangeSamples 1990
^P1 LockOutIndex 1
^P1 RangeAvgSamples 3

10.18.15 Set Unit to 1 Phase and Display it

Set the unit to 1 phase, RS232 only and display it.

#P1S

```
^P1 -------------------------
^P1 startdate 2009  1 12 11 56 27
^P1 NumPhases 1
^P1 NumFrequencies   2
^P1 Phase Type       normal phase
^P1 Output    RS232 only
^P1 Duration 3596400
^P1 DigRate          20000
^P1 PingPeriod       20
```

```
^P1 ProfileInterval  20
^P1 PingsPerProfile  1
^P1 RangeSamples     1990
^P1 LockOutIndex     1
^P1 RangeAvgSamples  3
^P1 StoreSTD         0
^P1 freq 1 frequency        125
^P1 freq 1 acquire          0
^P1 freq 1 gain             1
^P1 freq 1 pulselen         150
^P1 freq 2 frequency        200
^P1 freq 2 acquire          1
^P1 freq 2 gain             3
^P1 freq 2 pulselen         150
```

10.18.16 Save Parameters to VEEPROM (#P1U)

Save the current settings to the units VEEPROM (non volatile memory).

This save the parameters so that they are retained between power on/off cycles.

#P1U ASL

^P1 VEEPROMSAVE SUCCESSFULL

10.18.17 Initialize Phase Parameters for #PG command (#PI)

The #PI command initializes the data acquisition parameters for the use of the #PG command. When any new parameters have been programmed the command is called automatically on the first use of #PG. Besides programming the units parameters using the phase 1 parameters this command causes the real-time clock 1 second interval to be reprogrammed.

#PI

Example;

#PI

response:

P1 Initialized

10.18.18 Acquire a profile of data and transmit it over com port (#PG)

The command #PG is used to start the collection of on profile of data based on the Phase 1 programming.
The acquisition is started on the next real time clock one second trigger.

If any new parameters have been programmed the #PI command is executed before the profile is acquired.

Example:

#PG

asdf^%$^-asdassfasd asTAIL

NOTE: This command only sends data to serial port. Data is not stored to FLASH regardless of the Data Output setting.

10.18.19 Set Sound Speed (#PS)

Set the sound speed

#PS [SPEED]

Example;

#p1c 1450

response:

^PS soundspeed 1450.00

Note that sound speed is not used by the unit but the command is included in the command line set because the sound speed used by Ips5Link is programmed to the unit under normal operation. The sound speed is stored in XML and DPL files produced by the unit for information purposes.

11 Trouble Shooting

11.1 MfAwcpLink won't communicate with the unit

Check the COM port setting in the Preferences Tab section. Note that some USB to SERIAL products may not work with the unit. We recommend the ATEN USB to Serial (RS-232) Converter Model: UC-232A that is shipped with each instrument.

11.2 The Terminal Emulator won't talk to the unit

Check that the communications parameters for the terminal emulator are correct see Setting Up Terminal Emulation Communications section.

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