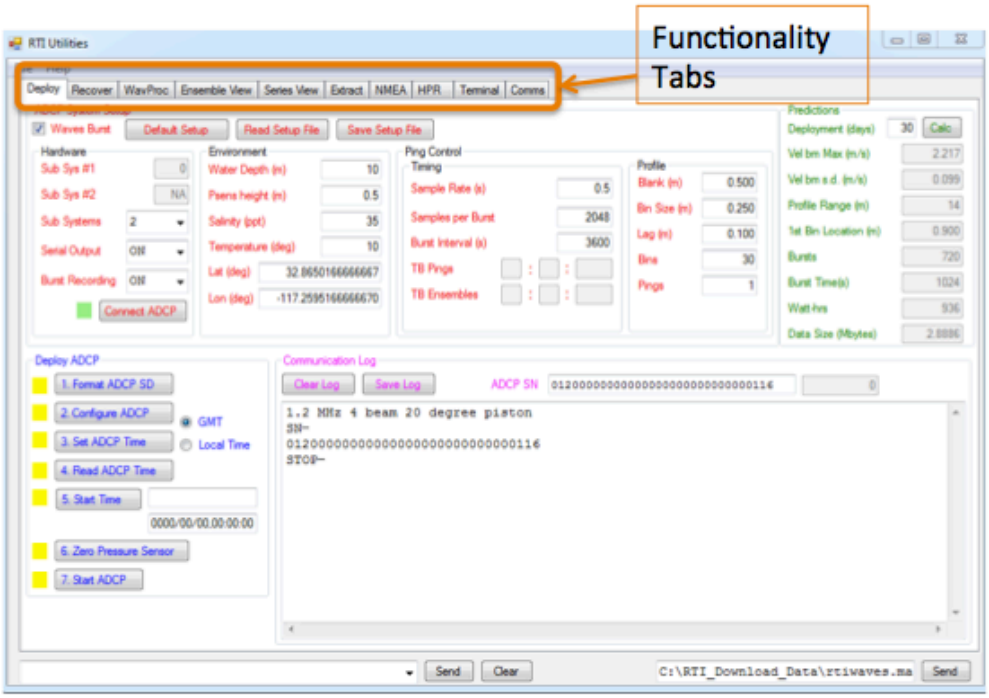
RTI UTILITIES SOFTWARE USER GUIDE

Table of Contents

1. General Layout

The RTI Utilities Software is divided into a number of tabs based on the type of task that the user wants to do. These tabs are presented at the top of the screen. Inside each tab there are specific functionalities. General information for each tab is present below with a detailed description about each tab presented in separate sections.

Deploy – allows users to configure and deploy an ADCP for waves data collection.
Recover – an interface for the user connect to the ADCP and download data from the ADCP
WavProc – allows an interface for users to process waves data
Ensemble View – presents an interface for user to playback data collected in saved data files
Series View – presents users a simple way to view time series data collected by the ADCP
Extract– utilities in this tab extracts data from the binary files and converts the data to ASCII or MatLab format.
NMEA – tab is used for real-time data for integrated systems, DVL, GPS and also extract NEMA data and puts it into a .txt format
HPR – diagnostic command – compass calibration and configuration
DVL Setup Tab – allows users to configure a DVL and configure output formats
Terminal – an interface for the user to communicate with the ADCP and upload new firmware
Comms – presents an interface for the user to configure Comm ports and Ethernet connection.



When interfacing with the system via the buttons provided (Connect ADCP, Format ADCP SD, etc.) there are color-coded quality indicators that advise the user of functionality.

Green – indicates that the user has initiated an action and the ADCP is ok to proceed.
Yellow – indicates that the user should verify settings
Red – indicates that action initiated by the user requires attention

2. Connecting to an ADCP/DVL

Please follow the following steps to connect to the ADCP/DVL. It is important to follow the steps sequentially.

Step1: Install Driver

Prior to connecting to the ADCP/DVL, be sure that you install the driver needed for serial communications between the PC and the ADCP/DVL. The drive can be found on the small CD provided in the shipping case or at the following link:

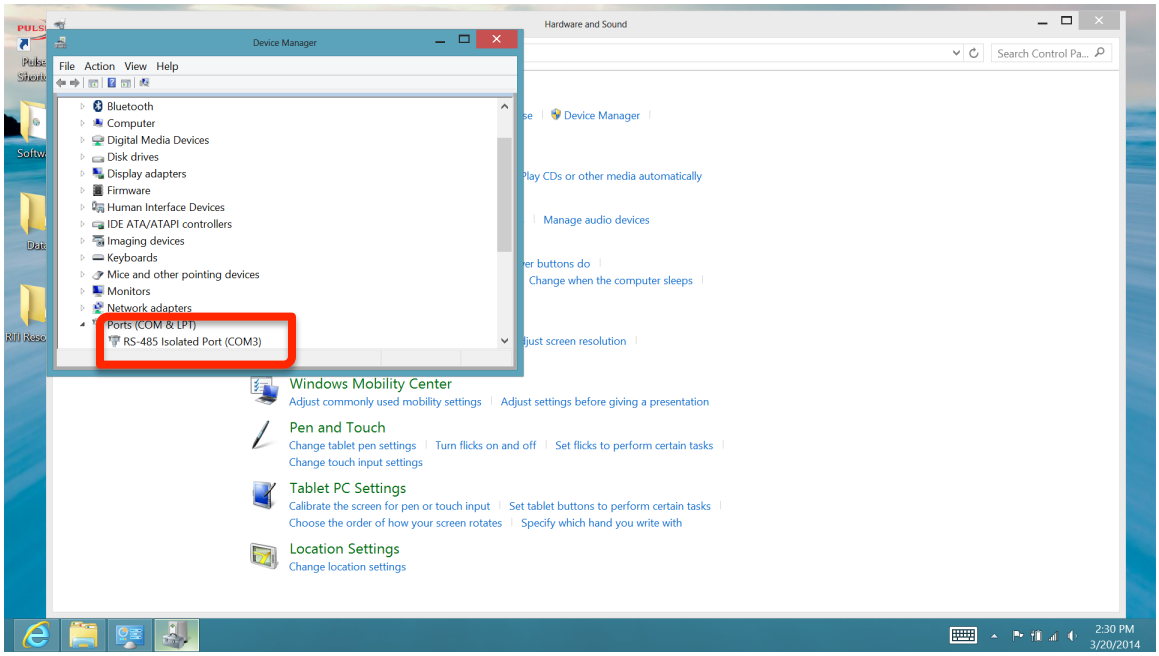
http://www.bb-elec.com/getattachment/c8461811-bebf-456a-8386-6ea1281219b4/USB_Drivers_PKG_v2-08-28.zip.aspx

Follow the instructions provided on screen to install the driver.

Step 2:Verify COM port

To verify that the installation proceeded correctly, insert the USB to Serial Converter into a USB port. Next go to the Control Panel and in the Device Manager menu expand the Ports menu to the COM port. The USB to serial converter should be identified as the following:

RS-485 Isolated Port (COM#)



The number sign will be replaced with an actual number, such as COM3 Indicated by the red box in the screen shot above). This is the COM port that the users should use to connect to the ADCP/DVL.

Step 3. ADCP/DVL Interconnecting

There are a few hard-connections that are required prior to interfacing to the instrument via software.

1. Connect the power supply to the instrument cable pig-tail via the keyed two pin connector
2. Make sure that the power supply is plugged into a power source/wall
3. Connect the keyed green five-pin connector on the instrument cable pig-tail to the USB-Serial adaptor
4. Insert the USB connector into a USB port on the PC

Troubleshooting: Once everything is interconnected, look at the ADCP/DVL. If things are powered up correctly, a red and a green light should be visibly pulsating/flickering – you may need to turn the lights off for the best view. If these lights are not visible verify that your connections are correct and that the power sources is actively providing power.

Step 4. Connecting to the Instrument via Software

Once all of the instrument interconnections have taken place, (presented in Step 3) open the RTI Utilities Software to connect/interface with the ADCP and go to the "Comms" tab.

- Be sure that the Serial Radio Button is selected (as in the image below).

- Click Scan in the Serial Communications, Port Section of the software – this will scan and present available COM Ports.

- Select the COM Port identified in Step 2 above:

    - If you are not sure of the port number: unplug the port adaptor and click Scan in the Main Port box.
    - Make note of which ports are listed.
    - Plug the port adaptor back in and press Scan. Make note of a new port added to the list. This is the port number you should use.
- Make sure default baud rate is selected (115200), if the default has been changed use the following procedure.

    - Select one of the Baud rates in the Main Port.
    - Click the "Terminal" TAB and then click BREAK.
    - If you have the correct port and Baud rate you will the the RTI wakeup message on the Terminal screen:
        - Copyright (c) 2009-2014 Rowe Technologies Inc. All rights reserved.
    - If you do not see the break message, select the next baud rate and click BREAK, continue this procedure until you see the break message. Make note of the Baud rate.

    - In the case that you cannot determine the baud rate, hold the "Break" button down for 20 seconds all COM ports will be set to 115,200 baud rate.

- Alternatively click the "Force Stop" button on the DVL configuration page. A countdown from 20 will initiate after which all COM ports will be set to 115,200 baud rate.
- The simply connect as described above.

- After the instrument is connected – go to the Deploy Tab to configure the ADCP/DVL (below). Click on the Connect ADCP to connect and configure the ADCP.

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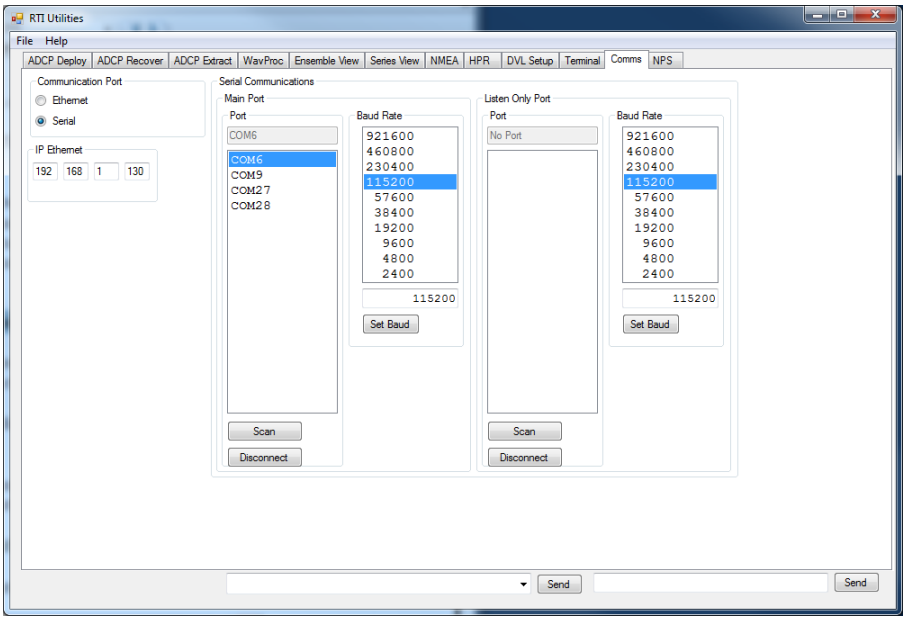
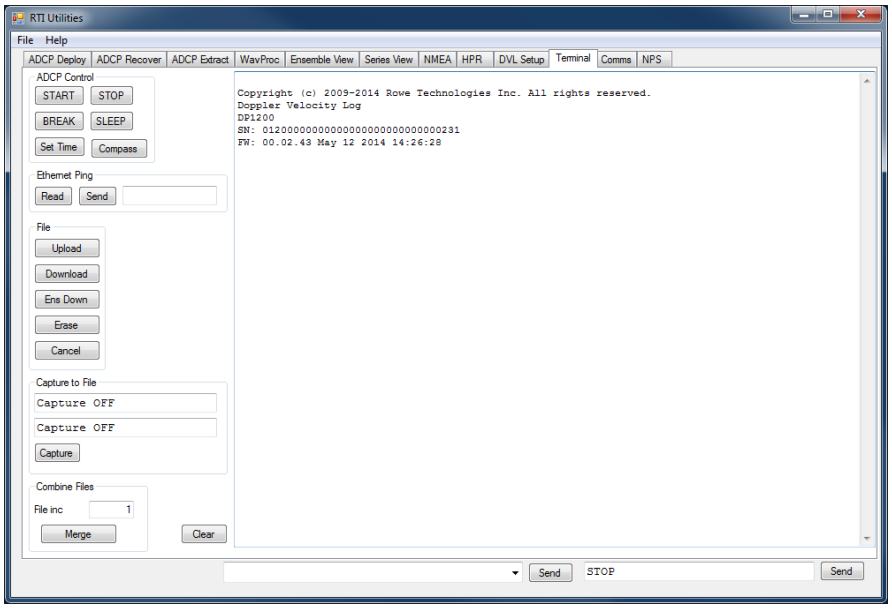
DP600 DP1200
SN: 013A000000000000000000000000121
FW: 00.02.40 Mar 28 2014 12:24:24



It is important to note that the Serial Communications portion of the Comms tab is divided into two sections, Main Port and Listen Only Port.

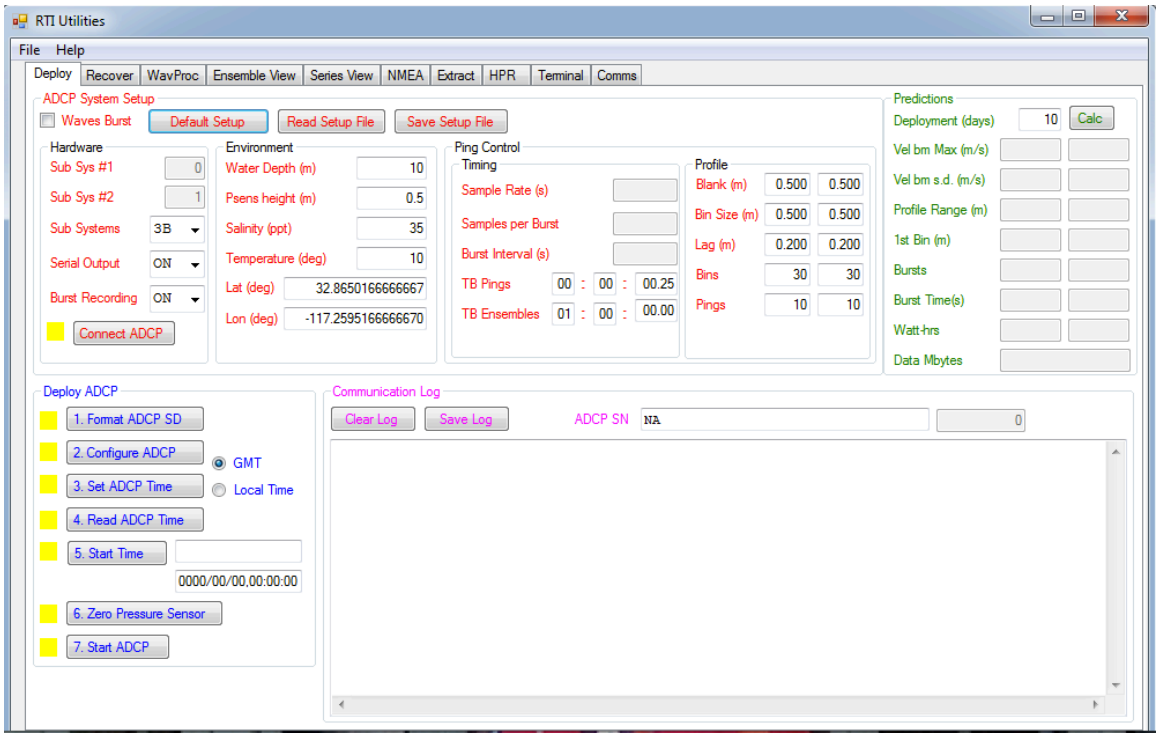
- The Main Port set Comms for communicating with the ADCP/DVL
- The Listen Only Port is useful for monitoring a serial port that streams in data such as GPS or another ADCP/DVL – information will be streamed in for listen only operations in the Terminal Tab.
  - Using the Capture Button in the Terminal tab allows users to capture the data to a text file from one or both ports to C:\RTI_Capture.



Troubleshooting: In the case the system does not connect using the known COM port, please try another baud rate. Although, default set-up baud rate is 155200, the system may have been used in another baud rate – cycle through various baud rates in the know COM to connect to the instrument.

3. Deploy Tab

The Deploy Tab has built-in functions for interfacing and configuring the ADCP for a deployment. The Tab is organized in four basic sections, ADCP System Set-up, Predictions, Deploy ADCP and Communications Log that are all described below.



3.1 ADCP System Setup

This section is divided into four sections; Hardware Environment, Ping Control and Profile all of which are described below. In addition, there are the buttons that aid in setting the instrument for data collection. The buttons are describe here:

Waves Burst – Check box that allow users to select a waves deployment by placing a check in the check box. Leaving the check box blank allows the user to set up the ADCP as a profiler.

Default Setup – loads standard/default values based on ADCP hardware configuration. Defaults will optimize data collection for Waves data.

Read Setup File – reads at template text file with predefined ADCP setup information. Default folder where the file is saved is located at: c:/RTI_Waves_Configuration_Files

Text template files can be modified and saved for specific deployments and then loaded to configure the system.

Save Setup File – saves the setup used on the screen to a text file saved at c:/RTI_Waves_Configuration_Files. Text files can be modified and or uploaded for configuration of ADCPs.

3.2 Hardware

Information for the first three fields (Sub system#1 and #2 and Sub system) is automatically filled in by connecting to the ADCP clicking the Wakeup ADCP in the Deploy ADCP section in the bottom left of the screen. The drop down menu for the field Serial Output and Burst Recording must be filled out and are described below.

Sub system #1 – details are provided in Section B4 of the User Guide

Sub system #2 – details are provided in Section B4 of the User Guide

Sub systems - details are provided in Section B4 of the User Guide

Serial output – provides a drop down menu for enabling (ON) or disabling (OFF) serial output. ON essentially enables the standard binary output data protocol to be sent out the serial port, allowing the user to visualize live data. OFF Saves battery energy when recording data to the SD card during a self-contained deployment by reducing extra on time of the system due to data transfer.

Burst recording – provides a drop down menu to turn ON or OFF burst recording.
For waves applications the Burst recording option must be turned on.

Connect ADCP Button – Scans Comm ports and connects to available systems. After connecting to the system, the Hardware information is automatically loaded (Sub Sys#1 and #2 And Sub Systems).

3.3 Environment

This section is used to describe the conditions for the deployment. Each field provides information that is used to generate defaults for the system for optimal set-up for data collection. Below are descriptions for each data field as well as guidelines for filling in the data field.

Water Depth (m) – required data entry by user that is used to define the water depth in meters for instrument deployment.

Psens height (m) – required data entry by user to define height (in meters) of the pressure sensor of the instrument off the bottom of the sea floor. This value should take into account the instrument height as well as any mounting that off sets the instrument off the sea floor.

Salinity (ppt) – required data entry by user that is used for the speed of sound calculation. The following guidelines should be used:

Ocean/Sea water: 35 ppt (parts per thousand)
Estuaries: 15 ppt
Freshwater: 0 -1 ppt

It is important to note that have in correct estimate for the salinity value is essential for the ADCP to determine speed of sound. Errors in this estimate will have an impact on velocity information.

Temperature (deg) – required data entry field that is used to define water conditions for the deployment. This number is just a estimate for deployment predictions. During the deployment temperature will be measured by the instrument and is used for speed of sound corrections.

Lat (deg) – Optional user entry in degrees, value for Latitude of deployment can be entered. Default is the Latitude for the Pacific Ocean near San Diego

Lon (deg) - Optional user entry in degrees, value for Longitude of deployment can be entered. Default is the Longitude for the Pacific Ocean near San Diego.

3.4 Ping Control

This section is used to configure the ADCP for data collection. The first three fields are required to be filled in by the user, while the last four are determined based on Acoustic Frequency and user inputs and defaulted to values for optimal data collection.

Defaulted values can be changes to user specified values using the Command Bar, at the bottom of the screen. Commands are defined in detail in the User Guide.

Sampling Rate (s) – required user entry field that indicates the frequency of the instrument sampling/pinging in seconds during the Burst-sampling interval.

Samples per Burst – required user entry field that defines the number of samples to be collected during the burst-sampling interval. The number of samples must be 2n for the Fast Fourier Transform (FFT).

Burst Interval (s) – required user entry field that indicates the interval in seconds between burst samples. For waves applications the interval is typically is every hour or 3600 seconds.

TB Pings – Time Between Pings, combined with sample rate will determine the total sample time for accumulating an Ensemble.

TB Ensembles – defined as Time Between Ensembles. An Ensemble is a group of pings defined by the user by the number of pings and TB Pings. After collecting an Ensemble the instrument will "sleep" until the next Ensemble is programmed to be collected.

3.5 Profile

This section defines characteristics for velocity profile data collection. It is important to note that there are two columns of data to fill-in. In the case where there is a single frequency, only one column is be used, however in the case that a dual frequency system is to be deployed, the second frequency must also be configured, as such the second column.

Blank (m) – required user entry that defines the vertical distance to the first bin or sample. It is important to note that default values are set based on system type.

Bin Size (m) – required user entry that defines the size in meters of the bin or sample that the ADCP collects. It is important to note that default values are set based on system type.

Lag (m) – required user entry that is defined by is distance (in m) between broadband pulses. Below are general guidelines:

The greater the lag distance the greater the velocity precision of the measurement, however a decreased maximum velocity can be measured.

The smaller the lag distance provides a decreased velocity precision and an increased maximum velocity measurement.

Bins – the number of bins defines by the number of equidistant measurements in the water column.

Pings – user entry for the number of pings to be used for averaging

Note: All RTI ADCPs allow for 200 bins however, in most cases for Waves measurements, large cells sizes are utilized to eliminate noise in the measurements. Default values entered in by the software optimize the system for waves measurements.

3.6 Predictions

The Prediction section allows users to understand the performance of the ADCP based on the values entered in in the previous sections as well as defining Deployment duration in days.

It is important to note that there are two columns of data in this section. In the case where there is a single frequency, only one column is be used, however in the case that a dual frequency system is to be deployed, data for the second frequency is also presented based on the time of deployment.

Deployment (days) – user required data field that defines the number of days in the deployment.

Vel bm Max (m/s) – Maximum (beam) velocity that can be measured based on user or default set-up. To modify this value, Ping Control parameters need to be modified.

Vel bm s.d. (m/s) – Standard deviation of (beam) velocity data based on user or default set-up parameters. To modify this value, Ping Control parameters need to be modified.

Profile Range (m) –Defined by Hardware/Instrument type, the user cannot modify this parameter.

1st Bin Location – Defined by blanking distance, which is standard for an instrument, and Lag, which is either user defined, or can be set by defaults.

Bursts – Number of bursts for the deployment, which is calculated by multiplying burst rate by the deployment time.

Burst Time (s) – calculated by multiplying the Sample Rate by the Samples per Burst.

Watts-hr – is a calculated parameter determined by physical characteristics of the instrument/hardware, Ping Control settings and Deployment duration.

To determine the number of battery packs required for the deployment divide the Watt-hr output from the Predictions section by 440 Watt-hrs (standard battery pack capacity used by RTI).

Data Size (MB) – based on the Ping Control settings and the Deployment duration a Date (File) Size (MB) is determined. All systems provided by RTI have an 8 MB internal recorder.

3.7 Deploy ADCP

This section is used to prepare the instrument for deployment. Deployment parameters and system time can be set as well as zeroing the pressure sensor. It is important to note that the software uses color-coded indicators for help deploy the instrument. The color codes are defined below:

Green – indicates that the user has initiated an action and the ADCP is ok to proceed.
Yellow – indicates that the user should verify settings
Red – indicates that action initiated by the user requires attention

Below are the descriptions of each button in the Deploy ADCP section.

1. Format ADCP SD – Erases data from the ADCP SD memory card.

2. Configure ADCP – Loads the parameters defined in the Hardware, Environment and Ping Control Sections. Configuration files are saved to:
3.7.1 C:\RTI_Configuration_Files.

The parameters in the text files can be modified and saved as a template for future deployments and then loaded to the instrument for deployment.

3. Set ADCP Time – allows users to set ADCP time. Radio buttons sets the time to GMT time (based on the current PC time) or the local time using the PC time.

4. Read ADCP Time – Reads the ADCP time, this function is used to verify that the time is set correctly.

5. Start Time – Allows the user to set the time the ADCP starts to collect data. A value of 0000/00/00, 00:00:00 immediately starts data collection, while a value in the future will start data collection at the date and time indicated by the user entry.

Important note: data format is YYYT/MM/DD, HH:MM:SS

6. Zero Pressure Sensor – this function zeros the current reading for the pressure sensor and is to be used prior to deployment to eliminate potential drift. Zeroing the pressure sensor should only be done when the system is in air and not deployed in the water column.

7. Start ADCP – loads the configuration parameters and starts the deployment.

It is important to note that if the Start Time is in the future, data collection will not be initiated until the set value and the system clock are the same.

3.8 Deploying the ADCP for Data Collection

Deploying the ADCP for default data collection can be done using the following steps:

1. For a deployment collecting Waves data, check the Waves Burst check box at the top of the screen. For a standard deployment do not check the box.

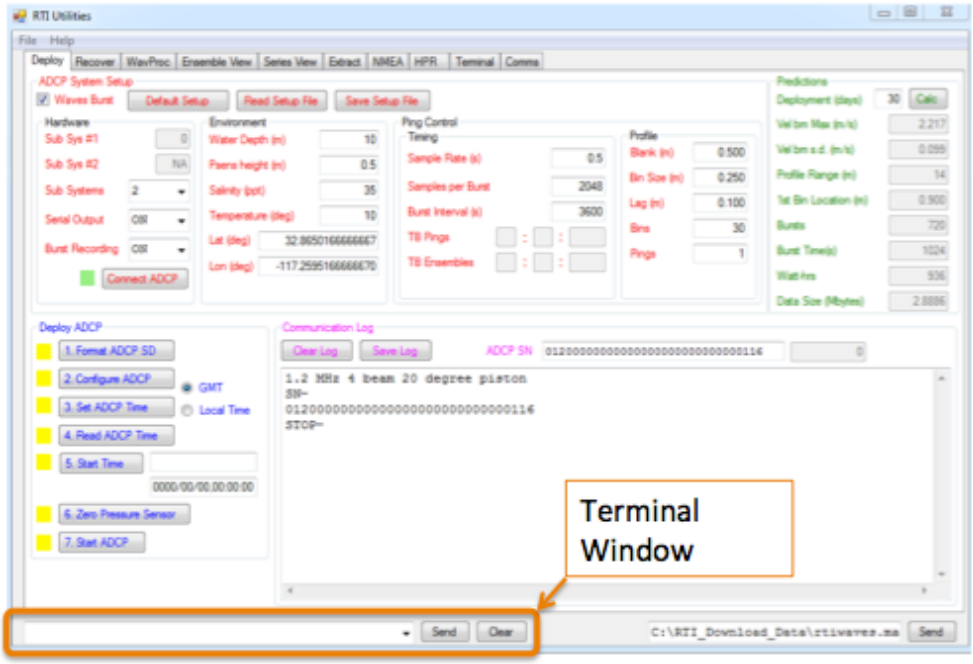
2. Click on the Connect ADCP button – once connected the color indicator to the right should be green. In the case that you are not able to connect to the ADCP the color indicator will be red. Check all cable connections (power and connection to computer) to troubleshoot.

3. For a Default Setup (one that is optimized for the system – that is not site specific), Click the Default Setup button and values will be automatically entered in the Environment, Ping Control and Profile sections. Values for the Environment section should be verified to be representative of the deployment.

Alternatively users can load a previous configuration by clicking the Read Setup File – this will load the parameters from a previous deployment.

If other changes to the deployment are necessary, the values can be changed. For a more detailed and specific configuration, users can use the Terminal window at the bottom of the screen (below) and use specific commands outlined in the ADCP user manual.

Once the deployment fields are entered users can click the Save Setup File button to save a file with deployment parameters that can be loaded for future deployments.



4. Once the values have been entered into the Environment, Ping Control and Profile fields, the user should enter the length of deployment (in days) in the Deployment field found in the Predictions section. Click the Calc button to review the calculations for the deployment.

Be sure to that there is sufficient available memory for the deployment; internal memory capacity is 8 GB - available memory can be determined by clicking on the Recover Tab and clicking on the ADCP Directory. After each deployment is it suggested to download data and save a permanent copy. As such, formatting the recorder is the next logical step to ensure that the new deployment will have sufficient memory space.

Power requirements are also an important consideration. The Prediction section will present expected power consumption for the deployment in Watt-hrs. RTI battery packs have a capacity of 440 Watt-hrs.

5. After checking the memory capacity and power consumption details the user should go to the deploy ADCP section and follow the order of the numbered buttons.

6. Configure ADCP loads the setup parameters to the ADCP.

7. Set ADCP time – set the time of the ADCP to a local time (that of the PC), GMT or a Custom time.

8. Read ADCP is a check to make sure that the time is set according to the previous step.

9. Set the Start Time allows the user to start the deployment immediately by filling in the current time or setting the time to all zeros. If the deployment is planned for a future time, then that time should be entered and the ADCP will wake up and collect data that the time entered.

10. Users should zero the pressure sensor prior to deployment to ensure accurate water level data – this procedure should be done while the ADCP is NOT in the water in order to have an accurate zero reading.

11. Clicking Start ADCP activates the system based on the deployment parameters and deployment time.

It is important to note for each of these steps a green indicator means that the step was successful and the user can proceed to the next step, while a red indicator means that the step fail and trouble shooting should be initiated.

3.9 Communication Log

The Communication Log displays ADCP serial number and the commands sent to the ADCP. Buttons at the top of the section allow the user to Clear Log and Save Log. Saving the Log allows users to save a text file of all of the commands (in the Log) used while interfacing with the ADCP. This procedure is often done prior to deploying the instrument as a QA/QC procedure to document details of the deployment as a historical record.

3.10 Terminal Interface

The Terminal Interface is locate at the bottom left of the screen and allows users to communicate with the ADCP using commands define in the User Guide. This interface is often used for custom configurations for deployment. Clicking the Send button sends the command to the ADCP while the Clear button clears the Terminal Interface window. It is important to note that Commands used in the Terminal Interface will be recorded in the Communication Log.

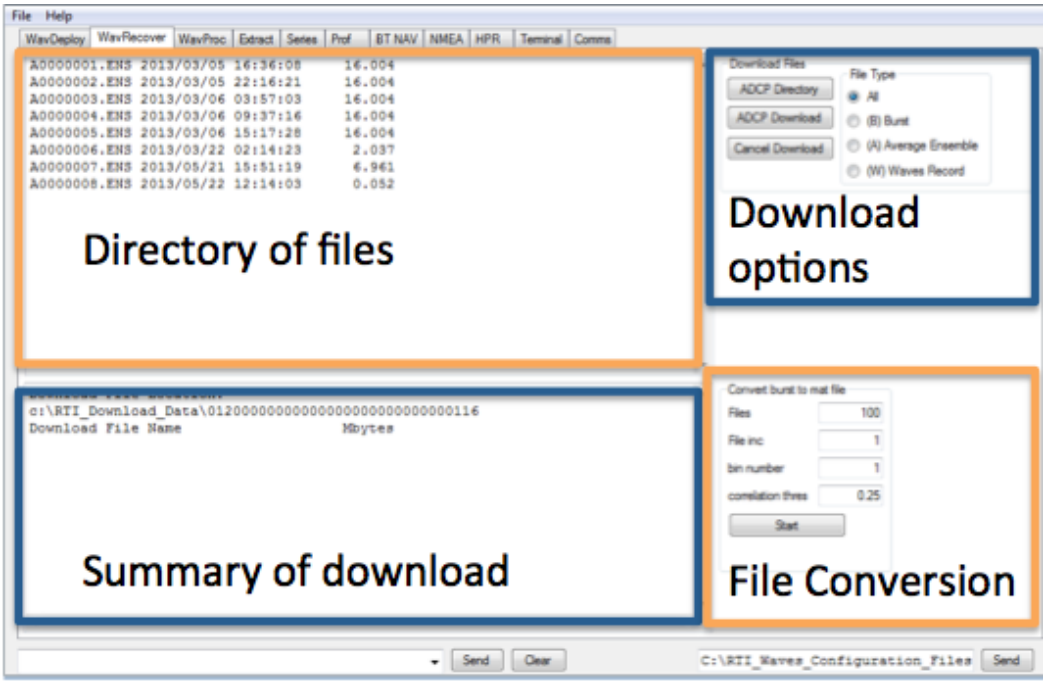
4 Recover Tab

The Recover is an interface for the user connect to the ADCP and download data from the ADCP and convert raw data to a MatLab file that can then be upload and analyzed and visualized in XWave and Wavector by Waveforce Technologies.

The Tab is organized by sections. Basically, files available for download will be presented in the top-left. In the bottom-left, a summary is presented of the files that were download as well as the location of the download. On the right side there are options for accessing and downloading files (top) and at the bottom right, a processing section allows users to convert a Burst (B) file to a Mat file that can be processed for additional analysis and visualization using XWaves and Wavector.

4.1 Directory of files

The directory of files is simply a list of files that are stored on the SD card of the instrument. Information presented is File Name, Date and Memory (MB).



4.2 Download Options

Provides options for interfacing with the SD memory card on board.

ADCP Directory – Accesses the memory card of the ADCP and presents files that are available for download.

ADCP Download – Using the radio buttons to the right users can download files from the ADCP to the following directory: c:\RTI_Dowload_Data

Cancel Download – Cancels the download initiated by the user.

Radio buttons allow for downloading: All Files, Burst Files (B), Average (A) ensemble data and Waves Records (W).

In the file conversion section users can convert Burst (B) files to .mat files that can be use in Wavector and XWaves as well as RTI Utilities to visualize processes waves waves data. All values in the File Conversion are set to default values, but can be changed by the user based on individual needs. Below is a description of each data field.

4.3 Summary of Download

The summary window presents information about the files downloaded from the SD card. Location of download (default is c:\RTI_Download_Data), File Name and file size.

4.4 File Conversion

This section is used to convert raw ADCP data to processed that data file (.mat) that can be visualized using the WavProc Tab of RTI Utilities, XWaves and Wavector.

Files – allows the users to define the number of files to convert into a single .mat file.

File inc – defined as the file increment, based on the number of files selected the user can load incremental files into the .mat file. A value of 2 would yield every other file loaded into the .mat file, while a value of 4 would load every four files into the .mat file.

Bin number – Allows users to select the bin to be used for waves analysis

Correlation threshold – allows users to filter velocity data by correlation threshold. Default is set to 0.25, however a user-selected value can be entered.

4.5 Procedure for Downloading Data

After the instrument has been recovered and connected to the PC use the following steps to download data.

1. Go to the Recover Tab

2. Click the ADCP directory button – be sure to have the "All" radio button clicked to the right (to display all files). Should the user only want to down load Burst files, select the radio button associated to (B) Burst Files.

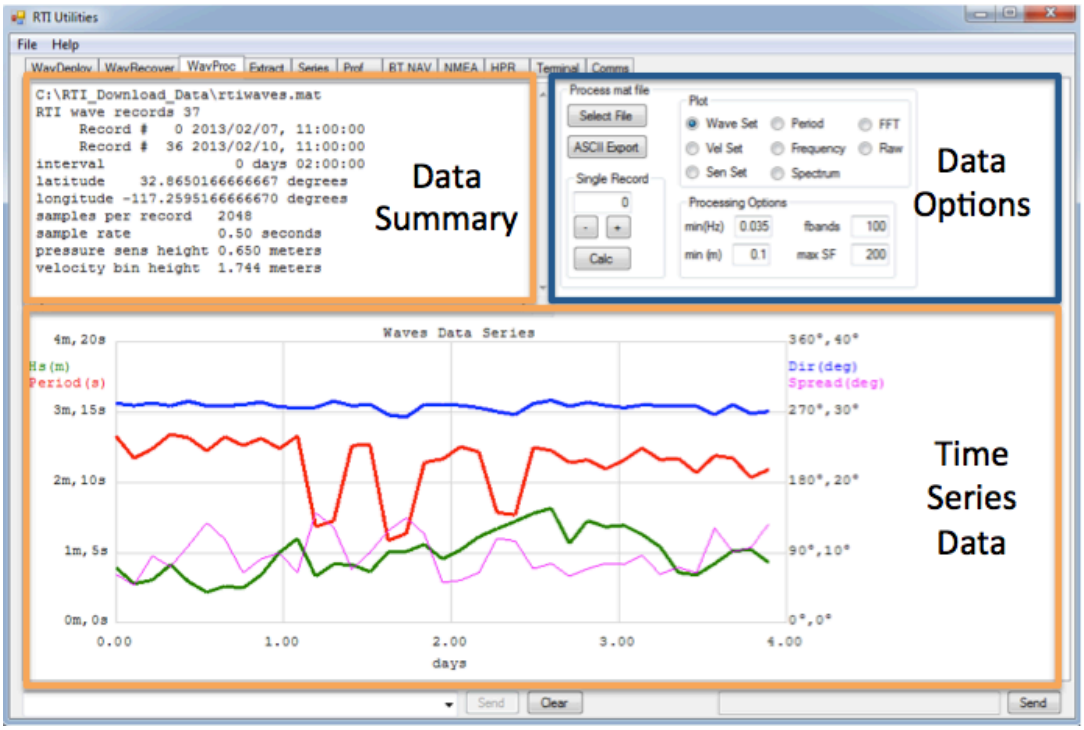
3. Click on the ADCP Download button to download the files.

4. Once all of the files are downloaded from the recorder, should you like to format the recorder, click on the Format Recorder button.

Important Note: Depending on the length of deployment and frequency of sampling, file sizes can become very large. Make sure that download speeds are optimized, when using a Serial connection the 115200 Baud Rate should be selected. For faster downloads the Ethernet option should be used (if available). In order to use the Ethernet option, be sure to enter the correct IP Ethernet address.

5 WavProc Tab

The WavProc Tab (Waves Processing) is used to visualize processed raw data files that are in .mat format (an action that can be completed in the WavesRecover Tab). The tab is divided into three sections: Data Summary, Data Options and Time Series Data. The Data Options section allows users to select file for visualization, export data to ASCII files, and process data. The time series section presents time series data based on the options selected in the Data Options section.



5.1 Data Summary

The Data Summary section presents general information (meta data) about the file and describes deployment details.

5.2 Data Options

The data options section is the interface for opening a file and exporting the data in the file to an ASCII format for additional information and analysis.

Select File – opens a window that allows the user to navigate to and open a file, default is c:\RTI_Download_Data

ASCII Export – exports the data to a .csv format that can be used by third party data analysis packages. The .csv file will automatically saved to the c:\RTI_Export folder with a file name using the following convention:

File name is date_export.csv, with date in the following format: YYYYMMDDHHMMSS

Single Record – pertains to the data plotted by the Period, Frequency, Spectrum, FFT and Raw radio buttons in the right-hand portion of the Plot section. The "+" button cycles forward through the data files while the "-" button cycles backward through the data files. The "Calc" button recalculates values presented in these plots.

5.3 Time Series Data

Graphs on the Time Series Data section can be change by simply clicking on the radio buttons in the Plot section of the Date Options section. Each radio button presents a default set of data described below.

Wave Set – presents Hs (m) and Period (s) on the left y-axis and Direction (deg) and Spread (deg) on the right y-axis.

Velocity Set – displays uvMag on left y-axis and uvDir (deg) on the right y-axis.

Sen Set – graphs Temperature (t) in degrees C on the left y-axis and Pressure (m) on the right y-axis.

(Wave) Period – displays Sp(m) on the left y-axis and Direction, SprR2 and SprR1 (all in degrees) on the right y-axis. Also presented are some general calculations related to Wave Period data.
(Wave) Frequency - displays Sp(m) on the left y-axis and Direction, SprR2 and SprR1 (all in degrees) on the right y-axis. Also presented are some general calculations related to Wave Frequency data.

Spectrum – Presents the Uncorrected Subsurface Energy Spectrum data, with all data using the left y-axis (p,u,v, uv).

FFT – presents p, u and v data (all m2/Hz) on the left y-axis and sample on the x-axis.

Raw – display the raw data collected by the ADCP, with sample on the x-axis and p (m) on the right y-axis and u and v (m/s) on the right y-axis.

For more detailed and customized data review it is suggested to use a 3rd party data package. RTI data (in .mat format) is compatible with XWaves and Wavector. These are custom programs for data analysis and visualization.

5.4 Processing Options

There a four processing options in this tab that are described below. These options are mainly for data presentation and allow users to configure the data to present.

Min Hz – allows a data cutoff for data presentation. The data field allows for a numerical value to be entered lowest frequency of waves expected in the data.

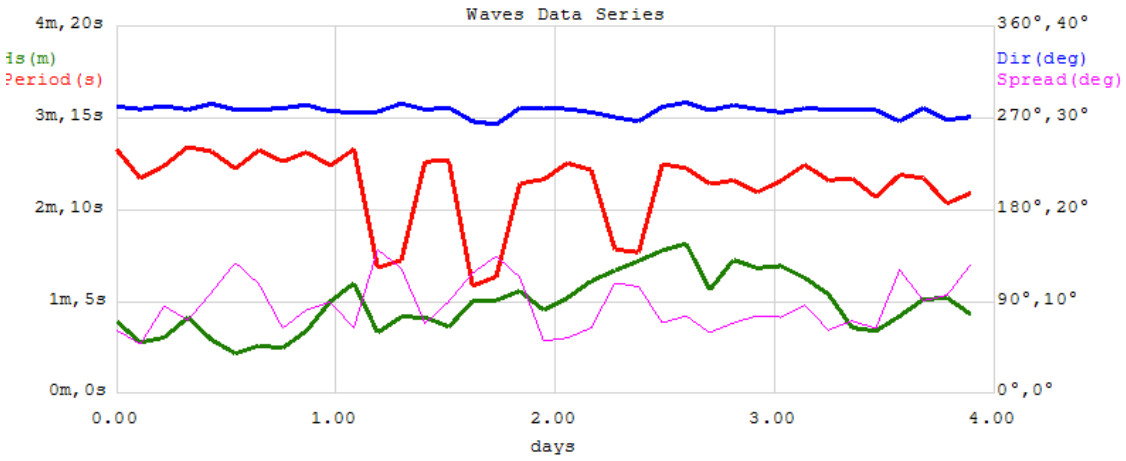
Min (m) –allows users a data cutoff for the presentation of wave height data

Fbands – sets the default for the number of frequency bands to be presented in the graphics.

Max SF – refers to the Maximum Scale Factor is used by a model in the code to scale data processed data to wave height data.

5.5 Time Series

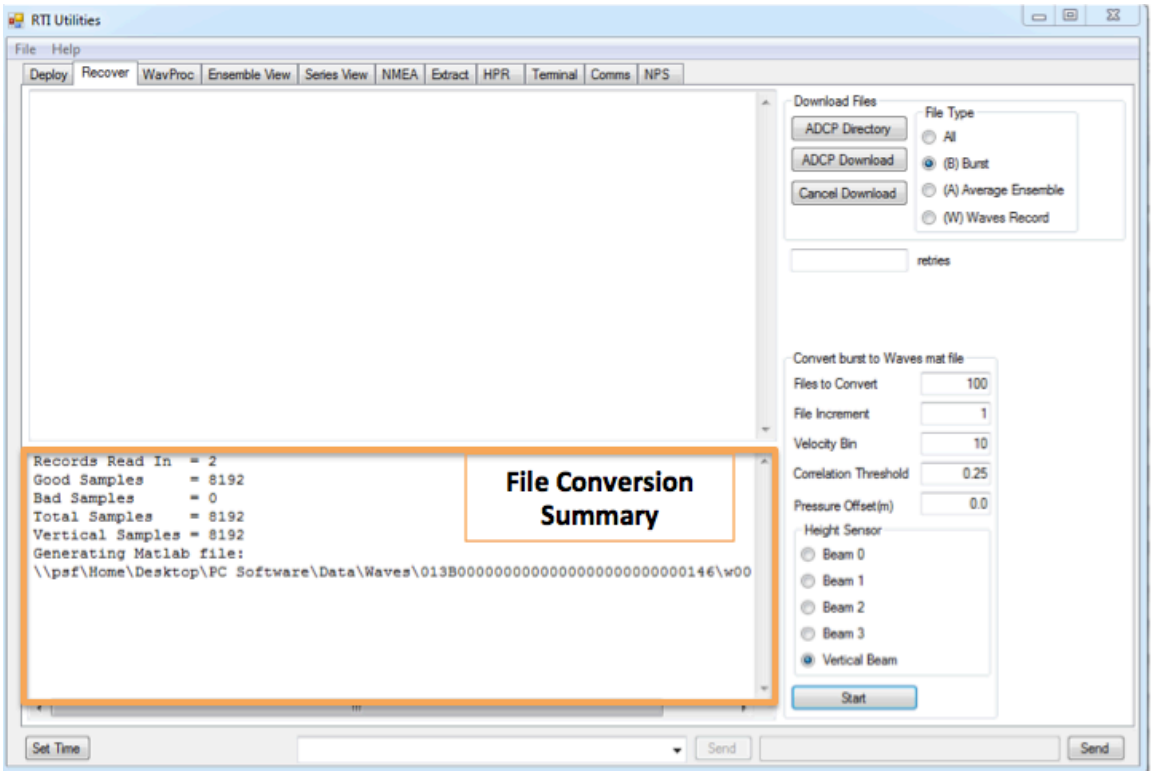
The graphs presented in the Time Series section are plotted based on user selections in the Data Options sections. It is important to note that almost all of the plots have multiple Y-Axes. Data presented are color-coded with the color of the plotted parameter corresponding to the color of the data field or parameter presented in the left of right axis. For the example above, the blue line/trace corresponds to direction, which is found on the right Y axis.



It is important to note that graphing parameters can be done by clicking the Radio buttons in the Plot section at the top right of the screen. Scaling of the X and Y axes is done automatically, to change customize the graph user have to export the data via ASCII Export and utilize a graphing package (i.e. Excel, MatLab, etc).

5.6 Further Analysis – Wavector and XWaves

RTI Utilities was designed to allow the user for a simple instrument interface with basic tools to visualizing data. For more detailed analysis users can convert data files to a Waves Mat file that is compatible with Wavector and XWaves software developed by WaveForce Technologies. In order to use WaveForce Technologies software contact WaveForce or Rowe Technologies to obtain a license to the software.



To convert an RTI data file to the .mat that is compatible with Wavector or XWaves, please use the following steps:

1. Go to the Recover Tab and download data from the ADCP to the c:\RTI_Download_Data.

2. Select the file of interest from the directory indicated in step 1; the file name should start with the letter “B” as Burst files are used in collecting directional waves data.

6 In the “Convert Burst to Waves Mat File” section be sure to have the appropriate settings for Files, File Inc, Bin Number, Correlation Threshold and Pressure Offset. In most cases, the Vertical Beam should be used for the Height sensor,

however in cases where the ADCP is installed at an angle, the beam that is facing upward should be used.

Here are some general explanations and recommendations for converting data to Mat files for Wavector and XWaves:

Files to Convert: Currently only 100 files can be converted at a time, in the future, additional capability will be added.

File Increment: The standard for converting burst files to mat file is one, that is to say that each burst file selected will be converted to a Mat file, however in the case that every other file is desired to be converted, a 2 would be used in the data field.

Velocity Bin: This is probably the most important field used in the file conversion process. Select the velocity bin used for directional waves analysis. The bin should be selected that is close to the sea surface, however too close to the surface turbulence will be included in the measurement, as such select the bin that is 3-4 bins below the minimum water depth. For example, if there are 15 bins that are measuring velocity at the minimum air-water interface, RTI suggests selecting bin 12. Of course all sites are different and best results will be determines for the site by evaluating different scenarios. It is important to note, all data is collected in the original data file and reprocessing various Mat files with different velocity bins can always be done to determine best directional analysis for the site.

Correlation Threshold: Default value of 0.25 should provide adequate results. Placing a higher correlation values can provide better data if the correlation value is met – in the case that the correlation value is not met, data may not be available.

Pressure Offset: This value is used to calibrate or post process the pressure sensor value to the vertical beam value. In many cases the ADCP will be calibrates in the laboratory and not at sea level, as such end users can post process the pressure data to correspond to the vertical beam data.

Height Sensor: This allows the user to set the beam used for wave height determination. When installed level, the vertical beam is typically, used to determine wave height. In the cases where the ADCP is not installed level (not recommended) the beam that is vertical upward looking can be used for height determination.

7 After the parameters have been selected, to select the data file to be converted to a Mat File - click Start. A window will open linked to the default folder (c:\RTI_Download_Data) where the data file can be selected. It is important to

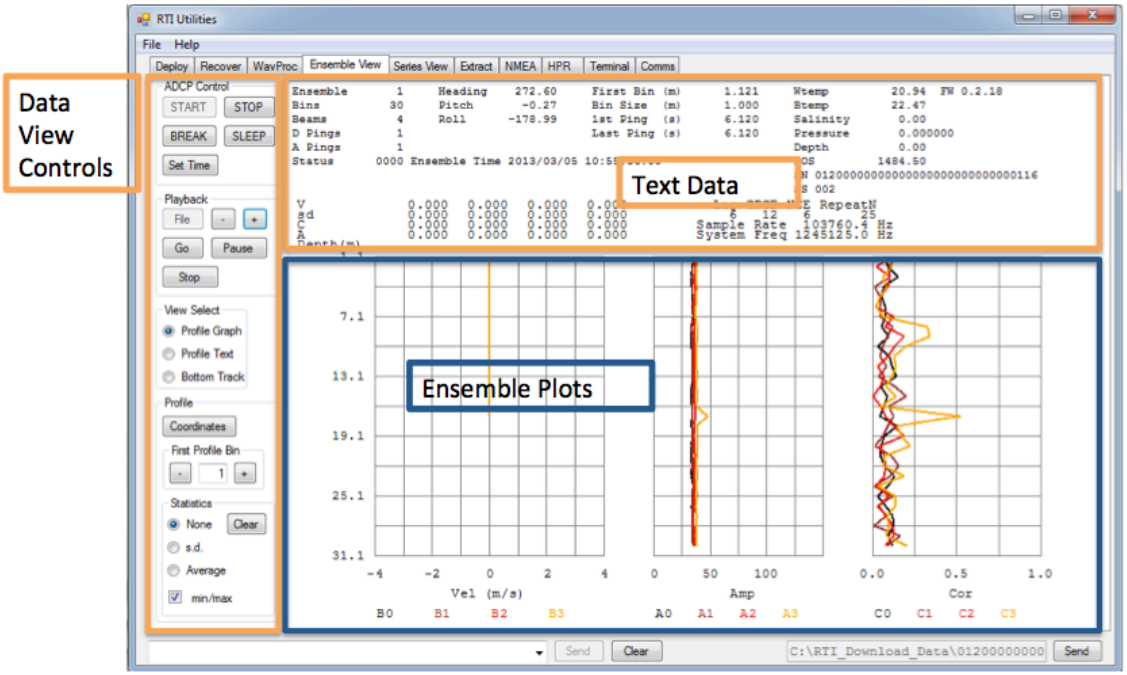
note that the data file needs to start with a "B" – which corresponds to a burst file.

8 After selecting the file it will be converted to a .Mat data file that can be imported into Wavector or XWaves. A summary is presented in the window (above).

9 The .mat file can then be imported into Wavector or XWaves for visualization and analysis.

10 Ensemble View Tab

The Ensemble View tab is divided into three sections and is used primarily to visualize ensemble data. The first section is the Data View controls section that allows users to interface with ADCP and data files. The Text Data section presents text based related to the ADCP, deployment and data represented in the graphs. The Ensemble Plots a presents graphically the data collected by the ADCP. Below is a detailed description of the content in this tab.



10.1 Data View Controls

The Data View Controls section is on the left side of the screen and allows the user to interface with the ADCP and view data files. The section is broken into five subsections. Detailed descriptions are presented below.

10.1.1 ADCP Control

Allows the user to interface with the ADCP in real-time and view data. There are five buttons in this section, described below. Note that tabular data and graphs are updated and present real-time information.

Start – starts data collection of the ADCP.

Stop – stops data collection of the ADCP.

Break – sends a signal to the instrument to test the communication line for which the instrument should respond with time and serial number.

Sleep – puts the instrument into sleep mode. If the instrument is programmed for a deployment to collect data a t a later time the instrument will do so.

Set Time – allows the user to set the time of the instrument.

10.1.2 PlayBack

This section allows users to select a file and playback the data sequentially. There are five buttons in for controls and are described below.

File: opens a navigation window to the folder c:/RTI_Download_Data to find a file.

Minus sign "-": allows users to move backwards in time when viewing ensembles.

Plus sign "+": allows users to move forward in time when viewing ensembles.

Go: automatically starts playing the ensemble data sequentially.

Pause: temporarily pauses the playback of the data files, click Go again to start collecting data files.

Stop: permanently stops data playback. To initiate playback data a new file must be selected.

10.1.3 View Select

This section provides a series of three radio buttons that allow users options in viewing data.

Profile Graph – is a graphic representation of the data with plots for velocity, amplitude and correlation.

Profile Text – presents ensemble data in tabular form.

Bottom Track – presents a series of data in report format about bottom tracking for each ensemble.

10.1.4 Profile

The profile section allows users modify the view of certain types of data, presented below.

Coordinates – changes the coordinate system for the measurements in the graphic and tabular data. Clicking the button changes the coordinate system from XYZ to Beam to ENU coordinates.

First Profile Bin – allows users to change the first bin of the collected data, by using the "-" and "+" buttons; essentially increasing the blanking distance.

10.1.5 Statistics

Provides users options for visualizing statistical data in the plots and tabular data. Below are descriptions of the utilities.

Clear button – clears the plots tabular data of statistical calculations.

None – radio button that when selected displays no statistical calculations.

Standard Deviation (S.D.) – radio button that when selected presents the standard deviation associated to the collected data.

Average – radio button that when selected presents the average associated to the collected data.

Min/Max – check box that plots the data based on the maximum and minimum vales observed, essentially a scaling factor for viewing data.

10.2 Text Data Section

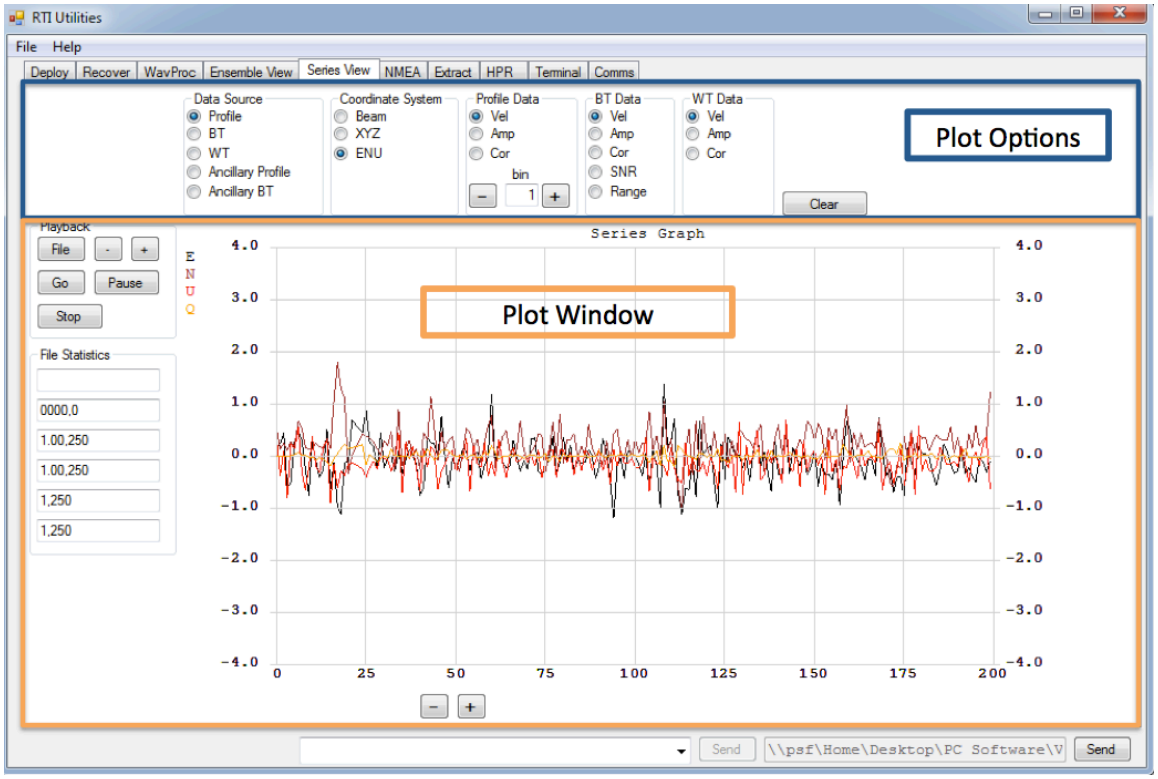
This section presents a text summary of the data collected and calculated in each ensemble. In addition, information is presented about the type of system and how the system was setup for deployment.

10.3 Ensemble Plot Section

This section resents data in graphic form. The options to the left (described above) aid in viewing the data in detail as well as presenting additional options. It is important to note that the Plot section can be used to review recorded data or collect data in real-time, which is useful to collect data prior to deployments.

11 Series View Tab

The Series View Tab presents options to view the data in time series organized by sample number on the x-axis. The tab is divided into two sections, Plot Options and Plot Window (described below).



11.1 Plot Options

The Plot Options section is divided into five sections. Each section allows users various plotting capabilities. The first two sections Data Source and Coordinate System are the basis for the plots and Profile Data, BT Data and WT are sub options for data plotting. The plotting sections are described below. A clear button is presented in the top middle of the page to clear all graphs.

11.1.1 Data Source

Clicking on the radio button plots the data type in the Plot Window at the bottom of the page. Modifications to the plot can be done using the other radio button sections to the right.

Profile – presents time series profile data from each beam of the ADCP.

BT (Bottom Track) – presents times series bottom track data from each beam of the ADCP.

WT (Water Track) – presents time series water track data collected form the ADCP.

Ancillary Profile – plots temperature (in Celsius) for the water (w) and the electronics (b) and Pressure (in meters and Pascals).

Ancillary BT - plots temperature (in Celsius) for the water (w) and the electronics (b) and Pressure (in meters and Pascals).

11.1.2 Coordinate System

Allows the user to select between Beam, XYZ and ENU coordinate systems for the plotted data via radio button.

11.1.3 Profile Data

Allows users the options of plotting Velocity, Amplitude or Correlation data (for the Profile data) by clicking on the associated radio button.

11.1.4 BT Data (Bottom Track)

Allows users options of plotting Velocity, Amplitude, Correlation, SNR and Range for Bottom track data by clicking in the respective radio button.

11.1.5 WT Data (Water Track)

Allows users the options of plotting Velocity, Amplitude or Correlation data (for the Water Track data) by clicking on the associated radio button.

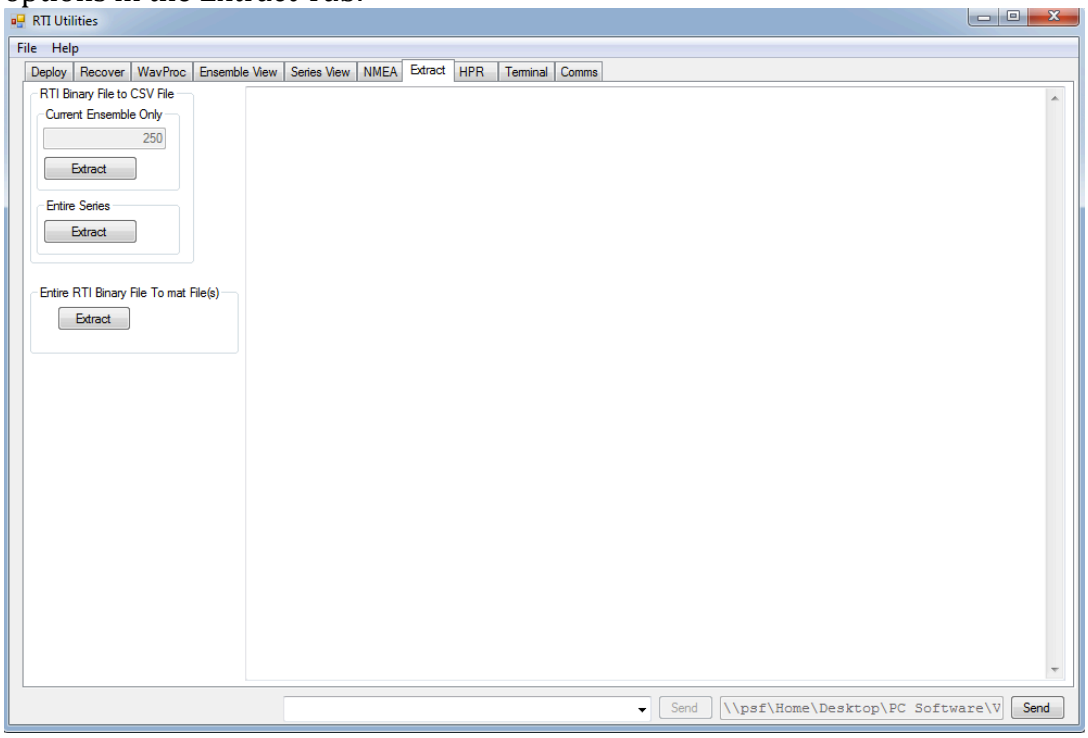
11.2 Plot Window

The Plot window displays time series information from saved files. The X-axis presents sample number and the data presented corresponding to the Y-axis is determined by the selections using the radio buttons at the top of the screen (described above). The plus sign "+" and minus sign "-" at the bottom of the screen allows users to view incremental files.

File statistics presents standard statistics for the given file.

12 Extract Tab

The Extract Tab allows users to Extract or export data to MatLab or ASCII. Data is extracted based sample/ensemble or the entire series. Below is an example of the options in the Extract Tab.

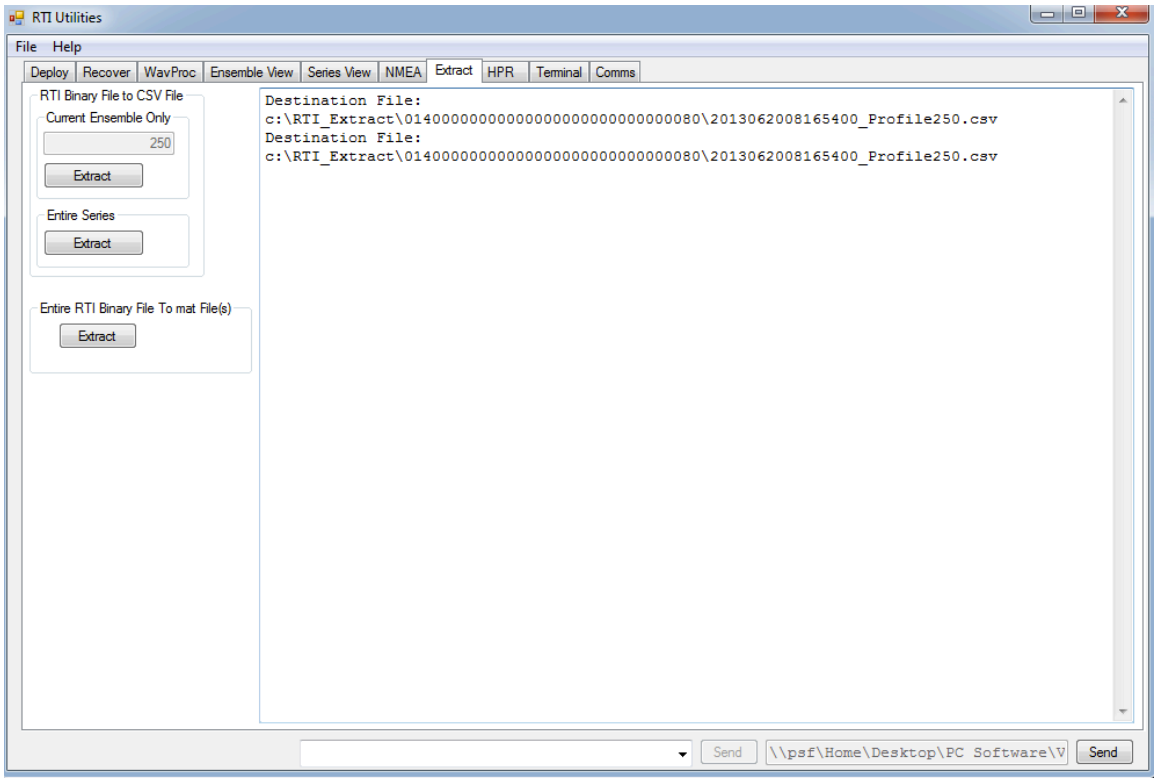


There are two options for extracting data from a RTI Binary File to a CSV file. Clicking the Extract button below Current Ensemble Only will create text files with all of the ensemble information for the ensemble indicated in the text box (for this example 250).

If a user would like to extract all of the ensemble data for the entire data series, simply click the Extract button in the Entire Series section. The user will be prompted to select a file and the new CSV files will be extracted to the RTI_Extract folder (c:\RTI_Extract) in a subfolder based on serial number. The file name is automatically defaulted to the date (yyyymmddhhmmss format). The CSV file will have all headers identifying all column of the table of data.

In the Entire RTI Binary File to .mat File, users can click on the Extract button, the user is required to select a data file and then the software will extract the data in a MatLab compatible file to RTI_Matlab (c:\RTI_Matlab) folder in a subfolder based on serial number. The file name is automatically defaulted to the date (yyyymmddhhmmss format). The .mat file will have all headers of the table of data labeled. It is important to note that this function will create one .mat file for each ensemble in the RTI binary file.

Below is an example of the dialog for extracting a file. The Dialog window indicates the destination and file name of the extracted file.

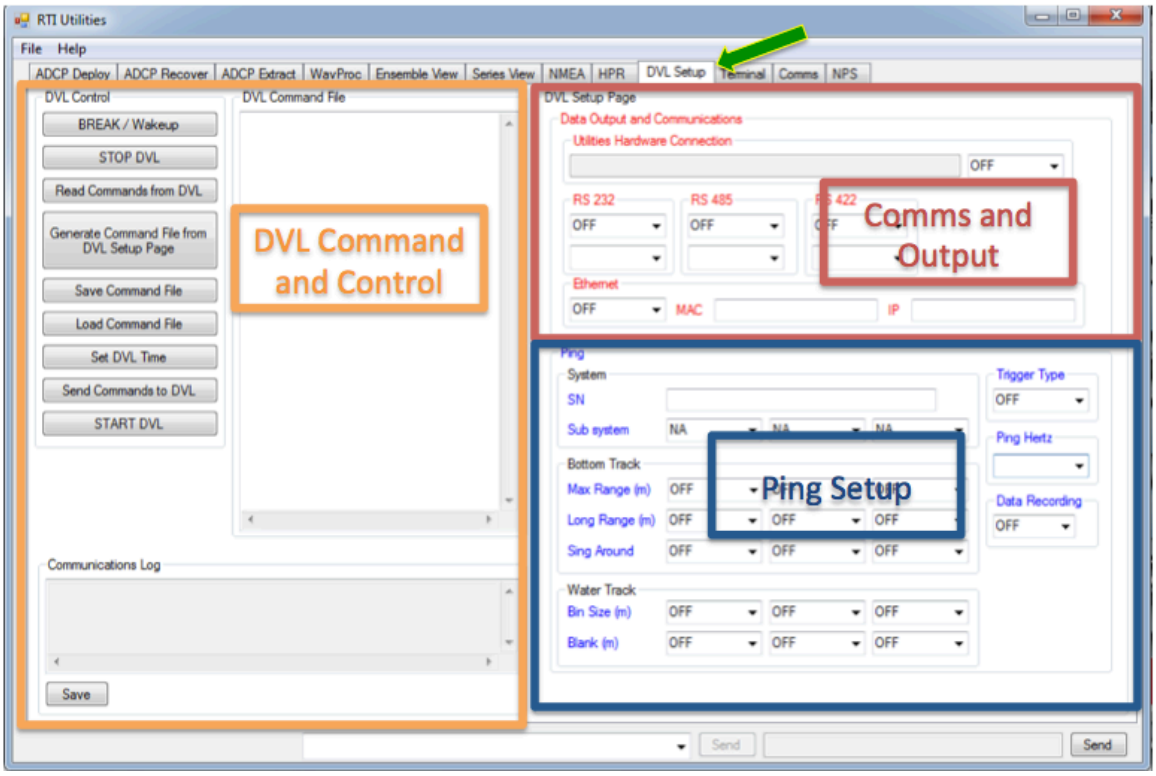


13 NMEA Tab

Is used to configure the NMEA string, please work directly with RTI to use this Tab.

14 DVL Setup Tab

The DVL Setup tab we developed to interface with efficiently and effectively with Rowe Technologies DVLs. The Tab is broken up into three sections, namely DVL Command and Control, DVL Comms and Output and Ping Setup. Below are descriptions of the DVL Setup Tab features followed by suggested workflow.



14.1 DVL Command and Control

This section provides communications with the DVL and is used to interface by sending commands to the DVL (via the Command File Window). Below is a list of options for communicating with the DVL:

BREAK/Wakeup – establishes communications with the DVL, once recognized a wakeup message is presented in the communications log.

STOP DVL – stops the DVL data collection, often referred to as "Pinging".

Read Commands from DVL – Reads the existing command set/DVL configuration.

Generate Command File from DVL Setup Page – Generates a script or list of commands that are generated by using the DVL Setup and Ping Setup windows and are presented in the DVL Command File window.

Save Command File – Saves the string of commands presented in the DVL Command File window in .txt format to the C:\RTI_Configuration_Files Folder. These files can then be used to upload to the DVL using the Load Command File or by copying and pasting the script into the DVL command file window.

Load Command File – Opens a browser window that allows users to select a file to configure the DVL. The browser window is defaulted to C:\RTI_Configuration_Files, however configuration files can be located and navigated to in other locations on the computer.

Set DVL Time – Sets the time of the DVL to the time of the computer that is interfacing with the DVL.

Send Commands to DVL – Sends commands to the DVL that have been loaded to the DVL command window, either by typing the information or loading a command file.

START DVL – Saves the commands sent to the DVL and initiates data collection or "Pinging".

DVL Command File - section shows the commands to be sent to the DVL either by directly typing them into the window, via loading a Command File or by configuring the DVL in the DVL and Ping Setup sections.. This window allows for editing commands and adding or deleting commands that will be sent to the DVL.

Communications Log - summaries the commands sent to the DVL and allows the user to save the information via clicking the save button. Saving the information in the Communications Log is useful for QA/QC and for recalling previous configurations and commands to the DVL.

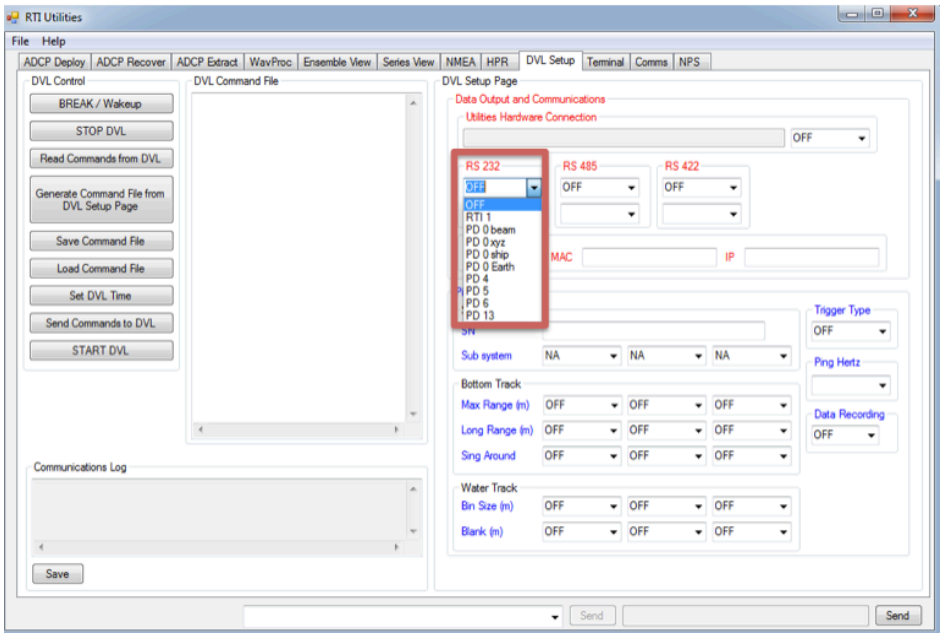
2.1. DVL Setup Section

This allows users to configure the Data Output and Communications of the DVL. The drop down menus allow users to configure the output formats and communication protocols as well as baud rates, as highlighted below**:**

- Utilities Hardware Connection identifies the hard connection on the PC and the inside the DVL and also includes the baud rate.
    - This setting must be set to OFF to configure other output options (below)
- First select the type of communications to be used and the associated output format from the drop down menu.
- Next select the baud rate corresponding to the communications protocol using the drop down menu.
- In the case that an Ethernet connection is used, select the output format and fill in the required MAC and IP information as described in the RTI ADCP/DVL User Guide

It is important to note that RTI DVLs support simultaneous independent communications with different output formats. As such data from a DVL can be used for station keeping using one communications channel (via RS232 for

example) and then utilize another data format, for surveying on the RS485 line for example. This type of dual Coms/Output formats cannot be done using RS422 due to hardware constraints.



Below is a description of the output formats that can be used:

RTI 1 – NMEA RTI output string (defined in detail on page 42 of RTI ADCP/DVL User Guide
PD 0 beam – applies standard PD0 format using beam coordinates
PD 0 xyz - applies standard PD0 format using xyz coordinates
PD 0 ship - applies standard PD0 format using ship coordinates
PD 0 Earth - applies standard PD0 format using ENU coordinates
PD 4 – applies standard PD4 format for the data stream
PD 5 - applies standard PD5 format for the data stream
PD 6 - applies standard PD6 format for the data stream
PD 13 - applies standard PD13 format for the data stream

Important Note: PD output formats are industry standard formats for DVLs and are typically a string of data output that is a subset of the total data available. Below is a summary of the data available in PD specific formats:

PD0 - binary output format that includes a header, fixed and variable leader, bottom track, and water profile information. The fixed and variable leader is a recording of time, DVL setup, orientation, heading, pitch, roll, temperature, pressure and self test diagnostic results. The user can select data fields to be output. In the case with RTI instruments users can select the coordinates for the data to be represented.

PD4 - is a binary output format that presents bottom track speed over bottom, speed through water and range to bottom information only.

PD5 – is a superset of PD4 and includes additional information such as, salinity, depth, pitch, roll, heading, and distance made good.

PD6 – is a text-based output format that groups separate sentences containing system attitude data, timing and scaling and speed through water relative to the instrument, vehicle, and earth coordinates. Each data sentence contains a unique starting delimiter and comma delimited fields.

PD13 - is a text output format, like PD6 with the addition of information about range to bottom and raw pressure sensor data.

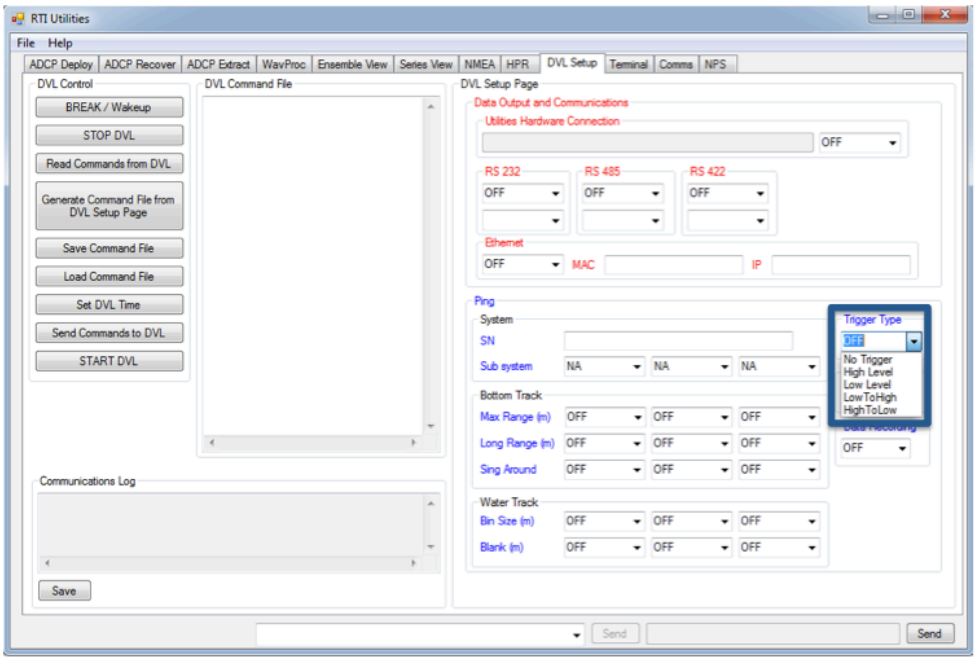
2.2. Ping Control Section

This section allows users to configure the DVL for data collection. The Ping control section is divided into four sections described in detail below. Drop down menus are used to select values in the Ping Control section. Once these values have been selected, click the send Commands to DVL button to the left of the screen (second from the bottom).

System – Allows users to select the system and subsystem to be configured for data collection. Drop down menus allow users to select the available options, which is followed by configuring other options, such as Bottom-Track, Water-Track, Ping Hertz etc.

- In the case that the DVL is connected and communicating with the software the system will be identified by its serial number.
- In the case that a user wants to prepare a deployment for a DVL that is not connected to the software, the user can enter the serial number and other information to set up the file.
- Page 69-70 of the RTI ADCP/DVL User Guide describe in detail the serial number convention used by RTI.

An example of the drop-down boxes in the Ping Control Section is provided below. This example shows the options for he Trigger Type. The other drop-down box options are defined below.



Data recording – allows users an ON/OFF option for data recording. ON records data to the SD card internal to the DVL, while OFF (the default) does not save data to the SD card.

Ping Hertz – sets the ping rate in Hertz for DVL data collection. Options available are 20, 10, 5, 2, 1, 0.5, 0.25. Typically for navigation a higher ping rate is better, however

Trigger Type – allows users to set triggers to activate or deactivate DVL data collection. The drop-down menu provides options to activate external trigger. Details about the trigger are provided on page 36 of the RTI ADCP/DVL User Guide. The DVL does not ping until it detects the selected transition. Ping rate is controlled by the trigger. If the time required to receive and process a ping is longer than the trigger rate the DVL may miss a trigger and will then ping on the next trigger edge.

No Trigger – no trigger is used - default setting.
High Level – Sets the threshold to High to activate the DVL, High corresponds to 3.34 VDC.
Low Level – Sets the threshold to Low to activate the DVL, Low corresponds to voltage values less than 3.34 VDC.
Low to High – allows the user turn on/off DVL pinging. When the DVL detects the selected level it pings at the preset ping interval until the level changes state.
High to Low - allows the user turn on/off DVL pinging. When the DVL detects the selected level it pings at the preset ping interval until the level changes state. Used for precise timing of DVL data collection.

Bottom Track – allows users to set values for bottom tracking or speed over ground in navigation applications.

> **Max Range (m)** – sets the maximum range, in meters, for the DVL to search for the bottom. Essentially the DVL will listen for return signals for the maximum prior to sending another ping.
> **Long Range (m) –** set the range (in meters) at which the DVL will switch from broadband pinging to narrowband pinging. Narrowband pinging has a longer range however is slightly less accurate when compared to broadband. Standard ranges are found on page 6 of the RTI ADCP/DVL User Guide.
>
> **Sing Around** – Traditionally, DVL transducers ping at the same time, however, in some cases side-lobe interference can produce problems when the seafloor is inconsistent in composition and level. The sing-around option was developed by RTI to ping transducers sequentially in order to avoid side-lobe interference. Performance of the sig around option is dependent on site conditions and should be evaluated prior to using for real-time data collection.

Water Track - allows users to set values for water track or speed through water in navigation applications.

> **Bin Size (m)** – allows users to configure the size of the bins for water velocity measurements. Bins are defined as individual velocity measurements that are located equidistant In meters) from the DVL.
>
> **Blank (m)** – blank or blanking distance is defined as the minimum range to start data collection. This distance is measured from the face of the transducer head (in meters).

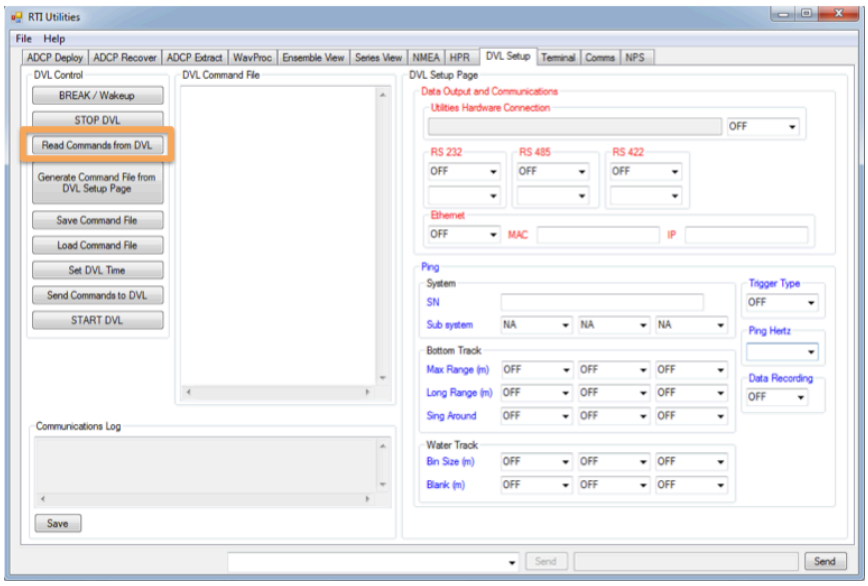
2.3. General Usage and Work Flow

The information presented below highlights the general usage or workflow that is suggested for using the DVL Setup Tab. The main function of the DVL Setup tab is to configure the DVL and create configuration files for future use.

- Prior to using the DVL Setup Tab be sure that you are connected to the DVL using the Comms Tab.
  - Connecting to the instrument is outlined on page 45 of this document.
  - After connecting continue to the next step (below)
- Go to the DVL Setup Tab and the Click Break/Wakeup button
  - A wakeup message should follow
  - In the case that the DVL is still pining click the STOP DVL button and then click break

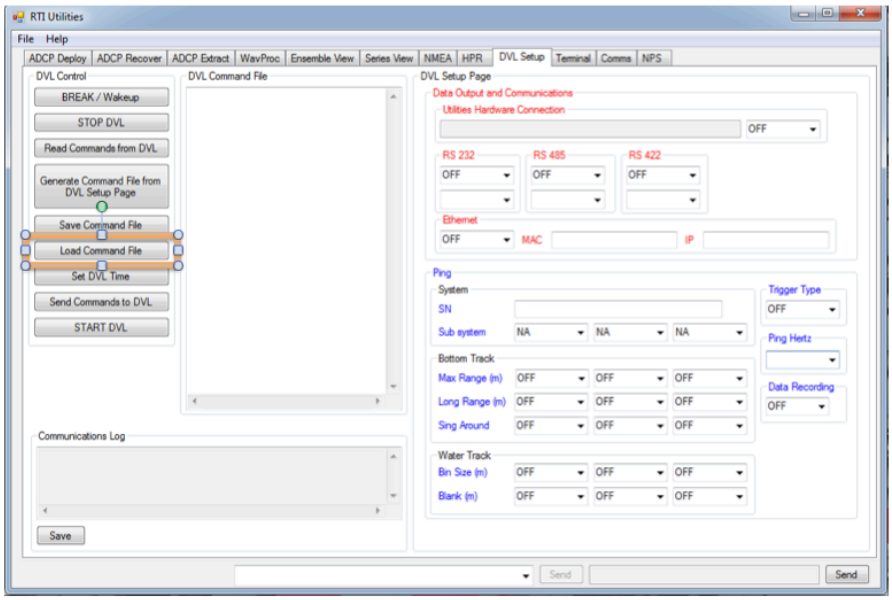
From this point there are a few ways to proceed, namely: read the command file from the DVL and modify, load an existing Command File or use the DVL and Ping Setup windows to configure the DVL. Each option is described below.

Reading a Command File from the DVL - Once connected to the DVL to read the existing DVL configuration, simply click on the Read Commands from DVL Button.



- This read and loads the current configuration into the DVL Command File Window
- Allows for editing and modifying of the text/script in the window
    - Before or after editing it is suggested that you save the new configuration by clicking the Save Command File
- Prior to data collection, it is important to set the time of the DVL, by clicking the corresponding button (Set DVL Time).
- The next step is to send the commands to the DVL by clicking the Send Commands to DVL
- Lastly Click the Start DVL button to start data collection.

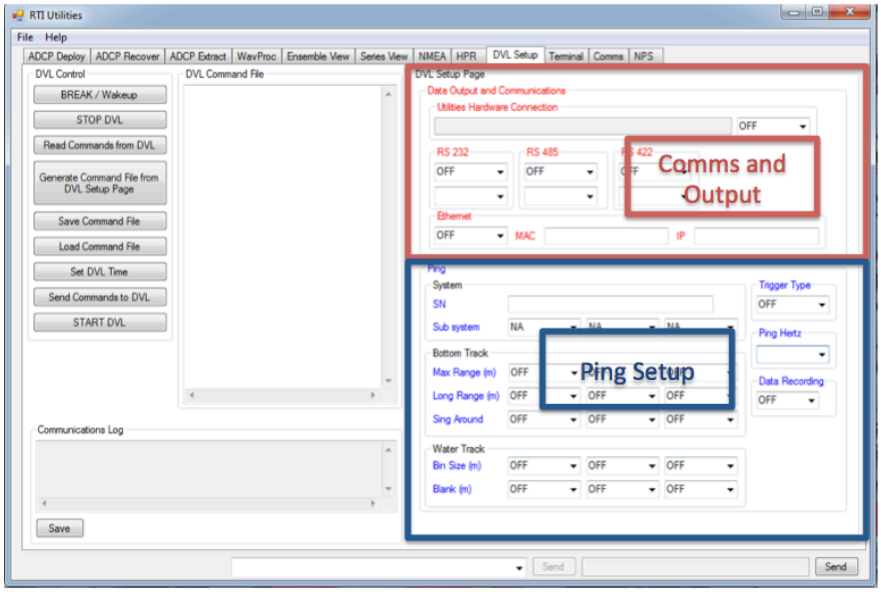
Loading a Command File – command files are text files with DVL commands that are saved on the user computer. These files can be loaded from the computer for rapid DVL configuration. Below are the steps to loading a command file:



- Clicking the Load Command File opens a browser window that allows users to select a file to configure the DVL.
    - The configuration commands are loaded into the DVL Command File Window
- Allows for editing and modifying of the text/script in the window
    - Before or after editing it is suggested that you save the new configuration by clicking the Save Command File
- Prior to data collection, it is important to set the time of the DVL, by clicking the corresponding button (Set DVL Time).
- The next step is to send the commands to the DVL by clicking the Send Commands to DVL
- Lastly Click the Start DVL button to start data collection.

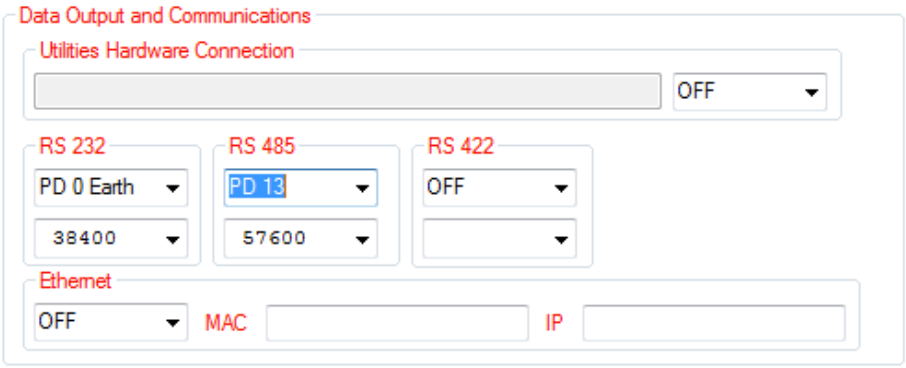
Configuring the DVL Setup Page (DVL and Ping Setup) – The DVL Setup Page provides users a series of drop down menus and data entry fields to configure the DVL. Once finished, simply click the Generate Command File from the DVL Setup Page to configure the DVL. Below are the steps for using the DVL Setup Page.

- The DVL Setup Page has two sections, Comms and Output and Ping Setup



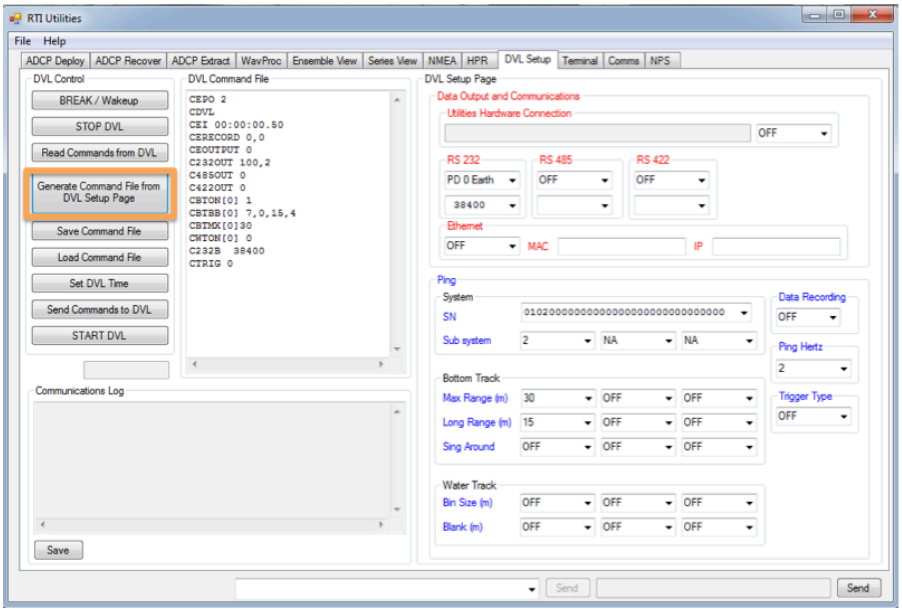
To configure the Comms and Output section use the drop down boxes.

- Utilities Hardware Connection identifies the hard connection on the PC and the inside the DVL and also includes the baud rate.
    - This setting must be set to OFF to configure other output options (below)
- Select the communications protocol that you want to use to output the data
    - It is important to note that RTI supports using RS232 and RS485 simultaneously with different output formats.
- Select the desired Baud Rate from the drop down menu
- For Ethernet turn on the option using the drop-down menu and configure the MAC and IP using the RTI ADCP/DVL user manual
- An example setup is provided below – that highlights outputting DVL data via the RS232 and RS485 ports with two different output formats and baud rates.



After the Comms and Output have been configured, the Ping Setup follows.

- The serial number will be provided if the DVL is connected to the software
    - In the case that the user is not connected to the DVL, the user can enter in a value or the drop-down box provides options.
    - Additional sub systems can be created for additional more detailed configurations, however this setting is typically used for dual frequency systems.
- Data Recording is defaulted to OFF, if it is desired to save data from the DVL mission simply use the drop-down button and select ON.
- Ping Rate can be selected using the drop-down menu; in general, higher ping rates are better for DVL operation.
    - Ping rate will be influenced by DVL frequency and altitude
- Next use the drop-down b ox to select the Trigger Type (each trigger is described above). This setting is defaulted to OFF.
- Bottom Tack values are set using the drop-down boxes; however user defined entries can be done by clicking inside the box and typing a numeric value.
    - Max Range (m) – sets the maximum range, in meters, for the DVL to search for the bottom. Essentially the DVL will listen for return signals for the maximum prior to sending another ping.
    - Long Range (m) – set the range (in meters) at which the DVL will switch from broadband pinging to narrowband pinging. Narrowband pinging has a longer range however is slightly less accurate when compared to broadband. Standard ranges are found on page 6 of the RTI ADCP/DVL User Guide.
    - Sing Around changes the DVL to a sequential pinging configuration, from the default parallel pinging. Prior to using this feature contact RTI Support (sales@rowtechinc.com)
- Water Track values are set using the drop-down boxes; however user defined entries can be done by clicking inside the box and typing a numeric value.
    - Default Bin Size (m) is OFF, however users can enter a numeric value for specific configuration
    - Blank (m) set the blanking distance or the distance where the instrument will begin to water track. Default OFF disables the water Track Option.
- After configuring the Comms and Output and Ping Setup, click the Generate Command File from the DVL Setup Page button to load the commands to the DVL Command File window (example below).



- Commands in the DVL Command File Window can e edited or modified.
  - Before or after editing it is suggested that you save the new configuration by clicking the Save Command File
- Prior to data collection, it is important to set the time of the DVL, by clicking the corresponding button (Set DVL Time).
- The next step is to send the commands to the DVL by clicking the Send Commands to DVL
- Lastly Click the Start DVL button to start data collection.

15 HPR Tab (Heading Pitch Roll)

This tab is used to calibrate the compass of the instrument. Please work directly with RTI in using this tab.

16 Terminal Tab

The Terminal Tab allows users to interface to the instrument by connecting to the ADCP and uploading and downloading files. Below is a description of the functionalities.

16.1 ADCP Control

Allows the user to interface with the ADCP in real-time and view data. There are five buttons in this section, described below. Note that tabular data and graphs are updated and present real-time information.

Start – starts data collection of the ADCP.

Stop – stops data collection of the ADCP.

Break – sends a signal to the instrument to test the communication line for which the instrument should respond with time and serial number.

Sleep – puts the instrument into sleep mode. If the instrument is programmed for a deployment to collect data a t a later time the instrument will do so.

Set Time – allows the user to set the time of the instrument.

16.2 File

This section allows users to interface with files and upload and download files from the ADCP.

Upload – allows users to upload files, such as firmware updates, to the instrument.

To upload new firmware use the following instructions. . It is important to note that upgrading the firmware will erase the previous configuration of the ADCP; as such we recommend that before updating the firmware send a CSHOW command to the instrument and copy the custom commands you have sent to the ADCP to a text or Word file. By doing so you will have your commands saved and have an easy way to upload the same configuration after the firmware upgrade.

To upload the firmware, first load the rtisys1.bin file using RTI Utilities (screen capture below) followed by the boot.bin file. This is done from the Terminal tab of RTI Utilities, using the UPLOAD command in the File section of the screen (just below Ethernet Ping).

After booth files are loaded to the system, please cycle the power to the instrument and send a break. After the system "wakes up", it is important to verify that the files were uploaded. This is done by looking at the firmware version on the terminal window and the date; the new firmware version should be presented (i.e. FW Version 2.40) and the current date should be on the screen.

Download – allows users to download all of the files from the instrument.

Ens Down – cycles down through the ensembles collected.

Erase – provides a method of erasing files from the instruments memory.

Cancel – cancels a function that has been initiated by the user.

The Capture button allows users to capture data in the dialog window and save it as a file. Simply click the capture button and the data will be saved to a text file.

The Combine Files feature allows users to combine multiple files into one file. Simply indicate the file increment and click merge to combine files.

17 Comms Tab

The Comms Tab provides options for managing communications with the instrument.

Radio buttons allow for the selection of the Ethernet or Serial Port for communication with the instrument. In the case that Ethernet is selected an IP Ethernet Address must be entered to communicate via Ethernet.

Default Ethernet IP is 192.168.1.130 and can be changed using the Terminal Interface by sending the IP 192.168.1.130 <CR>. To enable the Ethernet connection from the serial port send CEMAC<CR> in the terminal window.

For serial communications a serial port must be selected as well as a Baud Rate. To select a serial port click the Scan Button in the Serial Communications sections to find the instrument. Essentially the software will scan all available Serial Ports to identify the instrument. To select the Baud Rate, simply select from the options available. Suggested default is 115200.

Below are the following steps to connect to an ADCP/DVL. It is import to follow each step sequentially. It is important to note that RTI Unities Software is designed for a Windows operating system.

Step1: Install Driver

Prior to connecting to the ADCP/DVL, be sure that you install the driver needed for serial communications between the PC and the ADCP/DVL. The drive can be found on the small CD provided in the shipping case or at the following link:

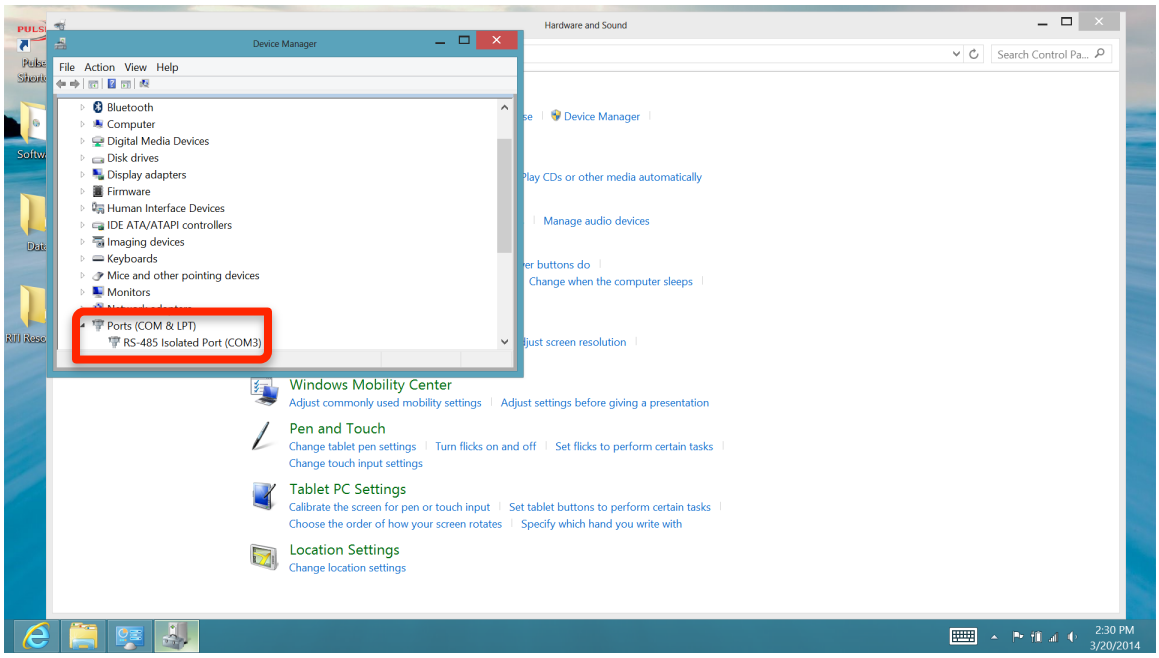
http://www.bb-elec.com/getattachment/c8461811-bebf-456a-8386-6ea1281219b4/USB_Drivers_PKG_v2-08-28.zip.aspx

Follow the instructions provided on screen to install the driver.

Step 2: Verify COM port

To verify that the installation proceeded correctly, insert the USB to Serial Converter into a USB port. Next go to the Control Panel and in the Device Manager menu expand the Ports menu to the COM port. The USB to serial converter should be identified as the following:

RS-485 Isolated Port (COM#)



The number sign will be replaced with an actual number, such as COM3 Indicated by the red box in the screen shot above). This is the COM port that the users should use to connect to the ADCP/DVL.

Step 3. ADCP/DVL Interconnecting

There are a few hard-connections that are required prior to interfacing to the instrument via software.

- Connect the power supply to the instrument cable pig-tail via the keyed two pin connector
- Make sure that the power supply is plugged into a power source/wall
- Connect the keyed green five-pin connector on the instrument cable pig-tail to the USB-Serial adaptor
- Insert the USB connector into a USB port on the PC

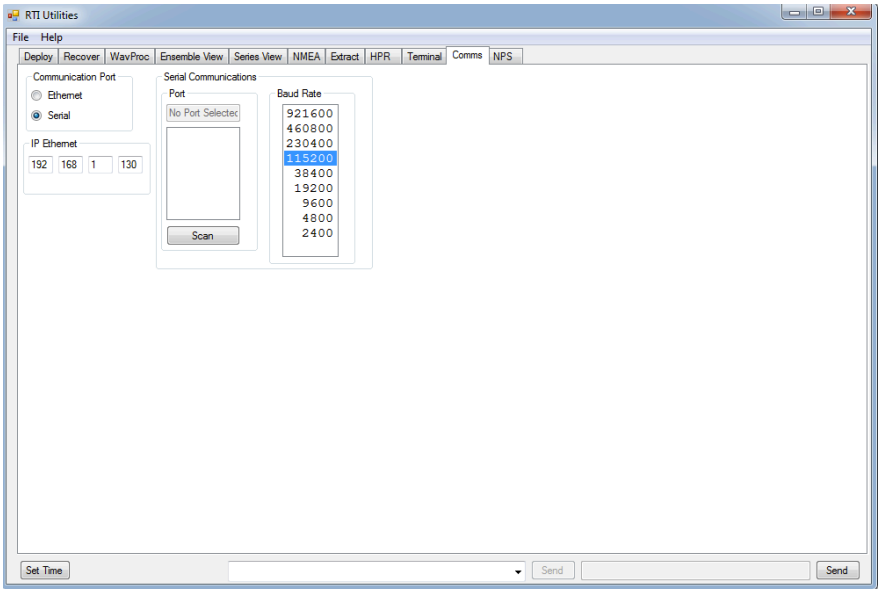
Troubleshooting: Once everything is interconnected, look at the ADCP/DVL. If things are powered up correctly, a red and a green light should be visibly pulsating/flickering – you may need to turn the lights off for the best view. If these lights are not visible verify that your connections are correct and that the power

sources is actively providing power. Detailed instructions are provided in the RTI ADCP/DVL User Guide.

Step 4. Connecting to the Instrument via Software

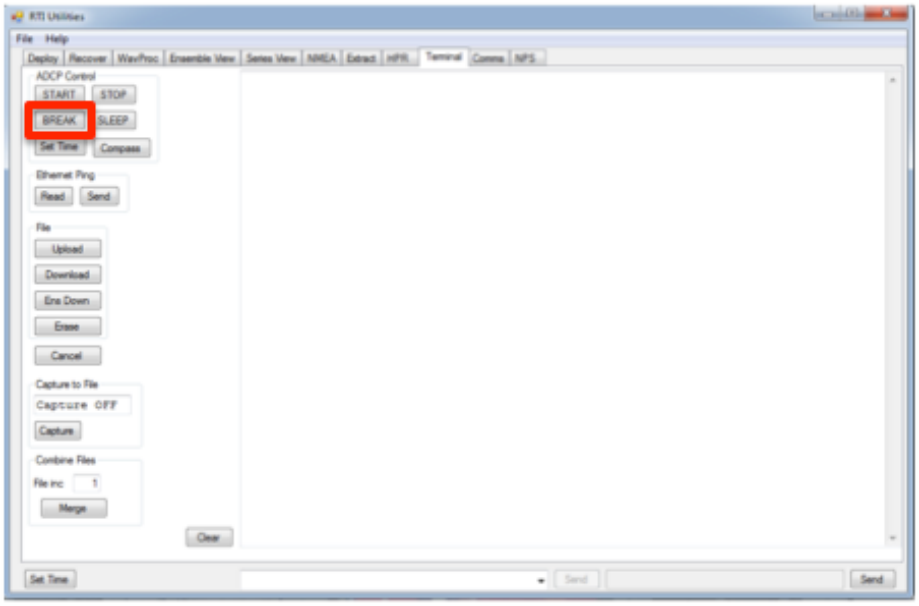
Once all of the instrument interconnections have taken place, (presented in Step 3) open the RTI Utilities Software to connect/interface with the ADCP.

- Be sure that the Serial Radio Button is selected (as in the image below)
- Click Scan in the Serial Communications, Port Section of the software – this will scan and display available COM Ports.
- Select the COM Port identified in Step 2 above.
- Make sure default baud rate is selected (115200)

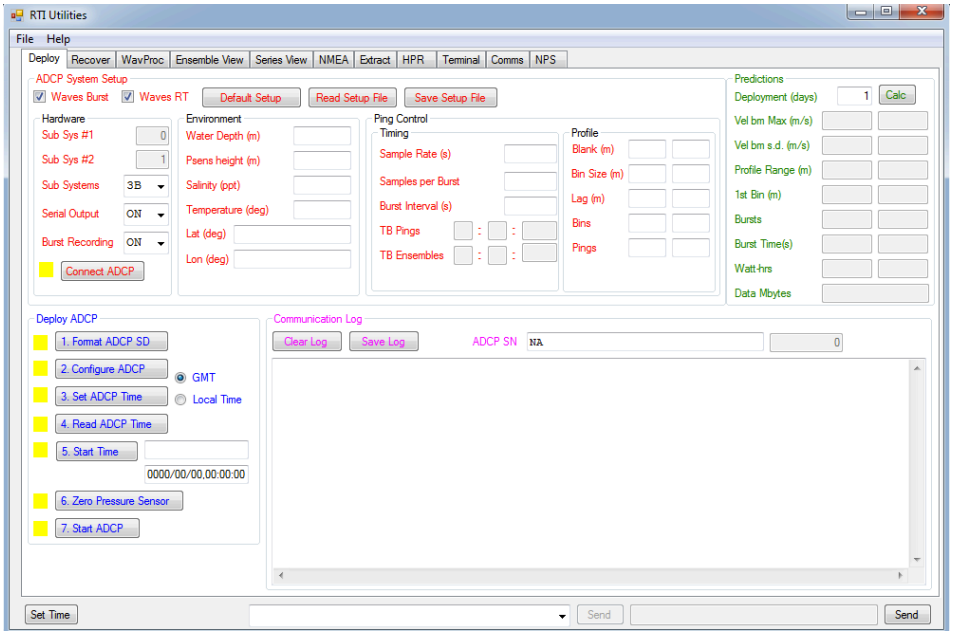


- In order to verify the instruments COMs are setup correctly; go to the Terminal tab (to the immediate left of the Comms Tab, example below).
- Click on the Break button to "wake-up" the instrument, a similar text string will appear in the terminal window:

Copyright (c) 2009-2014 Rowe Technologies Inc. All rights reserved.
DP600 DP1200
SN: 013A0000000000000000000000000121
FW: 00.02.40 Mar 28 2014 12:24:24



- After the instrument is connected – go to the Deploy Tab or the DVL Setup tab to configure the ADCP/DVL (below). Click on the Connect ADCP to connect and configure the ADCP.



Troubleshooting: In the case the system does not connect using the known COM port, please try another baud rate. Although, default set-up baud rate is 155200, the system may have been used in another baud rate – cycle through various baud rates in the know COM to connect to the instrument.