DataLog x2 and Terminal x2
Installation and User Guide

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Contents

1 Introduction

DataLog X2 and Terminal X2 are software packages to interface, configure and download data from Valeport Instrumentation. DataLog x2, in addition to interfacing and download capability, has extensive graphing and data analysis tools built in.

Terminal X2 will work with any Valeport Instrument that communicates via serial RS232. Functionality may be limited with some older instruments.

At present DataLog X2 is not fully compatible with the following instruments and the listed packages should be used instead:

Equipment	Software to be Used
TideMaster	TideMaster Express
MIDAS DWR	WaveLog Express
MIDAS WTR	WaveLog Express
MIDAS Surveyor	SurveyLog
MIDAS BathyPack	BathyLog
MIDAS CTD+	DataLog Pro
Model 803	ROVLog

2 Installation

2.1 System Requirements:

DataLog X2 and Terminal X2 have been tested on Windows 8, 8.1 and 10.

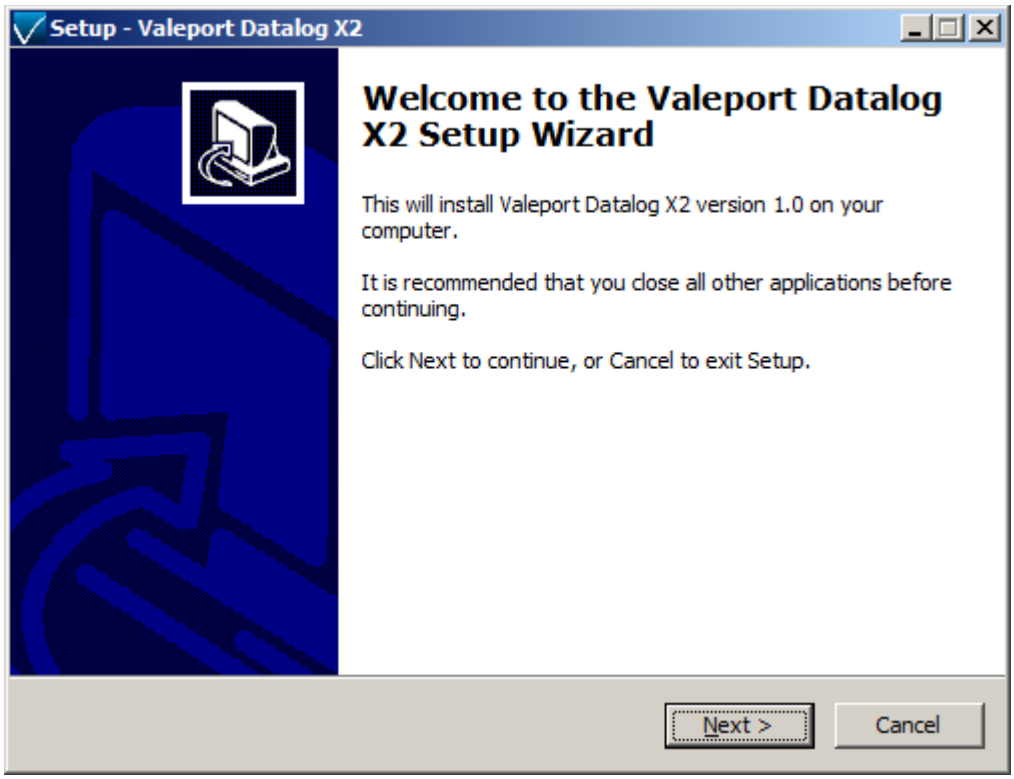
Basic Requirements: 800MHz processor; 512MB of RAM; 1024 x 768 screen resolution; Free Disk-space 20Mb (excluding data); IE6+ installed.

Recommended Requirements: 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor. 2 gigabyte (GB) RAM (32-bit) or 4 GB RAM (64-bit); 1280 x 1024 screen resolution; Free Disk-space 20Mb (excluding data of course!); IE9+ installed.

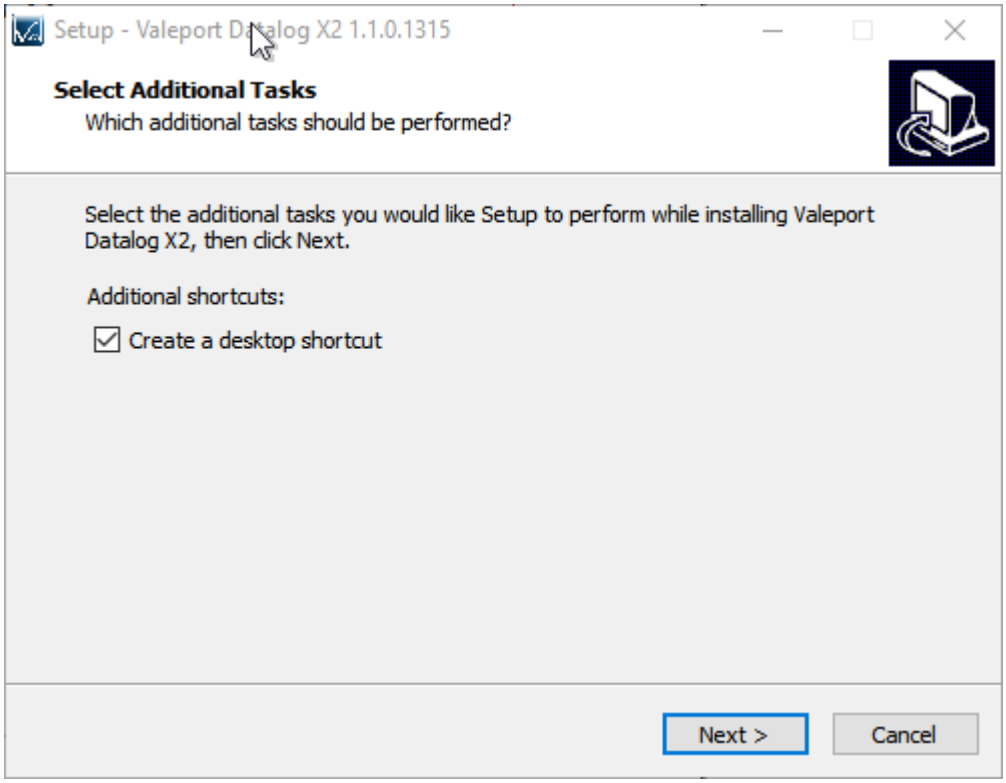
2.2 Installation Process:

To Install: Run Setup.exe from the installation directory.

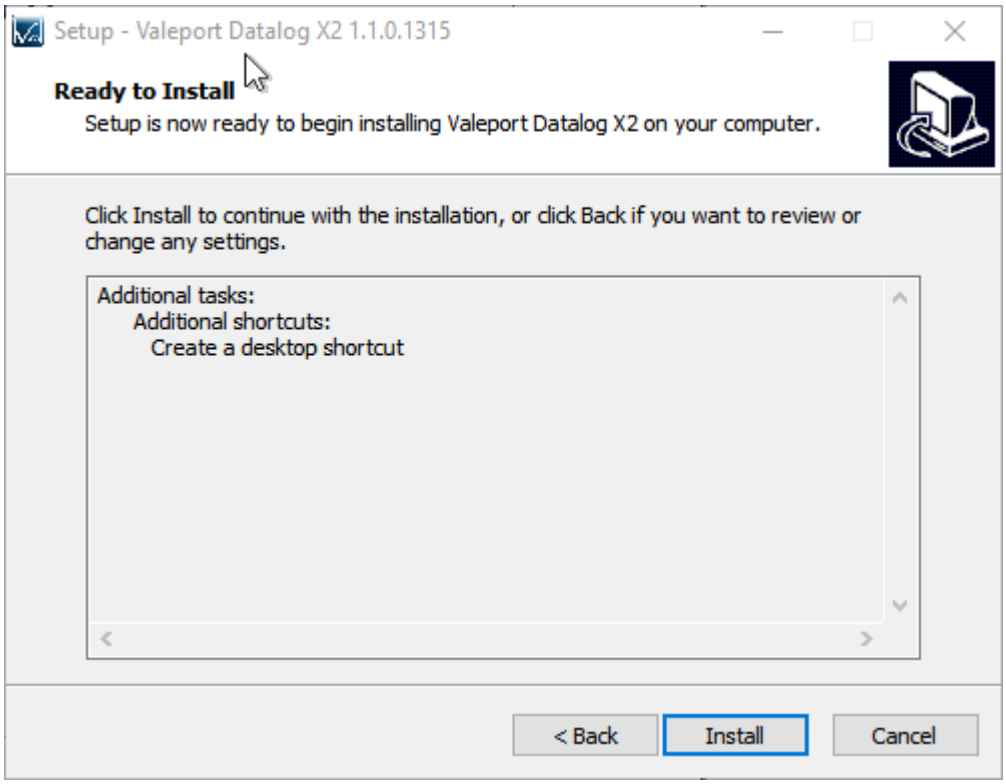
Note: You may need to accept a Windows security warning to proceed based upon your system configuration.



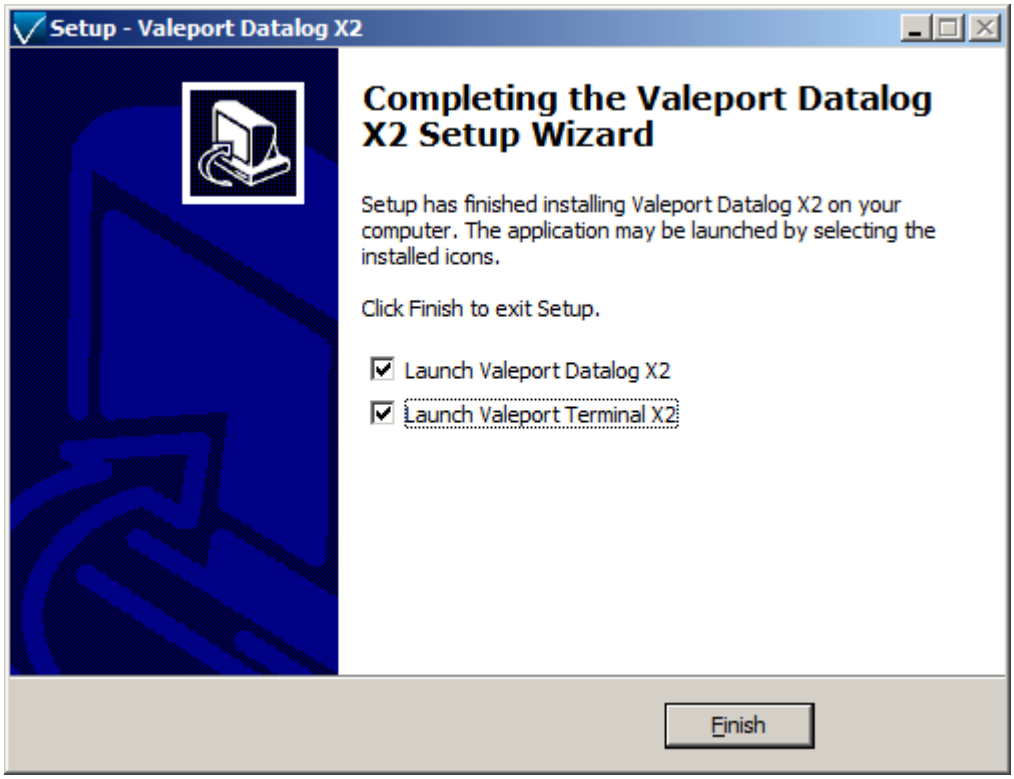
Confirm additional settings as required



Confirm the installation tasks and click "Install" to finalise the installation.



Installation can be terminated at any time by pressing the "Cancel" button.



2.3 **Uninstall**

To uninstall DataLog X2, navigate to the Windows "Control Panel" and select "Remove Program", DataLog X2 can be selected from the program list and uninstalled.

2.3.1 Starting DataLog X2

To start DataLog X2 use the following methods:

Navigate to the "All Programs" link under the Windows "START" menu

Navigate to the folder "Valeport Software"

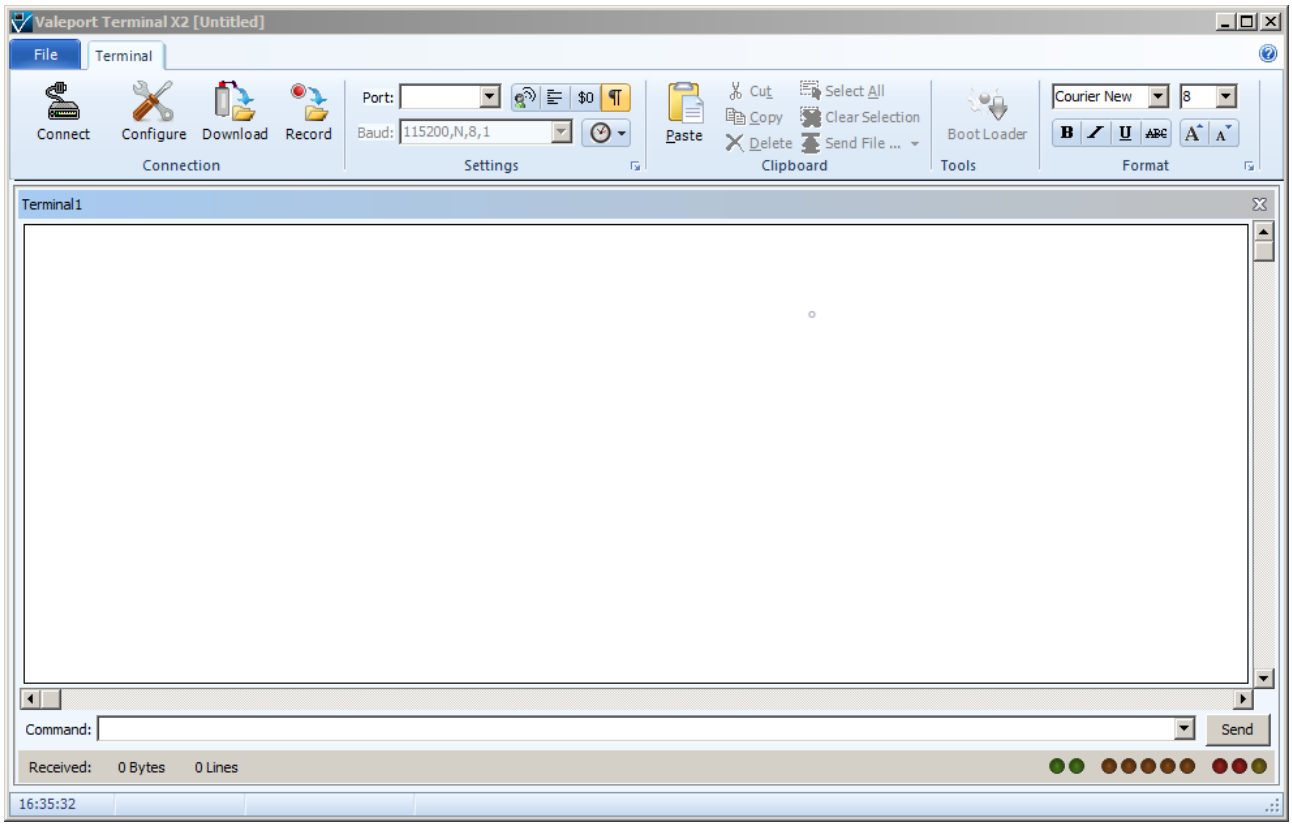
Click the icon "DataLog X2"

Alternatively, if during setup you chose to create a desktop icon, locate the icon on the desktop and double-click to open DataLog X2.

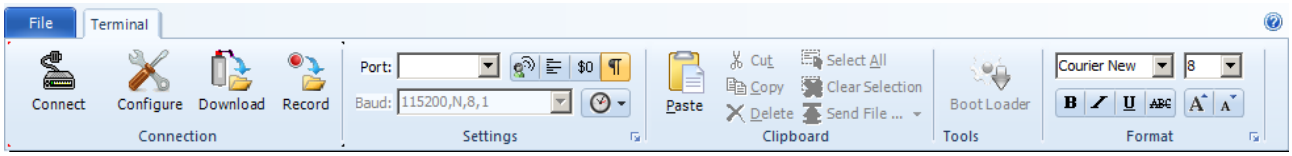
3 Terminal X2

Terminal x2 is a lightweight terminal program for serial communication, configuration and control of Valeport Instruments. It is intended as a direct replacement for Hyper Terminal which is no longer available for Windows PC's.

It has a number of additional features over and above most terminal packages including data logging, wizard based instrument configuration, file downloads, multiple port connections and TCP-IP serial connection for use over internet connections.



3.1 Terminal Toolbar



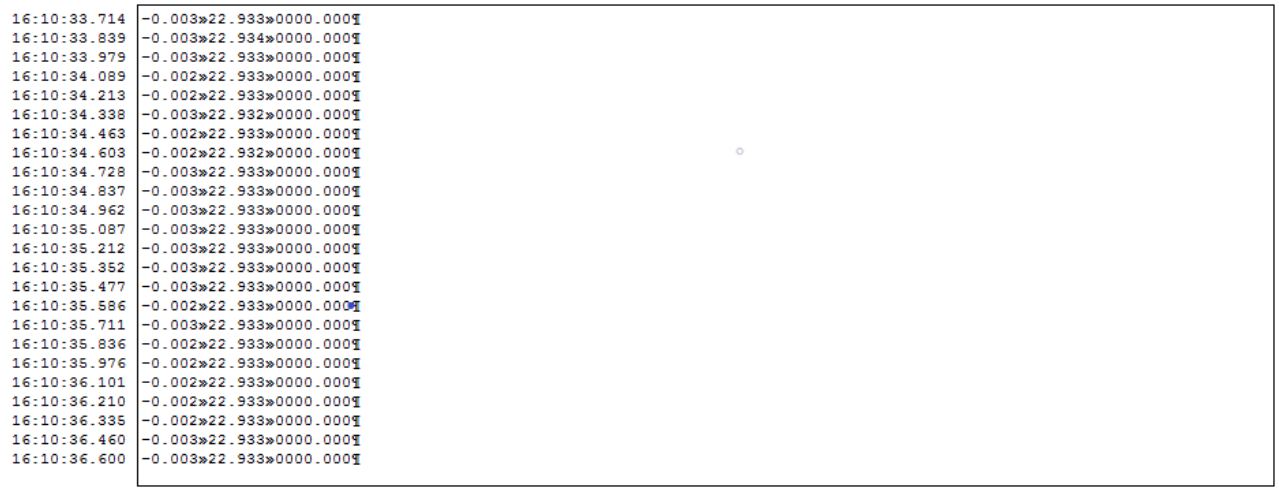
This allows the port to be configured, serial com ports or TCP/IP ports can be selected. Baud rates can be changed whilst still connected. Default port settings are 8 bit, No stop bit, No 1 Parity Bit. These settings can be changed but as standard will work with all Valeport instruments.

Other options available from this toolbar include echo on/off, wrapping, hexadecimal split screen, hide/show special characters and time stamping.

Connection Status

Shows the current port, baud rate and protocol and connection status.

Connection Window



The connection window shows any communications between the PC and the connected instrument. In the example above the time stamping is enabled. Once the window is full, it will scroll with any received data. Data can be highlighted, selected, copied and pasted.

Commands can be typed directly into the connection window or entered into the command line window below

Command Line and Dropdown

The command line can be used to send commands to a connected instrument. A history of sent commands can be accessed with the drop-down functionality

Connection information

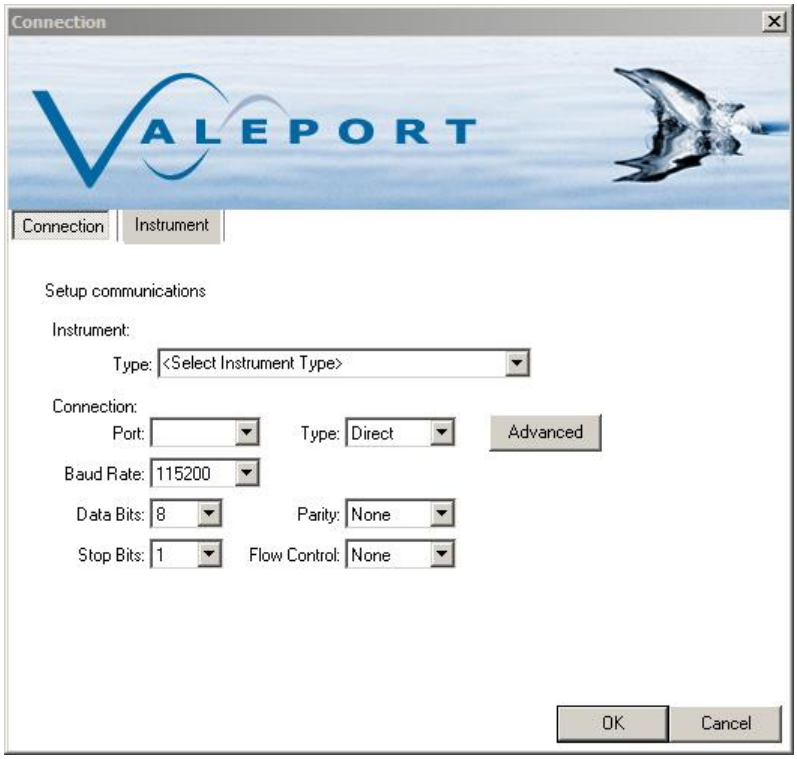
Shows volume of data received during currently connected session, number of lines of data received and rate at which data is being received.

3.2 Establish a Connection

There are two methods of establishing a connection. When the instrument type is known and when a generic serial connection is required.

Clicking on the connect icon will bring up the connection wizard. The instrument type can be selected from the drop down list.

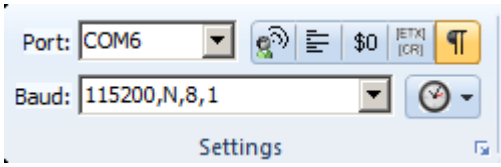
The connection settings will default to the factory settings for that instrument. If these have been changed by the user it may be necessary to change these.

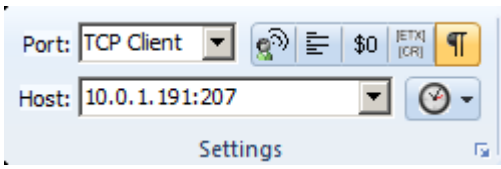


Alternatively, set the connection up using the settings toolbar. Once the appropriate port and baud rate settings are selected, press the connect icon to establish a connection

To establish TCP-IP serial connection, select TCP-IP port from the drop down menu,

Enter the IP address and port in the Host settings



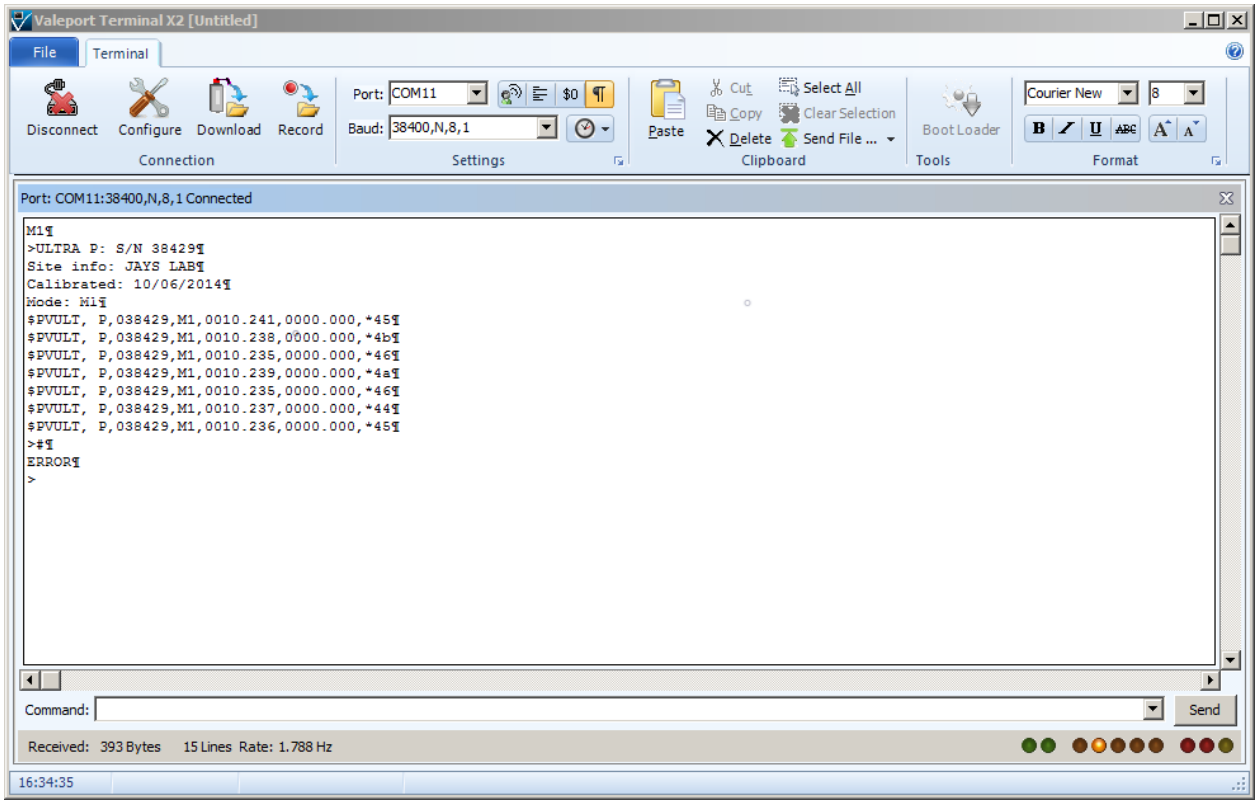


Once the connection is established, the status bar will show the connection details and any communications will be shown in the window.

Commands can be issued via typing directly into the command window or via the command toolbar.

The command toolbar stores a history of issued commands.

The status toolbar shows the amount of data received, sent and the received rate of data.



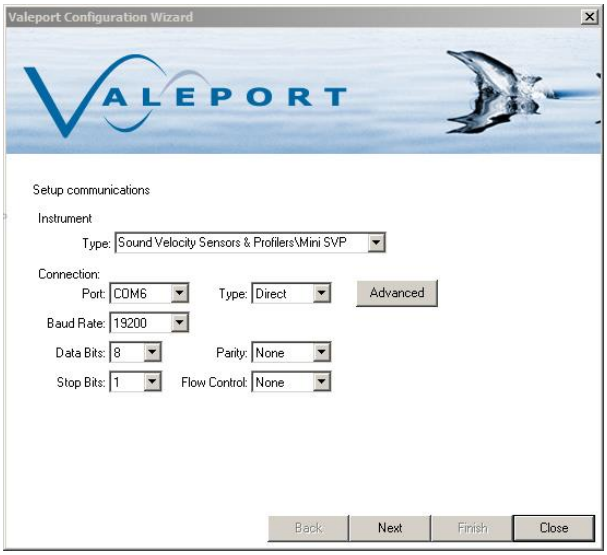
3.3 Configure an Instrument

The configuration wizard is instrument specific and the options given will depend on the instrument connected, the example given here is for a MiniSVP.

Clicking on the configure tool will bring up the configuration wizard.

Select the instrument type and the connection settings will be set to the factory default for this instrument. They can be altered if required.

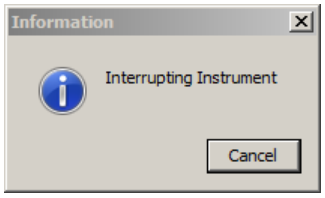
Select the comm port the instrument is connected to and click next.



At the next window, set the timeout setting for interrupting the instrument.

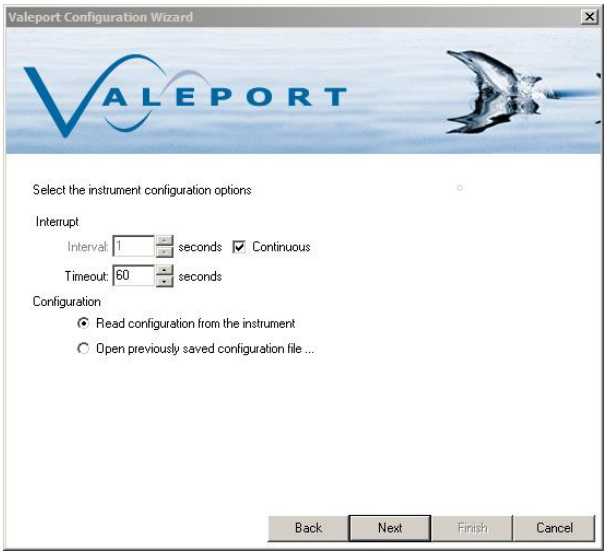
If attempting to connect to an instrument operating in Burst Mode, the timeout should be set to greater than the burst interval.

When Next is clicked the configuration wizard will attempt to interrupt the instrument and read out the current configuration.

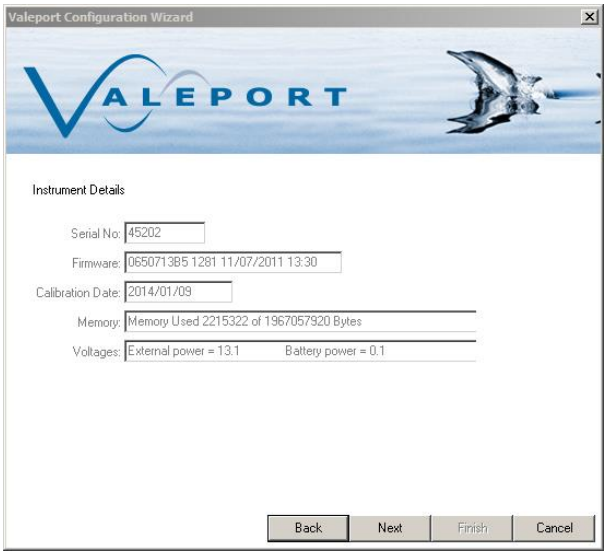


If the wizard fails to interrupt the instrument, then check the connection settings and retry.

If the instrument is successfully interrupted, commands and responses should be visible in the command window behind the configuration wizard.



The first wizard window shows information about the instrument. Boxes are greyed out as information cannot be changed by the user.



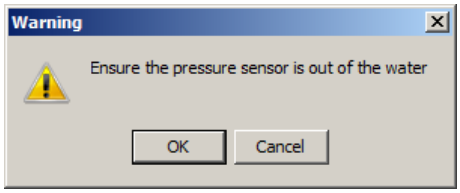
The next screen allows the pressure sensor to be configured.

Output units can be set and the Tare setting can be configured.

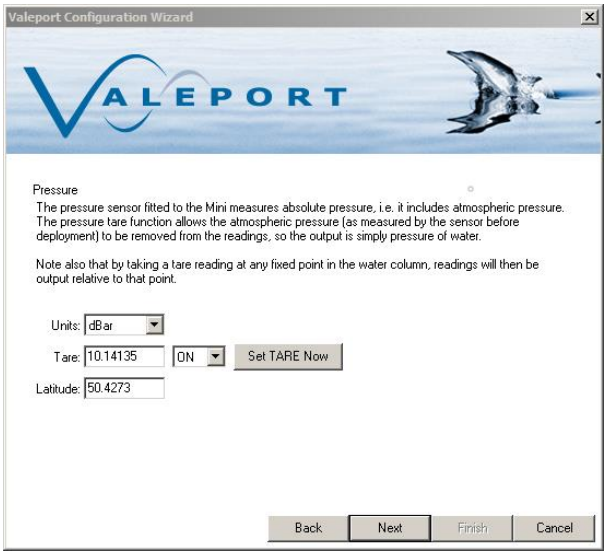
To set a manual Tare, enter the required figure in the box.

To take a measured Tare, press the Set Tare Button.

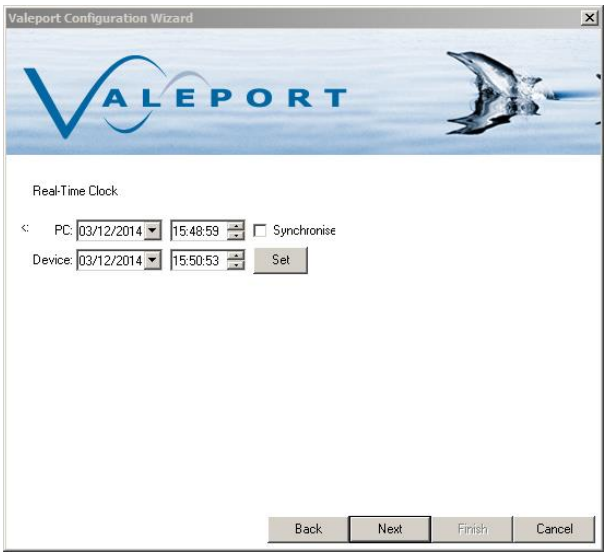
The following dialog will pop-up.

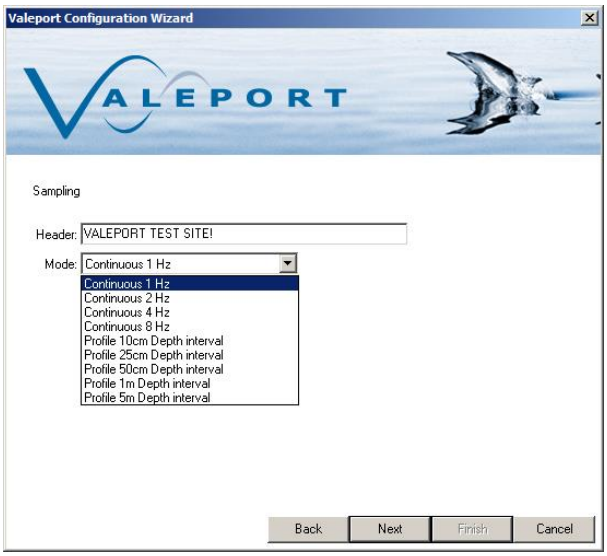
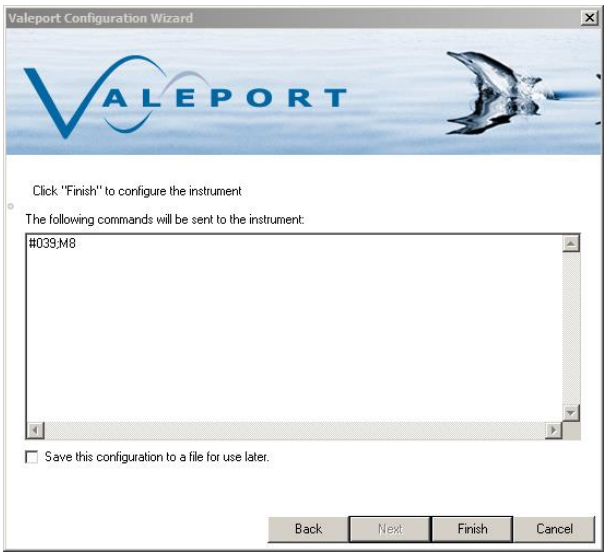
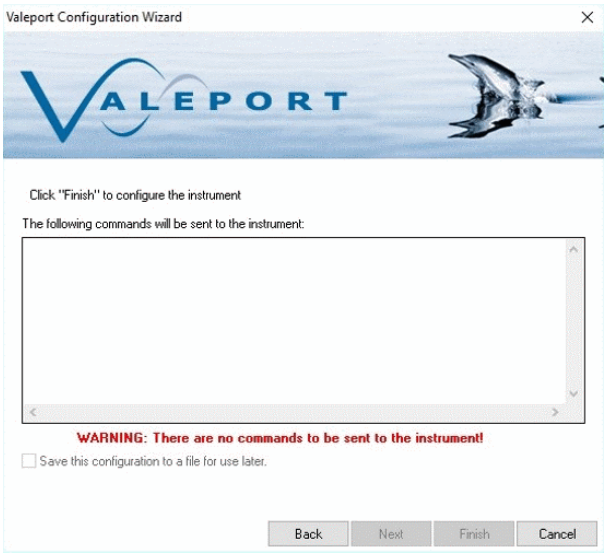


The Latitude value is used to convert pressure to depth. An approximate value can be used for the operational area.



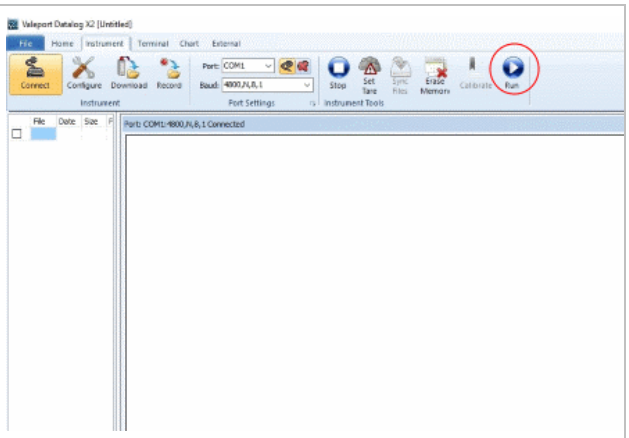
If the instrument being configured has a Real Time Clock, the option to sync it to PC time is available.



Header is a free text field that will be inserted into the header of every recorded file. Sampling modes will depend on the instrument connected.	
The final screen will show a summary of the commands that will be sent to the instrument.	
If settings have not been changed, then no commands will be shown and the finish button is greyed out. Simply type a # into the command window and the Finish button will be available.	

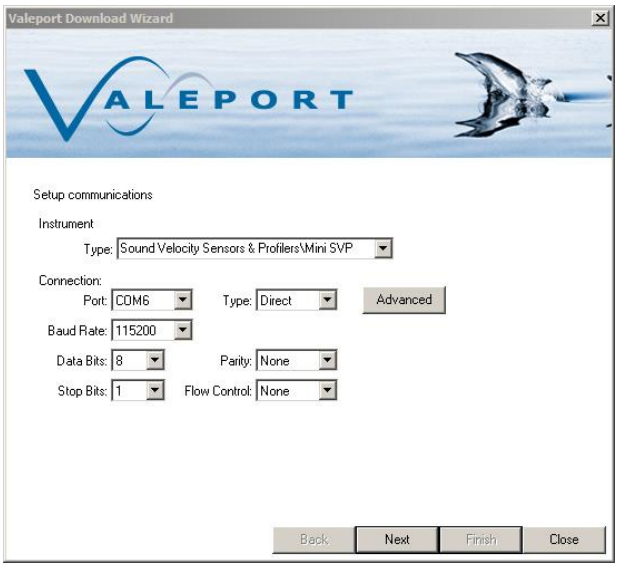
Once the configuration is completed, the instrument will be in a paused ('interrupted') state and, therefore, will require prompting from the user to set it running. This can be achieve in one of 3 ways:

1. Select the RUN button in the instrument tab of DataLog X2 (See image).
2. Enter the command #028 in the Terminal window.
3. Disconnect, then reconnect the Power/Comms cable to activate the instrument.

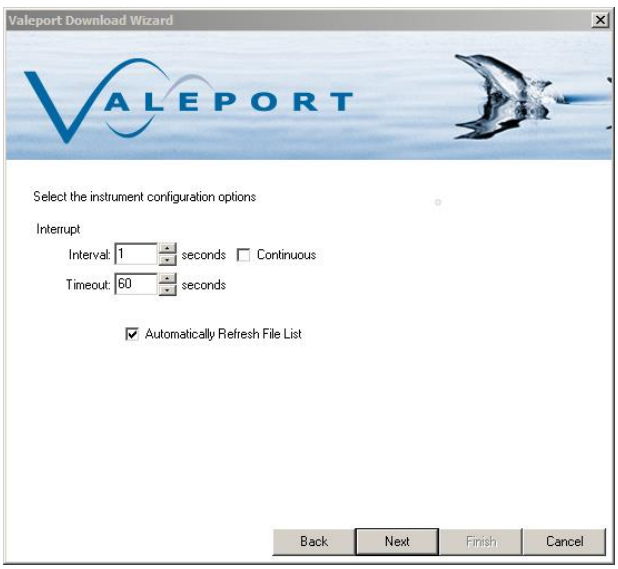


3.4 Download a file

Clicking on the download icon invokes the Download Wizard. As with all wizards the first stage is to identify the connected insturment and comms settings.



Ensure the instrument is switched on and connected. Extend the interrupt timeout if the unit is operating in burst mode (or cycle the power to the instrument)

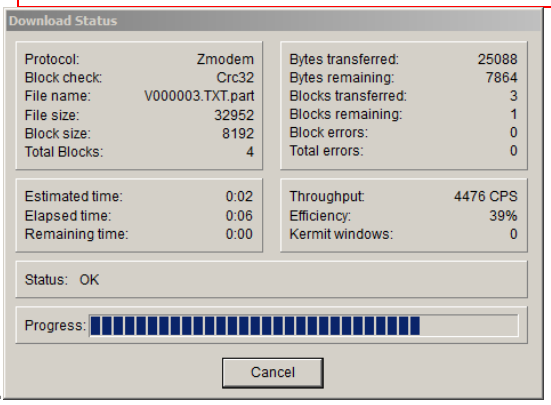


Location to download files to can be defined here. Sub folders by instrument and date will automatically created.

For instruments that support individual file downloads (mini and 400 series), a file list with check boxes will be displayed.

For older instruments such as the model 106/108/308 and the model 740, the entire memory has to be downloaded in one

A status window will show the progress of the download and estimated completion time.



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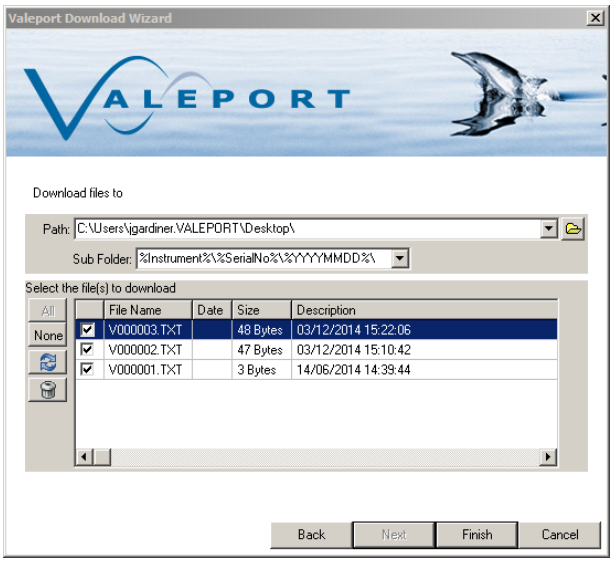
Files can be deleted by clicking on the bin icon.

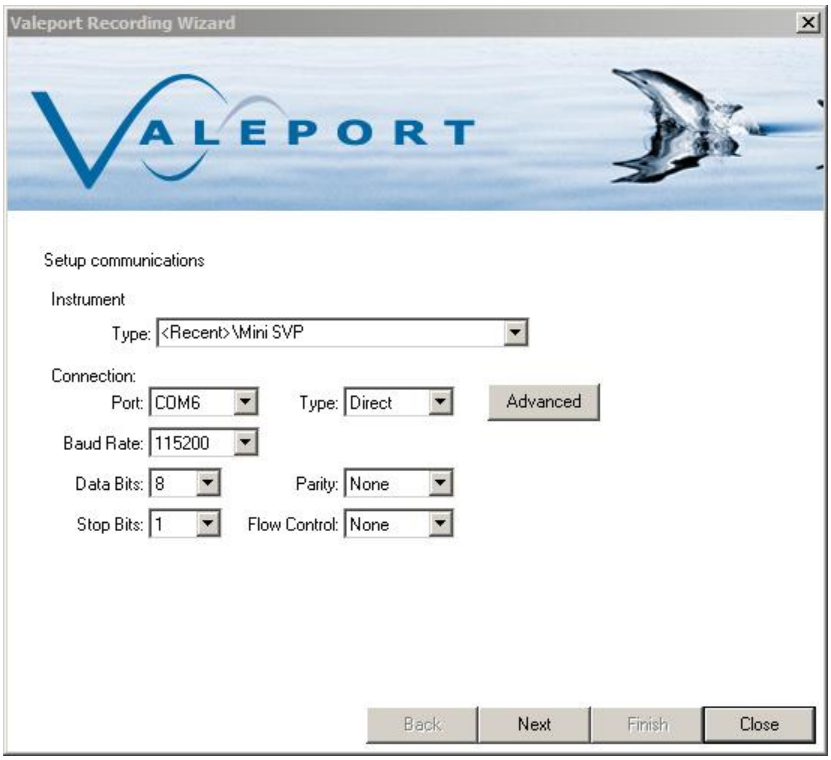
There is no recycle bin. If the file is deleted from the instrument it is gone forever



3.5 Record a File

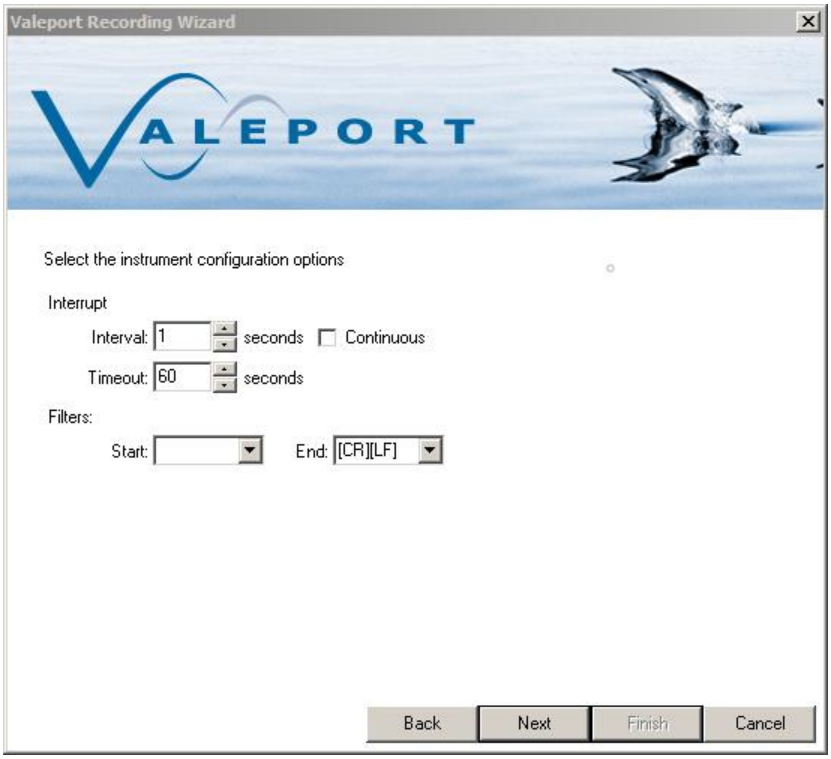
Real time data can be logged to file with the Recording wizard. As with the other wizards, set up the instrument type and communications settings.

If the instrument is not listed, then a 'Generic Instrument' can be selected from the dropdown and suitable comms settings entered.

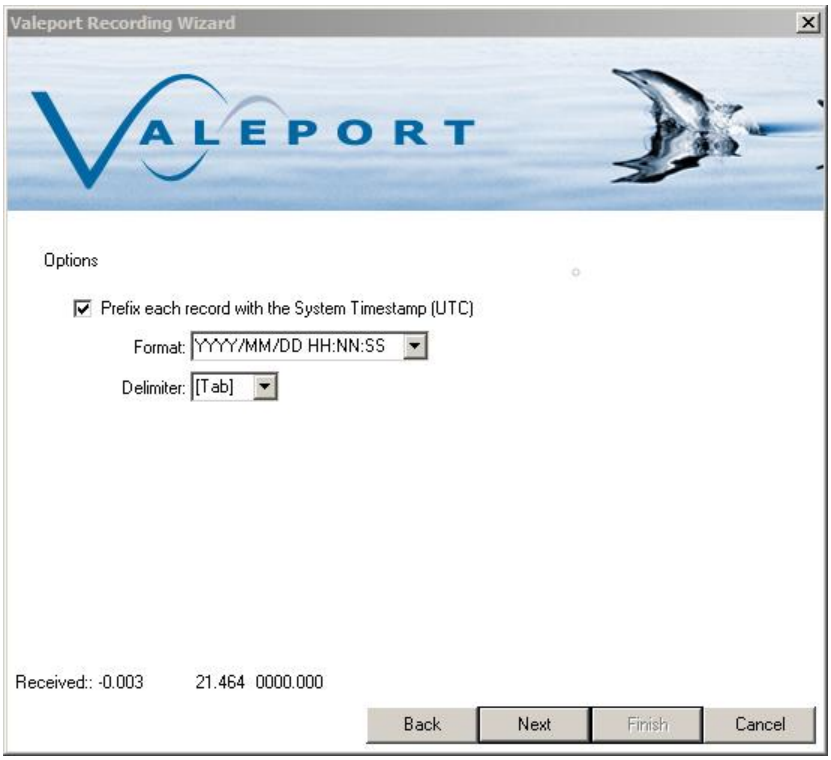


The next screen sets the interuppt settings, but also adds the ability to filter the incoming string.

For example, if an instrument such as the TideMaster is outputting multiple NMEA strings such as $PVTM1 for met, and $PVTMA for Tide, the start filter can be set to $PVTMA to only log the tide data.

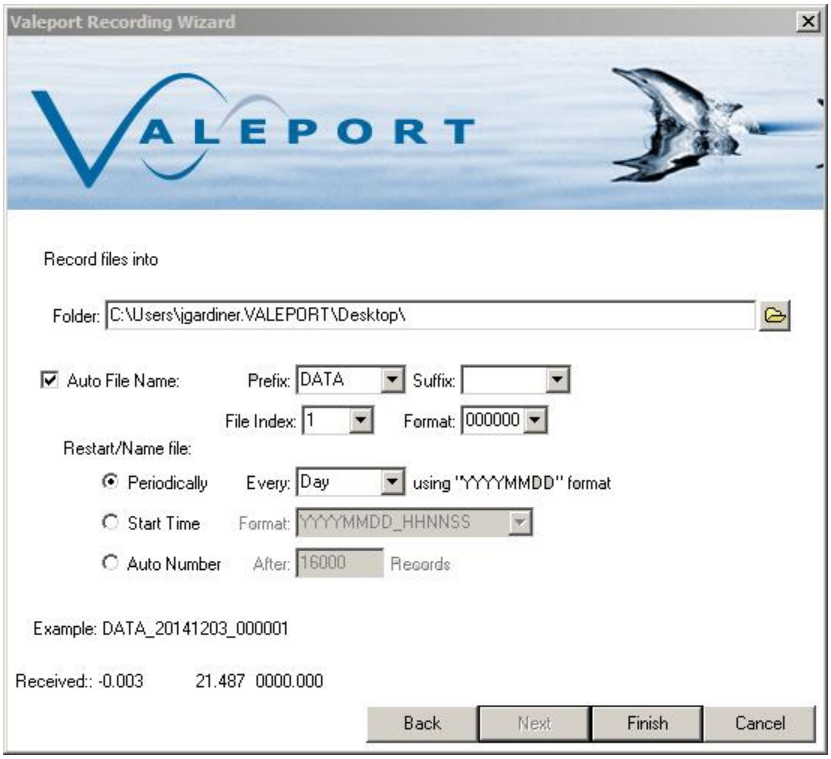


For data recorded on instruments without a Real Time Clock, there is the option to append a timestamp to each record.



Files will be saved to the selected location. Files can be automatically named, incremented and numbered.

Data will continue to be recorded until the record button is clicked again, or Terminal is closed.

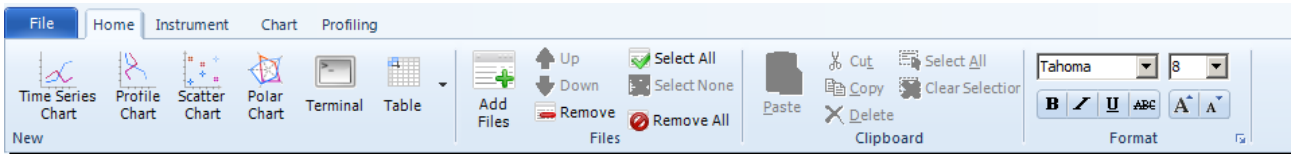


4 Datalog X2

DataLog X2 is a package for communication, configuration and control of Valeport Instruments. It also contains basic graphing and data display functions for internally recorded and real time data from Valeport Instruments.

It has all the features of Valeport Terminal including data logging, wizard based instrument configuration, file downloads, multiple port connections and TCP-IP serial connection for use over internet connections.

4.1 Home ToolBar



The Home toolbar gives access to graphing and file management tools. Data from recorded files and downloaded files can be loaded and viewed as tables and graphs.

4.1.1 File Manager

In DataLog X2 a file is either a recorded data file from real-time connection, or a downloaded file from an instrument. Downloaded files and recorded files are automatically loaded into the file manager window.

Previously downloaded or recorded files can be added by clicking on the button 

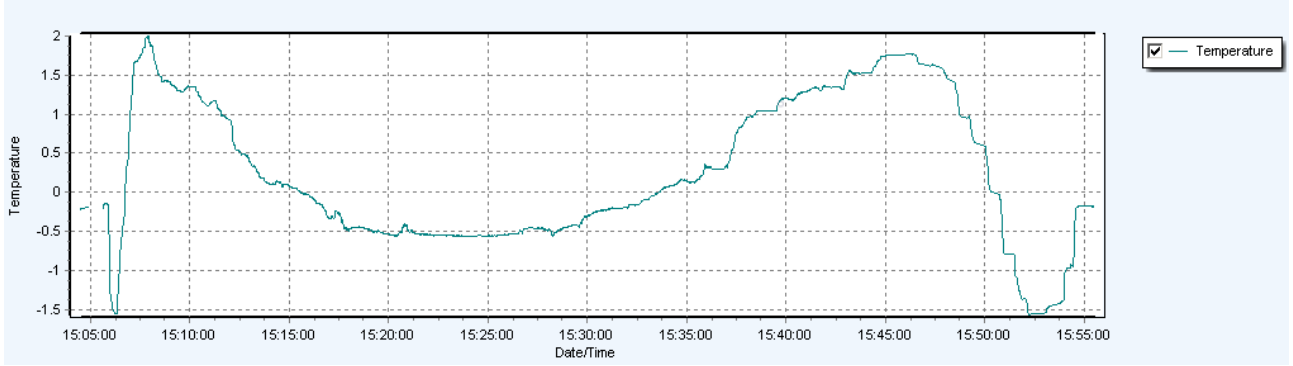
Files will be sorted in the order that they are added. The select button activates or deactivates the file.

4.1.1.1 Workspaces

A workspace is a saved configuration of files, graphs and tables. When the workspace is loaded, it will automatically load the files and create the graphs and tables saved in the workspace.

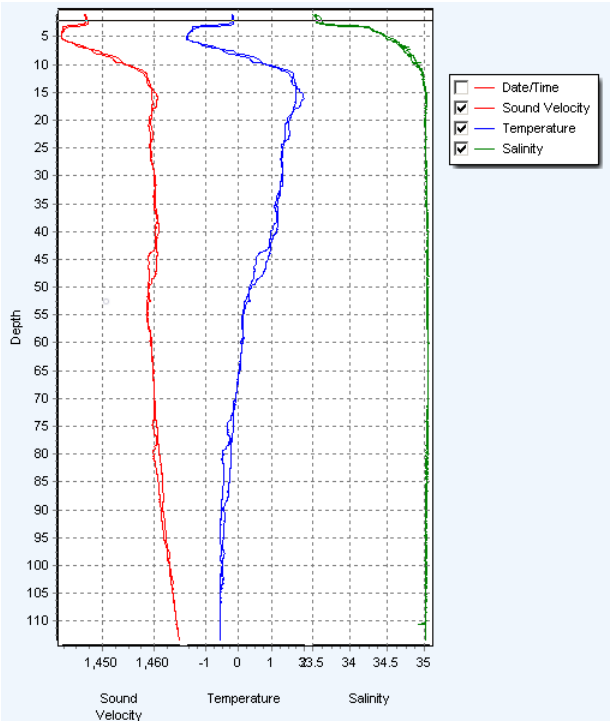
4.1.2 Time Series Chart

A time series chart can be for single parameter or multiple parameters. Time is always on the X axis. If multiple parameters are selected then multiple Y axes will be displayed.



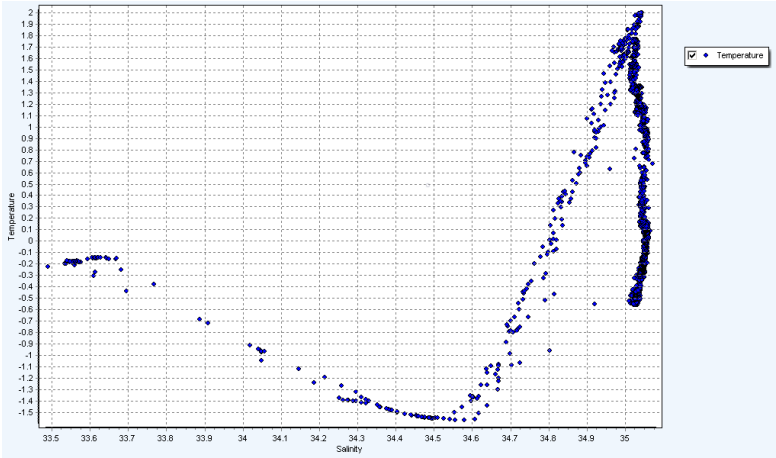
4.1.3 Profile Chart

A profile chart can show a single or multiple parameters plotted against depth/pressure. Depth/Pressure is always on a reversed Y axis.



4.1.4 Scatter Chart

A scatter chart allows one parameter to be plotted against another. A good example of this is T-S plot traditionally used in oceanography to identify water masses.
Temperature is show here on the Y axis with Salinity plotted on the X axis.

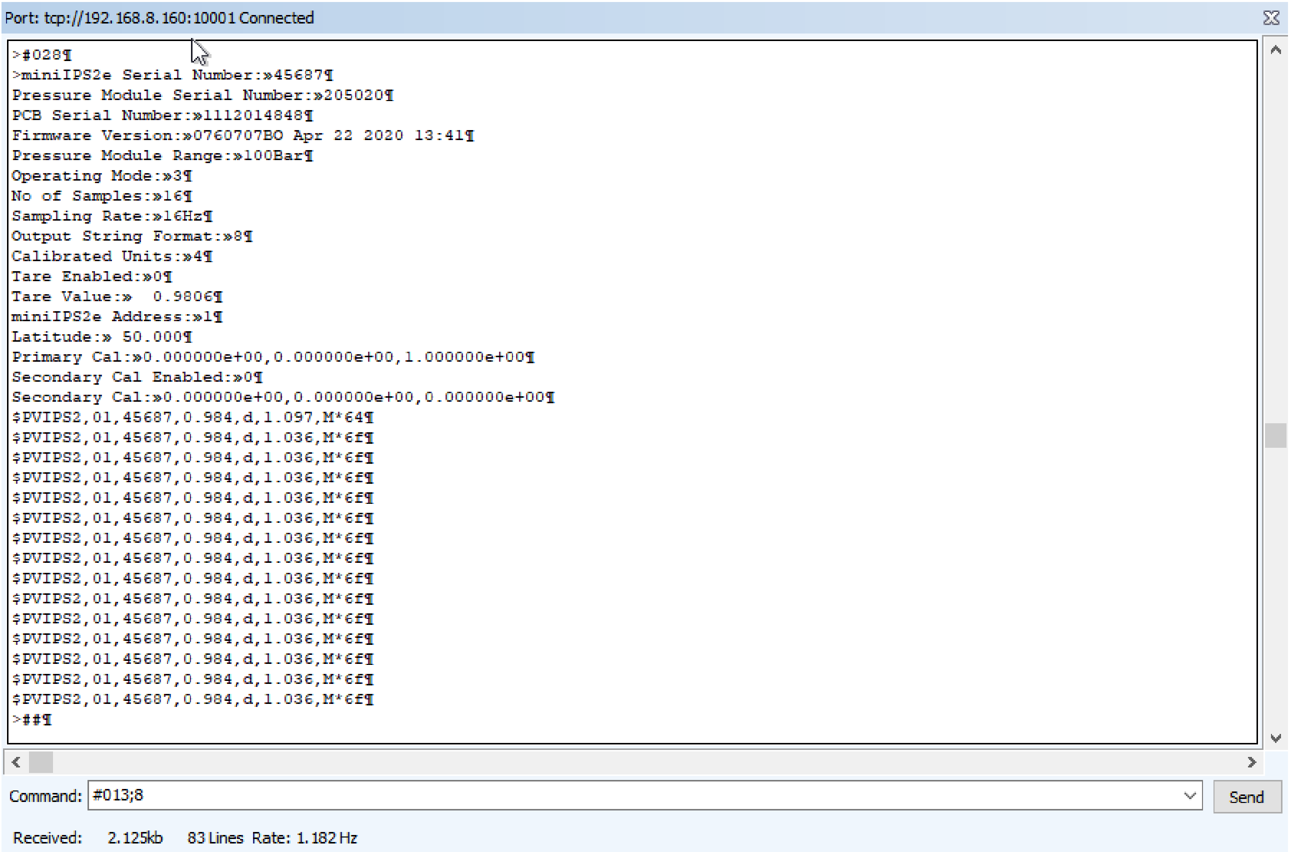


4.1.5 Polar Chart

Polar Charts can be used to display vector type data with a magnitude + direction. eg. water current direction and speed or wind speed and direction.

4.1.6 Terminal Window

The terminal window shows any comms between the insturment and DataLog X2. It can be used to manually interact with the instrument. It gives access to all the functionality of Terminal X2



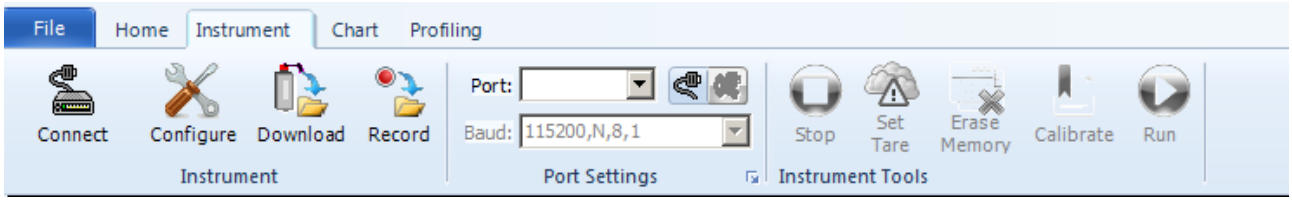
4.1.7 Table View

The Table view shows the data contained in the file currently highlighted in the File Manager.

Greyed out data is data that has been filtered using the Filtering Tools available in the Chart Toolbar

Date/Time	Depth (m)	Sound Velocity (M/SEC)	Pressure (DBAR)	Temperature (C)	Conductivity (MS/CM)	Salinity (PSU)	Sound Velocity (M/SEC)	Density (kg/m³)
2013/09/13 15:54:41	2.241	1446.207	21.974	-0.188	27.814	33.571	1446.715	1027.067
2013/09/13 15:54:44	2.140	1446.239	20.985	-0.174	27.820	33.565	1446.754	1027.056
2013/09/13 15:54:46	2.034	1446.197	19.951	-0.178	27.812	33.559	1446.711	1027.047
2013/09/13 15:54:50	1.935	1446.173	18.972	-0.176	27.810	33.555	1446.699	1027.039
2013/09/13 15:55:07	1.938	1446.170	19.009	-0.179	27.818	33.569	1446.704	1027.051
2013/09/13 15:55:09	1.937	1446.170	18.997	-0.179	27.812	33.561	1446.694	1027.044
2013/09/13 15:55:15	1.940	1446.169	19.024	-0.176	27.812	33.557	1446.703	1027.041
2013/09/13 15:55:17	1.931	1446.159	18.939	-0.179	27.814	33.563	1446.696	1027.045
2013/09/13 15:55:18	1.828	1446.144	17.928	-0.179	27.812	33.561	1446.677	1027.039
2013/09/13 15:55:20	1.731	1446.135	16.976	-0.177	27.810	33.557	1446.665	1027.031
2013/09/13 15:55:22	1.629	1446.113	15.975	-0.180	27.804	33.553	1446.630	1027.023
2013/09/13 15:55:24	1.522	1446.081	14.931	-0.185	27.798	33.551	1446.587	1027.017
2013/09/13 15:55:25	1.424	1446.059	13.963	-0.181	27.796	33.545	1446.581	1027.007
2013/09/13 15:55:27	1.319	1446.040	12.933	-0.183	27.794	33.545	1446.556	1027.002
2013/09/13 15:55:28	1.223	1446.037	11.997	-0.177	27.794	33.539	1446.560	1026.993
2013/09/13 15:55:30	1.116	1446.028	10.947	-0.178	27.800	33.548	1446.552	1026.995
2013/09/13 15:55:32	1.013	1446.011	9.936	-0.175	27.796	33.540	1446.538	1026.984
2013/09/13 15:55:33	*0.910*	*1445.990*	*8.929*	*-0.177*	*27.794*	*33.541*	*1446.513*	*1026.980*
2013/09/13 15:55:59	*0.918*	*1445.974*	*9.004*	*-0.183*	*27.788*	*33.539*	*1446.484*	*1026.979*
2013/09/13 15:56:01	*0.916*	*1445.973*	*8.979*	*-0.177*	*27.788*	*33.533*	*1446.503*	*1026.973*
2013/09/13 15:56:03	*0.815*	*1445.928*	*7.993*	*-0.181*	*27.780*	*33.527*	*1446.461*	*1026.964*
2013/09/13 15:56:05	*0.712*	*1445.583*	*6.982*	*-0.235*	*27.714*	*33.499*	*1446.157*	*1026.939*
2013/09/13 15:56:08	*0.611*	*1445.362*	*5.988*	*-0.280*	*27.650*	*33.464*	*1445.885*	*1026.908*
2013/09/13 15:56:10	*0.508*	*1445.351*	*4.982*	*-0.282*	*27.652*	*33.470*	*1445.867*	*1026.908*
2013/09/13 15:56:11	*0.406*	*1445.426*	*3.977*	*-0.259*	*27.670*	*33.469*	*1445.957*	*1026.902*
2013/09/13 15:56:16	*0.303*	*1445.357*	*2.972*	*-0.271*	*27.664*	*33.475*	*1445.893*	*1026.902*
2013/09/13 15:56:17	*0.196*	*1445.371*	*1.924*	*-0.264*	*27.664*	*33.468*	*1445.899*	*1026.891*
2013/09/13 15:56:21	*0.205*	*1445.366*	*2.008*	*-0.261*	*27.662*	*33.462*	*1445.906*	*1026.887*
2013/09/13 15:56:23	*0.201*	*1445.324*	*1.975*	*-0.274*	*27.650*	*33.460*	*1445.843*	*1026.885*
2013/09/13 15:56:39	*0.099*	*1445.317*	*0.969*	*-0.271*	*27.658*	*33.460*	*1445.843*	*1026.880*

4.2 Instrument ToolBar



The instrument toolbar gives access to a range of functionality for connecting, configuring and downloading data from a Valeport Instrument

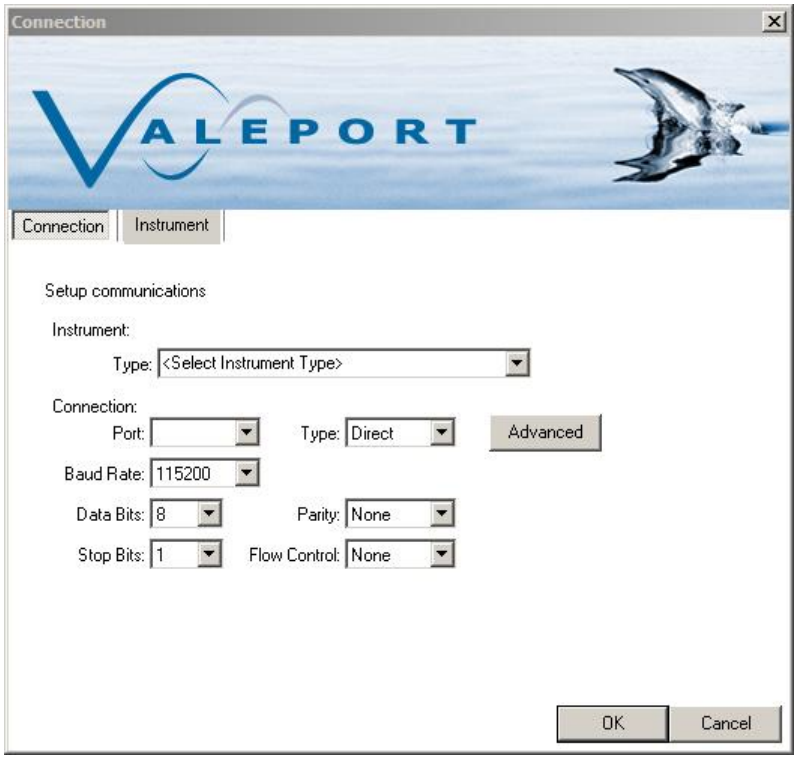
4.2.1 Establish a connection

The connection wizard is shard with DataLog X2

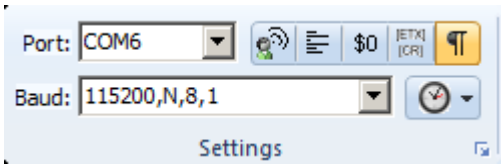
There are two methods of establishing a connection. When the instrument type is known and when a generic serial connection is required.

Clicking on the connect icon will bring up the connection wizard. The instrument type can be selected from the drop down list.

The connection settings will default to the factory settings for that instrument. If these have been changed by the user it may be necessary to change these.



Alternatively, set the connection up using the settings toolbar. Once the appropriate port and baud rate settings are selected, press the connect icon to establish a connection



To establish TCP-IP serial connection, select TCP-IP port from the drop down menu,

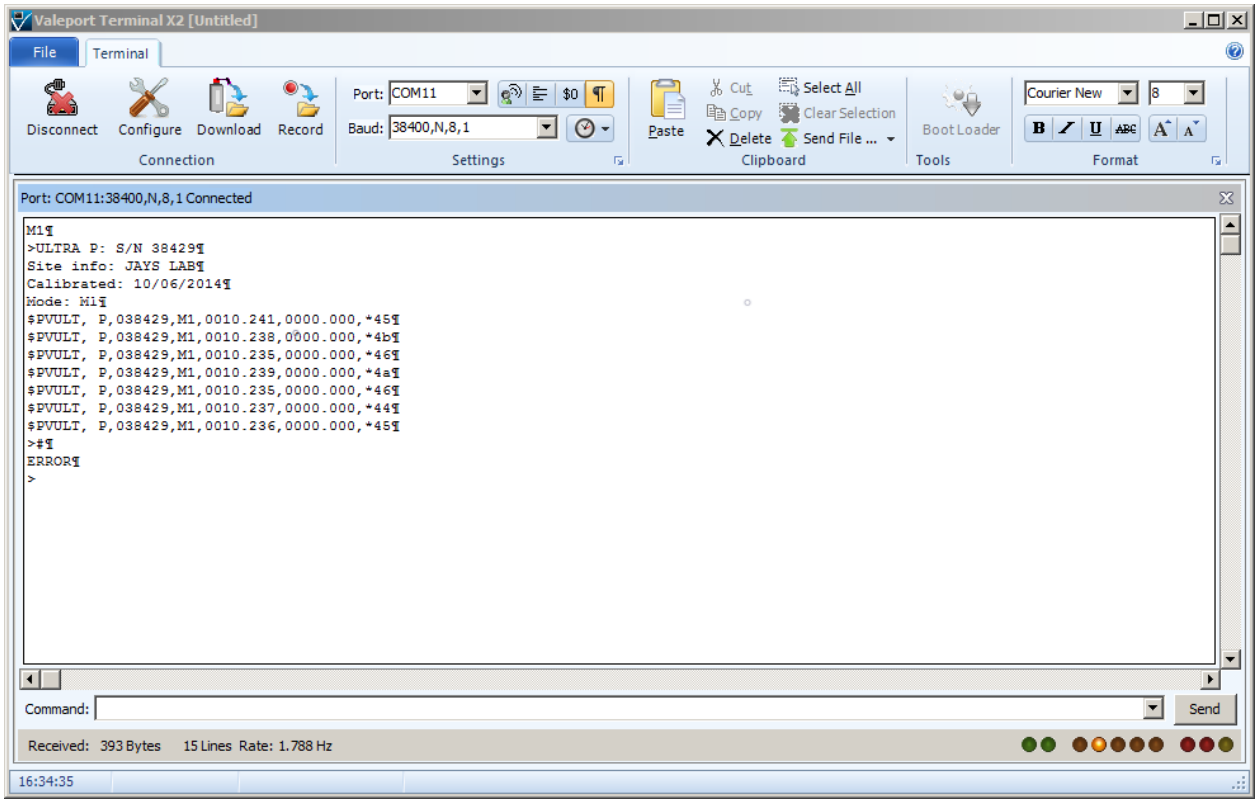
Enter the IP address and port in the Host settings

Once the connection is established, the status bar will show the connection details and any communications will be shown in the window.

Commands can be issued via typing directly into the command window or via the command toolbar.

The command toolbar stores a history of issued commands.

The status toolbar shows the amount of data received, sent and the received rate of data.



4.2.2 Configure an Instrument

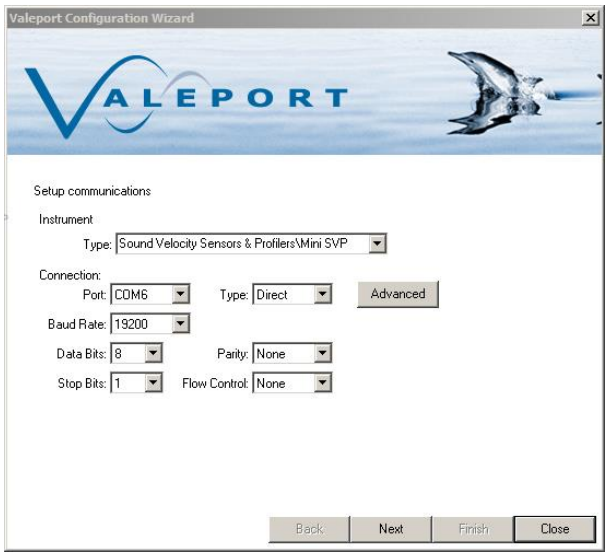
The configuration wizard is shared with DataLog X2.

The configuration wizard is instrument specific and the options given will depend on the instrument connected, the example given here is for a MiniSVP.

Clicking on the configure tool will bring up the configuration wizard.

Select the instrument type and the connection settings will be set to the factory default for this instrument. They can be altered if required.

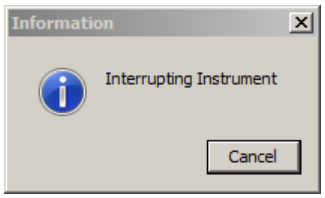
Select the comm port the instrument is connected to and click next.



At the next window, set the timeout setting for interrupting the instrument.

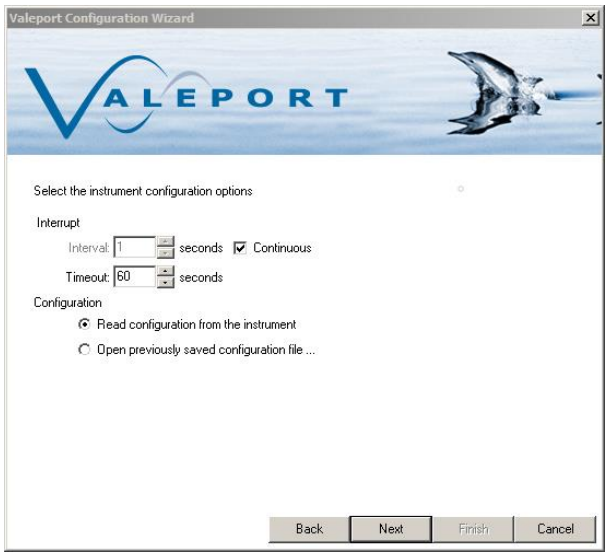
If attempting to connect to an instrument operating in Burst Mode, the timeout should be set to greater than the burst interval.

When Next is clicked the configuration wizard will attempt to interrupt the instrument and read out the current configuration.

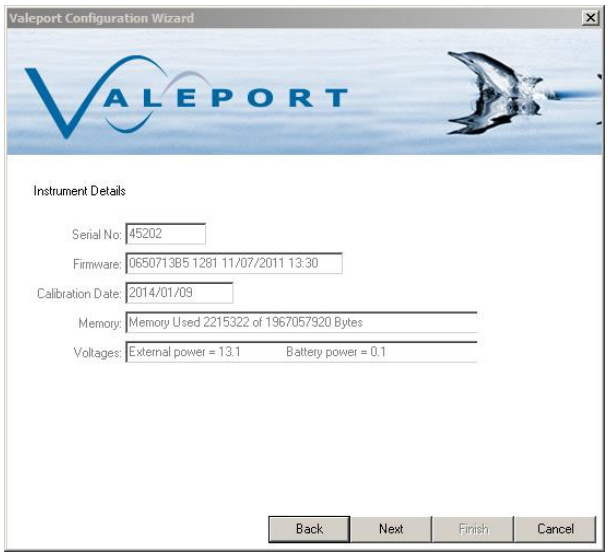


If the wizard fails to interrupt the instrument, then check the connection settings and retry.

If the instrument is successfully interrupted, commands and responses should be visible in the command window behind the configuration wizard.



The first wizard window shows information about the instrument. Boxes are greyed out as information cannot be changed by the user.



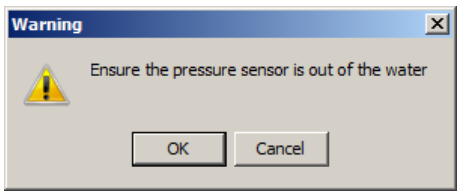
The next screen allows the pressure sensor to be configured.

Output units can be set and the Tare setting can be configured.

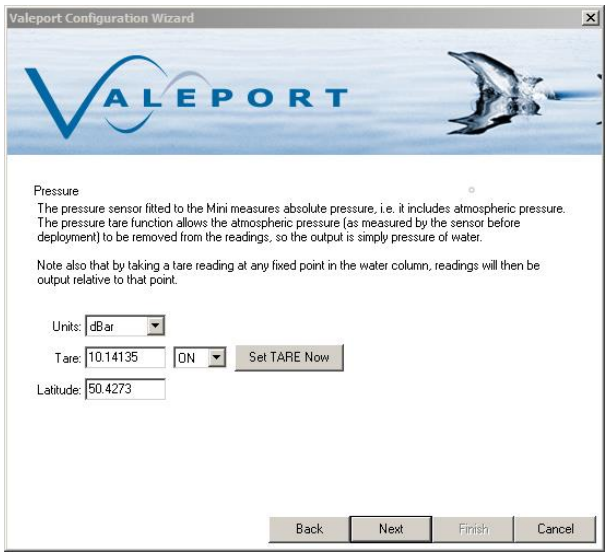
To set a manual Tare, enter the required figure in the box.

To take a measured Tare, press the Set Tare Button.

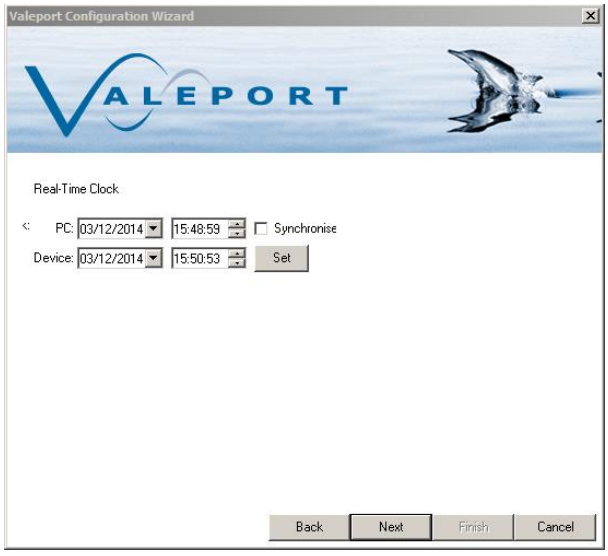
The following dialog will pop-up.

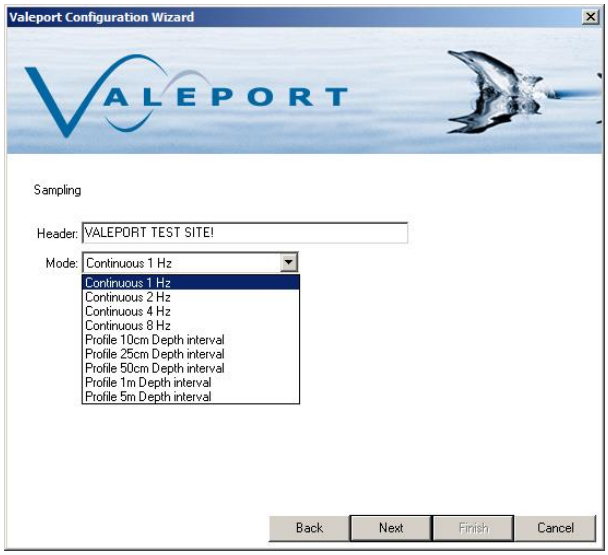
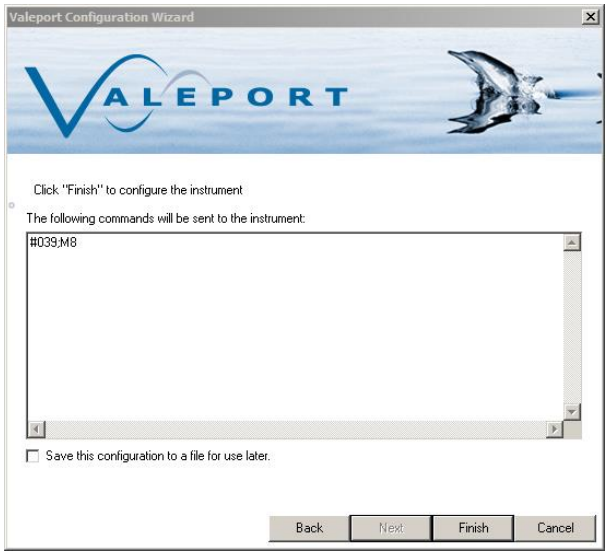
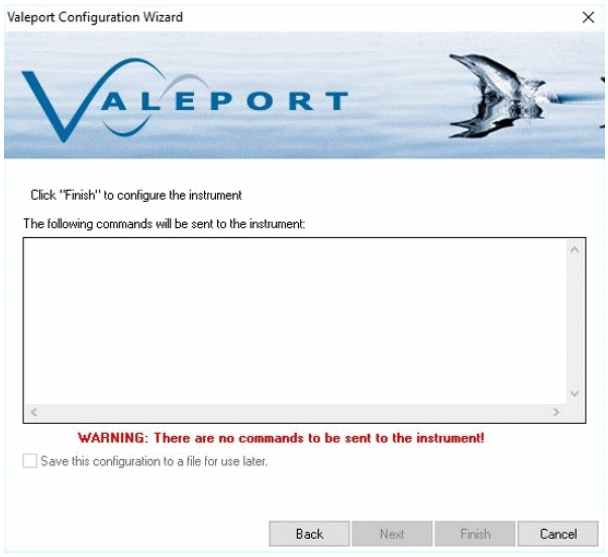


The Latitude value is used to convert pressure to depth. An approximate value can be used for the operational area.



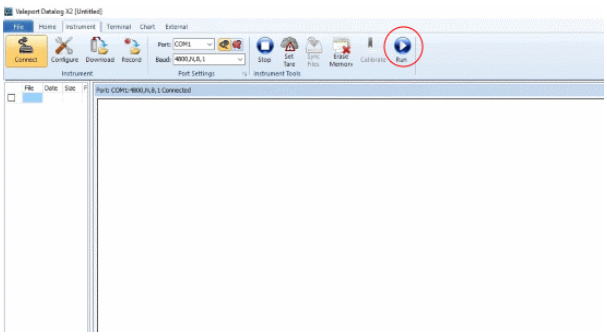
If the instrument being configured has a Real Time Clock, the option to sync it to PC time is available.



Header is a free text field that will be inserted into the header of every recorded file. Sampling modes will depend on the instrument connected.	
The final screen will show a summary of the commands that will be sent to the instrument.	
If settings have not been changed, then no commands will be shown and the finish button is greyed out. Simply type a # into the command window and the Finish button will be available.	

Once the configuration is completed, the instrument will be in a paused (‘interrupted’) state and, therefore, will require prompting from the user to set it running. This can be achieve in one of 3 ways:

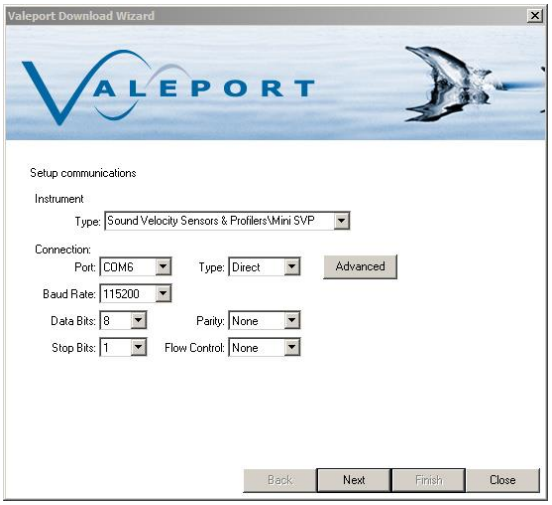
1. Select the RUN button in the instrument tab of DataLog X2 (See image).
2. Enter the command #028 in the Terminal window.
3. Disconnect, then reconnect the Power/Comms cable to activate the instrument.



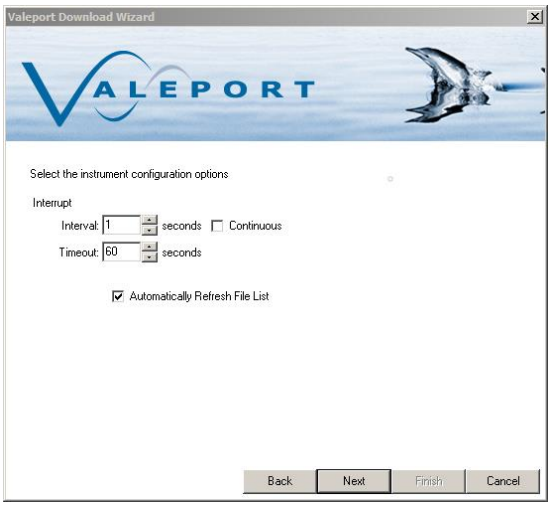
4.2.3 Download a File

The download wizard is shared with DataLog X2, it operates in the same way as in Terminal with the addition that any downloaded files are automatically loaded into the File Manager.

Clicking on the download icon invokes the Download Wizard. As with all wizards the first stage is to identify the connected insturment and comms settings.



Ensure the instrument is switched on and connected. Extend the interrupt timeout if the unit is operating in burst mode (or cycle the power to the instrument)

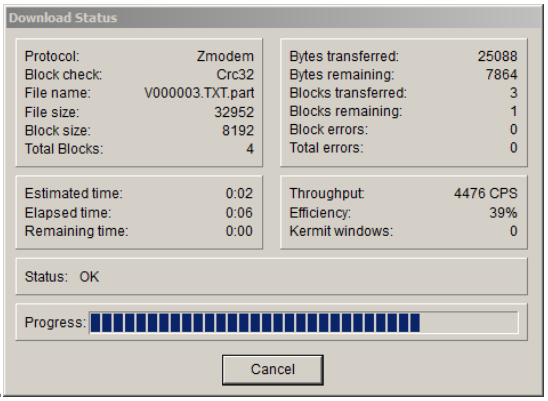


Location to download files to can be defined here. Sub folders by instrument and date will automatically created.

For instruments that support individual file downloads (mini and 400 series), a file list with check boxes will be displayed.

For older instruments such as the model 106/108/308 and the model 740, the entire memory has to be downloaded in one

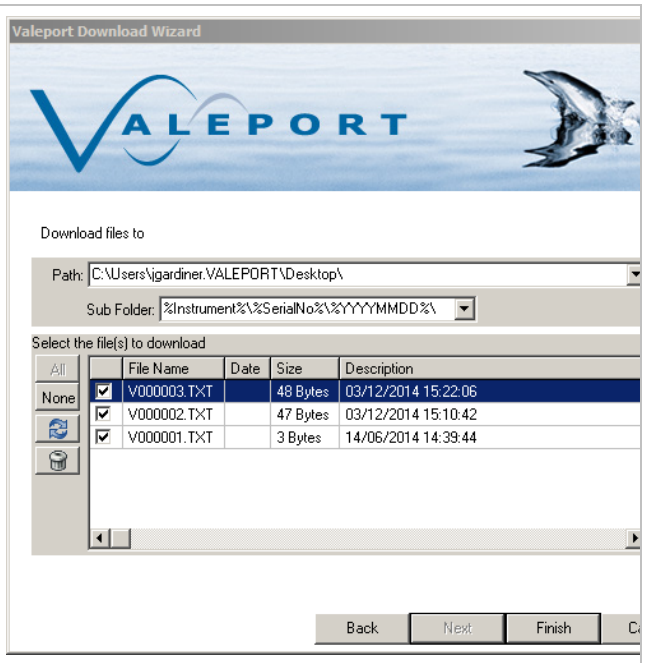
A status window will show the progress of the download and estimated completion time.



.

Files can be deleted by clicking on the bin icon.

There is no recycle bin. If the file is deleted from the instrument it is gone forever

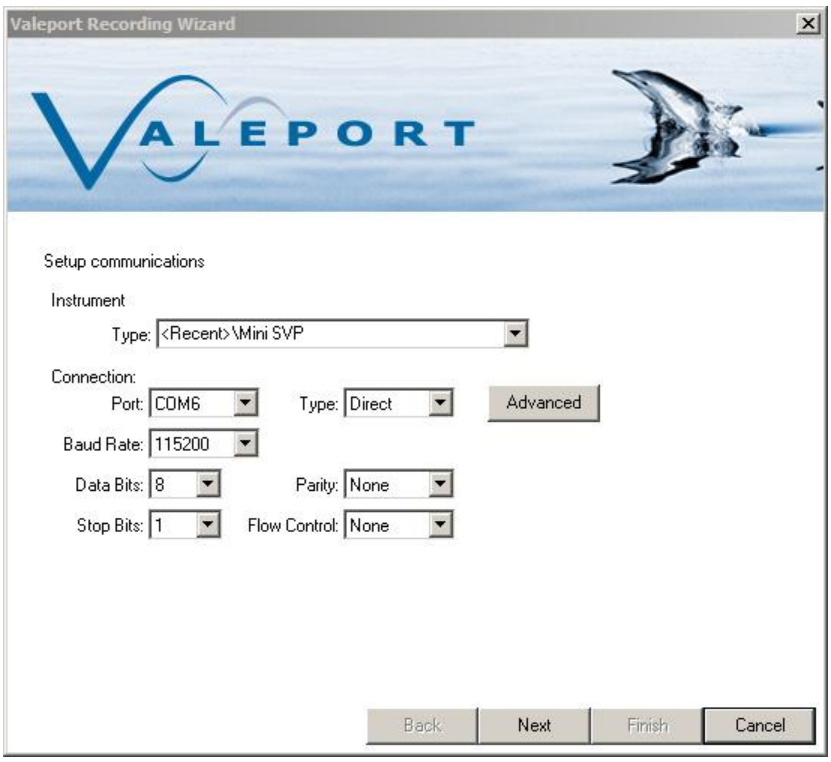


4.2.4 Record a File

The recording wizard in DataLog X2 differs from the recording wizard in Terminal X2. Rather than just recording any data incoming on the serial port, DataLog X2 will interpret and parse the data into the current workspace to allow real-time data to be displayed and potted using the charting tools available on the Home Toolbar

Real time data can be logged to file with the Recording wizard. As with the other wizards, set up the instrument type and communications settings.

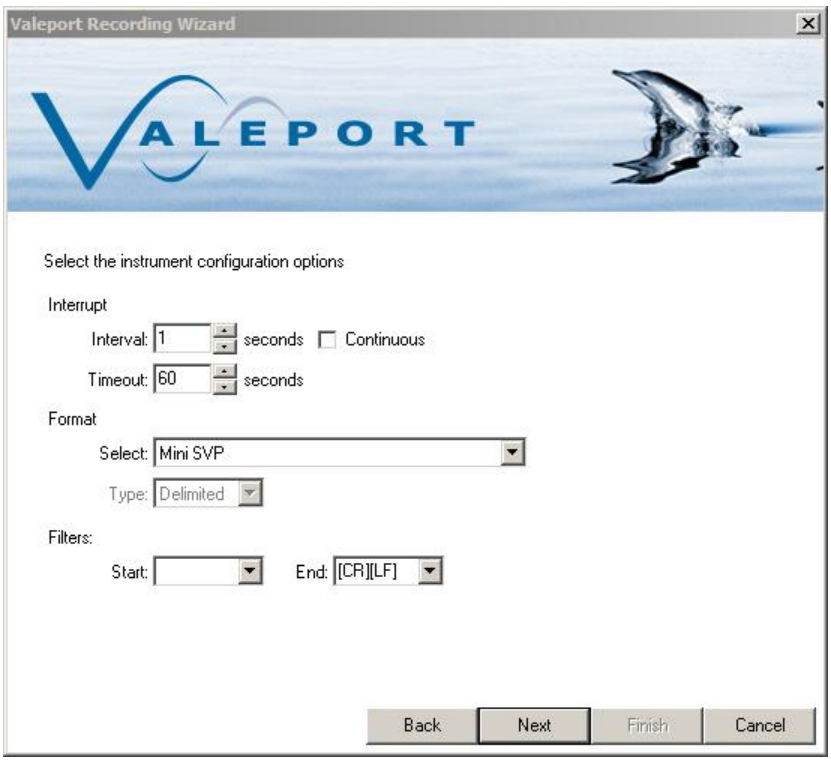
If the instrument is not listed, then a 'Generic Instrument' can be selected from the dropdown and suitable comms settings entered.



The next screen sets the interrupt settings, selects the incoming Data format and adds the ability to filter the incoming string.

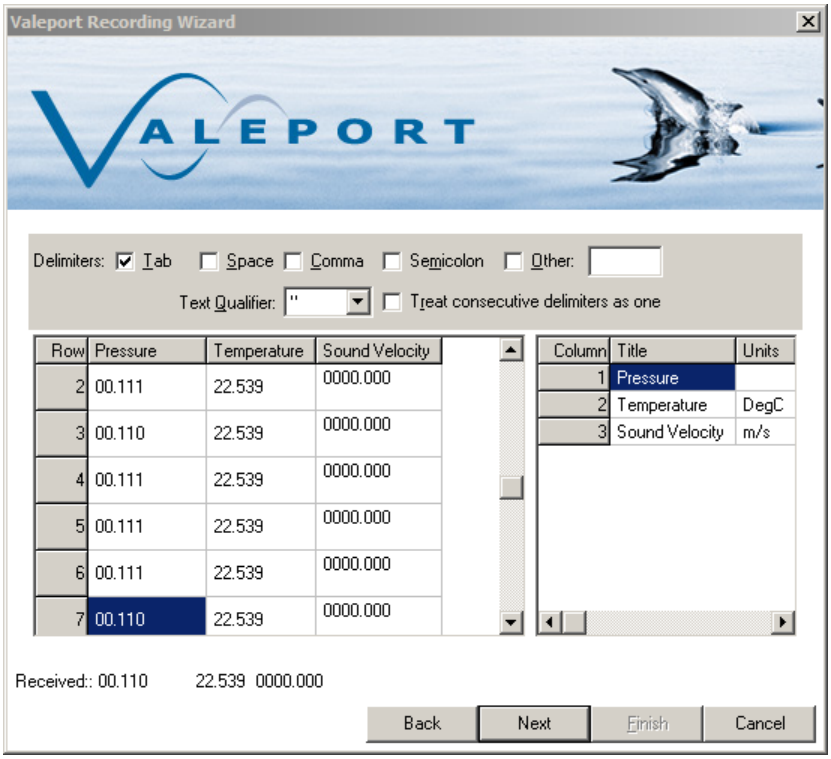
If the data format is not known, select generic instrument, the next screen will allow the format to be defined.

Filtering is also available. For example, if an instrument such as the TideMaster is outputting multiple NMEA strings such as $PVTM1 for met, and $PVTMA for Tide, the start filter can be set to $PVTMA to only log the tide data.

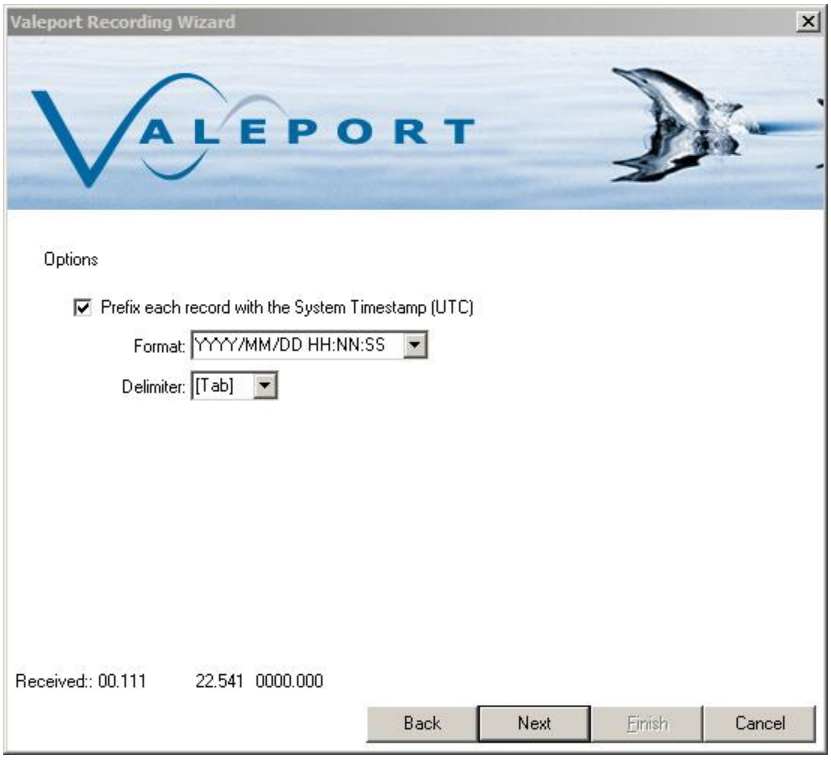


If the data format outputted by the instrument is recognised, the columns of data should automatically populate.

If Generic format has been selected in the previous screen, the delimters, columns names and units can be defined.

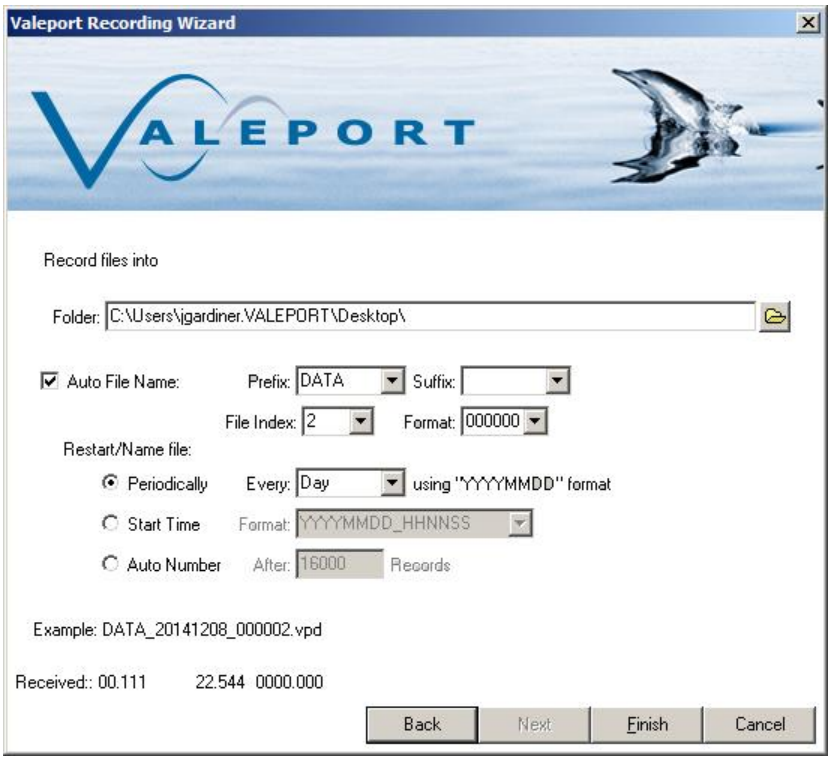


For data recorded on instruments without a Real Time Clock, there is the option to append a timestamp to each record.



Files will be saved to the selected location. Files can be automatically named, incremented and numbered.

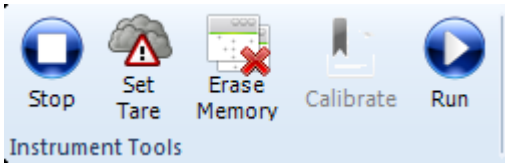
Data will continue to be recorded until the record button is clicked again.



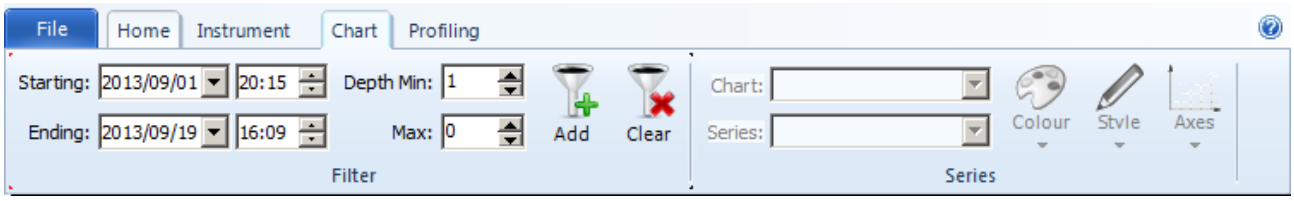
4.2.5 Instrument Tools

The instrument tools can be used a shortcut to carry out task on a connected instrument such as interupting a running intrument, set a pressure Tare, clearing the memory and setting the instrument into Run mode.

For certain instruments such as the model 740 that require site calibrations, the calibrate button will be available.

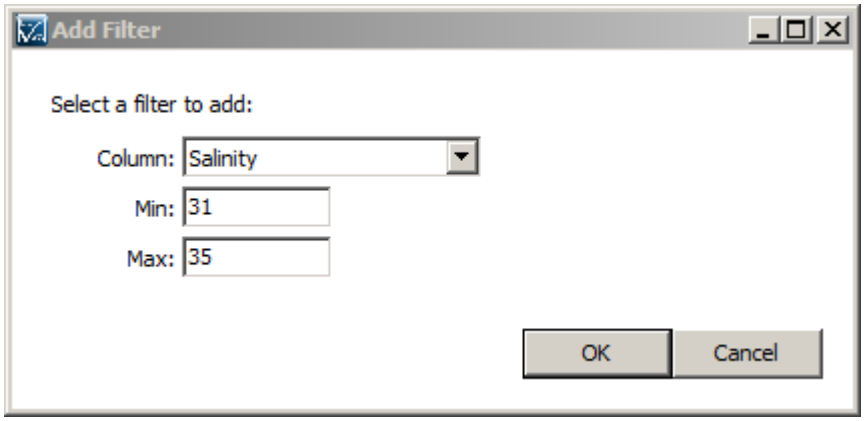


4.3 Chart ToolBar



The Chart Toolbar allows for some basic filtering to be applied to the datasets in the workspace.

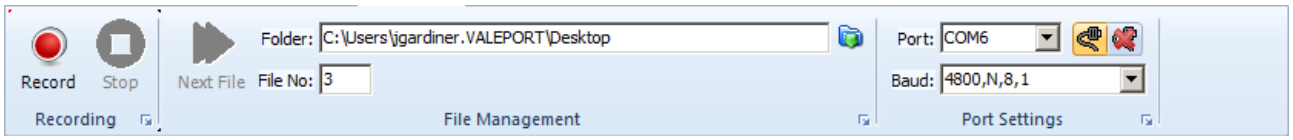
Date and Depth filters can be applied using the toolbar buttons, One additional filter can be added using the Add button. This brings up the filter dialogue where the parameter to filter with can be selected and upper/lower limits set.



To clear the filter, click the clear button.

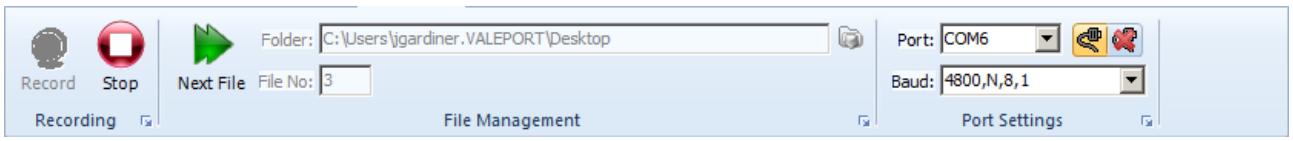
4.4 Recording Toolbar

The Recording toolbar becomes active when the Record button on the Home Toolbar is clicked. Clicking the record button will activate the Recording Wizard.



The recording toolbar can be used to manage incoming data. The toolbar informs on the location that files are being saved to, the file increment and the port settings of the attached instrument.

When DataLog X2 is actively recording data, a new file can be started by pressing the next file button.



This is will also have the effect of resetting any graphs or charts currently active.

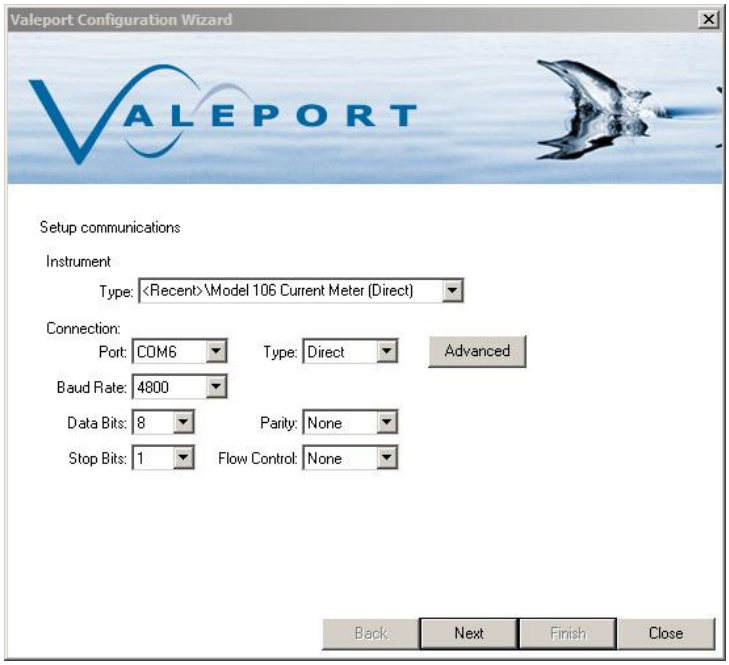
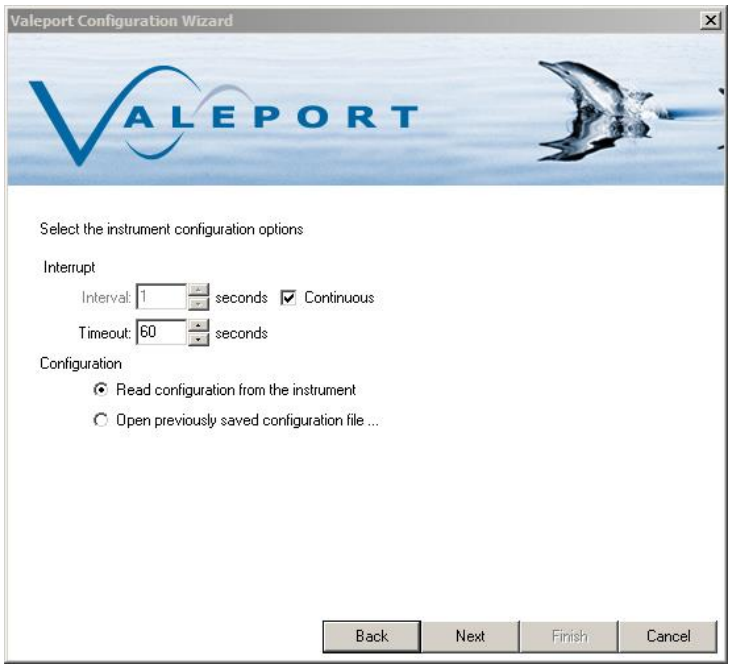
5 Tutorials

5.1 Configure a Model 106 Current Meter

Configuration of a Model 106 current meter is via the configuration wizard, this can be accessed via the Instrument ToolBar.

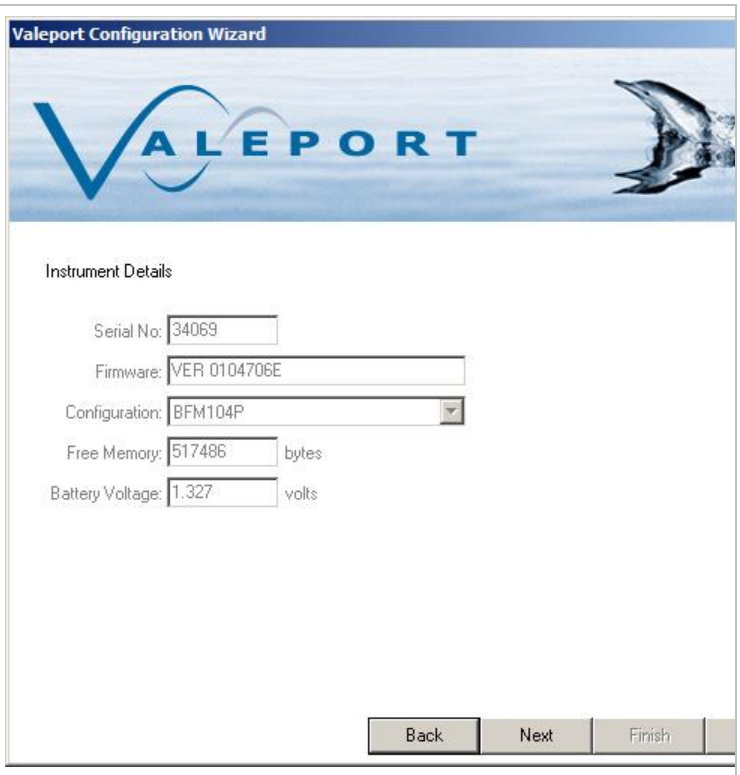
Clicking on the Configure button 

will invoke the configuration wizard.

Select Model 106 Current Meter from the dropdown menu. This will populate the connection settings with the default setting for a Model 106. Select the COM port that the instrument is connected to. Click Next.	
This will set the interrupt timeouts for the instrument. As default DataLog X2 will attempt to interrupt an instrument for 60s. If the instrument is not currently connected to the PC, or the seawater switch is not connected if using an older model, do so now and click next. If the interrupt is successful, then commands should be displayed bottom left being sent to the instrument. If no connection is established, check connections and the correct com port /baud rate is being used and try again.	

DataLog X2 will read the current setting of the instrument and display on screen.

Settings that are greyed out, are factory set and cannot be changed by the user



The instruments internal clock can be manually set, or synced to the PC time. This will be in the time zone that the PC is currently set to.

Sample Period and Averaging Period can be set.

The combination of these two will determine how often the Model 106 will log and output data.

Sample Period is how long the 106 counts impeller revolutions for. This is set to a minimum of 3 seconds.

Average Period is how many Sample Periods are averaged before a data point is recorded or output.

I.E

Sample Period = 3s

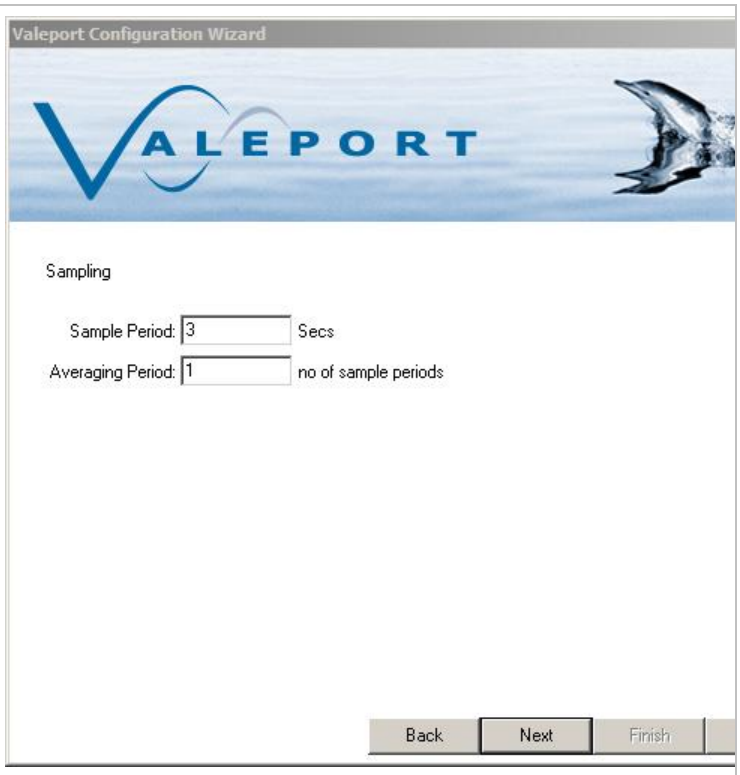
Average Period = 1

Data recorded once every 3s

Sample Period = 3s

Average Period = 20

Data recorded once every 60s.



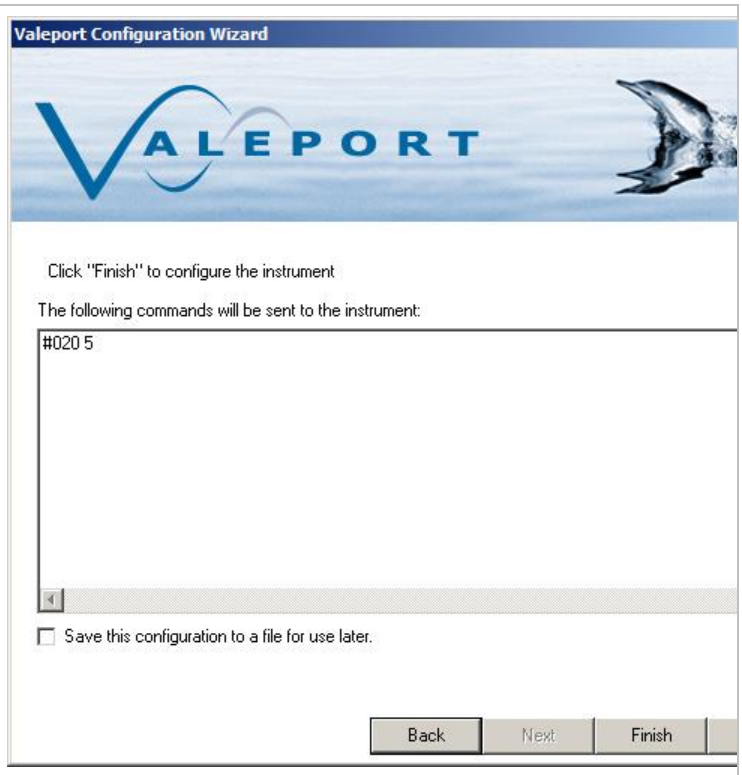
The final screen shows the commands to be sent to the instrument. If no changes have been made to the instrument setup, then no commands will be shown here.

Manual commands can be added here, for example if you want to put the instrument straight into run mode, then add #028 to the list.

The final screen shows the commands to be sent to the instrument. If no changes have been made to the instrument setup, then no commands will be shown here.

Manual commands can be added here, for example if you want to put the instrument straight into run mode, then add #028 to the list.

Alternatively, click finish to apply setup commands, and then start the model 106 running by using the Instrument Tools run button



5.2 Calibrate a 740 Tide Gauge

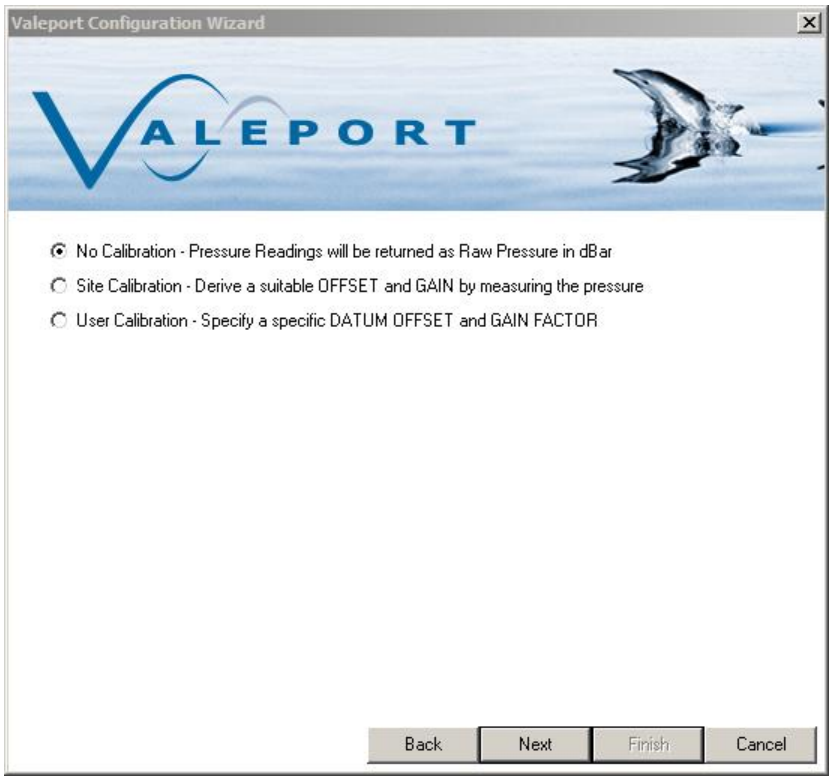
There are two routes to calibrate a 740 tide gauge in DataLog X2, it will appear as part of the configuration wizard while configuring a model 740, or can be directly accessed via the Instrument Tools Toolbar. To access via the Instrument Tools section, a connection will first have to be established with the Model 740.

There are three options for the calibration of a Model 740.

1: No calibration

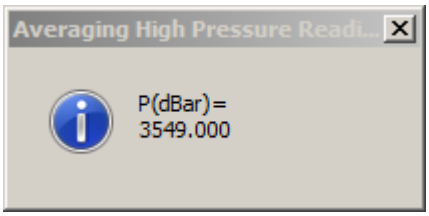
2: Site Calibration - A site specific calibration is calculated by measured the pressure at known high and low tide heights. See Model 740 manual or TideMaster manual for more detail on the operation procedure used to carry this out. Height can be output in metres or feet.

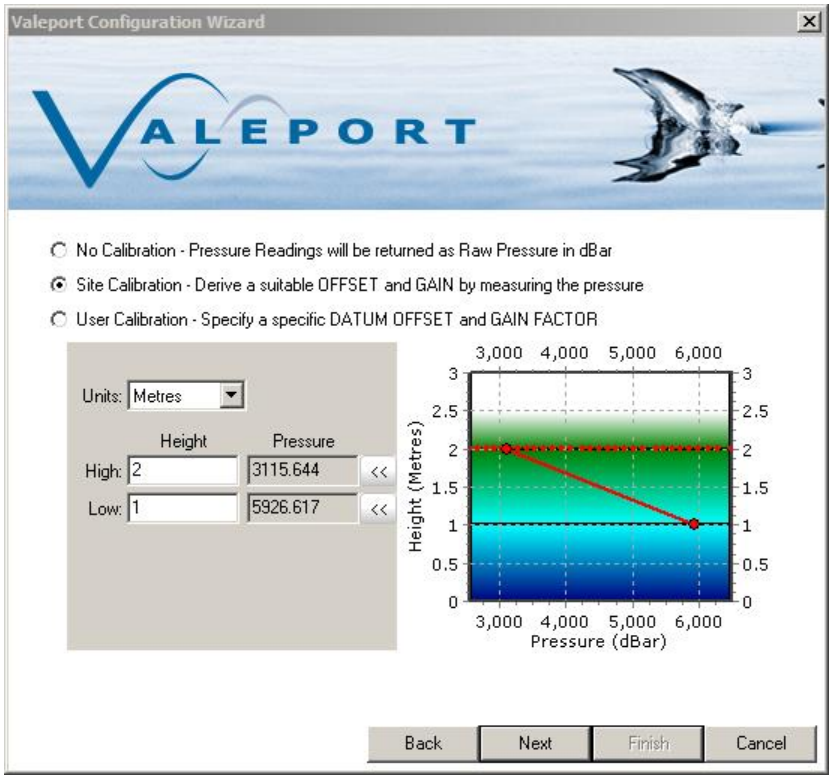
3: User Calibration - a datum offset and gain factor is manually applied.



Selecting the Site Calibration method activates the window shown.

Select the required units, enter the known tide heights and click the << button to measure the pressure at that height. 60s of pressure data will be averaged.

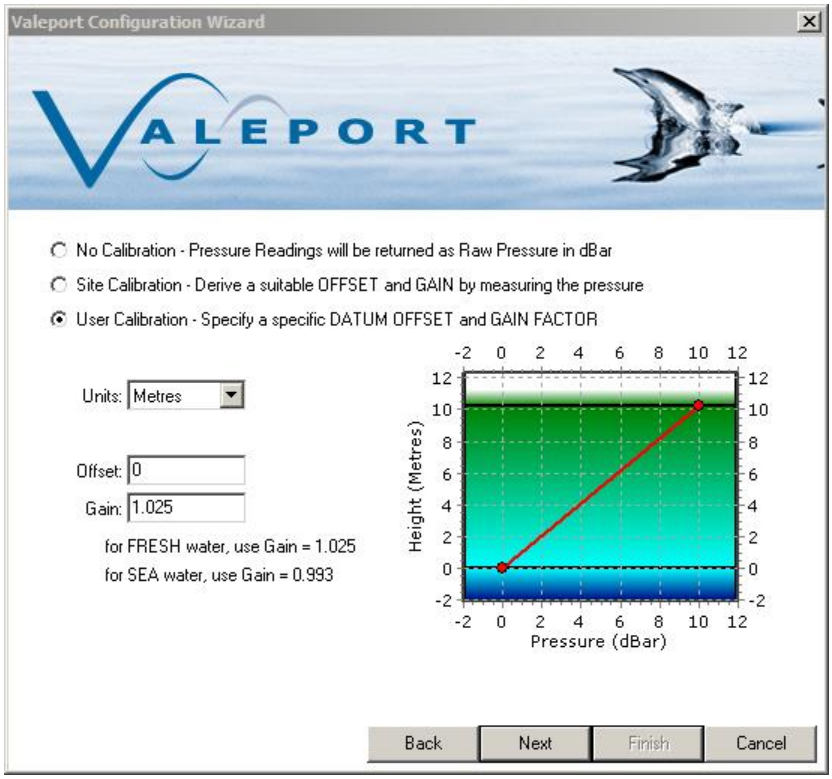




If a User Calibration is selected, the option to choose output units and enter and offset and gain factor are given.

Offset is the height of the pressure transducer above or below a known datum point IE Chart Datum or Lowest Astronomical Tide.

Gain is the factor applied to compensate for the density of the water in the pressure conversion to depth.

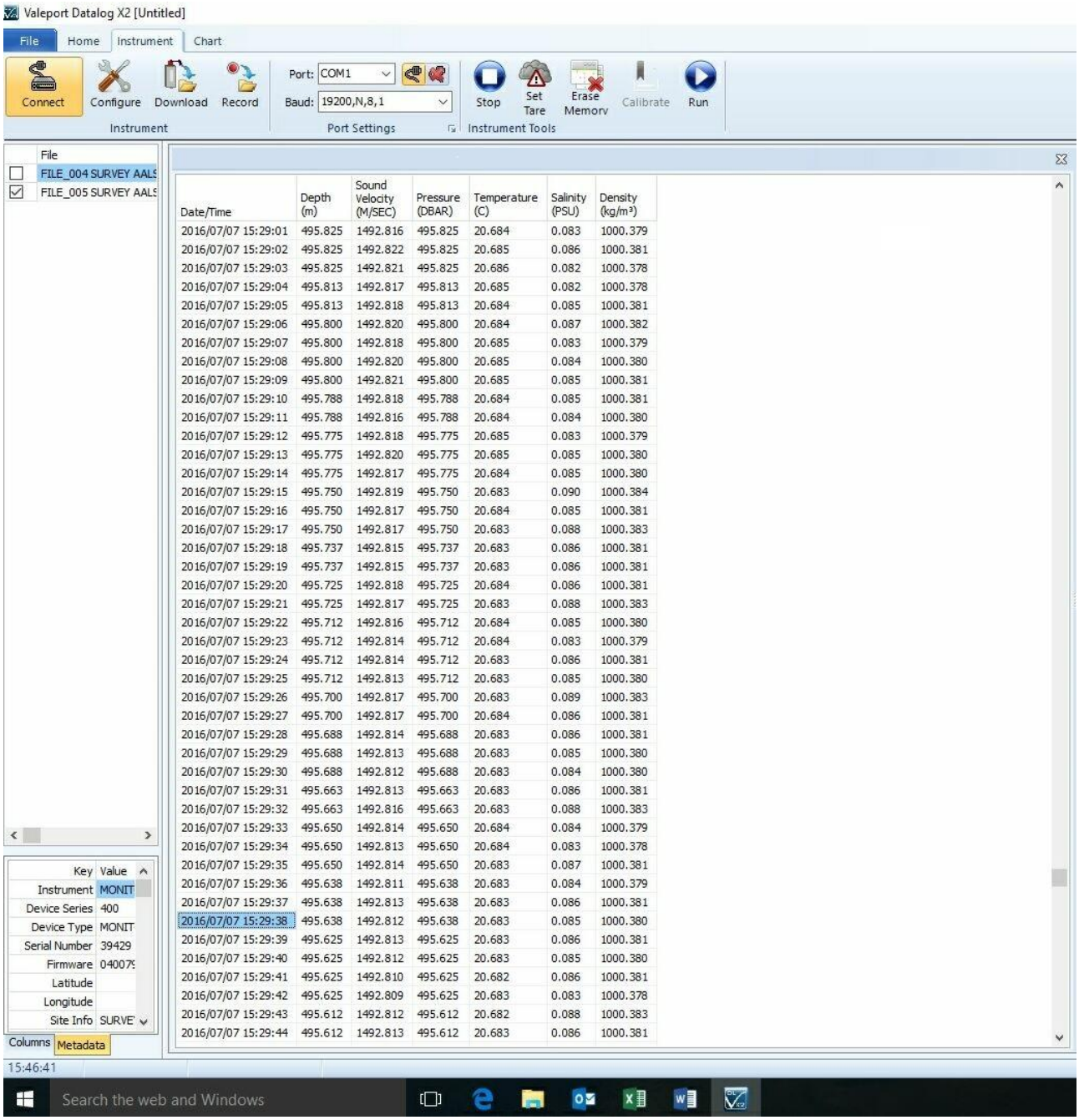


Once the calibration method has been completed, click on next to commit settings to the model 740.

5.3 Calculated Density and Salinity

By uploading a data set that contains Sound Velocity, Pressure and Temperature DataLog x2 will automatically calculate the Practical Salinity and from that Density at each point in the profile using Valeport's proprietary computational techniques.

Salinity is calculated to an accuracy of ±0.05 PSU and Density to an accuracy of ±0.05kg/m^3



Date/Time	Depth (m)	Sound Velocity (M/SEC)	Pressure (DBAR)	Temperature (C)	Salinity (PSU)	Density (kg/m³)
2016/07/07 15:29:01	495.825	1492.816	495.825	20.684	0.083	1000.379
2016/07/07 15:29:02	495.825	1492.822	495.825	20.685	0.086	1000.381
2016/07/07 15:29:03	495.825	1492.821	495.825	20.686	0.082	1000.378
2016/07/07 15:29:04	495.813	1492.817	495.813	20.685	0.082	1000.378
2016/07/07 15:29:05	495.813	1492.818	495.813	20.684	0.085	1000.381
2016/07/07 15:29:06	495.800	1492.820	495.800	20.684	0.087	1000.382
2016/07/07 15:29:07	495.800	1492.818	495.800	20.685	0.083	1000.379
2016/07/07 15:29:08	495.800	1492.820	495.800	20.685	0.084	1000.380
2016/07/07 15:29:09	495.800	1492.821	495.800	20.685	0.085	1000.381
2016/07/07 15:29:10	495.788	1492.818	495.788	20.684	0.085	1000.381
2016/07/07 15:29:11	495.788	1492.816	495.788	20.684	0.084	1000.380
2016/07/07 15:29:12	495.775	1492.818	495.775	20.685	0.083	1000.379
2016/07/07 15:29:13	495.775	1492.820	495.775	20.685	0.085	1000.380
2016/07/07 15:29:14	495.775	1492.817	495.775	20.684	0.085	1000.380
2016/07/07 15:29:15	495.750	1492.819	495.750	20.683	0.090	1000.384
2016/07/07 15:29:16	495.750	1492.817	495.750	20.684	0.085	1000.381
2016/07/07 15:29:17	495.750	1492.817	495.750	20.683	0.088	1000.383
2016/07/07 15:29:18	495.737	1492.815	495.737	20.683	0.086	1000.381
2016/07/07 15:29:19	495.737	1492.815	495.737	20.683	0.086	1000.381
2016/07/07 15:29:20	495.725	1492.818	495.725	20.684	0.086	1000.381
2016/07/07 15:29:21	495.725	1492.817	495.725	20.683	0.088	1000.383
2016/07/07 15:29:22	495.712	1492.816	495.712	20.684	0.085	1000.380
2016/07/07 15:29:23	495.712	1492.814	495.712	20.684	0.083	1000.379
2016/07/07 15:29:24	495.712	1492.814	495.712	20.683	0.086	1000.381
2016/07/07 15:29:25	495.712	1492.813	495.712	20.683	0.085	1000.380
2016/07/07 15:29:26	495.700	1492.817	495.700	20.683	0.089	1000.383
2016/07/07 15:29:27	495.700	1492.817	495.700	20.684	0.086	1000.381
2016/07/07 15:29:28	495.688	1492.814	495.688	20.683	0.086	1000.381
2016/07/07 15:29:29	495.688	1492.813	495.688	20.683	0.085	1000.380
2016/07/07 15:29:30	495.688	1492.812	495.688	20.683	0.084	1000.380
2016/07/07 15:29:31	495.663	1492.813	495.663	20.683	0.086	1000.381
2016/07/07 15:29:32	495.663	1492.816	495.663	20.683	0.088	1000.383
2016/07/07 15:29:33	495.650	1492.814	495.650	20.684	0.084	1000.379
2016/07/07 15:29:34	495.650	1492.813	495.650	20.684	0.083	1000.378
2016/07/07 15:29:35	495.650	1492.814	495.650	20.683	0.087	1000.381
2016/07/07 15:29:36	495.638	1492.811	495.638	20.683	0.084	1000.379
2016/07/07 15:29:37	495.638	1492.813	495.638	20.683	0.086	1000.381
2016/07/07 15:29:38	495.638	1492.812	495.638	20.683	0.085	1000.380
2016/07/07 15:29:39	495.625	1492.813	495.625	20.683	0.086	1000.381
2016/07/07 15:29:40	495.625	1492.812	495.625	20.683	0.085	1000.380
2016/07/07 15:29:41	495.625	1492.810	495.625	20.682	0.086	1000.381
2016/07/07 15:29:42	495.625	1492.809	495.625	20.683	0.083	1000.378
2016/07/07 15:29:43	495.612	1492.812	495.612	20.682	0.088	1000.383
2016/07/07 15:29:44	495.612	1492.813	495.612	20.683	0.086	1000.381