Seanet DumpLog

Software Manual

0706-SOM-00003, Issue: 01

Table of Contents

Help & Support 4
Warning Symbols 5
1. Introduction 6
2. Installation 7
3. What is a .v4log file? 8
4. Generating Log Files 9
5. Log File Processing Options 10
6. Opening and Converting a Log File 11
    6.1. Overview 11
    6.2. Opening the Log File 11
    6.3. Log File Output Format 13
    6.4. Selecting Devices 13
        6.4.1. GPS Data 14
    6.5. Converting the Log File 15
7. Output Formats 17
    7.1. General Options 17
    7.2. XTF 18
    7.3. SEGY 18
    7.4. CSV 19
        7.4.1. Profilers 19
        7.4.2. Sonars 20
        7.4.3. Sidescan 21
        7.4.4. SeaKing Sub-Bottom Profiler 22
        7.4.5. SeaKing 700 Series 23
        7.4.6. GPS 24
        7.4.7. Auxiliary Device Data 25
        7.4.8. `Status` and `Hdctrl` Byte Values 25
    7.5. TIF 27
    7.6. GeoTIFF 28
    7.7. XYZ 28
    7.8. KMZ 29
Glossary 31

Help & Support

First please read this manual thoroughly (particularly the Troubleshooting section, if present). If a warranty is applicable, further details can be found in a Warranty Statement at the end of the manual.

Tritech International Ltd can be contacted as follows:

	Mail	*Tritech International Ltd* Peregrine Road Westhill Business Park Westhill, Aberdeenshire AB32 6JL, UK
	Telephone	++44(0)1224 744 111
	Email	support@tritech.co.uk
	Website	www.tritech.co.uk

Prior to contacting *Tritech International Ltd* please ensure that the following is available:

1. The Serial Numbers of the product and any *Tritech International Ltd* equipment connected directly or indirectly to it.
2. Software or firmware revision numbers.
3. A clear fault description.
4. Details of any remedial action implemented.

Contamination

If the product has been used in a contaminated or hazardous environment you *must* de-contaminate the product and report any hazards *prior* to returning the unit for repair. *Under no circumstances should a product be returned that is contaminated with radioactive material.*

The name of the organisation which purchased the system is held on record at *Tritech International Ltd* and details of new software or hardware packages will be announced at regular intervals. This manual may not detail every aspect of operation and for the latest revision of the manual please refer to www.tritech.co.uk

Tritech International Ltd can only undertake to provide software support of systems loaded with the software in accordance with the instructions given in this manual. It is the customer's responsibility to ensure the compatibility of any other package they choose to use.

Warning Symbols

Throughout this manual the following symbols may be used where applicable to denote any particular hazards or areas which should be given special attention:

Note

This symbol highlights anything which would be of particular interest to the reader or provides extra information outside of the current topic.

Important

When this is shown there is potential to cause harm to the device due to static discharge. The components should not be handled without appropriate protection to prevent such a discharge occurring.

Caution

This highlights areas where extra care is needed to ensure that certain delicate components are not damaged.

Warning

DANGER OF INJURY TO SELF OR OTHERS

Where this symbol is present there is a serious risk of injury or loss of life. Care should be taken to follow the instructions correctly and also conduct a separate Risk Assessment prior to commencing work.

1. Introduction

Seanet Dumplog is a stand-alone utility program that will convert *Tritech International Ltd* `.v4log` files into several industry standard formats. This will enable the logged data from *Tritech International Ltd* sensors, along with other logged reference data including GPS and compass, to be processed in other packages.

This help guide will assist the user with installing, operating and troubleshooting the Seanet Dumplog program.

Seanet Dumplog is bundled with the *Tritech International Ltd* Seanet Pro software suite and is not compatible with other versions of *Tritech International Ltd* software (i.e., Winson or SonV3).

2. Installation

The `.v4log` files are generated in the Seanet Pro software. The Seanet Dumplog installation can be found on the Seanet Pro installation CD (or restore USB device if using a *Tritech International Ltd* SCU).

Note

All of the *Tritech International Ltd* software is also available from www.tritech.co.uk.

Seanet Dumplog can be installed on a different computer to the one that has the Seanet Pro software installed.

The Seanet Dumplog installation file is named `Dumplog_Setup.exe`. Running this application installs the program and place a shortcut on the desktop. Additionally the following files will be added to the system:

C:\Program Files\Seanet Dumplog\...

- `DumpLog.exe` (the program executable)
- `Dumplog.chm` (the online help)

C:\Windows\System32\...

- `Libtiff.dll` (TIFF link library)
- `Geotiff.dll` (TIFF link library)
- `UnzDll.dll` (TIFF link library)
- `ZipDll.dll` (TIFF link library)
- `GIQ60.dll` ("Grid InQuest" OS transform link library)
- `GIQ60.dat` ("Grid InQuest" OS transform DAT file)

Note

On 64bit versions of windows the program will be installed in the folder `C:\Program Files (x86)`

3. What is a .v4log file?

`.v4log` files are proprietary data files produced from the *Tritech International Ltd* Seanet Pro sonar acquisition software.

The files are formatted to hold all the *Tritech International Ltd* sensor data in a binary format. This data is stored in the structure that is transmitted from the sensor heads. Multiple sensor head data can be stored in these files alongside other input data from devices such as GPS and compass. For example, data from a *Tritech International Ltd* SeaKing Sidescan, Sub-Bottom Profiler and SeaKing 700 (Bathy) package can all be logged alongside an incoming serial NMEA string from a GPS receiver.

In addition to storing the binary sensor data the `.v4log` file will also store a snapshot of the Windows Registry keys that contain all the configuration settings for the sensors and the Seanet Pro display program. This is useful to retain such things as the display properties and range settings that were used at the time of recording.

As already mentioned the `.v4log` files are a side product of the Seanet Pro software program. This software package is primarily designed for data acquisition and logging purposes.

It is often required to perform further processing and analysis of this data, perhaps to produce a mosaic or to analyse using another survey package. Many of these packages may only import data that is stored with a certain file format. Seanet Dumplog is designed to read the `v4log` files and translate them into other formats so that other programs can use the data.

The structure of the `v4log` file can be obtained on request from *Tritech International Ltd* technical support. Along with any such request, please specify the sensor heads that are being used in the system.

4. Generating Log Files

Full information on how to create a `v4log` file can be found within the Seanet Pro Software Manual (*document reference: 0706-SOM-00001*).

The important thing to note is that if the log file is to be used with Seanet DumpLog it has to be "closed off" correctly. This will happen automatically when the `Stop` button is pressed (or the `Record` button un-ticked in older versions of Seanet Pro). If Seanet Pro is shutdown prior to the log file being "closed off" then the data may be corrupted and might not work correctly with Seanet DumpLog.

5. Log File Processing Options

Once the `v4log` file has been generated from the Seanet Pro software it can be converted to another file format to be opened by another processing package.

For example, the `v4log` file may contain Sidescan, Sub-Bottom and GPS data records. Seanet DumpLog can be used to extract all this data into another file format such as XTF (Extended Triton Format), that can be processed in GIS or various mosaic and analysis packages.

Another option is to output Sidescan data in graphical format such as a TIF or a GeoTiff (if logged GPS data is available). It is also possible to convert the Sidescan and GPS data into a Google Earth KMZ file.

The Sub-Bottom data could also be output as an SEGY file to be analysed using seismic processing software.

Profiler and GPS data can be combined to produce a 3D XYZ output file with a space delimited ASCII file format containing Easting, Northing and depth of each point in the profiler scans. Alternatively, sequential Profiler data records can be processed with Turns Count `Aux data` to provide a 3D XYZ output for such applications as inner pipe and sewer inspection - "Turns Count" data provides the distance separation between adjacent profiler records in the sequence.

Finally, all sensor data can be output in an ASCII or comma delimited CSV format for further analysis.

6. Opening and Converting a Log File

6.1. Overview

There are several areas within the main page that are used to configure output file options and select desired device data to extract from the `.v4log` file.

The procedure is as follows:

1. Click the `Open File(s)` button.
2. Select the file (or files) to be loaded.
3. Select the start/end time and output format (configure if necessary).
4. Select the devices present in the log file.
5. Click the `Convert File(s)` button.

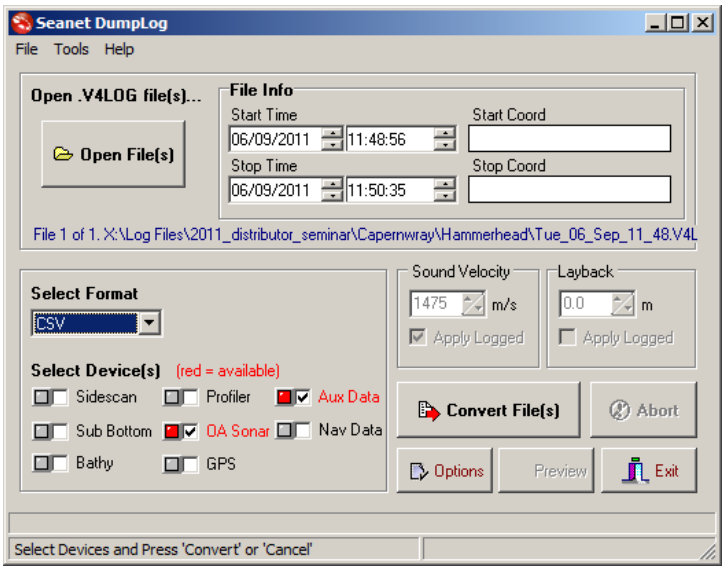

Figure 6.1. File opened and ready for conversion

6.2. Opening the Log File

Click on the `Open File(s)` button:

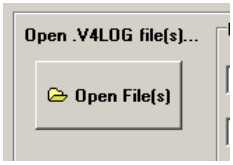

Figure 6.2. Open File(s) button

This will present the `Open V4LOG` dialog where one or more files can be selected. Once the desired files are selected, click on the `Open` button.

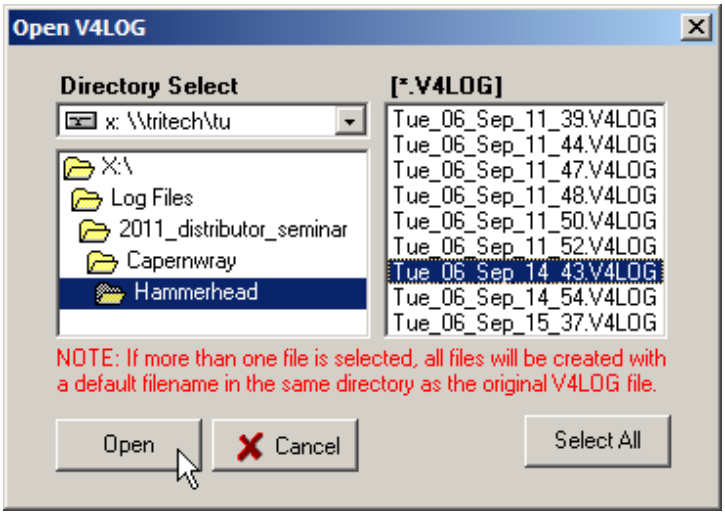

Figure 6.3. Open V4LOG dialog

Note

The `.v4log` file is scanned to determine the type of sensor data stored within it. If multiple files are selected then only the first file in the list is scanned, so if converting log files from different devices they should be processed separately and one at a time.

If a single file is selected it will be possible to crop the log file by altering the times in the `File Info` section of the program. The default `Start Time` and `Stop Time` when the log file is scanned are the limits and they can be reduced as required to shorten the output file. If GPS data is also present it will be displayed as the start and end coordinates.

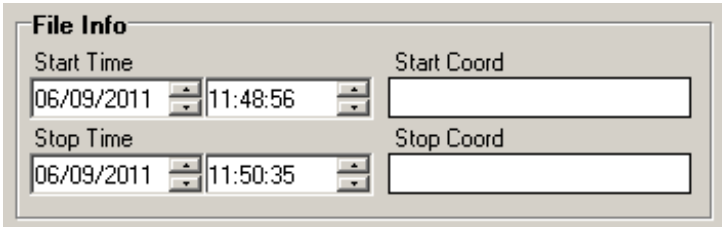

Figure 6.4. File Info section

6.3. Log File Output Format

Note

For detailed information of the configuration options for the output formats refer to Chapter 7, *Output Formats*.

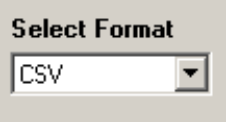

Figure 6.5. Select Format

From the drop-down list labelled `Select Format` choose the desired output format. This will enable or disable the devices as appropriate since not every input type can be converted to every format.

If the desired input type is greyed out after selecting the output format then it will be necessary to choose a different format to proceed.

6.4. Selecting Devices

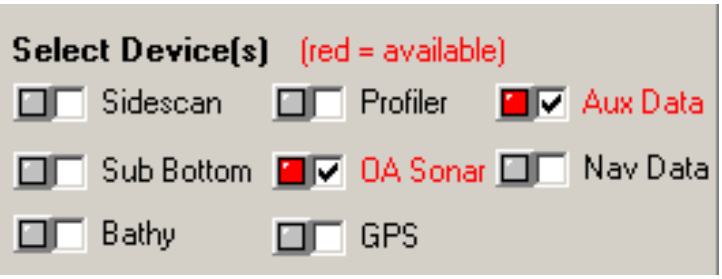

Figure 6.6. Select Device(s)

The `.v4log` file will be scanned and the software will determine which devices have been logged. It is possible to create log files that contain multiple devices (for example, a SeaKing Sidescan and a GPS) and the output can be one or more of the available devices.

If the device is not available in the log file then it will not be possible to export the data (since the data will not exist).

Note

Available devices are marked with a red highlight.

Tick all of the available devices that are required to be exported and then proceed with the conversion.

6.4.1. GPS Data

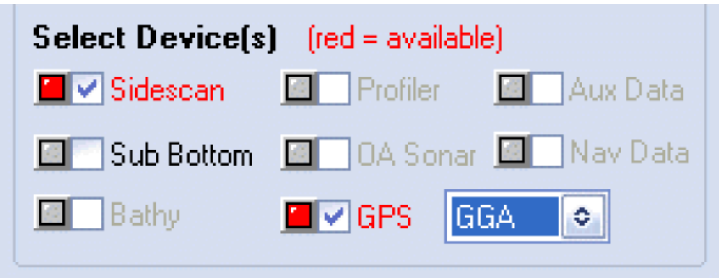

Figure 6.7. GPS Device Selected

If GPS data is detected, a drop-down list will appear to the right to select the particular NMEA message type to extract the latitude/longitude (or Easting/Northing) position data from. It may be that only one NMEA message type will be logged in which case the drop-down menu will only contain a single option. There is also an option to "Import CSV" which will output the GPS data into a `.csv` file and then process/filter this data to re-import and use with the `.v4log` file.

To output GPS data as a `.csv` file format, set the "GPS Format" drop-down list in the "CSV" tab page in the "Options" menu pages. This is used to select the string format for the CSV output. This can be either "NMEA 0183" which is the raw format, with latitude/longitude position, as transmitted by the GPS receiver or it can be "Time, E, N" which outputs UTC Time (hhmmss), Easting and Northing position.

The GPS "Import CSV" option imports from a `.csv` file with the following format:

```
MsgTime,RawData
```

MsgTime Can be either of two formats:

1. `xxxxx.xxxx` - where the integral part of this value is the number of days that have passed since 12/30/1899 and the fractional part is the fraction of a 24 hour day.
2. `dd/mm/yyyy hhmmss.zz`

MsgTime is not in UTC but a local time that should correlate with the Sidescan data record time-stamps for the synchronisation purposes. In DumpLog, convert the Sidescan data to a `.csv` file output, then read the Time fields (field 2) to establish any local time differences with the GPS UTC times.

RawData Raw NMEA string format as sent by the GPS receiver (e.g., RMC, GGA or TTL).

Example RawData strings:

```
$GPRMC,135643,A,5411.540,N, 00305.896,W,00.5,128,230295,05.9,W*62
```

```
$GPGGA,hhmmss.ss,5411.540,N, 00305.896,W,1,ss,d.d,a.a,m,g.s,m,d.t,drid
```



```
$GPGLL,5411.54,N,00305.90, W,hhmmss.ss,A*hh
```

Note

The 'RMC' string requires at least the first 9 fields (e.g. between commas) to be processed. There must be values for Lat/Lon (fields 4-7) and Status (field 3) should always be "A". The SOG and COG values (fields 8,9) can be set to 0.

The 'GGA' string requires at least the first 7 fields (e.g. between commas) to be processed. There must be values for Lat/Lon (fields 3-6). The Status (field 7) should be set to a value between 1 to 5 (e.g. 1 is default).

The 'GLL' string requires at least the first 6 fields (e.g. between commas) to be processed. There must be values for Lat/Lon (fields 2-5).

Examples of CSV file formats to input

1. Truncated RMC string with no COG/SOG used

```
38489.59689,$GPRMC,21944,A, 4635.9991,S,16823.2323,E,0,0
```

2. Full RMC string

```
24/10/2008 165735.320,$GPRMC, 145735.00,A,4113.96614,N,00021.90508,E,02.63,000.7,
   241008,001.1,W,A*25
```

The GPS position data will be processed as a latitude/longitude or in a converted Easting/Northing. The Easting/Northing conversion from GPS latitude/longitude data can be either to WGS84 UTM or OSGB. OSGB is a UK/Irish grid reference whereas UTM can be applied world-wide. To select UTM or OSGB, set the 'GPS E/N' option in the 'General' Tab page found in the 'Options' menu pages. If OSGB is selected a drop-down box will appear to the right with a Vertical Datum selection (e.g. 'Newlyn' is datum for mainland Britain).

6.5. Converting the Log File

Once all configuration settings have been made, click on the `Convert File(s)` button to convert the log files to the selected format.

Figure 6.8. Convert File(s) button

If only one file is to be converted, a save file dialog will appear giving the option to choose a directory to save the file to. If multiple files are present they will be saved into the same folder as the original log file.

The output files will be given the same file name as the original log file but with an appropriate file extension for the given output format.

Note

If the directory already contains output files from a previous conversion they will be overwritten so it is important to move the old files or re-name them if they are to be kept.

7. Output Formats

7.1. General Options

The `Options` dialog is accessed from the main screen by clicking on the `Options` button:

Figure 7.1. Options button

There are several options which will affect more than one output format and these are configured using the first tab labelled as `General`.

These options are mostly self explanatory, note that selecting `OSGB` is only appropriate for data collected around the United Kingdom and when selected a drop-down list will present itself with the available areas.

Note

`Contrast Level` and `Sensitivity Level` settings apply in Sidescan and SubBottom Profiler TIF/GEOTIFF image reproduction and also in the SEGY and XTF file production.

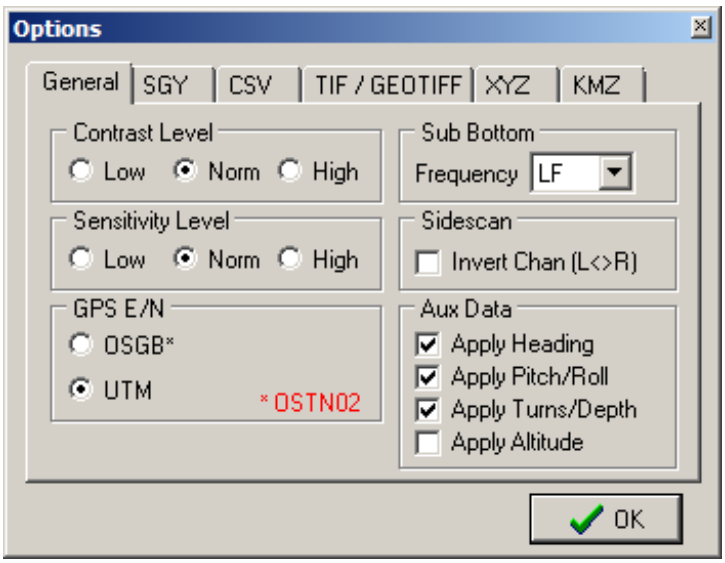

Figure 7.2. General Output Options

7.2. XTF

This is the Extended Triton Format which is compatible with a number of mosaicing packages. The compatible *Tritech International Ltd* devices for this format are SeaKing Sidescan and SeaKing Sub-Bottom Profiler. GPS data should also have been logged to geo-reference the data. Compatible NMEA messages that latitude and longitude data will be extracted from are `GGA`, `GLL` and `RMC`.

The SeaKing Sidescan contains two channels (port and starboard) and the SeaKing Sub-Bottom Profiler has one channel. The XTF file *cannot* be generated with all three channels simultaneously so only Sidescan *or* Sub-Bottom data can be selected along with GPS data.

The drop-down list to the right of the GPS check-box is to select the NMEA message type to extract the latitude and longitude position data from.

Note

This format does not have any configurable options except those configured in the `General` tab (such as GPS and Sub-Bottom channel).

7.3. SEGY

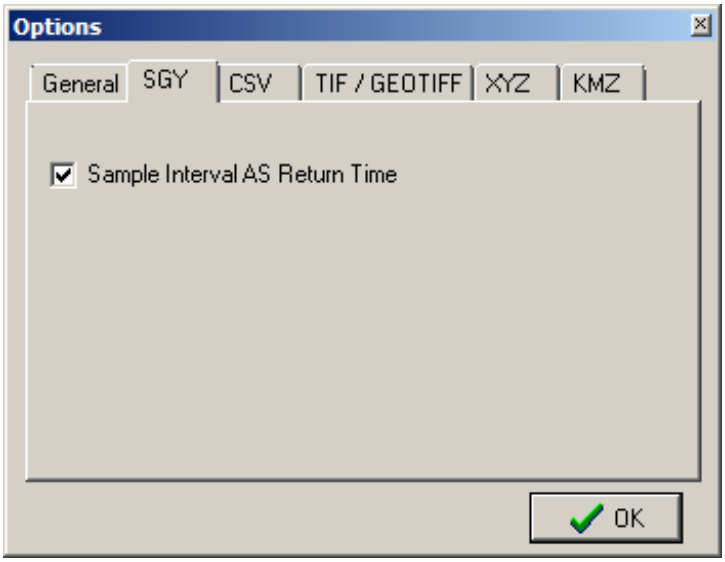

Figure 7.3. SEGY Output Options

This is an industry standard 2D seismic data format that uses data from a *Tritech International Ltd* SeaKing Sub-Bottom Profiler. The trace lengths and sampling intervals of this device can be variable. If the SEGY reader can only process fixed trace lengths at a set interval then ensure that the `Range Scale` (in Seanet Pro) is fixed throughout the logging period.

7.4. CSV

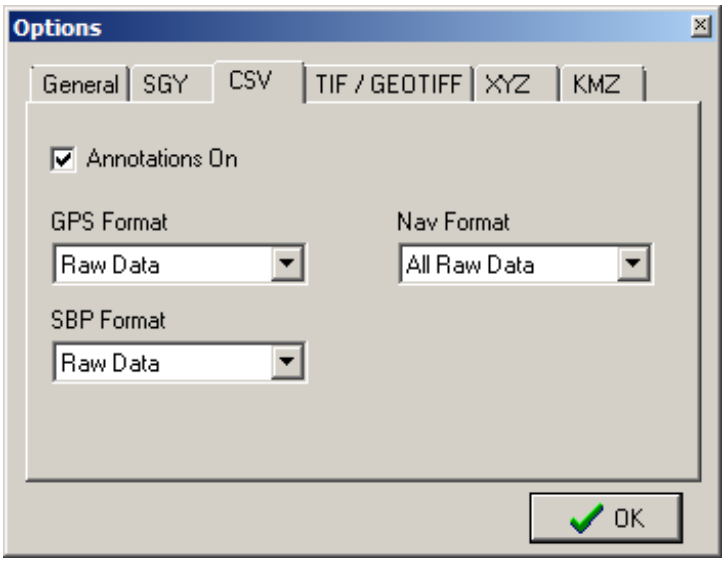

Figure 7.4. CSV Output Options

This is a comma separated variable format which represents the device data in an ASCII, comma delimited file format. The structure of the CSV file is proprietary *Tritech International Ltd* format. The data structure for each compatible device is as follows:

7.4.1. Profilers

This applies to the SeaKing Profiler only.

Example 7.1. SeaKing Profiler CSV

```
SPf,DateTime,Node,Rangescale,Gain,LefLim,RightLim,Steps,Pings,<DATA*pings>...
PRF,10:26:54,21,300,25,1600,4800,16,201,0,0,1654,0,1712,...,2535,2236,2263
PRF,10:26:54,20,300,25,1600,4800,16,201,1298,1310,1289,1296,1332,...,0,53048,0
❶     ❷     ❸ ❹ ❺  ❻  ❼  ❽ ❾ ❿
```

❶ `Spf` is the Line Header.
❷ `DateTime` is the Scan Start Time.
❸ `Node`. Use to determine between Master and Slave if using a pair of profilers, master is 20 and slave is 21.
❹ `Rangescale` is the range setting in decimetres. This is the range scale setting at time of logging and may not be required for re-building the profile image.
❺ `Gain` is the gain value. This is the gain setting at the time of logging in 1/255 units. Not required for re-building the profile image.
❻❼ `LeftLim` and `RightLim` are left and right limit in 1/16 Gradian units.
❽ `Steps` is the angular resolution in 1/16 Gradians. This is the step interval of the transducer and the value is signed; negative is scan towards left limit and positive is scan towards right limit. 1 Gradian Step Interval is 0.9° and for Seanet Pro this varies according to the Resolution control setting.

❾ `Pings` is the number of samples (data points) in profile.
❿ `<DATA*pings>` is the profile data points (ping echoes) in microsecond units. These time values are for the echo return path, this is the time to the seabed/ reflector and back. Apply a velocity of sound equation to calculate the range.

7.4.2. Sonars

This applies to the SeaKing Sonar, SeaPrince Sonar, Micron Sonar and SeaKing Survey Sonar (Hammerhead).

Example 7.2. Imaging Sonar CSV

```
SOf,DateTime,Node,Status,Hdctrl,Rangescale,Gain,Slope,AdLow,AdSpan,LeftLim,RightLim,
    Steps,Bearing,Dbytes,Dbytes of DATA
SON,13:26:49.178,2,16,5863,60,21,90,29,66,0,6368,32,4928,260,0,1,28,82,80,...,0,0,0
SON,13:26:49.210,2,16,5863,60,21,90,29,66,0,6368,32,4896,260,0,2,21,79,72,...,0,0,0
❶       ❷       ❸ ❹  ❺   ❻ ❼  ❽ ❾  ❿ ⓫  ⓬   ⓭  ⓮   ⓯  ⓰
```

Note

To fit within the margins a line break has been added to the header line in the example; in the actual CSV file each line will be continuous.

❶ `SOf` is the line header.
❷ `DateTime` the date and time of the line.
❸ `Node` is usually 2 for imaging sonars.
❹ `Status` is the data validation byte in hexadecimal (see Section 7.4.8, "`Status` and `Hdctrl` Byte Values").
❺ `Hdctrl` is a 2 byte bitset in hexadecimal (see Section 7.4.8, "`Status` and `Hdctrl` Byte Values").
❻ `Rangescale` is the range value in decimetres.
❼ `Gain` is the receiver gain that was applied for the current scanline of data and helps to show the control state during replay.
❽ `Slope` is the receiver slope or Time Variable Gain (TVG) that was applied at the receiver for the current scanline and helps to show control state during replay.
❾❿ `AdLow`/`AdSpan` control the mapping of the received sonar echo amplitude. The sonar receiver has an 80dB dynamic range and signal levels are processed internally such that 0 to 80dB = 0 to 255 (full 80dB (8 bit)
⓫⓬ `LeftLim`/`RightLim` are the limit angles in 1/16 Gradians. Values of 0 to 6400 equate to 0 to 360° (so multiply by 360/6400 to convert to degrees).
⓭ `Steps` is the angular step size in 1/16 Gradians.
⓮ `Bearing` is the transducer bearing in 1/16 Gradians.
⓯ `Dbytes` the number of data bytes in the scanline.
⓰ `Dbytes of DATA` the sample data points, the total number should match the value of `Dbytes`.

7.4.3. Sidescan

This applies to the SeaKing ROV Sidescan, the SeaKing Towfish and the SeaKing SK150.

Example 7.3. Sidescan Sonar CSV

```
SOf,DateTime,Node,Status,Hdctrl,Rangescale,Gain,Slope,AdLow,AdSpan,LeftLim,RightLim,
    Steps,Bearing,Dbytes,Dbytes of DATA
SSS,14:40:32.488,10,144,8581,200,44,125,62,124,1600,4800,0,4800,396,35,119,...,92
SSS,14:40:32.509,10,144,8581,200,44,125,62,124,1600,4800,0,1600,396,49,125,...,95
❶       ❷      ❸ ❹  ❺  ❻ ❼ ❽ ❾ ❿  ⓫  ⓬  ⓭ ⓮  ⓯ ⓰
```

Note

To fit within the margins a line break has been added to the header line in the example; in the actual CSV file each line will be continuous. The first line of data is the starboard scanline and the second is the port scanline, the lines alternate starboard to port in this manner throughout the CSV file.

Later DST models will have the option to fire both channels (port & starboard) simultaneously and output will be a single record with interleaved sample data (i.e., port sample 1, starboard sample 1, port sample 2, starboard sample 2). HdCtrls `Toggleadcmux` is 1 when both channels fired simultaneously - see Section 7.4.8, "`Status` and `Hdctrl` Byte Values"

❶ `SOf` is the line header.
❷ `DateTime` the date and time of the line.
❸ `Node` is usually 10 for Sidescan sonars.
❹ `Status` is the data validation byte in hexadecimal (see Section 7.4.8, "`Status` and `Hdctrl` Byte Values").
❺ `Hdctrl` is a 2 byte bitset in hexadecimal (see Section 7.4.8, "`Status` and `Hdctrl` Byte Values").
❻ `Rangescale` is the range value in decimetres.
❼ `Gain` is the receiver gain that was applied for the current scanline of data and helps to show the control state during replay.
❽ `Slope` is the receiver slope or Time Variable Gain (TVG) that was applied at the receiver for the current scanline and helps to show control state during replay.
❾❿ `AdLow`/`AdSpan` control the mapping of the received sonar echo amplitude. The sonar receiver has an 80dB dynamic range and signal levels are processed internally such that 0 to 80dB = 0 to 255 (full 80dB (8 bit)
⓫⓬ `LeftLim`/`RightLim` are the limit angles in 1/16 Gradians. Values of 0 to 6400 equate to 0 to 360° (so multiply by 360/6400 to convert to degrees).
⓭ `Steps` is the angular step size in 1/16 Gradians (note this is not applicable to Sidescan data).
⓮ `Bearing` is the transducer bearing in 1/16 Gradians.
⓯ `Dbytes` the number of data bytes in the scanline.
⓰ `Dbytes of DATA` the sample data points, the total number should match the value of `Dbytes`. In this case the first data point is 49 and the 396th point is 95.

7.4.4. SeaKing Sub-Bottom Profiler

Three output formats are available:

1. Raw (interleaved low frequency and high frequency sample data in each output line)

2. Time,Easting,Northing,Altitude (requires GPS data to be present)

3. Time,Latitude,Longitude,Altitude (requires GPS data to be present)

Note

The output format are selected from the `CSV` tab in the `Options` setup page.

Raw Output

Example 7.4. Sub-Bottom Profiler Raw CSV

```
SOf,DateTime,Node,Status,Hdctrl,Rangescale,Gain,Slope,AdLow,AdSpan,LeftLim,RightLim,
    Steps,Bearing,Dbytes,Dbytes of DATA
SBP,14:38:54.474,15,144,8645,200,42,90,31,95,1600,4800,0,4800,1288,0,...,50
SBP,14:38:54.554,15,144,8645,200,42,90,31,95,1600,4800,0,4800,1288,0,...,34
❶       ❷      ❸ ❹   ❺   ❻  ❼  ❽ ❾ ❿   ⓫   ⓬  ⓭ ⓮   ⓯   ⓰
```

Note

To fit within the margins a line break has been added to the header line in the example; in the actual CSV file each line will be continuous.

❶ `SOf` is the line header.
❷ `DateTime` the date and time of the line.
❸ `Node` is usually 15 for Sub Bottom Profilers.
❹ `Status` is the data validation byte in hexadecimal (see Section 7.4.8, "`Status` and `Hdctrl` Byte Values").
❺ `Hdctrl` is a 2 byte bitset in hexadecimal (see Section 7.4.8, "`Status` and `Hdctrl` Byte Values").
❻ `Rangescale` is the range value in decimetres.
❼ `Gain` is the receiver gain that was applied for the current scanline of data and helps to show the control state during replay.
❽ `Slope` is the receiver slope or Time Variable Gain (TVG) that was applied at the receiver for the current scanline and helps to show control state during replay.
❾❿ `AdLow`/`AdSpan` control the mapping of the received sonar echo amplitude. The sonar receiver has an 80dB dynamic range and signal levels are processed internally such that 0 to 80dB = 0 to 255 (full 80dB (8 bit)
⓫⓬ `LeftLim`/`RightLim` are the limit angles in 1/16 Gradians. Values of 0 to 6400 equate to 0 to 360° (so multiply by 360/6400 to convert to degrees).
⓭ `Steps` is the angular step size in 1/16 Gradians (this is not applicable to Sub Bottom Profiler data).

⓮ `Bearing` is the transducer bearing in 1/16 Gradians (this is fixed at 4800).
⓯ `Dbytes` the number of data bytes in the scanline.
⓰ `Dbytes of DATA` the sample data points, the total number should match the value of `Dbytes`. In this case the first data point is 0 and the 1228th point is 34.

With Easting & Northing

The Easting/Northing are in OSGB or UTM(WGS84), which is selected in the `General` tab of the `Options` dialog. If there are several Sub Bottom data records between successive GPS fixes, interpolation is applied so each output record in the CSV has a unique position associated.

Altitude is in metres.

Example 7.5. Sub-Bottom Profiler Easting/Northing CSV

```
Time,Easting,Northing,Altitude
14:38:54.554,234856.35410,2497457.83693,15.393
14:38:54.755,234856.75110,2497457.54144,15.378
    ❶          ❷          ❸          ❹
```

With Latitude & Longitude

The latitude and and longitude are output as GPS coordinates in the form `ddmm.mmmm`, so the first line in the example would have a latitude of 22°33.7921' and longitude of 11°425.2965'. The altitude is in metres.

If there are several Sub Bottom data records between successive GPS fixes, interpolation is applied to each output record in the CSV has a unique position associated.

Example 7.6. Sub-Bottom Profiler Latitude/Longitude CSV

```
Time,Easting,Northing,Altitude
14:38:54.554,2233.79210,11425.29650,15.393
14:38:54.755,2233.79194,11425.29673,15.378
    ❶         ❷          ❸        ❹
```

7.4.5. SeaKing 700 Series

The SeaKing 700 Series (Bathy) output has more entries than a typical sonar so an example is not presented and instead the entries are listed in the table. Each row of the table corresponds to a value in the CSV file.

Header Name	Example	Notes
SBt	`BAT`	Indicates a Bathy is connected
Time	`16:19:14.824`	
Node	`40`	The node for the Bathy is usually 40

Header Name	Example	Notes
Depth(m)	`17.616`	
Altitude(m)	`N/A`	No altimeter connected
LocVOS(m/s)	`1496.090`	
ManVOS(m/s)	`1475.000`	
LocDensity(g/cm3)	`1.025`	
ManDensity(g/cm3)	`1.047`	
LocBaro(mbar)	`N/A`	No barometer connected
ManBaro(mbar)	`1000.000`	
Temp(°C)	`12.321`	
Conductivity(mS/cm)	`38.524`	
Salinity(ppt)	`33.300`	
DQOffset(m)	`0.000`	
DQZero(m)	`-0.100`	
AltOffset(m)	`0.000`	

Note

Where the table lists entries as `Loc` or `Man` it refers to "Local" or "Manual". The "Local" data is taken from locally attached sensors, such as an altimeter or barometer. If no "Local" value is found the "Manual" value should be used, which is set in Seanet Pro.

7.4.6. GPS

The GPS data is logged (within the `.v4log` file) in the original NMEA format that was transmitted by the GPS receiver. All NMEA messages received will be logged, however, some of these will not be used by DumpLog

Example 7.7. Logged NMEA data for 1 GPS fix

```
$PGRME,8.0,M,12.0,M,12.4,M*22
$GPGLL,4635.557,S,16821.014,E,193315,A*31
$PGRMZ,42,f,3*2D
$PGRMM,WGS 84*06
$GPBOD,,T,,M,,*47
$GPRTE,1,1,c,0*07
$GPHDT,44.2,T
$GPRMC,193317,A,4635.557,S,16821.013,E,002.5,308.2,281004,025.3,E*6D
$GPRMB,A,,,,,,,,,,,V*71
$GPGGA,193317,4635.556,S,16821.013,E,1,05,2.1,13.0,M,-1.1,M,,*74
$GPGSA,A,3,04,05,07,,,20,24,,,,,3.7,2.1,1.3*35
$GPGSV,3,1,10,04,75,094,44,05,43,238,40,07,35,092,41,09,28,292,30*78
```

Out of this DumpLog will only process the following strings:

HDT Heading Data

RMC Position Data (latitude/longitude) and Course Data

GGA Position Data (latitude/longitude

Note

The CSV output will comprise data from *one* of the NMEA data strings that include Position (latitude/longitude) data.

7.4.7. Auxiliary Device Data

The auxiliary device data is received through a serial port and logged in `.v4log` file. The data can be up to 100 bytes long and must be terminated with a line feed character (<LF>). The data is logged in the original format that it was received through the serial port.

When converted to a CSV file the output will contain 2 comma separated fields. The first field is the message time stamp and the second field is the device data. If the auxiliary device data contains the line feed or carriage return terminators (<LF> and <CR>) they will be removed.

Example 7.8. Tritech PA Altimeter as an Auxiliary Device

```
Msg Time,Aux Data
12:19:06.811,001,150m
12:10:06.874,001.030m
```

7.4.8. `Status` and `Hdctrl` Byte Values

`Status` Byte	
Bit	**Function**
0	HdPwrLoss
1	MotErr
2	PrfSyncErr
3	PrfPingErr
4	AdUnMapped
5	hdsp5
6	hdsp6
7	ExtraBytes

Example 7.9. Status Byte

For a status value of 16:
16 (hexadecimal) = 00010110 (binary)
Note: this value is big-endian so the order is Bit7...Bit0
Bit0 = 0 (the scan is OK and can be used)
Bit1 = 1 (this can be ignored)
Bit2 = 1 (this can be ignored)
Bit3 = 0 (this can be ignored)
Bit4 = 1 (indicating the data is in 8-bit ADC mode)
Bit5 = 0 (this is always 0 and not used)
Bit6 = 0 (this is always 0 and not used)
Bit7 = 0 (if this is 1 a message is appended after the data record)

`Hdctrl` Bitset				
Bit	**Function**	**If 0**	**If 1**	**Notes**
0	adc8on	4bit mode	8bit mode	
1	cont	sector scan	continuous	
2	scanright	scan left	scan right	
3	invert	upright	inverted	
4	motoff	motor on	motor off	
5	txoff	TX on	TX off (for test)	
6	toggleadcmux	off	on	for Sub-Bottom Profiler
7	chan2	use channel 1	use channel 2	
8	raw	cookedADC	raw ADC mode	
9	hasmot	no motor	has motor	
10	applyoffset	no offset	heading offset	
11	pingpong	fire together	pingpong mode	applicable to Sidescan
12	stareLLim	normal	point at left limit	
13	ReplayASL	normal	analogue scanline	
14	ReplyThr	reserved and should always be 0		
15	IgnoreSens	normal	no error checking	diagnostic use only

Example 7.10. Hdctrl Bitset

For a status value of 8923:
8923 (hexadecimal) = 1000100100100011(binary)
Note: this value is big-endian so the order is Bit15...Bit0
Checking against the table shown, the bitset indicates that the sonar is in a diagnostic mode (Bit15 is 1) so the scanline cannot be relied on for data. Additionaly pingpong mode has been enabled (Bit11), the data is in RawADC mode (Bit8), TX is off (Bit5), the device is operating in continuous mode (Bit1) and the data is being transmitted in 8bit form (Bit0).

7.5. TIF

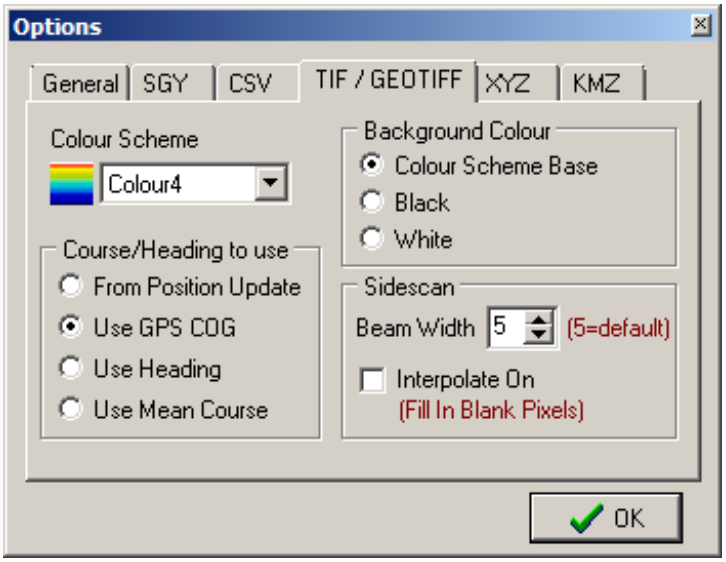

Figure 7.5. Tiff/GeoTiff Output Options

This option will provide a graphical representation for both Sidescan and Sub Bottom devices. Only one of these devices can be selected whenever a `.v4log` file contains both types of data.

The Sub Bottom conversion will produce a 2D seismic trace and assumes that the survey data follows a straight line.

The Sidescan or Sub Bottom data can be converted with or without GPS data integrated.

For conversion without GPS data, the TIF image will be a waterfall representation of all the data in the log file.

For conversion with included GPS data, the TIF image will be geo-referenced with overlayed grid-lines plotted on top of the Sidescan or Sub Bottom image.

If GPS data is selected along with the device data there is a drop-down list to select the type of GPS data to extract the position from. Once the `.v4log` file is opened, the drop-down list will be updated to include all the compatible NMEA strings logged within the file.

The output TIF image can be plotted as a grey-scale or with several other colour palette schemes selectable from the `TIF Colour Scheme` drop-down list.

7.6. GeoTIFF

Note

This format is configured using the same page as the TIF format, see Figure 7.5, “Tiff/GeoTiff Output Options”

This is very similar to the TIF output apart from the file will contain geographic reference data. This type of file can be opened and processed by many analysis packages including GIS.

This output option is only available for Sidescan or Sub Bottom data. GPS data must also be selected or else a standard TIF output will be produced.

The GPS message type must be selected from the drop-down list which is made visible whenever the `GPS` check-box is ticked. This drop-down list will update whenever a `.v4log` file is opened and compatible GPS data is found within the file. The selected GPS message type will be where the latitude/longitude data is extracted to be applied to the device data.

Similar to the TIF output the GeoTIFF can be plotted as grey-scale or with several other colour palette schemes selectable from the `TIF Colour Scheme` drop-down list.

7.7. XYZ

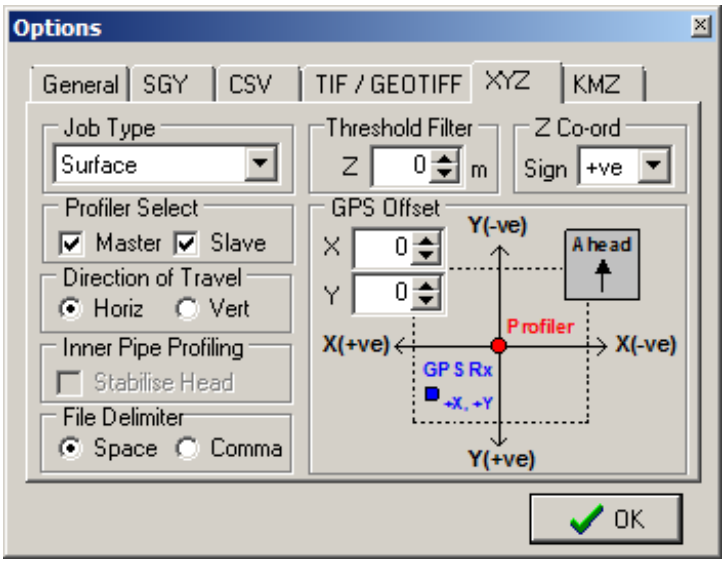

Figure 7.6. XYZ Output Options

This option only applies to a log file containing Profiler and either GPS Position, "Turns Count" Aux data or Depth/Pressure Aux data. Either `GPS` or `Aux Data` devices must be selected with the `Profiler` device in the `Select Format` frame.

However, if the additional data is not present then it is possible to input a manual value to be used for the fixed distance between each cross sectional profile. When XYZ is selected from the Select Format frame on the DumpLog main page, the panel to the right of the Sound Velocity panel changes from Layback to Y (inter-scan) Dist (or Z (inter-scan) Dist depending on travel direction selected). Manually enter a distance in metres and de-select the Use GPS/Aux check-box to manually apply a fixed distance between each cross sectional profile. If Use GPS/Aux is enabled then GPS or Turns/Depth/Pressure data needs to be active and selected.

The file format is ASCII Space Delimited with one space character between each data point (i.e. X Y Z).

If the GPS receiver is sited apart from the Profiler, an offset for this can be entered in the XYZ tab from the Options dialog.

Note

The Profiler has an onboard clock that should be synchronised to the GPS receiver clock. The UTC time from the GPS messages should be used to set the clock of the computer that is running Seanet Pro, and this will update the Profiler clock. It is important that all the clocks are synchronised to ensure that the data is correctly positioned.

7.8. KMZ

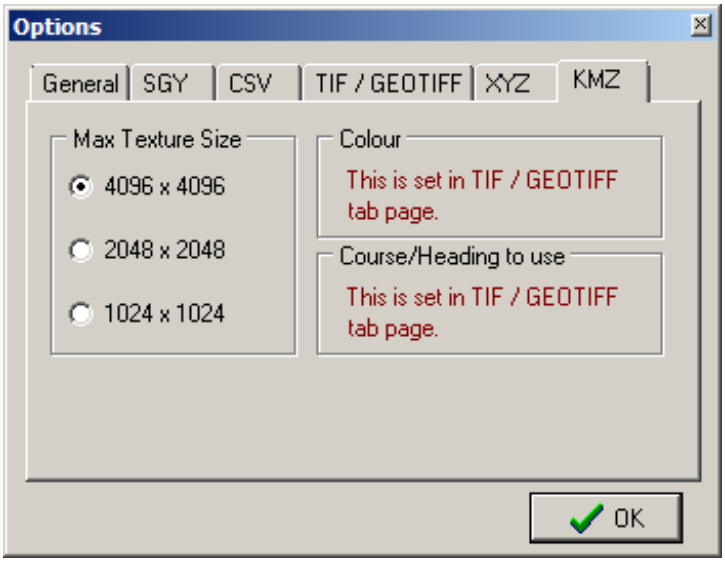

Figure 7.7. KMZ Output Options

This is a compressed KML file format that is native to Google Earth. The KMZ file contains geo-spatial image data from the Sidescan and integrates GPS data. The embedded images are in GIF format which is scaled and marked with latitude/ longitude coordinates extracted from the GPS data.

The KMZ file can be opened with Google Earth viewer.

The GIF image embedded into the KMZ file may need to be restricted in size to be opened correctly. This restriction is dependent on the specification of the graphics card installed in the computer that is running Google Earth. The image size can be configured in the `KMZ` tab in the `Options` dialog.

Note

To find the texture size that is supported on a computer launch Google Earth and navigate to the `About` dialog (usually from the `Help` menu). This dialog will indicate the supported texture resolution for the computer.

Glossary

.kmz	The standard filename extension for a compressed file containing the Keyhole Markup Language file (`.kml`) and image file. For storing georeferencing data and images in a single file. Used by Google Earth.
.tiff or .tif	The standard filename extension for Tagged Image File Format.
.v4log	The standard file format used by Seanet Pro log files.
ASCII	American Standard Code for Information Interchange - a character encoding scheme originally based on the English alphabet.
Bathy	Alternate name for the *Tritech International Ltd* SeaKing 700 Series Integrated Oceanographic Sensor Suite which outputs data about the conditions of the seawater and water column which may have an affect on the sonar (temperature, depth, etc.,)
CSV	Comma Separated Value - a text file in tabular format with table cells separated by commas, usually given the filename extension `.csv` but this can vary depending on the application.
GeoTiff	A public domain standard file format which allows georeferencing information to be embedded into a TIFF (Tagged Image File Format) image, uses the filename extension `.tif` or `.tiff`.
Google Earth	A virtual globe, map and geographical information program, originally called EarthViewer 3D prior to being acquired by Google Inc. in 2004.
GPS	Global Positioning System.
NMEA	National Marine Electronics Association - a USA based standards association responsible for overseeing electrical and data communications standards between marine devices (due to become the IMEA or International Marine Electronics Association in 2012).
SCU	Surface Control Unit - a specially manufactured computer which is rack mountable and capable of processing the data from the sonar equipment running either Windows XP Embedded or Windows 7 and Seanet Pro or Gemini software.
SeaKing	A specific sonar produced by *Tritech International Ltd* but also refers to the family of sonar equipment manufactured by *Tritech International Ltd* comprising of the SeaKing, SeaKing DST scanning and profiling sonars and the Hammerhead survey sonar.

Seanet Pro	The software supplied by *Tritech International Ltd* which is capable of running all the sonar devices.
Sidescan	A sonar that is typically towed behind a boat or mounted to the side of an ROV which takes a series of narrow sonar images that are joined together to form strips. Typically used for survey work.
UTM	Universal Transverse Mercator coordinate system - a 2-dimensional Cartesian coordinate system to give locations on the surface of the Earth.
WGS84	World Geodetic System (1984 revision) - a standard for use in cartography, geodesy and navigation and used as the reference coordinate system by GPS devices.

