VisualSoft Suite User Manual

VisualEdit Professional 11.0

Published: 21 February 2023

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1 VisualEdit Professional

1.1 The Different VisualEdit Editions

VisualEdit is available in three different editions, with increasing levels of functionality:

VisualEdit

- Video and data viewer with import, export and reporting tools.

VisualEdit Eventing

- Video and data viewer with import, export and reporting tools.
- Event editing (add, delete, move, modify, filter etc.) for inspection and survey "observations" or "incidents".

VisualEdit Professional

- Video and data viewer with import, export and reporting tools.
- Event editing (add, delete, move, modify, filter etc.) for inspection and survey "observations" or "incidents".
- Complete manual and automated data processing tools, including VisualSoft's "**Smart Processing**".

See also: VisualEdit Editions Compared 15

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1.1.1 VisualEdit

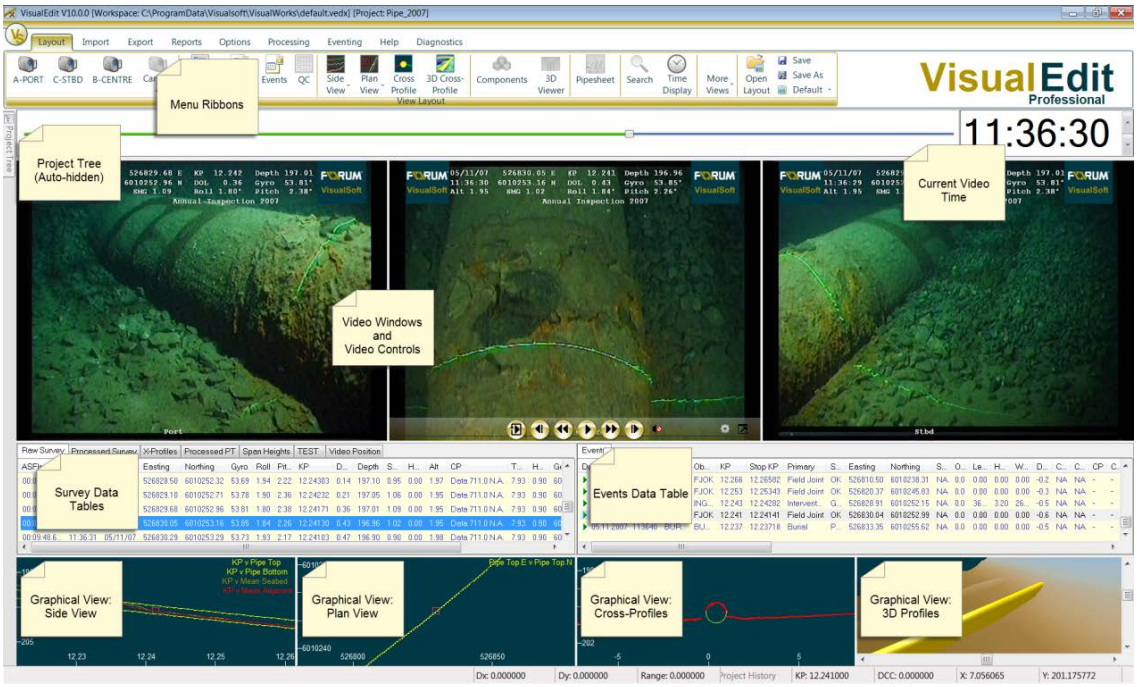
VisualEdit's most basic edition has synchronised views of video and all other data types.

It let you import, export and report data.

It has some basic tools to change data.

The VisualEdit Display

The basic display window for VisualEdit is the same for all three editions.



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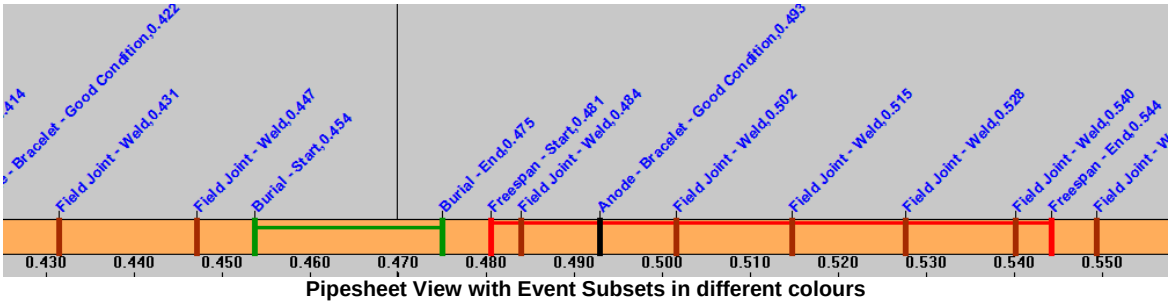
1.1.2 VisualEdit Eventing

VisualEdit Eventing provides all the functionality found in VisualEdit and also has the ability to add, edit, move, and delete “events” such as pipeline inspection observations and records. **VisualEdit Eventing** has the ability to Auto Update event records with associated data such as KP and position. When events are input or moved in offline review the process will merge any corresponding data based on the time of the event and the time in source table

VisualEdit Eventing has useful filtering and QC functions and can automate the creation of events such as pipeline freespan or burial start and end positions, and the calculation of span height and burial depth. Event Subsets allow you to create your own filters based on any number of criteria such as event type, and/or by using attributes such as length or height, or CP readings.

- Adjust event times to match video
- Update event positions and other attributes using time-based links to other data
- Display a pipesheet view, with optional history comparison
- Display event markers on plan and longitudinal views
- Filter events by type and/or property



Pipesheet View with Event Subsets in different colours

Side View with Event Subsets in different colours

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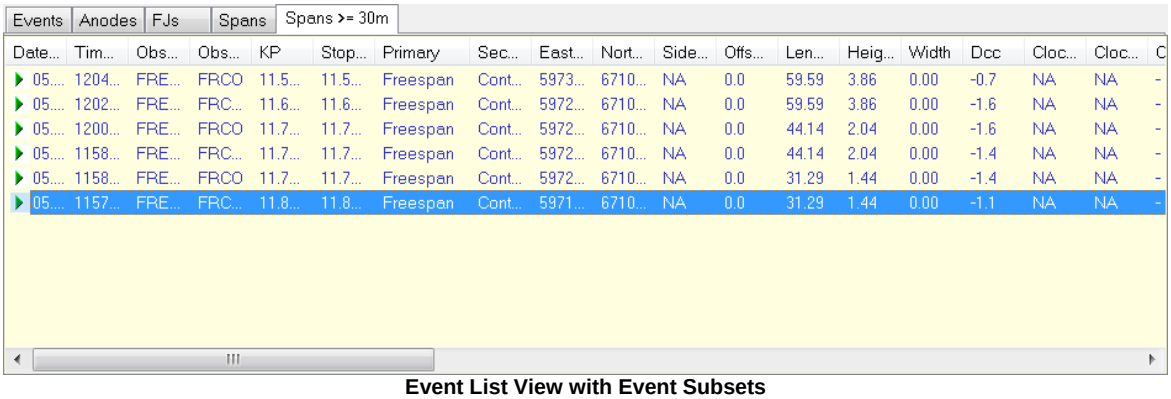
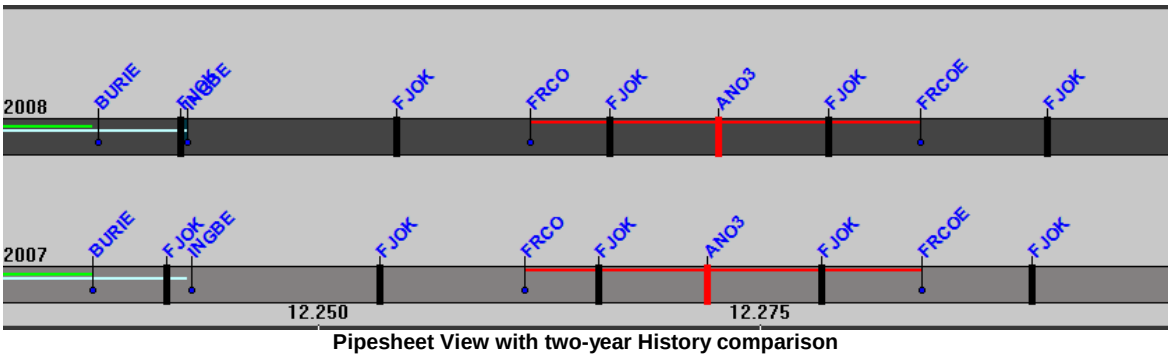


Event List View with Event Subsets



Pipesheet View with two-year History comparison

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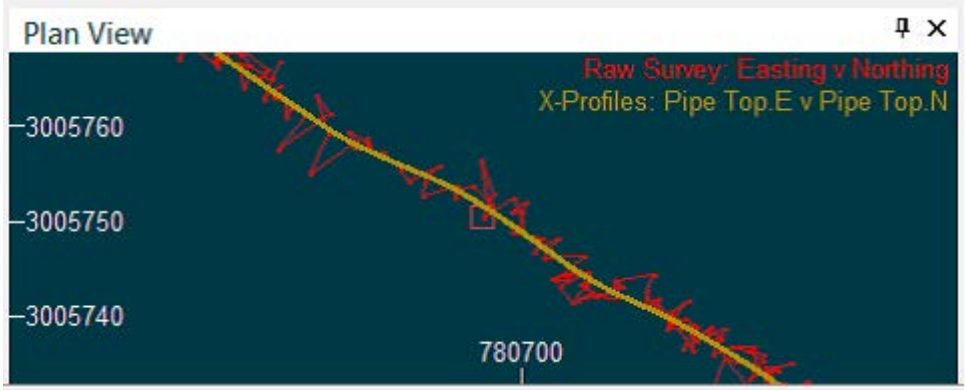
1.1.3 VisualEdit Professional

VisualEdit Professional is a complete solution for automated processing of survey data. It has been designed specifically for the offshore survey industry to reduce the time consuming, and costly, need for manual data processing. It has all of the features of VisualEdit 10 and VisualEdit Eventing 11 plus a wide selection of data processing tools.

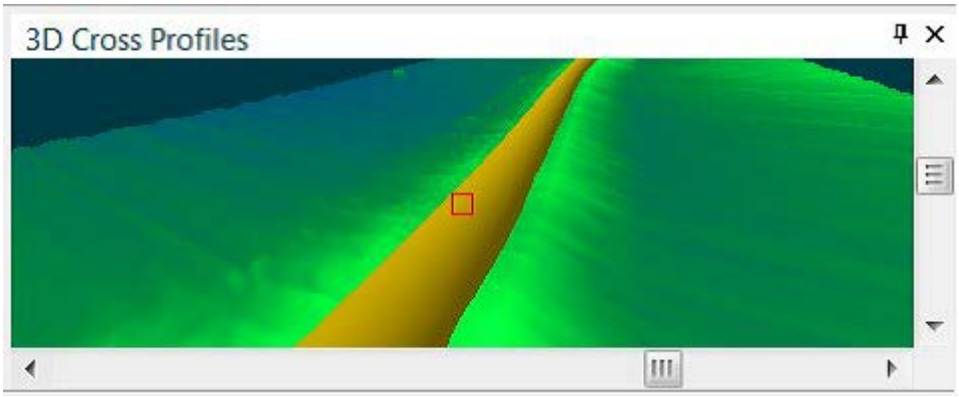
VisualEdit Professional offers tools for processing a wide variety of survey data including survey track plots, bathymetry, ROV sensors, cross-profiles and longitudinal profiles.

Position Processing



- Import data
- Apply C-O's
- Apply offsets
- Remove spikes and smooth data
- Recompute KP's
- Output computed ROV track/pipe
- Apply DVL smoothing

Bathymetry Processing



- Process depth/altitude
- Apply C-O's
- Apply offsets
- Remove spikes and smooth data
- Apply tidal corrections
- View 3D seabed and pipeline graphics

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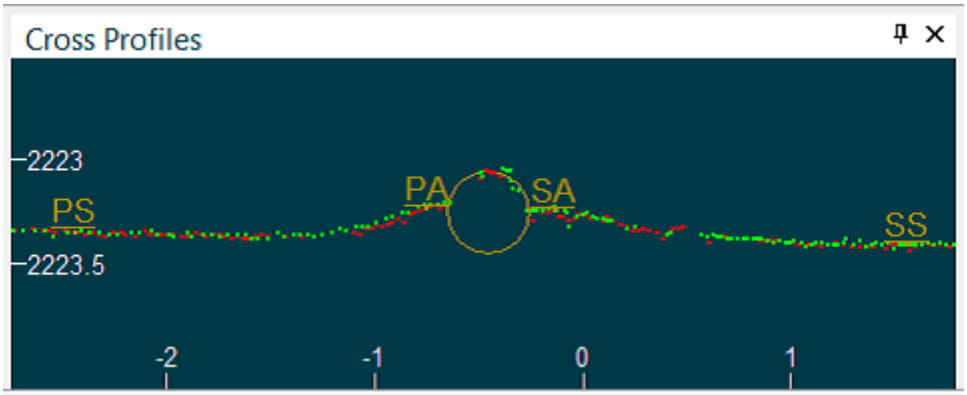
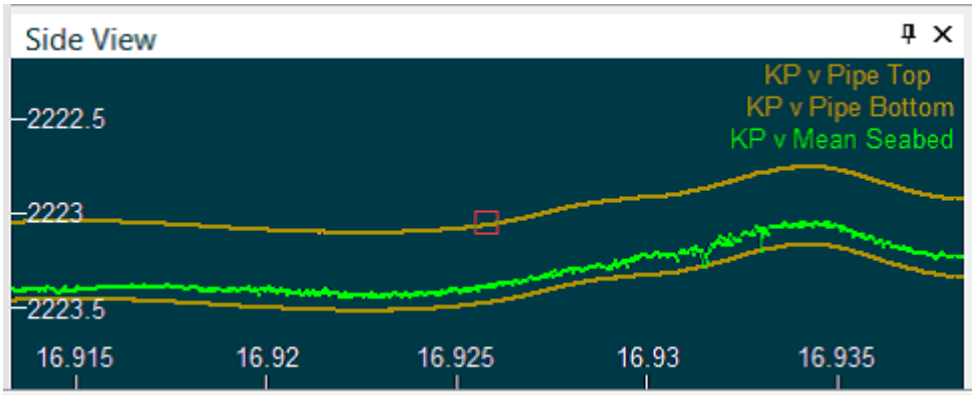
Automated Cross-Profile Processing



- Remove or clean noisy scans
- Apply motion corrections
- Apply pipe-tracker data
- Fit pipe to scan data
- Compute pipe and seabed depths
- Calculate trench depth data

Long Profile Processing



- Remove spikes and smooth data
- Compute seabed depths
- Output computed pipe position
- Output computed long profile
- Output processed cross-profiles

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1.1.4 VisualEdit Editions Compared

The table below shows some of the key functions available, and the main differences between the three editions of VisualEdit.

Key Functions	VisualEdit	VisualEdit Eventing	VisualEdit Professional
Video and audio playback	✓	✓	✓
Grab stills and video clips	✓	✓	✓
Search tool – KP/Time/Position etc.	✓	✓	✓
Offline Overlay configuration and display	✓	✓	✓
Pipesheet View for year-on-year inspection comparison	✓	✓	✓
Basic editing functions: Video, Survey & Inspection data	✓	✓	✓
Full import and export functions including configurable ASCII output	✓	✓	✓
Filter and display Event list subsets by type, anomaly status, size, etc.	✓	✓	✓
Full Event editing and configuration		✓	✓
Event QC functions		✓	✓
Manual or Automated Track, Depth and Sensor processing: Clean, smooth, offset, merge etc.			✓
Manual or Automated Cross-Profile processing: Clean, rotate, align, assign pipe, seabed, etc.			✓
Graphical QC and Audit Trail of data processing tasks			✓

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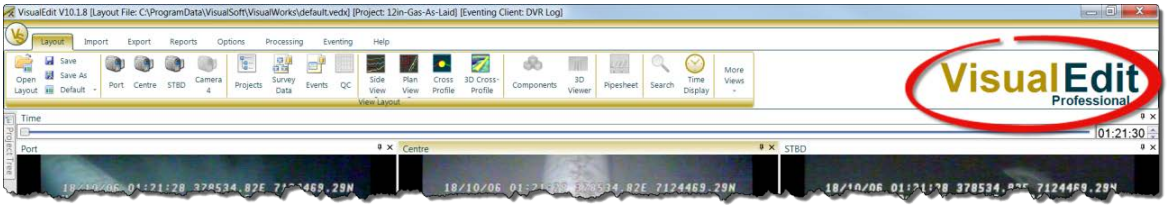
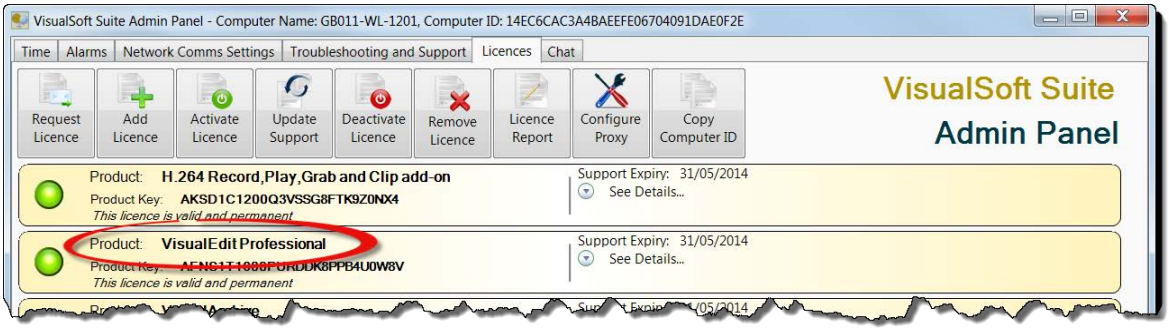
1.1.5 Which Edition do I have?

There are two places where you can check which edition of VisualEdit is on your PC.

When VisualEdit is running, the edition is shown very clearly in the top right corner of the main window. If you have the Eventing or Professional edition this will be shown below the VisualEdit text.



The second place that you can check, is in the VisualSoft Admin Panel where you can see the available licences in the Licences tab.



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1.2 VisualEdit Professional Introduction

VisualEdit Professional has all of the features of VisualEdit and VisualEdit Eventing **plus** the tools needed to edit and process navigation and sensor data such as:

- Remove navigation spikes from position data.
- Smooth position data.
- Remove spikes from depth and altitude data.
- Apply tidal corrections.
- Apply calibration values to motion data or to other sensor data.
- Calculate offset positions.
- Clean and process mechanical profiler or multibeam echo-sounder data.
- Process data from pipe trackers, and combine it with profiler or MBE data.

These processing tasks can be almost fully automated in our "Smart Processing 206", partially automated using our " Processing Scripts and Batches 212" or done almost entirely manually according to the needs and preferences of the user. At all stages the user has the ability to adjust and control settings used for processing.

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1.3 Definitions used in the VisualSoft Suite

Definitions of words and terms used in VisualSoft Suite applications	
Data Table	A **Data Table** is used in **VisualEdit** and **VisualReview** to display survey positioning or sensor data in a readable text format. Data Tables may contain information from individual survey sensors or positioning systems logged by **VisualDataLogger**, or they may contain information from multiple sensors or positioning systems. A Data Table may also contain event or observation records logged online using **VisualDVR** or in **VisualEventing** or logged and edited offline using **VisualEdit Eventing**. Each row of a Data Table has a unique time stamp, with a timing resolution of just one millisecond. Data Tables typically have multiple columns showing a range of information all applicable at the same time.
Dataset	A Dataset is simply group of video and associated survey data files which all cover the same time period. **Datasets** are displayed in the VisualSoft Project Tree in **VisualArchive**, **VisualEdit** and **VisualReview** where they are shown with a start time and a duration for the video recordings. If you have pipeline data the Project Tree will also show the KP limits of each dataset. On the hard disk each Dataset is a single folder which contains a group of individual but related files such as one or more video files from different cameras, one or more files of position data, a file of observed events, and possibly various files containing other data types like multibeam or profiler data.
Events	The **Events** list in **VisualEdit** and **VisualReview** is a special data table used to hold information relating to what can be seen in the video. The Events list is used for inspection tasks and similar surveys to record the time, position and status of components on pipelines or structures. Other companies may have different words for what we call Events. For example Shell use the word "incident" and Equinor use "observation". Whether you call it an Event or an incident or an observation it describes something that has been seen at a specific time and place during an inspection or other survey.
H.264	A video compression standard, usually stored in MPEG-4 container files, so a VisualSoft .mp4 file contains video compressed using the H.264 standard.
MPEG	A series of video (and audio) standards developed by the Motion Picture Experts Group. The VisualSoft Suite has always included support for MPEG-2 video files, and more recently has also added support for MPEG-1 and MPEG-4.

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Definitions of words and terms used in VisualSoft Suite applications	
Processed PT	The **Processed PT** Data Table is a pre-defined data table used to hold cleaned and corrected pipetracker data and also the position data for the Top of Pipe derived from the pipetracker data.
Processed Survey	The **Processed Survey** Data Table is a special data table used to hold a simple collection of processed and cleaned position data and other survey data such as pitch, roll, heading and depth. For relatively simple jobs the Processed Survey data table and the Video Position table might be all that you need to provide the data that a client needs. For more complex operations you may also need to add one or more User Defined data tables (see below).
Project	A **Project** is used in the VisualSoft Suite to group together all related data. This may be for a single pipeline, a single structure, a single survey task or a single client. A Project may or may not contain Sub-Projects (see below), and after a survey has been completed a Project will usually contain multiple Datasets. Projects are usually created in advance before survey work and video recording begins, and will initially be empty. As a survey or inspection task is carried out, more and more data and video will be added to the Project as a sequence of Datasets.
Project Tree	The **Project Tree** is used to display and manage the hierarchic structure of data and video files used by all applications of the VisualSoft Suite. The Project Tree is made up of one or more Projects, Sub-Projects and Datasets (see below).
Raw Survey	The **Raw Survey** Data Table is a special data table used to hold the time, position and other survey data recorded by **VisualDVR** during video recording. **VisualDVR** can be interfaced to a navigation system and can receive a simple ASCII data string containing survey position and sensor information. The data in this data string are logged to a file and are displayed in the Raw Survey data table in **VisualEdit** and **VisualReview**. This Raw survey information can be processed offline to clean or smooth the positioning data, and to apply corrections and offsets.
Sub-Project	A **Sub-Project** is used to divide the data of a large Project into logical groupings. For example a Project might represent all of the pipelines in one oil or gas field, with Sub-Projects for each individual pipeline. Alternatively a Project may represent one offshore structure with individual Sub-Projects for different part s of that structure.

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Definitions of words and terms used in VisualSoft Suite applications	
Time Sync or Time Synchronisation	Time Synchronisation is the process of applying the Timestamp information (see above) so that differing data types logged on different computers or to different data files can be linked together.
Timestamp	Each data record or row in each individual data table has a precise time and date associated with it. This timestamp is created at the time of logging and is preserved through all data processing operations. The timestamp allows different types of data to be linked together so that relevant information from different survey sensors or video cameras can be joined accurately and appropriately.
User Defined Table or UDT	**User Defined Tables** can be used to hold any data of any type you want. Typically they allow the data from individual sensors to be retained at the native time interval and resolution of the relevant logging system so that data is not lost by combining it with other sensors that have a lower timing resolution.
Video Position	The **Video Position** Data Table is a pre-defined data table used to hold the Easting, Northing, Depth and KP information relating to the position displayed in the video windows. This data table is filled during the data processing operations carried out using **VisualEdit Professional**, and is usually the source for the position, depth and KP information in the Events table.
WMV	Windows Media Video. A Microsoft video file format based on the MPEG-4 standard. The WMV standard has had a number of versions over time. Most WMV files used by the VisualSoft Suite are either WMV version 8 or WMV version 9.
X-Profiles	The **X-Profiles** Data Table is a pre-defined data table used to hold the beam information and position data from either mechanical or multibeam profiling systems. The data is logged by **VisualDataLogger** from either Tritech SeaKing, Reson or Imagenex systems. Other hardware such as R2Sonic will be added soon.

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1.4 Offset and Motion Conventions

Convention	Units	Description
X Offset	Metres	Positive to Starboard
Y Offset	Metres	Positive Forwards
Z Offset	Metres	**Positive downwards.** **Z is treated as a depth not a height.**
Pitch angle	Degrees	Positive with bow up
Roll angle	Degrees	Positive with port up

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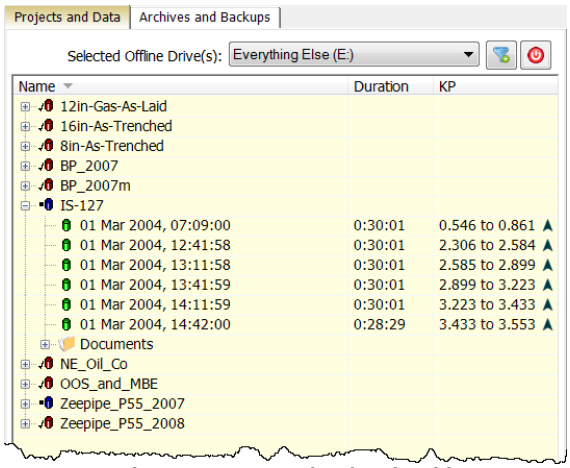
1.5 Projects and Datasets

The VisualSoft Suite groups all data into Projects, Sub-Projects and Datasets in a hierarchy or “Tree” structure just like the folder structure in Windows Explorer. This “Project Tree” hierarchy is saved using folders and individual files on the disk drive, but it is displayed in a more user-friendly way in the VisualSoft Suite programs. To see how the data and video files are saved on your hard disk see VisualSoft Files on your Disk 45.

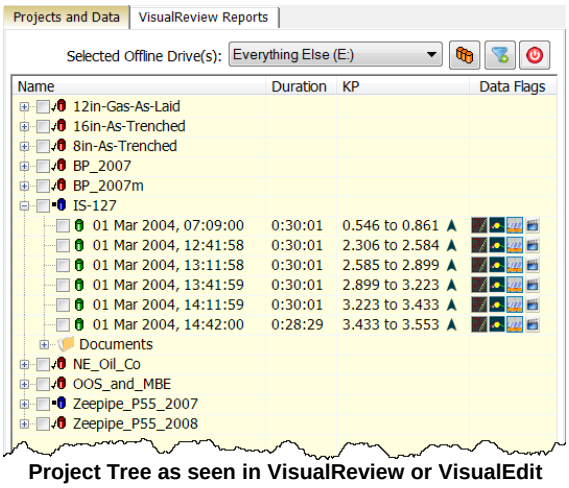
A Project will usually represent one client, one survey or one inspection task, or perhaps just one particular pipeline or structure. Each of these Projects can, if you want, have one or more Sub-Projects inside it to group data and video recordings into smaller sections. For example a “Client” Project for Shell or BP may contain video and data for many different pipelines, each of which will have its own Sub-Project. A “Structure” Project for one jacket inspection might contain different Sub-Projects for different faces or levels of the jacket. It is also possible for Sub-Projects to have other Sub-Projects inside them.

Within each Project 25 or Sub-Project 34 the video and associated data for the same time period is grouped in Datasets 36. In the online recording and logging software a new Dataset is created automatically at regular time intervals, typically every 15 or 30 minutes.

The Project and Data structure is the same in **VisualArchive**, **VisualReview** and all editions of **VisualEdit** but the default display options are slightly different in **VisualArchive** compared with the others. In **VisualEdit** and **VisualReview** there are columns of “Data Flags” to the right of the KP limits. These Data Flags indicate the current status of the data, showing you what does or does not exist, and what has or has not been processed. These status flags are explained in the topic Data Status Flags 41. The Data Flags are not normally shown in **VisualArchive**.



Project Tree as seen in VisualArchive



Project Tree as seen in VisualReview or VisualEdit

The Project Tree shows the VisualSoft data that is stored on the selected Offline disk drive. The disk drive can be chosen using the drop-down list at the top of the Project Tree.

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Many data management functions can be accessed by right-clicking in the Project Tree window.

Each Project 25, Sub-Project 34 and Dataset 36 has status information which is shown using the icons in the Project Tree.

Each Dataset shows the following information:

- Local date and time when the video and data files were recorded.
- The duration of the video and data recorded in the Dataset.
- The KP limits of the data in the Dataset, with an arrow indicating whether the survey ran in ascending or descending KP direction.

Each Project or Sub-Project can have Comments added to its properties. These are used to save any extra information that you think might be useful for your colleagues or clients.

Project Tree Status Bar

The Status Bar at the bottom of the Project Tree shows you whether or not the filter is turned on, and also shows the progress if the Project Tree is being refreshed.

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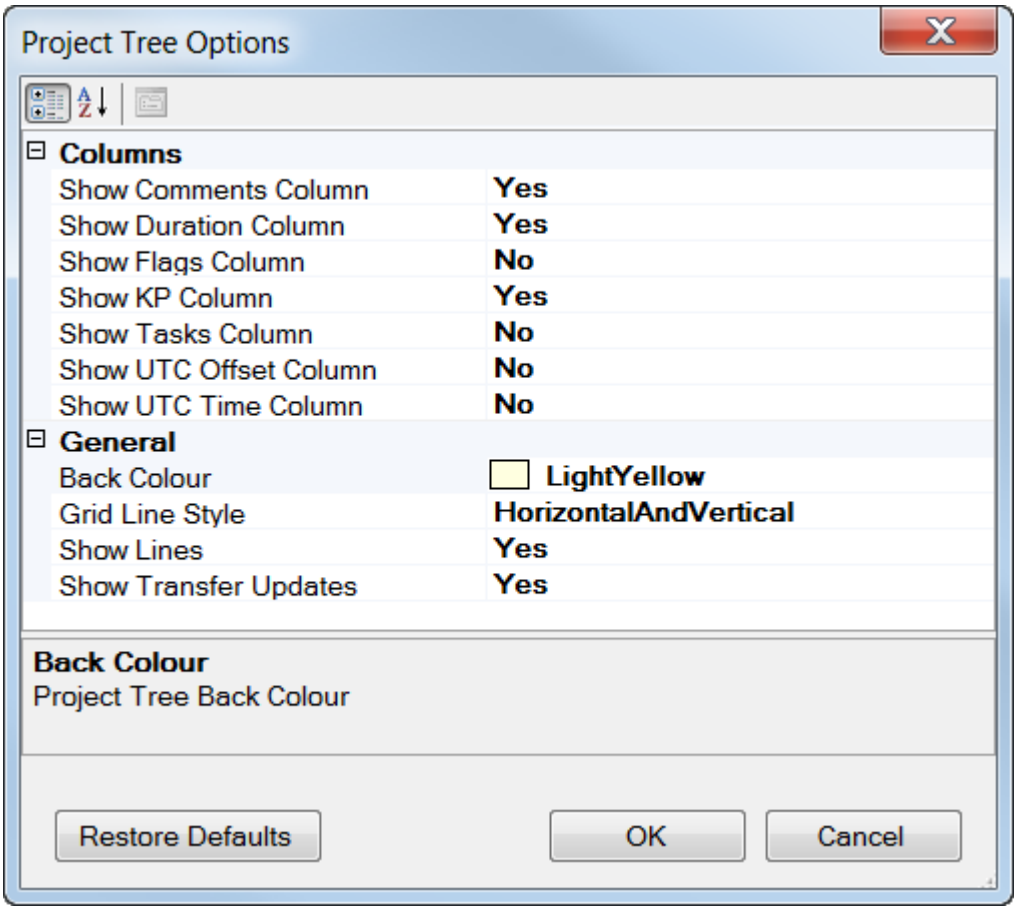
1.5.1 Project Tree Display Options

The Project Tree usually has a pale yellow background, and faint grey lines separating the rows and columns. You can change these colours or hide the grid lines completely, and you can turn individual columns such as "KP" on or off. To do this, right-click in the background area of the Project Tree (not on a Project or Dataset), and select Options from the pop-up menu.

This will open the window shown below. You can click on each setting to make changes. Which columns are shown as defaults is slightly different in VisualEdit, VisualReview and VisualArchive. To return to the default settings for the current application, click the Restore Defaults button at the bottom of the window.



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1.5.2 Projects

Projects are at the top level of the tree structure and can be used for either an individual pipeline or for a wider survey area which will contain a number of pipe surveys or structural surveys. The Project root directory also defines a Backup Media Set: this indicates that all surveys within a root Project will be archived to the same Backup Media Set i.e. a series of tapes with a common tape name prefix e.g. Project1....the first tape of this set will be numbered Project1001A, the second tape Project1002A etc. You can always view the Backup Media Sets and the individual contents of a tape in the Archives and Backups tab.

Project Status Icons

The status of each Project (or Sub-Project) is indicated by one of the following icons:

	Online: Logging & Editing	This project may be selected for logging by **VisualDVR**.
	Offline: Editing Only	This project cannot be selected for logging.
	Closed: Read Only	This project cannot be selected for logging. The Project has been marked by the users as closed. Note that the data may still be edited – **the Read Only status is advisory, and is not enforced by the software**.

Create a Project

To create a new Project right-click in the blank area of the Project Tree view. In the pop-up menu select, New, Project. A new Project will be created with the name “New Project” and you can type to change the name.

You will see that the new Project has a red icon like this:

This red icon, with the tick (or check) mark beside it indicates a **Closed** project. These cannot be seen by **VisualDVR** until the status is changed to Online and the icon turns green .

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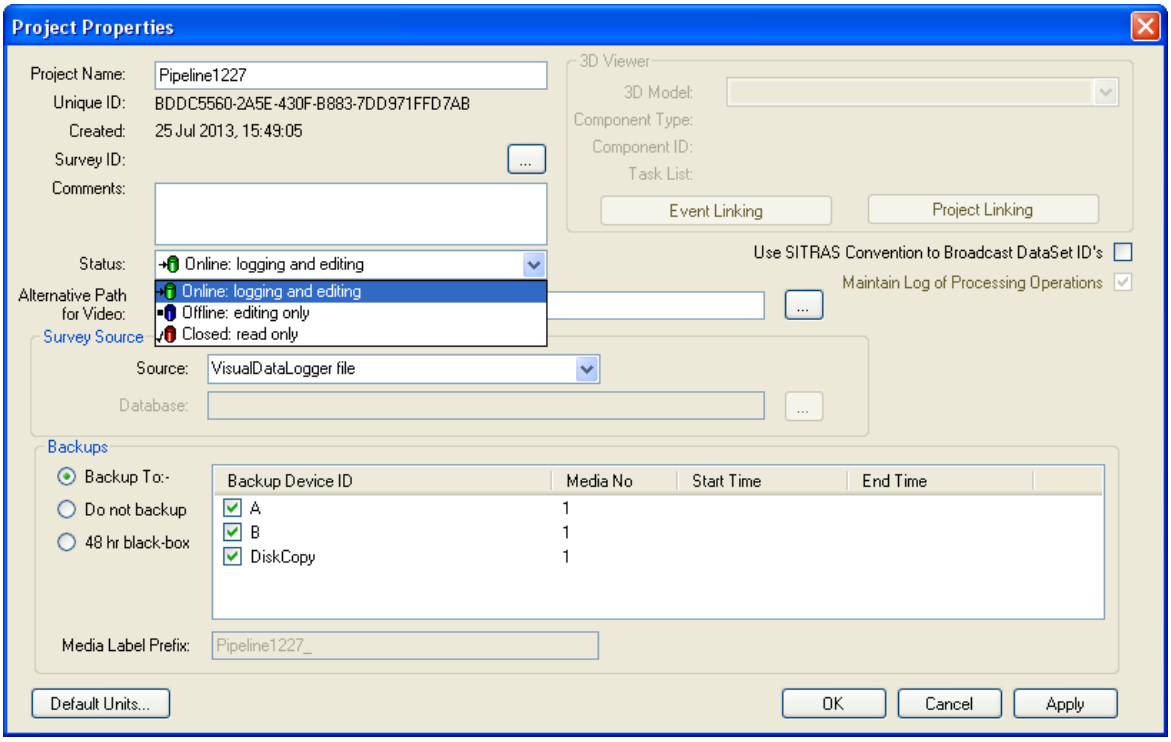
To change the Status to Online, right-click on your new Project and open the Properties where you will be able to select the "Online: Logging and editing" status with the green icon, as shown below.

For more details see Project Properties 26.



Project Properties

VisualSoft Projects have many properties that allow you to configure where the raw data should come from, where and how things are backed up, and for structural inspection – how data should be linked to a 3D drawing.

In the image below you can click to find information about specific properties, or you can look through the list below the image.

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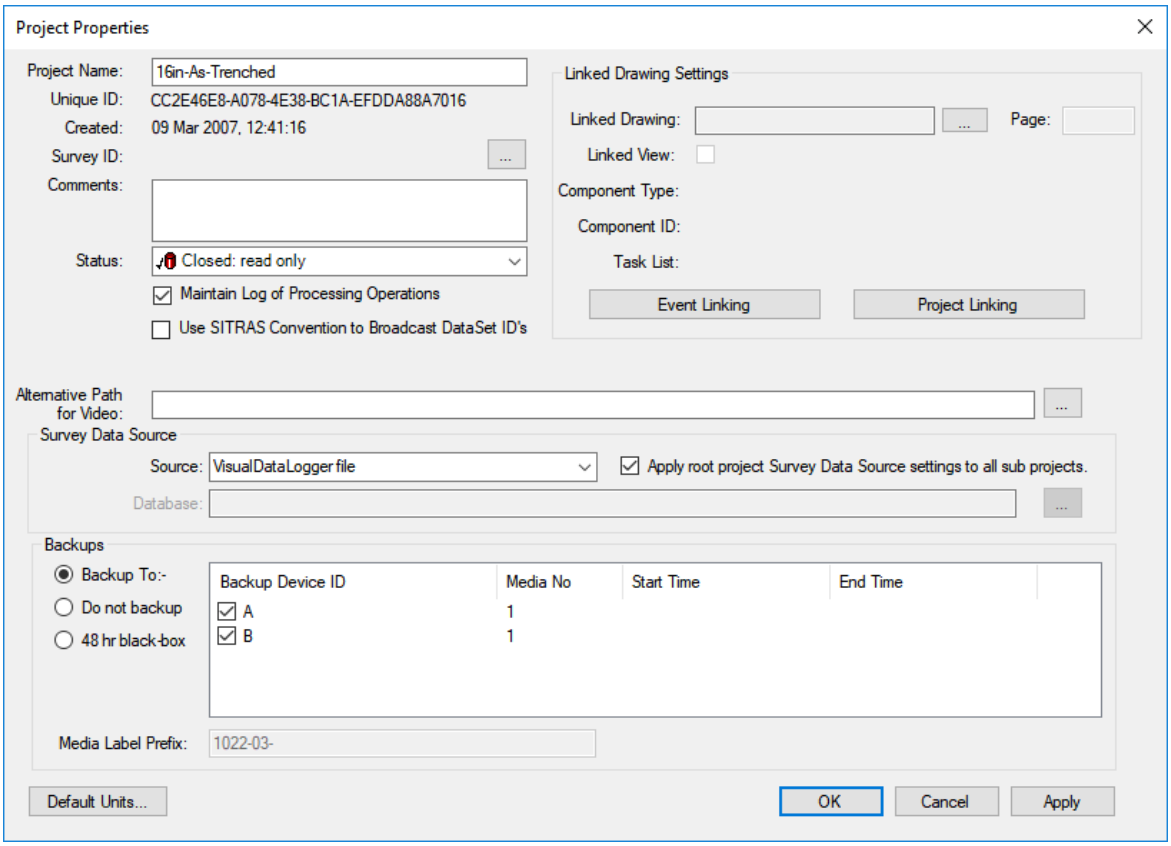

Project Name

A Project name is used to describe and identify the Project. It will typically include a Project number and the name of the pipeline or structure being surveyed. It should be kept as brief as possible.

Allowable characters are [0–9], [a–z], [A–Z], and hyphens or underscores. Spaces, quotation marks and other punctuation are not allowed.

Examples:

1234_12in_Gas_Export

5379-123_Platform_A3

Keep it brief:

Each VisualSoft Project exists as a folder on a hard disk. That folder has the same name as the Project. The Project folder lives inside X:\VisualWorks\Projects\ where X can be any disk drive.

Each Sub-Project is a also a folder on a hard disk. That folder has the same name as the Sub-Project.

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Inside Projects and Sub-Projects there will be datasets. Each dataset folder has a name in the form DATA_YYYYMMDDhhmmssttt (i.e. the date and time of logging).

Inside each dataset folder there will be video and data files, e.g.: YYYYMMDDhhmmssttt@PortCamera.asf

Windows allows a total of 255 characters all the way from the drive letter to the suffix of a file name, so you need to make sure that there are not too many levels of Sub-Project and that the names are kept short. If the Project name is "Inspection" then you don't need to specify Inspection in its Sub-Projects. If the whole Project has the pipeline name, then you don't need the pipeline name in the Sub-Projects... and so on.

Unique ID

Each Project that you create is automatically given a "Unique ID". This cannot be changed.

The Unique ID is a way for the software to link backup tapes and disks to the Project they came from – even if the Project Name is changed for some reason. They are also used by VisualArchive to tell whether or not two Projects that have the same name are or are not actually the same thing, for example if two different ships each work on different 10 inch Gas Pipelines and both send their data to the same office.

Creation Time

Each Project that you create is automatically tagged with the date and time of its creation. This cannot be changed.

It can be used to help you identify data if the Project name is not sufficient or has been changed.

Survey ID

The Survey ID is not often used, but is available if you want an automated way of sending video and data to a particular project. In VisualDVR you can receive a data string from your online navigation software. Typically this includes the position information for the ROV so that it can be used in the overlay. If you also include a column for "Pipe Name", or "Route File Name" (or something similar) you can then use the data in that column to match to the Survey ID of a Project so that it is the data itself that "tells" VisualArchive which Project to use. In the example below if the text "PL1234" appears in the column named "Pipe Name" of the survey data received by VisualDVR, then VisualArchive will place the video and associated data into this Project.

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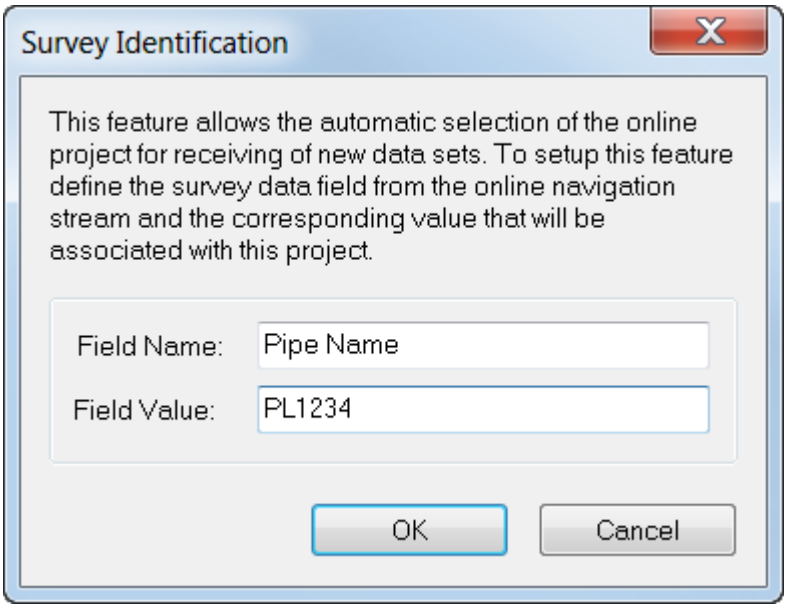

Comments

The Comments allows you to add any notes that you think might be useful. You may want to add a note for colleagues in the office to help them understand what the data is, or you may want to put a more detailed version of the pipeline or project name than is possible in the short space available for the Project Name.

Project Status

The Status of each Project (or Sub-Project) is indicated by one of the following icons:

	Online: Logging & Editing	This project can be selected for logging by **VisualDVR**. Only the Online Projects are sent to VisualDVR when the user presses **F5** in VisualDVR to "Get Projects from VisualArchive".
	Offline: Editing Only	This project cannot be selected for logging.
	Closed: Read Only	This Project cannot be selected for logging. The Project has been marked by the users as closed. This is usually done by the Data Processing team when they have finished their work. (Note that the data may still be edited – the Read Only status is for information purposes only and is not enforced by the software.)

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Alternative Path for Video

Most companies, in most circumstances, should not need to use this setting, and SHOULD LEAVE IT BLANK.

The "Alternative Path for Video" is designed for use by very big companies like Shell which have extremely large archives of data and wish to separate the video files from all other types of data. If you are required to do this you will need to have two separate disk drives with identical directory trees – one of them containing video files inside the dataset folders and one of them with the other survey data files. After you have put your data and video into these two separate but identical folder structures you should select the path for the video here, and select the disk with the survey data in the normal Project Tree disk selector.

Automated Data Import

A VisualSoft Project can use survey data logged by VisualSoft's own VisualDataLogger application, or it can use data imported from other logging and processing systems.

In VisualArchive you can configure a Project to use data from any one of the following **Survey Data Sources**:

- **VisualDataLogger files**
- **Configurable File Import** of data files exported from QPS's QINSy. For more details see Configurable File Import 30.
- **Configurable File Import** of Equinor's SITRAS data files which can be exported from many processing systems including Eiva's NaviModel or NaviEdit, and QPS's QINSy. For more details see Configurable File Import 30.
- **Database** import from 3rd Party relational databases. This has been used in the past and may be used in the future, but is currently disabled. If you would like to use this option, please contact our sales 336 or support 334 teams to discuss this.

Configurable File Import

The Configurable File Import in VisualArchive currently supports data files from QPS's QINSy or Equinor's SITRAS data files. In the Project properties you can specify a data format and a location for that data. When VisualSoft Datasets are loaded in VisualEdit, the files in the Configurable Import Location are then searched to see if they contain data with times matching the Datasets being loaded. Matching data will be imported automatically, converting it to a VisualSoft format.

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To use the Configurable File Import for a VisualSoft Project, open that Project's properties and then select Configurable File Import in the drop down list of supported Survey Data Sources.

Next, click on the browse button to open the more detailed configuration window.

Select either QINSy or SITRAS as the type of file to be imported, and then use the small browse button to locate the folder where these files will be placed. VisualArchive will then monitor this folder for any new files. To view the details of any files already in the selected folder, click on the button labelled "View file details".

If the selected data type is QINSy, you can import Raw Position data and/or Cross-Profiles (which may be mechanical profiler data or multibeam echo-sounder data), and/or Sensor data from equipment such as motion sensors or pipe-trackers. Choose which types you want to import by selecting from the displayed options.

If the selected data type is SITRAS, you can import Processed position data and/or Cross-Profiles, and/or Sensor data from equipment such pipe-trackers. Choose which types you want to import by selecting from the displayed options.

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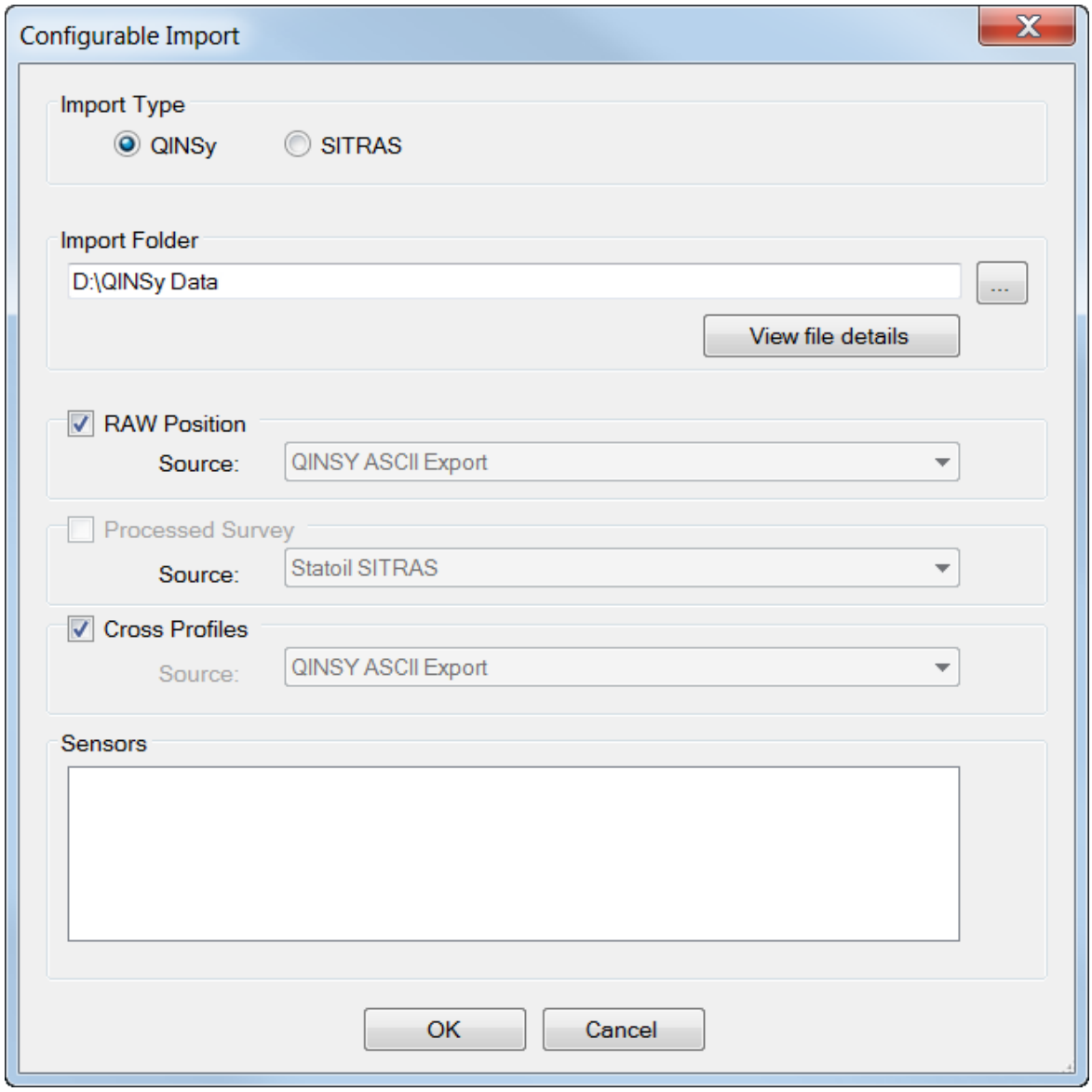

Project Backup Options

Each VisualSoft Project has its own specific backup settings. It is up to you whether or not you want all Projects to backup in the same way to the same devices, or to each use different devices and different options.

There are three main backup options:

1. **Backup to** a list of devices that you select. This is the option that we recommend! It is explained in detail in the help and User Manual for VisualArchive.

2. **Do not backup** at all. We do NOT recommend this. It might occasionally be the right thing to do, but please be careful: If you are not 100% sure what to do, make a backup.

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3. **48 Hour Black-Box**. This keeps the files on the offline disk drive for 48 hours, and then automatically deletes them. This might be useful if you don't really expect to need the data, but would like a bit of time to decide. Remember that you can always change the Project to use a normal backup and time during the first 48 hours, before anything gets deleted.

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1.5.3 Sub-Projects

Projects can contain one or more Sub-Projects. All Sub-Projects are archived to the same backup media set as the root project. Therefore, if you require a Project to have its own set of backups it must be created as a top level, or "root" Project, and not as a Sub-Project. However, if you have a job consisting of several small tasks then it may be more efficient to group the small project tasks under one main Project representing the whole job. This can make data administration much simpler.

Sub-Project Status Icons

The status of each Sub-Project is inherited from its parent Project and can only be changed by changing the status of the parent Project. The status is indicated by one of the following icons:

	Online: Logging & Editing	This project may be selected for logging by **VisualDVR**.
	Offline: Editing Only	This project cannot be selected for logging.
	Closed: Read Only	This project cannot be selected for logging. The Project has been marked by the users as closed. Note that the data may still be edited – **the Read Only status is advisory, and is not enforced by the software**.

Create a Sub-Project

To create a new Sub-Project right-click on an existing Project (or a Sub-Project) in the Project Tree view. In the pop-up menu select, New, Sub-Project. A new Sub-Project will be created with the name “New Project” and you can type to change the name.

You will see that the new Sub-Project has the same status icon as its parent Project.

1.5.4 Documents

A VisualSoft Project or Sub-Project can include a Documents folder which you can use to store any type of file that you like. You can use it to store drawings, procedures, or reports inside your VisualSoft Projects. If you right-click or double-click on a file in the Documents folder it will behave exactly the same as if you right-click or double-click on it in Windows Explorer.

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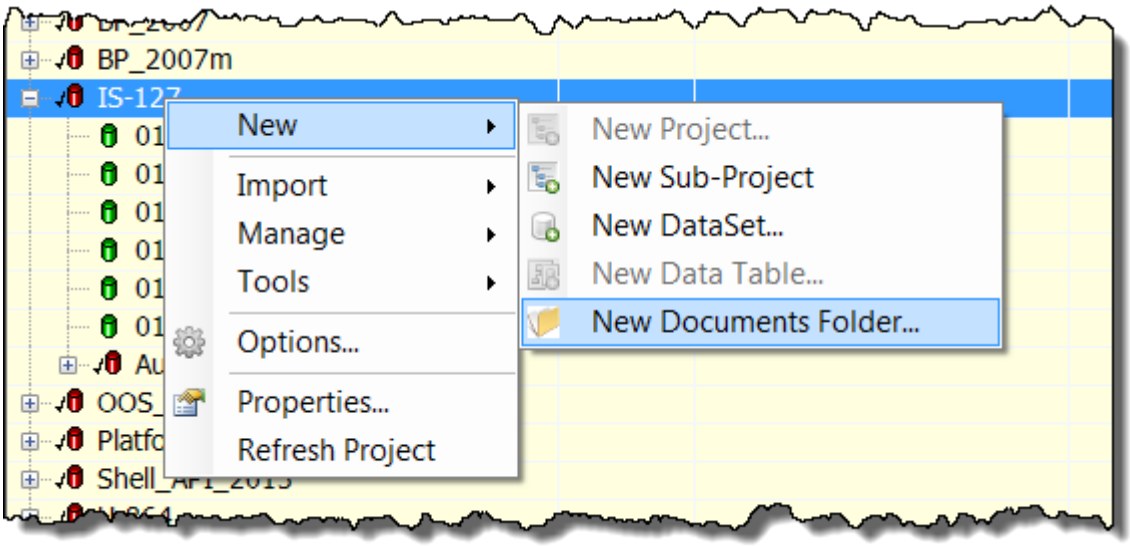
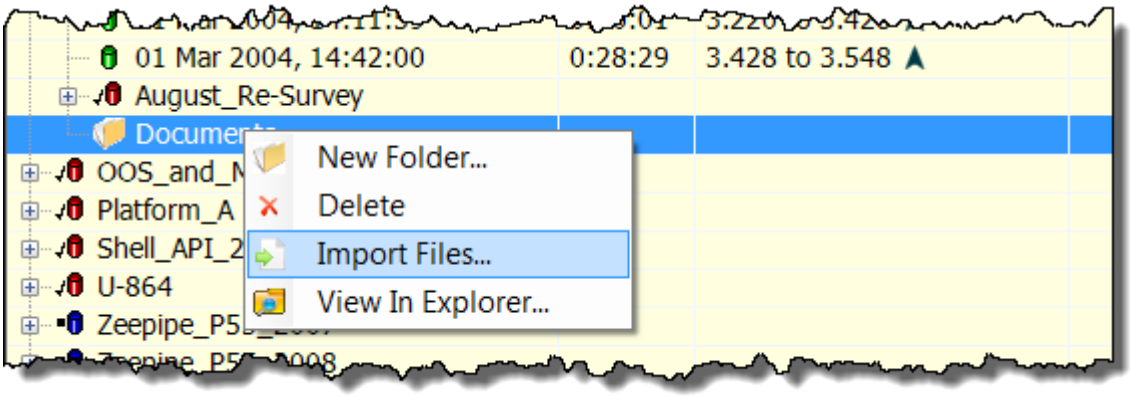
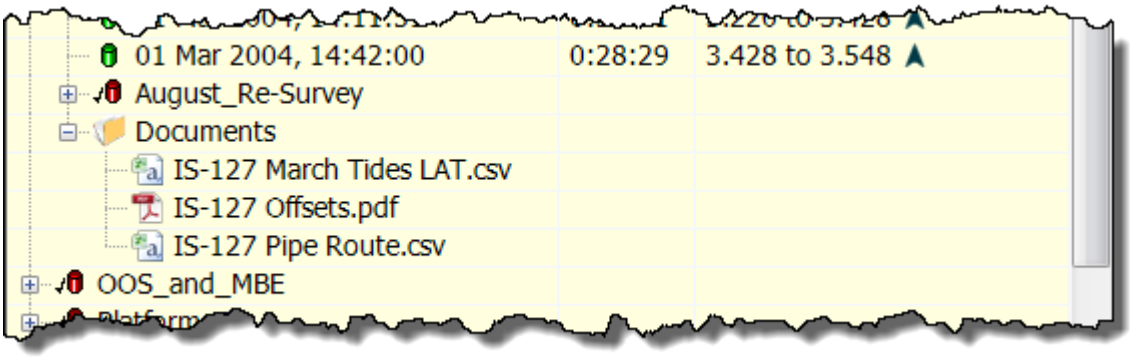
You can create a Documents folder inside any Project or Sub-Project using the right-click menu as shown below.



After you have created a Documents folder you can add files to it, by right-clicking on it to use the Import tool:



The imported files will be shown with the same icons as in Windows Explorer and will behave in the same way when you double-click or right-click on them.



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1.5.5 Datasets

Datasets are groups of files logged over one continuous, unbroken time period. A Dataset usually has video files and other survey data such as position and sensor data. All of these files will cover the same time period. The video recording and data logging applications are designed to create a new Dataset at a fixed time interval, usually every 30 minutes but you can change to shorter times if you wish. If you do not stop recording before this time limit is reached the recording and logging will automatically switch to new files at the time limit. In this case there will be no gap between the end of one the files in one Dataset and the start of the files in the next Dataset. In other cases where you manually stop recording and logging, and then start again later there can be gaps between Datasets.

Dataset Limits

Each Dataset shows the following information in the Project Tree:

- Local date and time when the video and data files were recorded.
- The duration of the video and data recorded in the Dataset.
- The KP limits of the data in the Dataset, with an arrow indicating whether the survey ran in ascending or descending KP direction.

See also: Dataset Properties 36.

Dataset Properties

To display the properties of a Dataset right-click on the Dataset and select Properties from the pop-up menu.

To change the Start Date & Time, UTC Offset or Duration of a dataset click on the button to the right of the Start Date & Time

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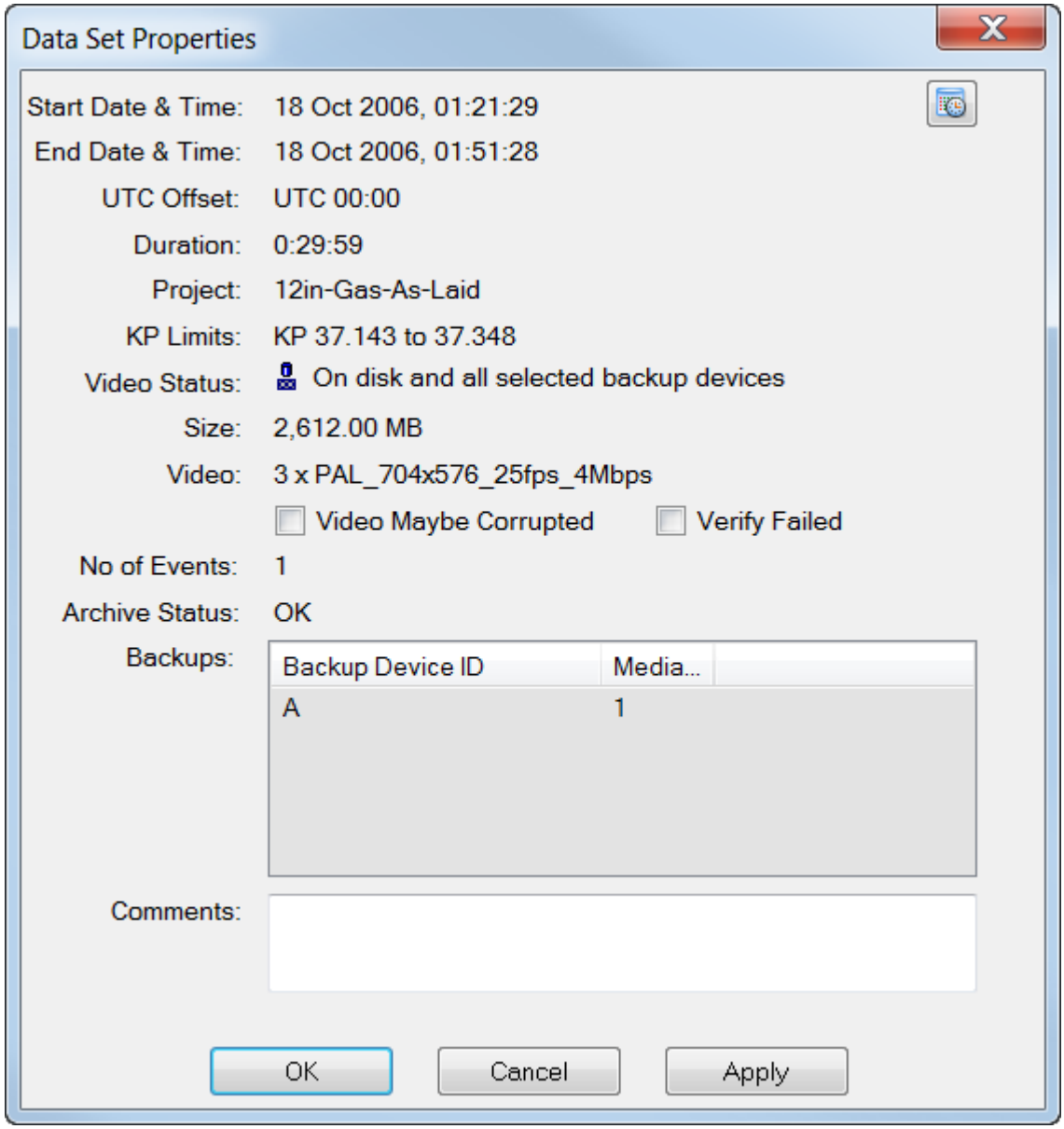

Dataset Start Time

The start time of the Dataset is displayed in this window as local time.

To change the time or to adjust the time offset between UTC and local time, click on the button to the right of the time and date.

The time can be set manually, or you can use the option to make it match the logged Raw Survey data (which is the Survey Data sent from your navigation software to the

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VisualDVR video recorder during the recording). In normal circumstances the time and date in the Raw Survey data should already match the video and dataset start time, but occasionally things go wrong with the online setup, so you may need to reset the dataset start time.

Dataset End Time

The end time of the dataset is displayed in this window as local time. The end time of the dataset is calculated from the start time plus the duration of the video files.

Dataset Duration

The duration of the dataset is displayed in seconds. When the dataset is created by **VisualArchive**, the duration is set to match the length of the first video file.

To change the duration manually, click on the button to the right of the time and date.

Dataset UTC Offset

The file and folder names used on the disk drive have the data and time of the saved as a UTC timestamp, but the dates and times that you see in VisualArchive, VisualReview and VisualEdit are usually displayed as "Local Time" so that times are adjusted around the world and as daylight saving settings are applied.

The offset from UTC to the applicable Local Time at the location and season where the data was logged and the video was recorded is saved inside each dataset as part of its properties. This setting is taken from the PCs used to record the data.

Occasionally the PCs used for recording and logging might be set to the wrong timezone, or they might not have the correct daylight saving settings. This can cause the data to be saved with the wrong UTC offset.

The UTC offset of each Dataset is displayed in the Dataset Properties 36, and it can be adjusted by clicking on the button to the right of the time and date in the Dataset Properties 36.

The UTC offset can also be displayed in the Project Tree as an extra column by turning it on in the Project Tree Display Options 24.

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Dataset KPs

The KP limits of the dataset are updated automatically from the **Video Position** data table.

If the **Video Position** table does not exist or is empty, the KP limits will be updated from the **Processed Survey** table.

If **Processed Survey** is also unavailable or empty, the **Raw Survey** data table will be used.

If **Raw Survey** is also unavailable or empty, the KP limits will remain as zero.

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Dataset Video Status

The status of the video files within each dataset is indicated as follows:

Icon	Status	Description
	Dataset Locked	While **VisualArchive** is transferring (i.e. copying) a video from **VisualDVR** to the offline disk drive it places a lock file to stop **VisualEdit** and other parts of **VisualArchive** accessing the dataset too early. When the transfer is complete and checked the lock is removed. If the transfer is interrupted or something goes wrong the lock might be left in place. See Managing Lock Files for more information.
	Video on Disk only	Video files are on **VisualArchive**'s hard disk. These files have not yet been written to a backup device.
	Video on Disk & Tape	Video files are on **VisualArchive**'s hard disk, and have also been written to a backup device. Note: These files might still exist on the online hard disk also.
	Video on Tape only	Video files have been written to a backup device, but no longer exist on **VisualArchive**'s hard disk. Note: These files might still exist on the online hard disk.
	Video missing	Video files are not on **VisualArchive**'s hard disk, and have not been written to a backup device. Note: These files might still exist on the online hard disk.

To view more detail about a Dataset, see Dataset Properties 36.

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Data Status Flags

The “Flags” column of the Project Tree displays icons to indicate the status of certain data files in each Dataset.

Icon	Status	Description
	Raw position data	There is data in the Raw Survey data table of this Dataset, but not in the Processed Survey data table.
	Raw profiler / MBE / sensor data	There is raw data from VisualDataLogger in this Dataset, but there are no processed cross-profiles.
	Raw (online) event data	There are events in this dataset which were logged online. None of them has been edited, deleted, moved or added offline.
	Processed position data	There is data in the Processed Survey data table of this Dataset.
	Processed profiler / MBE data	Some or all of the cross-profiles in this Dataset have been processed.
	Processed (offline) event data	Some or all of the events in this dataset have been edited, moved, deleted or added offline.

1.5.6 Project Tree Filter

The Project Tree Filter allows you to control which Projects, Sub-Projects or even which Datasets are displayed in the Project Tree. By adjusting the filter settings you can show or hide data based on its start date and time, its recording duration, its KP limits, its online or offline status, or a variety of other properties such as the backup status.

The filter can be configured, with options to save and reload a collection of Named Filters with different settings, and it can be turned on or off.

The buttons to configure the filter 43, or to turn it on or off 44 are shown just to the right of the disk selector at the top of the Project Tree.

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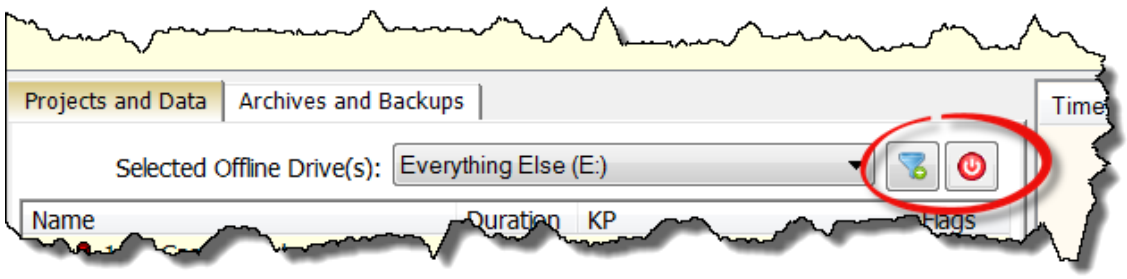

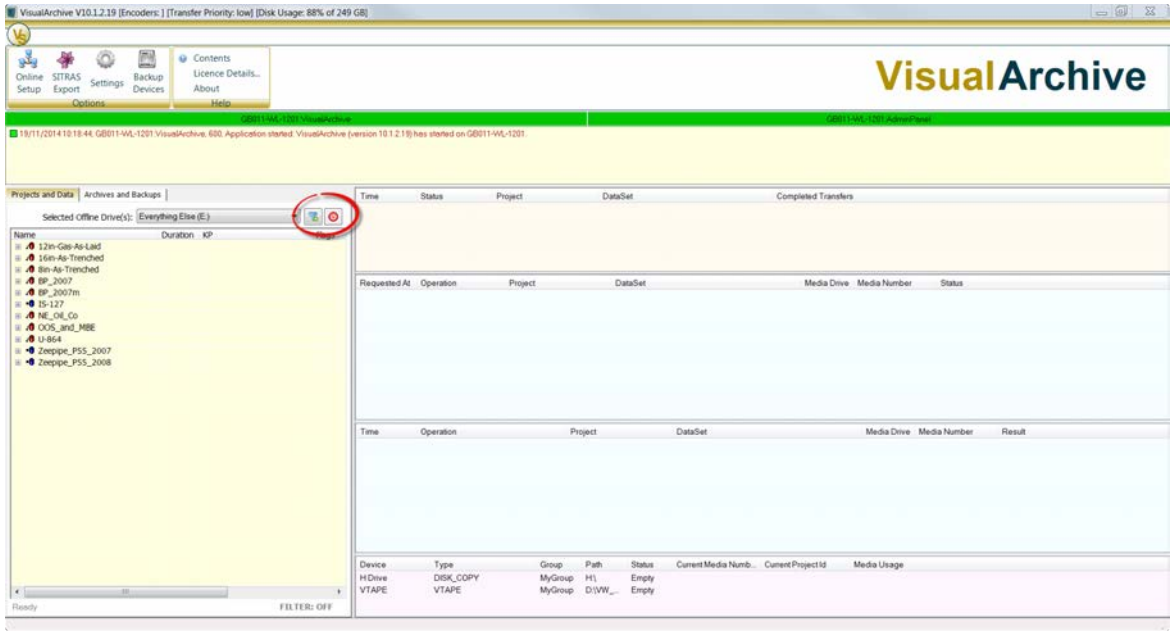

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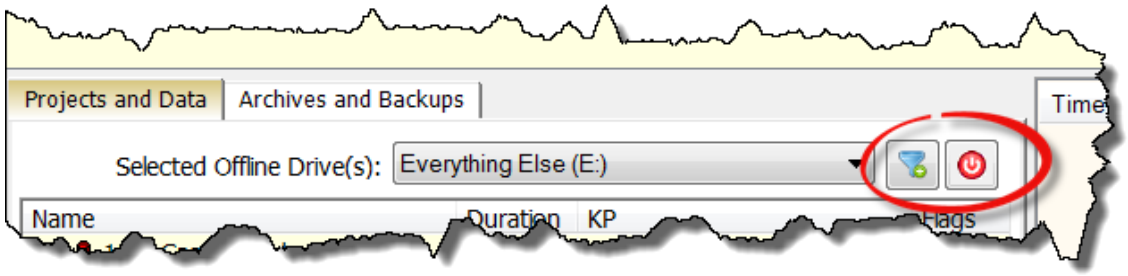
Configure Filters

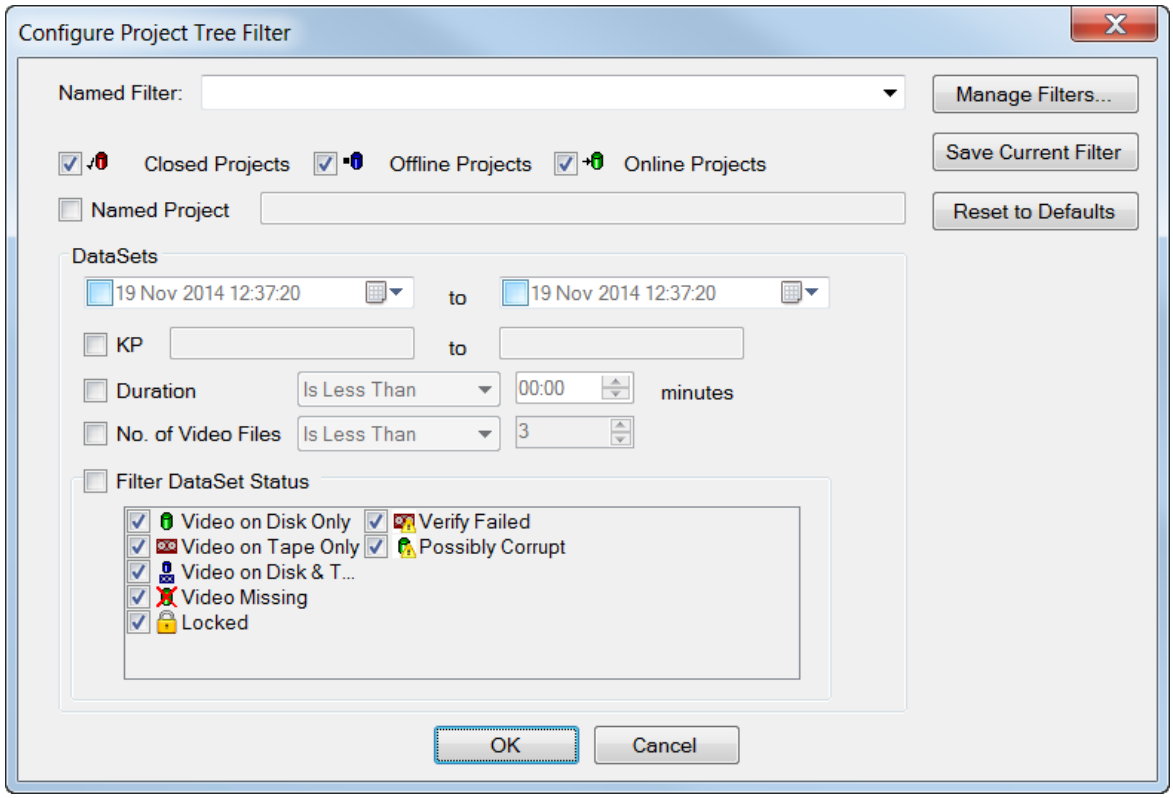
To configure the Project Tree Filters, click on the button at the top of the Project Tree.



This opens a window where you can configure many different types of filter.

You can filter by Project Status; Closed, Offline or Online, by Project Name, by date and time limits, KP and so on in any combination that you like.

You can save a configured filter so that you can re-use it later. Saved filters can be selected using the drop down list at the top of the window. If you want to delete a saved filter you can do so using "Manage Filters".



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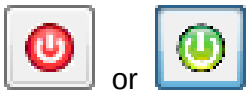
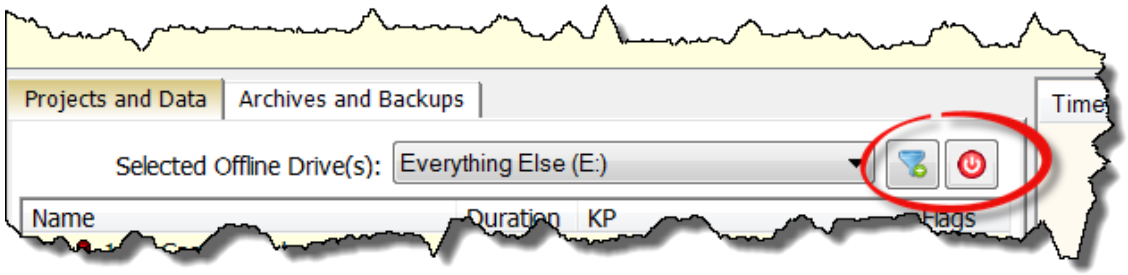
Turning Filters On or Off

To turn the Project Tree Filters on or off, click on the button at the top of the Project Tree.

 or



When the filter is Off the button is red , and the text **FILTER:OFF** is shown at the bottom of the Project Tree.

When the filter is On the button is green , and the text **FILTER:ON** is shown at the bottom of the Project Tree.

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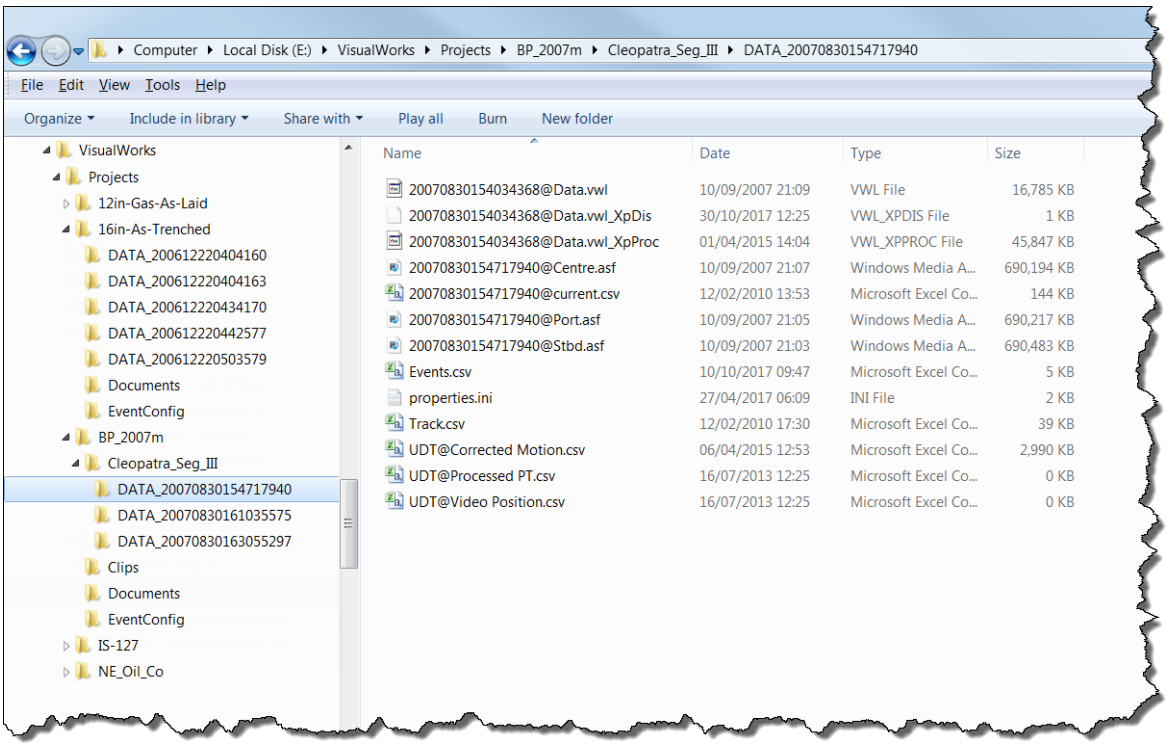
1.5.7 VisualSoft Files on your Disk

At the top of the Project Tree in VisualEdit, VisualReview and VisualArchive is a drop-down list of available disk drives. When you select one of these drives, the Project Tree will automatically show any data that is inside the \VisualWorks\Projects folder on that disk. For example if you select the D:\ drive, the Project Tree will show any data that is inside D:\VisualWorks\Projects.

Any folders inside the \VisualWorks\Projects folder will be displayed as VisualSoft Projects, and folders inside those, at lower levels, will be shown as Sub-Projects or Datasets. Dataset folders are identified by having names that begin "DATA_" folllowed by year, month, day, hours, minutes and decimal seconds in the format YYYYMMDDhhmmssttt.

In the images below the same folders are shown as they appear in Explorer and then in VisualEdit. Notice that the folders named EventConfig and Clips are hidden in VisualEdit, and how the Documents folders are shown differently from the Project folders like "12in-Gas-As-Laid". The Project Tree display will work which folders contain data and which are for configuration settings or saved video stills and clips and then display them or hide them accordingly.



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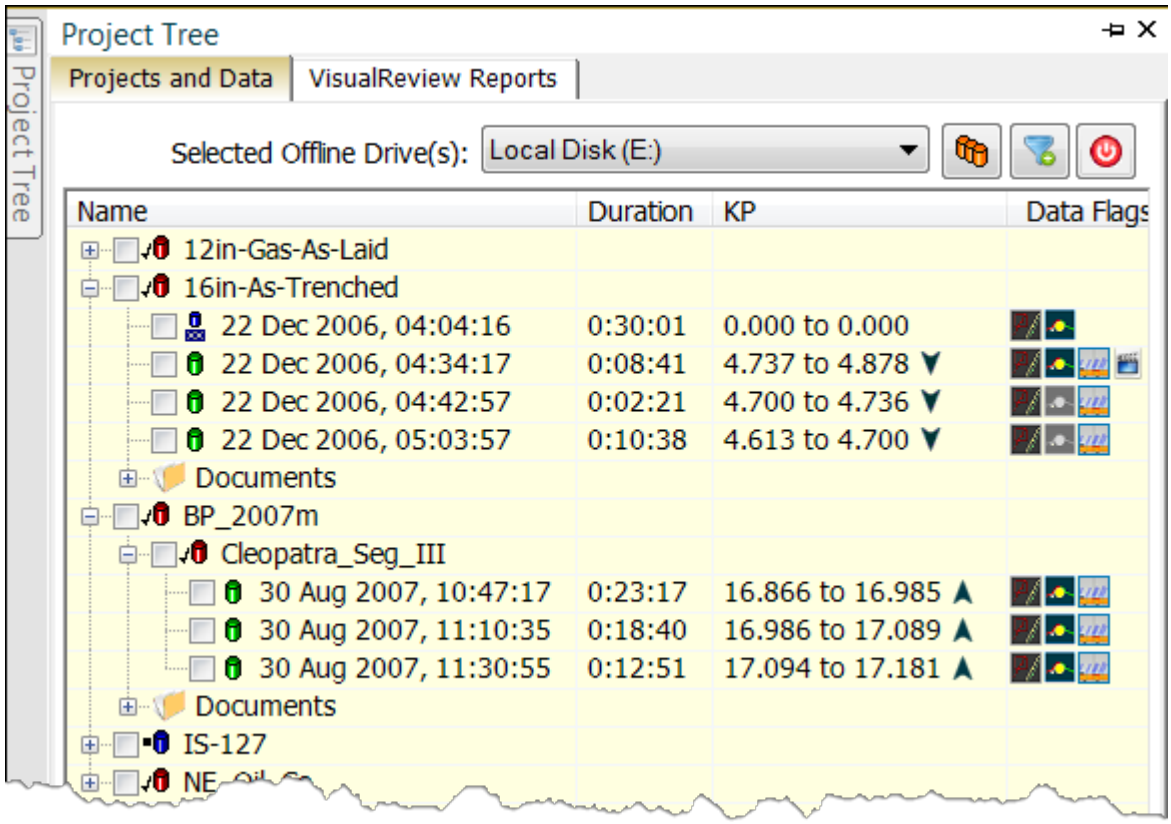

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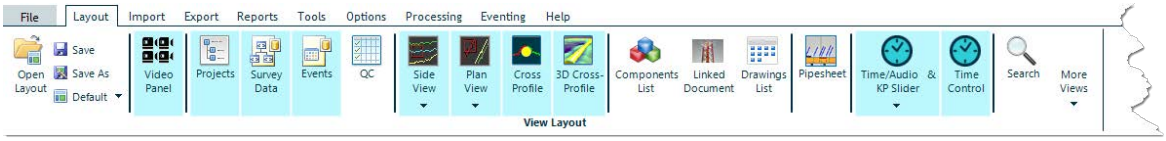
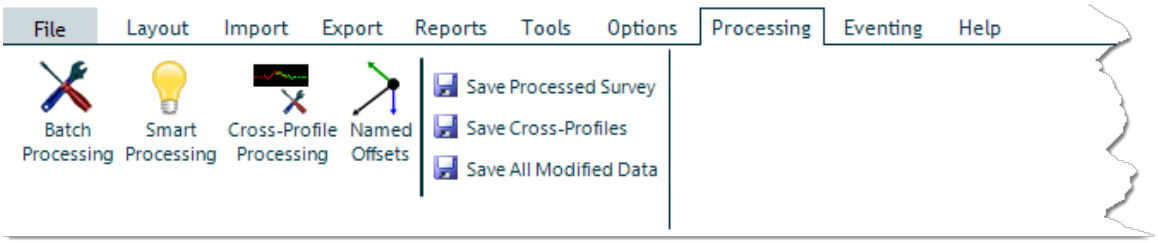
1.6 The Ribbon Toolbars

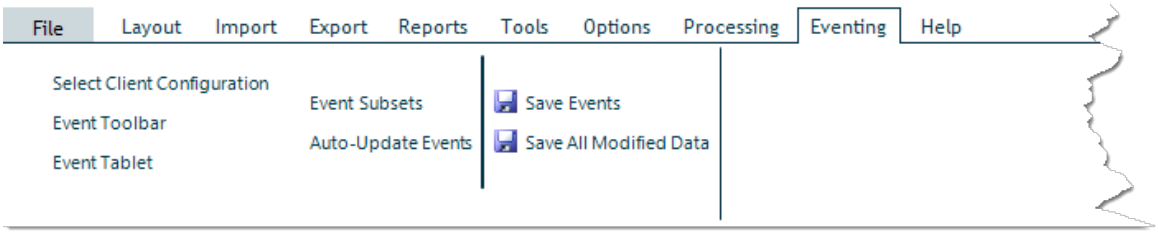
All three editions of **VisualEdit** use a Ribbon Toolbar to allow you to access most of the tools and functions of the application. The picture below shows the Layout ribbon, with other tabs available to the right with tools for data Import, Export, or Reports, with application Options and Help, and also with two extra ribbons for Processing and Eventing. These last two are only available if you have a licence for one of the higher editions of **VisualEdit**.



The Processing ribbon, shown below, is only available if you have a licence for **VisualEdit Professional**.



The Eventing ribbon, shown below, is available with a licence for either **VisualEdit Eventing** or **VisualEdit Professional**.



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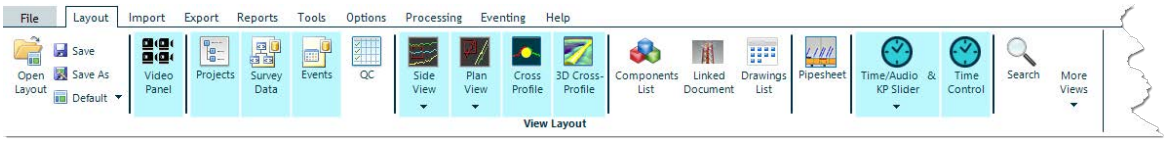
1.6.1 Button Styles and their Meanings

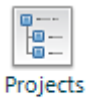


Button Names

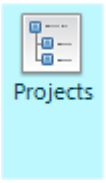
Each button has a name underneath it to help describe what it does. Most buttons have fixed names, representing particular functions or view windows. The Video window buttons have names which change as data is loaded.

Open or Closed View Windows

Some of the buttons on the Layout ribbon are used to open and close the various display windows available in VisualEdit. The buttons show which windows are open or closed, by changing the background colour of the button:



Buttons with a white background indicate a closed window. Click the button to open the window.



Buttons with a blue background indicate an open window. Click the button to close the window.

Buttons with Sub-Buttons

Some buttons have extra sub-buttons available, which are indicated by small arrows pointing downwards at the bottom edge of the button. These extra sub-buttons pop up when you click in the lower half of the main button, i.e. on the text not the picture. If you click on the top half of the button, the main picture icon, this performs the main action. In the example below the top half of the button opens or closes the main Plan View window, and the lower half pops-up buttons to open or close extra pop-up plan view windows.

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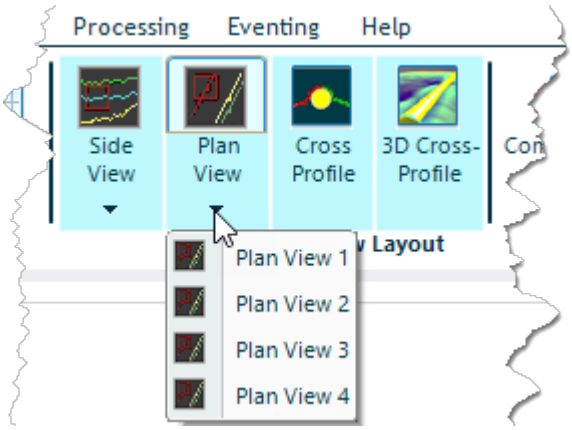

Text-Only Buttons

Some of the buttons, especially on the Import and Export ribbons do not have picture icons, only text. These work in exactly the same way as other buttons. They are used instead of more traditional menus because they make it easier for you to see what functions and options are available. There may be features that you didn't know about and which you would probably never find if they were hidden away in traditional menus.

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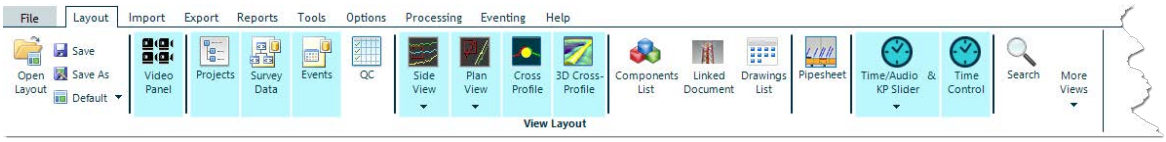
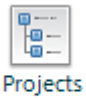
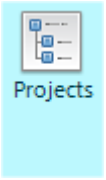
1.6.2 The Layout Ribbon



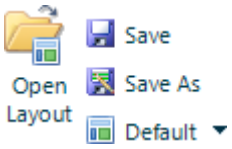
A "Layout" controls which of the display windows are open or closed, where they are positioned on the screen, and how they are configured. A Layout controls ***how*** the data is displayed, not ***what*** data is displayed. The buttons on the Layout Ribbon are used to open and close the many different types of display window. The Layout configuration can be saved to a VEDX file, and you can save different Layout files for different purposes, each with different windows open or closed and each with different sizes and positions for the windows.



Buttons with a white background indicate a closed window. Click the button to open the window.



Buttons with a yellow background indicate an open window. Click the button to close the window.

Buttons		Function
		At the left of the Layout Ribbon you will find a group of buttons to open and save Layout 165 files, and also a drop-down list of pre-defined default Layouts designed for different purposes.
		Open or close the Video Panel 67
		Open or close the Project Tree 22

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Buttons		Function
		Open or close the Survey Data Lists 128
		Open or close the Event List 132
		Open or close the QC Table 134
		Open or close the Side View 138
		Open or close the Plan View 136
		Open or close the Cross-Profile View 141
		Open or close the 3D Cross-Profile View 143

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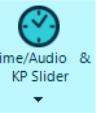
Buttons		Function
		Open or close the Components List 152
		Open or close the Linked Document View 152
		Open or close the Drawings List 152
		Open or close the Pipesheet View 145
		Open or close the Time and KP Slider Bar
		Open or close the Time Control (HH:MM:SS clock)
		Open or close the Search Tool

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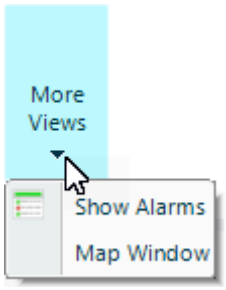
Buttons	Function
	Open or close the Alarm Window or the Map Window

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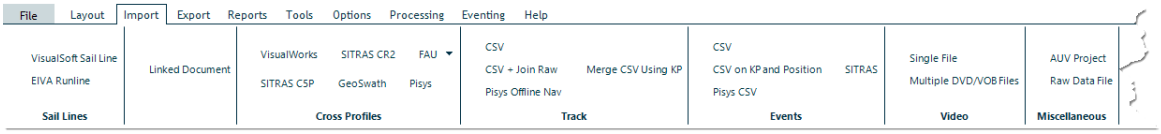
1.6.3 The Import Ribbon



Group	Button	Function
Sail Lines	VisualSoft Sail Line	Import a sail line (i.e. routefile or runline file) from a CSV matching the **VisualSoft** Sail Line format 177.
Sail Lines	EIVA Runline	Import a Runline file as used in **Eiva's NaviPac** and NaviEdit.
3D Model	3D Model	Import a 3D structure drawing (model) in **AutoCAD 3D DWF** file format into a VisualSoft Project.
Cross-Profiles	VisualWorks	Import MBE or cross-profile data from a CSV in the **VisualSoft** Cross-Profile CSV File Format 172.
Cross-Profiles	SITRAS C5P	Import MBE or cross-profile "5 Point" scan data from an Equinor SITRAS C5P file.
Cross-Profiles	SITRAS CR2	Import MBE or cross-profile data from an Equinor SITRAS CR2 file.
Cross-Profiles	GeoSwath	Import gridded seabed data from the GeoAccoustics GeoSwath SWF format. VisualEdit will cut sections through the gridded surface to create cross-profile records.
Cross-Profiles	FAU	Import data from binary FAU data files.
Cross-Profiles	Pisys	Import from a Pisys TPDS file.
Track	CSV	Import into the Processed Survey table from a CSV in the **VisualSoft** Processed Data File Format 171.
Track	CSV + Join Raw	Import into the Processed Survey table from a CSV in the **VisualSoft** Processed Data File Format 171 and then add to the right of it any columns from the Raw

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Group	Button	Function
		Survey data table which do not match column names in the imported file.
Track	Merge CSV Using KP	Import a CSV file, and add it to an existing Processed Survey table as extra columns, by using the KP fields of the table and the CSV file to interpolate values from the CSV file.
Track	Pisys Offline Nav	Import from a Pisys navigation data file.
Events	CSV	Import into the Events data table from a CSV file with date and time in it.
Events	CSV on KP and Position	Import into the Events data table from a CSV file **without** date and time in it. This will read KP or position from the CSV file and match it to KPs stored in another existing data table so that event time and date can be calculated.
Events	Merge CSV Using KP	Import a CSV file, and add it to an existing Events table as extra columns, by using the KP fields of the table and the CSV file to interpolate values from the CSV file.
Events	Pisys CSV	Import from a Pisys events data file.
Video	Single File	Import a single video file into an existing dataset. The video file will be assigned the same start time as the start of the dataset, and you will asked to enter a camera name to identify the video.
Video	Multiple DVD/VOB Files	Import multiple video files in the VOB file format into a Project or Sub-Project. The VOB files will be converted to standard MPEG-2 files during import. The first video file will be assigned a start time which you specify, and a dataset will be created to match this. Other video files will be assigned times which follow on from the previous video file plus its duration. These times can be changed after import if required. Because this tool creates datasets it must be run by right-clicking on a Project or Sub-Project. Selecting this item on the ribbon will guide you towards the

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Group	Button	Function
		correct process. It is provided on the toolbar to let you see that the option for multiple files exists.
Miscellaneous	AUV Project	Import JPEG files created by the Gavia AUV. These files will be displayed in the video windows of VisualEdit or VisualReview.
Miscellaneous	Raw Data File	Import a raw data file (*.vwl) recorded by VisualData Logger. Usually these are imported automatically by VisualArchive but if that has not happened you can use this to import manually.

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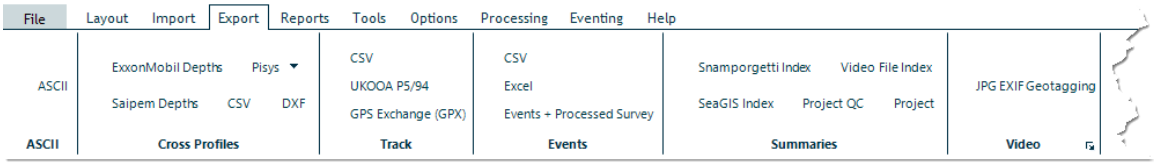
1.6.4 The Export Ribbon

This ribbon is only displayed if you have a licence for **VisualReview Professional**, or **VisualEdit Eventing/Professional**.



Group	Button	Function
ASCII	ASCII	Configure, save and run a powerful ASCII export allowing you to create a listing combining data columns from one or more data tables, sorted by time or KP, with options for data interval and formatting. See Configurable ASCII Export.
Cross-Profiles	Exxon Mobil Depths	Export cross-profile data in a format specified by ExxonMobil. See ExxonMobil Depths 179.
Cross-Profiles	Saipem Depths	Export cross-profile data in a format specified by Saipem. See Saipem Depths 180.
Cross-Profiles	Pisys	This button has two options, V1 and Processed each exporting a different file format specified by Pisys. See Pisys Format V1 182 and Pisys Processed (TPDS) 182.
Cross-Profiles	CSV	Export data in the VisualSoft Cross-Profile CSV File Format 172
Cross-Profiles	DXF	Export Cross-Profile data to a series of AutoCAD DXF files. See Cross-Profile DXF 182 .
Track	CSV	Export the Processed Survey data table to a CSV file, maintaining the same formatting and columns that are seen in **VisualEdit**.

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Group	Button	Function
Track	UKOOA P5/94	Export the Processed Survey data table in the P5/94 format as defined by UKOOA (United Kingdom Offshore Operators Association) and now available via the International Association of Oil & Gas Producers (IOGP).
Track	GPS Exchange (GPX)	Export the Processed Survey data table in GPS Exchange (GPX) format. The GPX file can be displayed in GIS or other applications and it can be used as a source for adding position data to the EXIF header of JPEG image grabs.
Events	CSV	Export the Events data table to a CSV file, maintaining the same formatting and columns that are seen in **VisualEdit**.
Summaries	Snamprogetti Index	Export a list of videos in a format defined by Snamprogetti. Used for TMPC and some other pipeline inspection jobs.
Summaries	SeaGIS Index	Export a list of videos in a format defined by Snamprogetti for use in their GIS. Used for inspection of pipelines between Sicily and mainland Italy – i.e. the Messina Straits extensions of the TMPC pipelines.
Summaries	Video File Index	A configurable list of video files and their locations.
Summaries	Project	A list of all datasets with information about backup status.
Summaries	Project QC	A list of all datasets with information about any gaps (time or distance) in each of the main data tables.
Video	JPG EXIF Geotagging	Add EXIF position and time data to previously exported JPEG files.

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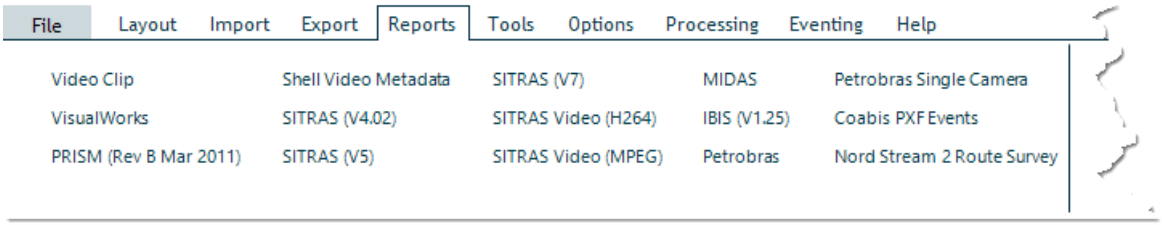
1.6.5 The Reports Ribbon



From the Reports ribbon you can generate data files from the currently loaded data using various pre-defined formats for a number of key pipeline operators.

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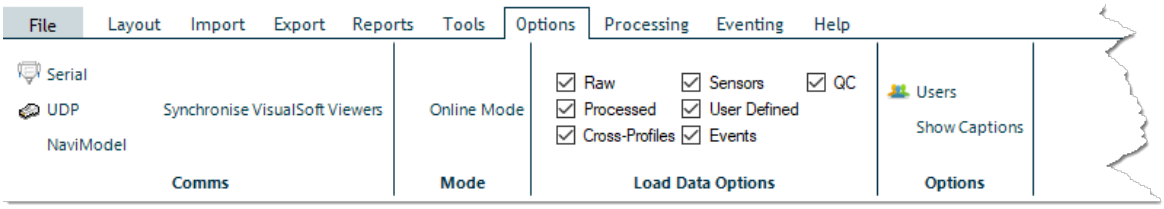
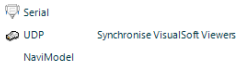
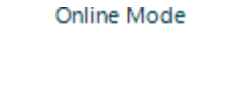
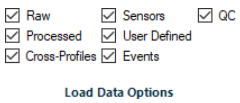
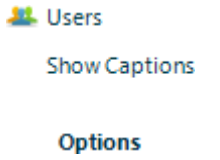
1.6.6 The Options Ribbon



Buttons	Function
	At the left of the Options Ribbon you will find buttons to setup communication with other applications. The UDP option will configure a port to which API commands may be sent. The NaviModel option allows you to synchronise the 3D display of Eiva's NaviModel to the video playback in VisualEdit. You can also synchronise the displays of more than one VisualSoft Viewer (VisualEdit and/or VisualReview).
	Online mode allows the display of video streamed live from the online recorders. This should be used with caution because the online streaming in current versions of VisualDVR can cause problems for the online recording.
	The Load Data Options 66 let you control which types of data should be loaded when you select a dataset for loading using the Project Tree. If you have large amounts of data that you do not need for your current task, you can turn it off so that the remaining data loads faster.
	Users let's you keep track of who edited what data in VisualEdit Eventing and VisualEdit Professional. Show Captions will turn on (or off) the title bars of each window. These title bars can be used to drag and drop the windows if you want to rearrange them. See Moving a Window 166.

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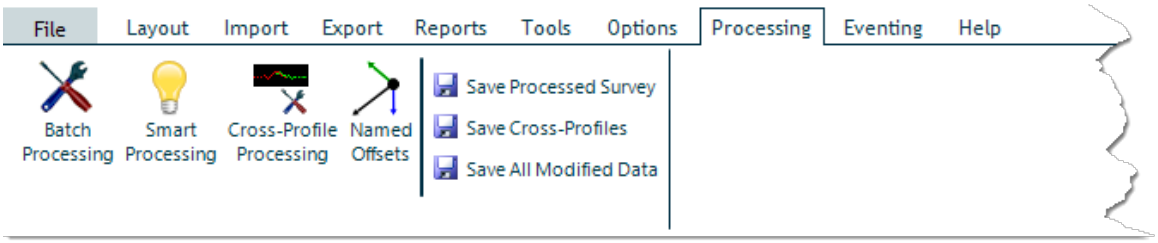
1.6.7 The Processing Ribbon

This ribbon is only displayed if you have a **VisualEdit Professional** licence.



Enter topic text here.

Buttons	Function
Batch Processing	Open the VisualEdit Professional Batch Processing configuration window.
Smart Processing	Open the VisualEdit Professional Smart Processing tool to automatically configure the batch processing based on some simple questions about your data and equipment configuration.
Cross-Profile Processing	Open the VisualEdit Professional Cross-Profile Processing settings window.
Named Offsets	Open and edit the list of Named Offsets for the current Project. The named offsets can be used in the data processing scripts during Batch Processing, and also in the setup of the Smart Processing.
Save Processed Survey	Save Processed Data
Save Cross-Profiles	Save Cross-Profiles
Save All Modified Data	Save All Modified Data

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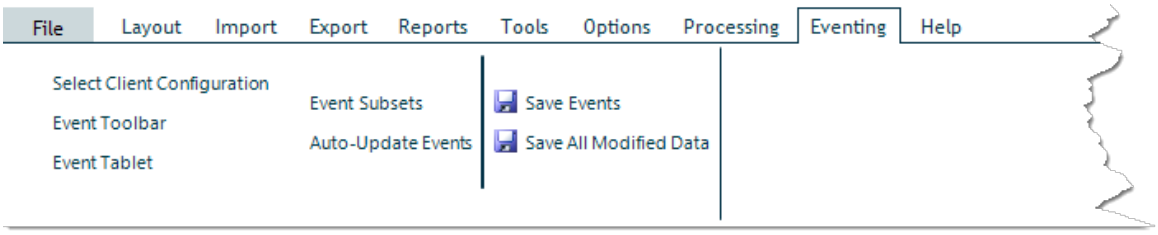
1.6.8 The Eventing Ribbon

This ribbon is only displayed if you have a **VisualEdit Eventing** or **VisualEdit Professional** licence.



The eventing ribbon lets you choose a Client Configuration for the currently loaded data (if it does not already have one), lets you open the event logging toolbar, and lets you run the Auto-Update tool. It also has various buttons to save some of all of the loaded data – saving just the Events data or saving all data in all modified tables.

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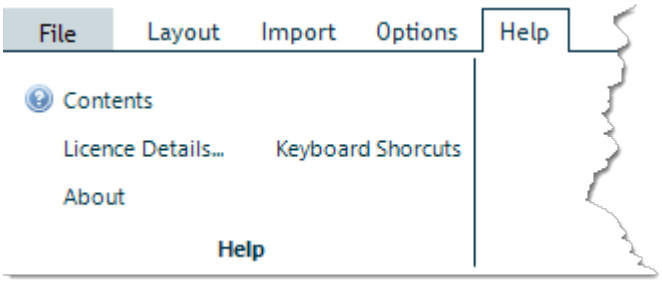
1.6.9 The Help Ribbon



Select Contents to open the Help file, which has details of all VisualSoft applications.

Select Licence Details to open the Licences tab of the VisualSoft Admin Panel.

Select About to see details of this software application and its version number.

Select Keyboard Shortcuts to see a list of useful shortcuts for video playback and other commonly used operations.

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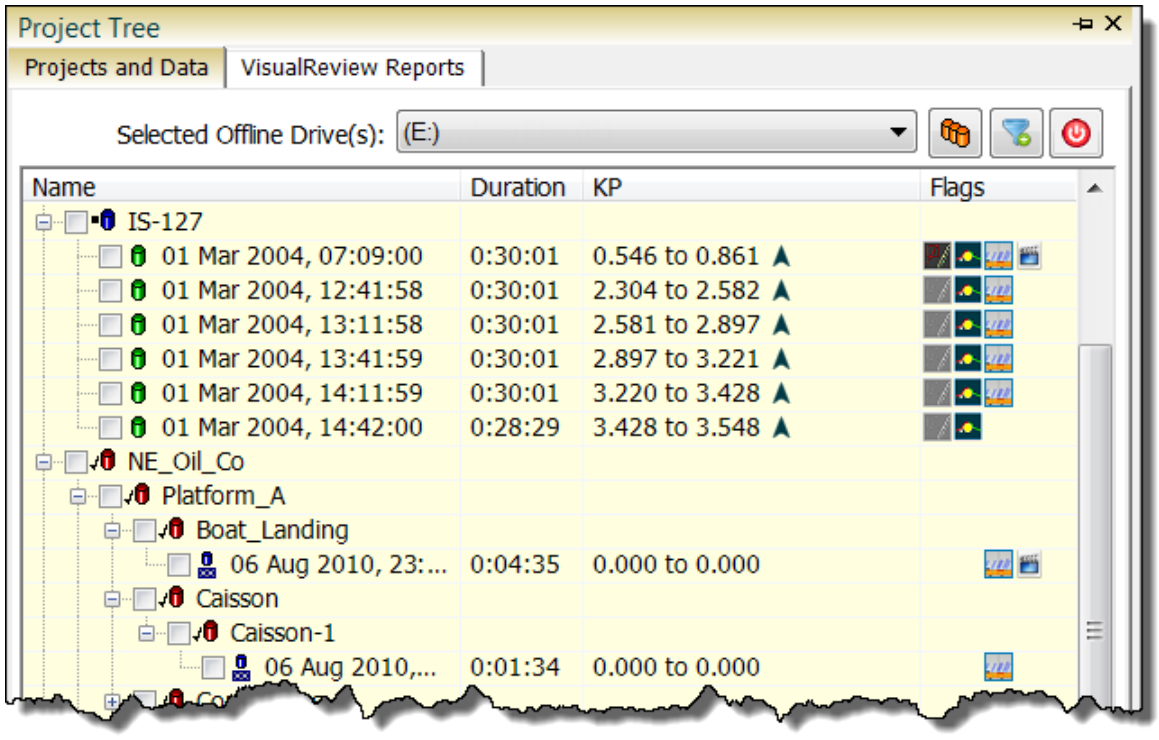
1.7 Loading Video & Data

Video files and other data types can be loaded for display in **VisualEdit** or **VisualReview** using the Project Tree.

Place the mouse cursor over the Project Tree tab on the top left edge of the screen, and the Project Tree window will slide out from the edge of the screen.

To select and load data for playback, click in the boxes of the Project Tree. You can select one or more datasets, or entire Projects or Sub-Projects depending where you click.

If you do not want to load all of the different data types within each dataset, you can select what should or should not be loaded by using the Load Data Options 66 which can be opened using the Tools section of the Project Tree's right-click menu.



Branches of the tree may be expanded using the + signs shown beside each Project or Sub-Project. Data is then loaded by clicking the mouse in one or more “check box” to the left of a Dataset, Sub-Project or Project as described below.

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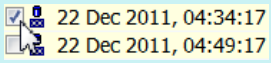
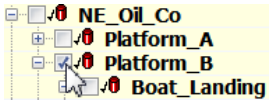
One Dataset		To load video and survey data from just one Dataset, simply click the mouse in the “check box” to the left of the Dataset.
Multiple Datasets		To load more than one Dataset, left click on the first dataset, then hold down the Shift button and click on last required Dataset. This will highlight the selected Datasets in blue. You can then click on any one of the highlighted check-boxes to load all of the selected data.
Entire Projects or Sub-Projects		To load an entire Project or Sub-Project click on the check-box for that Project or Sub-Project. This will load the video and data for all lower levels of the hierarchy contained within the selected Project or Sub-Project.

If the window is blank or does not show the Projects that you expect, check that the window is showing the correct disk drive at the top, and change it if necessary.

The Project Tree window will auto-hide after a project is selected and data is loaded. This can be changed if you want the Project Tree to remain visible at all times. To do so, go to the Options tab on the main ribbon, and enable Captions. Then click the small pin at the top right corner of the Project Tree.

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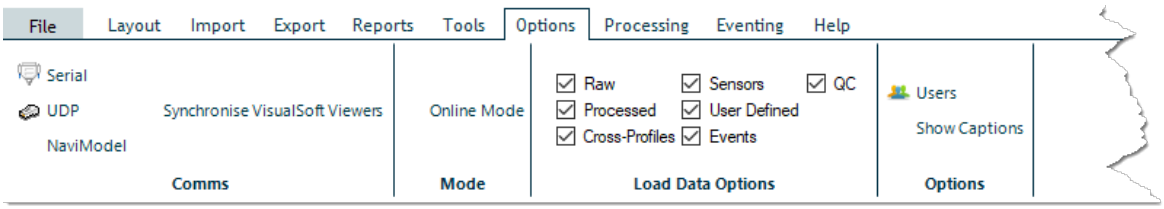
1.7.1 Load Data Options

The different options for loading data are shown on the Options ribbon. These choices will remain in force until you close and re-start the application.



Each Dataset in a VisualSoft Project can contain many different types of data in addition to the video files.

These data types are as follows:

Data Type	Data Table Name	Description
Raw	Raw Survey	"Survey Data" as logged by VisualDVR. Typically holds raw position data for an ROV or other survey platform.
Processed	Processed Survey	The Processed Survey table is created during data processing using VisualEdit Professional or it can be used to hold imported data from another processing system.
Cross-Profiles	X-Profiles	Raw or processed cross-profiles from from Multi-Beam Echo-sounders like Reson or R2Sonic, or from mechanical profilers like Tritech SeaKing.
Sensors	(Varies)	These tables hold raw data logged by VisualData Logger. They are not normally displayed in VisualReview but can be enabled here if needed.
User Defined	(Varies)	Tables created by the data processors to hold specific types of edited data or data for specific offset locations. Also includes the pre-defined "Video Position" and "Processed PT" (pipetracker) data tables.
Events	Events	Event data logged online, or logged and/or edited offline.
QC Data	QC	A list of QC warnings and suggestions generated by various QC scripts in VisualEdit Eventing or VisualEdit

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		Professional.

1.8 The Video Panel

The Video Panel is a special window which can contain one or more video playback windows. It is opened and closed using the Video Panel button on the Layout ribbon. The Video Panel has it's own toolbars to control the playback and display of the videos. Each of the individual video windows also has its own toolbar which you can use to control video display settings, to make video clips and still images, and to turn audio playback on or off. The function of the Video Window toolbar buttons are described in the section called Playing Videos 67.

1.9 Playing Videos

Before you can play video files you must first load them 64 into the application. The video files are contained in Datasets, along with their associated position data, events and other survey or inspection information. To load Datasets see Loading Video & Data 64.

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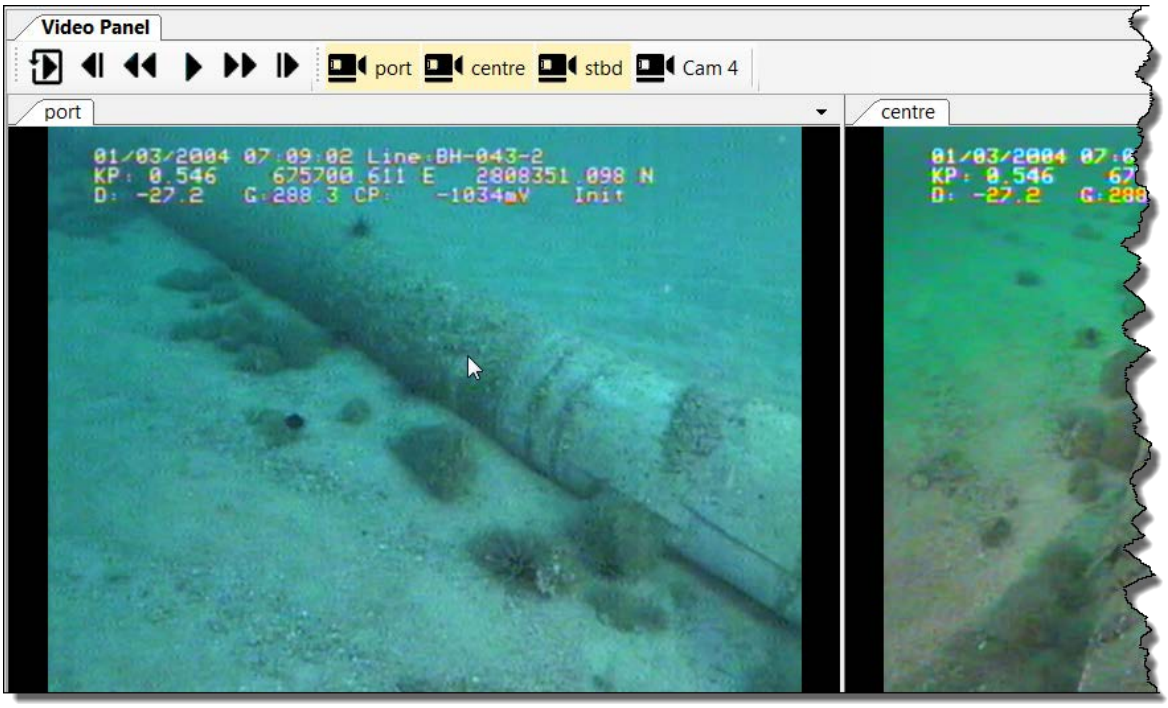

After the video and data has been loaded you will usually see the start of each video file displayed in the video windows. Each camera has its own window which is usually docked or tiled inside a "Video Panel".

If none of the video windows is visible, turn on the Video Panel using the button on the main Layout Ribbon at the top of the screen.

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1.9.1 Video Playback: Buttons

Button	Function
	Grab a still image
	Start and end a video clip
	Audio is currently on or off. Click the button to toggle on or off.
	Return to the start of the current video and Play.
	Step Back by a fixed time. (Configured in Video Settings 118.)
	Rewind. (Speed configured in Video Settings 118.)
	Play (at currently selected speed).
	Pause. Displayed only when video is playing.
	Fast Forward. (Speed configured in Video Settings 118.)
	Step Forward by a fixed time. (Configured in Video Settings 118.)

1.9.2 Video Playback: Keyboard Short-Cuts

Key	Function
Space Bar, Tab, or End	Toggle between Play and Pause
1, 2, 3, ..., 9,0 at top of keyboard	Play or Fast Forward at speed indicated by selected number. Use 0 for 10x.

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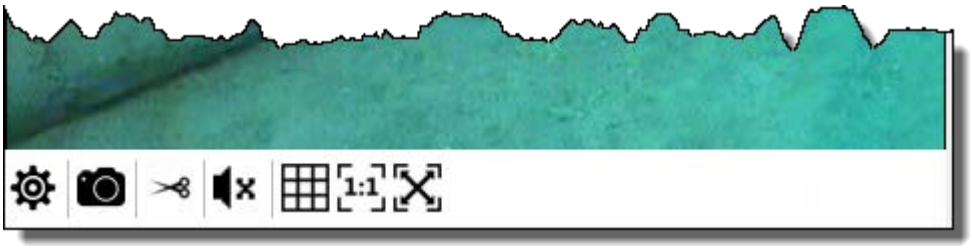
Key	Function
1, 2, 3, ..., 9,0 on numeric keypad	Rewind at speed indicated by selected number. Use 0 for 10x.
Left arrow Down arrow	Slowdown during playback, or step back if paused. (Configured in Videos Settings 70.)
Right arrow Up arrow	Speed up during playback, or step forward if paused. (Configured in Videos Settings 70.)
Enter	Stop playback

1.9.3 Video Window Toolbar

Each of the open Video Windows has its own toolbar to adjust settings and to create video clips and still image grabs. This toolbar is usually configured to pop-up automatically when the mouse cursor is near the top or bottom edges of a Video Window.



Buttons on the Video Window toolbars may be turned on or off using the Video Settings 114.

Button	Function
	Open the Video Settings 114.
	Grab still images, using the current Video Settings 114.
	Mark the start point of a video clip, using the current Video Settings 114.

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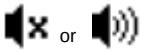
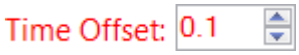
Button	Function
	Mark the end point of a video clip. (Shown if clip start point is already set.)
	Toggle the audio on or off for this individual Video Window. Button shows current state.
	Tile the Video Windows within the Video Panel using the current Video Settings 114.
	Display the selected Video Window in 1:1 ("as-recorded") resolution with one video pixel mapped to one screen pixel.
	Display the selected Video Window Full Screen.
	Toggle the Playback Lock 72 status of this Video Window. Button shows current state.
	Change the Time Offset 72 of this Video Window.
	The Playback Controls 69 can be included on the Video Window toolbar.

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1.9.4 Video Playback Lock

It is sometimes useful to have one or more of the Video Windows remain at a particular frame while you continue to play the others. For example you may have passed the same feature more than once, and may want to compare different views, by stopping one of the video windows at the first time the feature was seen, and then continuing to play other windows until the next time that the same feature is seen.

The Playback Lock can be turned on using a button on the Video Window Toolbar 70, and it can be configured using the Video Settings.

The Video Window Toolbar button has three states, matching the three options below. Click the button on or more times to cycle through the three different options.

Button State	Description
	Normal Playback mode. This video window will play in sync with other Video Windows.
	Playback is Locked with "Re-sync". This video will not play while other Video Windows are playing, but as soon as the other windows stop or pause, this one will jump to the matching time.
	Playback is Locked without "Re-sync". With re-sync turned off, this Video Window will not update or change regardless of what happens in other Video Windows.

1.9.5 Video Playback Time Offset

You can apply a time offset to one or more cameras so that they synchronise a few seconds ahead or behind the main time in the clock at the top of the screen. This can be useful if the cameras were not correctly aligned to all view the same place at the same time, but it should be used with caution especially when logging event data.

1.9.6 Camera Layout and Window Order

The layout and order of the video camera windows can be changed by dragging and dropping individual Video Windows within the Video Panel. Any two windows can be swapped by dragging one on top of the other.

Use the Camera name tabs at the top of the window to drag and drop: Place the mouse cursor on the camera name tab at the top of a video window, and then keep the left button pressed down while you drag the window onto the one that you want to swap it with.

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1.10 Grabbing a Still Image

Using **VisualReview** or **VisualEdit** you can grab any frame of video as a still image and save it to a file. Play the video to the place you want to grab as an image. You can make fine adjustments using the Video Control Buttons 69 for Step Forward and Step Back.

When you have the video window showing the picture that you want, press the Grab Image button on the Video Window Toolbar.

You will see the normal "Save As" window, where you can change the file name, change the location for it to be saved, and change the file type if you want to. The image can be saved as JPEG, BMP, GIF, PNG, TIFF, or TGA. Note that the GIF format has a lot of compression, and is "lossy". It should only be used if the images are to be displayed at a low resolution. JPEG also has a lossy compression, but the effect is minimal in most cases.

1.11 Grabbing a Video Clip

Using **VisualReview** or **VisualEdit** you can cut (i.e. copy) a section of video as a video clip and save it to a separate file. Play the normal video to the start of the section that you want to cut as a clip. You can make fine adjustments using the Video Control Buttons 69 for Step Forward and Step Back.

When the video is at the start of what you want in your clip, press **Mark Video Clip Start** .

You then have a choice of three different ways to define the end point of the video clip:

1. Manually select the end by playing the video forwards until you reach the required end time. To do this choose "*Pick end time later from the video*", then press the Close button. Play the video to the point you want, then press **Mark Video Clip End** .
2. Specify the **end time**, and then press the Close button.
3. Specify a **duration** for the clip in minutes and seconds, then press the Close button.

Whichever of the three methods you used, you will then see a confirmation window, where you can change the file name or the location where it will be saved by pressing the browse button with the three dots to open the "Save As" window.

You cannot change the file type, which will automatically match the type of the source video.

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1.12 Importing Video

There are two types of video import, one for individual files and one for files on (or copied from) DVDs.

Importing a single video file

To import a video file you must first have a dataset. If you already have other logged data from VisualDataLogger, or other videos from VisualDVR then you will already have a dataset. If you do not have a dataset you can create one by a right-click on a Project or Sub-Project.

To import the video file:

1. Right-click on the dataset and select Import, Video, Single Video File.

2. Select the file that you want to import.

3. Enter a camera name for the file.

The file will be imported and named to match the time of the dataset and the camera name that you typed.

Importing video from authored DVDs

This tool allows you to import multiple video files in the VOB file format into a Project or Sub-Project. The VOB files will be converted to standard MPEG-2 files during import.

A DVD can be "authored", meaning that it will play in a DVD player like a normal movie disk, or it may be a data disk with standard files on it. This import method is for authored DVDs. A DVD it may contain more than one video file. Sometimes this is because it has different chapters, and sometimes it is because the video is long and has been automatically divided into smaller files by the authoring software. If two or more VOB files form part of a single video sequence on the DVD, and were divided on the DVD only because of file size, they will be automatically joined together again during the import.

If you have a lot of DVDs to import you might want to copy all of the files onto a large disk drive before you import them. In this case create a main folder, and inside that create one folder for each DVD.

To start the import, right-click on a Project or a Sub-Project (not on a Dataset) and select Import, Video, Multiple DVD/VOB Video Files.

The first imported file will be assigned a start time which you specify, and a dataset will be created to match this. All other video files and their datasets will be assigned times which follow on from the previous file plus its duration. These times can be changed after import if required (see Set Multiple Dataset Start Times 169).

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1.13 Importing Data

- Data can be imported in a variety of ways.
- Right-click in a data tabla and import into that table.
- Right-click on a Project, Sub-Project or Dataset in the Project Tree and open the Import Menu 75.
- Click the buttons on the ribbon at the top of the screen.

1.13.1 Project Tree Menu – Import

The data import menu option allows the user to load track, event, cross-profiles and other data files and to associate the data with the selected project.

The files are copied into the local storage and are available for viewing thereafter.

A wide range of Import options is available (click the links for details):

Track

CSV Format 78
CSV Format + Join Raw 79
Pisys Offline Nav Format 81
Merge CSV using KP 80

Events

CSV Format 77
Pisys CSV Format

Cross Profiles

VisualSoft Format 172
Pisys Format
FAU Format
SITRAS CR2
GeoSwath Format

Sail Line

VisualSoft Format 177

AUV Project

Video

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Single Video File
Multiple Video VOB Files

Raw Data File 81

3D Model

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1.13.2 Importing Event Data CSV

To import Event data into a Project or Dataset you should right-click on the item in the project tree and select **Import**, then **Events**, then **CSV Format**.

The files are copied into the local storage and are available for viewing thereafter.

The user must ensure that the imported files are of the correct format and the data matches the selected project file duration i.e. the start/end time should match those of the video files for which they are being imported.

Event Import CSV File Specifications

The file should be ASCII CSV (comma separated values). The first line should contain the names of the columns, separated by commas. You will be prompted to select the time reference as UTC or local.

Date and Time may be in either one or two columns and must match one of the following formats. If using a single column the date and time should be separated by a single space.

- dd/mm/yyyy OR dd\mm\yyyy
- hh:mm:ss OR hh:mm:ss.s

e.g:

Date,Time,Type,Sub Type,Easting,Northing,Depth
22/12/2006,10:22:12.3,Anode,Bracelet,523146.01,6745312.78,123.45

TimeDate,Type,Sub Type,Easting,Northing,Depth
22/12/2006 10:22:12,,Anode,Bracelet,523146.01,6745312.78,123.45

TimeDate,Type,Sub Type,Easting,Northing,Depth
22\12\2006 10:22:12,,Anode,Bracelet,523146.01,6745312.78,123.45

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1.13.3 Importing Processed Survey Track CSV

To import Processed Survey (Track) data into a Project or Dataset you should right-click on the item in the project tree and select **Import**, then **Track**, then **CSV Format**.

The files are copied into the local storage and are available for viewing thereafter.

The user must ensure that the imported files are of the correct format and the data matches the selected project file duration i.e. the start/end time should match those of the video files for which they are being imported.

Processed Track/Survey Nav Data CSV File

The track file should be ASCII CSV (comma separated values). The first line should contain the names of the columns, separated by commas. You will be prompted to select the time reference as UTC or local - i.e. you must tell the importer what times are used in your ASCII CSV file, are they local or UTC?

Date and Time may be in either one or two columns and must match one of the following formats. If using a single column the date and time should be separated by a single space.

- dd/mm/yyyy OR dd\mm\yyyy
- hh:mm:ss OR hh:mm:ss.s

e.g:

Date,Time,Easting,Northing,Depth
22/12/2006,10:22:12.3,523146.01,6745312.78,123.45

DateTime,Easting,Northing,Depth
22/12/2006 10:22:12,523146.01,6745312.78,123.45

DateTime,Easting,Northing,Depth,Pitch,Roll,Heading
22\12\2006 10:22:12,523146.01,6745312.78,123.45, 0.15,1.24,187.2

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1.13.4 Importing Processed Survey Track CSV and Join Raw

This option is very similar to importing a standard Track position data file, except that the resulting Processed Survey table will have all of the columns from the imported file, and then any columns from the Raw Survey table which do not match the column names in the imported file.

To import Track (position) data into a Project or Dataset you should right-click on the item in the project tree and select **Import**, then **Track**, then **CSV Format + Join Raw**.

The files are copied into the local storage and are available for viewing thereafter.

The user must ensure that the imported files are of the correct format and the data matches the selected project file duration i.e. the start/end time should match those of the video files for which they are being imported.

Track Import CSV File Specifications

Processed Track/Survey Nav Data File

The track file should be ASCII CSV (comma separated values). The first line should contain the names of the columns, separated by commas. You will be prompted to select the time reference as UTC or local.

Date and Time may be in either one or two columns and must match one of the following formats. If using a single column the date and time should be separated by a single space.

- dd/mm/yyyy OR dd\mm\yyyy
- hh:mm:ss OR hh:mm:ss.s

e.g:

Date,Time,Easting,Northing,Depth
22/12/2006,10:22:12.3,523146.01,6745312.78,123.45

TimeDate,Easting,Northing,Depth
22/12/2006 10:22:12,523146.01,6745312.78,123.45

TimeDate,Easting,Northing,Depth
22\12\2006 10:22:12,523146.01,6745312.78,123.45

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1.13.5 Merge CSV Using KP

This tool will import a CSV file, and add it as extra columns in an existing data table, by using the KP field of the table to interpolate values from the CSV file.

To use this tool select **Import**, then **Track**, then **Merge CSV Using KP**.

The user must ensure that the imported files are of the correct format and the data matches the selected project file duration i.e. the start/end time should match those of the video files for which they are being imported.

CSV File Specifications for KP Merge

The file should be ASCII CSV (comma separated values). The first line should contain the names of the columns, separated by commas. There must be a KP column.

e.g:

KP,Easting,Northing,Depth
1.253,523146.01,6745312.78,123.45

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1.13.6 Pisys Import

This option will import a file exported from Pisys software.

1.13.7 Import Raw Data File

This option allows you to import a raw logging file created by **VisualData** (or **VisualProfiler**).

Usually these files are transferred automatically by **VisualArchive** but occasionally you may need a manual import process.

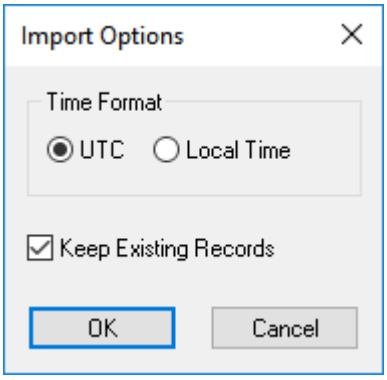
You will be asked to select the file using a standard file browser windows.

1.13.8 Import Documents

Each VisualSoft Project can contain a Documents folder where you can place drawings, spreadsheets, mobilisation reports, offset diagrams and so on. Files can be imported into that folder by right-clicking and selecting Import Documents. If the folder does not already exist it will be created.

1.13.9 Import into Used Defined Table

If your Project includes User Defined Tables you can import data into them from CSV files. The CSV file should have column names matching the UDT that import into. Data in the files should match the date and time range of the Project, and will be sub-divided and imported into the appropriate dataset(s). Dates and Times in the file may be UTC or Local – you just need to specify which it is. If the UDT already has data in the same date and time range it may be kept or it mat be replaced.



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1.14 Reporting Data and Video

All three editions of VisualEdit include tools for reporting data in specific pre-defined formats. Most of these pre-defined formats are specified by pipeline operators such as Shell, BP, Equinor, Nord Streamor Petrobras, or are specified by engineering and management companies such as J P Kenny working on behalf of multiple operators.

The available pre-defined Report formats are listed below.

VisualEdit also includes some more generic and flexible data Exports which are described in Exporting Data 99.

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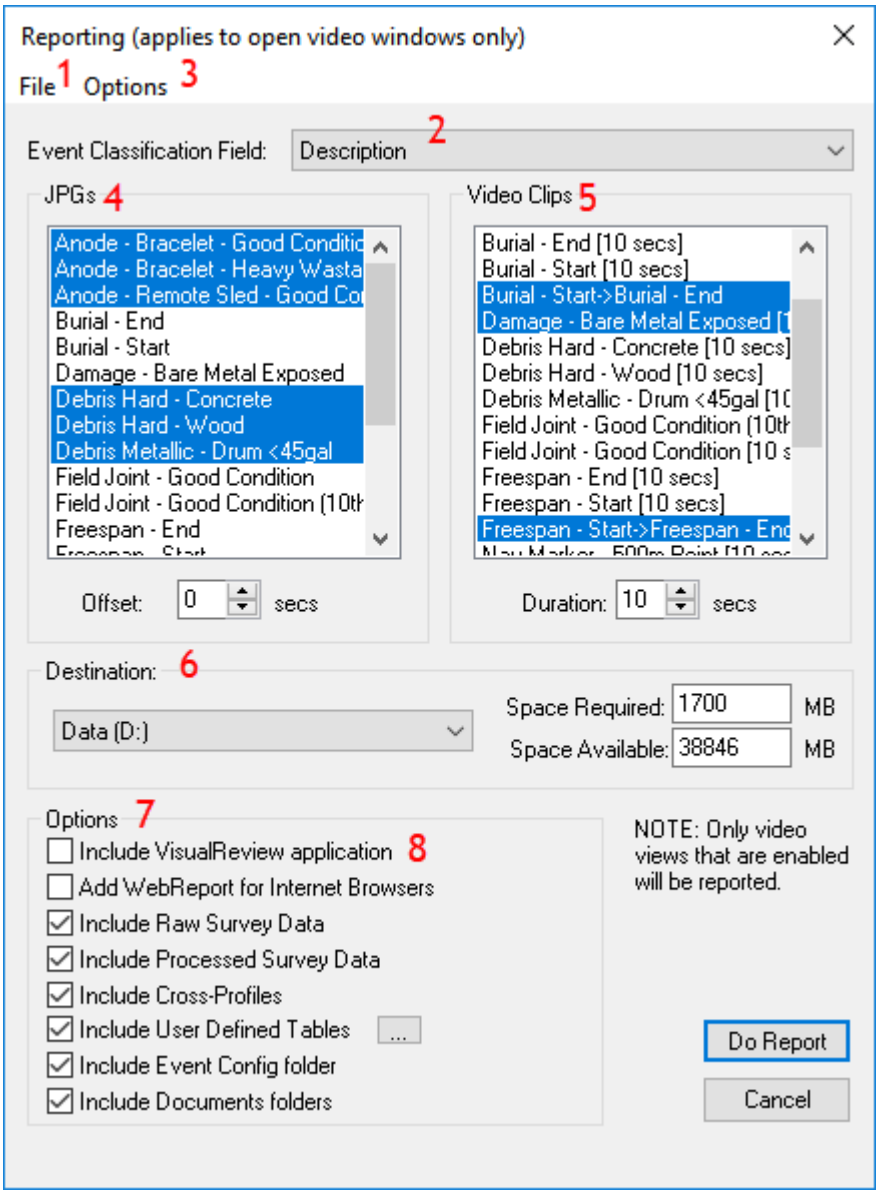
1.14.1 VisualWorks Report

The VisualReview Report or VisualWorks Report is a cut-down version of all of the video and data for a survey or inspection job. It is designed to be compatible with VisualSoft's free viewer, VisualReview. A normal VisualSoft Project contains full video recordings covering the entire duration of a survey or inspection task. The VisualReview Report reduces this to just short video clips or even just still images of the points of interest. This greatly reduces the size of the data while still retaining a record of all important features. The report might for example have short videos of each freespan and any areas of damage, but only have still images of joints, anodes and flanges.

To create a new report, right-click on a Project, a Sub-Project or just a few selected Datasets in the VisualEdit Project Tree. In the pop-up menu select Report, VisualWorks Report. This will open the configuration window shown below.



1. At the top of the window there is a File menu where you can open and save configurations for this report.

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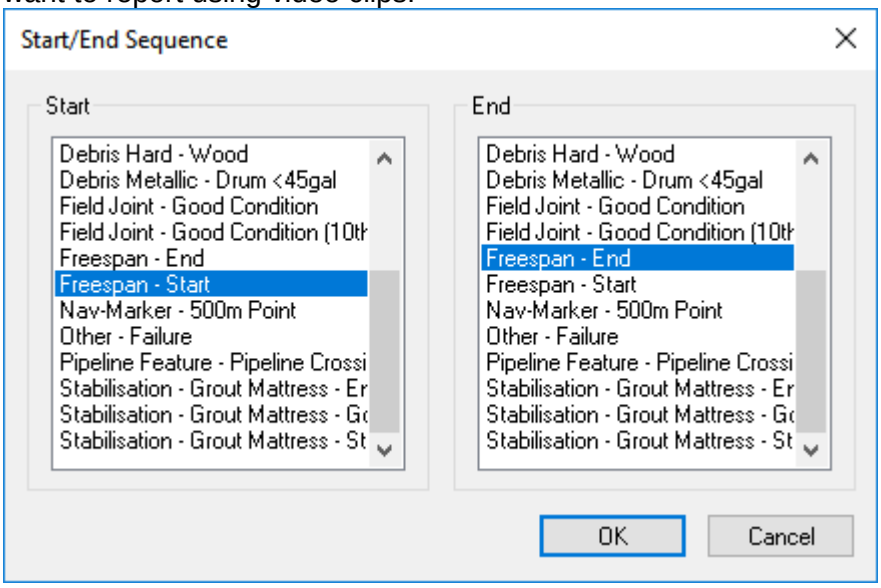
2. So that you can select which events you want to report with still images, which of them with video clips, and which will have no imagery, you need to be able to tell which event types are which. Choose an "Event Classification Filed" that lets you do this. Most often this will be a column like "Description" or "Code", but in some cases you might want to report all anonymous events, or all Anodes with CP readings so you might want to classify the data using an Anomaly column or a CP column.

3. In the Options menu you can select which of the available User Defined Tables you want to include in your reported data. You can also define paired event sequences for things like Freespans to let you create video clips that run from a Start event to a matching End event. To define a Start/End Sequence select it in the Options menu to open the window shown below. Select a Start event type on the left, and the matching End event type on the right then click OK. Repeat this for each Start/End pair that you want to report using video clips.



4. In the main configuration window there are two lists – one for Still Images and one for Video Clips. You will see all of the possible entries for the column that you chose as the Classification Field. In the list on the left, highlight the event types that you want to be reported as still images. Use Ctrl+Left Click to add to your selection. Still images will be grabbed at the time of each selected event. If you want to offset them by few seconds before or after each event, use the Offset control under the list on the left.

5. For the video clips, select any Start/End sequences for "linear" events that you want to show as videos. Notice in the example above that "Freespan End" and "Freespan Start" are not selected. Instead the sequence shown as "Freespan - Start -> Freespan - End" has been selected. You can also create video clips for "point" events such as severe damage or anything else that you think might be best shown using video instead of a still image. Below the list on the right you can define a duration. For a point event the video clip will be centred on the time of the event, with half of the chosen duration before that time, and half after it. For linear event pairs the duration will also be divided in two and the clip will start half of the duration before the Start event and end half of the duration after the End event.

6. Select a destination drive for the report files. They will be saved with the same Project, Sub-Project and Dataset hierarchy as the source data, inside ?:

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\VisualWorksReports\Projects\ProjectName\... where the ? is the disk letter that you select here.

7. Choose what types of other data you want to be included in the Report. You can select which User Defined Tables to include by clicking the ... button or by using the Options.

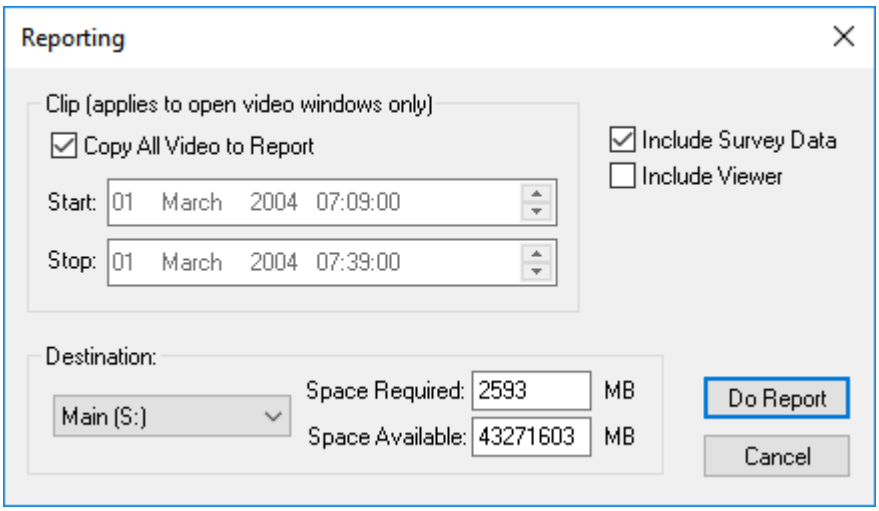
8. You can also put a copy of the free viewer software on the same disk as the reported data if you want.

After you have made all of your configuration choices it would be a good idea to save them to be used again next time. You can do this from the File menu at the top.

1.14.2 Video clip with data

The "Video Clip with Data" Report extracts a section of the video and data for a survey or inspection job. It is designed to be compatible with VisualSoft's free viewer, VisualReview. A normal VisualSoft Project contains full video recordings covering the entire duration of a survey or inspection task. The "Video Clip with Data" copies some or all of this video and data to another disk.

To create a new report, right-click on a Project, a Sub-Project or just a few selected Datasets in the VisualEdit Project Tree. In the pop-up menu select Report, Video Clip with Data. This will open the configuration window shown below. Select the time limits that you want, or use "Copy All" to report all of what you selected before the right-click. Decide whether or not to include the non-video files – the "Survey Data", choose a destination disk and click "Do Report".



1.14.3 Coabis Report – Chevron Australia

The Coabis PXF Events Report lists all selected event data (a Project, Sub-Project, or one or more Datasets) in a format specified by Chevron Australia for use in AiZe's Coabis inspection software. The file is output to an Excel file formatted as a Coabis PXF file.

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The tool prompts you to map your VisualSoft Event data columns to the column names used in Coabis. This is best achieved by logging all data using the "Coabis - Chevron Gorgon ROV" event configuration which is designed to match this report format. Other variants of Coabix PXF file use all the same columns as the Chevron variant but may use different event coding. If you are unsure about your event coding speak to visuasoft.support@f-e-t.com. If you are unsure about the PXF format or other client specific requirements then you may need to speak to AiZe's Coabis team or to the owner of the infrastructure that you plan to inspect.

1.14.4 MIDAS Report

The MIDAS report has a matching Event configuration. You should log data using that matching configuration otherwise you may not capture the data that is needed to create the MIDAS report. MIDAS is a format used historically by a number of pipeline operators such as Marathon, and it may still be used for some legacy assets that have been sold to other operators. This format and the accompanying Event logging configuration should only be used if your client has specifically requested the MIDAS data format.

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1.14.5 Nord Stream 2 Route Survey Report

The Nord Stream 2 Route Survey Report creates an Excel spreadsheet formatted to the requirements of Nord Stream 2, and is used to report data from boulder and unexploded ordnance (UXO) surveys.

The event data used as the source for this report must have been logged and edited using the corresponding "Nord Stream 2 Route Survey Rev 1" eventing configuration.

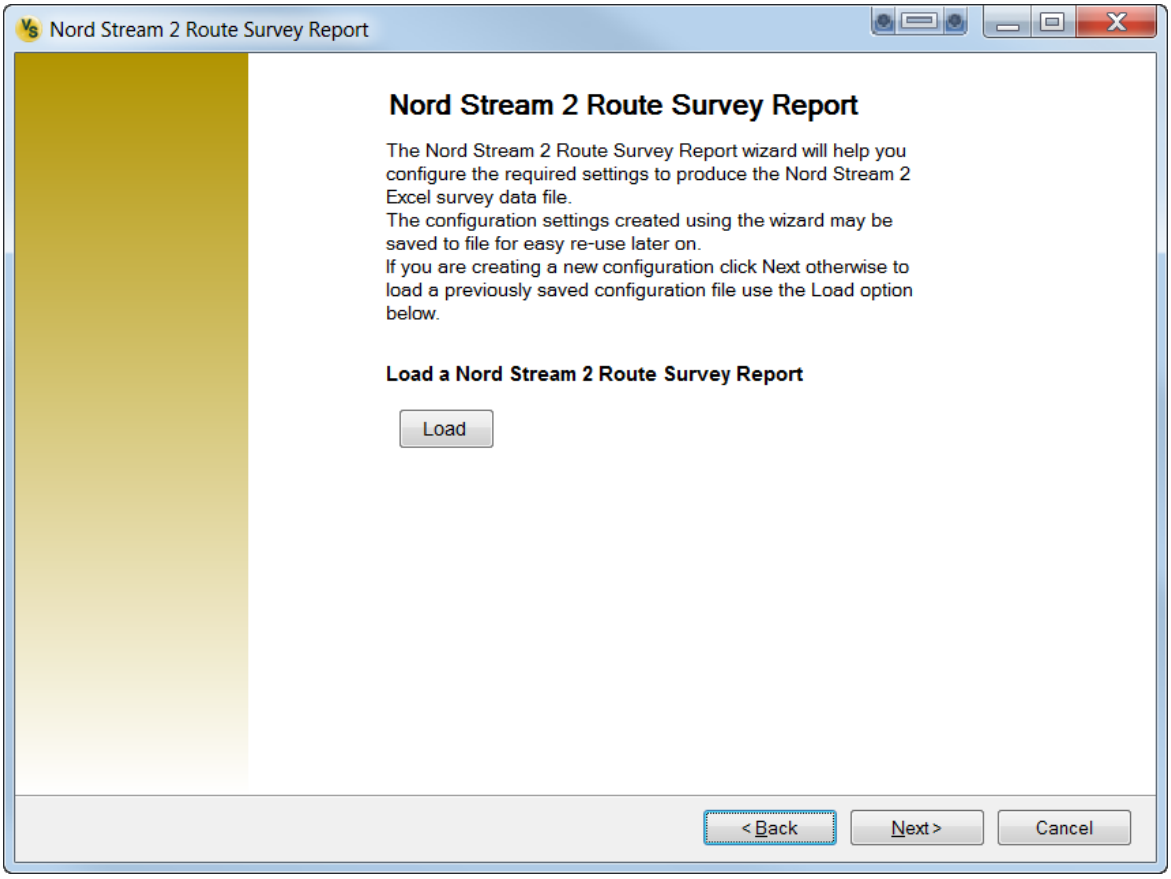
This report is primarily intended for the ROV video phase of the surveys. If the surveys have previously included Sidescan Sonar or Magnetometer passes then this data can be imported into the VisualEdit Project as User Defined tables.

The report may be run on single or multiple Datasets, or on single or multiple Sub-Projects or on a whole Project. This is determined according to what is selected and highlighted in the Project Tree before you right-click to select the report format.

When you select the report, a wizard will open and you should step through the pages of the wizard to configure the settings.

NS2 Route Survey Wizard – Introduction

The first page of the configuration wizard allows you to load a previous configuration – if you have one. If you don't you should skip this page.



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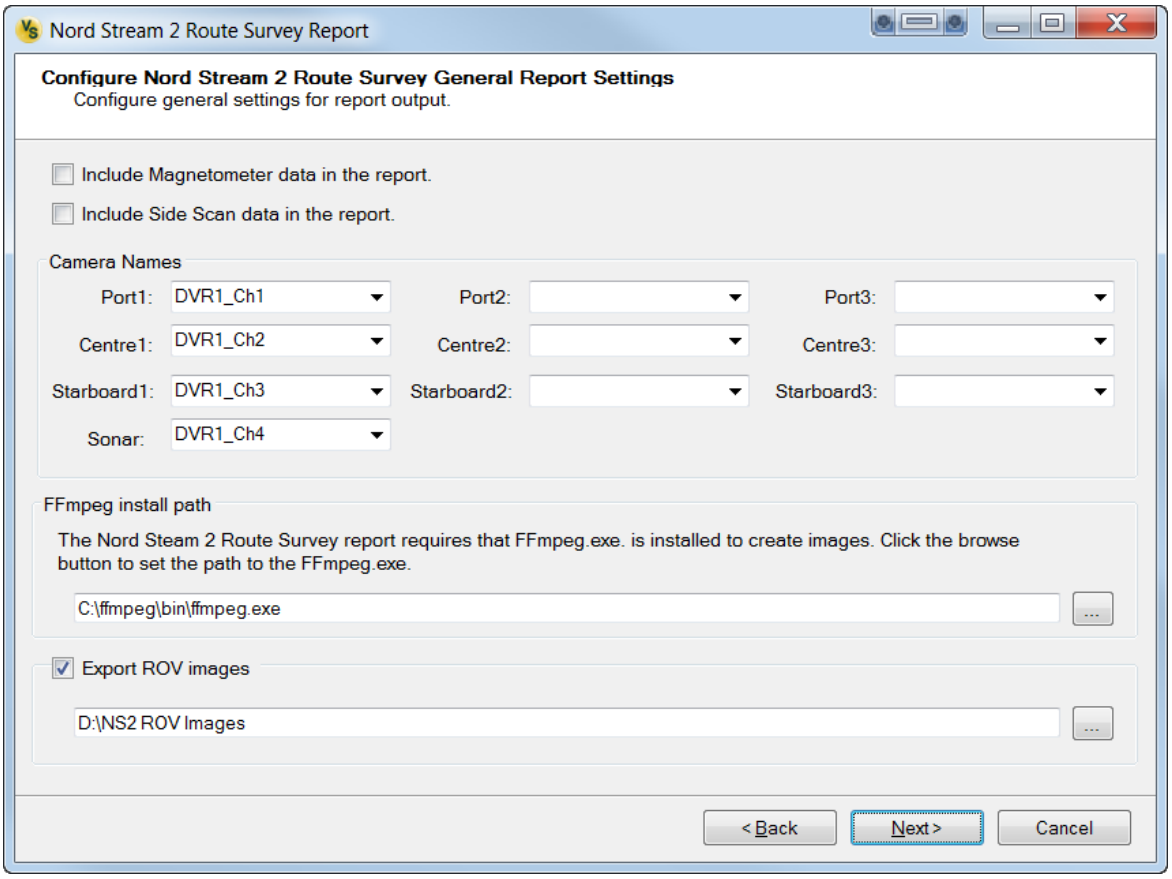
NS2 Route Survey Wizard – General Settings

The general settings page lets you specify whether or not you have Magnetometer or Side Scan data to include in the report, and lets you assign up to three cameras for each of Port, Centre and Starboard, plus one more for a Sonar image. Some ROVs use multiple cameras on each side, angled to increase the video coverage of the route corridor. If you are using these extra cameras, use the boxes for cameras 2 and 3. If you only have one camera for each side, use the column on the left for Port1, Centre1 and Starboard1.

The report uses FFmpeg to create still images from the video files. You must specify the path where the ffmpeg.exe file is on your PC.

The image grabs are automatically embedded in the final spreadsheet. There is an option to also save the image grabs separately in a specified folder.



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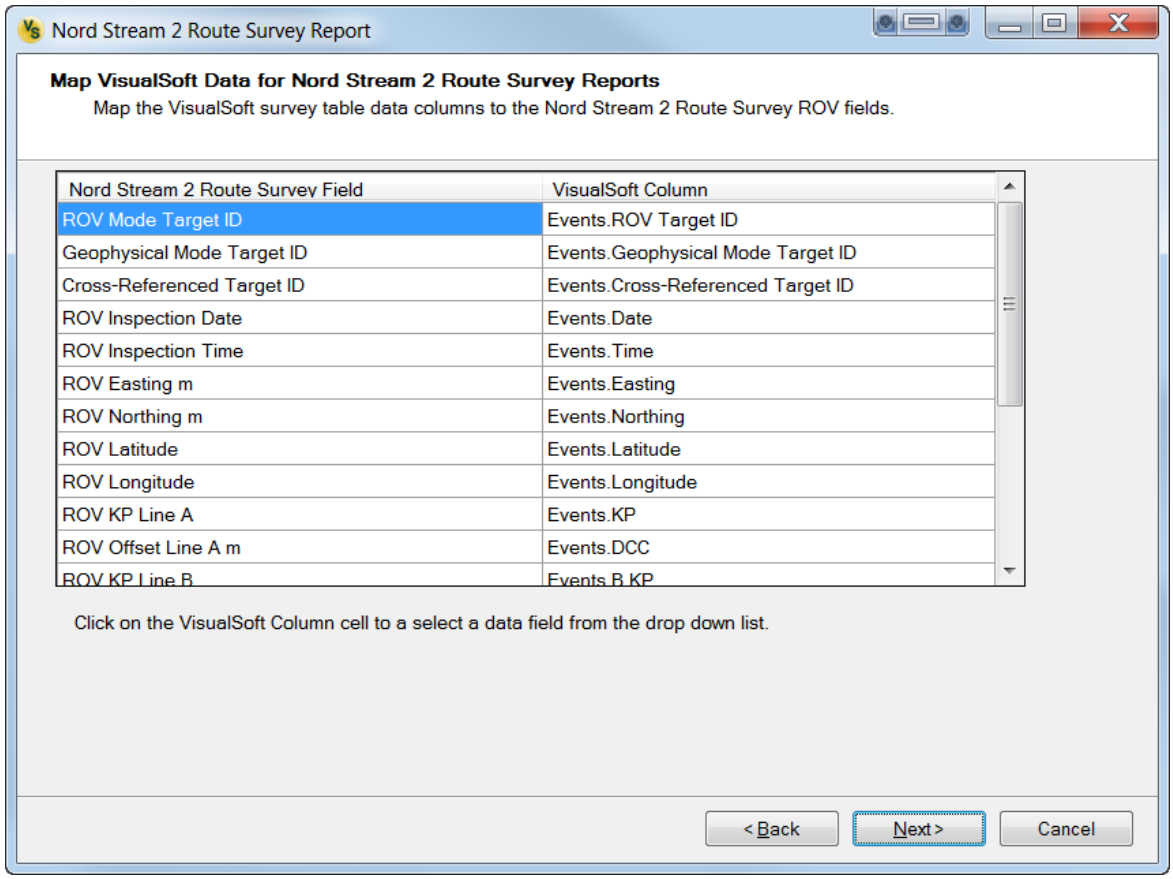
NS2 Route Survey Wizard – Mapping

If you have used the pre-configured eventing configuration "Nord Stream 2 Route Survey Rev 1" then all of the column mapping will be done automatically, as in the example below. If you need to make any adjustments you can do so by clicking in the cells of the right side of the list to select a different column or even a different data table.



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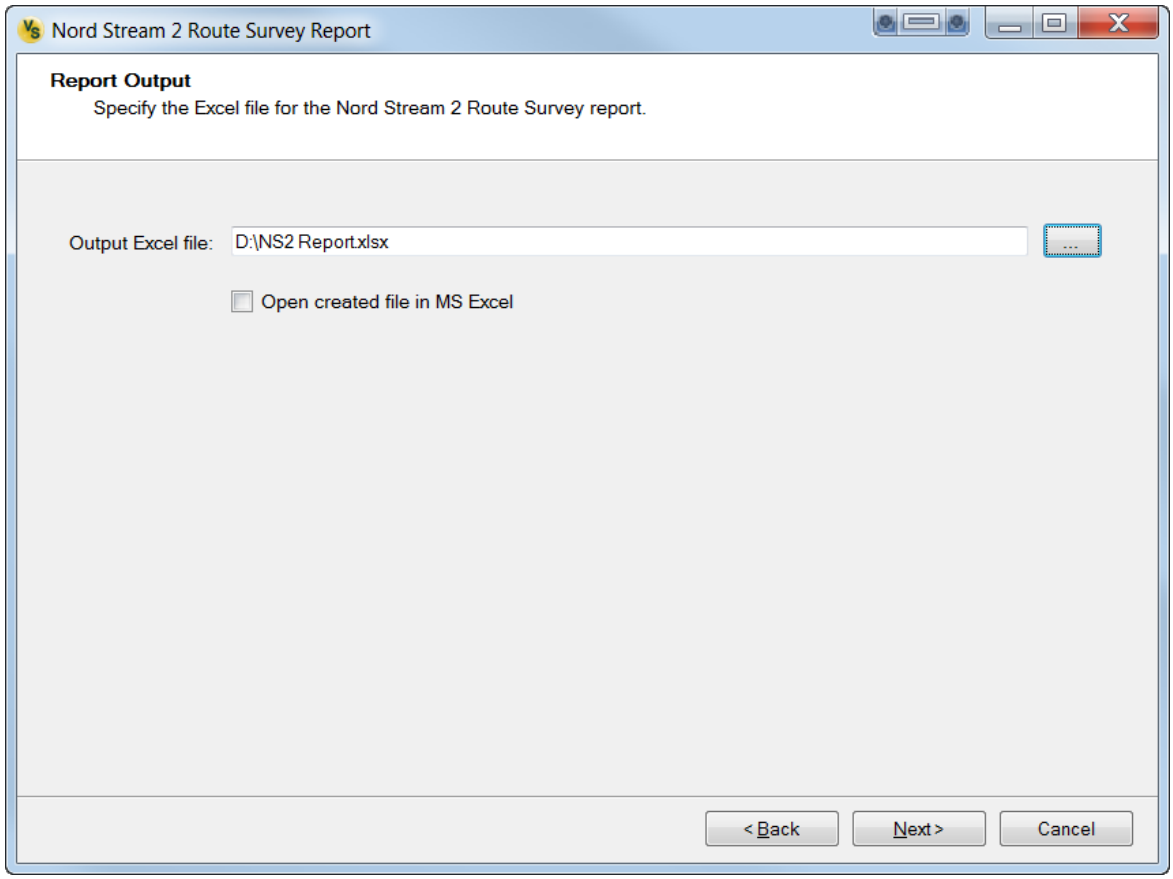
NS2 Route Survey Wizard – Output File

This page asks for the file name and location where you want the Excel spreadsheet to be created. There is an option to have the file opened automatically when the report is complete.



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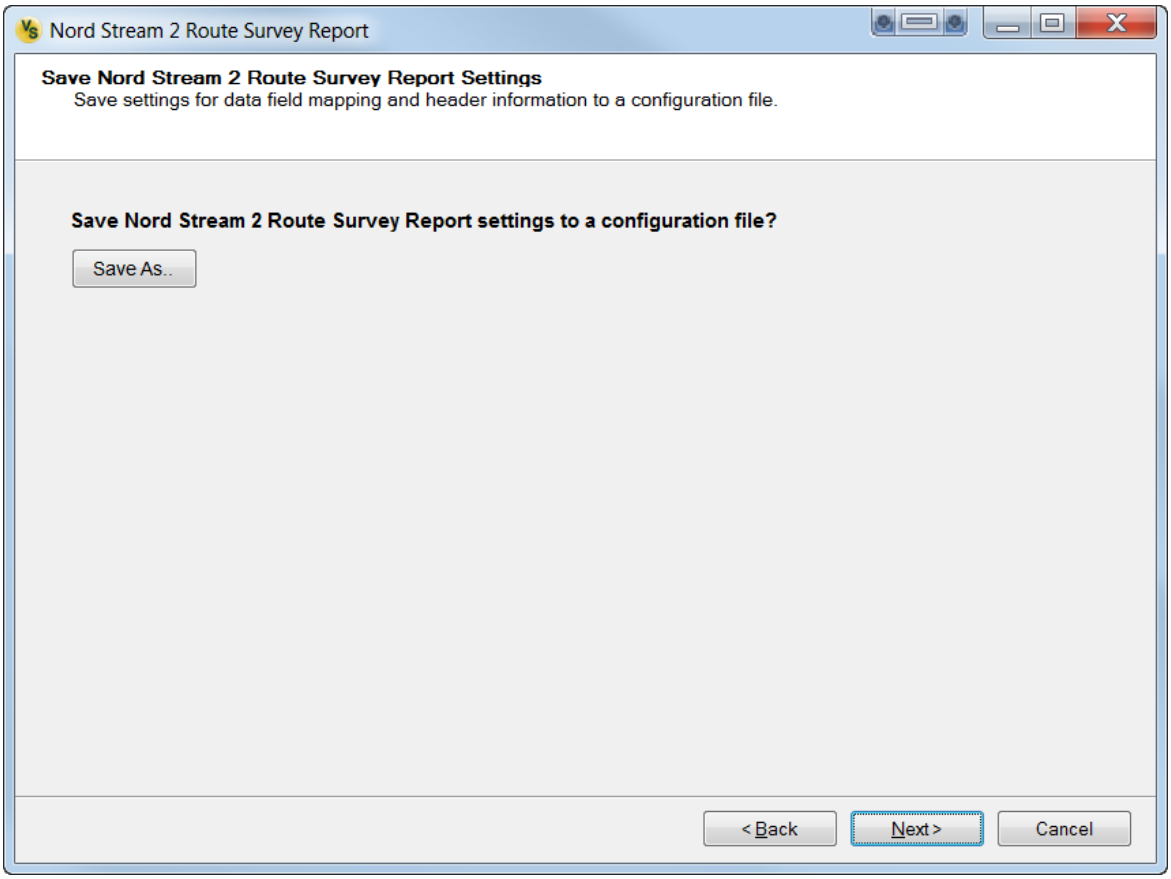
NS2 Route Survey Wizard – Save Config

After you have configured all of the options on the previous pages, you can save them to use again another time. The file that you save here can be opened on the introduction page of the wizard the next time you use it.



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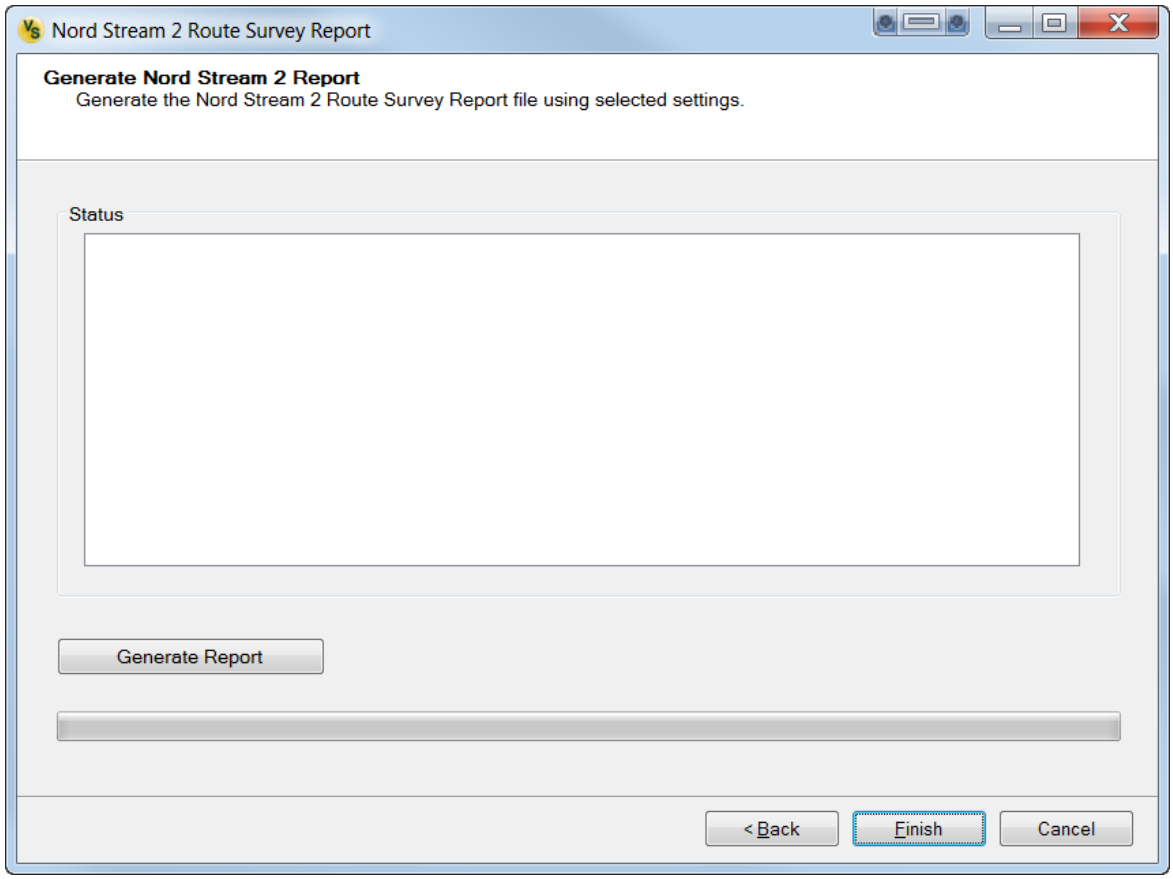
NS2 Route Survey Wizard – Finish

To create the spreadsheet, click the button to "Generate Report".



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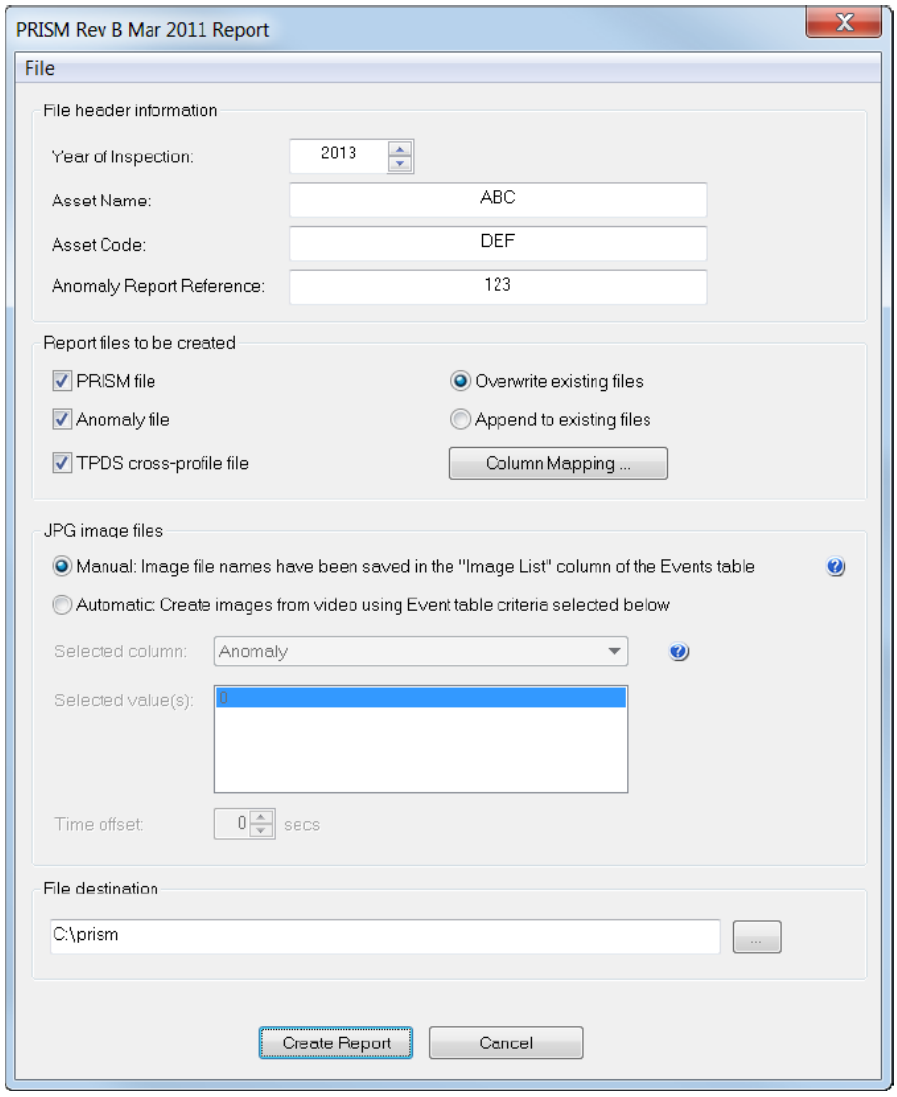
1.14.6 PRISM Rev B Mar 2011 Report

This report (and an associated event logging and editing configuration) has been created to report data in a format that will match **Revision B** of the JP Kenny specification document 06-3103-01-SPE-U-001 entitled "**BP Subsea Pipeline Inspection Technical Specification**".

It is important to log and edit event data using the event configuration named "**PRISM Rev B Mar 2011**". Data that was not logged with this format may require complex conversion or repeat logging before it can be reported in the PRISM format.

Year of Inspection: The "Year of Inspection" is set automatically based on the start time of the data being reported. It can be changed if necessary.

JPG Images: You can create image files in advance, and type their names into the "Image List" column of the events table, or they can be created automatically during reporting. For images to be created automatically , you must specify which event attribute identifies the relevant events – usually the "Anomaly" column. Images may be offset from the event times by a fixed number of seconds.



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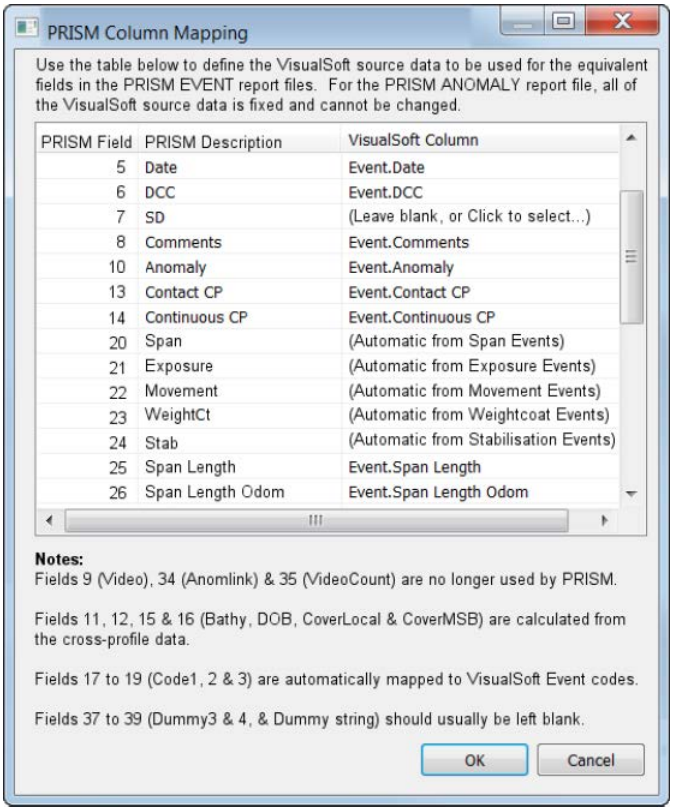
Column Mapping: In the Column Mapping window, the PRISM Fields have been numbered and named to match the specification document. This numbering makes it clear where fields have been omitted from the mapping table and any omitted fields are explained in the notes below the table. This ensures that users are not asked to map something which is unused, or which has only one mapping choice, or which is calculated automatically from other data. Mapping is therefore available for some but not all of the Fields in the PRISM EVENT file. All Fields in the ANOMALY file have only one possible source and so are mappable.



Automatic Mapping, “Leave blank” or “Click to Select”: Wherever possible the PRISM Field names are automatically mapped to the matching VisualSoft Event column names. Where there is no available match the VisualSoft column is labelled as “(Leave blank, Click to select…) as shown in Field 7 (SD) above. If the user leaves that option in place the selected column will be blank in the report. Alternatively the user can select any VisualSoft column to map to the PRISM field.

Boolean flags: The reporting tool allows a choice of using the event code pairs for Span Start/End, Movement area Start/End etc., or using columns in the events table. The default is to use the event pairs automatically.

Notes: Some notes have been included at the bottom of the dialog to explain the omitted fields.

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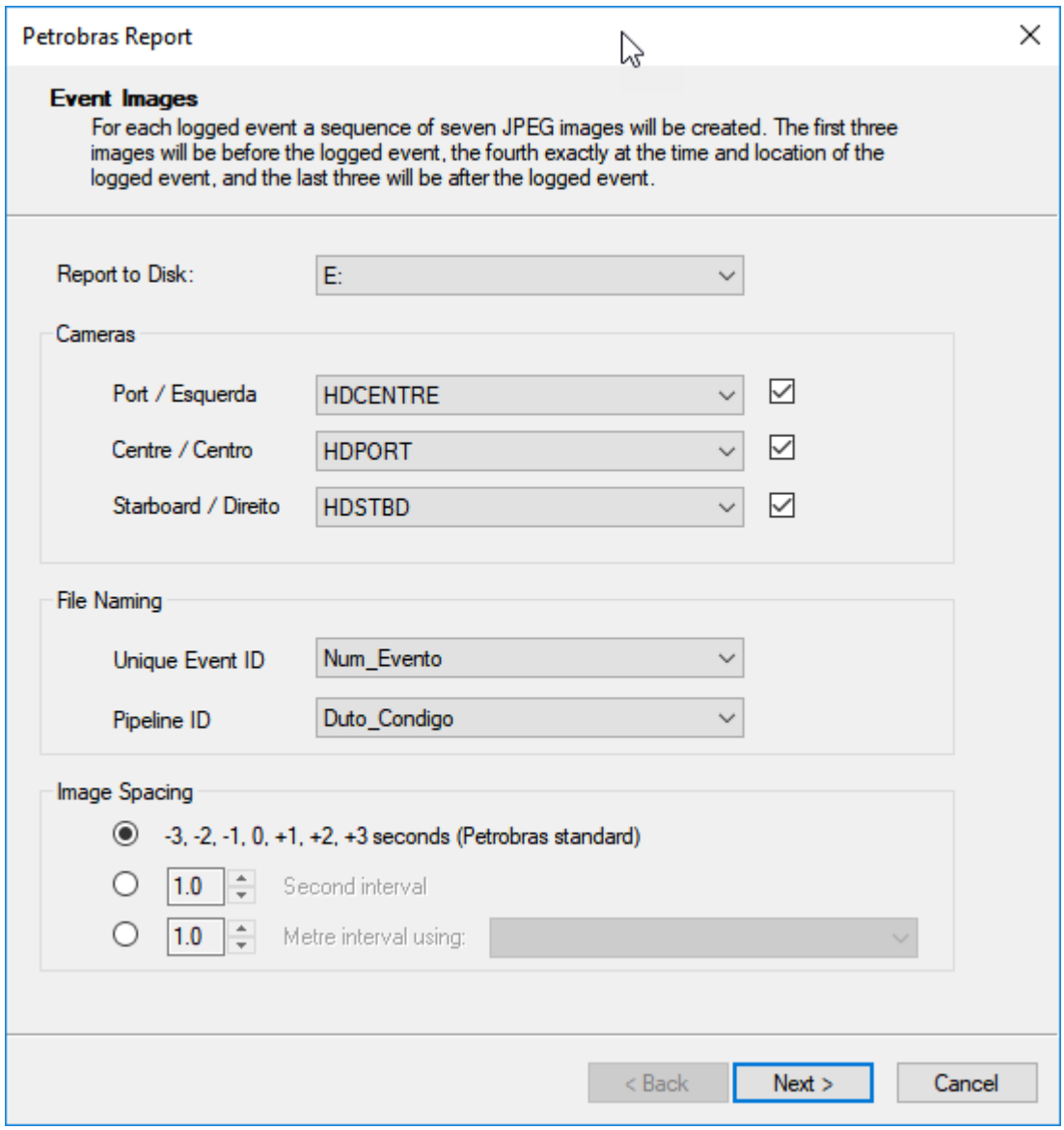
1.14.7 Petrobras Report

This report reduces the video recordings to a sequence of still images in JPG format, one for each logged event record. For each event, seven images will be created, one at the exact time of the event, and also three before it, and three after it. The spacing is usually one second apart, with the seven images running from from -3 seconds to +3 seconds, but you can change this to other time or distance intervals if you (and your client) want to do so. Each event and each pipeline must have a unique ID, which is stored with the data in the events table.



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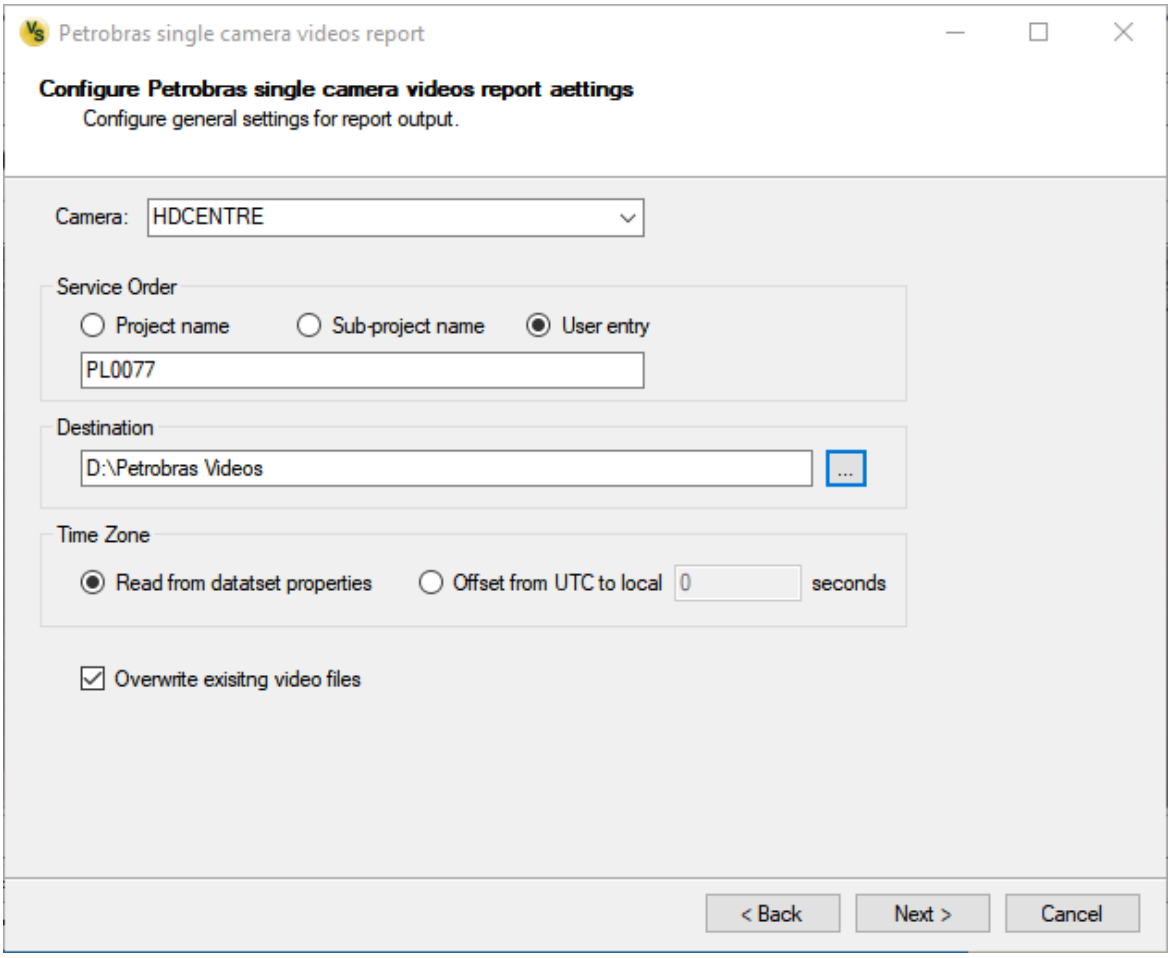
1.14.8 Petrobras single camera videos

This simple report makes a copy of one selected camera with a naming convention defined by Petrobras. Options allow you to read the time zone from the data or enter it manually and allow you to use the Project structure to get the Service Order number, or to enter in manually. The configuration can be saved and reloaded later.



Files are copied with names like the following: **OS**XXXXXXXXXXXX**-**2022**-**09**-**15**T**121634**D**030. Text in red is fixed and not configurable.

OS	Prefix for Service Order number
XXXXXXXXXXXX	Service Order number. i.e. Project or Task
2022	Year 20xx (using local time and date)
09	Month number 01–12 (using local time and date)
15	Day number 01–31 (using local time and date)
T	Time prefix
12	Hours 00–23 (using local time)
16	Minutes 00–59 (using local time)
34	Seconds 00–59 (using local time)
D	Duration prefix
030	Duration of video in minutes

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1.14.9 SITRAS 7 Report

This reports events, cross-profiles and other data in a format specified by Statoil (now Equinor) in specification TR2234 version 7.

1.14.10 SITRAS 5 Report

This reports events, cross-profiles and other data in a format specified by Statoil (now Equinor) in specification TR2234 version 5.

1.14.11 SITRAS 4.02 Report

This reports events, cross-profiles and other data in a format specified by Equinor (formerly Statoil) in specification TR2234 version 4.02.

1.14.12 SITRAS Video (H.264)

This report makes a copy of MP4 (AVC H.264) video files. The copies are web-optimised and are saved with file names matching the Statoil / Equinor SITRAS specification TR2234.

1.14.13 SITRAS Video (MPEG-2)

This report makes a copy of MPG (MPEG-2) video files. The copies are in Transport Stream format and are saved with file names matching the Statoil / Equinor SITRAS specification TR2234.

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1.14.14 Shell IBIS 1.25 Report

Reports data in Shell's IBIS format for import to their pipeline inspection databases. This report is occasionally updated to match each revision of the IBIS specification. The current version uses IBIS rev 1.25.

1.14.15 Shell Video Metadata

Reports video metadata to describe the video files submitted to Shell with an IBIS report. Th resulting file is used by Shell for import into their inspection database.

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1.15 Exporting Data

All three editions of VisualEdit include tools for exporting data in generic or configurable formats. Some of these formats are specified by companies such as ExxonMobil, Saipem, or PiSYS.

The available Export formats are listed below.

VisualEdit also includes some more specific data Reports in client defined which are described in Reporting Data 82.

1.15.1 Project and Data Summaries

Project Summary

The Project Summary export creates a listing of all Datasets within a Project, and lists their start and end times and KP limits, plus information about the tapes where they are archived.

Project QC Summary

The Project QC Summary export creates a listing of all Datasets within a Project, and lists their start time, duration and KP limits, plus information about any time or KP gaps in the main data tables (Raw Survey, Processed Survey, Cross-Profiles, and Events).

Snamprogetti Index

The Snamprogetti Index creates a listing of all video files, formatted to match a specification by the Italian project management company Snamprogetti, which is a part of Saipem.

Video File Index

The Video File Index creates a listing of all video files with their start and end times and KP limits.

1.15.2 Track (Processed Survey)

CSV

This option exports the Processed Survey data table to a CSV file, maintaining the same formatting and columns that are seen in VisualEdit.

UKOOA P5/94

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This exports a position listing in the P5/94 format as defined by UKOOA (United Kingdom Offshore Operators Association). Note that this listing is position data only and does not include event records.

GPS Exchange (GPX)

This exports the Processed Survey data table to a GPX file, with date, time Latitude, Longitude and Height. It can be used later with exported images and the Video export tool "JPEG EXIF Geotagging 105".

1.15.3 Events

CSV file

This option exports the Events data table to a CSV file, maintaining the same formatting and columns that are seen in VisualEdit.

Events and Processed Survey

This option exports the Events data table to a CSV file, maintaining the same formatting and columns that are seen in VisualEdit, and adds extra columns to the right of each record. These columns include all of the columns in the Processed Survey data table with the values interpolated to match the times of each event record. (This export is now very rarely used because it creates a vast array of columns which can all be found elsewhere.)

Excel file

Exports the Events data table to an Excel spreadsheet. If the Events table in VisualEdit has subsets configured (for example to separate the Anode, Field-Joints, Freespans etc.) then each subset will appear as a separate worksheet in the spreadsheet alongside the full events list – exactly as they do in VisualEdit.

1.15.4 Cross-Profiles

CSV File

This option exports the Cross-Profile data table to a CSV file. The format of the exported file is as specified here: VisualSoft Cross-Profile CSV File Format 172

DXF File

This option exports the Cross-Profile data to a series of AutoCAD DXF files. One or more scan can be exported to each DXF file. Note that this is not required for use with AutoChart from Wish Software (www.wishsoftware.com) which can read Cross-Profiles from a VisualWorks Report 83.

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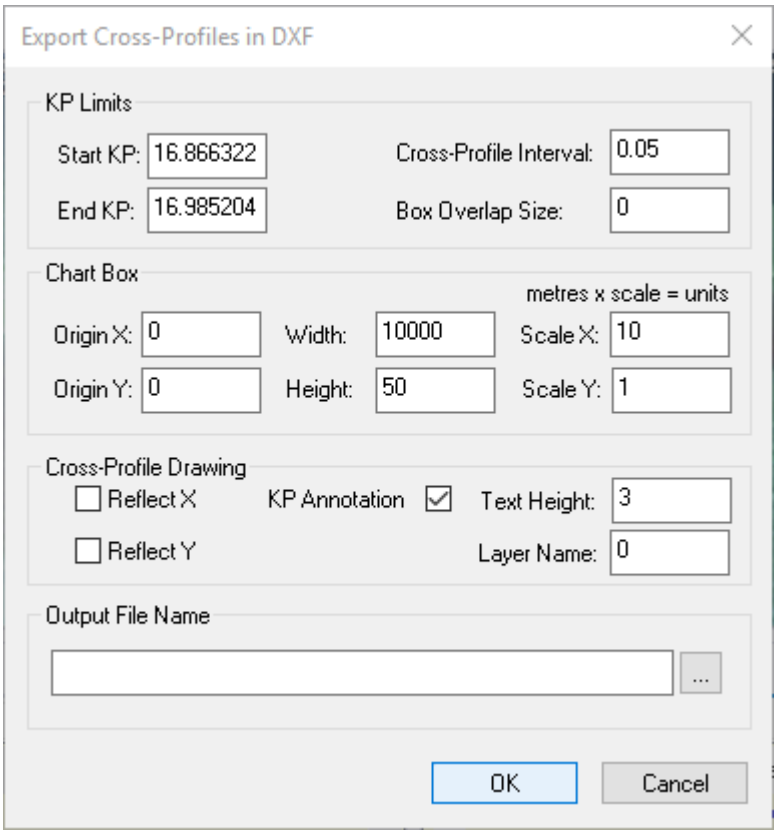

PiSYS v1 format

This format matches the "Transverse Profile Data" format defined in PiSYS document "PiSYS formats1.6.doc". You will be prompted to enter an interval in metres for scan export. If you enter zero, then all scans will be exported. If you enter a non-zero value scans will be exported using that interval, with the closest scan being used if there is no exact match at the defined interval.

PiSYS processed format

This format matches the "Processed Transverse Profiles Format" format defined in PiSYS document "PiSYS Formats1.6.doc", and recommended for use with their TPDS viewer. You will be prompted to enter an interval in metres for scan export. If you enter zero, then all scans will be exported. If you enter a non-zero value scans will be exported using that interval, with the closest scan being used if there is no exact match at the defined interval.

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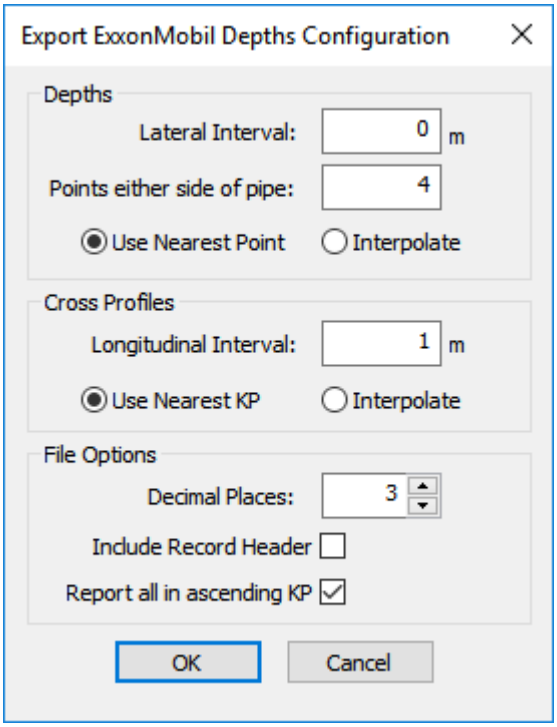
ExxonMobil Depths

This creates a list of depth values from the processed cross-profile data. Depth points are spaced both along the pipeline (Longitudinal Interval) and to either side of it (Lateral Interval) according to the chosen settings. In each case you can either export the depth of the data point closest to the selected interval, or can interpolate a value at the exact interval.

The default "Lateral Interval" for the spacing of depth points is half of the pipe diameter in the current scan.



This exports a comma separated listing of processed cross-profile data in the following format:

- Profile ID number
- Time & Date
- KP
- Pipe Diameter
- Easting of Top of Pipe
- Northing of Top of Pipe
- Top of Pipe Depth
- Central Seabed Depth
- Seabed Pipe Left immediately adjacent to Pipe
- Seabed Pipe Left at 1 x Lateral Interval from Pipe
- Seabed Pipe Left at 2 x Lateral Interval from Pipe
- Seabed Pipe Left at 3 x Lateral Interval from Pipe
- ...
- Seabed Pipe Right at N-1 x Lateral Interval from Pipe (where N is the specified number of depth points either side of the pipe)
- Seabed Pipe Right immediately adjacent to Pipe

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- Seabed Pipe Right at 1 x Lateral Interval from Pipe
- Seabed Pipe Right at 2 x Lateral Interval from Pipe
- Seabed Pipe Right at 3 x Lateral Interval from Pipe
- ...
- Seabed Pipe Right at N-1 x Lateral Interval from Pipe (where N is the specified number of depth points either side of the pipe)

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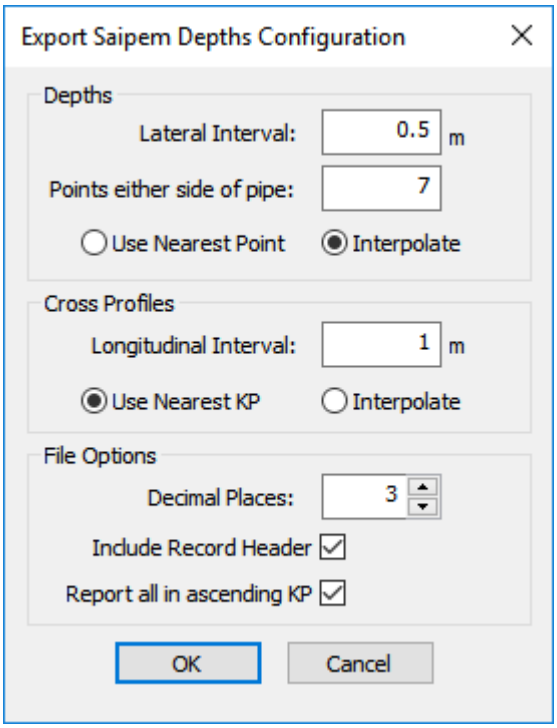
Saipem Depths

This creates a list of depth values from the processed cross-profile data. Depth points are spaced both along the pipeline (Longitudinal Interval) and to either side of it (Lateral Interval) according to the chosen settings. In each case you can either export the depth of the data point closest to the selected interval, or can interpolate a value at the exact interval.



This exports a comma separated listing of processed cross-profile data in the following format:

- Profile ID number
- Time & Date
- KP
- Pipe Diameter
- Easting of Top of Pipe
- Northing of Top of Pipe
- Top of Pipe Depth
- Central Seabed Depth
- Seabed Pipe Left immediately adjacent to Pipe
- Seabed Pipe Left at 1 x Lateral Interval from Pipe
- Seabed Pipe Left at 2 x Lateral Interval from Pipe
- Seabed Pipe Left at 3 x Lateral Interval from Pipe
- Seabed Pipe Left at 4 x Lateral Interval from Pipe
- Seabed Pipe Left at 5 x Lateral Interval from Pipe
- Seabed Pipe Left at 6 x Lateral Interval from Pipe
- Seabed Pipe Right immediately adjacent to Pipe
- Seabed Pipe Right at 1 x Lateral Interval from Pipe
- Seabed Pipe Right at 2 x Lateral Interval from Pipe
- Seabed Pipe Right at 3 x Lateral Interval from Pipe

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- Seabed Pipe Right at 4 x Lateral Interval from Pipe
- Seabed Pipe Right at 5 x Lateral Interval from Pipe
- Seabed Pipe Right at 6 x Lateral Interval from Pipe

1.15.5 Video (JPG stills)

JPEG EXIF Geotagging

Uses an exported GPX file with timestamped latitude, longitude and height to add EXIF position tags to previously exported JPG files. The JPEG images must have a timestamp either in the file name or already present in the EXIF header data.

1.15.6 ASCII (configurable export)

The ASCII export tool provides a highly configurable way of exporting data data columns from one or more data tables.

The export can be at a fixed interval of either time or distance, or can match the interval of records in any existing data table.

The export is configured using a tabbed window which can be used to step you through the necessary steps to choose your source data, select output formatting, and define output intervals. It is best to work through each tab from left to right to be sure of setting everything that you need.

Export ASCII: Step 1 - Main Page

The settings may be saved and re-loaded using the File menu on the main ASCII Export window. The main page allows you to specify start and end limits using Time, KP or both. The default values represent all currently loaded data. At the bottom there is an option either to create a new file each time the export is run (Overwrite) or to add to the end of an existing file with the same name (Append). Other settings are accessed by clicking Configure.

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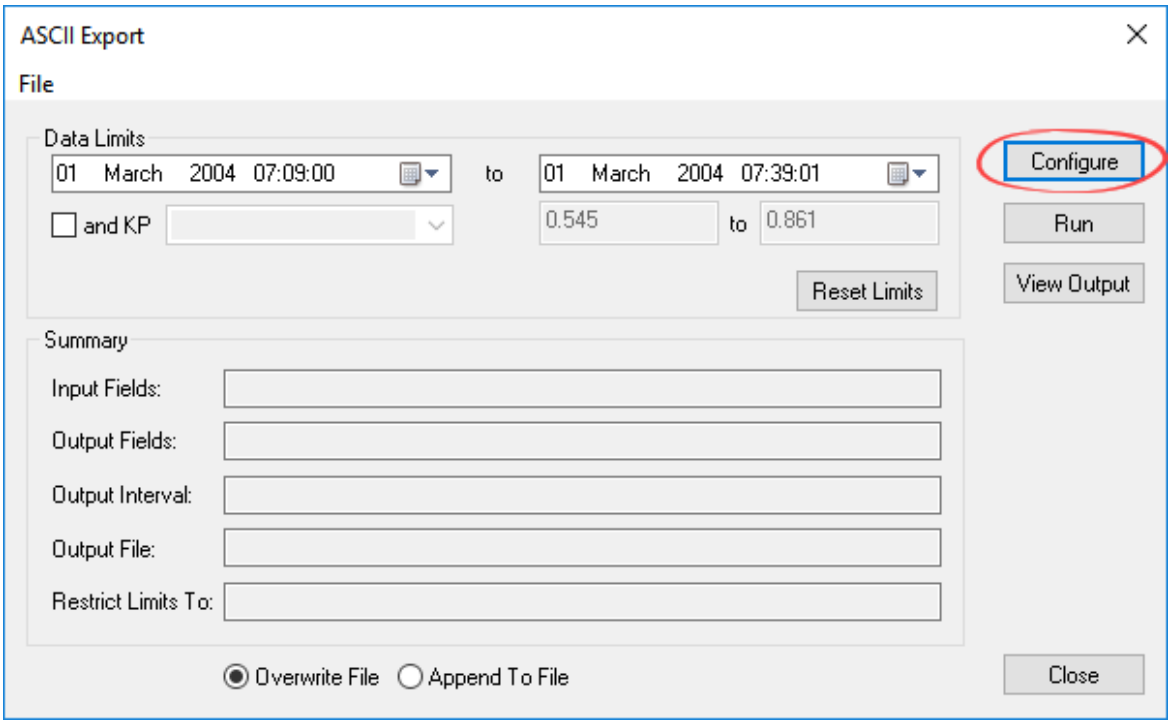

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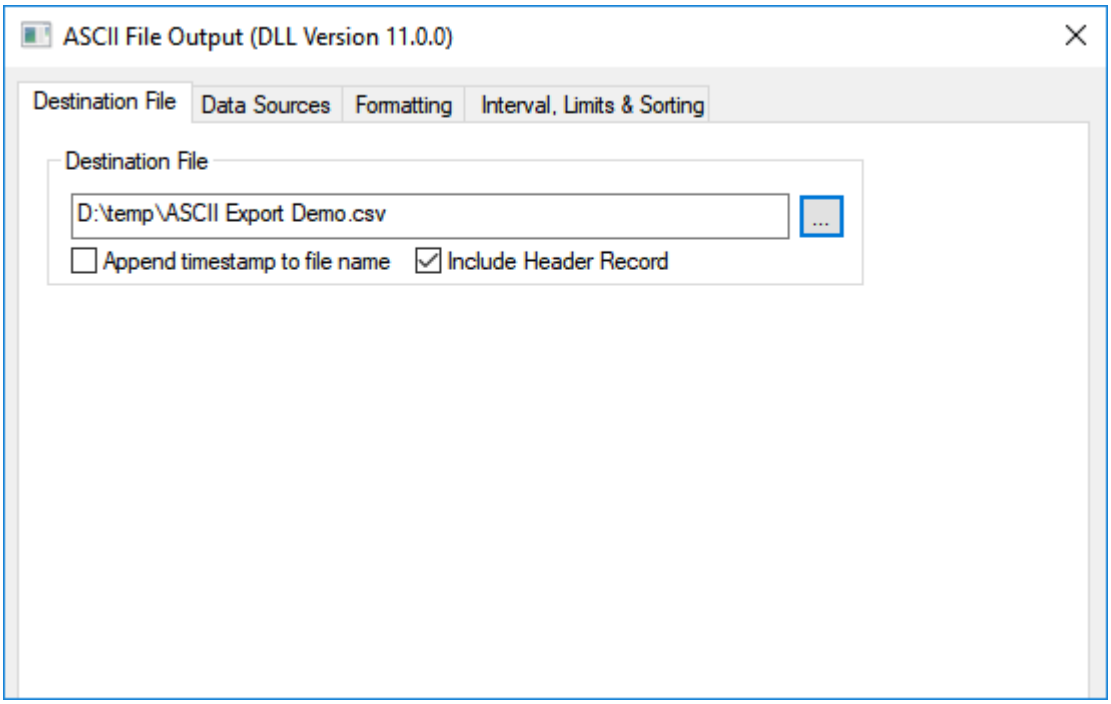
Export ASCII: Step 2 - File and File Header

Select the Destination File tab to specify the destination for the exported data.

Click on the Browse button to select a folder and type a file name.

If you want to have column headings in the exported file select the option to "Include Header Record".



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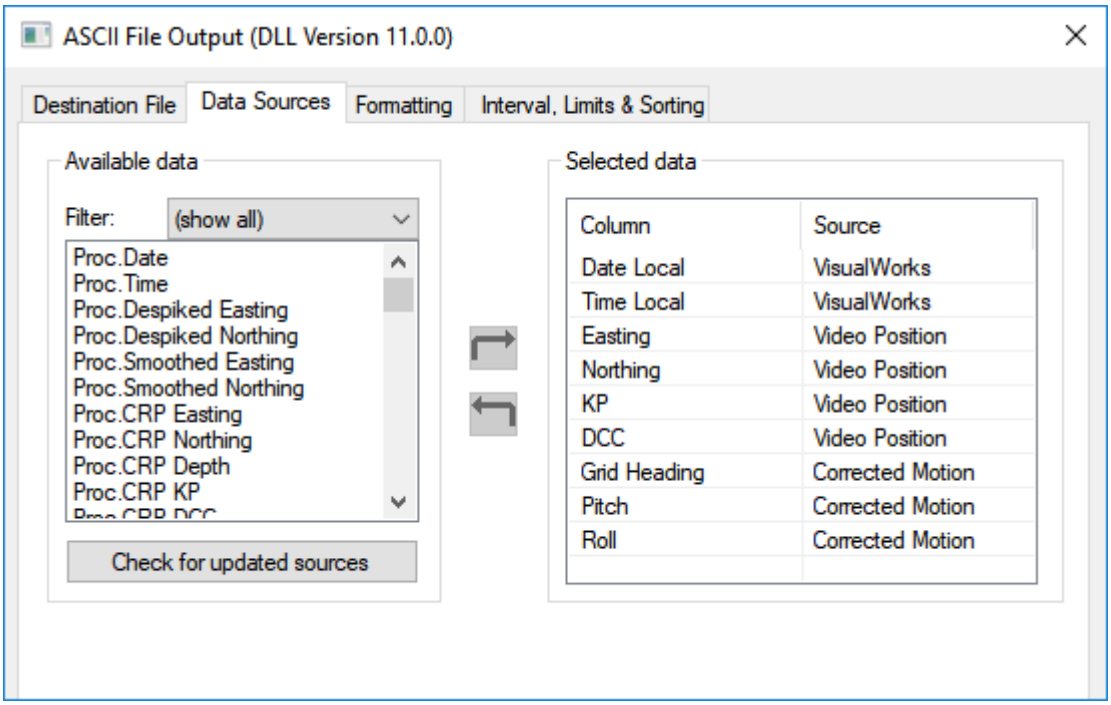
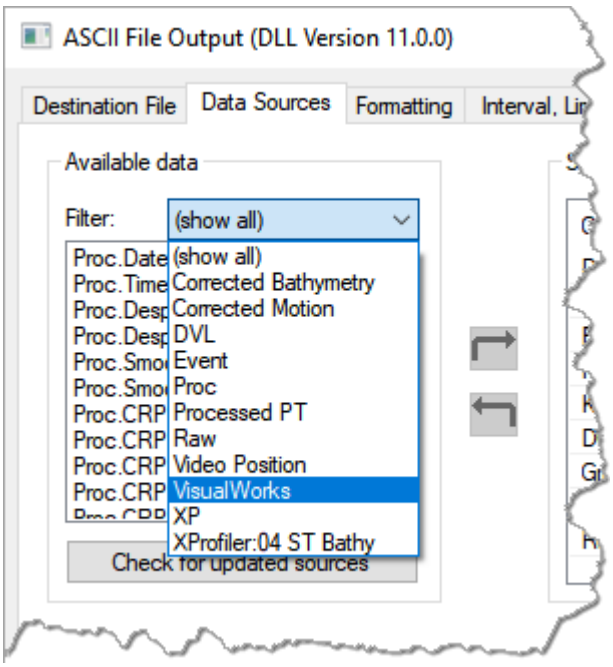
Export ASCII: Step 3 - Data Selection

Select the Data Sources tab to select what data you want to export.



Use the Filter to limit the list of sources to only one data table at a time. This makes the list easier to read and will help you find what you want. In the Filter list, the "VisualWorks" section includes time and date in either UTC or local time offsets. It is recommended that you use these rather than the date or time columns in individual tables. This will ensure that all exported dates and times accurately match those of the video displays.



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The example at the top shows the use of these "VisualWorks" date and time columns followed by positions and KPs from the Video Position table and then the motion data from a different table. (When you get to the Limits and Sorting tab you can decide at what interval this data will be listed - do you want to interpolate motion data to match the interval of the positions, or the other way around, or perhaps interpolate both of them to a fixed interval?)

To add data to your export, double click the chosen entry in the Available data list on the left, or click once to select it and then click the right-pointing arrow in the middle. This will add the item to the Selected data list on the right.

To remove an item from the Selected data list, select it in the list on the right, and then click the left-pointing arrow.

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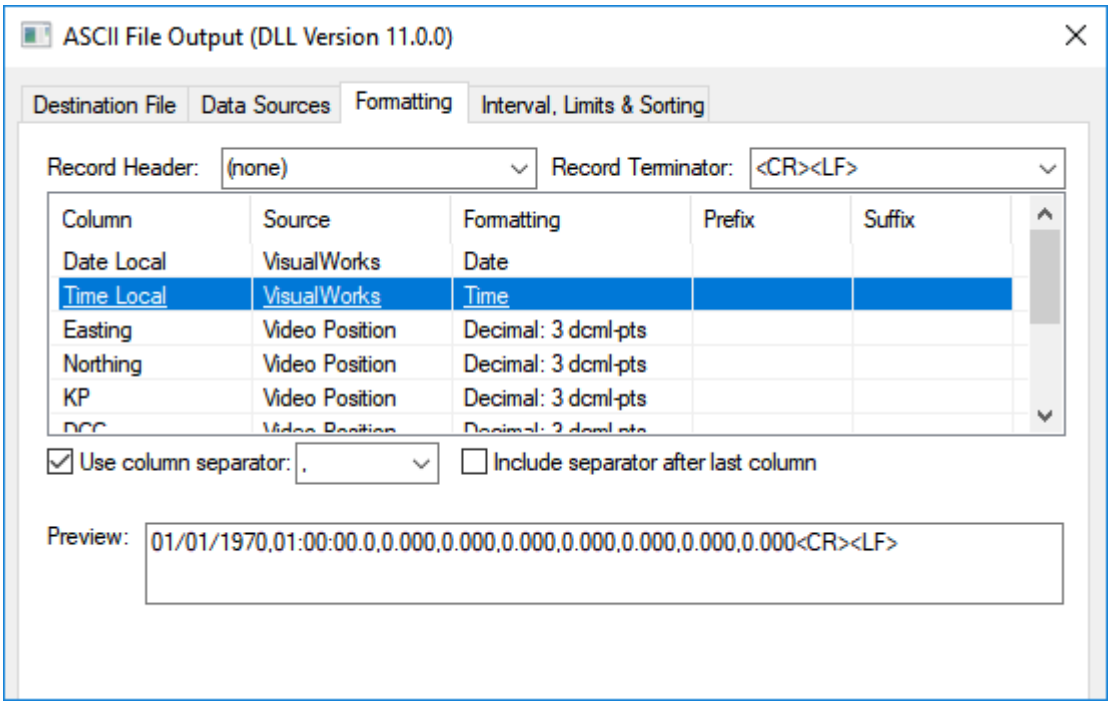
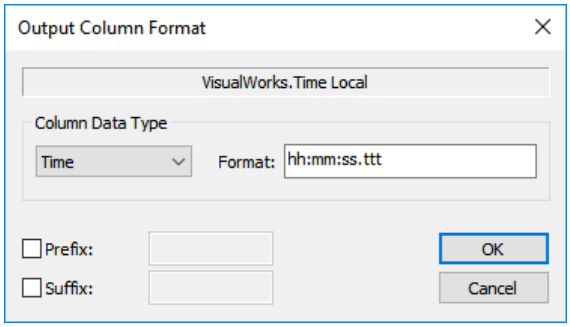
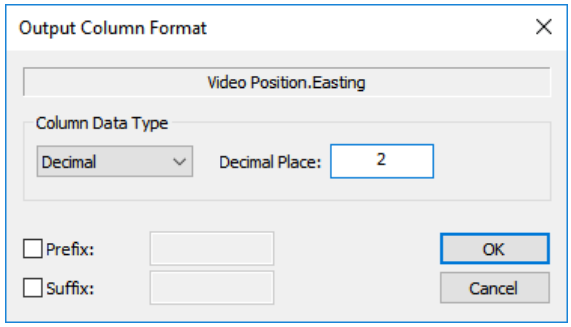
Export ASCII: Step 4 - Formatting

To change the formatting of the data that you will be exporting, double click in the row that you want to change.



This will open a window like the ones shown below. Change the "Column Data Type" using the drop-down list. The available types are Integer, Decimal, Text, Date-Time, Date, Time, Latitude or Longitude. Then edit the Format to match what you want.





For Latitude or Longitude values you will see a browse button ... to open a page of formatting choices:

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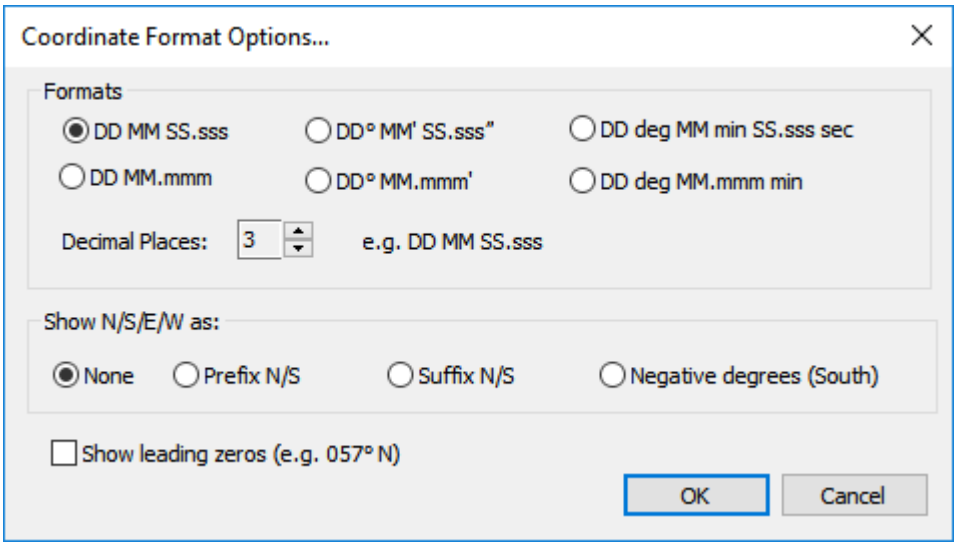

You can also add text as a prefix before the exported value, or as a suffix after the exported value, so you can specify the units or label the data if you want.

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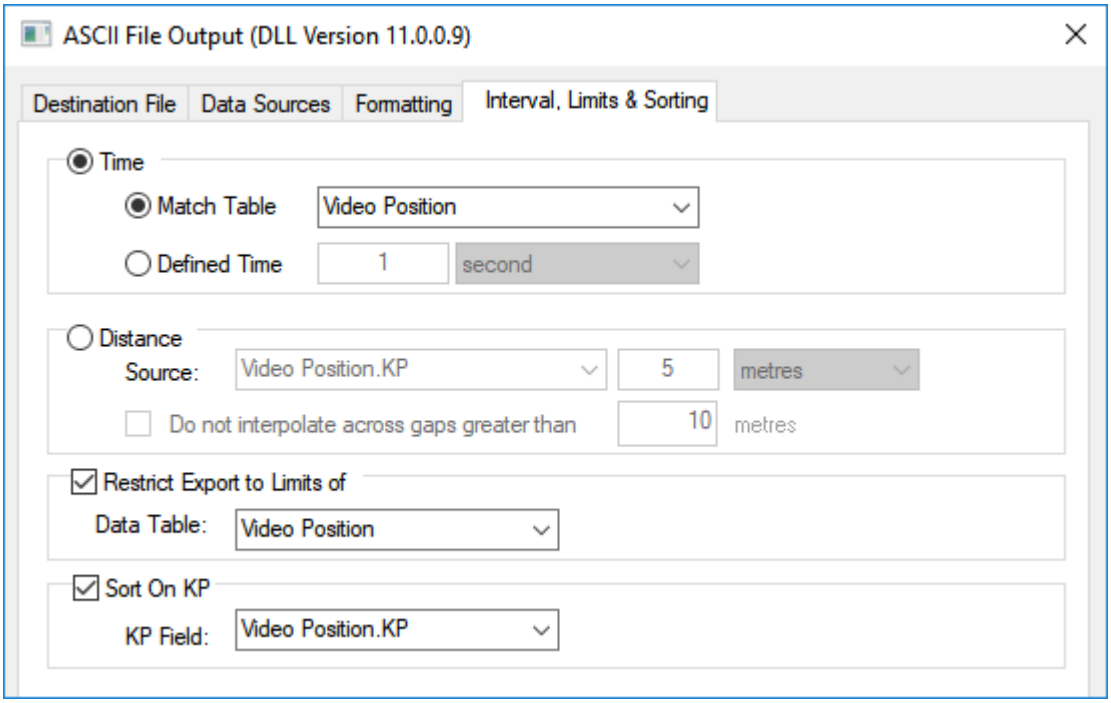
Export ASCII: Step 5 - Interval, Limits, and Sorting

Select the "Interval, Limits, and Sorting" tab to specify the interval for the exported data. When you have made all configuration choices, click the red close button.



Data can be output at an interval matching an existing data table, as shown in the example above. Any data columns being exported from other tables will be interpolated to match. If any of the data is Text such as in the columns of an event list, then you must export at the interval of that source table - it is not possible to interpolate text. Alternatively (if there are no text fields) data can be exported at a fixed interval of time or KP distance, as in the example below at a 5m interval using the Video Position KP. Data from the Corrected Motion table will be interpolated to match the times of the Video Position interval.

Note that in both examples the option to Restrict Export to the limits of one table is used. By restricting to the limits of the Video Position table we make sure that no motion data is reported or extrapolated beyond those position limits.

Note too that the final output will be sorted using the KPs of the Video Position table. This makes sure that if survey sections were not in KP order, or not performed in the in ascending KP direction, all data will be re-sorted and reported in ascending KP order.

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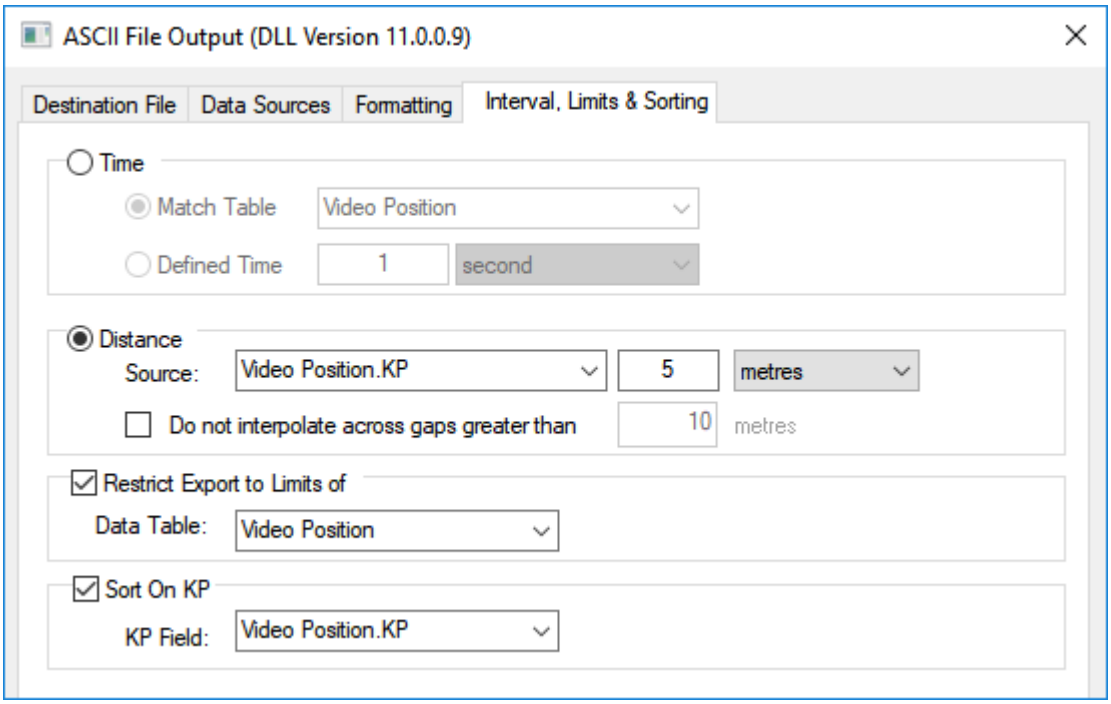

When you have made all configuration choices, click the red close button.

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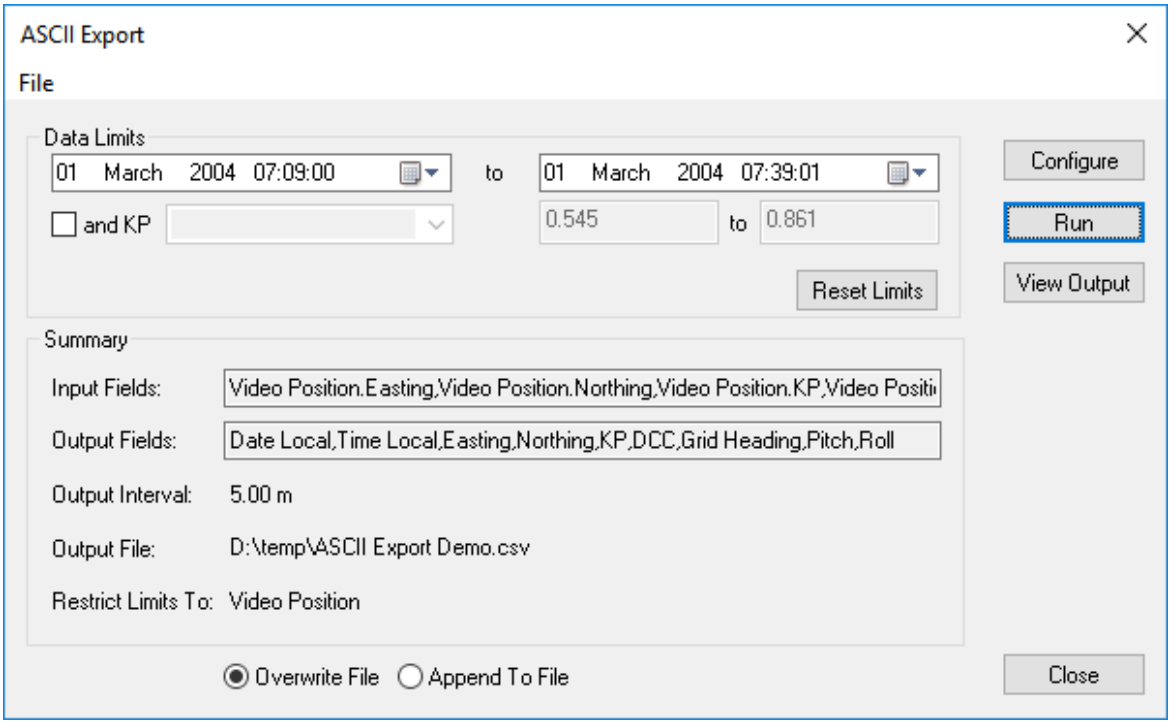
Export ASCII: Step 6 - Main Page

After the configuration choices have been made, the settings will be shown in the Summary section of the window.



These settings may be saved and re-loaded using the File menu on the ASCII Export window.

The main page allows you to specify start and end limits using Time, KP or both. The default values represent all currently loaded data.

At the bottom there is an option to either create a new file each time the export is run (Overwrite) or add to the end of an existing file with the same name (Append).

Click Run to export the data using the chosen settings.

Click View Output to open the newly created file in Notepad.

1.16 Video Settings

The Video Settings can be opened by clicking on the settings button on the Video Window Toolbar 70. (To open the Video Window toolbar move the mouse cursor to the top or bottom edge of the video window.)

The settings are divided into different groups. You can move from one group of settings to another using the grey menu panel on the left and the settings themselves can be configured using the white panel on the right.

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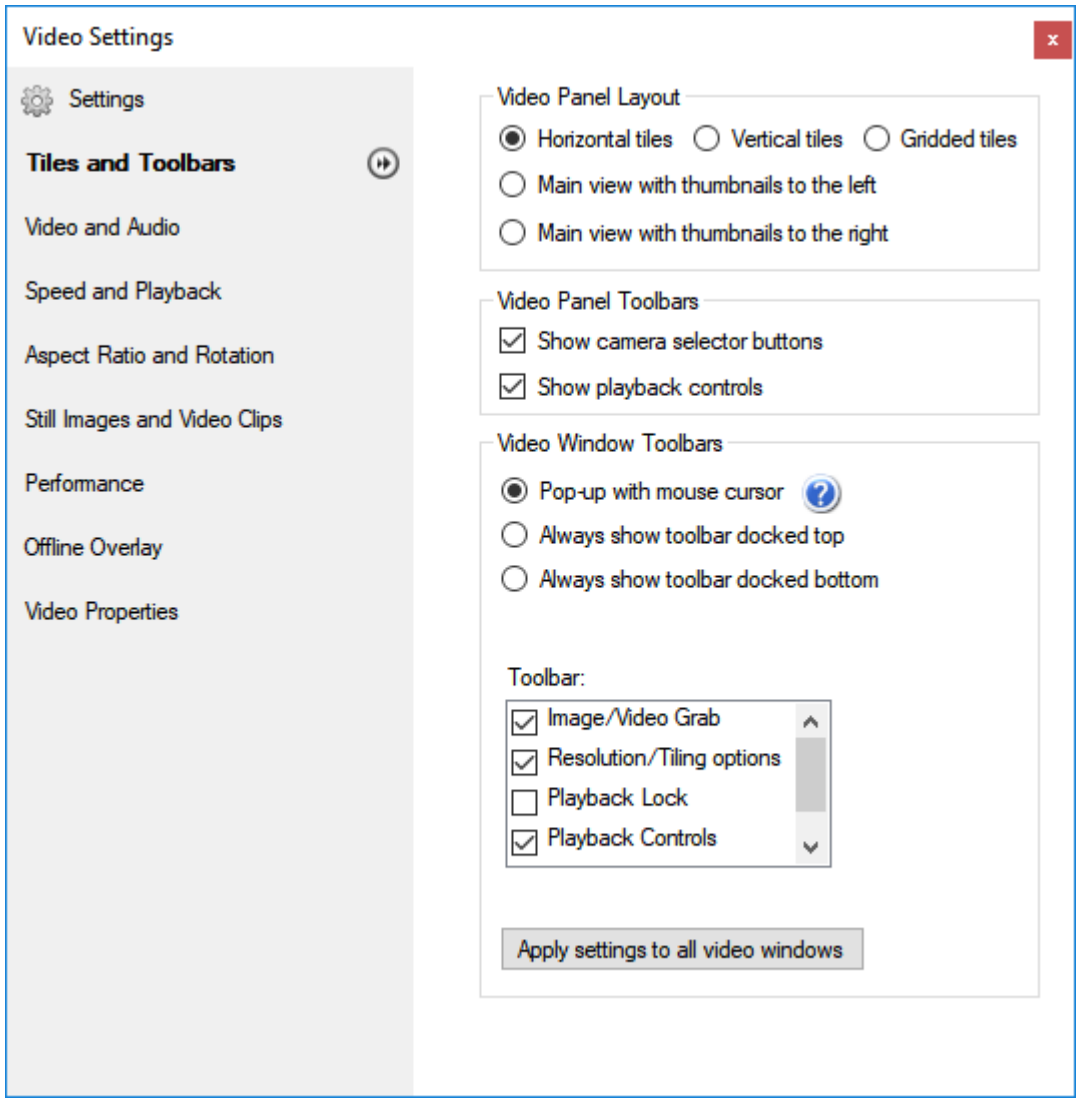

1.16.1 Video Settings: General

Settings	Description
Video Panel Layout Horizontal tiles Vertical tiles Gridded tiles Main view with thumbnails to the left Main view with thumbnails to the right	Select how to arrange and fit Videos Windows in the Video Panel when using Tiled Layout 71.

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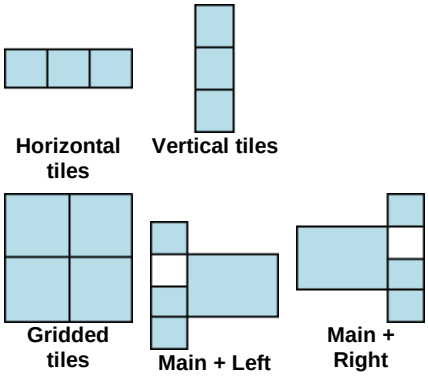
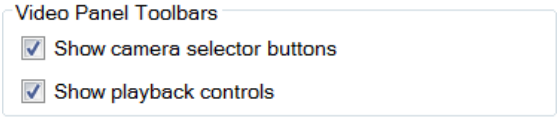
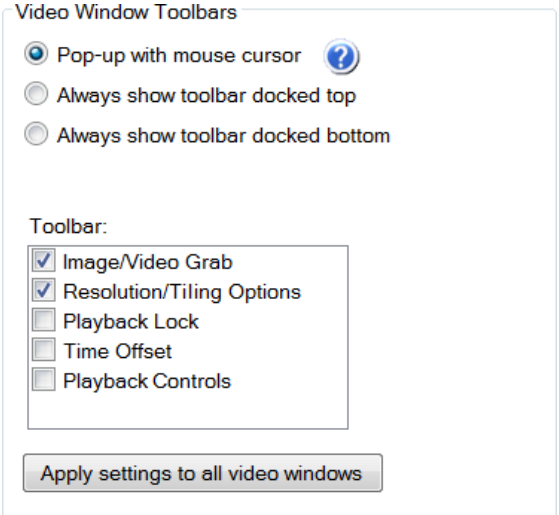
Settings	Description
	
	Select toolbars to show on the Video Panel. Camera selector buttons Playback Controls
	Select how and when the Video Window toolbars should appear. They can pop-up when you move the mouse cursor close to the top or bottom edges of a Video Window, or they can be permanently displayed, docked to the top or bottom edge. Select which buttons you want on the Video Window toolbars. You can apply your chosen settings to all Video Windows using the button at the bottom of this section.

See also: Grabbing a Still Image 73 and Grabbing a Video Clip 73, Resolution and Tiling options 71, Video Playback Lock 72, and Video Playback Time Offset 72.

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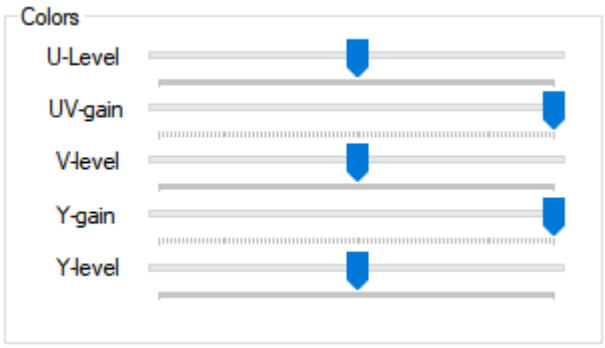
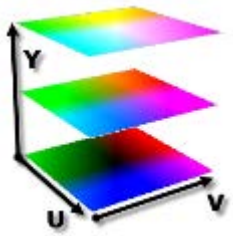
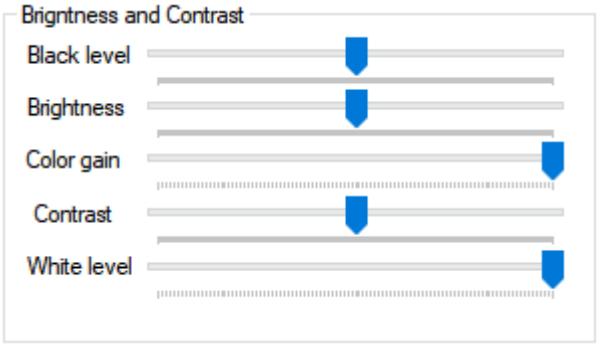
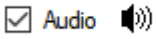
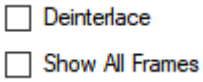
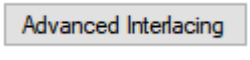
1.16.2 Video Settings: Video and Audio

Settings	Description
	Adjust the YUV colour levels for this video channel. The adjustments are illustrated by the displayed colour cube: 
	Adjust the Brightness, Contrast, and Black and White levels for this video channel.
	Turn audio playback on or off for this video channel.
	Enable deinterlacing for video playback of this video channel. Show all frames, or skip frames to preserve requested playback speed.
	Reset the settings above to default values, or apply the settings of this Video Window to all other Video Windows.
	Opens a new window with many different options for interlacing so that you can find one that works best for you. In most cases the default is

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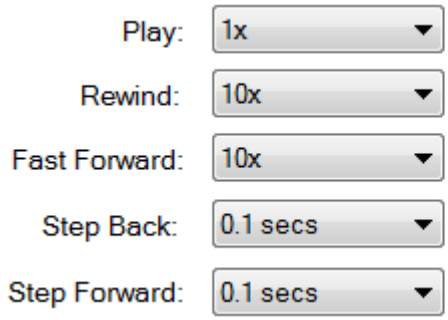
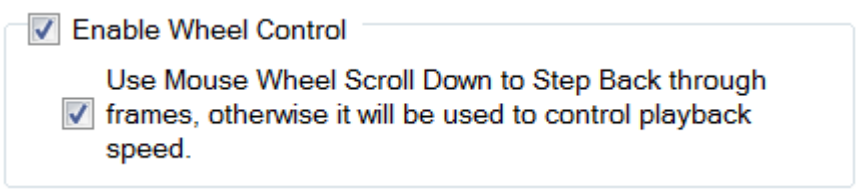
Settings	Description
	ideal, but if you are using very old video files, or you are using imported video files that were not recorded by a VisualSoft DVR, you may need to adjust the interlacing setting. You may need to try a few different options to see what works best for your current video files. When you find the right setting, there are options to apply it to all open video windows, and/or to all currently loaded datasets. Note that you cannot apply the setting to datasets that are not currently loaded.

1.16.3 Video Settings: Speed and Playback

Settings	Description
	Select how fast the video should Play, Rewind or Fast Forward (relative to normal playback speed), and select how many seconds the Video Widow should move forward or back using the Step Back and Step Forward buttons.
	Switch "Wheel Control" on or off. When Wheel Control is on, the playback speed can be increased or decreased by rotating the

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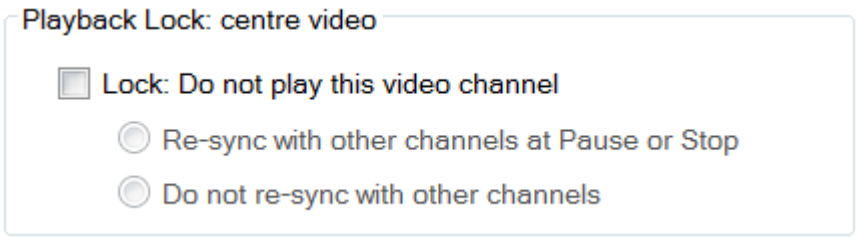
Settings	Description
	mouse wheel. Rotate the wheel away from you to increase speed, or towards you to reduce speed. If you do not want the wheel to reduce playback speed, it can instead be set to step backwards through a paused video when rotated towards you.
	Turn Playback Lock 72 on or off for this Video Window, and select how it should behave if turned on. "Re-sync" will mean that this window will not play while other Video Windows are playing, but as soon as the other windows stop or pause, this one will jump to the matching time. With re-sync turned off, this Video Window will not update or change regardless of what happens in other Video Windows.

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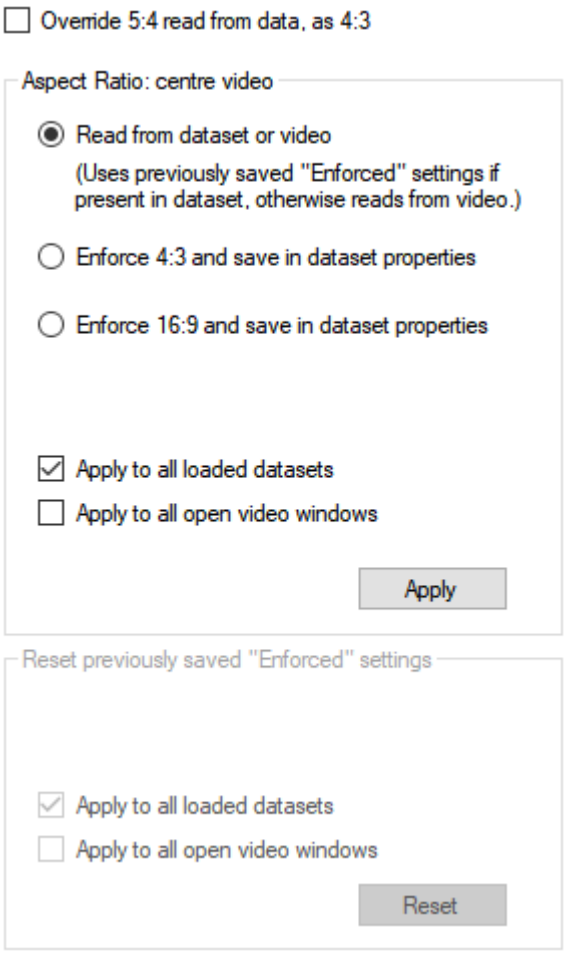
1.16.4 Video Settings: Aspect Ratio

Settings	Description
	In most cases the aspect ratio (Width:Height) will be read from the video file of each Video Window and it will be displayed here. If you want to override the setting inside the video file, you can do so here by selecting either 4:3 or 16:9. Sometimes a video will have 5:4 in the properties, but should display as 4:3. You can override that saved 5:4 setting if you want. The chosen setting can be applied to all loaded datasets and/or Video Windows. Settings can be removed to reset defaults.

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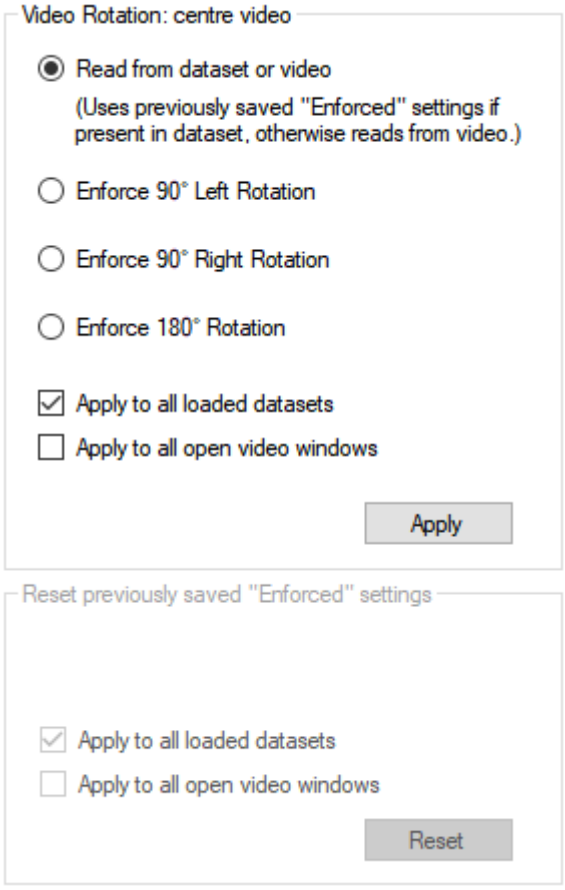
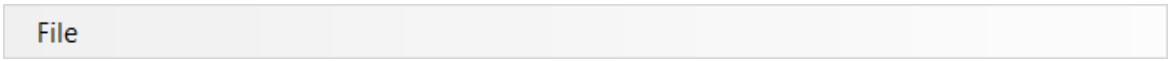
Settings	Description
	In most cases the rotation will be read from the video file of each Video Window. If you want to override the setting that is saved inside the video file, you can do so here by selecting to rotate 90° left or right, or a full 180°. The chosen setting can be applied to all loaded datasets and/or Video Windows. Settings can be removed to reset defaults.

1.16.5 Video Settings: Still Images and Video Clips

Save Settings

All of the settings that you configure for where and how to save still images and video clips can be saved to a file so that you can re-use them another time. Click on "File" in the grey menu bar at the top of the page.



Location to save stills and clips

You can choose to have still image grabs, and video clips saved to a "Clips" folder inside the current Project, or you can save them to any location that you select. If you select the Project Clips folder, it will be created if it doesn't already exist.

File naming

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You can build the file names using text that you type and/or using text from the Project Tree, the timestamp of the image or the camera name. The following pre-defined fields are available:

Field name	Stills	Clips	Description
[Project]	✓	✓	Insert the name of the top level Project containing the current data
[SubProject]	✓	✓	Insert the name of the lowest level Sub-Project containing the current data
[Timestamp]	✓	✗	Insert the time of recording of the current frame of video. Format is YYYYMMDDhhmmssttt.
[StartTime]	✗	✓	Insert the time of recording of the first video frame of this clip. Format is YYYYMMDDhhmmssttt.
[EndTime]	✗	✓	Insert the time of recording of the last video frame of this clip. Format is YYYYMMDDhhmmssttt.
[Camera]	✓	✓	Insert the camera name of the video file in this still or clip

Example:

If you have loaded data from D:\VisualWorks\Projects**Inspection 2017**\Pipelines**PL1234**\, then the [Project] is "Inspection 2017" and [SubProject] is "PL1234.

Type the file name format using text, spaces and the pre-defined fields:
IMAGE - [SubProject] - [Timestamp] - [Camera] will give a file name of ""IMAGE - PL1234 - 20170608132652541 - Port" if you grab a still from the Port camera for the video frame at just after 13:26:52 on 8 June 2017.

File Formats

Still images can be grabbed in one of five formats: JPEG, BMP, GIF, PNG, TIFF, or TGA. Note that the GIF format has a lot of compression, and is "lossy". It should only be used if the images are to be displayed at a low resolution. JPEG also has a lossy compression, but the effect is minimal in most cases.

The file format of a video clip will always match the file format of the source video.

Sequential Numbering

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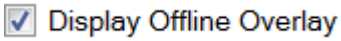
For both still images and video clips, you can add sequential numbering to the file names, and you can specify a starting number.

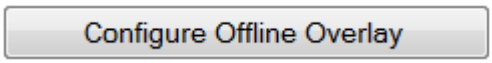
One Window or All Windows

For both still images and video clips, you can choose whether to grab only the window where you click on the Image Grab of Video Clip button, or to grab from all open Video Windows.

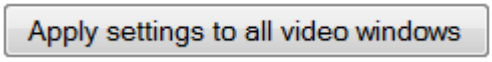
1.16.6 Video Settings: Offline Overlay



You can turn on Offline Overlay for the current Video Window by selecting the check box at the top.



The overlay itself is configured 126 by clicking the button in the middle.



If you want to show the same overlay on all open Video Windows, click the button at the bottom.

1.16.7 Video Settings: Video Properties

The Video Properties page displays detailed information about the current video file, including duration, aspect ration, encoding and file container formats, bit-rate, frame-rate, and resolution, plus information about the audio track.

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1.17 Video Overlay

A video overlay is a display of text and/or graphics shown over the top of a video picture. For offshore survey a video overlay is used to identify the video image: where and when was it recorded, for what purpose and by what company. It will usually include the position and depth of the ROV, the name of the pipeline or structure being surveyed or inspected, and the details of both the client company and the survey or inspection company.

The video overlay can be applied "online" during the initial recording, or "offline" during video playback. If the overlay is recorded online then it forms an integral and fixed part of the video picture and cannot be changed in any way after the recording is made. If the overlay is applied offline then it is drawn on the display screen and is not a part of the recorded picture. This means that you can use the offline overlay to blank out and replace the online overlay.

In the VisualSoft Suite, the following options are available:

Online Overlay

An online overlay can be configured, created and recorded by the **VisualOverlay** tools that are part of **VisualDVR**, or it can be configured and created by other software such as a stand-alone version of **VisualOverlay** (or other third-party applications and devices) before the pictures are recorded by **VisualDVR**.

The online overlay in **VisualDVR** and **VisualOverlay** can show data received as an ASCII data string on the **VisualDVR** or **VisualOverlay** PC itself, or data received by **VisualDataLogger** on a different, networked, PC.

Offline Overlay

An offline overlay can be configured 126 and displayed 124 by **VisualEdit**, **VisualEdit Eventing**, **VisualEdit Professional** or **VisualReview Professional**.

An offline overlay can be displayed 124 by **VisualReview**, but it must have been previously configured 126 using one of the three **VisualEdit** applications or **VisualReview Professional**.

The offline overlay can be used to display corrected navigation data, corrected KP or Station values, depth of pipeline burial, CP data or other values. It can be displayed on any of the video windows or on the graphical views of survey data.

1.17.1 Displaying an Offline Overlay

To show the Offline Overlay on a video window or one of the graphical windows (Side View, Plan View, Cross-Profiles, or 3D Cross-Profiles), right-click on the video window and select "Settings..." from the pop-up menu. This opens a small configuration window.

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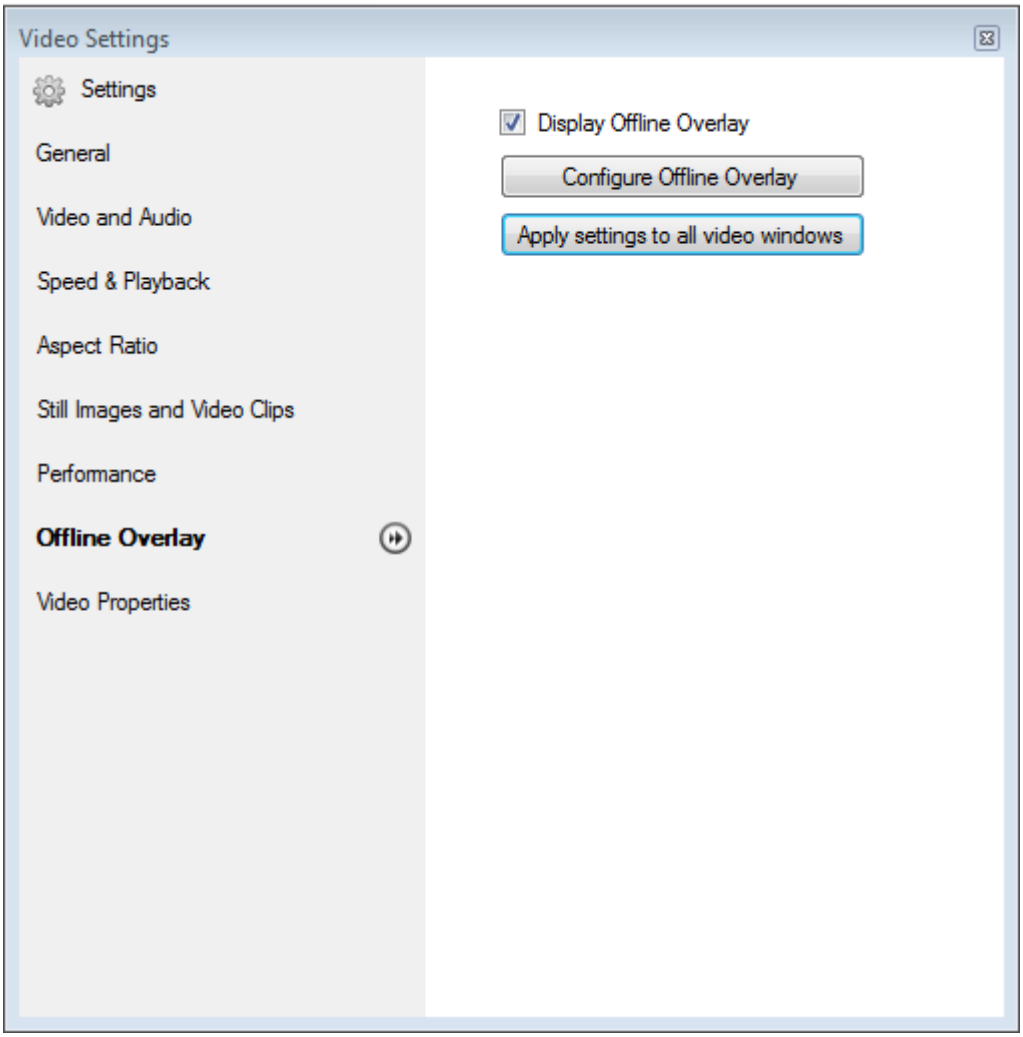
Tick the box to enable the overlay for display, and click the "Apply settings to all video windows button".



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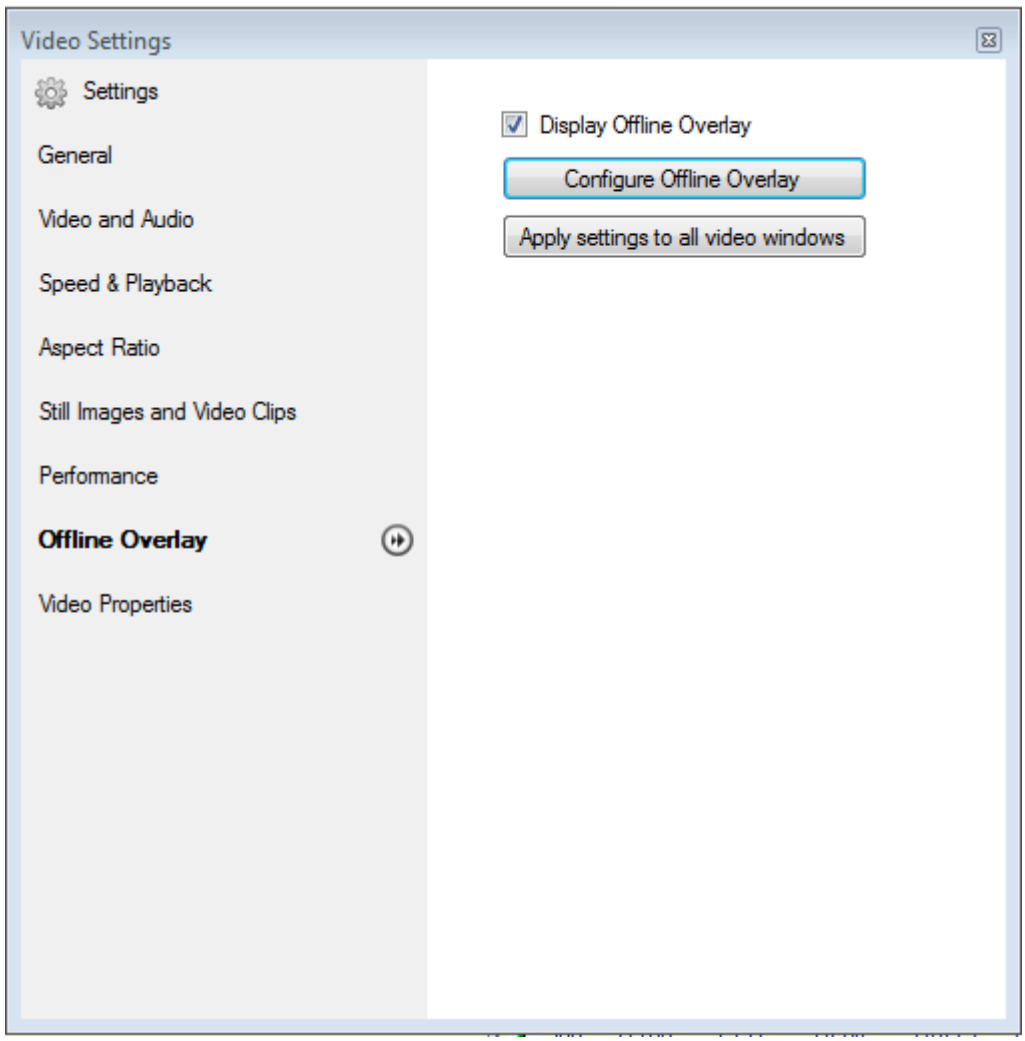
1.17.2 Configuring an Offline Overlay

This option is only available if you have a licence for **VisualReview Professional**, or one of **VisualEdit**, **VisualEdit Eventing**, or **VisualEdit Professional**. If you only have the basic edition of **VisualReview**, you can still Display an Offline Overlay 124 that has already been configured for you, but you cannot configure a new one.

To configure the Offline Overlay and to select what to display, right-click on the loaded project in the Project Tree and select "Settings..." from pop-up menu. In the window that opens, select "Offline Overlay" from the left-hand side of the window and click "Configure Offline Overlay"



On the left of the VisualOverlay window is a list of Available Data Items, which includes all of the data tables and columns available in the loaded data. At the foot of the Available Data Items are the options for adding Text and Images.

All Available Data Items are drag-and-drop items.

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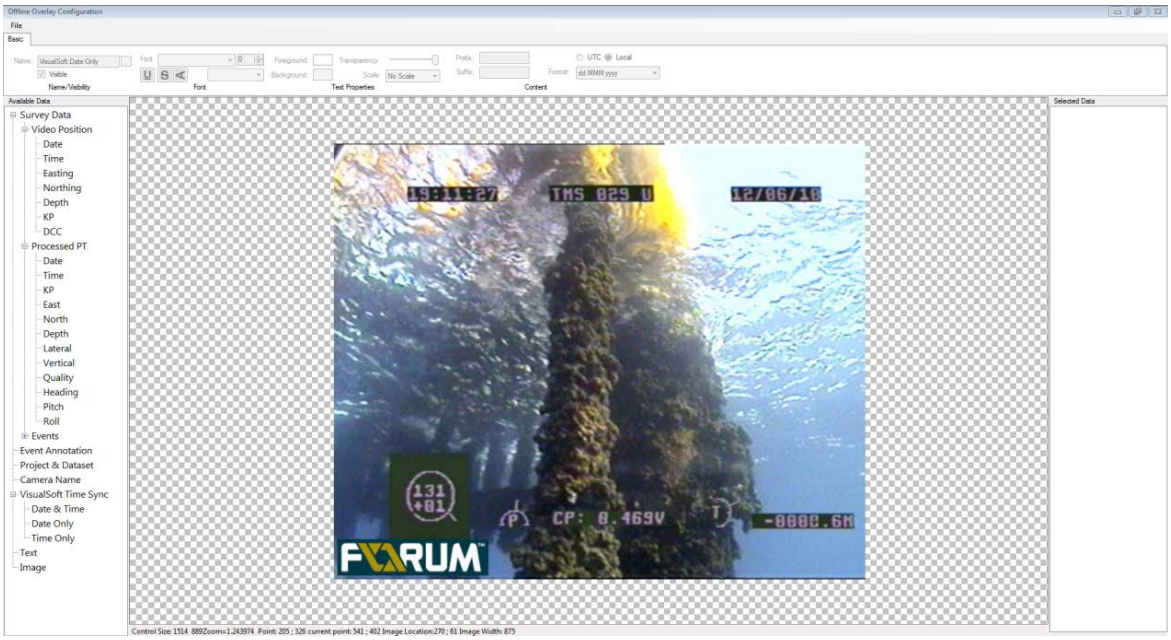
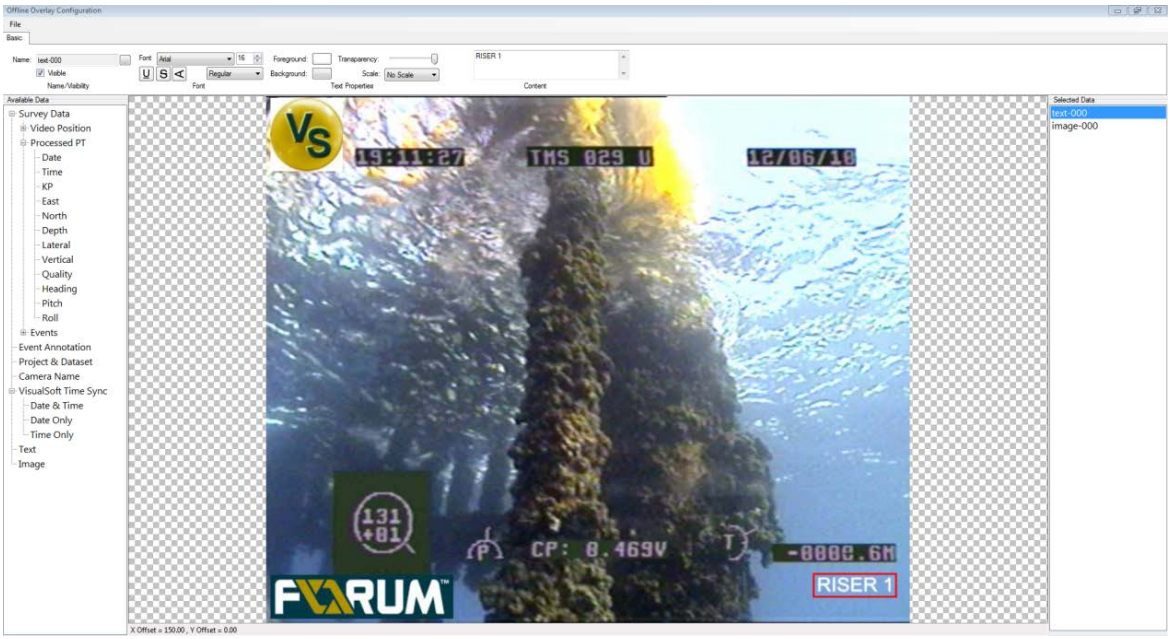


Configuring Text in Offline Overlay

Dragging the data item called Text onto the picture will create a transparent text box highlighted in red. The content of this box, as well as the font and transparency, can be modified from the Basic tab at the top of the page.



Configuring an Image in Offline Overlay

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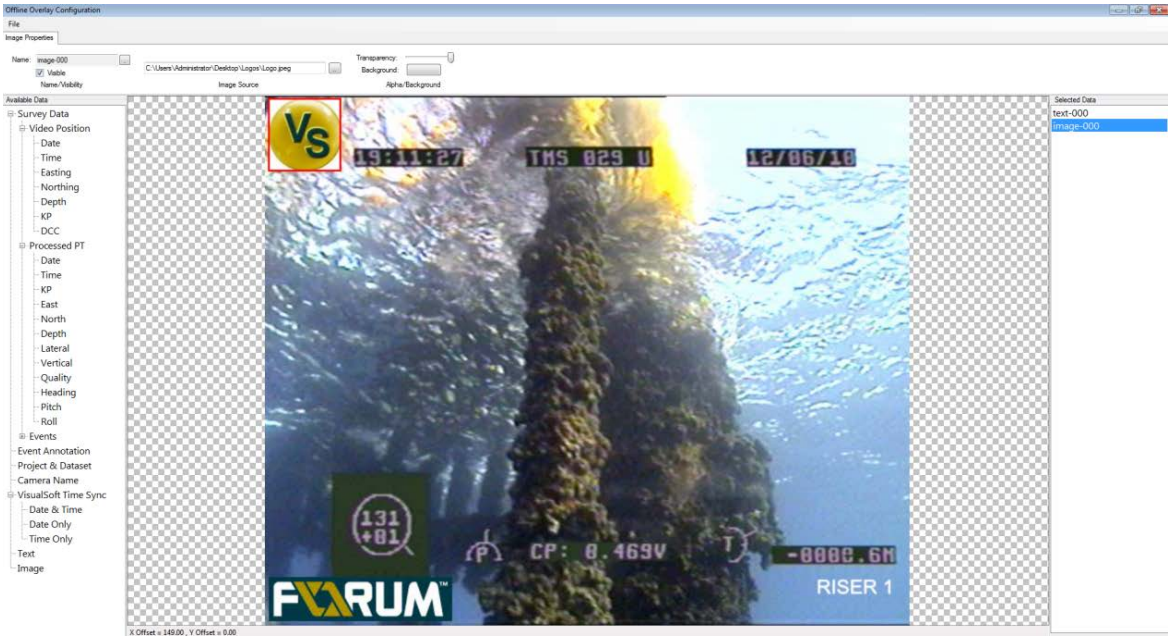
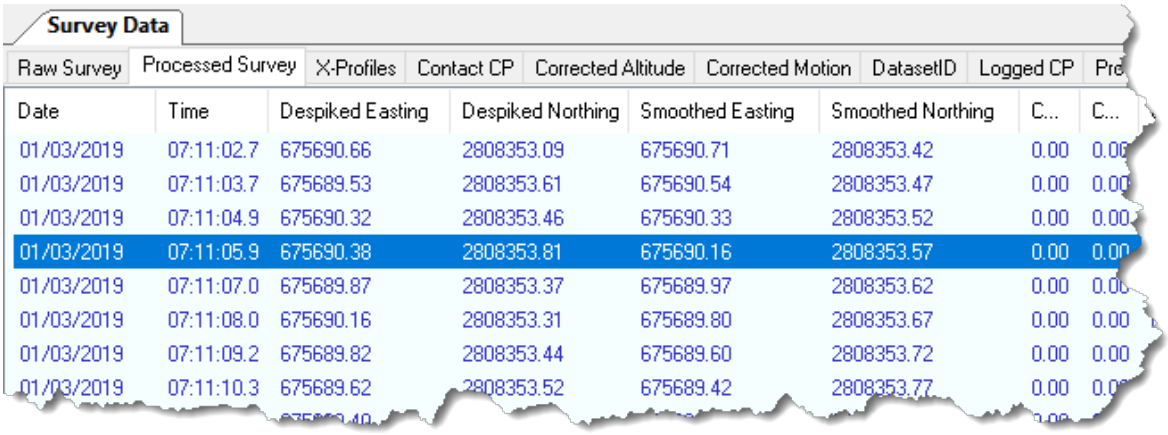
Dragging the data item called Image onto the picture will display a window allowing you to choose an image file. After selecting the file, it will appear highlighted in red on the picture. You can use the Image Properties tab at the top of the page to change the image source, the background colour and transparency.



Once you have finished adding overlay to the picture, close the window using the red X.

1.18 The Survey Data Tables

The Survey Data Tables are where data such as ROV position, motion data, depth data and so on is stored. The tables are displayed as a series of text views looking similar to a spreadsheet. Each Data Tables has its own tab with table names shown on the tabs across the top of the view.



Data Tables can hold raw or processed data, and may be either standard, system tables which always exist, logging tables which are dependent on the configuration of sensors in VisualDataLogger, or User Defined tables which hold processed data and are created to the user's own design during data processing.

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1.18.1 Standard Data Tables

There is one Standard Data Table for raw data logging, one which displays both raw and processed data, and three for processed data. These are as follows:

Data Table	Data type	Description and Purpose
Raw Survey	Raw data only	"Survey Data" as logged by VisualDVR. The columns in this table are defined by the setup of the Survey Data decode and logging in VisualDVR.
X-Profiles	Raw and processed data	This table is actually a view of two different data sources, one raw and one processed. It shows the basic time and position data of the logged and processed cross-profiles and is used for both mechanical profiler data such as Tritech SeaKing and for Multi-Beam Echosounder data such as Reson or R2Sonic.
Processed Survey	Processed data only	The Processed Survey table is designed and filled with data during data processing using VisualEdit Professional or it can be used to hold imported data from another processing system. The columns in the Processed Survey table are defined by the user and can be anything you want.
Video Position	Processed data only	The Video Position table is filled with data during data processing using VisualEdit Professional or it can be used to hold imported data from another processing system. The columns of this table are pre-defined and cannot be changed. They are intended to hold the position of the focal point of the video views – i.e. the point being looked at in the video.
Processed PT	Processed data only	This table is filled with data during data processing using VisualEdit Professional or it can be used to hold imported data from another processing system. The columns of this table are pre-defined and cannot be changed. They are intended to hold the position of a pipe or cable tracker, the ranges recorded by that tracker, and the

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		resulting pipe or cable position calculated from those positions and ranges.

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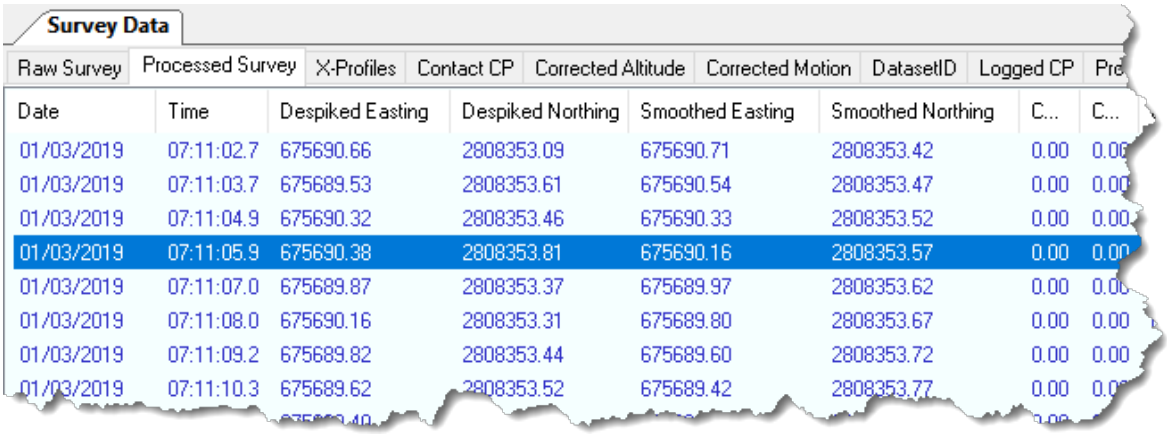
1.18.2 VisualData's Logging Tables

Each sensor or data string that you interface to VisualDataLogger is recorded to its own individual Data Table. The name of that table is the name that was used in the logging configuration window online when setting up VisualDataLogger. For some sensors (such as Octans or TSS440) in VisualDataLogger the names are pre-defined, but for others (such as ASCII input) they need to be typed by the user.

Each of the Data Tables created by VisualDataLogger is shown with its own tab across the top of the Survey Data Tables window. In the example below, the Data Tables Valeport Bathy, Octans and DVL are each raw data logging tables created by VisualDataLogger.

These raw Data Tables cannot be updated and saved. If you need to make changes to the raw, logged data this must be done using copies of the data in a processed table: Processed Survey, Processed PT or a User Defined Table.



1.18.3 User Defined Tables (UDTs)

VisualEdit Professional allows you to create extra data tables in addition to the Standard Data Tables. The tables that you create yourself are called User-Defined Tables (or UDTs). A UDT can have any number of data columns and you can specify the time interval for the data records (or rows) in the table. That time interval can be a fixed number of seconds or it can be set to match the timing interval of another data table. By matching the interval of another table you can avoid unnecessary interpolation of data which will preserve data integrity and may make it easier to perform tasks such as detecting and removing data spikes.

After a UDT has been created in one dataset of a Project it will be automatically created in other datasets the next time that they are loaded in **VisualEdit**. The UDT will not be automatically filled with data, but it will be created with the correct columns and formatting so that it can be quickly and easily filled with data using the data processing scripts in **VisualEdit Professional**'s Batch Processing or by importing data directly into the UDT.

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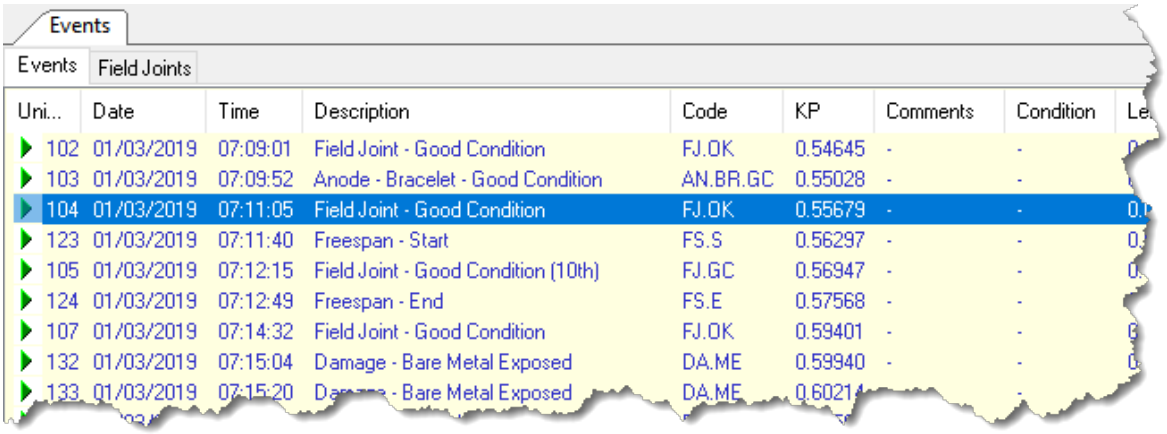
1.19 The Event List Data Table

The Events Data Table shows a list of the events or observations logged online using VisualEventLogger and also any events logged or changed using the event editing tools of VisualEdit Eventing 11 or VisualEdit Professional 13.

These "Events" are any items of interest seen on or near a pipeline or structure, or in route corridors or site survey areas during an inspection or other survey. Other software and other companies may refer to these events using other terms such as "Observations", "Incidents" or "Features".

The columns of the Events table and the types, descriptions and properties of the features listed are defined in the eventing configuration (sometimes known as the Client configuration because each end-user client or pipeline operator may have their own preferred and pre-defined configuration).

The main Events table is always shown in time order.



Uni...	Date	Time	Description	Code	KP	Comments	Condition	Le...
102	01/03/2019	07:09:01	Field Joint - Good Condition	FJ.OK	0.54645	-	-	
103	01/03/2019	07:09:52	Anode - Bracelet - Good Condition	AN.BR.GC	0.55028	-	-	
104	01/03/2019	07:11:05	Field Joint - Good Condition	FJ.OK	0.55679	-	-	
123	01/03/2019	07:11:40	Freespan - Start	FS.S	0.56297	-	-	
105	01/03/2019	07:12:15	Field Joint - Good Condition (10th)	FJ.GC	0.56947	-	-	
124	01/03/2019	07:12:49	Freespan - End	FS.E	0.57568	-	-	
107	01/03/2019	07:14:32	Field Joint - Good Condition	FJ.OK	0.59401	-	-	
132	01/03/2019	07:15:04	Damage - Bare Metal Exposed	DA.ME	0.59940	-	-	
133	01/03/2019	07:15:20	Damage - Bare Metal Exposed	DA.ME	0.60214			

You can create filtered Event Subset Views 133 of the data in the Events table, showing features of a specific type, or matching various other criteria such as Anomalies, or perhaps Freespans above a certain length. These Subsets can be sorted by time, KP or any other column you choose.

When you click on a row in the Events table or one of its Subsets, the video and all other windows will immediately display the data that corresponds to the time of the event that you clicked. For example, if you click on an Anode event then you should immediately see that Anode in the video windows. If you click on a Freespan event you should see it in the videos and also in the 2D and 3D cross-profile or multibeam views.

See also Editing and Managing Inspection Events 182

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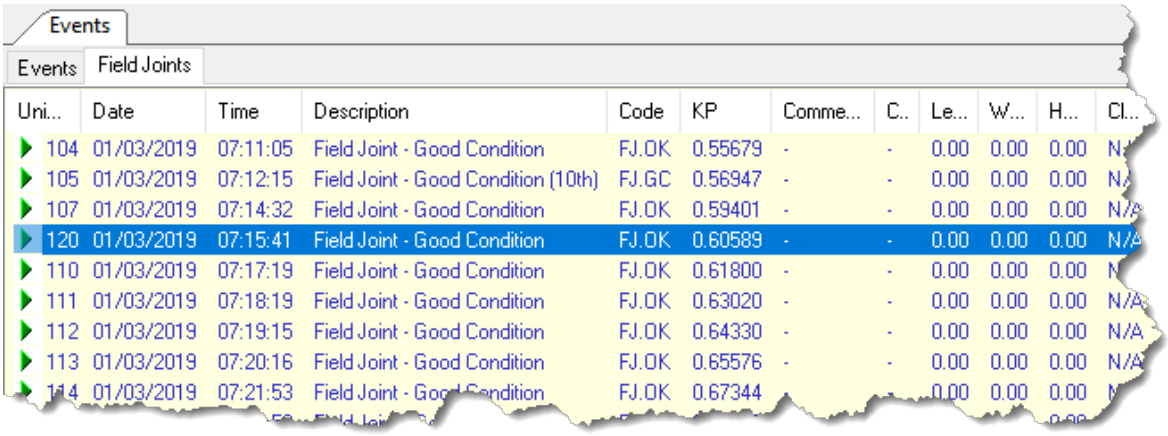
1.19.1 Event Subset Views

Event Subsets show different selections of the data in the main Events table. You can use them to show events of one particular type, for example only the Anodes, only the Freespan events, or as shown below, only the Field Joints. You could also use a subset to show events that match particular rules, for example items of Debris that have a length, width or height of over half a metre, Freespans greater than a certain length, or perhaps all features flagged as Anomalies.

The Subset views make it easy to carry out QC and can make it easy to generate listings for use in reports. It is possible to export Subset views directly to Excel spreadsheets.

The subset views update automatically if events are added, modified or deleted, so if you move a Freespan start during video review, and you update the span length that span may suddenly appear in a subset list of long Freespans – or it may disappear from the list if it became too short.



Uni...	Date	Time	Description	Code	KP	Comme...	C..	Le...	W...	H...	Cl...
104	01/03/2019	07:11:05	Field Joint - Good Condition	FJ.OK	0.55679	-	-	0.00	0.00	0.00	N/
105	01/03/2019	07:12:15	Field Joint - Good Condition (10th)	FJ.GC	0.56947	-	-	0.00	0.00	0.00	N/
107	01/03/2019	07:14:32	Field Joint - Good Condition	FJ.OK	0.59401	-	-	0.00	0.00	0.00	N/A
120	01/03/2019	07:15:41	Field Joint - Good Condition	FJ.OK	0.60589	-	-	0.00	0.00	0.00	N/A
110	01/03/2019	07:17:19	Field Joint - Good Condition	FJ.OK	0.61800	-	-	0.00	0.00	0.00	N
111	01/03/2019	07:18:19	Field Joint - Good Condition	FJ.OK	0.63020	-	-	0.00	0.00	0.00	N/A
112	01/03/2019	07:19:15	Field Joint - Good Condition	FJ.OK	0.64330	-	-	0.00	0.00	0.00	N/A
113	01/03/2019	07:20:16	Field Joint - Good Condition	FJ.OK	0.65576	-	-	0.00	0.00	0.00	N/A
114	01/03/2019	07:21:53	Field Joint - Good Condition	FJ.OK	0.67344			0.00	0.00	0.00	N

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1.20 The QC Data Table

The QC Data Table is mainly for use in VisualEdit Eventing and VisualEdit Professional, where the various QC scripts will write to the list displayed in this table. The QC Data Table can be displayed in VisualReview, but the scripts are not available to write to it.

The entries in the QC Data Table have a time stamp corresponding to an item of data such as an event or other data record, and a description of the problem or suggestion associated with that data. Clicking on a row of the QC Data Table will cause all other display windows including the video windows to jump to the time indicated in the QC record.

Some entries in the QC table describe errors detected by the QC scripts, and others provide suggested solutions for these errors. Examples include:

- Event spacing errors such as Field Joints that are too close together or too far apart
- The expected locations of "missing" Field Joints where a gap has been found that is long enough to suggest that one or more joints was not logged.
- "Illogical" events such as the start of a Freespan within an area where the pipe is buried.

Over time more QC scripts are being added to VisualEdit Eventing and VisualEdit Professional, so the list of things that you might find in the QC table may get larger with each new software version.

For more information, see the individual data processing scripts in VisualEdit Eventing and VisualEdit Professional.

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1.21 Using the Graphical Views

VisualReview and VisualEdit have various windows that display data graphically. This might mean a map type view showing where an ROV travelled or where a pipeline is laid, or a three-dimensional view of that pipeline on the seabed, or indeed any number of other views of different data types.

Each of the Graphical Views is configurable, giving you control over what data is shown, and also how it is shown. You can display most data columns from most of the data tables, in a variety of ways and in a variety of windows. Each of the Graphical Views is also fully synchronised with the video and with other Graphical Views and text lists so that you can view the same data simultaneously in multiple different ways.

For more details, take a look at what you can do with each of the following different Graphical View windows:

The Plan View 136

The Side View 138

The Cross-Profile View 141

The 3D Cross-Profile View 143

The Pipesheet View 145

The Pipesheet History View 150

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1.21.1 The Plan View

The Plan View is designed to be used as a traditional map-like view with the data seen from directly above. It is useful for viewing the track of an ROV, or a sensor, or for viewing the route of a pipeline. You can display data from any of the data tables, in any combination.

Examples of different uses include:

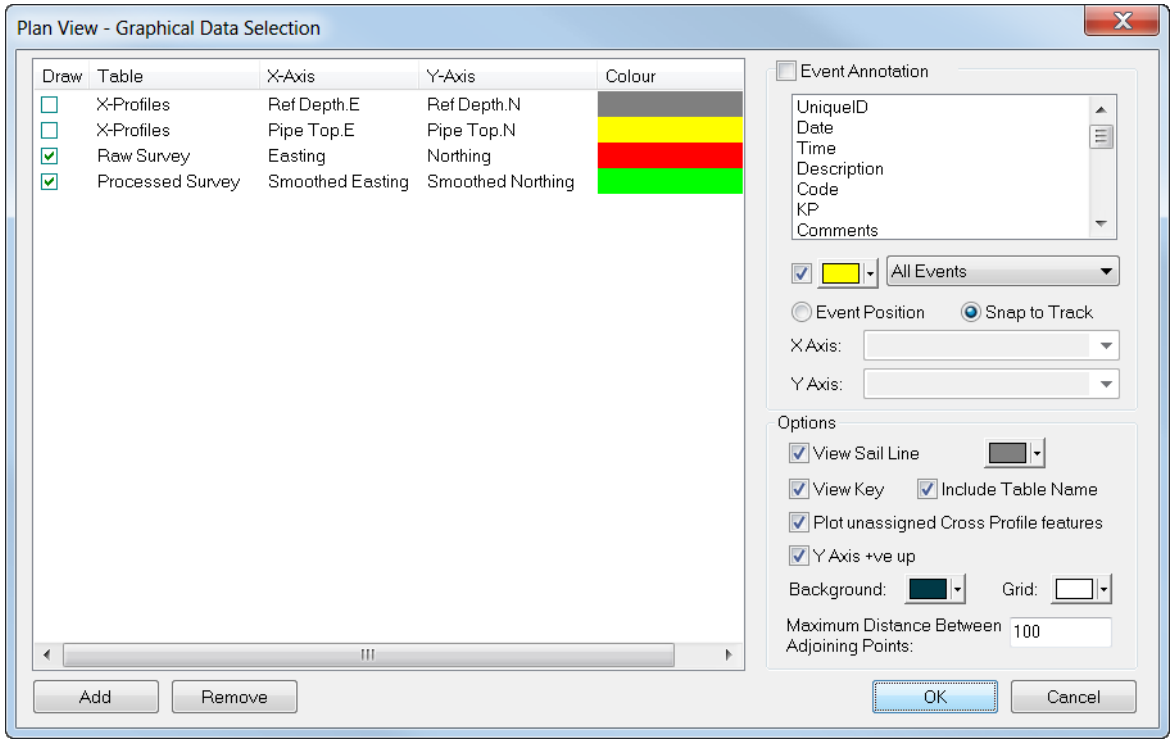
- Compare the raw logging position with an edited and smoothed position.
- Compare the position of one sensor or offset with another to assist with QC.
- Compare the as-found or as-laid position of a pipeline with the theoretical route.

All three of the examples above would plot Easting and Northing grid coordinates, but the window can also be used for time-series plots, such as:

- Pitch or Roll changes over time
- DVL velocities (X, Y or Z) over time
- Heading changes over time

Plan View Configuration

To configure the plan view and add data to it, right-click in the Plan View window and select **Options** from the pop-up window. This will open a window like the one shown below.



On the left panel you will see a list of possible track-plot items. Usually the Cross-Profile (or X-Profiles) reference position and pipeline position are added automatically. You can add your own items to the list using the Add button in the bottom left corner, or you can

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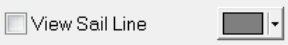
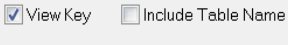
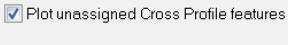
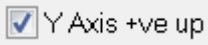
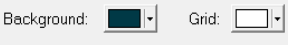
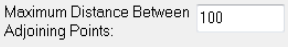
remove things from the list by highlighting them and clicking the Remove button. Each item in the list can be turned on or off, so that it will be drawn or not drawn, by clicking the square "check-box" to the left of it. In the example above you can see that the raw, logged position of the ROV will be drawn, along with an edited and smoothed position for the ROV.

When you add a new item to the list, you will need to click in the new row to select a Data Table, and then a pair of columns in that table to plot relative to the X and Y axes of the window. For a track or position plot this usually means that you want an Easting column for the X-Axis, and a Northing column for the Y-axis.

At the top of the panel on the right you can configure the display of Events on the Plan View. For details see Event Annotation in 2D Graphics 140.

Below that you can change various other options as follows:

Setting	Description
	Show the sail line, runline, or route file, on the plan view graphics using the selected colour
	Add a text "key" in the top right corner of the graphics showing which data is which. Matches the text colour to the colours used in the graphics. This can include the table names to avoid confusion if, for example, more than one data plot has "Easting v Northing".
	If you have chosen to plot "feature" data derived from processed cross-profiles, for example Top of Pipe, or Mean Seabed, then you can choose whether or not to show the unassigned, zero values from scans that are not processed.
	In the Plan View, the default setting is for the Y-Axis to have values increasing towards the top of the window, i.e. "Positive Up" or "+ve up". This is because the Plan View is most often used to plot Easting v Northing, and the Northing values should increase towards the top of the screen.
	If you want to change the background colour of this graphics window, or change the colour of the grid labels on the axes, you can do so here. The chosen colours are saved as part of a Layout File, so you can re-use the same layout with the same colours another time.
	Data points in the graphics view will be joined together, in time order, using straight lines unless the gap between two points is larger than the value entered here. The gap is calculated using

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	the X and Y axes distances; in a Plan View this is usually metres east and north.

1.21.2 The Side View

The Side View is designed to be used as a longitudinal profile view, typically plotting depth against KP. It is useful for viewing the depth profile of a pipeline or seabed, or for examining the relationship between a pipeline and the seabed. You can display data from any of the data tables, in any combination.

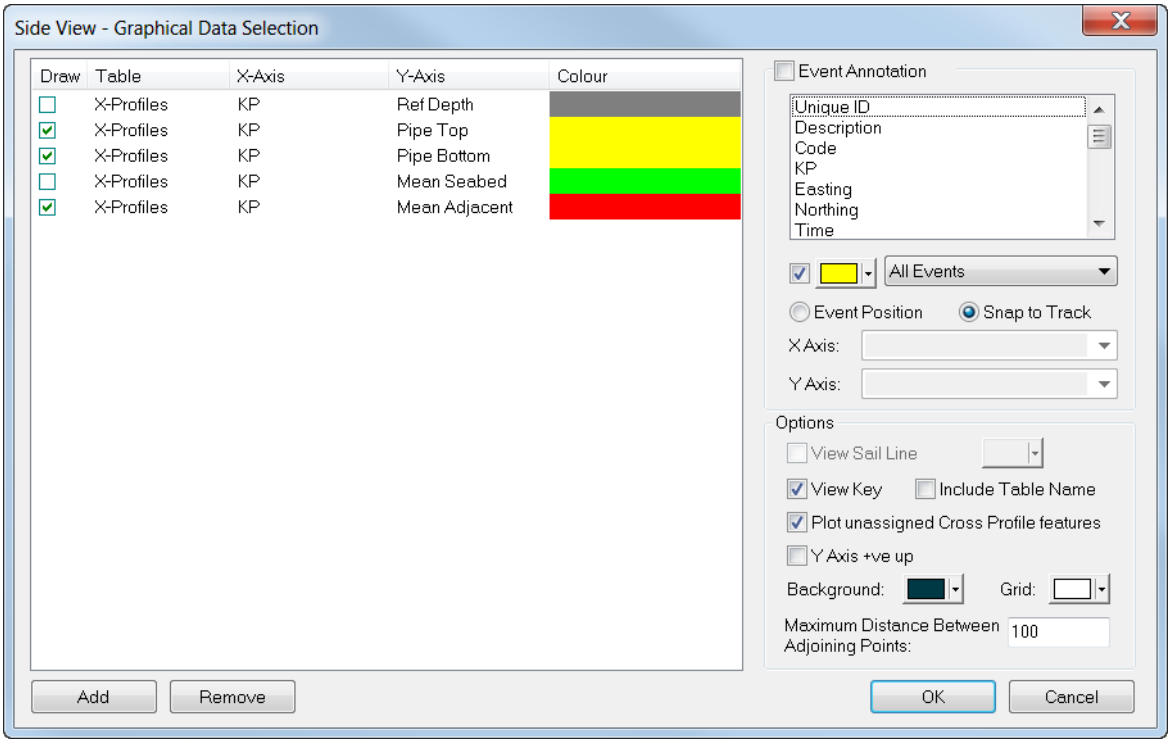
Examples of different uses include:

- Compare the raw depth data with tidally reduced and corrected depth data.
- Compare the depth of one sensor or offset with another to assist with QC.
- Compare the position of a pipeline with the seabed to assess areas of freespan or burial.

All three of the examples above would usually plot depth against KP.

Side View Configuration

To configure the side view and add data to it, right-click in the Side View window and select **Options** from the pop-up window. This will open a window like the one shown below.



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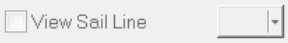
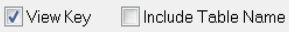
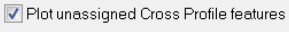
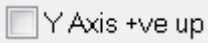
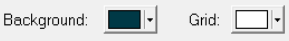
On the left panel you will see a list of possible data-plot items. Usually the Cross-Profile (or X-Profiles) reference position, pipeline and seabed levels are added automatically. You can add your own items to the list using the Add button in the bottom left corner, or you can remove things from the list by highlighting them and clicking the Remove button. Each item in the list can be turned on or off, so that it will be drawn or not drawn, by clicking the square "check-box" to the left of it. In the example above you can see that the top and bottom of the pipeline will be drawn, along with the mean depth of the seabed adjacent to the pipeline.

When you add a new item to the list, you will need to click in the new row to select a Data Table, and then a pair of columns in that table to plot relative to the X and Y axes of the window. For a side view, longitudinal plot this usually means that you want a KP column for the X-Axis, and a depth column for the Y-axis.

At the top of the panel on the right you can configure the display of Events on the Plan View. For details see Event Annotation in 2D Graphics 140.

Below that you can change various other options as follows:

Setting	Description
	The sail line is not relevant on the Side View, so this option is disabled.
	Add a text "key" in the top right corner of the graphics showing which data is which. Matches the text colour to the colours used in the graphics. This can include the table names to avoid confusion if, for example, more than one data plot has "KP v Depth".
	If you have chosen to plot "feature" data derived from processed cross-profiles, for example Top of Pipe, or Mean Seabed, then you can choose whether or not to show the unassigned, zero values from scans that are not processed.
	In the Side View, the default setting is for the Y-Axis to have values increasing towards the bottom of the window, i.e. "Positive Down". This is because the Side View is most often used to plot KP v Depth, and the Depth values should increase downwards towards the bottom of the screen.
	If you want to change the background colour of this graphics window, or change the colour of the grid labels on the axes, you can do so here. The chosen colours are saved as part of a Layout File, so you can re-use the same layout with the same colours another time.

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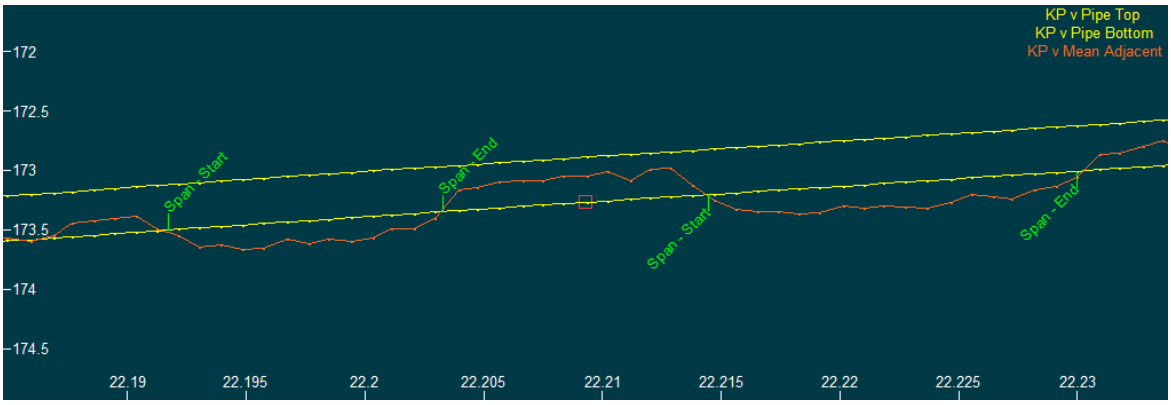
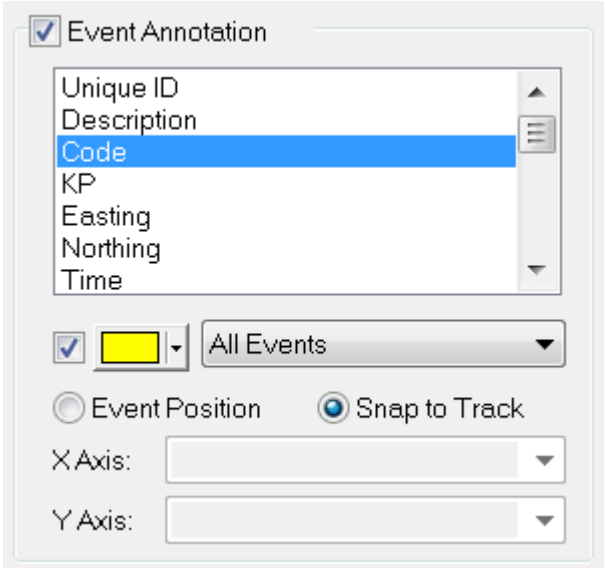
Maximum Distance Between Adjoining Points: 100	Data points in the graphics view will be joined together, in time order, using straight lines unless the gap between two points is larger than the value entered here. The gap is calculated using the X and Y axes distances.

1.21.3 Event Labels in Plan and Side Views

You can plot text "annotation" labels for logged Event data in either the Plan View or Side View windows.



To configure these event labels, right-click in the graphics window and select Options. At the top right of the graphics Options window, you will see a section called "Event Annotation" with a check-box to turn that annotation on or off. With the annotation turned on, you can then select one or more columns from the Events table to use as text labels in the graphics view. In the example above, the Description column is being used. To select more than one column, hold down the shift key and left click on the names of the columns that you want to use.



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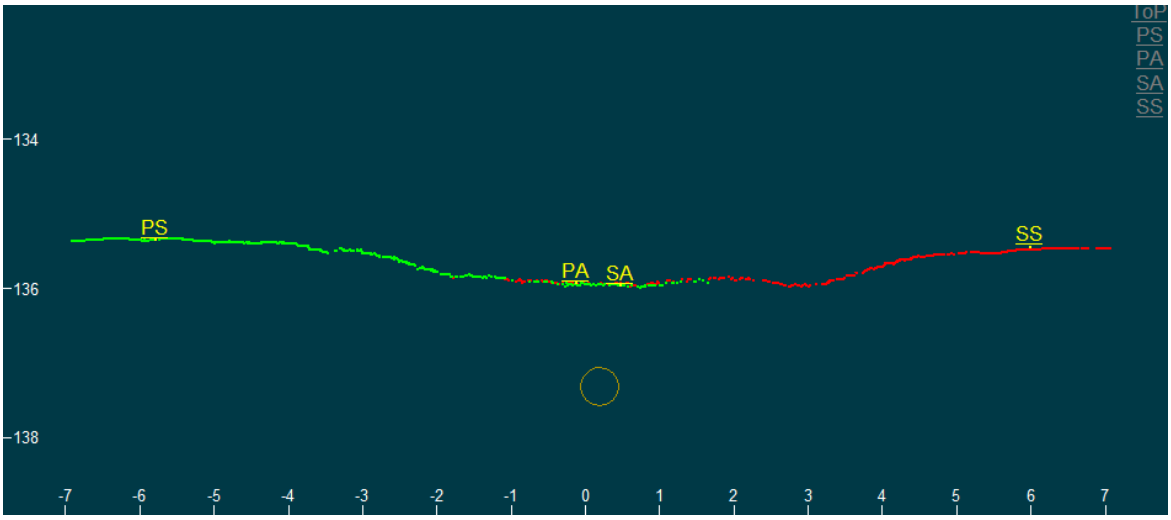
The annotation labels are drawn with short arrow lines that can either snap to a track plot in the graphics window (using the event time to link to the times of the plotted points), or they can be drawn from a specified coordinate using a pair of columns in the Events table. Typically this would be Easting and Northing for a Plan View window, or KP and Depth for a Side View window.

1.21.4 The Cross-Profile View

The Cross-Profile View displays one paired scan at a time. It can show or hide data points that have been disabled by the scan cleaning tools. It can show the pipeline and seabed feature markers if these have been assigned during scan processing. In the example below there is a shallow, backfilled trench with a buried pipeline below it.



Cross-Profile View Options

Open the Cross-Profile View Options by right-clicking in the Cross-Profile window and selecting Options from the pop-up menu.

You can change the colours of the window and the data, and you can select what to display.

The "Polynomial Near Pipe" is used during scan processing and feature assignment. See Cross-Profile Scan Processing 305 in VisualEdit Professional.

Disabled Scan points can be viewed or hidden as you wish.

Points above the Reference Depth (i.e the mid-point of the Profiler or MBE heads) are usually not shown, but in a deep trench or in a tunnel you may want to enable them.

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You can show and annotate the features assigned during processing by clicking in the list. Those with a blue background are selected for display. Those with a white background will not be shown. If a selected feature is not assigned in the current scan, it will appear as a small text label in the upper right corner of the window. The list of features is as follows:

Abbreviation	Feature depth
ToP	Top of pipe (with pipe shown as a circle)
PS	Port side natural seabed
PT	Port side top of trench spoil
PA	Port side depth adjacent to pipe
TB	Trench bottom
SA	Starboard side depth adjacent to pipe
ST	Starboard side top of trench spoil
SS	Starboard side natural seabed

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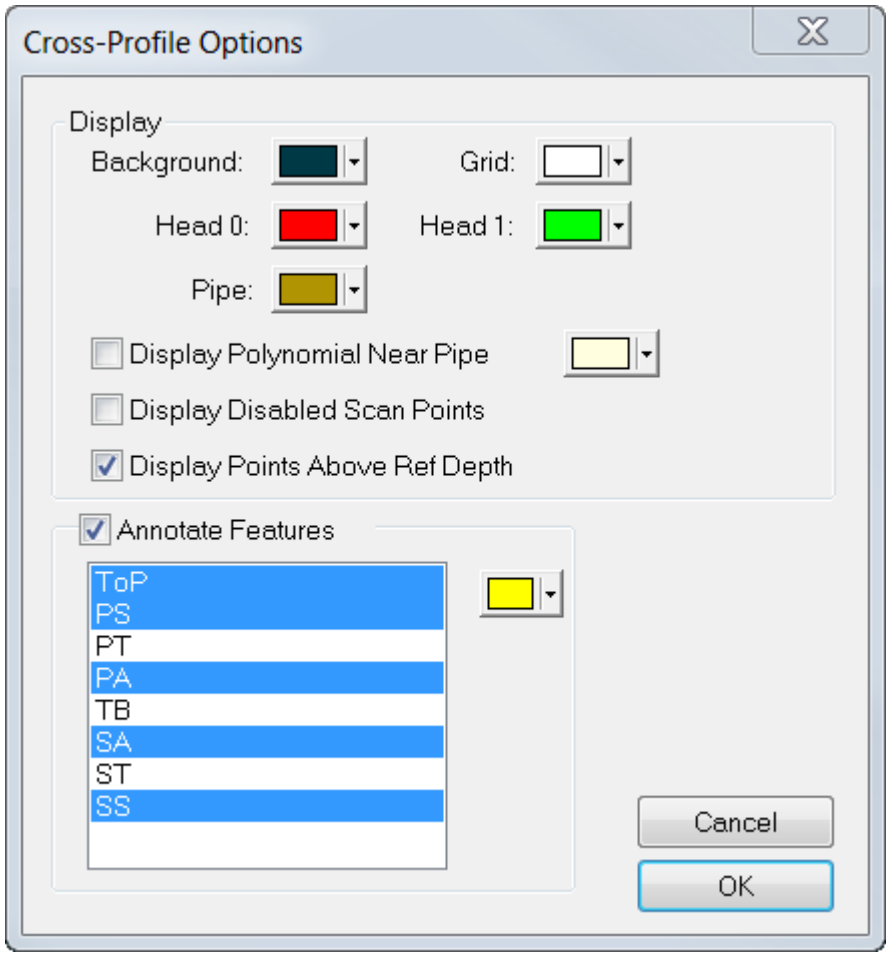
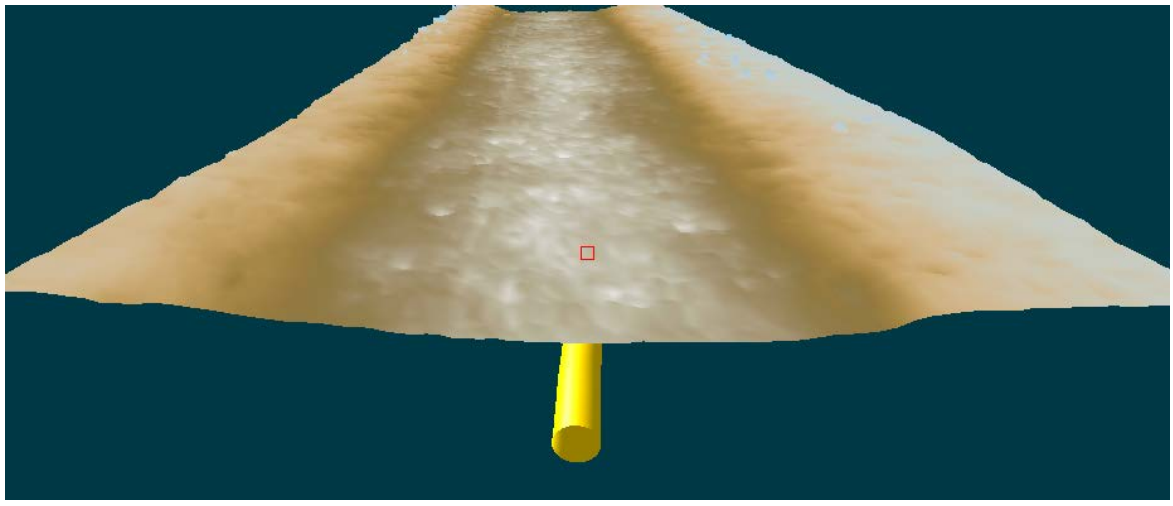


1.21.5 The 3D Cross-Profile View

The 3D Cross-Profile View is built up from multiple paired scans. It shows only the data points that have not been disabled by the scan cleaning tools. It shows the pipeline if it has been assigned during scan processing. In the example below there is a shallow, backfilled trench with a buried pipeline below it. The view can be rotated using the scroll bars on the right and bottom edges of the window.



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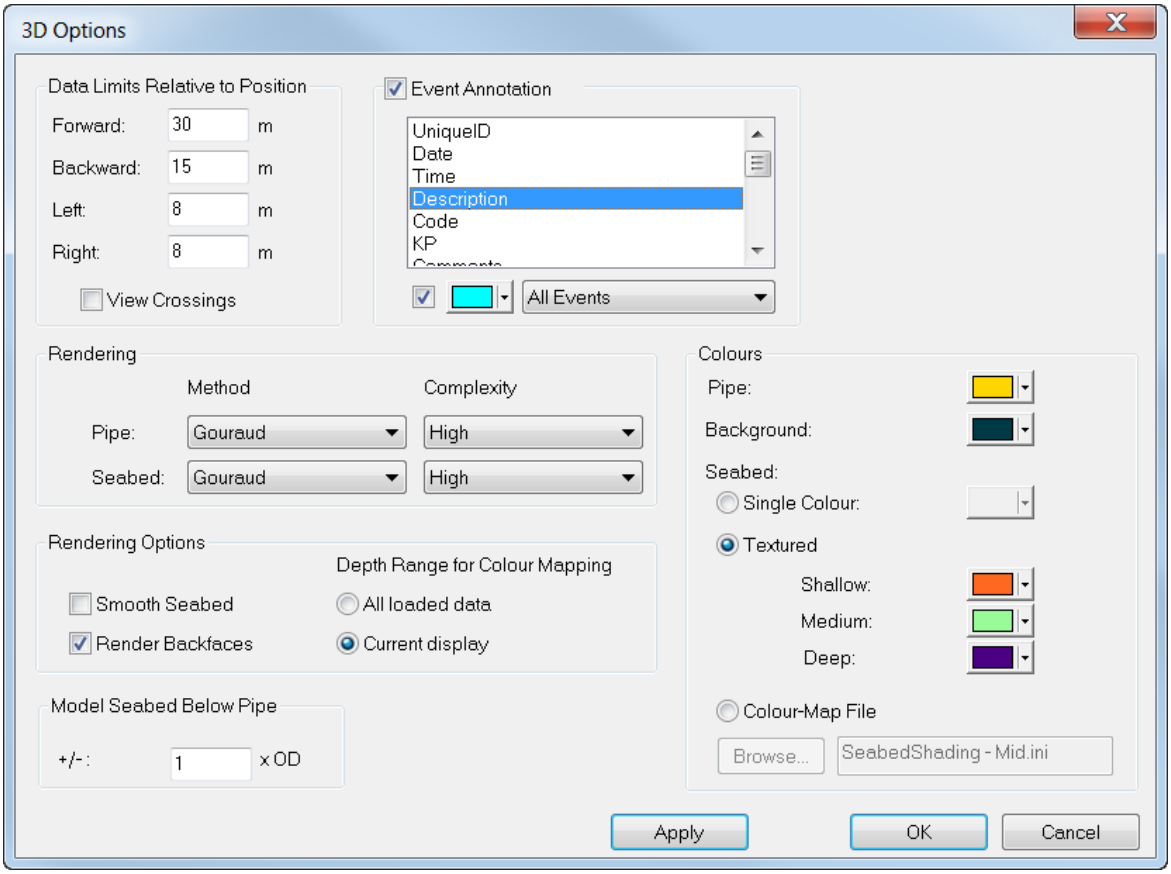
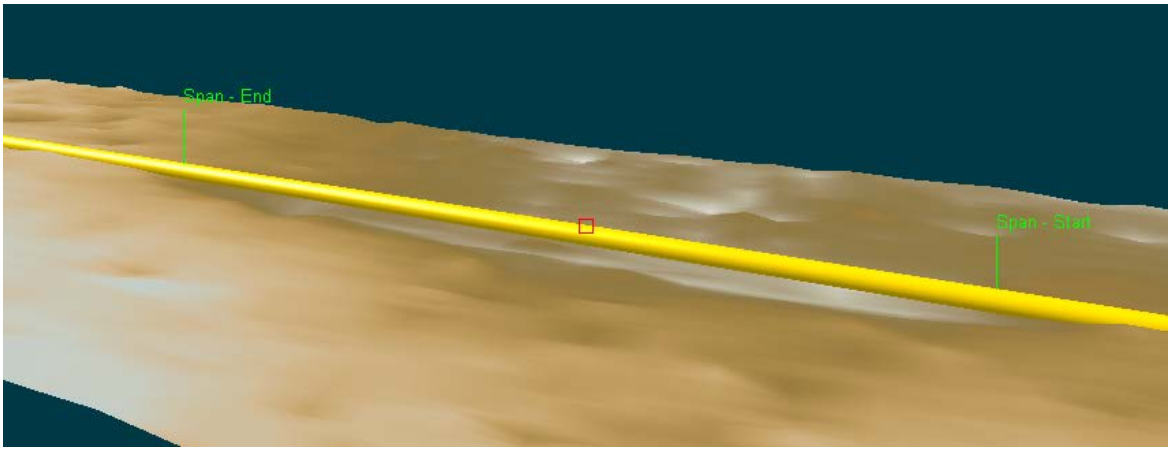
3D Cross-Profile View Options

Open the 3D Cross-Profile View Options by right-clicking in the 3D Cross-Profile window and selecting Options from the pop-up menu.



1.21.6 Event Labels in 3D Graphics

You can plot text "annotation" labels for logged Event data in the 3D Cross-Profile View.



To configure these event labels, right-click in the graphics window and select Options. At the top right of the graphics Options window, you will see a section called "Event

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Annotation" with a check-box to turn that annotation on or off. With the annotation turned on, you can then select one or more columns from the Events table to use as text labels in the graphics view.

The annotation labels are drawn with short arrow lines that snap to the pipeline using KP.

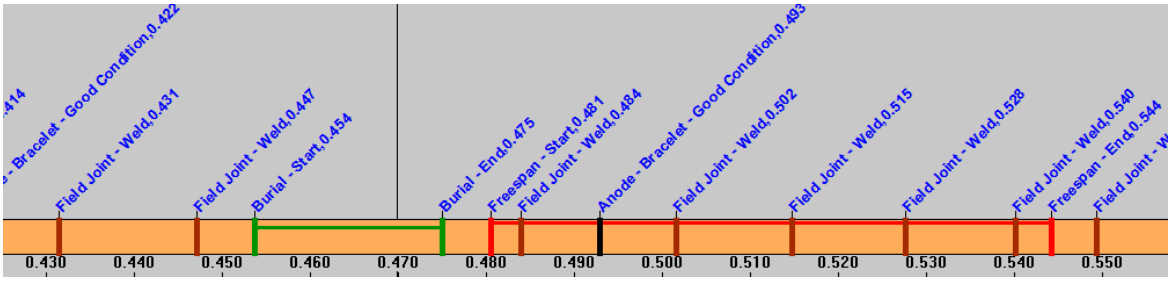
1.21.7 The Pipesheet View

The pipesheet view lets you show event data on a simplified plot with KP increasing across the width of the window.

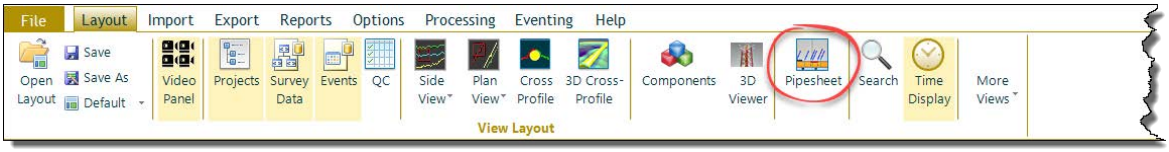
You can display text labels for all events, or just for selected subsets of events.

You can highlight specific event types using vertical coloured bars for different types. The example below has burial start and end as green vertical bars, and freespan starts and ends as red vertical bars. An anode is shown in black, and field-joints in brown

You can highlighted paired events (start to end) using coloured horizontal bars. The example below uses green for the buried area and red for the freespan.



To open the Pipesheet view, click the Pipesheet button on the layout ribbon:



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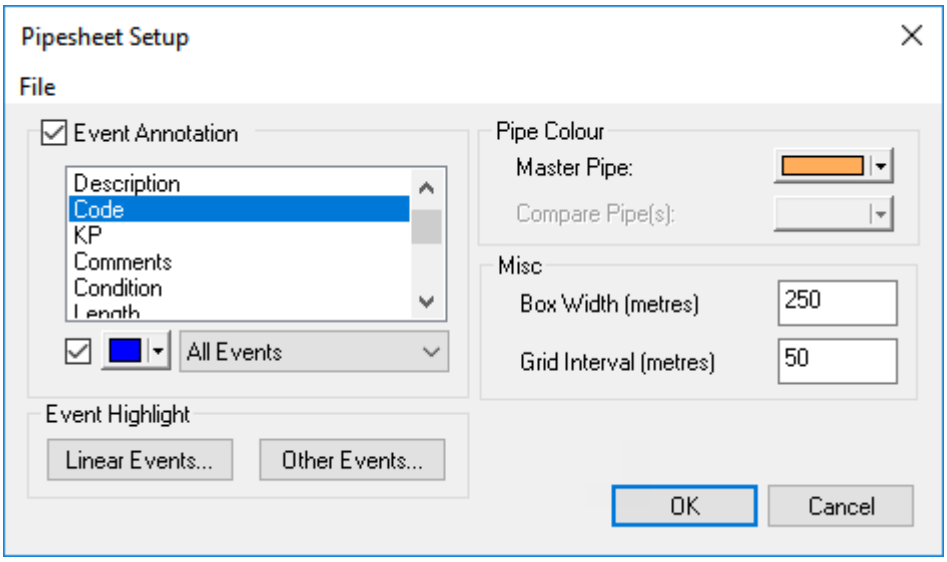
Pipesheet View Options

To configure the pipesheet, right-click and select Options.



On the left turn on Event annotation, and select which event column(s) to display. Do not select too many or the window will be hard to read. In the example above the Code column has been selected instead of the Description column because "FJ" or "AN" are shorter and simpler than "Field Joint" or "Anode". As shown in picture of The Pipesheet View 145 on the previous page, if you use the full Description text the window will need to be quite large and may get cluttered.

On the right, choose what colour you want to show the pipe, and then select how many metres of pipe to show in the window and how often to label the KPs. In the pipesheet view there is no zoom control; if you want to see more or less data at a time you need to change the number of metres used for the Box Width.

As well as the annotation labels the pipesheet view can use vertical lines of different colours to highlight different event types, and it can use horizontal lines with different colours to link different types of Start/End pair such as Freespan Start/End, Burial Start/End and so on.

See also:

Linear Events 147

Point Events or Other Events 149

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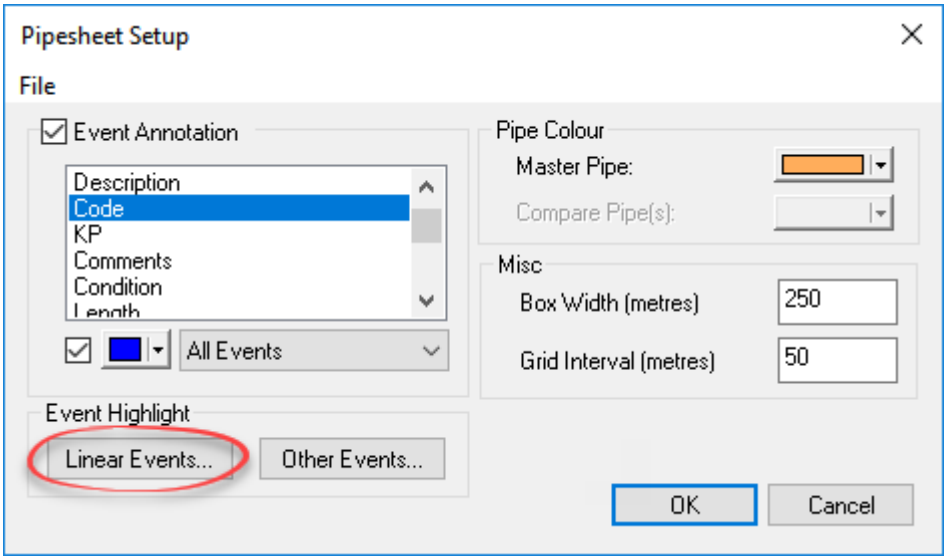
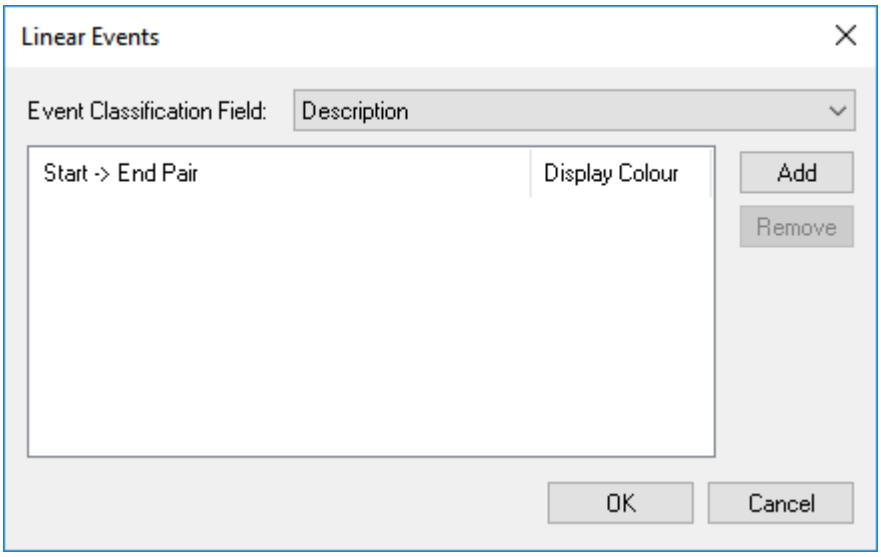
Linear Events

To add horizontal lines linking paired events such as Freespan start to Freespan end, click on Linear Events, and then click the Add button to select a Start / End pair in the list. Which column is used to form the pairs can be changed in the Classification Field at the top. You might want to use the Code or the Description – or any other column that makes it easy to choose which event types should form a logical pair. Beside each pair you can click in the coloured box to change the colour of the lines used to link the paired events.



Right-click in the Pipesheet to open this Setup Window, then click on Linear Events



Click the Add button to show a list of event types

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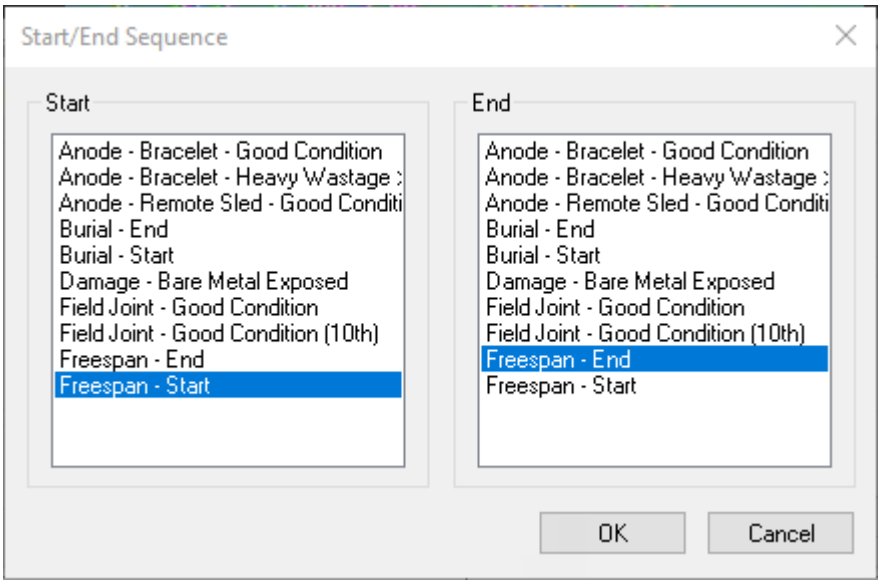
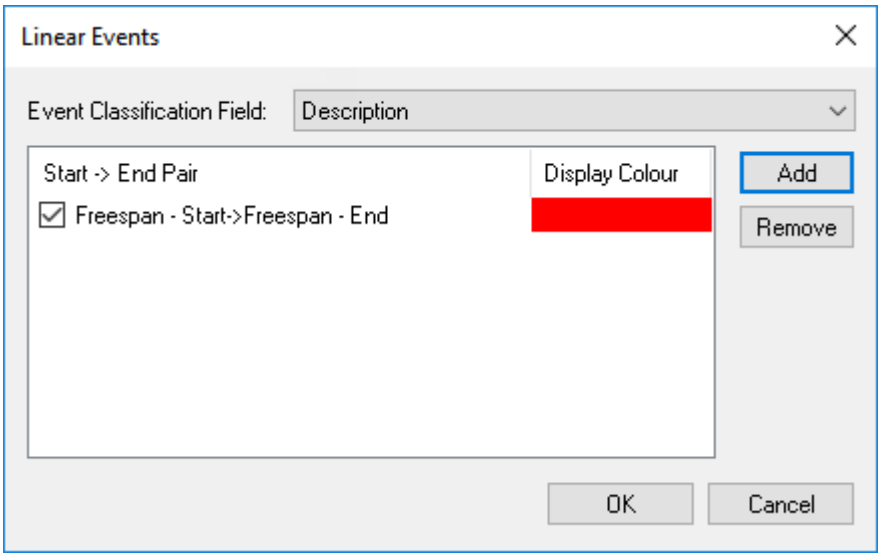


Select a Start event on the left, and the matching End event type on the right



The chosen pair will be displayed. You can add more pairs, or click OK to exit the setup.

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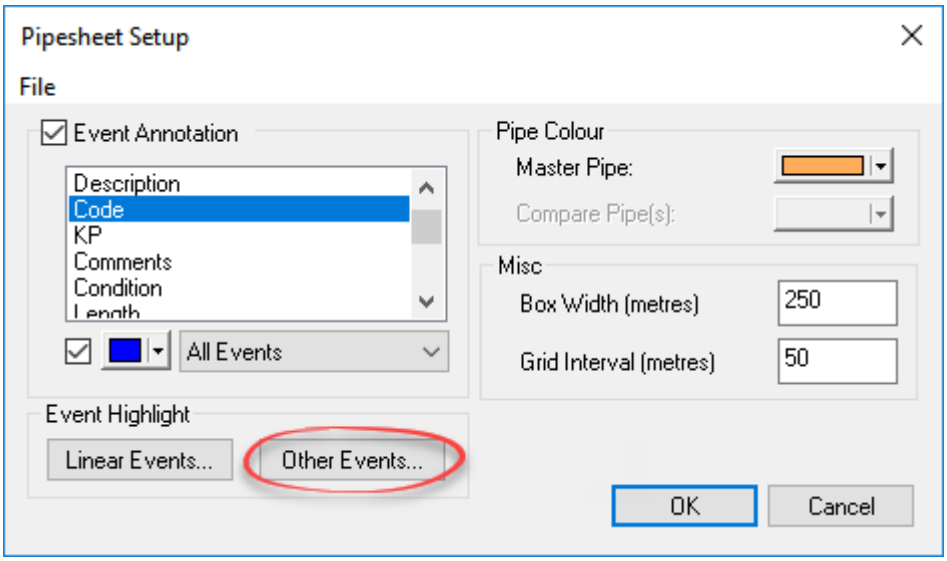
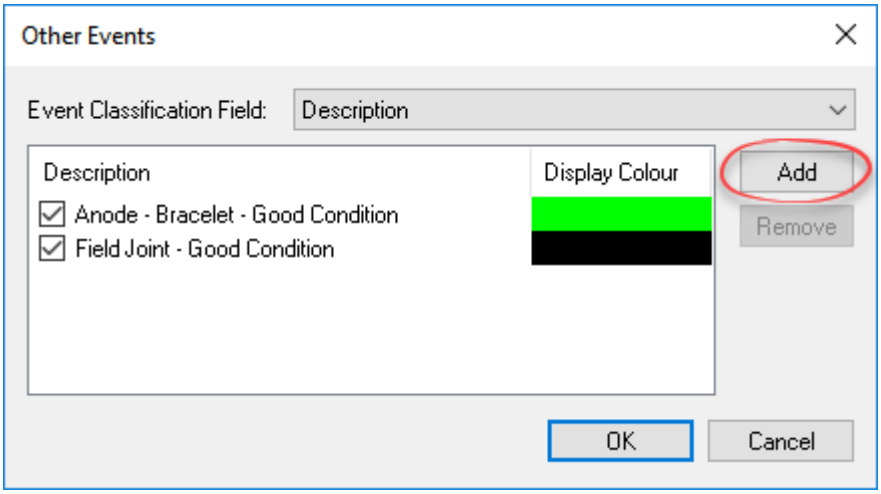
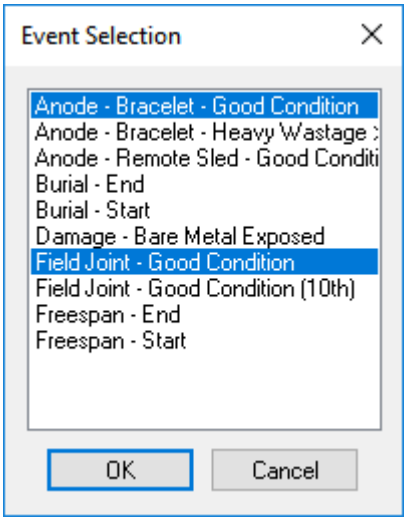
Point Events or Other Events

To add vertical lines to highlight events such as Anodes and Field Joints, click on "Other Events" and then click Add to select from the list of event types.







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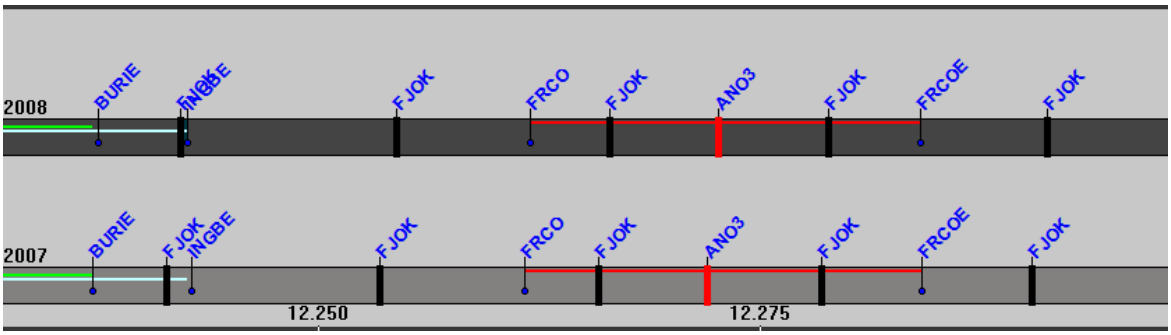
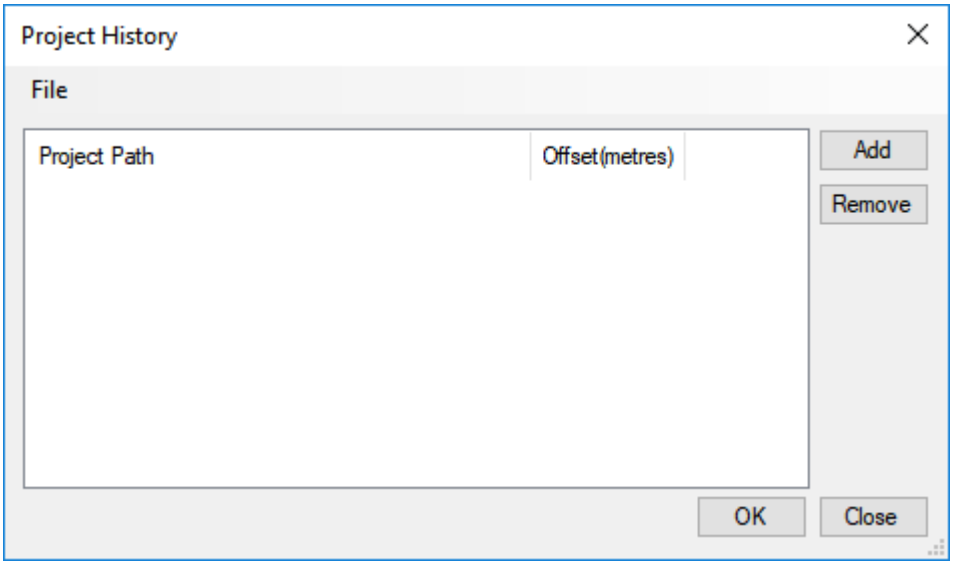
Project History in the Pipesheet

When History mode is enabled, the Pipesheet View can be used to compare data from two or more different inspections of the same pipeline at different times. In the example below there is data from 2007 at the bottom and from 2008 at the top and you can see that there are slight differences in the data from one year to the next. Some differences might be real, for example Freespans may change over time, but Anodes or Field Joints should never move so you can use this history view to QC your data. (Do not assume that the old data is always correct; it could be that the new data is more accurate!)



To use the History view, right-click in the Project Tree ans select Tools, then History, or open the Pipesheet view, then right-click in that view and select History. Both of these methods open the Project History set-up window.



Click on the Add button and select two Project, representing inspections of the same Pipeline in two different years, or surveys at two different phases of the same construction job such as As-Laid and As-Trenched.

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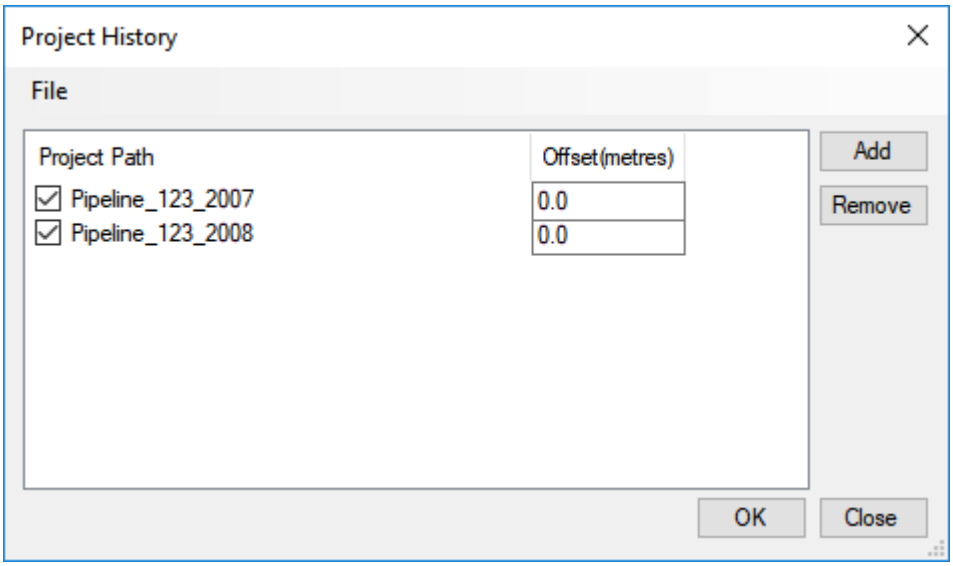

Sometimes the KPs logged one year may be slightly different from the earlier year. You can use a positive or negative offset to apply a shift to the data to correct for this difference. This does not change any of the data, it only adjusts the way that it is displayed in the Project History View in the Pipesheet. To use an offset, click in the Offset box of the set-up window and type a value in metres.

If you want to add more than two years' or phases of data, just select more projects in the History set-up window.

When the History view is turned on the pipe will be shown in different colours for the different Projects – a "Master pipe" and "Compare Pipe(s)". If you click on one of the pipes it will become the Master Pipe and the video display, the event list and all other windows will change to show the video and data associated with that year. If you want to look at the Anode marked with the red bar in the above example, you can click on it in the top pipe to see the video from 2008 and then click on the red bar in the lower pipe to see the video of the same anode one year earlier.

To change the colours of the different pipe displays, right-click in the Pipesheet to open the Pipesheet View Options 146.

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1.21.8 Linked Drawings and Documents

VisualEdit and **VisualReview** use the same **Drawing View** as **Visual3D-Inspector**, but here it is called a "Linked Document" because you can use it for more than just the inspection drawings used by Visual3D-Inspector. In VisualEdit you might also use this same window for ROV offset diagrams, specification documents or notes.

Video and other data can be linked to drawings. This could be drawings of structures such as jackets and wellheads shown in that video and data, or it might be documents relating to the specification or reporting of the project.

Three different types of "**Linked Drawing**" can be used:

- **Adobe PDF Files**, with one or more pages. Logged data is linked to the PDF using a page number, or even a specific zoomed-in area of a page. Select the page you want and zoom to the full page or a smaller part of it, then save that as a "**Linked view**".

- **Autodesk 3D DWF CAD files** using **Linked views**. These are usually drawings of whole jackets, platforms or other structures, or they may be field layout drawings showing multiple pipelines. Logged data can be linked to the 3D drawing in the same way as for 2D PDF drawings. You can zoom and rotate the 3D drawing to the relevant place (a view of an Anode, or other component) and then save that as a "**Linked view**".

- **Autodesk 3D DWF CAD files**, using **embedded Component ID** data. These are usually drawings of whole jackets, platforms or other structures, or they may be field layout drawings showing multiple pipelines. Logged data is linked to the 3D drawing using individual Component IDs to identify a specific anode, bracing, weld, flange etc. These Component ID tags are added to the different parts of the drawing before it is exported from AutoCAD to the DWF file format. The Component IDs in the drawing can be mapped to the Project and its Sub-Projects. This can be done automatically if the names of sub-projects match the names of Component IDs, or you can may them manually selecting which IDs link to which Sub-Projects.

For an inspection project you can load video and other data in the normal way using the Project Tree, and then import and display the Linked Drawing. Alternatively, if you are working with DWF files with Component IDs, then after the Linked Drawing has been imported into the Project you can right-click on the different components in the drawing to load video and data.

Display the Linked Document view

Use the Linked Document button to open or close a window to display PDF or DWF drawings. This is the same as the one in **Visual3D-Inspector**, except for the menus which will show “offline” operations instead of “online” operations.

Display a list of DWF and PDF documents

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Use the Drawings List button to open or close a list of all DWF and PDF documents in the VisualSoft area of the current offline disk drive.

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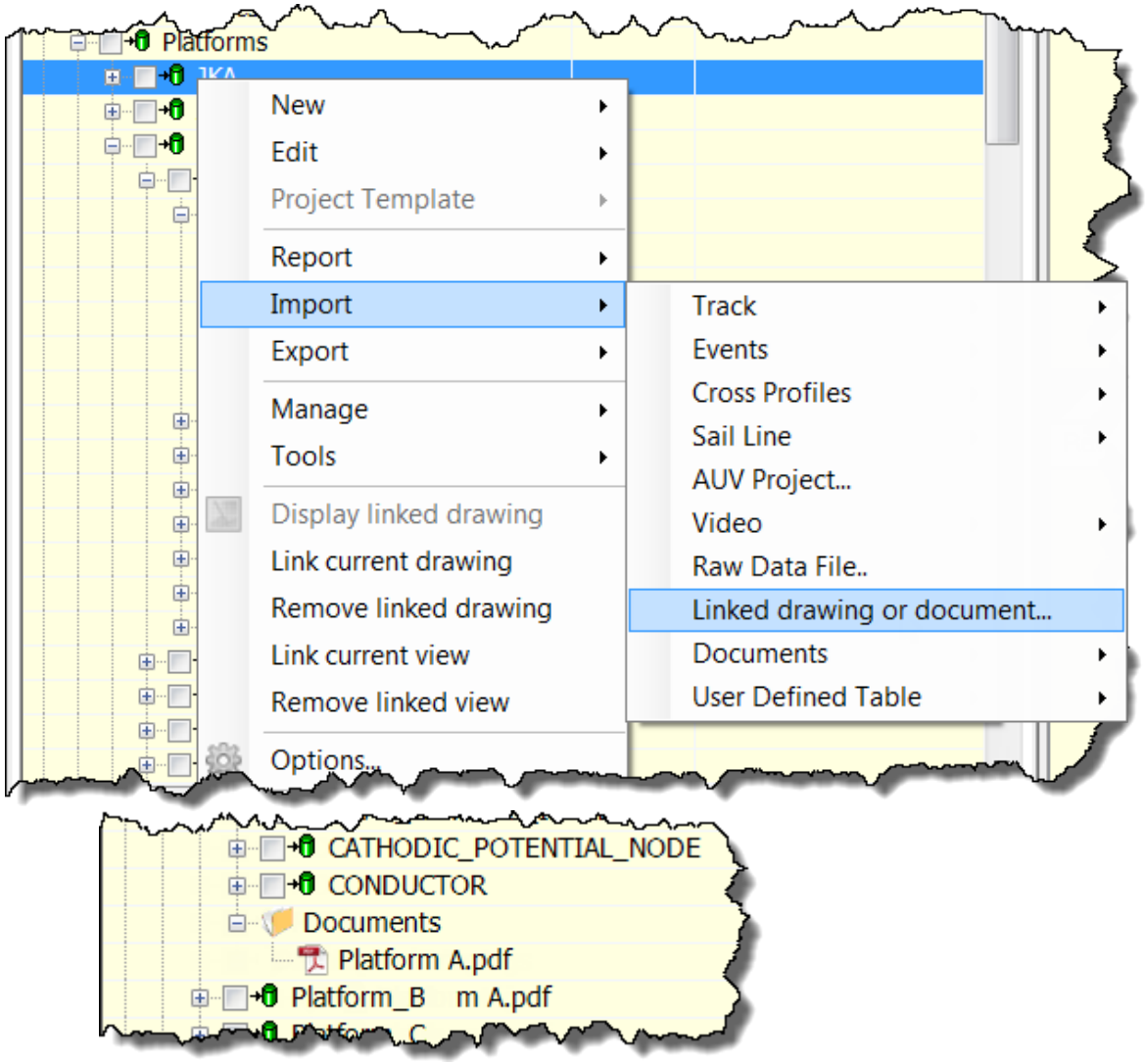
Import a Drawing into a Project

If the Project or Sub-Project that you are working in does not yet have a drawing linked to it, you can import one by right-clicking on that Project or Sub-Project to open the Import menu. Normally you should import the same drawing file that was used online when recording video and data in Visual3D-Inspector. When you import a drawing it will be placed in the Documents folder of the Project or Sub-Project. If the Documents folder does not yet exist it will be created automatically.



When you import a drawing you will be given a choice to either copy the file into the Documents folder, or to create a Windows shortcut to it. We recommend copying the file into the Project's Documents folder.

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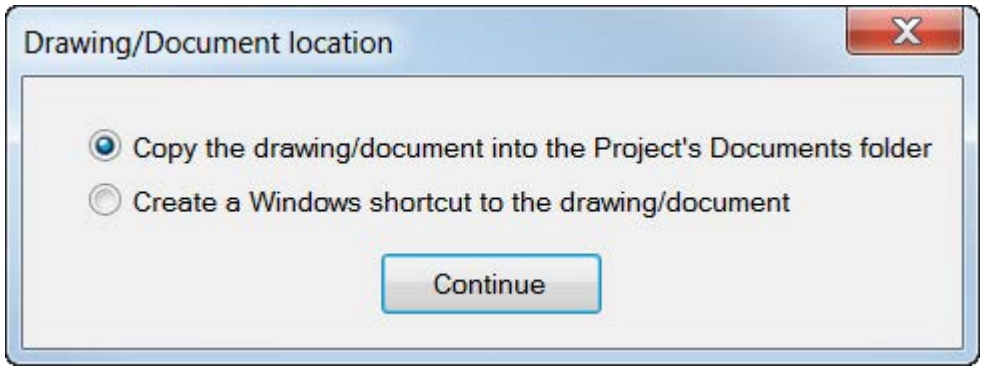

It is possible to import more than one drawing into a Project, so if changes have been made you can import an updated file, or you may have multiple drawings for different purposes.

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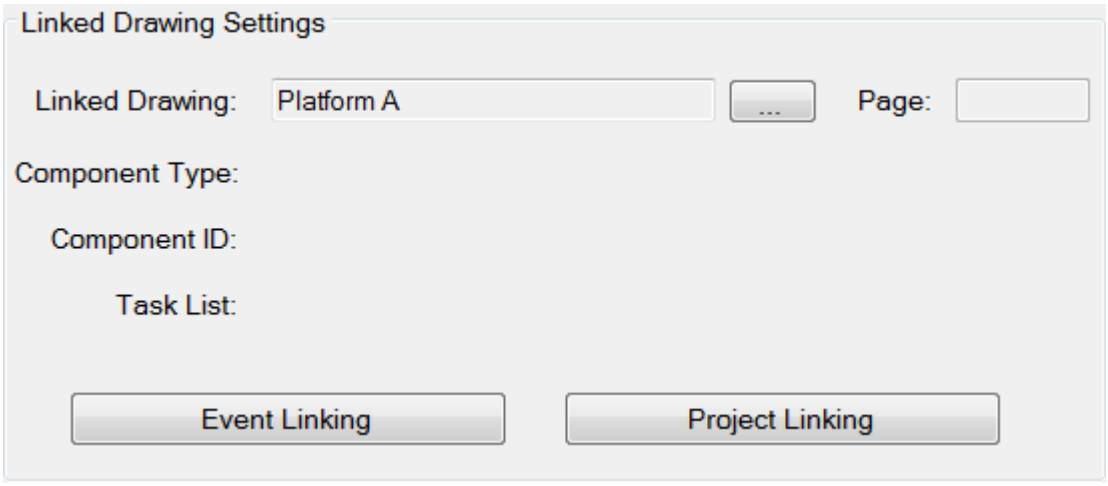
Link a Drawing to a Project or Sub-Project

When you import a drawing file into a Project or Sub-Project, it will be automatically linked to that Project or Sub-Project. Sometimes you might want to change that link to use a different drawing file, for example maybe an updated version of the drawing.

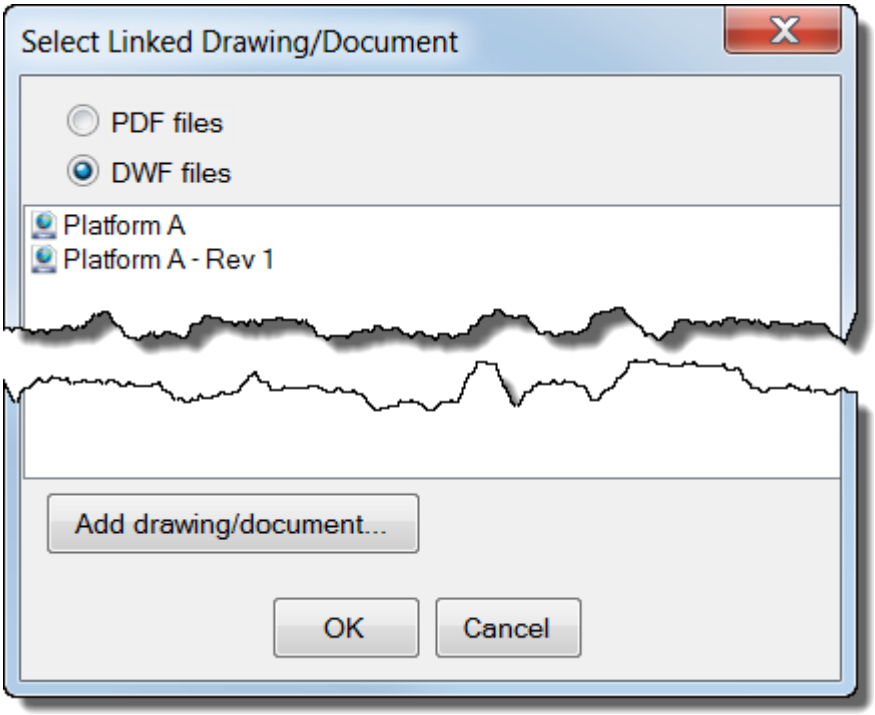
To do this, right-click on the selected Project or Sub-Project, and open the Properties. In the top right you will see the Linked Drawing Settings.



If you click the browse button,

you will see a list of all PDF or DWF files inside the current Project.

Change the drawing type at the top to show either PDF files or DWF files. You can add extra drawings using the button at the bottom of the list.



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Select the drawing that you want to link to the Project or Sub-Project.

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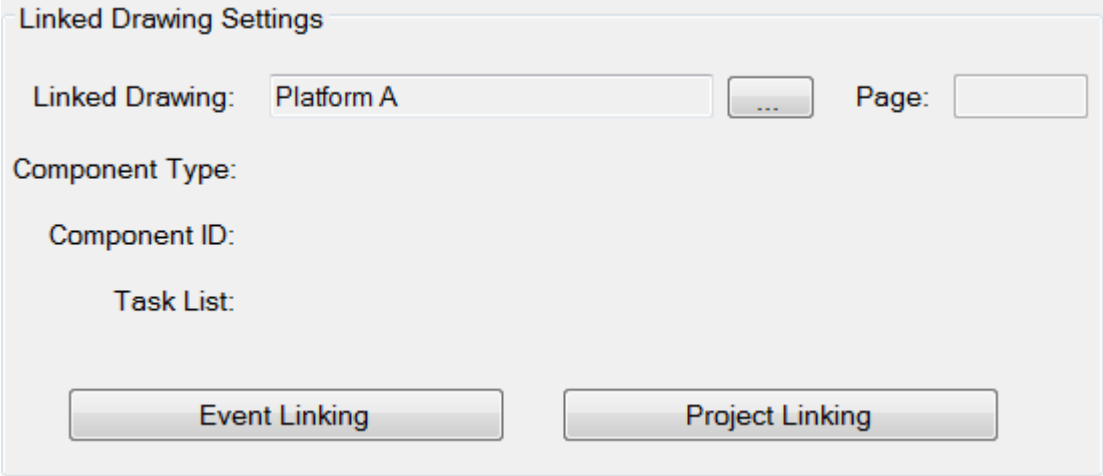
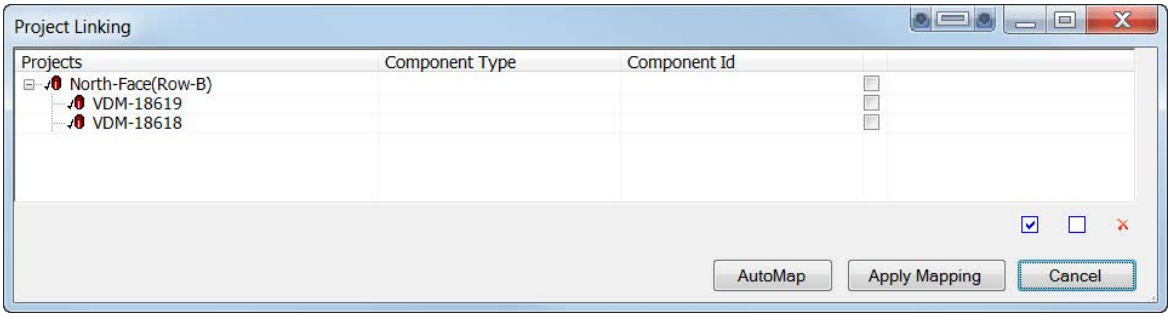
Link Drawing Components to a Project or Sub-Project

If you are working with DWF CAD files with embedded Component IDs, then you can map the Component IDs in the drawing to your Projects and Sub-Projects.

To do this, right-click on the selected Project or Sub-Project, and open the Properties. In the top right you will see the Linked Drawing Settings.



If you click the Project Linking button to open the Component ID mapping tool.



Manual Mapping

In the drawing each Component should have been tagged with a Component Type and a Component ID.

Click in the Component Type and Component ID columns of each row and select the data from the drawing to map to the Projects and Sub-Projects shown on the left. After you select the Component Type and a Component ID be sure to click the check-box to the right.

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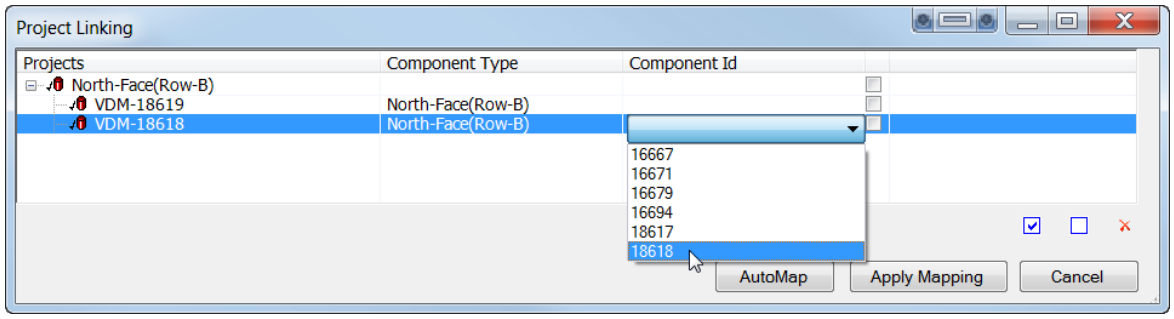
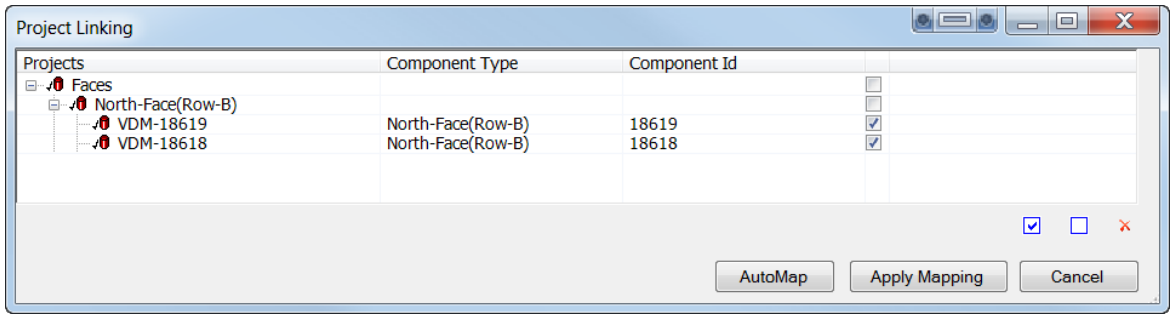


After making all of your selections for the mapping, make sure that the rows you changed all have the grey check-boxes selected ☑, and then click Apply Mapping. If you want to select all rows, use the blue ☑ button at the bottom.

If you make a mistake deselect all of the check-boxes using the ☐ button at the bottom and then select only the grey check-box ☑ in the one row that you need to un-map. When you have only that row selected, click the remove button ✕ at the bottom.

Auto Mapping

If the Project and Sub-Project names match the text of the Component Types and Component IDs used in the DWF drawing you can map them automatically using the Auto Map button.



Make sure that all the rows with mapping have the grey check-boxes selected ☑, and then click Apply Mapping. If you want to select all rows, use the blue ☑ button at the bottom.

If you make a mistake deselect all of the check-boxes using the blue ☐ button at the bottom and then select only the the grey check-box ☑ in the one row that you need to un-map. When you have only that row selected, click the remove button ✕ at the bottom.

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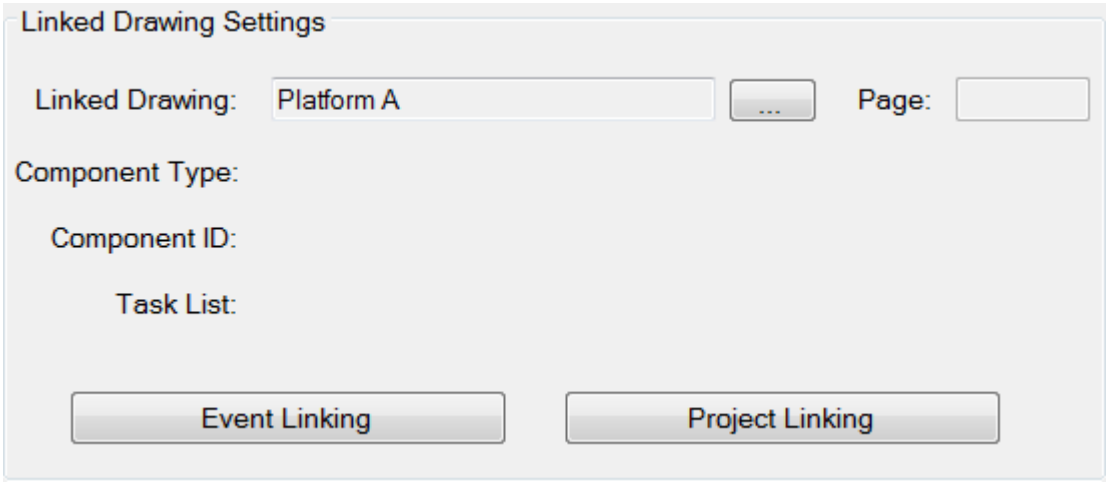
Link Drawing Components to Inspection Events

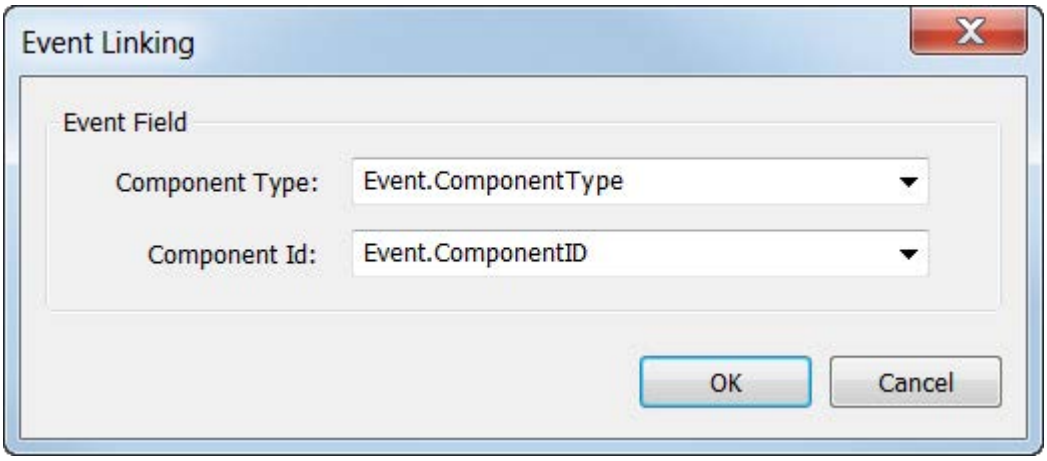
If you want more precision that just linking a particular Component ID to a whole Sub-Project, you can link to individual event records.

To do this you must use an Eventing configuration that includes columns for the Component Type, and the Component ID, and make sure that these columns contain text that matches the Component Types, and the Component IDs in the linked 3D DWF CAD file.

Right-click on the Project or Sub-Project and open the Properties.



Click the button for Event Linking, and select the column names in the event table that hold the text matching the Component Types, and the Component IDs in the linked DWF file.



When you click on an event in the Event list, the drawing will show the relevant component type. Note that individual events cannot be linked to saved views, only to the default view of a component.

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Link a Drawing View to a Project or Sub-Project

If you are working with PDF files or with DWF CAD files without embedded Component IDs, then you can link a specific view of the drawing to each your Projects and Sub-Projects. You can link to a page of a PDF file, to one zoomed-in part of a page of a PDF, or to a zoomed and rotated view of a 3D DWF file.

Use the zoom and rotate controls in the Linked Document view (see Moving Around the Linked Drawing View 164) and when you have the view that you want, right-click on the matching Sub-Project and select "Link current view".

Use a Linked Component and a Linked View

Sometimes if data is linked to a Component ID in a DWF file, when you load that data, the matching component in the drawing is hidden behind another part of a drawing, for example an Anode might be on the reverse side of a Jacket leg.

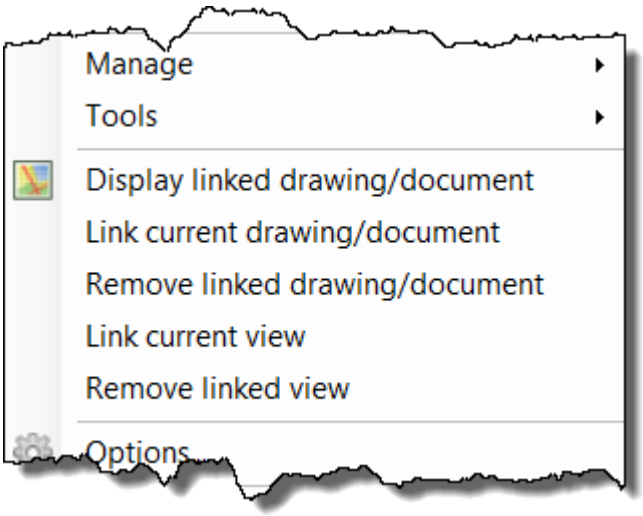
If this happens you can use the drawing navigation tools 164 to rotate and zoom to find a better view of the relevant component and then you can save this view, so that the next time you load the same data, instead of using the automatic view it uses your preferred view.

To save the view, right-click on the relevant Sub-Project and select "Link current view".

Display a Linked Drawing or Document

If you load data using the Project Tree the Linked drawing associated with that data will load and display automatically.

If you want to display the drawing or document associated with a project, without first loading the data, make sure that you have the Linked Document window open , and then right-click on the Project or Sub-Project and select **Display linked drawing/document**.



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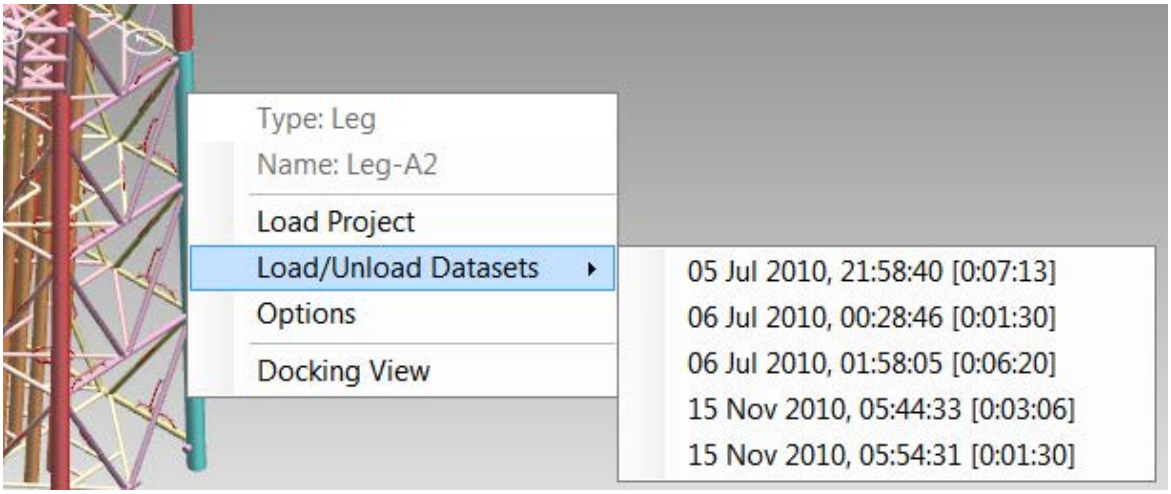
Use Component IDs to Load Video & Data

If you are working with DWF CAD files with embedded Component IDs, then you can use the drawing to load data and video in VisualEdit or VisualReview.

If you right-click on part of a 3D DWF in the Linked Drawing view, a pop-up menu will open if the selected component has any video or other data associated with it. This requires the Component ID tags that are in a 3D DWF, it is therefore not possible to do this with PDF files.

The pop-up menu shows the Type and Name of the selected component so you can check that you are in the correct place before you load the data.

Select **Load Project** to load all video and data associated with the chosen component, or select an individual Dataset if you know the date and time of the particular inspection that you want to view. Each dataset shows the start time of that recording, and also the duration of the recording.



Colour in the Linked Drawing View

When working with DWF files, some of the colours used in the Linked Document view can be changed. The colours of the actual Components shown in a 3D DWF drawing are set using **AutoCAD** before the drawing is exported as a DWF file but the background of the viewer and the colours used when you move and click the mouse in the window can be changed in **Visual3D-Inspector**.

To change the colours, right-click in the Linked Document window and select Options.

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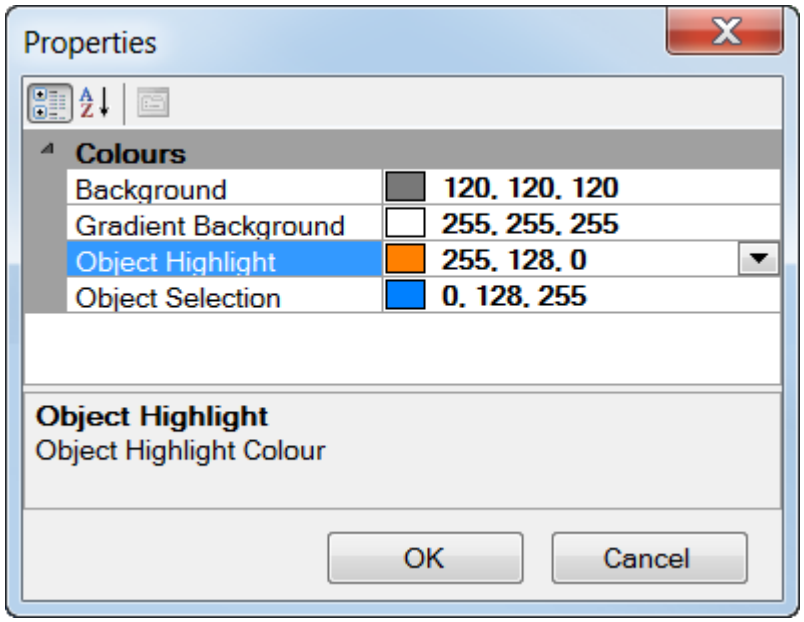

Object Highlight & Object Selection Colours

When you click to select an object in the 3D DWF or click on an item in the Project or Work Scope task list you will see that component change to the **Object Selection** colour.

As you move the mouse cursor around a 3D DWF drawing you will notice that the component under the cursor changes colour. This colour is the **Object Highlight** colour and you can change it using the buttons on the ribbon bar.

You should try to set the Highlight and Selection colours to something which is not already used in the 3D drawing.

Background Colours

The 3D DWF view has a two-tone background colour. The **Background** colour is used at the top of the window and is shaded gradually into the **Gradient Background** colour used at the bottom of the window.

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Moving Around the Linked Drawing View

The Linked Drawing view has a toolbar and keyboard shortcuts which allow you to pan and zoom. In the case of 3D DWF drawings you can also tilt and rotate the drawing.

Tool	Name	Shortcut	Description and usage
	Select	A	Enables the Select tool. When using DWF drawings, click in the drawing to select a component.
10	Zoom Scale 1:XX		Select larger numbers to zoom out
	Zoom Slider		Slide to the right to zoom out
	Home	Home	Restore the default “Home” view & scale
	Pan	H	Click and drag to move the drawing
	Zoom	Q	Click in the drawing and slide the mouse up to zoom in, down to zoom out
	Fit to Window	F	Keeps the current view angle and zooms in or out to fit the whole drawing
	Zoom Rectangle	R	Click and drag a rectangle in the drawing to zoom in
	Orbit	B	Click and move to rotate in three dimensions. (DWF mode only.)
	Turntable	E	Click and move sideways to rotate, up or down to tilt. (DWF mode only.)
	Navigation Wheels	Ctrl+Shift+I	(DWF mode only.) See the Autodesk Design Review Help

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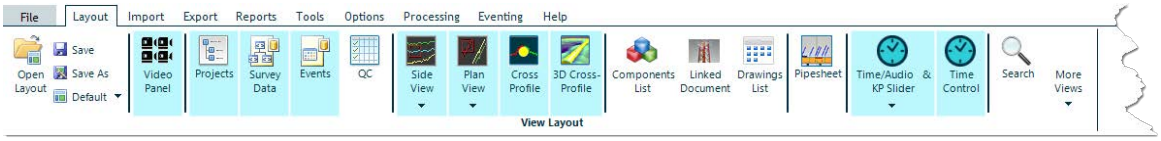
Tool	Name	Shortcut	Description and usage
TIP:	If you find the Orbit control difficult to use, try the Turntable instead.		
TIP:	You can also zoom in and out by rotating your mouse wheel.		
TIP:	With Windows 7 these buttons may occasionally disappear. If this happens, go to the Windows Control Panel and open the System settings. Click on Advanced System Settings in the list on the left, and then select the Advanced tab. In the Performance section of the window click the Settings button and then select the Visual Effects tab. Disable the top item “Animate controls and elements inside windows”.		

Many other tool and options are available in the Linked Drawing view, and full details of these can be found in Autodesk’s own Design Review documentation. You will be able to find this installed on your PC by going to Start, Programs, Autodesk.

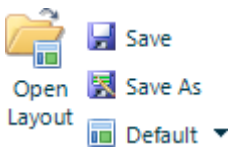
1.22 Window Layouts

You can arrange the windows in **VisualReview** and **VisualEdit** in any way you like. Each graphics view, data list or toolbar can be dragged wherever you like: You can open it in its own separate window 167, snap it side by side 166 with another window, snap it above or below 167 another window or make it appear as a tab 167 sharing the same space as another window.

To open and close individual windows, just click the buttons in The Layout Ribbon 50.



The window layout can be saved and then reopened later, so you can configure different layouts for different types of task, or just different layouts to suit the personal preferences of different operators. To restore the default layout of the windows just click the arrow on the “Default” button and select from one of the options: the Pipeline Layout with three video windows, or Structure Layout with just one.



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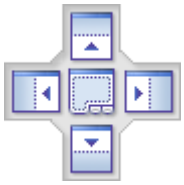
1.23 Moving a Window

To pick up a window, left-click at the top of it and hold down the left mouse button. Move the mouse around the screen while holding down the left mouse button. As you move around the screen you will see a blue box appear on screen indicating a preview of how your window will appear if you drop it at this location.

When the cursor is away from the centre of any other window you will see a blue square showing how the window would be placed as a free-floating window. As you move the cursor over the central area of any other window you will see a **Drop-Target** appear. The Drop-Target has five possible drop areas:

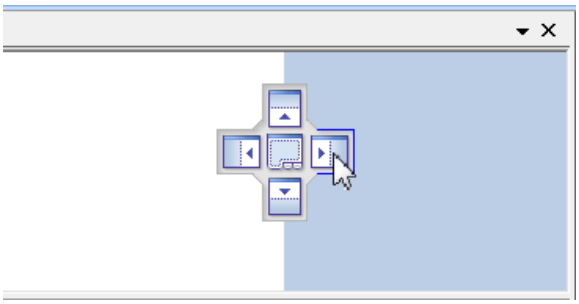
The Drop Target



If you release the mouse button while over the central area of the **Drop-Target** your window will be added as an extra tab, sharing the same space as the target window.

If you release the button while over one of the four arrowed areas of the **Drop-Target**, your window will be placed beside, above or below the target window, with the original space of the target window being divided equally between them. A blue rectangle will show a preview of the area which will be used for the window that you are moving.

Dock side by side with another window



To arrange two windows side by side, click and drag one window over another until the Drop-Target appears. As you move the mouse over the left and right targets, you will see a rectangle covering one half (left or right) of the window that you are dragging over. Release the mouse when the blue rectangle is in the half where you want your window to be placed.

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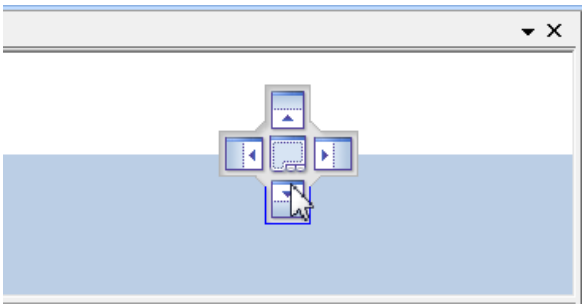
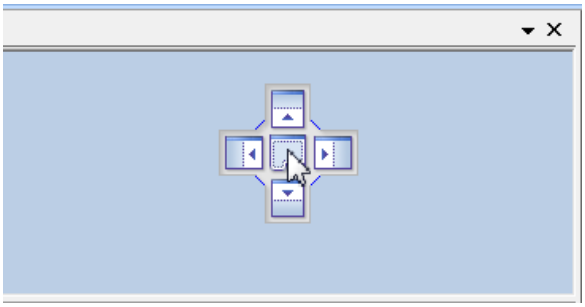
Dock above or below another window



To arrange two one above the other, click and drag one window over another until the Drop-Target appears. As you move the mouse over the upper and lower targets, you will see a rectangle covering one half (top or bottom) of the window that you are dragging over. Release the mouse when the blue rectangle is in the half where you want your window to be placed.

Dock over another window as a tabbed view



To arrange two or more windows to share the same space, creating a tabbed view, drag over another window until the pop-up Drop-Target appears, and release the mouse over the central square.

Move to a Floating Window

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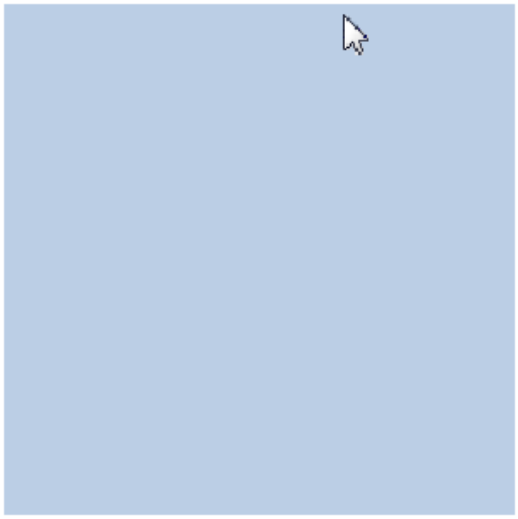
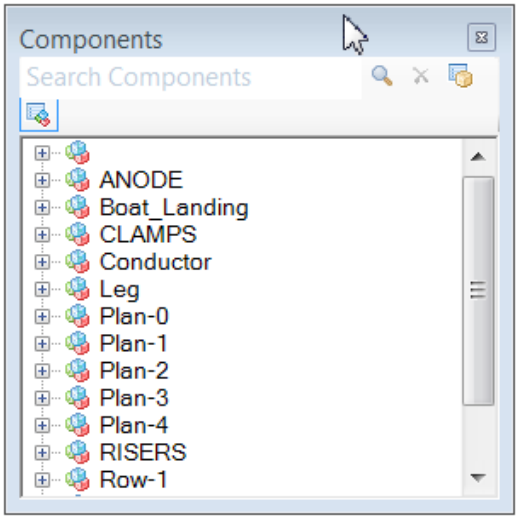
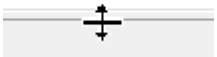


To open a list or other view in its own window, click on its title bar or tab and drag it until you see a blue square appear on the screen as shown in the example on the left below. When the rectangle appears release the mouse and you will see the view that you were moving will now have its own window (with the normal title bar and close button) that you can move around and place as you want.



Resizing a Window



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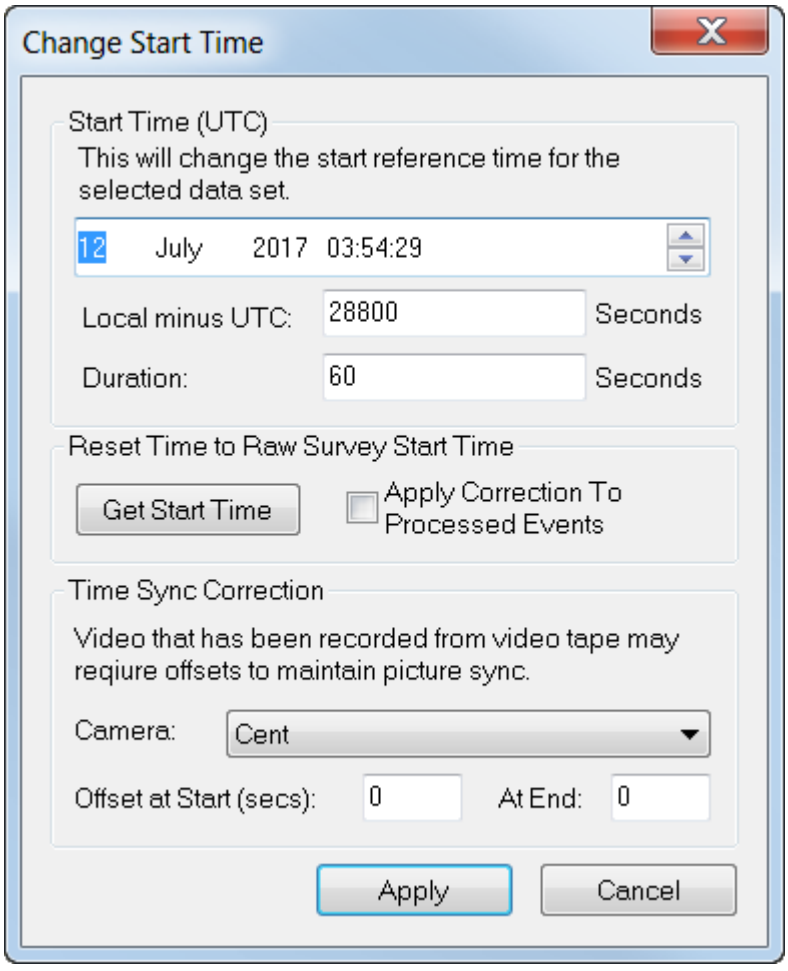
To resize a window hold down the left mouse button over one of the edges of the window. When you see the Resize Handle appear, keep the button held down and drag the window edge to where you want it, then let go.

1.24 Set Multiple Dataset Start Times

This tool allows you to set the start times of multiple datasets without having to open and close the properties window for each dataset.

1. Load all of the datasets for which you need to change the start times.

2. Right click on the first dataset and open this option from the tools menu. It will open a window like the one shown below:



3. Make sure that the displayed video is at the start of the dataset, and change the start time to match what you see in the video overlay.

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4. Click on the apply button

5. Left click on the next dataset in the Project Tree

6. Repeat steps 3, 4 and 5 as required.

1.25 File Formats

1.25.1 VisualSoft Event File Format

This format describes the Events.csv file used internally to store the "Events" data table in **VisualEdit** or **VisualReview**.

Please note that this is not the format to use when importing data.
For importing data please see **Importing Data** 75.

This is a CSV file format, with comma delimited fields. Records are terminated with a carriage return and line feed.

This format must contain a header record to define the column contents.

The first column must contain a timestamp, however the remaining columns can be anything. The data can consist of numbers or text fields.

The VisualWorks Timestamp is of the form YYYYMMDDhhmmssddd, a 17 digit string providing year, month, day, hour, minute, second and decimal seconds to millisecond resolution. The timestamp must be GMT.

Example:

```
VWTimestamp,Event Id,Code,Comment
200203011210101,1,Anode,
200203011210252,2,Damage,0.5m scar
200203011210302,3,Anode,
…
```

Note, that it is important to maintain a consistent format for the duration of a project otherwise the display of the data within VisualWorks may become confusing.

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1.25.2 VisualSoft Processed Survey Format

This format describes the Track.csv file used internally to store the "Processed Survey" data table in **VisualEdit** or **VisualReview**.

Please note that this is not the format to use when importing data.
For importing data please see **Importing Data** 75.

This is a CSV file format, with comma delimited fields. Records are terminated with a carriage return and line feed.

This format must contain a header record to define the column contents.

The first column must contain a timestamp, however the remaining columns can be anything. The data can consist of numbers or text fields.

The VisualWorks Timestamp is of the form YYYYMMDDhhmmssddd, a 17 digit string providing year, month, day, hour, minute, second and decimal seconds to millisecond resolution. The timestamp must be GMT.

Example:

```
VWTimestamp, Date, Time, East, North, Depth, KP
200203011210101,01 Mar 2002,12:10:10.1,500000.01,6700000.22,101.23,0.10212
200203011210110,01 Mar 2002,12:10:11.0,500000.02,6700000.23,101.22,0.10333
200203011210121,01 Mar 2002,12:10:12.1,500000.03,6700000.23,101.20,0.10442
200203011210132,01 Mar 2002,12:10:13.2,500000.04,6700000.24,101.23,0.10556
…
```

Note, that it is important to maintain a consistent format for the duration of a project otherwise the display of the data within VisualWorks may become confusing.

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1.25.3 VisualSoft Cross-Profile CSV File Format

Note: This format was revised from version 10.1 onwards.

This format is used for data that is imported into **VisualEdit** or exported from it, and not for data logged by VisualDataLogger.

This is a CSV file format, with comma delimited fields. Records are terminated with a carriage return and line feed.

This format may contain a header record to define the column contents, but this is not essential because the column order and format MUST match the definition shown below.

The record format is:

VWTimestamp, ID Number, KP, Easting, Northing, Reference Depth, Grid Heading, Pipe Diameter, Pipe Top X, Pipe Top Z, Mean Seabed Level, Depth of Burial, Number of Scan Points, 1st Point X, 1st Point Z, 2nd Point X, 2nd Point Z, …,Last Point X, Last Point Z, Number of Features, 1st Feature Label, 1st Feature X, 1st Feature Z, 2nd Feature X, 2nd Feature Z, …, Last Feature X, Last Feature Z [, Mean Adjacent Seabed [, DCC]]

1	VWTimestamp	The VisualWorks Timestamp **should be UTC** and is of the form YYYYMMDDhhmmssddd, a 17 digit string providing year, month, day, hour, minute, second and decimal seconds to millisecond resolution.
2	ID Number	A cross-profile scan number that uniquely identifies the scan.
3	KP	Kilometre Post of the scan Reference Position in kilometres. (See Note 1 below.)
4	Easting	Grid position of the scan Reference Position in metres. (See Note 1 below.)
5	Northing	Grid position of the scan Reference Position in metres. (See Note 1 below.)
6	Reference Depth	Depth of the scan Reference Position in metres. (See Note 1 below.)
7	Grid Heading	ROV Grid heading in degrees.
8	Pipe Diameter	Pipe diameter in metres.

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9	Pipe Top X	Lateral offset in metres of the top of pipe from the position defined by fields 4 and 5, in a direction perpendicular to the heading in field 7, positive to Starboard of the ROV. (See Note 2 below.)
10	Pipe Top Z	Vertical offset in metres of the top of pipe from the depth defined in field 6. Positive downwards. (See also Note 2 below.)
11	Mean Seabed Level	Vertical offset in metres of the mean seabed level from the depth defined in field 6.
12	Depth of Burial	Distance in metres from seabed to top of pipe.
13	Number of Scan Points	The number of X, Z coordinate pairs to follow.
14	Point X	Lateral offset in metres of the scan point from the position defined by fields 4 and 5, in a direction perpendicular to the heading in field 7, positive to Starboard of the ROV.
15	Point Z	Vertical offset in metres of the scan point from the depth defined in field 6. Positive downwards.
16	Number of Features	The number of Feature Label markers to follow within the record.
17	Feature Label	A concise text code used to identify the feature. See Feature Labels 174 below.
18	Feature X	Lateral offset in metres of the feature point from the position defined by fields 4 and 5, in a direction perpendicular to the heading in field 7, positive to Starboard of the ROV.
19	Feature Z	Vertical offset in metres of the feature point from the depth defined in field 6. Positive downwards.
20	Mean Adjacent Seabed	Vertical offset in metres of the Mean Adjacent Seabed level from the depth defined in field 6. The Mean Adjacent Seabed level is derived from PA and SA as defined in the Feature Labels 174 section below. (See Note 3 below.)

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21	DCC	Distance Cross Course (or off-track). The lateral distance in metres of the position defined by fields 4 and 5, from the sail-line (or route-file) measured perpendicular to the closest section of that route-file. Positive to starboard of the route-file looking in increasing KP direction (Note: this is not not necessarily the ROV heading). (See Note 3 below.)

Notes

1. The Reference Position defined by fields 3 to 6 (KP, Easting, Northing & Depth) is usually the mid-point of the two heads in a dual head system, but could be any appropriate offset location to which the scan X and Z coordinates may be related. All other positions are computed relative to this position.

2. If the pipe is not present in a scan, it should be assigned values of X = 0, and Z = 0.

3. Either or both of items 20 and 21 (Mean Adjacent Seabed and DCC) can be omitted with the following guidelines:

   a. If both are omitted the record should be terminated with a carriage return and line feed immediately after the final "Feature Z" value.

   b. If using Mean Adjacent Seabed but not DCC, the record should be terminated with a carriage return and line feed immediately after the Mean Adjacent Seabed value.

   c. If using DCC but not Mean Adjacent Seabed then a blank column must be included for Mean Adjacent Seabed – i.e. with two consecutive commas after the last "Feature Z" value and before the DCC value.

Conventions

All numeric fields may have any number of decimal places.

All angles are in degrees.

Distances are in metres, except KP, which is in kilometres.

Depths are positive downwards.

Relative depths and Z offsets are positive downwards.

Relative lateral offsets (X offsets) are positive to starboard of the ROV, relative to ROV heading not pipe heading.

Side of pipe (Port/Stbd) is relative to ROV heading not pipe heading.

Feature Labels

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The table below shows the **standard** Feature Label codes used by VisualSoft, and which are used in automatic calculations for depth of burial, mean adjacent level etc. Other labels may **also** be used, and the data will be displayed but will **not** be included in any automatic calculations.

Feature Label	Feature Name	Description (NOTE: Side of pipe is relative to ROV heading not KP direction.)
PS	Port Seabed	The level of the natural, undisturbed seabed to the port side of the pipeline or trench.
PT	Port Top of Trench	The level of the top of the port spoil-heap.
PA	Port Adjacent Seabed	The seabed level immediately beside the pipeline on the port side.
TB	Trench Bottom	The deepest point in the trench.
SA	Starboard Adjacent Seabed	The seabed level immediately beside the pipeline on the starboard side.
ST	Starboard Top of Trench	The level of the top of the starboard spoil-heap.
SS	Starboard Seabed	The level of the natural, undisturbed seabed to the starboard side of the pipeline or trench.

Example

```
20131015074803059,12874,32.874999,675521.042,5901837.475,28.840,215.191,0.412,0.037,1.912,
1.285,-0.211,516,-7.134,1.010,-7.118,1.010,-7.086,1.010,-7.058,1.020,-7.026,1.020,-
6.990,1.020,-6.962,1.030,-6.934,1.030,-6.904,1.030,-6.870,1.040,-6.842,1.040,-
6.815,1.050,-6.779,1.050,-6.756,1.050,-6.723,1.060,-6.686,1.060,-6.660,1.070,-
6.632,1.080,-6.601,1.060,-6.578,1.070,-6.537,1.070,-6.515,1.070,-6.479,1.080,-
6.454,1.090,-6.424,1.080,-6.393,1.090,-6.363,1.090,-6.332,1.090,-6.304,1.100,-
6.274,1.100,-6.249,1.090,-6.213,1.100,-6.185,1.100,-6.149,1.100,-6.129,1.100,-
6.093,1.100,-6.066,1.100,-6.030,1.100,-6.005,1.100,-5.974,1.100,-5.941,1.100,-
5.913,1.100,-5.877,1.110,-5.849,1.110,-5.825,1.100,-5.788,1.100,-5.768,1.100,-
5.730,1.110,-5.703,1.100,-5.680,1.110,-5.649,1.110,-5.619,1.100,-5.581,1.100,-
5.553,1.100,-5.517,1.090,-5.489,1.090,-5.461,1.090,-5.433,1.090,-5.397,1.080,-
5.363,1.080,-5.333,1.080,-5.308,1.080,-5.269,1.070,-5.245,1.080,-5.219,1.070,-
5.186,1.060,-5.158,1.060,-5.125,1.060,-5.101,1.050,-5.061,1.060,-5.039,1.060,-
5.006,1.060,-4.981,1.050,-4.942,1.060,-4.915,1.060,-4.884,1.060,-4.865,1.060,-
4.831,1.060,-4.801,1.060,-4.769,1.070,-4.743,1.070,-4.712,1.080,-4.683,1.080,-
4.653,1.080,-4.625,1.090,-4.598,1.090,-4.559,1.090,-4.529,1.100,-4.495,1.090,-
4.475,1.100,-4.443,1.100,-4.417,1.100,-4.381,1.110,-4.351,1.120,-4.318,1.110,-
4.290,1.120,-4.260,1.120,-4.235,1.130,-4.203,1.130,-4.174,1.150,-4.135,1.150,-
4.113,1.170,-4.081,1.160,-4.057,1.170,-4.026,1.160,-3.990,1.160,-3.968,1.180,-
3.938,1.180,-3.907,1.190,-3.877,1.200,-3.837,1.190,-3.816,1.200,-3.791,1.220,-
```

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3.752,1.230,-3.729,1.230,-3.696,1.240,-3.674,1.250,-3.636,1.260,-3.613,1.260,-
3.585,1.280,-3.546,1.280,-3.519,1.280,-3.493,1.280,-3.458,1.300,-3.441,1.320,-
3.402,1.320,-3.377,1.340,-3.338,1.330,-3.310,1.340,-3.274,1.340,-3.250,1.340,-
3.230,1.360,-3.200,1.380,-3.164,1.380,-3.138,1.400,-3.114,1.430,-3.086,1.420,-
3.055,1.420,-3.025,1.440,-2.986,1.450,-2.962,1.450,-2.928,1.470,-2.900,1.460,-
2.883,1.470,-2.844,1.480,-2.820,1.490,-2.789,1.510,-2.766,1.510,-2.736,1.500,-
2.697,1.510,-2.675,1.530,-2.642,1.530,-2.612,1.560,-2.580,1.540,-2.553,1.550,-
2.517,1.590,-2.481,1.570,-2.458,1.560,-2.440,1.640,-2.406,1.610,-2.373,1.630,-
2.348,1.630,-2.314,1.630,-2.286,1.640,-2.262,1.660,-2.232,1.660,-2.206,1.670,-
2.170,1.680,-2.142,1.700,-2.126,1.710,-2.090,1.710,-2.054,1.730,-2.034,1.730,-
2.001,1.740,-1.976,1.780,-1.948,1.800,-1.921,1.820,-1.896,1.820,-1.874,1.850,-
1.843,1.860,-1.810,1.920,-1.792,1.930,-1.751,1.940,-1.727,1.950,-1.699,1.950,-
1.671,1.970,-1.640,1.990,-1.612,1.990,-1.591,2.020,-1.562,2.050,-1.541,2.070,-
1.505,2.060,-1.468,2.070,-1.452,2.080,-1.424,2.080,-1.390,2.100,-1.355,2.090,-
1.333,2.080,-1.290,2.080,-1.271,2.110,-1.241,2.100,-1.204,2.110,-1.177,2.090,-
1.147,2.130,-1.118,2.130,-1.085,2.130,-1.061,2.150,-1.024,2.130,-0.996,2.130,-
0.972,2.160,-0.945,2.130,-0.913,2.130,-0.881,2.140,-0.852,2.150,-0.822,2.180,-
0.791,2.160,-0.767,2.220,-0.737,2.170,-0.708,2.180,-0.681,2.180,-0.645,2.150,-
0.622,2.210,-0.591,2.170,-0.555,2.210,-0.523,2.190,-0.501,2.180,-0.469,2.180,-
0.431,2.200,-0.392,2.160,-0.361,2.150,-0.333,2.170,-0.305,2.120,-0.273,2.140,-
0.237,2.130,-0.209,2.090,-0.178,2.110,-0.142,2.010,-0.093,1.970,-0.059,1.930,-
0.017,1.860,0.027,1.840,0.033,1.850,0.077,1.850,0.102,1.860,0.116,1.930,0.149,1.960,0.175,
2.010,0.199,2.040,0.224,2.060,0.241,2.090,0.277,2.110,0.302,2.120,0.338,2.110,0.365,2.120,
0.399,2.140,0.426,2.120,0.454,2.130,0.485,2.130,0.515,2.130,0.541,2.160,0.577,2.170,0.604,
2.160,0.621,2.140,0.649,2.170,0.707,2.180,0.734,2.150,0.751,2.160,0.784,2.150,0.820,2.150,
0.848,2.140,0.877,2.160,0.909,2.170,0.934,2.170,0.965,2.150,1.006,2.160,1.028,2.160,1.065,
2.120,1.100,2.110,1.131,2.100,1.162,2.120,1.193,2.110,1.220,2.100,1.250,2.090,1.281,2.070,
1.314,2.110,1.345,2.060,1.372,2.050,1.412,2.040,1.445,2.010,1.476,2.040,1.500,2.010,1.534,
2.010,1.567,1.980,1.600,1.970,1.631,1.970,1.664,1.990,1.681,1.940,1.717,1.930,1.752,1.930,
1.786,1.910,1.814,1.890,1.850,1.920,1.875,1.890,1.916,1.870,1.934,1.850,1.972,1.870,2.005,
1.840,2.038,1.840,2.064,1.820,2.100,1.800,2.130,1.780,2.155,1.790,2.188,1.780,2.219,1.780,
2.238,1.770,2.288,1.760,2.305,1.760,2.346,1.760,2.377,1.770,2.400,1.780,2.430,1.740,2.460,
1.750,2.486,1.720,2.530,1.750,2.564,1.740,2.588,1.750,2.618,1.700,2.650,1.720,2.672,1.730,
2.704,1.730,2.738,1.710,2.766,1.700,2.802,1.710,2.832,1.710,2.866,1.700,2.887,1.690,2.915,
1.680,2.952,1.680,2.979,1.710,3.015,1.700,3.038,1.690,3.068,1.690,3.101,1.690,3.129,1.700,
3.154,1.700,3.187,1.700,3.218,1.680,3.245,1.690,3.287,1.690,3.309,1.680,3.339,1.680,3.373,
1.680,3.396,1.670,3.431,1.670,3.465,1.670,3.497,1.680,3.518,1.660,3.551,1.660,3.581,1.660,
3.609,1.670,3.647,1.680,3.669,1.680,3.697,1.680,3.725,1.660,3.767,1.660,3.797,1.670,3.827,
1.670,3.851,1.670,3.887,1.650,3.897,1.670,3.947,1.660,3.977,1.660,4.009,1.670,4.036,1.670,
4.061,1.680,4.089,1.660,4.127,1.640,4.150,1.640,4.178,1.630,4.211,1.650,4.239,1.650,4.278,
1.640,4.297,1.650,4.327,1.650,4.358,1.650,4.386,1.650,4.427,1.650,4.458,1.650,4.481,1.650,
4.511,1.660,4.544,1.650,4.575,1.650,4.611,1.640,4.643,1.640,4.666,1.640,4.691,1.640,4.730,
1.640,4.753,1.640,4.785,1.640,4.816,1.640,4.849,1.640,4.875,1.640,4.902,1.640,4.938,1.630,
4.961,1.640,4.996,1.630,5.032,1.630,5.063,1.630,5.088,1.640,5.107,1.640,5.151,1.640,5.182,
1.640,5.213,1.640,5.241,1.640,5.263,1.640,5.299,1.640,5.332,1.640,5.355,1.640,5.382,1.640,
5.413,1.630,5.443,1.630,5.477,1.630,5.506,1.630,5.535,1.620,5.568,1.620,5.590,1.620,5.629,
1.620,5.656,1.620,5.690,1.620,5.715,1.610,5.748,1.620,5.781,1.620,5.814,1.610,5.834,1.610,
5.870,1.610,5.904,1.610,5.928,1.610,5.953,1.600,5.986,1.610,6.017,1.600,6.048,1.600,6.084,
1.600,6.108,1.600,6.137,1.600,6.167,1.600,6.202,1.600,6.222,1.600,6.256,1.600,6.286,1.600,
6.320,1.600,6.344,1.600,6.384,1.590,6.417,1.600,6.444,1.600,6.467,1.600,6.503,1.590,6.524,
1.600,6.547,1.600,6.588,1.590,6.622,1.590,6.656,1.590,6.686,1.590,6.710,1.590,6.741,1.590,
6.777,1.590,6.806,1.590,6.832,1.590,6.856,1.590,6.886,1.590,6.919,1.590,6.942,1.590,6.974,
1.590,7.010,1.590,7.041,1.590,7.072,1.580,7.096,1.590,7.127,1.580,7.160,1.590,7.190,1.580,
7.222,1.580,7.252,1.590,7.279,1.590,7.310,1.590,7.349,1.580,7.371,1.580,7.401,1.590,7.424,
1.580,7.462,1.580,7.494,1.580,7.523,1.580,7.549,1.580,7.579,1.580,7.610,1.580,7.643,1.580,
7.676,1.580,7.707,1.580,7.731,1.580,7.762,1.580,7.793,1.580,7.826,1.580,7.857,1.580,7.881,
1.580,7.912,1.580,7.945,1.580,7.976,1.580,8.009,1.570,8.032,1.570,8.065,1.570,8.090,1.570,
8.123,1.570,8.148,1.570,8.184,1.570,8.212,1.570,8.245,1.570,8.275,1.570,8.312,1.570,6,TB,0
.037,1.285,PS,-7.160,1.000,SS,8.037,1.570,PA,-
0.221,2.122,SA,0.282,2.124,TC,0.000,0.000,2.123,-0.472

20131015074807054,12873,32.873999,675521.644,5901838.274,28.840,215.161,0.412,0.068,1.915,
1.295,-0.169,522,-7.454,1.080,-7.434,1.080,-7.390,1.080,-7.367,1.080,-7.343,1.080,-
7.301,1.080,-7.276,1.090,-7.252,1.080,-7.216,1.090,-7.180,1.090,-7.152,1.090,-
7.124,1.090,-7.090,1.080,-7.060,1.090,-7.037,1.090,-7.001,1.090,-6.971,1.080,-
6.946,1.090,-6.916,1.090,-6.888,1.090,-6.854,1.090,-6.824,1.090,-6.800,1.090,-
6.763,1.090,-6.728,1.090,-6.708,1.090,-6.671,1.090,-6.642,1.090,-6.614,1.090,-
6.578,1.090,-6.550,1.090,-6.524,1.090,-6.488,1.090,-6.460,1.090,-6.436,1.090,-
6.408,1.090,-6.378,1.090,-6.350,1.090,-6.316,1.090,-6.278,1.090,-6.252,1.080,-
6.222,1.080,-6.188,1.080,-6.158,1.080,-6.128,1.080,-6.108,1.080,-6.080,1.080,-
6.048,1.080,-6.022,1.080,-5.986,1.090,-5.952,1.080,-5.930,1.080,-5.894,1.080,-
5.866,1.080,-5.839,1.080,-5.806,1.080,-5.773,1.080,-5.748,1.090,-5.714,1.080,-
5.681,1.090,-5.650,1.080,-5.620,1.080,-5.587,1.080,-5.567,1.080,-5.537,1.080,-
5.509,1.070,-5.487,1.070,-5.440,1.080,-5.407,1.070,-5.379,1.070,-5.357,1.070,-
5.318,1.060,-5.290,1.070,-5.254,1.060,-5.235,1.060,-5.198,1.050,-5.178,1.060,-
5.146,1.060,-5.110,1.060,-5.079,1.050,-5.060,1.060,-5.021,1.050,-4.991,1.050,-
4.965,1.050,-4.937,1.060,-4.907,1.050,-4.874,1.050,-4.846,1.060,-4.812,1.060,-
4.785,1.050,-4.760,1.050,-4.721,1.050,-4.693,1.060,-4.661,1.060,-4.633,1.060,-

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```
4.604,1.060,-4.569,1.070,-4.539,1.070,-4.519,1.070,-4.489,1.080,-4.460,1.070,-
4.424,1.080,-4.396,1.080,-4.371,1.080,-4.333,1.090,-4.307,1.090,-4.280,1.090,-
4.244,1.090,-4.207,1.100,-4.189,1.100,-4.161,1.100,-4.122,1.100,-4.102,1.100,-
4.066,1.120,-4.033,1.140,-4.008,1.140,-3.972,1.130,-3.950,1.140,-3.914,1.140,-
3.886,1.140,-3.850,1.140,-3.827,1.140,-3.800,1.150,-3.769,1.160,-3.745,1.180,-
3.709,1.170,-3.677,1.180,-3.645,1.190,-3.611,1.180,-3.589,1.180,-3.567,1.190,-
3.528,1.200,-3.497,1.210,-3.469,1.220,-3.434,1.220,-3.405,1.230,-3.384,1.220,-
3.351,1.230,-3.320,1.230,-3.292,1.260,-3.259,1.270,-3.217,1.270,-3.201,1.270,-
3.167,1.270,-3.143,1.290,-3.115,1.290,-3.082,1.300,-3.057,1.310,-3.020,1.320,-
2.993,1.310,-2.962,1.320,-2.931,1.330,-2.909,1.350,-2.876,1.350,-2.848,1.370,-
2.818,1.380,-2.798,1.390,-2.759,1.390,-2.726,1.380,-2.696,1.380,-2.671,1.410,-
2.635,1.420,-2.615,1.410,-2.576,1.440,-2.543,1.450,-2.523,1.450,-2.490,1.460,-
2.465,1.490,-2.437,1.480,-2.401,1.480,-2.372,1.510,-2.343,1.510,-2.315,1.540,-
2.282,1.540,-2.254,1.550,-2.241,1.560,-2.204,1.590,-2.178,1.580,-2.141,1.600,-
2.114,1.600,-2.092,1.640,-2.058,1.650,-2.030,1.670,-1.991,1.650,-1.969,1.670,-
1.938,1.700,-1.906,1.680,-1.877,1.690,-1.856,1.740,-1.824,1.730,-1.792,1.740,-
1.761,1.760,-1.738,1.760,-1.710,1.750,-1.683,1.780,-1.647,1.800,-1.620,1.810,-
1.597,1.830,-1.564,1.840,-1.530,1.860,-1.502,1.860,-1.475,1.900,-1.450,1.890,-
1.428,1.880,-1.388,1.900,-1.358,1.920,-1.325,1.900,-1.306,1.920,-1.270,1.940,-
1.248,1.940,-1.226,1.970,-1.184,1.970,-1.166,1.950,-1.128,2.000,-1.103,2.000,-
1.076,2.010,-1.044,2.070,-1.012,2.060,-0.998,2.050,-0.970,2.070,-0.931,2.120,-
0.908,2.100,-0.879,2.090,-0.843,2.100,-0.820,2.110,-0.798,2.170,-0.759,2.100,-
0.732,2.140,-0.701,2.150,-0.673,2.120,-0.635,2.150,-0.606,2.110,-0.576,2.150,-
0.554,2.140,-0.527,2.140,-0.496,2.150,-0.454,2.140,-0.426,2.150,-0.391,2.130,-
0.360,2.110,-0.327,2.140,-0.298,2.140,-0.271,2.110,-0.246,2.100,-0.219,2.130,-
0.179,2.110,-0.154,2.130,-0.111,2.050,-0.063,1.930,-
0.029,1.850,0.011,1.830,0.061,1.820,0.073,1.820,0.098,1.840,0.123,1.880,0.148,1.930,0.176,
1.960,0.201,1.970,0.212,2.080,0.254,2.070,0.279,2.060,0.306,2.070,0.331,2.090,0.365,2.070,
0.397,2.080,0.423,2.070,0.456,2.100,0.497,2.100,0.514,2.100,0.542,2.100,0.565,2.080,0.606,
2.130,0.639,2.110,0.670,2.070,0.719,2.090,0.736,2.080,0.761,2.100,0.791,2.130,0.822,2.120,
0.844,2.120,0.880,2.080,0.908,2.070,0.945,2.100,0.972,2.070,1.017,2.060,1.033,2.050,1.058,
2.060,1.097,2.030,1.122,2.030,1.161,2.020,1.188,2.020,1.225,2.020,1.261,1.980,1.294,2.010,
1.325,1.960,1.352,1.970,1.389,1.940,1.405,1.940,1.441,1.930,1.471,1.950,1.505,1.900,1.541,
1.890,1.577,1.880,1.593,1.870,1.633,1.860,1.668,1.850,1.693,1.850,1.719,1.820,1.757,1.820,
1.782,1.800,1.818,1.790,1.854,1.770,1.885,1.790,1.910,1.770,1.940,1.770,1.970,1.780,2.004,
1.750,2.032,1.760,2.060,1.730,2.088,1.710,2.118,1.710,2.160,1.720,2.184,1.730,2.214,1.730,
2.250,1.710,2.273,1.690,2.300,1.680,2.337,1.700,2.365,1.680,2.390,1.690,2.426,1.680,2.451,
1.670,2.490,1.680,2.512,1.680,2.532,1.660,2.578,1.690,2.601,1.660,2.645,1.680,2.658,1.670,
2.695,1.670,2.745,1.680,2.758,1.700,2.786,1.700,2.808,1.680,2.845,1.660,2.884,1.650,2.925,
1.640,2.945,1.660,2.964,1.640,2.989,1.640,3.033,1.630,3.062,1.630,3.089,1.640,3.125,1.630,
3.152,1.640,3.178,1.630,3.225,1.630,3.238,1.620,3.275,1.610,3.305,1.640,3.333,1.630,3.369,
1.630,3.402,1.620,3.420,1.620,3.458,1.630,3.483,1.610,3.506,1.630,3.542,1.620,3.580,1.610,
3.597,1.620,3.630,1.620,3.657,1.610,3.694,1.630,3.721,1.610,3.758,1.600,3.779,1.620,3.808,
1.600,3.841,1.610,3.872,1.600,3.907,1.600,3.938,1.600,3.971,1.610,3.991,1.610,4.027,1.600,
4.044,1.590,4.077,1.600,4.118,1.590,4.152,1.600,4.177,1.600,4.204,1.610,4.231,1.590,4.266,
1.610,4.296,1.600,4.332,1.590,4.359,1.610,4.387,1.590,4.409,1.590,4.446,1.590,4.476,1.590,
4.510,1.590,4.532,1.590,4.565,1.580,4.601,1.590,4.617,1.590,4.651,1.590,4.689,1.580,4.718,
1.580,4.745,1.580,4.779,1.580,4.797,1.580,4.829,1.570,4.867,1.560,4.893,1.560,4.931,1.570,
4.956,1.560,4.993,1.560,5.019,1.560,5.043,1.550,5.073,1.560,5.111,1.560,5.133,1.560,5.161,
1.560,5.192,1.560,5.223,1.550,5.261,1.550,5.287,1.540,5.314,1.540,5.353,1.540,5.369,1.540,
5.414,1.540,5.439,1.540,5.469,1.540,5.503,1.540,5.522,1.540,5.555,1.540,5.581,1.540,5.619,
1.540,5.653,1.540,5.683,1.540,5.705,1.550,5.745,1.550,5.763,1.550,5.797,1.550,5.833,1.550,
5.860,1.540,5.889,1.540,5.925,1.540,5.947,1.540,5.989,1.540,6.011,1.550,6.039,1.550,6.075,
1.550,6.102,1.550,6.127,1.550,6.174,1.550,6.190,1.550,6.210,1.550,6.255,1.560,6.269,1.560,
6.310,1.550,6.340,1.560,6.368,1.560,6.404,1.560,6.429,1.550,6.454,1.560,6.490,1.560,6.515,
1.550,6.548,1.550,6.584,1.550,6.607,1.550,6.643,1.550,6.668,1.550,6.701,1.550,6.726,1.550,
6.760,1.550,6.782,1.540,6.812,1.550,6.846,1.550,6.876,1.550,6.912,1.550,6.943,1.540,6.968,
1.550,7.000,1.540,7.023,1.540,7.046,1.540,7.090,1.540,7.123,1.540,7.154,1.540,7.184,1.540,
7.209,1.540,7.237,1.540,7.268,1.540,7.303,1.540,7.331,1.540,7.356,1.540,7.389,1.540,7.420,
1.530,7.453,1.540,7.480,1.530,7.520,1.530,7.544,1.530,7.567,1.530,7.603,1.530,7.636,1.530,
7.661,1.530,7.694,1.520,7.719,1.530,7.747,1.520,7.783,1.520,7.811,1.520,7.844,1.520,7.875,
1.530,7.908,1.520,7.930,1.520,7.974,1.520,7.988,1.520,8.014,1.520,8.050,1.520,8.077,1.510,
8.110,1.520,8.141,1.510,8.166,1.510,6,TB,0.068,1.295,PS,-7.329,1.080,SS,8.068,1.510,PA,-
0.193,2.096,SA,0.304,2.071,TC,0.000,0.000,2.084,-0.491
```


1.25.4 VisualSoft Sail Line File Format

This is a CSV file format, with comma delimited fields. Records are terminated with a carriage return and line feed.

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This format must contain a header record to define the column contents. This must be: Type,Easting,Northing,KP

The Easting, Northing & KP columns contain decimal numbers; the number of decimal places can vary. The units should be same as the units in the associated Project (most commonly metres for grid coordinates and kilometres for KP).

The type column has the following options:

0 – specifies the start or end of a straight line segment.

1 – specifies the centre of an arc in a clockwise direction

2 – specifies the centre of an arc in a anti-clockwise direction

The line is made up of straight lines and arcs (or curves). It is not necessary to repeat a point if it is both the end of a straight line and also the start of an arc, or the end of an arc and start of a straight line. An arc will be defined by the centre point (type 1 or 2) and the records of type 0 immediately before and after it.

The line sections (straight lines or arcs) must be in ascending KP order.

e.g.

```
Type,Easting,Northing,KP
0,450000.00,5650000.00,0.000
0,450000.00,5654000.00,4.000
1,451000.00,5654000.00
0,451000.00,5655000.00,5.571
0,452500.00,5655000.00,7.071
2,452500.00,5657500.00
0,455000.00,5657500.00,10.998
0,455000.00,5660000.00,13.498
```

1.25.5 VisualSoft Tidal Height File

The Tide file is comma-separated with three columns: UTC Date, UTC Time and Tidal Height.

- Date and time **must be UTC** not local time.
- Date format must be **dd/mm/yyyy** and time format must be **hh:mm:ss**.
- Tidal height should be in **metres**.

e.g.:

```
26/08/2014,00:00:00,0.62
26/08/2014,00:10:00,0.60
26/08/2014,00:20:00,0.58
```

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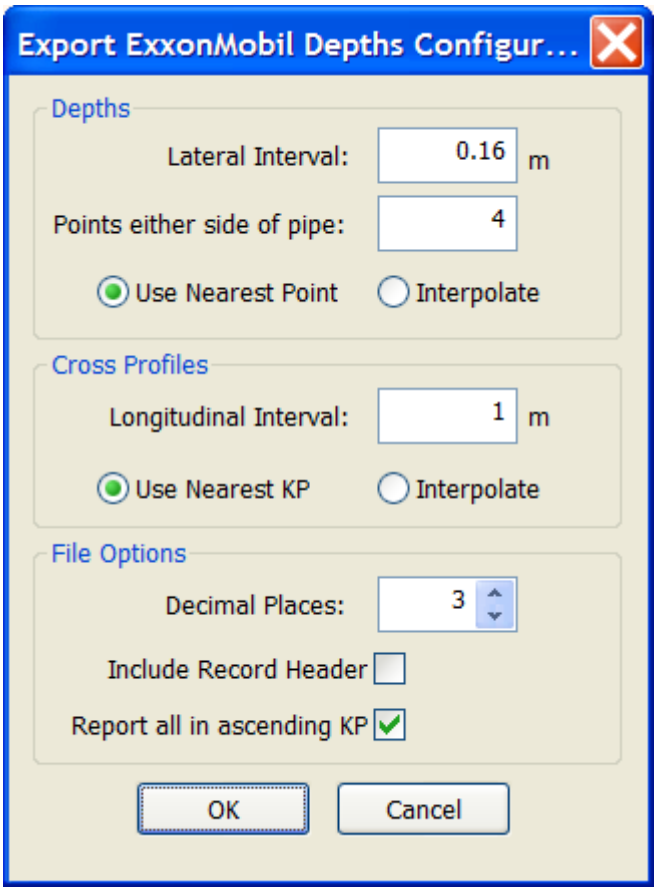
```
26/08/2014,00:30:00,0.57
26/08/2014,00:40:00,0.54
```

1.25.6 Export Formats

Enter topic text here.

ExxonMobil Depths

This creates a list of depth values from the processed cross-profile data. Depth points are spaced both along the pipeline (Longitudinal Interval) and to either side of it (Lateral Interval) according to the chosen settings. In each case you can either export the depth of the data point closest to the selected interval, or can interpolate a value at the exact interval.



The default "Lateral Interval" for the spacing of depth points is half of the pipe diameter in the current scan.

This exports a comma separated listing of processed cross-profile data in the following format:

- Profile ID number
- Time & Date

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- KP
- Pipe Diameter
- Easting of Top of Pipe
- Northing of Top of Pipe
- Top of Pipe Depth
- Central Seabed Depth
- Seabed Pipe Left immediately adjacent to Pipe
- Seabed Pipe Left at 1 x Lateral Interval from Pipe
- Seabed Pipe Left at 2 x Lateral Interval from Pipe
- Seabed Pipe Left at 3 x Lateral Interval from Pipe
- ...
- Seabed Pipe Right at N-1 x Lateral Interval from Pipe (where N is the specified number of depth points either side of the pipe)
- Seabed Pipe Right immediately adjacent to Pipe
- Seabed Pipe Right at 1 x Lateral Interval from Pipe
- Seabed Pipe Right at 2 x Lateral Interval from Pipe
- Seabed Pipe Right at 3 x Lateral Interval from Pipe
- ...
- Seabed Pipe Right at N-1 x Lateral Interval from Pipe (where N is the specified number of depth points either side of the pipe)

Saipem Depths

This creates a list of depth values from the processed cross-profile data. Depth points are spaced both along the pipeline (Longitudinal Interval) and to either side of it (Lateral Interval) according to the chosen settings. In each case you can either export the depth of the data point closest to the selected interval, or can interpolate a value at the exact interval.

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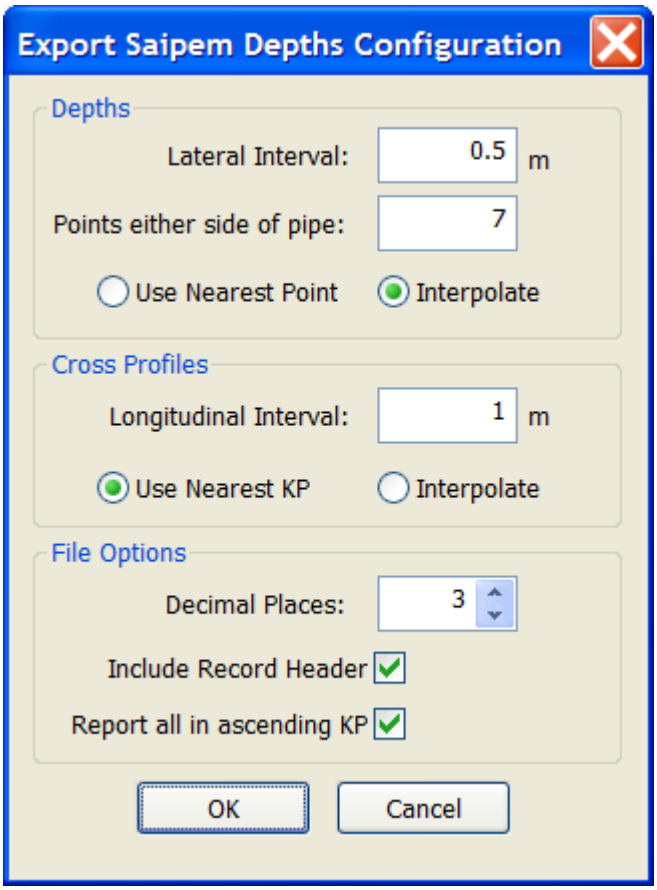

This exports a comma separated listing of processed cross-profile data in the following format:

- Profile ID number
- Time & Date
- KP
- Pipe Diameter
- Easting of Top of Pipe
- Northing of Top of Pipe
- Top of Pipe Depth
- Central Seabed Depth
- Seabed Pipe Left immediately adjacent to Pipe
- Seabed Pipe Left at 1 x Lateral Interval from Pipe
- Seabed Pipe Left at 2 x Lateral Interval from Pipe
- Seabed Pipe Left at 3 x Lateral Interval from Pipe
- Seabed Pipe Left at 4 x Lateral Interval from Pipe
- Seabed Pipe Left at 5 x Lateral Interval from Pipe
- Seabed Pipe Left at 6 x Lateral Interval from Pipe
- Seabed Pipe Right immediately adjacent to Pipe
- Seabed Pipe Right at 1 x Lateral Interval from Pipe
- Seabed Pipe Right at 2 x Lateral Interval from Pipe
- Seabed Pipe Right at 3 x Lateral Interval from Pipe
- Seabed Pipe Right at 4 x Lateral Interval from Pipe
- Seabed Pipe Right at 5 x Lateral Interval from Pipe

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- Seabed Pipe Right at 6 x Lateral Interval from Pipe

Pisys Format V1

This format matches the "Transverse Profile Data" format defined in Pisys document "pisys formats1.6.doc".

You will be prompted to enter an interval in metres for scan export. If you enter zero, then all scans will be exported. If you enter a non-zero value scans will be exported using that interval, with the closest scan being used if there is no exact match at the defined interval.

Pisys Processed (TPDS)

This format matches the "Processed Transverse Profiles Format" format defined in Pisys document "Pisys Formats1.6.doc", and recommended for use with their TPDS viewer.

You will be prompted to enter an interval in metres for scan export. If you enter zero, then all scans will be exported. If you enter a non-zero value scans will be exported using that interval, with the closest scan being used if there is no exact match at the defined interval.

Cross-Profile DXF

This option exports the Cross-Profile data to a series of AutoCAD DXF files. One DXF file is created for each scan.

Note that this is not required for use with AutoChart from Wish Software (www.wishsoftware.com) which is able to read the VisualSoft data directly, without the need for conversion to DXF files.

1.26 Editing and Managing Inspection Events

"Events" are used to record the time and location of something that was seen during a video survey, with details of what was seen and what condition it was in. These Events can be logged online during a survey or inspection, or offline when the recorded video is being played back and reviewed.

What VisualSoft calls an Event, other companies call by different names, for example they are "Incidents" at Shell and "Observations" at Equinor. All are essentially the same thing: Something that is seen at a given time or place during an inspection or survey. They might be physical features that are part of a pipeline's construction, areas of damage or corrosion, areas of marine growth, or items found on the seabed or around a pipeline or structure, whether natural or otherwise. An event, incident, or observation can be anything to which you can assign a time and a position.

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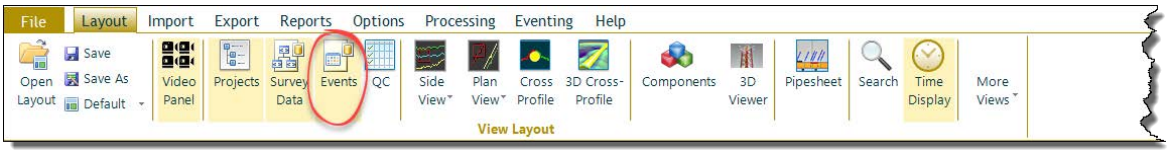
If Events have been logged online using VisualEventLogger, they will be displayed automatically when the relevant video dataset is loaded offline in any edition of VisualEdit. If you have a licence for VisualEdit Eventing or VisualEdit Professional you will then also be able to make changes to those Events, add new ones or delete them.

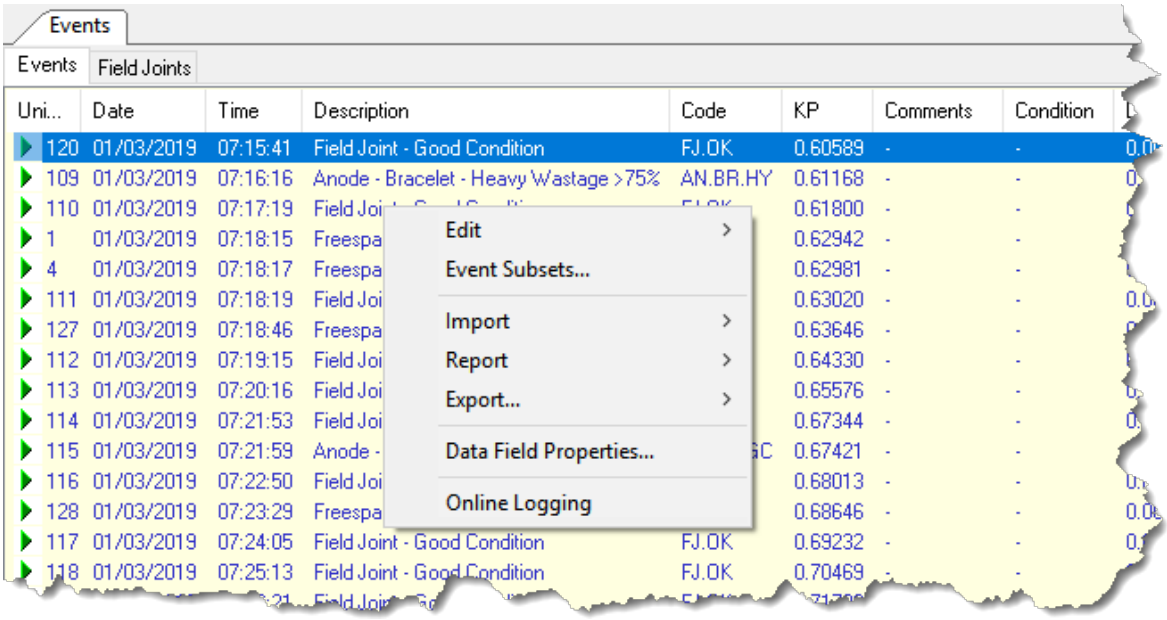
If Events were not logged online you can create them offline instead using a right-click menu, keyboard shortcuts, a toolbar, a logging tablet, or a logging wizard.

Events are displayed in a text list which can be turned on or off using the Events button on the Layout ribbon as shown below. They can also be displayed in the Side View, Plan View, 3D Cross-Profile View, and Pipesheet graphics.



1.26.1 The Right-Click Menu

When the Event list is displayed, you can right-click to open a menu.



The menu has the following options:

Menu Item	Description
Edit, New 185	Insert a new event at the time of the current video frame
Edit, Move 193	Move an event to the time of the current video frame
Edit, Delete 197	Delete the selected event
Edit, Use Wizard, New Event... 185	Insert a new event at the time of the current video frame

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Menu Item	Description
Edit, Use Wizard, Edit Event... 192	Open the selected event in the editing wizard
Edit, Use Wizard, Quick Edit Mode	Turn on Quick Edit mode for the wizard. This means that only columns configured for logging of the current event type will appear in the wizard. With Quick Edit mode off the wizard will show all columns for all event types.
Edit, Use Wizard, Configuration...	Enable or disable Quick Entry mode,and show or hide event types
Edit, Show Event Toolbar... 186	Open a small toolbar for logging new Events
Edit, Show Event Tablet... 186	Open a logging tablet, with configurable buttons for logging new Events
Edit, Delete All Listed Events... 197	Delete all Events shown in the current list, which can be either the full event list or a configured Subset.
Edit, Auto Update Events... 194	Update fields in the event list which are configured to use timestamps, data from other tables or calculated lengths etc.
Edit, Laser Positioning... 196	Update event positions to match the calculated position where a laser line is projected onto the pipeline.
Edit, Sync Events Using Time...	Update the hidden event timestamp from the date and time columns or update the date and time columns from the hidden timestamp. neither of these is normally necessary and this should probably only be done under advice from VisualSoft's Support team.
Edit, Refresh QC Icons	Updates the icons which warn of non-paired events or events where the calculated length may be incorrect.
Edit, Processing Scripts... 212	Open the batch processing window to use data processing scripts to update event positions or set values in other columns.
Edit, Auto Generate Events, Spans 187	Use processed Cross-Profile data to create Freespan Events.
Edit, Auto Generate Events, Burials 190	Use processed Cross-Profile data to create Burial Events.
Edit, Auto Generate Events, Regular Events 191	Create Events at a fixed distance interval, for example PRISM's "Nav Marker" events every 12 or 50 metres.
Edit, Reclassify Events, SITRAS 4.02 Freespans 204	Convert simple Freespan Start/End events into the different span categories defined by Equinor's SITRAS.
Edit, Block Shift Events...	Adjust the time of all events by a fixed number of seconds
Edit, Recover Raw...	Undo all changes since event data was logged **online**. Any offline changes will be lost.
Edit, Undo Changes	Undo all changes since event data was last saved.
Edit, Save Changes	Save all edited event data
Event Subsets... 198	Open the Subset builder to configure, save and load definitions for Subsets of events
Import..., From DVR Log Table...	Import basic DVR Log event entries into the standard Events table where they can be edited.

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Menu Item	Description
Report..., VisualWorks Report... 83	Report video and data in a format compatible with the VisualReview free viewer application.
Report..., PRISM Report... 93	Report video and data in a format compatible with the PRISM software used by BP and others.
Export..., To CSV...	Export the loaded Event data to a CSV file
Export..., To Excel..	Export the loaded Event data and each Subset to an Excel spreadsheet file with extra worksheets for each Subset
Data Field Properties...	Configure the data type and formatting of the selected data column.
Online Logging	Re-log loaded events as part of as currently survey or inspection

1.26.2 Inserting New Events

If you logged Events using the online **VisualEvent Logger** you may find that you missed a few of them. Using **VisualEdit Eventing** or **VisualEdit Professional** offline, you can review the recorded video and create these missed events. If you did not use the online logger, then you will be able to create all the Events offline.

There are a few different ways to do this:

Keyboard shortcuts – Quick and useful for things like Field Joints that are seen often and usually don't need extra comments or details

Small toolbar – 186 Also quite quick and simple, but the buttons can be a bit small if you are in a hurry

Tablet buttons – 186 Quick and easy, with nice big buttons that are easy to "hit" in a hurry. You may even want to use a touchscreen with these big buttons?

Logging Wizard – Lets you select from all available Event types. Useful for Event types that you don't expect to see very often.

Auto Generate Events – There are tools to create some Event types automatically:

- Create Freespan Events Automatically 187
- Create Burial Events Automatically 190 which also lets you Create Exposure Events Automatically
- Create Regular Events Automatically 191

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The Eventing Toolbar

The Logging Toolbar has small buttons, and most people use it to log events that won't be seen very often, or for events where you can be sure that the ROV will stop (if using online logging). For more frequent events that the ROV will fly past without stopping you will probably find it easier to use the larger buttons of the Logging Tablet.

Online, the toolbar is opened by clicking the Tool Bar ... button in the main window. Offline, in VisualEdit it is opened using the right-click menu, or the button on the Eventing ribbon at the top of the screen.

You can use the toolbar to open the Logging Wizard by clicking the New Event button .

If the toolbar has extra buttons for specific types of event, you can click those to log the relevant event types.

If a button has Quick Entry mode enabled, no further action is required and the event will be logged immediately.

If a button does not have Quick Entry mode enabled, the Logging Wizard will prompt you for extra details about the new event.

For online logging, the time associated with each logged event is taken from the time that you click the button on the toolbar, not the time when you complete the Wizard. Offline, the time is taken from the currently displayed video frame.

The Eventing Tablet

After you have used the Tablet Designer to design a logging tablet you can open that Logging Tablet online by clicking on the Tablet ... button in the main window. The Tablet button will open whichever tablet was last used in the Tablet Designer. Offline, in VisualEdit the tablet is opened using the right-click menu, or from the button on the Eventing ribbon at the top of the screen.

Click on the tablet's buttons to log the relevant event types.

If a button has Quick Entry mode enabled, no further action is required and the event will be logged immediately.

If a button does not have Quick Entry mode enabled, the Logging Wizard will prompt you for extra details about the new event.

For online logging, the time associated with each logged event is taken from the time that you click the button on the tablet, not the time when you complete the Wizard. Offline, the time is taken from the currently displayed video frame.

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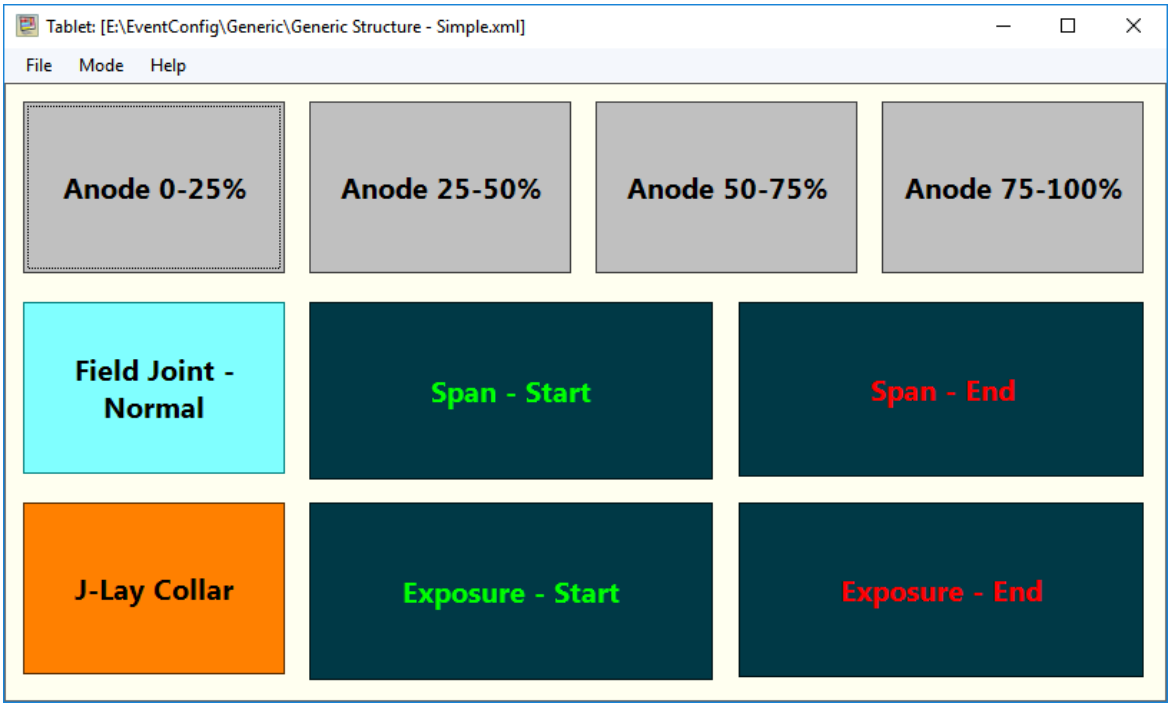
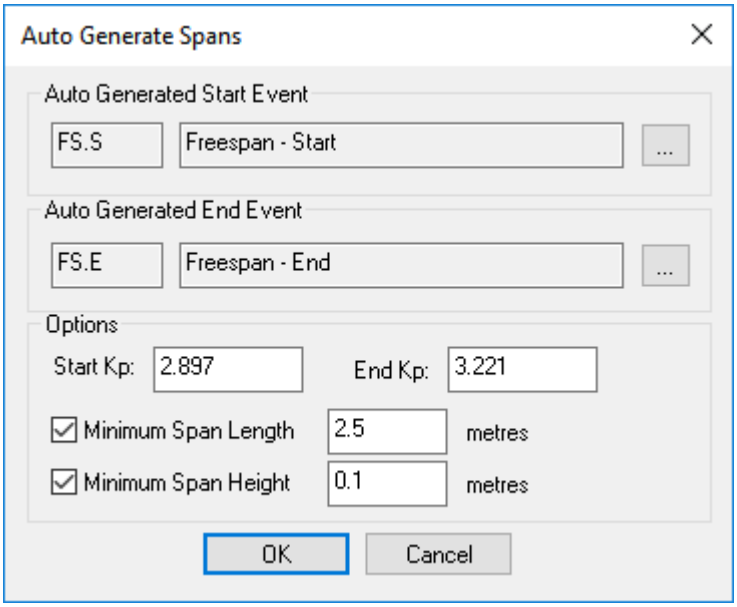


Create Freespan Events Automatically

If you have processed Cross-Profile data, you can use it to create Freespan Start and End events automatically. Right-click in the Event list and select Edit, Auto Generate Events, Spans.



Click the ... buttons to select the relevant Event types for the start and end of a freespan.

The KP limits will show all loaded data, but you can reduce these limits if you only want to work on a small section of data.

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Most pipeline operators will ask you not to report spans that are very short. The lower limit will be different from one client to another, and even from one pipeline to another; the larger the pipeline diameter, the less relevant the short spans will be. You can set a minimum length here. It is probably sensible to set it a bit shorter that your client's limit and then review any spans that are close to the limit.

Similarly you can set a minimum height so that spans are not created for areas where the data is a bit ambiguous. This minimum should usually be very small.

When you click OK the tool looks through all of the processed cross-profile data in KP order. It finds the places where one scan shows a span but its neighbour does not and then it creates a Start or End event half way between the two scans. The closer together your cross-profile interval, the more accurate this will be, so if you have quite big gaps between your scan records be careful not to set the minimum span length too short. You may find that the start and end are further apart than the automatic tool thinks they are and so when you review the data you may need to move them slightly.

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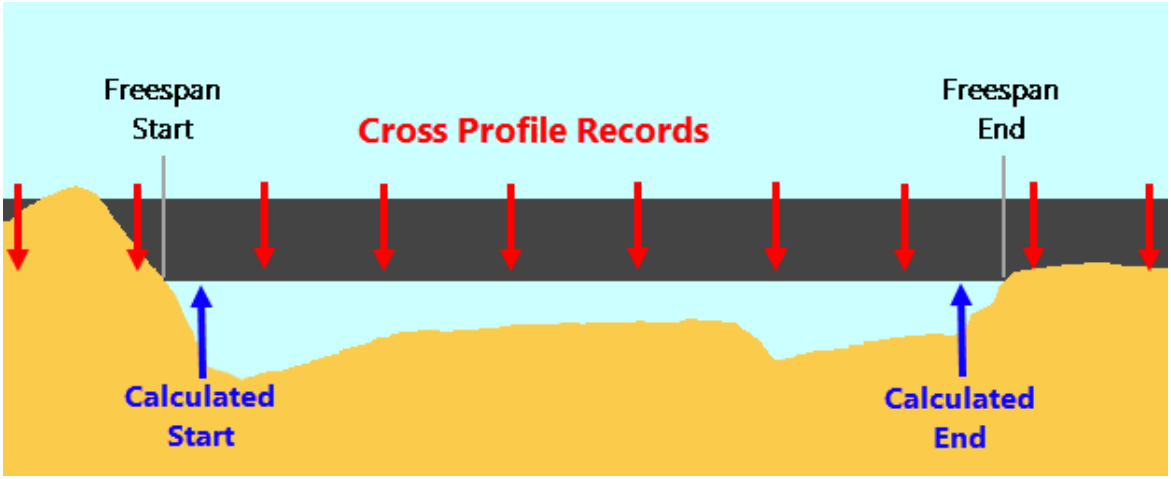
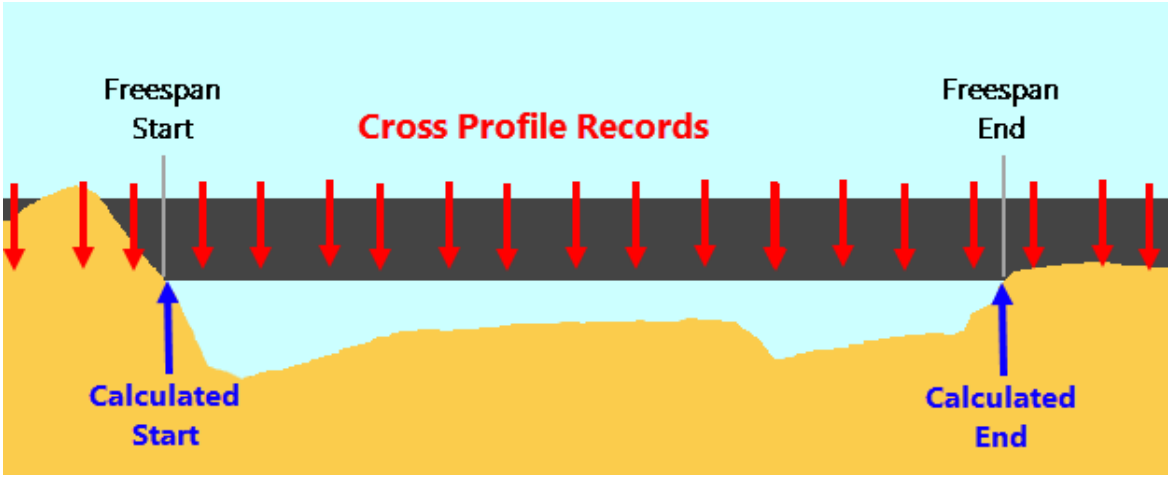
In the examples below, you can see that the second version with twice as many scans, at a closer interval, will give a far more accurate result than the version with fewer and wider spaced scans.





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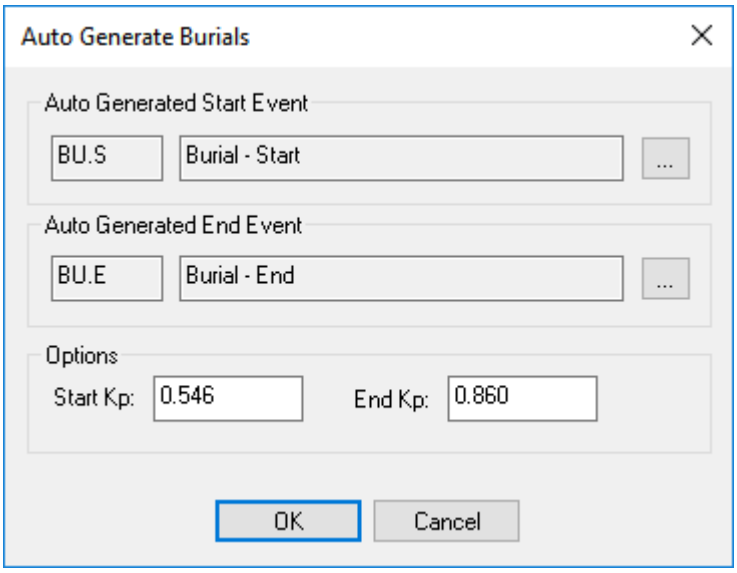
Create Burial Events Automatically

If you have processed Cross-Profile data, you can use it to create Burial Start and End events automatically. Right-click in the Event list and select Edit, Auto Generate Events, Burials.



Click the ... buttons to select the relevant Event types for the start and end of a burial area.

The KP limits will show all loaded data, but you can reduce these limits if you only want to work on a small section of data.

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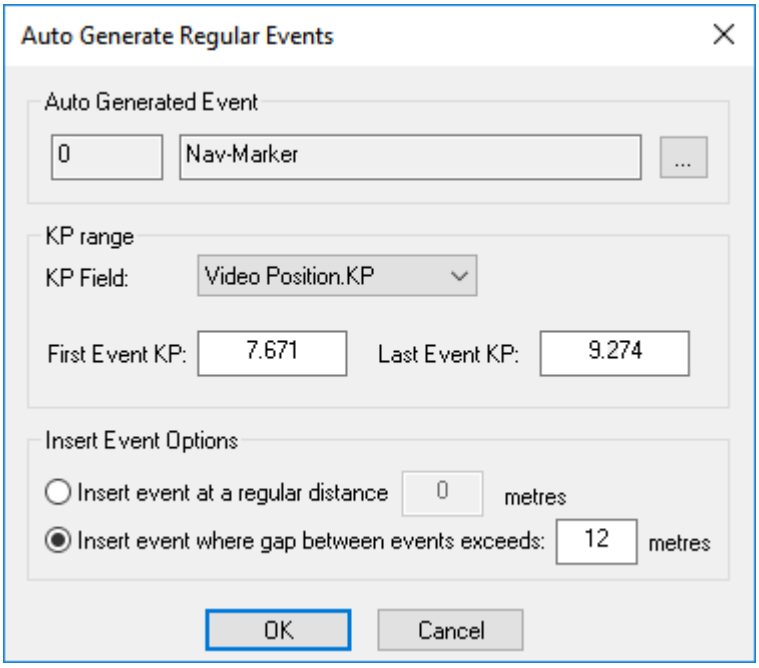
Create Regular Events Automatically

Some clients ask you to create event records at a minimum interval, even in areas where nothing specific changes. Examples of this are "Burial continues" events which are sometimes used in areas of very long areas of buried pipeline, or PRISM's "Nav Marker" events which are created every 12 or 50 metres unless another event has occurred within that distance of the previous event.



For "Burial continues" events you will need to run the tool once for each section of long burial, adjusting the KP limits in the window to match the KP limits of each buried section and setting the regular distance interval to match your client's requirements.

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1.26.3 Editing Events

Event data can be changed in a number of different ways:

You can move events to a new position by changing the timestamp 193 to match a different time in the video, and then Auto-Update 194 the positions, depth, KP, etc., to match that new timestamp. This is useful if you find that something was logged a little bit late online, and it is worth remembering that it is quick and easy to do – so it is always better to log something a bit too late online than to not log it at all.

You can change the type or classification of an event if it turns out to be different from what you first thought. For example you may have thought that an item of debris was soft when seen quickly during an online inspection, but when you review the video more slowly you may want to change it to hard debris, or metalic debris.

You can Auto-Update event data 194 to match changes made to processed position data, or because you have made changes to the time or type of an event. In the Event Configuration, each column of the event data table can be set to update automatically or to be entered manually. Things like the Easting, Northing, Depth and KP are best set to update automatically so that if you re-edit the processed ROV position data or re-edit the Cross-Profile or MBE data you can quickly change the event positions to match.

You can update event positions by calculating where a laser line 196 is projected onto a pipeline. Quite a few companies now use a green laser on their survey and inspection ROVs, drawing a green laser line across the pipeline and the seabed. Events are logged when the user sees the green line centred on the feature to be logged. This helps to ensure consistency between different users and different survey directions. Because you know where the laser source is mounted on the ROV, at what angle it is shining the light, and how high off the seabed or pipeline the ROV is flying, you can calculate where the projected green line will be and then use this calculated position to update the event positions.

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Moving or Changing the Time of Events

If an Event has been logged at the wrong time, either too early or too late, you can change it as follows:

1. Play and then Pause the video to the show the correct time and position for the event

2. Use Step Forward or Step Back 69 if you need to make small adjustments to get the video picture that best shows the event

3. In the Event list, **right-click** on the event that should match the displayed video, and select Edit, Move. (Be careful to RIGHT-click so that you can update the event time to match the new video time. If you accidentally LEFT-click, the video will move to match the event time instead of the event moving to the video time.)

The next time that you click on that Event, it will take you back to the same video frame that you chose in steps 1 and 2 above.

After changing your event(s) to the correct times, you can use Auto Update Events 194 to change the positions and KPs to match the new times, and to recalculate the lengths of any Freespans, Burials, or other paired events that might have been moved.

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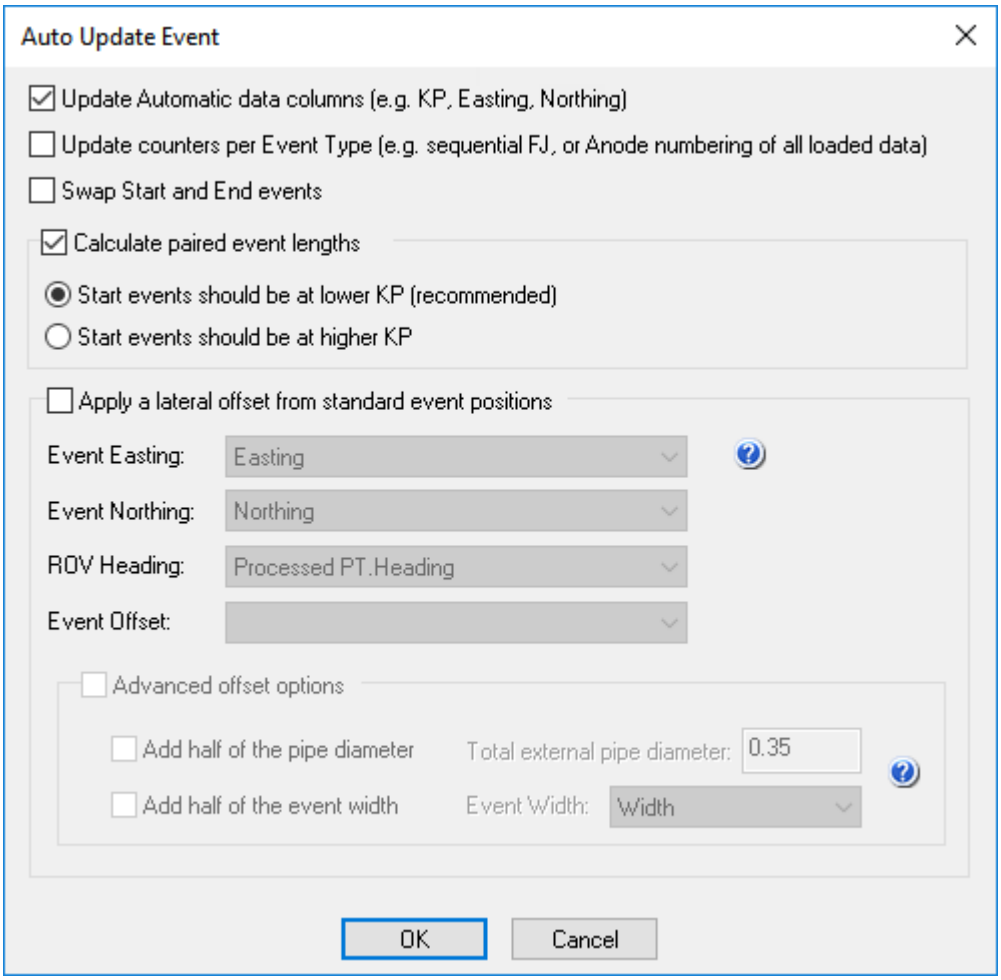
Auto Update Events

"Auto Update" is a quick and easy way of making sure that your event data matches other processed data tables.

After you have made changes to your data, for example changing event types, moving any events, or inserting or deleting any events you should run the Auto Update tool. Right-click in the events list and go to Edit, Auto-Update Events, or click on Auto-Update Events on the Eventing ribbon at the top of the screen. This will open the Auto-Update window. This window has a lot of settings, but **most often you will only need to use "Update automatic data columns" and "Calculate paired event lengths", and occasionally "Swap Start and End events".** These and the other settings are explained in the table below.



Setting	Description
Update automatic data columns	For each event, any columns that are defined as automatic, will be updated using the methods described in the list of Auto-Update Methods below. Most commonly this means updating readable dates and times, and copying positions from the Easting, Northing,

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	Depth and KP columns of the Video Position table into each event record, interpolating to match the event time.
Update counters per Event Type	This is now very rarely used. **It is better to use the script Set Advanced Numbering 285 instead.** The script lets you define a starting number (so that you do not have to load a whole project at once) and it lets you set the numbers in KP order instead of time order. It also has "conditions" so that the numbers can be applied separately to different types of event. These numbers are best assigned after all editing and QC when you might add, delete or move events.
Swap Start and End events	When logging linear events like Freespans it is always easiest to record the data in the order that you see it, so when the pipeline leaves the seabed you log a Start of Freespan, and when it comes back down you log an End of Freespan. The final report will usually ask for data to be reported in KP order, so if you survey a pipeline in descending KP direction, travelling towards KP zero, you will have logged the Start and End events in the "wrong" order. This option lets you very quickly swap them round, changing Starts to Ends, and Ends to Starts.
Calculate paired event lengths	Each linear event has a KP for the Start event, and a KP for the End event. If you have defined a paired, linear event in the Event Configuration, for example pairing "Freespan Start" with "Freespan End", you can then use the two KP values to calculate a length in metres from start to end. The calculation uses (End event KP minus Start event KP) multiplied by 1000.
Apply a lateral offset from standard event positions	When you update the Easting and Northing columns by copying them from the Video Position table the event will be assigned a position on the centre of the processed pipeline route. However, some events are not on or part of the pipeline. You may have a boulder or an item of debris that is some distance to the side of the pipeline. If your event configuration has a column where you can record that distance, you can use it to calculate a more accurate position for these boulders or debris items. For the basic calculation you need to specify what position you want to offset from – usually the Event table Easting and Northing – and then which column in the data tables holds the distance from pipeline to boulder and which column has the ROV heading. If you want to be as accurate as possible you

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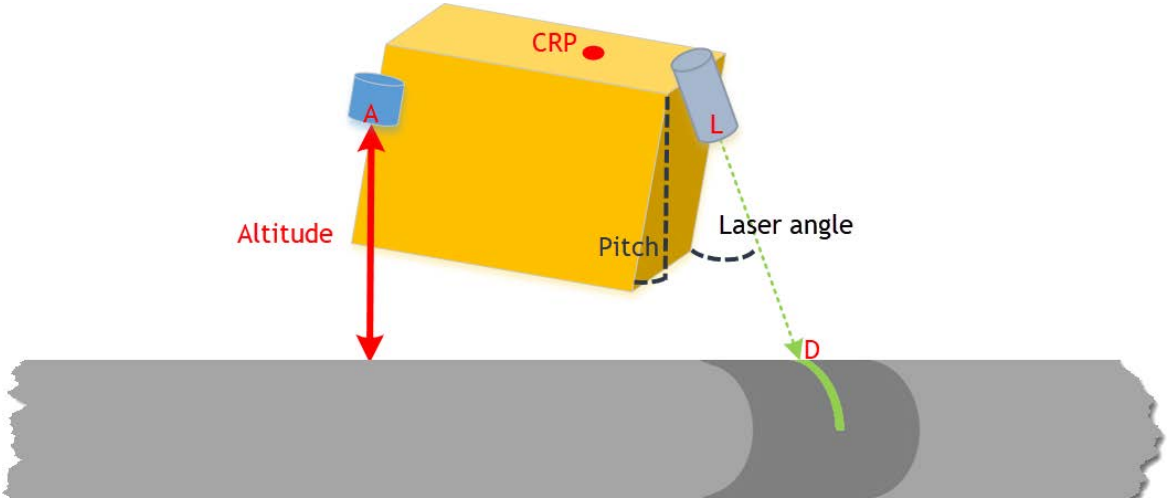
need to consider that the default Easting and Northing (copied from the Video Position) will be the middle of the pipeline, but the distance you entered for how far a boulder is from the pipeline is from the edge of the pipeline ("distance off"), not the middle. You can therefore turn on an advanced offset option to add half the pipe diameter to the distance off before calculating the boulder position. Sometimes even this is not good enough. If you have a large boulder you probably want to calculate a position for the middle of the boulder, not a position of the point closest to the pipeline. In that case you need to allow for half of the pipe diameter and also half of the width of the boulder.

Calculate the Position of a Laser Line

Some ROVs use a green laser to project a line on the seabed and/or pipeline at 90° to the ROV's heading. We need to know the ROV CRP position, its pitch, roll and heading, and its altitude above the seabed or pipe, and we need to know the angle of the laser line relative to the ROV. We can then calculate where the laser line meets the seabed of pipe.



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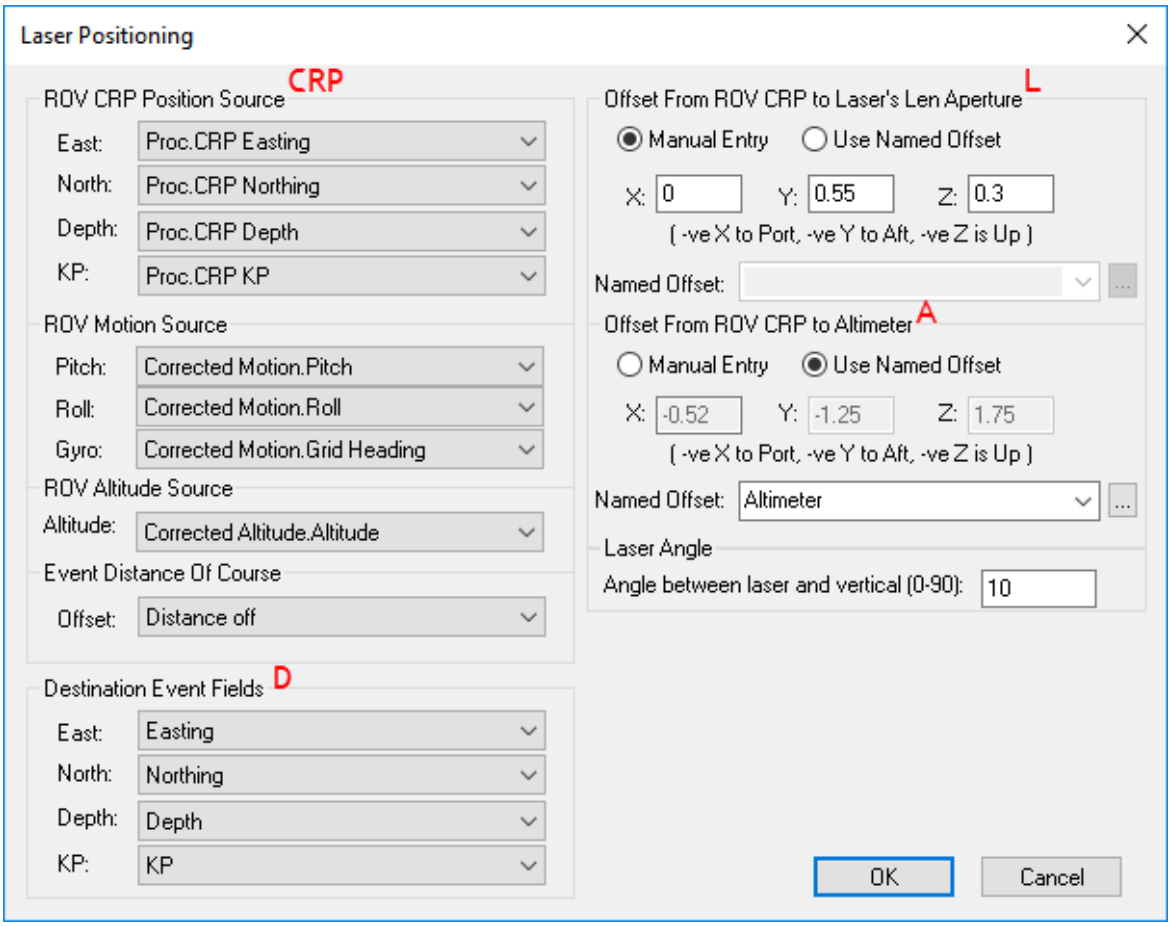

The "Laser Angle" is the angle from vertical where 0° is pointing vertically down and 90° is pointing horizontally forwards.

1.26.4 Deleting Events

There are two options for deleting listed Events: You can delete just **one event** or you can delete **all the events in a list**. That list can be all events if you use the main Events tab, or more commonly it can be just one filtered subset 133.

To delete a single Event, right-click on it in the list and select Edit, Delete from the pop-up menu.

Delete All Listed Events is best used with defined Subsets, to delete all events of one type, or perhaps to delete all freespans or debris events that are shorter than a reportable length. First create a subset that applies the required rule – spans shorter than 3m maybe, or all "Litter" debris – and then check carefully to be sure that it has nothing that you want to keep. Then, make absolutely sure that you are looking at the correct subset, right-click in it, and select Delete, All listed events.

Note that deleting events is permanent. Unless they were logged online there is no way of recovering them without restoring a backup. Unlike the data in the Survey Data lists (Processed Survey, Video Position etc.) the records in the Events table are deleted and not just disabled.

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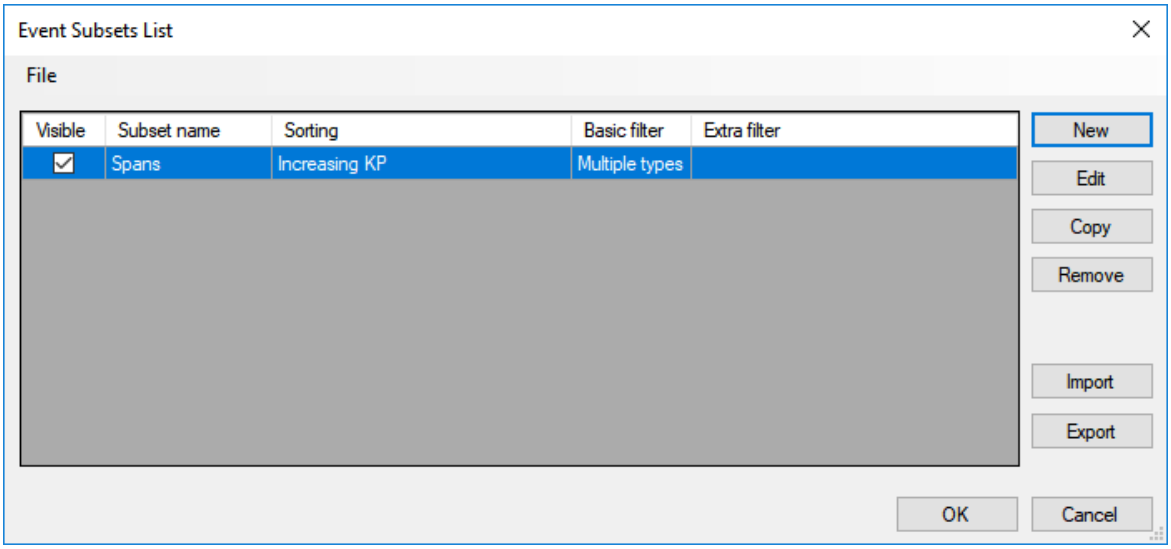
1.26.5 Filtering the Event List with Sub-Sets

To create Subsets, right-click in the Event list and select the option in the pop-up menu, or click Event Subsets on the Eventing Ribbon at the top. Both open the Event Subsets List.



To define and create a Subset, click on "New" to open the Event Subset Builder.

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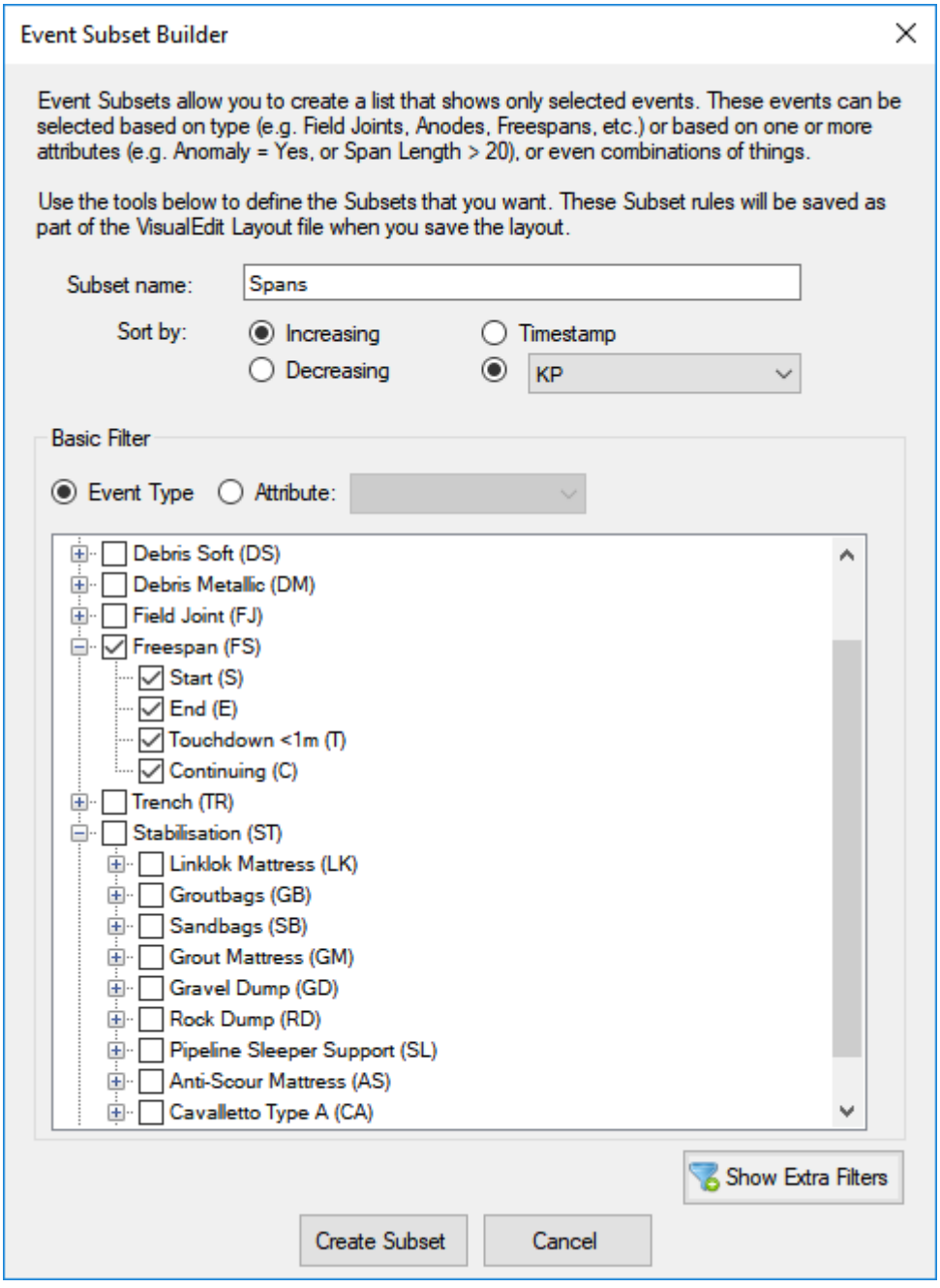
Event Subset Builder

Give the new subset a name, which will be shown as a new tab beside the main event list. If you plan to make a lot of different subsets, try to keep the names short. Next decide whether you want to sort the events in the subset using time, KP, or even some other data column such as Length or CP value. Then select which Event Types you want in the subset, for example all Freespan events, or all damage events, or perhaps just one or two types of severe damage. Instead of event types, you can also create a subset using other attributes or data columns, for example all events where the Anomaly column has a value of "Yes" instead of "No". The example below shows a simple subset of all Freespan event types sorted by KP. Click on Create Subset to add this to the list of configured subsets.



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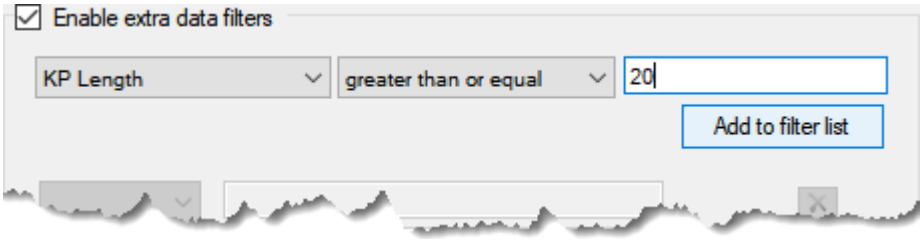
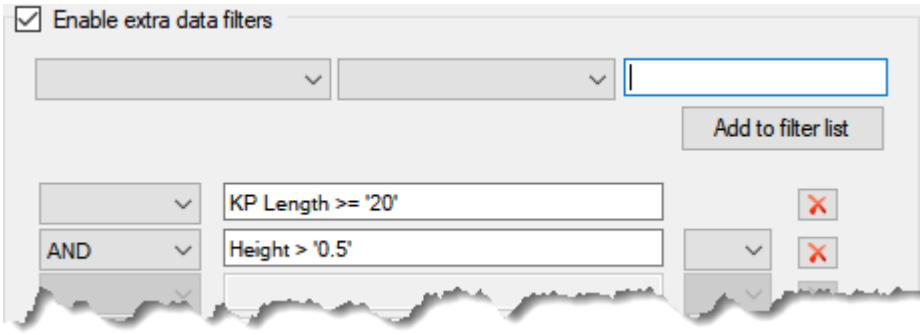
If you only want to show Freespans that are longer than 20m, select the Event Types as before, and then click the button to Show Extra Filters. Enable the Extra Filters by selecting that box and define a filter rule. In this example the extra filter says that the subset will only show the chosen event types if the KP Length (from span start to end) is 20m or longer. Click "Add to filter list" to add this rule to the definition of the subset.

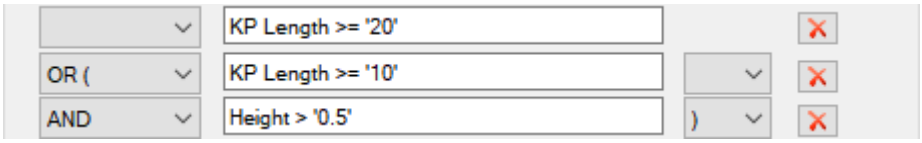


You can make the filter more complex, for example to show Freespan Start and End events where the KP Length is 20m or more AND the Height is over 0.5m.

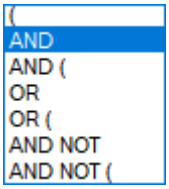


Or you might want all spans that are EITHER long OR high:

You can also use brackets to make an even more complex rule showing all spans of 20m or more, and also all spans that are over 10m if they are also more than half a metre high.



To build the set of rules, define them one by one, clicking to "Add to filter list", and then use the options for AND, OR etc., with or without brackets to define how the different rules interact and combine with each other.



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1.26.6 Finding and Managing Anomalous Events

Anomalous events are those that record features where something is wrong; a freespan is too long, an item of debris is too large or too close to a pipeline, an area of damage is too severe, and so on. During any survey or inspection it is important to identify these features and report them to the end client. Typically you will have been given a set of rules about what is or is not classified as an Anomaly. These rules will vary from one company to another and from one location to another.

VisualEdit has a number of tools that you can use to detect and manage these anomalous features.

Event Subsets

You can use Event Subset Views 133 to separate out events that are too long, too high, too close to the pipeline, or whatever the relevant criteria might be. If your client wants all Freespans that are longer than 20m to be flagged as anomalies then it would be sensible to check all of them that even come close to that limit because there may be some slight inaccuracy in the logged start and end event positions. It is quick and easy to create a subset that shows all of the Freespans that are over 18m or whatever value you think is appropriate. You can then use that subset to select each Freespan start or End and quickly check its position against the video and the profiler or multibeam data. When you have adjusted any events that need to be moved slightly, you can then re-define the subset to use the intended 20m criteria so that you now have a list of all spans that need to be marked as Anomalies.

Similarly you could filter a debris listing to find anything that comes close to a size limit and check their dimensions before flagging them as Anomalies, or you could create a subset using CP stab readings on Anodes, or using Anode wastage or activity levels.

When using the subsets, remember that the subset definitions can be saved and re-used later. You can save the subsets as part of a Layout file, and you can also save them to their own configuration file so that you can easily copy subset rules from one Layout to another.

Data Processing Scripts

You can use data processing scripts with similar "conditional rules" to those used in the subset filters. For example you could use the script "Set Field Value 244" to set the Anomaly flag to "Yes" for all events with a Freespan code and a length of 20m or more:

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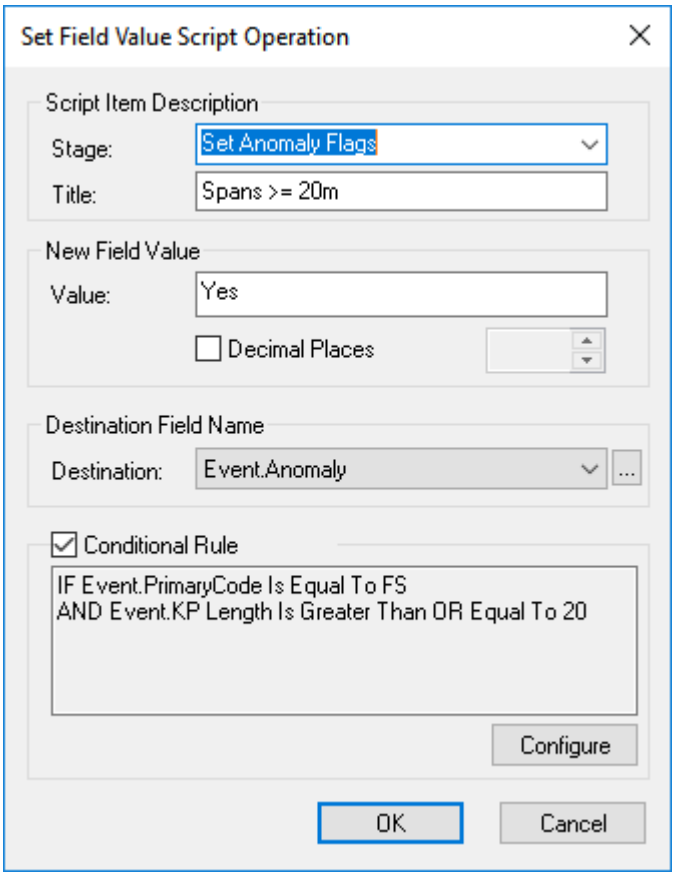

Other scripts that might be useful during QC are Calculate Span Event Heights 281 to set the event height column from the processed profiler or MBE data so you are sure that they match, and the Spacing QC 287 script to check for missed Anodes or Field Joints. Click the links to view more information about those scripts, and see Processing Scripts in VisualEdit Eventing for information on some of the other scripts that are available, and how to use them.

Like the subset rules, you can save the configured processing scripts so that they can be quickly and easily re-used later.

Measurement tools

In the cross-profile view you can measure the distance between two points, for example from a pipeline to a boulder so that you can decide whether or not that boulder should be flagged as an anomaly in the case where you are asked to highlight boulders that are within a certain distance of the pipeline. You can open the Measure tool by right-clicking in the 2D cross-profile graphics view. Select Measure from the pop-up menu and then hold down the left mouse button while you drag a line from one point to another, and read the results at the bottom of the screen. The result is shown as horizontal distance (dX) direction, vertical distance (dY), and the combined diagonal range. (Dx may and Dy will be shown positive or negative depending on whether you draw your line left to right, top to bottom or the other way. X is positive to starboard and Y positive down (a Z in survey terms, but Y graphically).

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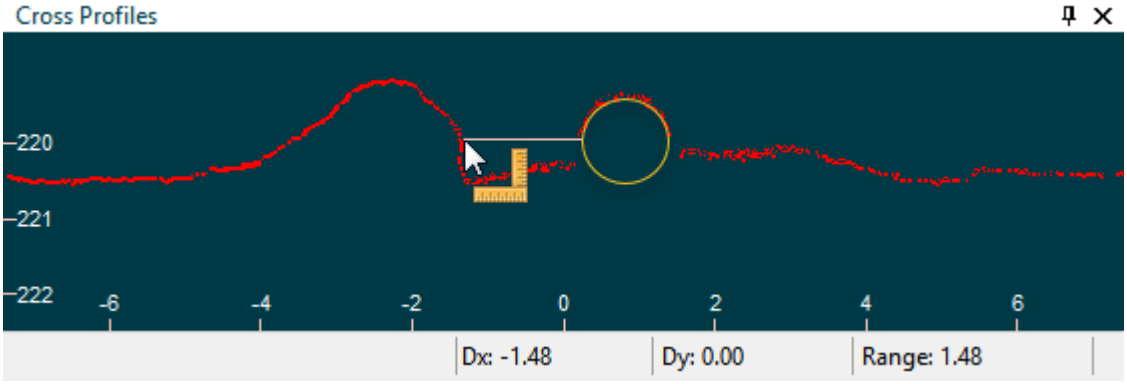
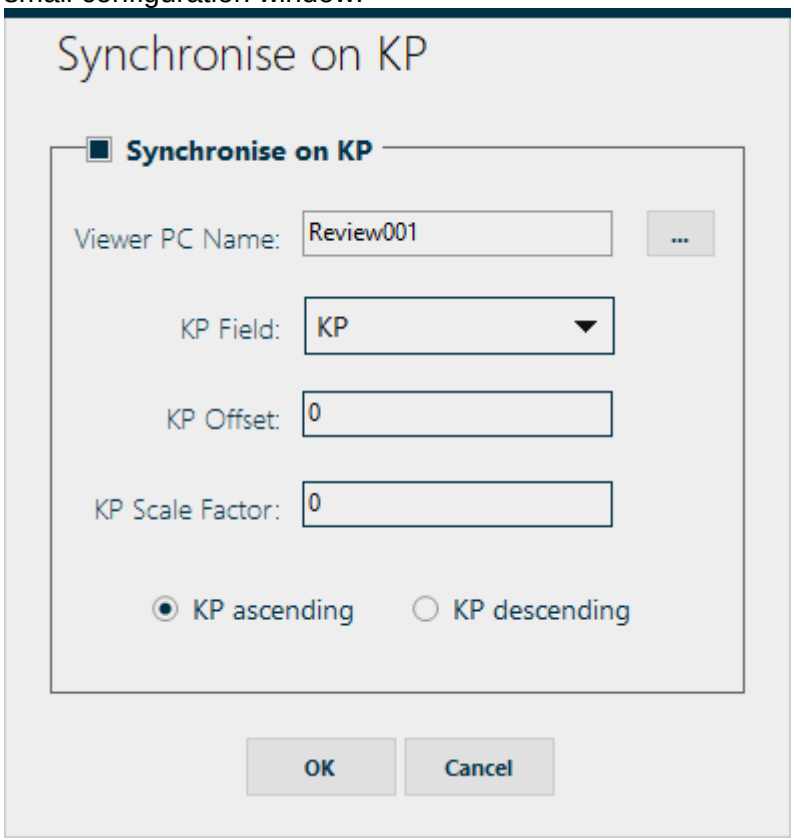


1.26.7 Use Existing Events for Online Logging

If you are performing a survey or inspection of a pipeline for which you already have data, you can use that old data to re-log events and features as you find them during the new survey. This might be useful if you are inspecting a pipeline that you have inspected before – or for which you can import previous data – or it might be useful during a post-trenching survey of a line that you also surveyed before it was trenched. There are a few things you need to do for this to work:

1. Send KPs from VisualDVR:

   Synchronise the offline playback to the online ROV position so that you see the old data move in sync with the current survey. In VisualDVR, open the Settings and go to the Survey Position Data tab. Click on "Sync Viewer using online KP". This opens a small configuration window:



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Turn on Synchronise on KP, and click on the button to select an offline PC. This will show a list of PCs on the network that are running VisualEdit or VisualReview. Select one of the VisualEdit PCs.

Select the name of the KP column from your received Survey Data in DVR. This will usually be "KP" but it might be a station or FP value.

If the KPs of this survey don't quite match the previous survey you can apply an offset in Km, and/or a scale factor.

Finally Indicate whether the current survey is in ascending or descending KP direction.

2. Load data in VisualEdit:

Select and load the previous survey in the selected VisualEdit making sure that you load enough data to cover the expected KP range of the live survey – but don't load more than you need to.

3. Configure Event Logging

On the online Event Logger choose the correct "Client" configuration for logging the new survey. This should if possible match the data from the previous survey – but don't worry if it's not an exact match so long as most event types and event list columns have a match.

4. Enable Logging

In VisualEdit, right-click in the Events list and select Online Logging

You are now ready to re-log old events and/or add new ones. As the ROV moves, VisualDVR will send a KP to VisualEdit and the video and other windows in VisualEdit will jump to that KP. Watch the live video feeds and when you see an event such as an Anode or Field joint that is already in the old data, double click that old data row. This will send it to the online Event logger where it will be logged with the new timestamp. Any data columns with names in VisualEdit that match those in the online configuration will be copied. This may include positions and KPs but those will be updated again later using offline Auto Update. Any new events or features can be logged as normal using the event logger toolbar or tablet.

1.26.8 Equinor SITRAS Freespan Events

As part of Equinor's SITRAS TR2234 pipeline reporting specification, freespans are divided into a number of different categories based on their length and their proximity to each other. When logging data for a pipeline inspection you cannot tell what type of freespan you are looking at until you have seen what is still to come; only after all data is logged and processed can the spans be classified to determine what is an end followed by a start rather than just a short touchdown, and to determine which spans combine to form multi "spans". This tool allows you to log all freespans as the basic "Continuous freespan" type FRCO and the automatically reclassify them.

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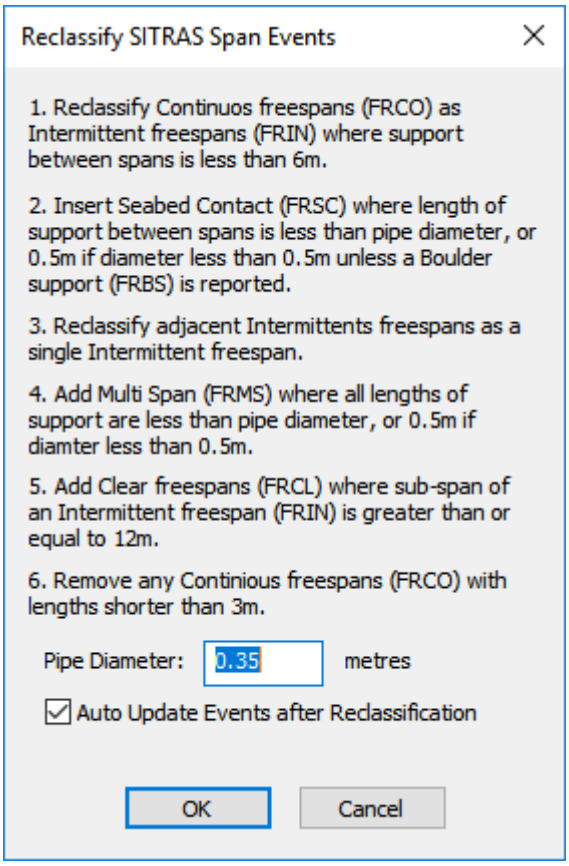
Right-click in the Events list and select Edit > Reclassify Events > SITRAS Freespans. This will open a window which explains what the tool will do, and which asks you for the pipeline diameter.



1.27 Data Processing

VisualEdit Professional is the top-of-the-range edition of VisualEdit 10. It has many data processing tools with different levels of automation ranging from manual tools for moving individual data points, through to a "Smart Processing" tool which configures an automated processing system for you. A limited number of the data processing scripts is available in **VisualEdit Eventing**.

Smart Processing

The Smart Processing tool will ask you a few simple questions, requiring little technical knowledge and no previous data processing experience. You will be asked some simple questions about the size and nature of any pipelines or cables included in your survey. The Smart Processing tool will ask you to choose for a list of different types of survey work, and will ask you to select from a list of equipment types that you might be using. You will need to provide some basic information about the location of the equipment as XYZ offsets from a Common Reference Point (CRP), and will need to provide some basic information about any calibration or correction values to be applied to any sensors. All of this information should be easily available to the online surveyors.

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Using this information, the Smart Processing tool will decide what data processing scripts are needed, in what order they should be used, and how each of them should be configured. It will then add all of the necessary scripts to a VisualSoft Batch file ready for you to run. If you want to check or change and of the settings this is quick and easy to do. For more information see Smart Processing 206.

Batch Processing

The Batch Processing tool allows you to build and configure your own sequence of data processing operations using our library of scripts. Each script performs one task, for example detecting and removing significant spikes in position data, smoothing position data, applying calibration values to pitch, roll or heading data, applying offset calculations to locate individual sensors on an ROV, applying tidal corrections to depth data, and so on. The scripts can be be arranged into a logical sequence, such as removing large spikes before smoothing, and this sequence of individual scripts then forms a "Batch" of tasks which can be saved to a VisualSoft Batch file to be reused as often as you want. For more information see Processing Scripts and Batches 212.

Cross-Profile Scan Processing

VisualEdit Professional includes tools to apply head offsets and had rotation values to multibeam or mechanical profiler systems, tools to clean and correct the scan beams to apply motion corrections and remove spikes and other errors, and it has tools to detect and place the pipe within the scan beam data and to detect and place various seabed and trench marker points within the scan. Like the previous tools for cleaning the position, depth and motion data, the tools for cross-profile scan processing also include some manual options, some scripts and some automated options. For more information see Cross-Profile Scan Processing 305.

Manual Processing

The manual tools to move, smooth or disable relatively small numbers of data points are sometimes useful for a bit of final tidying-up after other more automated tools have been run. To open the data processing toolbar, right-click in one of the graphical views and select the 'toolbar' option. You will have a choice of a Free-floating toolbar which you can move where you like, or a toolbar which is docked against any of the four the edges of the window. For details of the buttons on each toolbar and how to use them see Plan and Side View Manual Processing Tools 303 and Cross-Profile Manual Processing Tools 305.

1.27.1 Smart Processing

VisualSoft's **Smart Processing** tool allows both expert and non-expert data processors to quickly configure data processing scripts appropriate to their data. This is done by answering a few simple questions about what equipment is in use, what type of work is being performed, and where is the equipment mounted on your ROV or ship. The Smart Processing incorporates the decision making processes that an experienced expert user might use when processing data in a more manual way.

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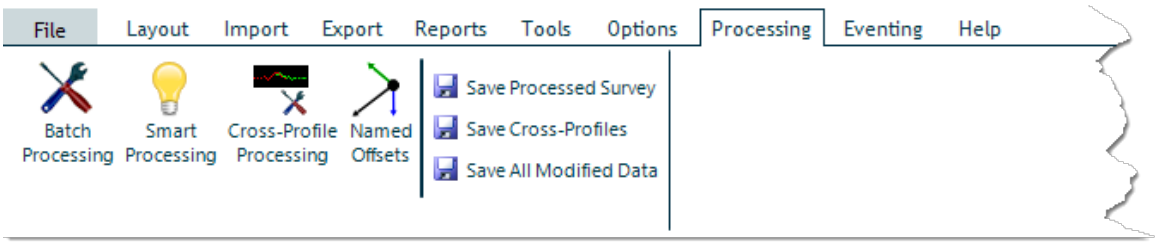
For the expert user, all of the Processing Scripts that are configured in the Batch files created by the Smart Processing can be reviewed and the settings may be adjusted if you wish. You retain total control over how your data is processed – but we hope that we will have saved you a lot of time on the basic configuration of that processing.

For the less expert user, the configured scripts can be run as they are and your data will be appropriately processed. If you have time and would like to learn a bit more, you could review the configured scripts, and perhaps run them one by one to see for yourself what each of them is doing.

The Smart Processing tool will usually be needed only once per Project unless something significant changes. The Batch Processing file and scripts that it creates can then be run on their own to process other data that you log later in the Project.

To Start the Smart Processing tool, select the Processing Ribbon at the top of the VisualEdit Professional display, and then click on the Smart Processing light-bulb button.



This will open the introduction page of the Smart Processing tool.

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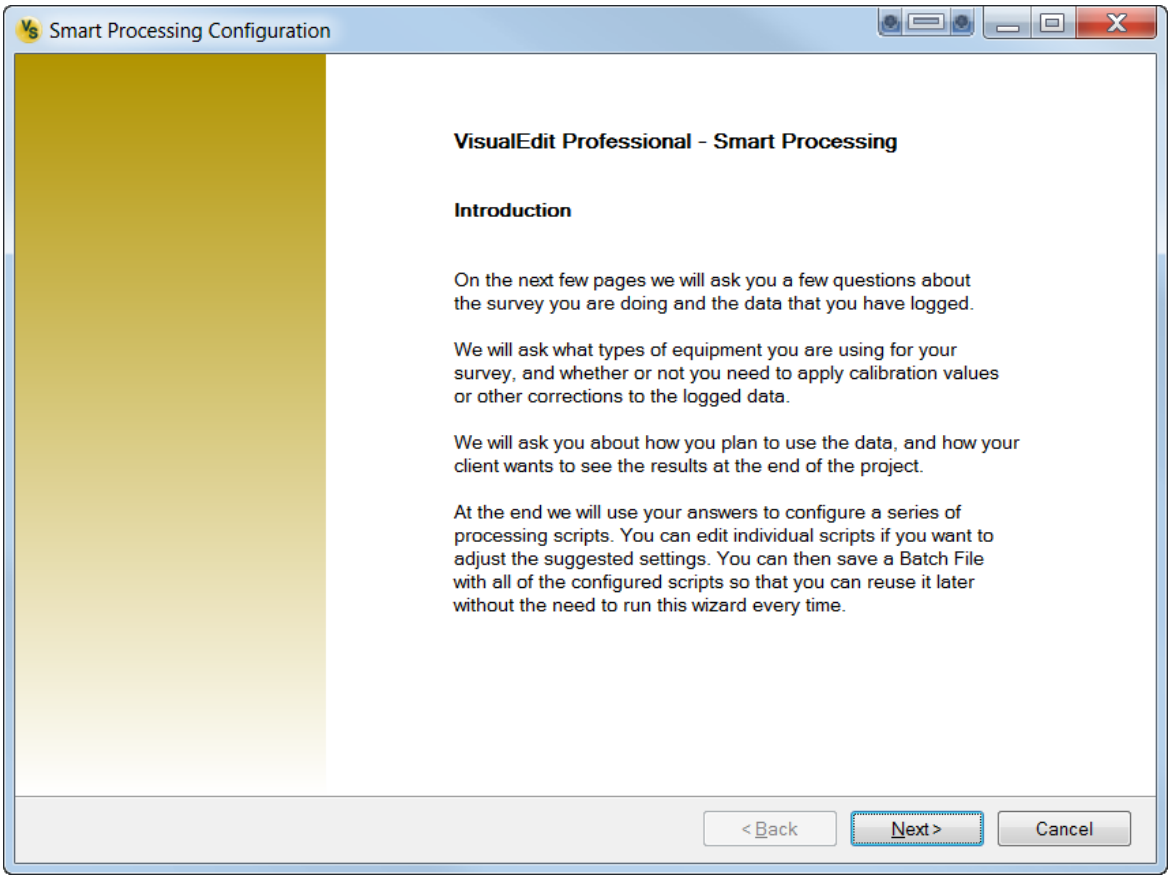
Smart Processing – Introduction

The first page provides an explanation of what the tool is for and how it should be used.



Click Next 208 to continue. As you step through the later pages of the Smart Processing tool, you will see a small progress bar at the top of the window, moving through various stages.

Smart Processing – Load Template

If you have already run the Smart Processing tool and you have come back to it to make a small adjustment to something, you can load a template file containing all of the previous settings so that you do not have to re-enter them.

To do this, click Load. If you want to skip this, or if it is the first time that you have run the Smart Processing on this Project, click Next 209 to continue.

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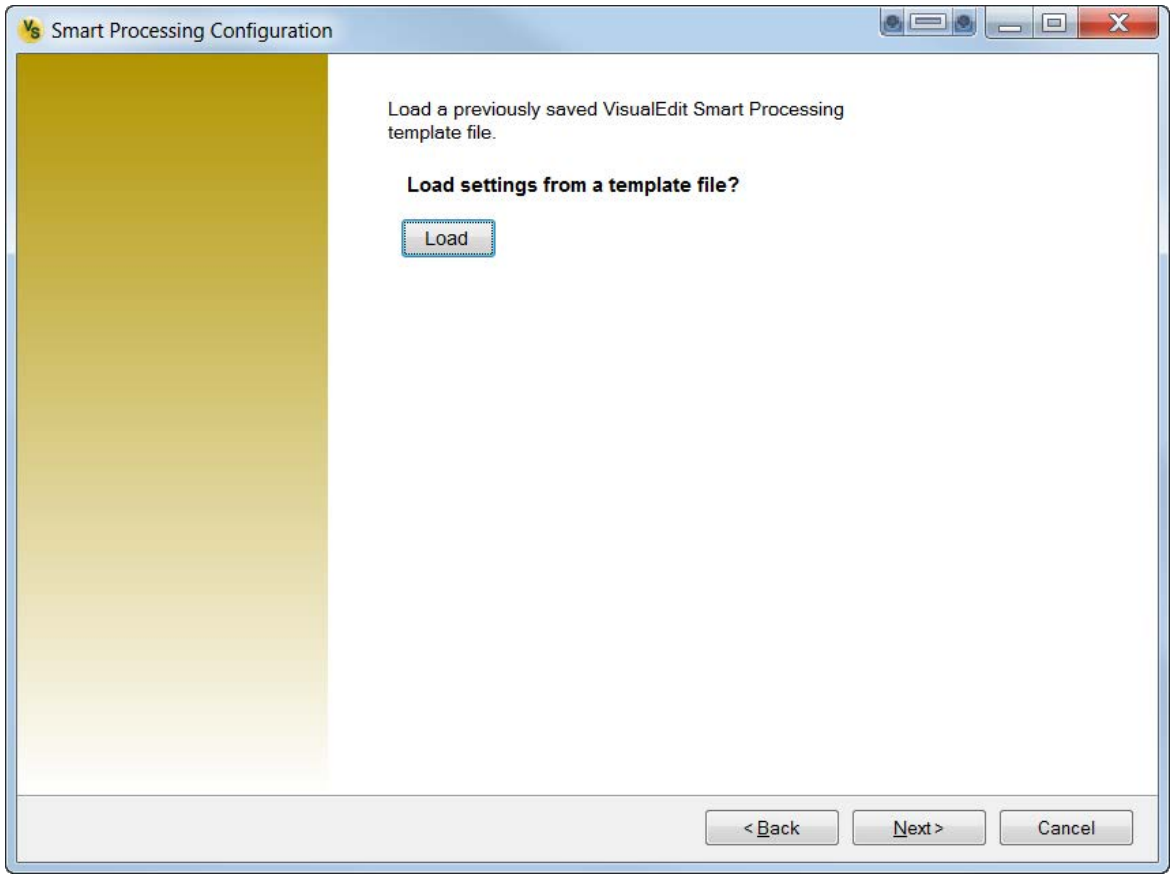

Smart Processing – Survey Type

This page has some very simple questions about the type of work you are doing, and what you are using to do it.

We use this information to make some decisions about what the data is expected to look like; for example and ROV with wheels will move more smoothly along a pipeline than one which is free-flying... but only if the pipeline is not buried.

Select the relevant options, and then click Next 210.

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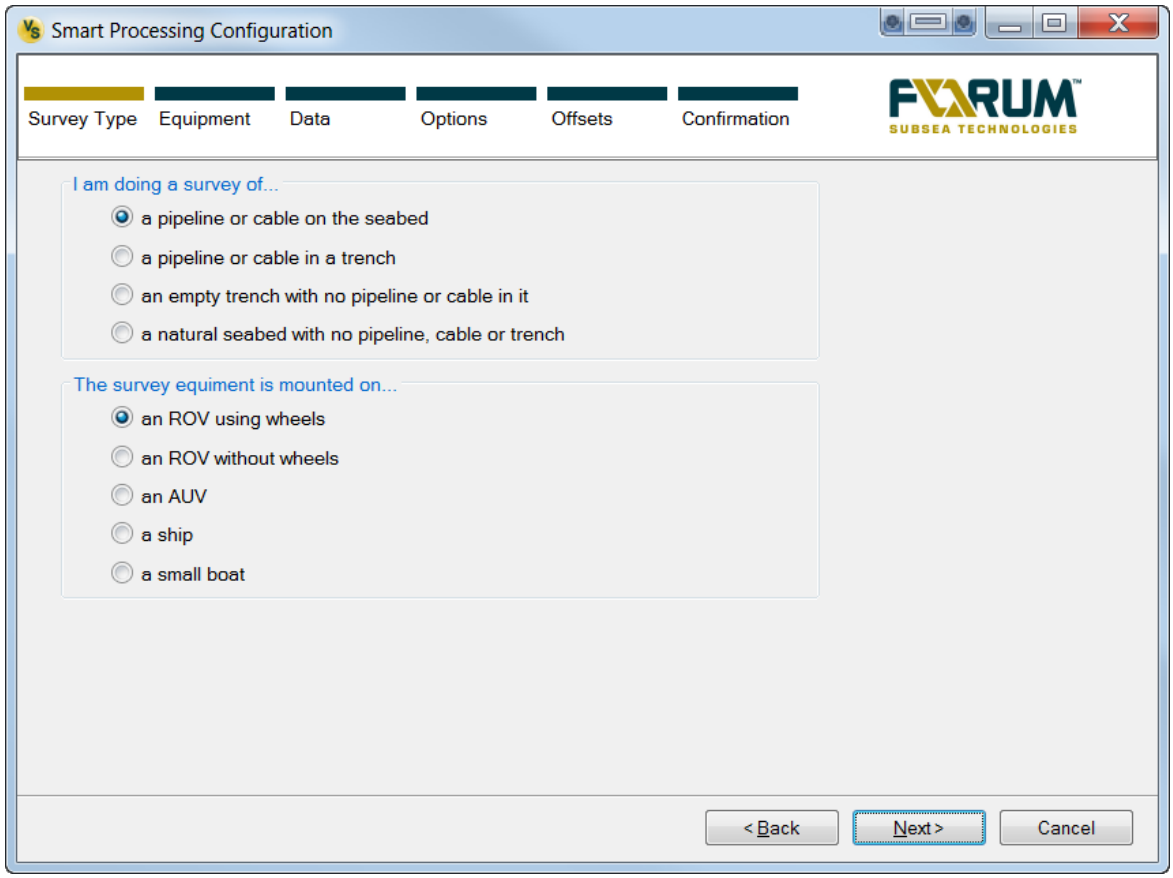

Smart Processing – Pipeline Details

If the Survey Type that you selected on the previous page included a pipeline or cable, you will see this page to enter some details about that pipeline or cable.

We use this information to work out how closely the ROV route will follow the pipeline route and how "bendy" that pipeline route might be. We also want to know if a pipeline has things that an ROV must "jump over" such as J-Lay collars or anodes that are bigger than the pipeline coating diameter.

Where you see a blue circle with a question mark you can hover your mouse cursor over it to get a little bit of extra help.

Select the relevant options and click Next to continue.

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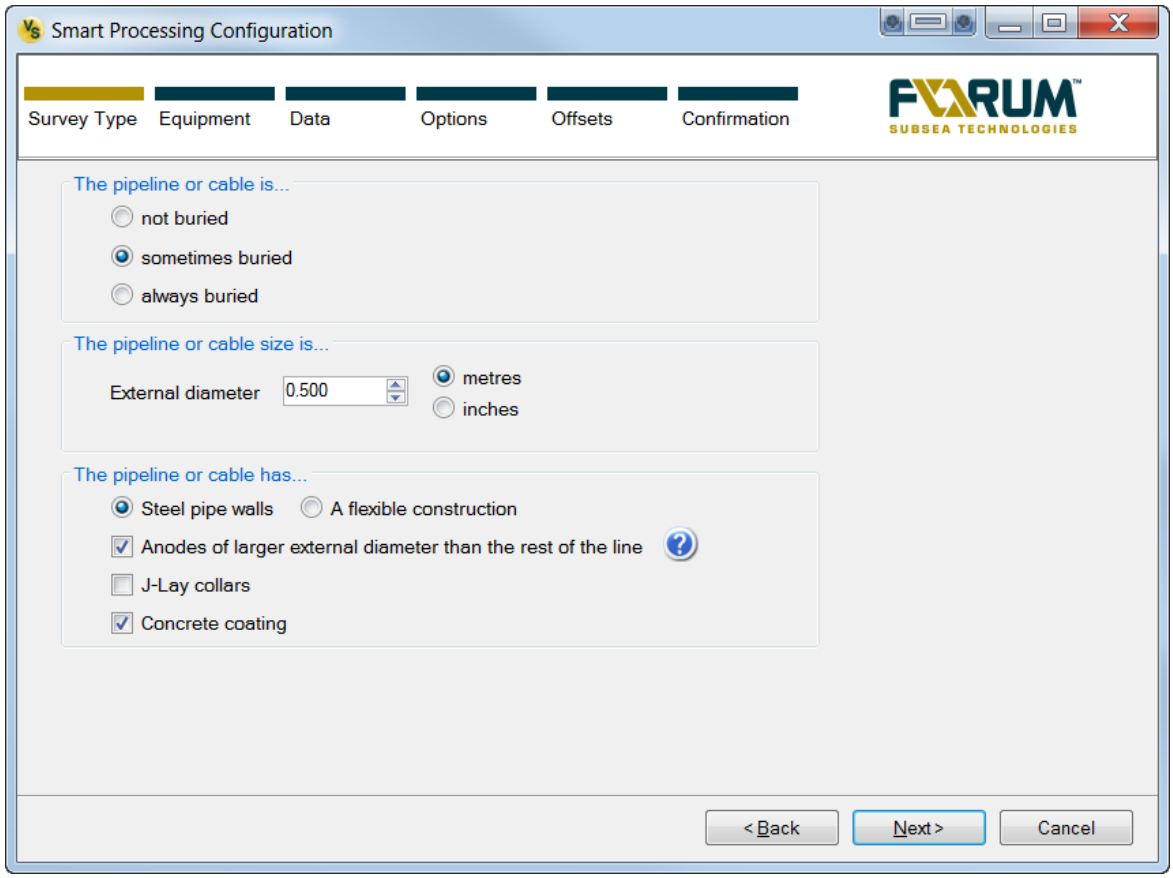

Smart Processing – Equipment

The Equipment page is a simple list of the likely and common equipment that you might be using. Select the things that you have.

What you see on later pages will depend on which boxes you select here. If you have a particular type of equipment we will need to ask a few questions about where it is and how the data is being logged.

Where you see a blue circle with a question mark you can hover your mouse cursor over it to get a little bit of extra help.

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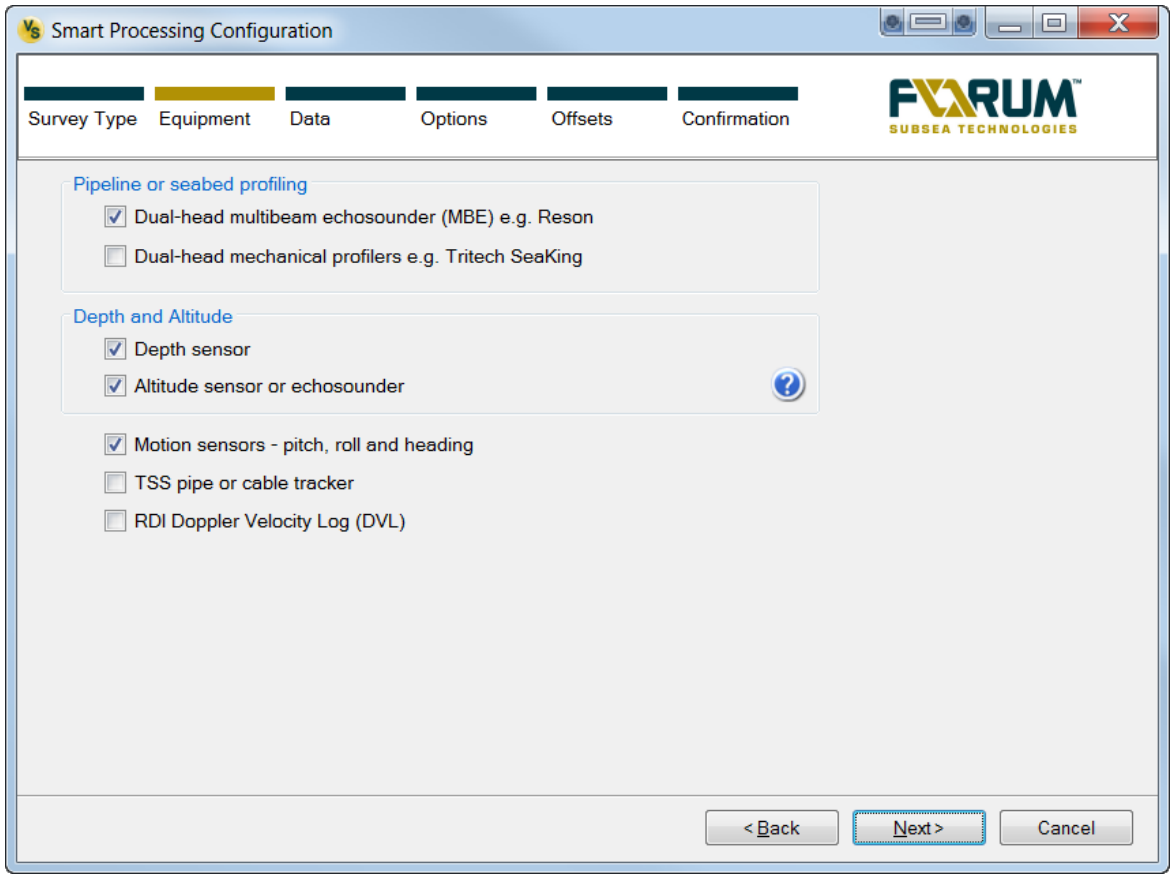

1.27.2 Processing Scripts and Batches

Data processing is mostly done using a sequence of operations that we call a **Batch**. Each individual operation in a Batch is done by one configurable **Script**.

- **Each Script does one thing;** for example it might calculate something, copy something, or correct something.

- **A sequence of scripts forms a Batch** and typically the results of one script go on to form the source for later scripts.

The **Batch Processing window** allows you to add and configure Scripts to build a sequence of data processing tasks performing any of the available operations in any order. This provides a powerful data processing environment in which the user has a lot of control over what they do with their data. There is usually a logical order of tasks such as removing any very large spikes before smoothing something, or applying tidal corrections to logged depth readings before applying offsets to calculate the depths of multiple different items – if you apply the tidal corrections at the start you only need to do it once, but if you calculated multiple offset positions first you would then need to apply tidal corrections to each one separately.

- You can **add a script** to a batch sequence using the right-click pop-up menu, or by using the menu at the top of the Batch Processing Window.

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- You can **permanently remove a script** from a batch sequence by clicking on the script in the displayed list and selecting Operations, Remove from the menu, or by right-clicking on it and selecting Remove. (You can remove an entire group of scripts in a similar way, by selecting or right-clicking on the Stage header.)

- You can **temporarily disable a script**, by removing the tick or check mark from the box to the left of it in the batch processing list. (You can disable an entire group of scripts in a similar way, by selecting or right-clicking on the Stage header. If the stage is not ticked/checked then none of the scripts in that Stage will be run.)

- You should **Group scripts** together using "**Stages**", for example "Motion data corrections", "ROV position cleaning", or "Offset calculations", so that it is easy for other people to see what the batch does.

- If a Stage has already been created in the batch sequence you can use it again for another script by selecting it in the drop-down list. If you want to create a totally new Stage just type the new name into the box.

- You can add a "**Title**" to a script to describe what it does within the batch. For example if you are using the Apply Offset script, add the title "MBE from CRP" so that when you look at the main batch window you will see "Apply Offset: MBE from CRP". This gives a quick, readable summary of what that step in the batch is doing.

- You can **Edit a script configuration** by double-clicking on it in the batch window or by selecting it and then clicking the Edit button on the right of the window. These will each re-open the configuration window for the script and allow you to view and change the settings.

- You can **Change the order** of the scripts in the batch sequence by dragging and dropping to move them up or down the list.

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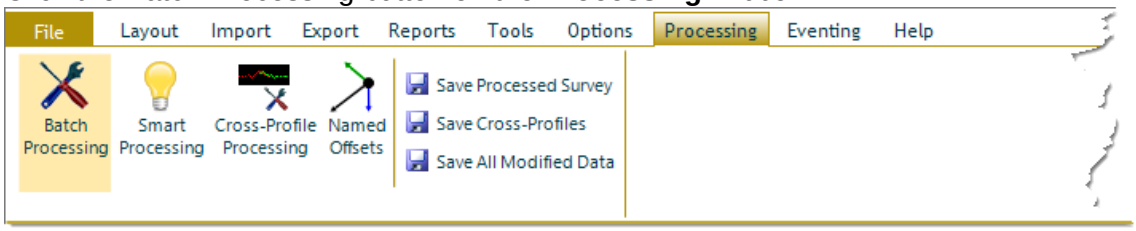
Opening the Batch Processing

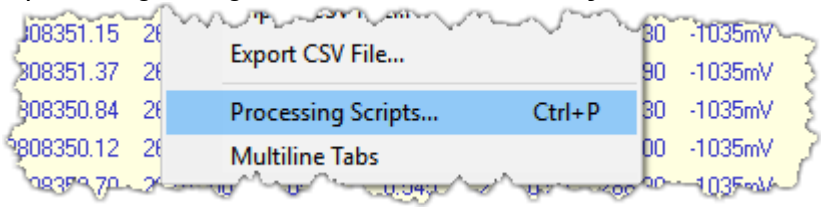
The batch processing tool can be started in a few different ways:

- Click the Batch Processing button on the **Processing Ribbon**

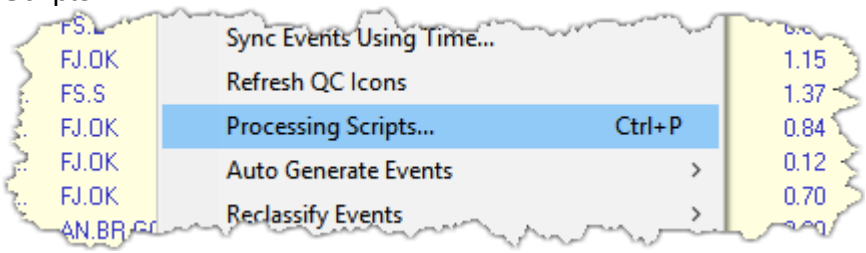


- Keyboard short-cut **Ctrl+P**

- Open using the right-click menu in the **Survey Data lists**



- Open using the right-click menu in the **Event list**. Go to Edit and then Processing Scripts.



- Click the Batch Processing button on the the **toolbars in the Plan View or Side View** graphical views

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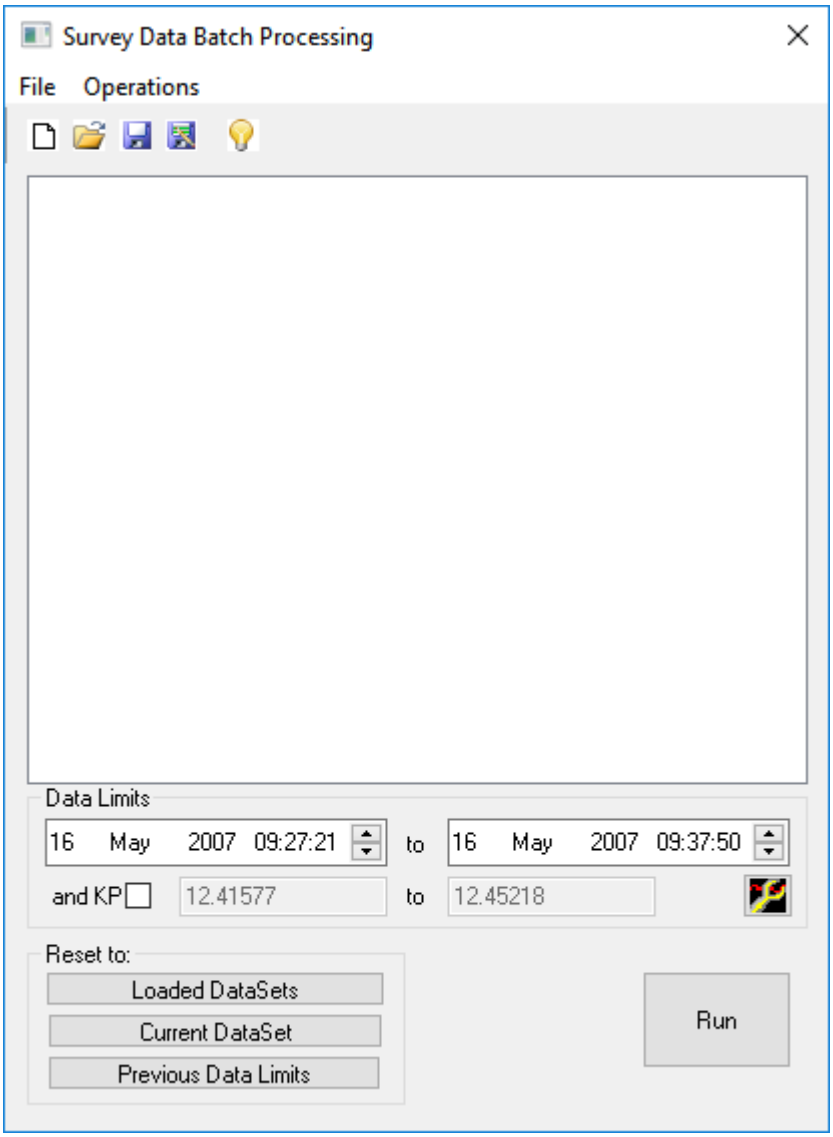
The Batch Processing Window

When you open the Batch Processing you will see a window that is mostly blank, like the one shown below. You can Open a saved Batch configuration file using the File menu – where you can also save a configuration after you create or change it. If you do not already have a saved Batch configuration file, you can create a batch of processing scripts either by using the Smart Processing or by adding scripts manually.

If you are using **VisualEdit Professional**, you can run the **Smart Processing** by clicking the light-bulb on the toolbar. This will help you to build a fully configured batch processing file by asking a few simple questions. See Smart Processing 206 for more information about this useful tool.

You can start to add processing scripts manually by a right-click in the blank white part of the window. You can also add scripts by selecting opening Operations menu where you can then click Add to select from a list of Available Processing Scripts.



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Naming Batch Files

When configuring and saving processing Batches you should consider how the scripts will be used. It is sometimes better to split the processing into a number of separate batches rather than a single large one. This allows you to save different options allowing for things like different HiPAP beacons on an ROV, or different offset configurations. The Batch files should be saved with logical names describing what they do. A typical set of saved batches is shown below. Note that the file names include numbers to indicate the order in which they are run, with letters being used to distinguish options relating to two different HiPAP beacons:

- 01 Initialise and Copy Data
- 02a Despike and Smooth – Beacon 11
- 02b Despike and Smooth – Beacon 13
- 03a Offsets and KPs – Beacon 11
- 03b Offsets and KPs – Beacon 13
- 04 Smooth Top of Pipe

Script Configuration Windows

Most of the data processing scripts have the same basic layout in their configuration windows:

- The **Stage and Title** will be at the top.
- There will be one or more "**Source**" data columns. These are the data fields or columns that will be read by the script.
- There will be one or more "**Result**" data columns. These are the data fields or columns that will be written by the script.
- Between the Source selection and the Result selection there will be some configurable **settings and options**. These settings will be applied to the Source data before it is written to the the Result columns.
- The Source and Result columns can be the same or they may be different.
- Note that if you select a Result column that it is in a raw logging table (from VisualDVR or from VisualData Logger) although you can make changes to it while the data is loaded in memory in VisualEdit, you will not be able to save those changes back to the raw table and file. You can only save to a processed table not a raw table.

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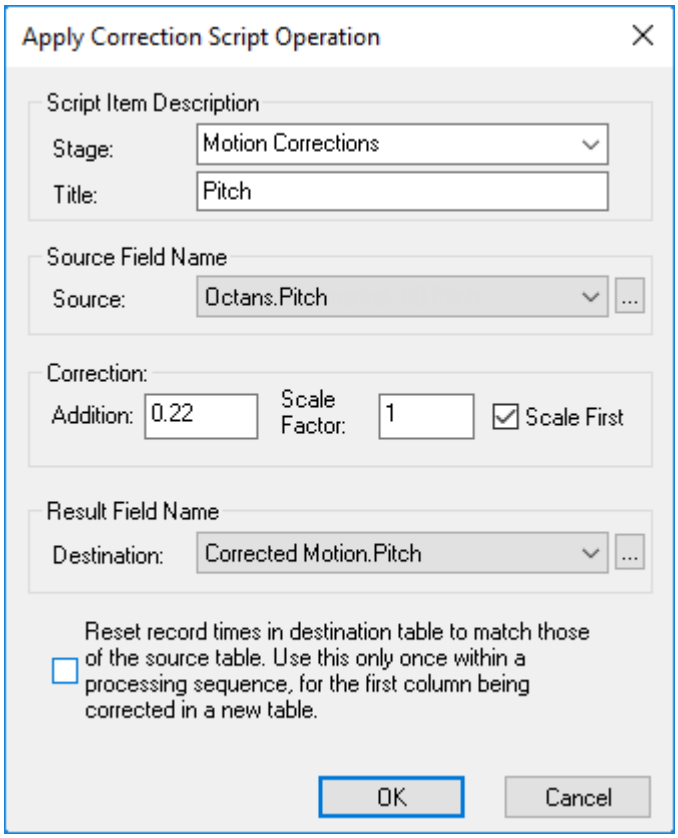

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Available Processing Scripts

When you add a Script to a Batch you will be shown a list of available scripts. The scripts are in groups that are relevant to different tasks such as "Corrections and Calculation", "Data Cleaning and Smoothing", "Data QC" and so on. The table below gives a very brief description of what each script can do. For more details click on the name of the script in the middle column.

Script	Description
Script Group: Main	
Define Processed Survey Table 224	Creates the rows and columns that you want in the Processed Survey data table.
Define User Defined Table 227	Create your own data tables, and create the rows and columns inside them.
Load Layout 229	Change the layout file part way through a batch file, so that the graphics and other displays can be changed automatically to show newly created tables and their data columns.
Comment 230	Inserts a comment between scripts displayed in the batch window. This doesn't have any affect on any data; it exists only to help make a batch file understandable to other users. You can use it to explain what the batch is doing, or to leave an instruction for your colleagues.
Script Group: Corrections and Calculations	
Apply Correction 231	Change a data column by adding or subtracting a fixed value, or by multiplying by a fixed value.
Apply Motion Correction 232	Correct altitude data for the effects of pitch and roll, to give a vertical altitude distance instead of a distance perpendicular to the ROV.
Apply Offset 234	Calculate a position as an offset from another position, such as the location of a piece of equipment relative to the CRP or a beacon position.
Apply Tidal Correction 236	Subtract the tidal height from logged depth values using tidal heights saved in a file.
Combine Numeric Data 238	Add or subtract on data column from another.
Copy Field 239	Copy data from one column to another, in the same table or a different table.
Corrections From File 241	Change a data column by adding or subtracting values read from a file, or by multiplying by values read from a file. The data in the table and the data in the file are linked using a KP value.
Find and Replace 242	Find and replace text data in the column of a data table. Useful for spelling mistakes in Event data!

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Script	Description
Generate Tide 243	Calculate tide based on time and position using a licensed installation of POLPRED (from the National Oceanography Centre in Liverpool, UK.)
Set Field Value 244	Fill a column with a fixed value, either numeric or text.
Set Metadata 246	Fill a column with meta-data such as the Dataset date and time or the Project name of folder path.
Script Group: Cross-Profiles	
Cross-Profile Cleaning 247	Clean and correct cross-profile data from multibeam or mechanical profiler.
Re-Align Pipe 251	Adjust the pipe in cross-profile data to match a 3D position in another data table.
Reference XP Display to Video KP 253	Calculate an time offset for each scan so that it is displayed when the video is at the KP (rather than time) of the scan.
Remove Scan Markers 255	Remove one or more selected seabed or pipe markers from processed scan data.
Rescale Cross-Profiles 256	Adjust cross-profile ranges to correct for an incorrect speed of sound used during logging.
Reset Cross-Profile Join Times 258	Undo the effects of the script "Reference XP Display to Video KP".
Script Group: Data Cleaning and Smoothing	
Distance Off-Course Gate 259	Remove any spikes in position data where the DCC value exceeds a specified threshold.
Remove Spikes 261	Remove spikes from position or depth data.
Remove Spikes Advanced 263	Remove spikes from position or depth data, with greater control of the settings used.
Smooth Using Moving Average 266	Smooth position or other data using a moving average. This is well suited to data that you expect to be fairly regular such as the position of a pipeline or of an ROV running on wheels along a pipeline.
Script – Smooth Using Polynomials 270	Smooth position or other data using a polynomial curve fitting. This is well suited to data that you expect to be less regular such as the position of a free-flying ROV, or data such as pitch and roll that you expect to oscillate.
Script – Least Squares on Track 272	Smooth position data using a mix of acoustic position data and DVL speed data. This combination of absolute position from a "noisy" acoustic source, with precise relative position from the DVL usually gives a good result.

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Script	Description
Reduce Density 275	Reduce the data interval of a data table, changing it to a fixed or approximately regular interval of time or KP distance.
Script Group: Data QC	
KP Overlap Check 277	Search the data for areas where there are overlaps and back-tracks.
QC Frozen Fields 278	Check the data for values that have stopped updating, such as a depth reading that has stuck or "frozen" at a set value. With most modern sensors this is no longer as necessary as it was a few years ago.
Standard Deviation 279	Calculate the SD values of points in a population. Used for some Out of Straightness (OOS) specifications.
Standard Deviation of a Sample 280	Calculate the SD values of points in a sample. Used for some Out of Straightness (OOS) specifications.
Script Group: Event Data	
Calculate Span Event Heights 281	Use processed cross-profile scans to calculate the height of each freespan event.
Combine Text Data 283	Combine text from two columns, selecting all or part of the source text.
Set Advanced Numbering 285	Build event numbers using typed text, existing data columns, or partial data columns as prefix and/or suffix text, with sorting by time or KP. Has options for number formatting and conditional rules to allow different event types or status levels to be numbered independently.
Set Sequential Numbers 284	Build simple event numbers with text for prefix and or suffix and sorting by time or KP.
Spacing QC 287	Check the spacing of regular events such as Field joints or Anodes, and provide information about the expected location of missing event.
Overlap QC 290	Check for illogical overlaps between events such as Spans and Burials, or for events that should not be seen within these areas.
Script Group: Import and Export	
Export Track XYZ 292	Export a selected position as and ASCII XYZ (Easting, Northing and Depth) file.
Export Cross-Profile XYZ 293	Export cross-profile or multibeam data as an ASCII XYZ (Easting, Northing and Depth) file using all edited beam data or interpolated regular data points.
Import on KP 294	Import a column of data from a file that contains KP and the required data value.
Script Group: Position Processing	

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Script	Description
Apply DVL 296	Calculate positions relative to a start coordinate of Easting, Northing and Depth, using the speed data logged from a DVL.
Coordinate Transformation 298	Convert between Easting/Nothing coordinates and Latitude/Longitude.
Recompute East North 299	Calculate Easting and Northing position using KP and a sail-line. Assumes DCC of zero and will place all points exactly on the sail-line.
Recompute KP 300	Calculate KP and DCC of positions using a sail-line.

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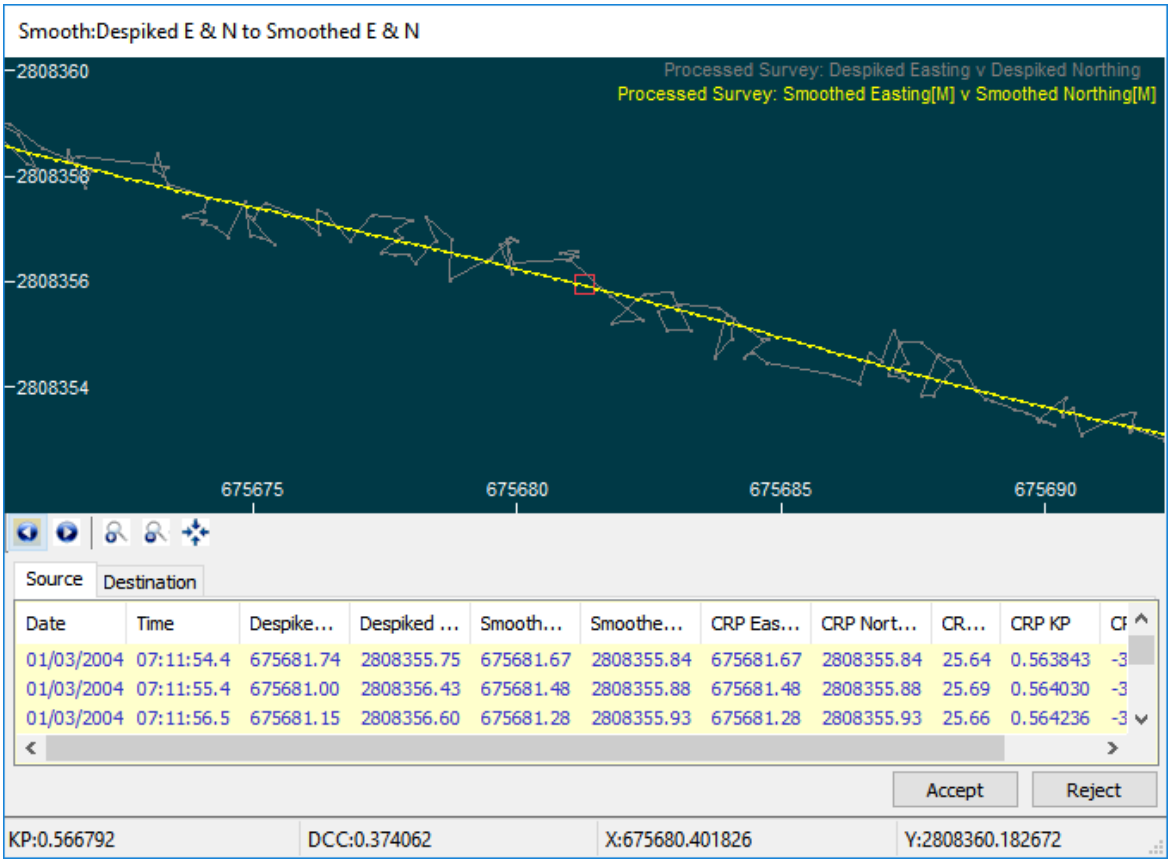
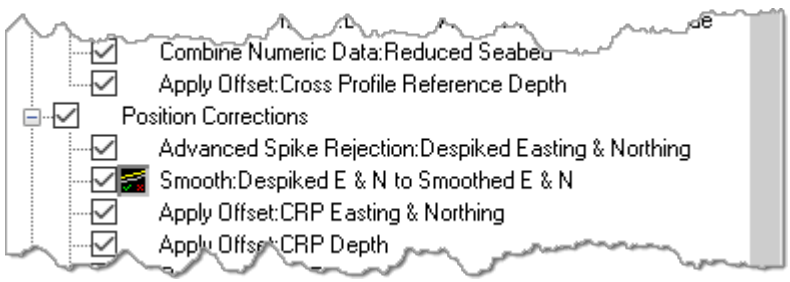
Graphical QC of Survey Data

Certain scripts within the Batch Processing can have a Graphical QC enabled so that after the script has run, a new window will open showing the data before and after smoothing, as both graphics and text. This window allows the user to zoom and pan through the data and has buttons which allow the user to either Accept or Reject the results.



This option is enabled by right clicking on the script in the Batch Window after the script has been configured; Select “Graphical QC” from the pop-up menu.

A small graphics icon will be placed next to the script in the Batch Window to indicate that Graphical QC is enabled for that script. This is shown in the image below.



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The following scripts can have Graphical QC enabled:

- Apply Correction
- Apply Offset
- Apply Tidal Correction
- Combine
- Least Squares on Track
- Remove Spikes
- Remove Spikes – Advanced
- Smooth Using Moving Average
- Smooth Using Polynomials

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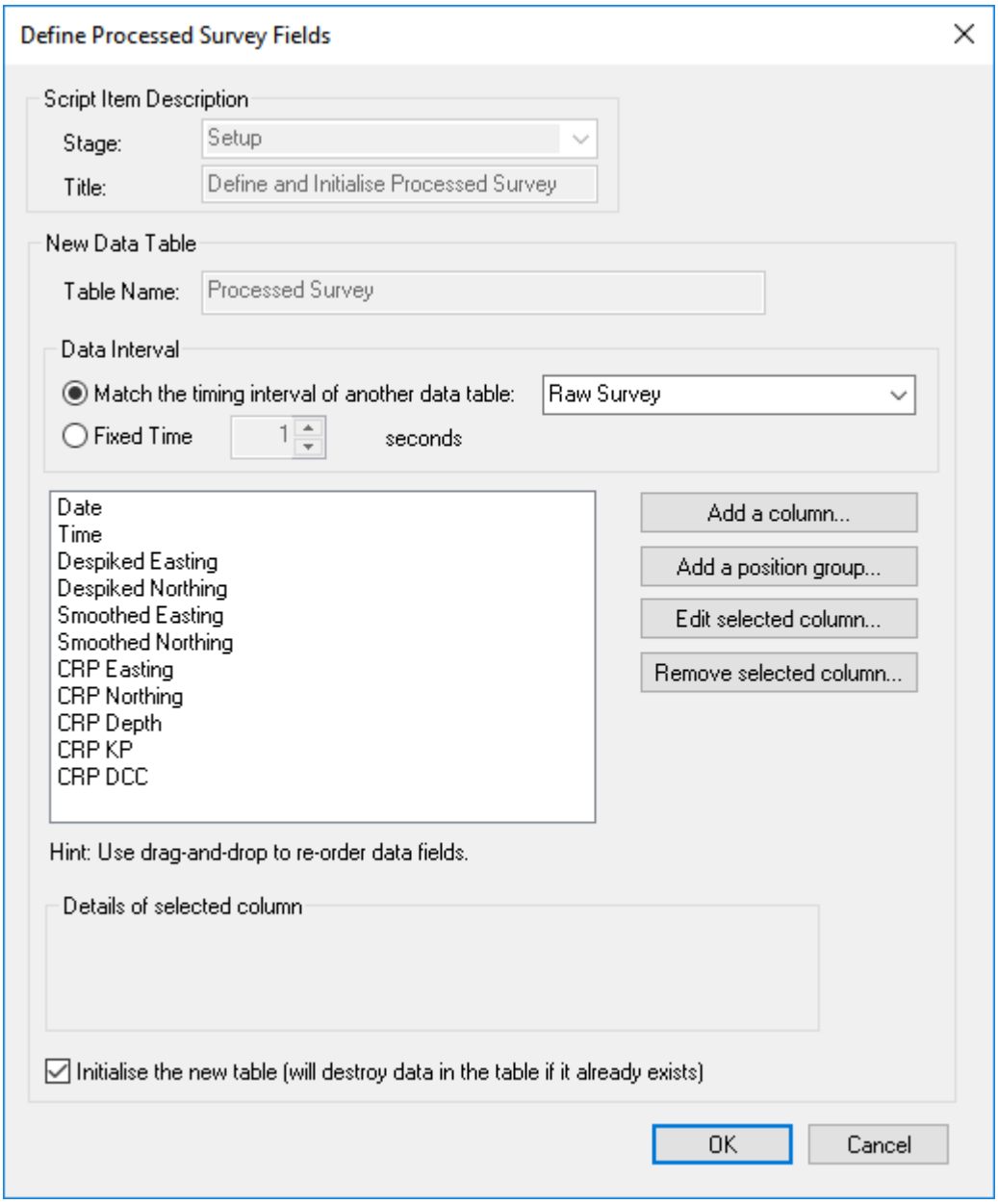
Processing Scripts

Script – Define Processed Survey Fields

Description

This is almost always the first script that you need. It lets you specify names and formatting of columns in the Processed Survey table, and lets you set the time interval of the rows of data. Columns can be created in three ways: with blank entries, with fixed values (usually zero), or by copying from raw data. This script is always in the "Setup" stage of the Batch, the title is always "Define and Initialise Processed Survey", and it always creates the "Processed Survey" table. These three options cannot be changed for this script.



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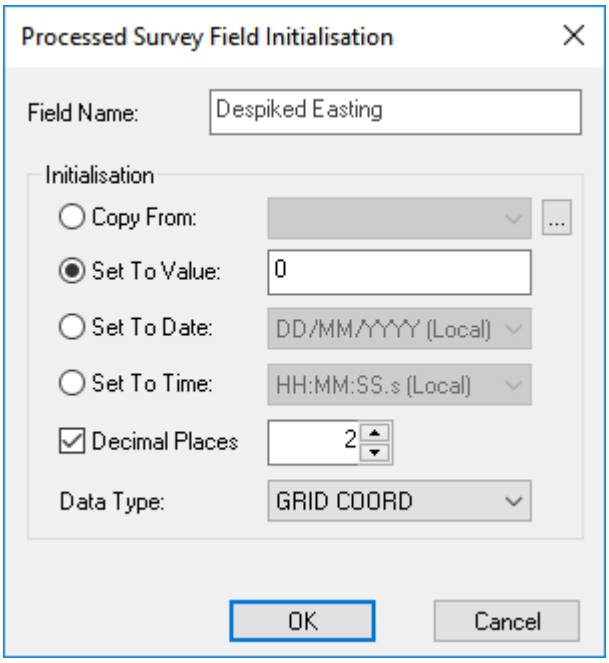
Configuration

The configuration window lets you add and configure your list of columns for the Processed Survey table. At the bottom of the window is an option to “Initialise Data Fields”. This is switched on by default, and it means that any existing Processed Survey data will be destroyed and replaced when this script is run. If you turn off the “Initialise Data Fields” option then you can use the script to add extra columns in the Processed Survey table without destroying data in other columns that already exist.Clicking the Add button opens a window where you can type a name for the new column and select how it should be initialised.



The “Column Name” is the name of the new data column and will be displayed in the data views of **VisualEdit Pro**. It is important to enter a name that accurately but briefly describes and identifies the data. The examples shown above and below have a column for “Depth” but do not indicate what point on the ROV this refers to. In some cases this might be acceptable, but in others it might cause confusion and perhaps a longer name such as “SeaKing Depth” would be better, so as to distinguish this from the CRP or Profiler depths.

TIP: If you are using the copy option or setting a column to be Time or Date, leave the Column Name blank until after you select the Initialisation method – it will be filled in automatically to match what you select, and can then be edited if necessary.

It is also important to consider the formatting of the columns. In particular make sure that you allow enough decimal places; data can always be rounded down to fewer places later. For example if bathy data is to be charted you may need to allow for depths in metres with three decimal places – although this exceeds the accuracy of the raw data, it will ensure that when data is plotted on a chart with vertical exaggeration it appears nice and smooth rather than looking like it has steps in it.

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If you want to copy a raw column you can select it from a drop-down list as shown below. If this is done before a Column Name has been typed in, the software will automatically set the Column Name to be the same as the name of the source.

Other options are to “Set to Value” which allows you to enter a fixed number to be used for all records, “Set to Date” or “Set to Time” which format a readable copy of the internal timestamp of the data. (All raw and processed data has a hidden “VisualWorks Timestamp” column. Adding a processed column using the Set to Date / Time options adds an extra copy of this with a more readable format.)

The final option allows you to specify the number of decimal places that will be displayed and saved for this column.

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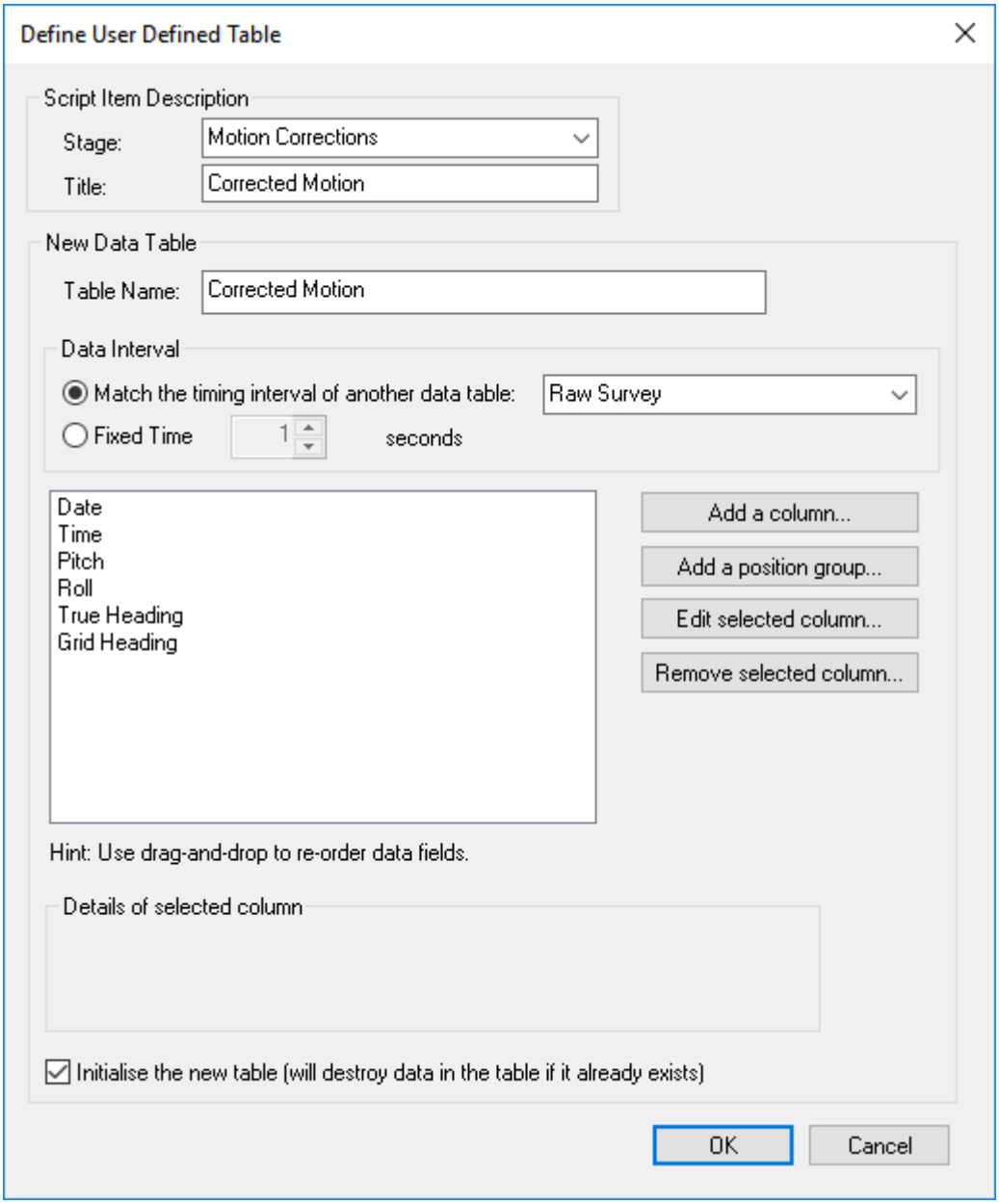
Script – Define User Defined Table

Description

This script allows you to create a new data table with a name that you choose yourself. It allows the user to specify the names and formatting of the columns in the processed data table. Columns may be created with blank entries, with user specified constant values (usually zero), or by copying a data value from a raw data field. This script is useful if you want to process data from a sensor without changing the time interval of the logged data.



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Configuration

Unlike the the configuration for the script to Define **Processed Survey** Fields, this one for a **User Defined Table** lets you specify a Stage and a Title and, most importantly, it lets you type the Table Name that you want for this new data table.

The configuration window allows you to add and define a list of data fields. At the bottom of the window is an option to “Initialise Data Fields”. This is switched on by default, which means that any existing processed survey data will be replaced when this script is run. If you disable the “Initialise Data Fields” option it is possible to use the script to add a new Data Field without destroying the data in those which already exist. This allows extra columns to be added to the Processed Survey Data table.

All other settings for defining a User Defined Table are the same as for the script Define Processed Survey Fields 224.

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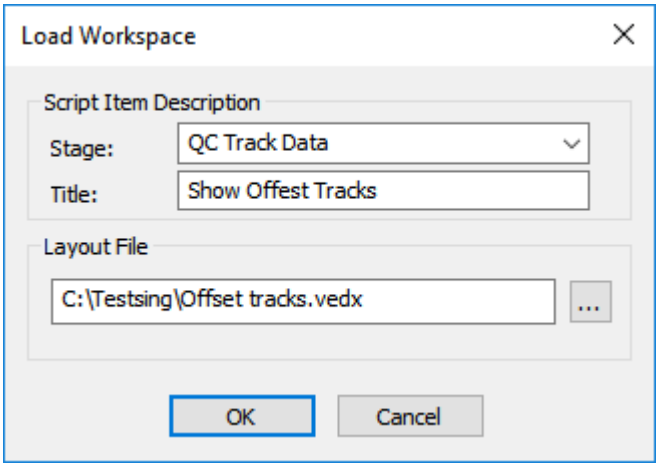
Script – Load Layout

Description

The Load Layout script allows a different Layout file to be loaded automatically during the processing batch. The Layout file controls the choice of which windows are displayed and which data is displayed in each window.



Configuration

The configuration of the Load Layout script simply involves using the file browser to select a Layout file. In common with other scripts, the Load Layout script may be assigned a Stage name and a Title to describe its intended purpose.

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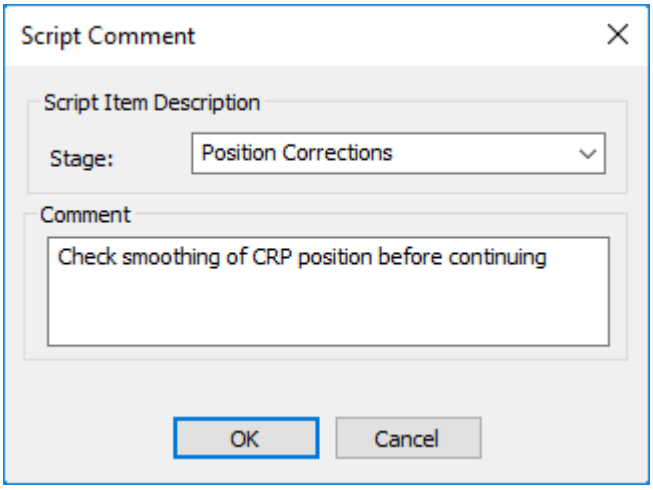
Script – Comment

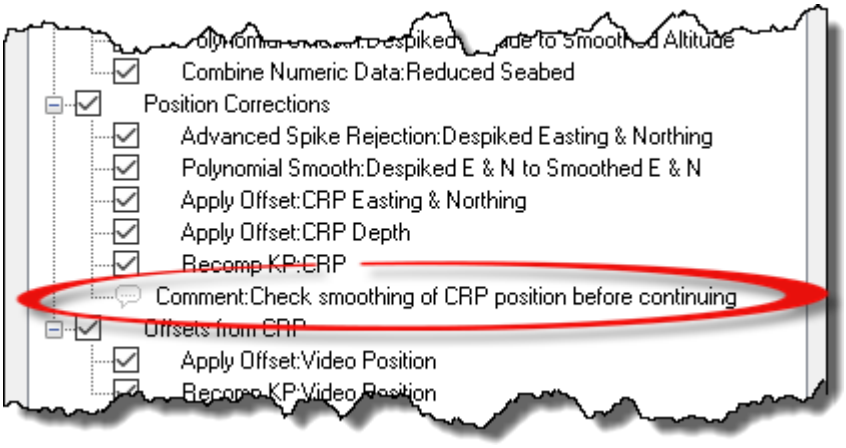
Description

The Comment script does nothing to any data. This script allows you to add a text comment in the batch window to help other users know what the batch is doing or what you want them to do. For example you might put an instruction saying "Check the results at this stage before running other scripts."



Configuration

Select the relevant stage, and type the comment that you want to show in the batch window.



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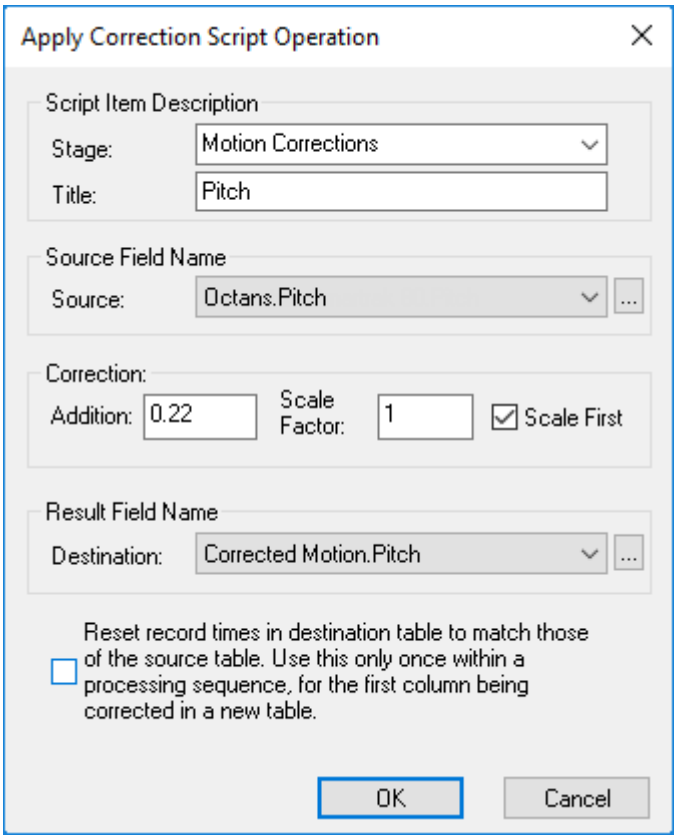
Corrections and Calculations

Script – Apply Correction

Description

This script allows you apply a Correction and/or a Scale Factor to a processed data field. This can be used to apply calibration corrections to a motion sensor or to apply any other correction value to any logged numeric data. The correction value is added to the source data so if you need a negative correction enter a negative number in the correction field. Note that the Scale Factor can be applied before or after the Correction value is added. This is controlled by the "Scale first" option.



Configuration

The configuration window allows you to enter a Stage and Title for this script operation.

The Source and Destination data are each selected from lists of available data fields. The script allows you to use the same field for both Source and Destination if you wish, or to select two different fields as is shown in the picture below.

If the destination table does not already contain any rows of data and you want to create one row to match each row in the source table, select the option at the bottom to "Reset record times in the destination table to match those of the source table".

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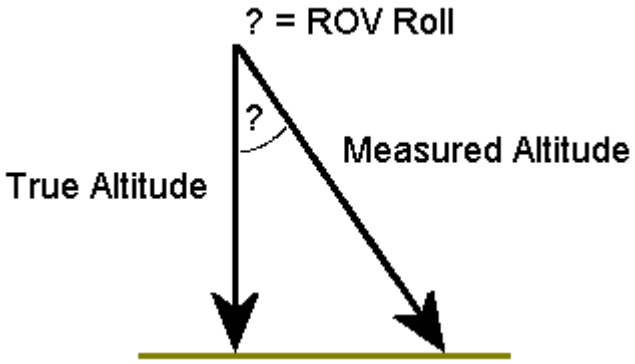
Script – Apply Motion Correction

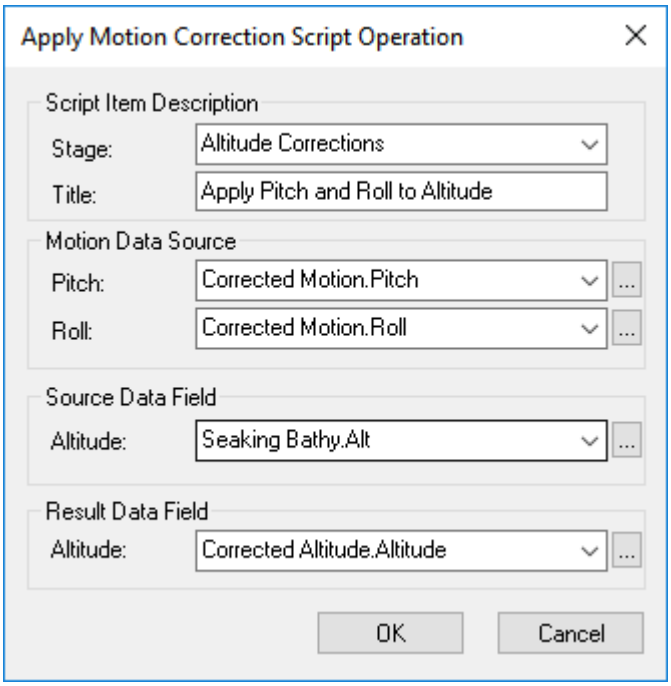
Description

This script corrects logged altitude data to reduce it to the vertical. Altimeters are range measuring devices therefore if the ROV and the Altimeter are not vertical the measured range may be greater than the true altitude. By applying the pitch and roll of the ROV it is possible to reduce the measured altitude range to its vertical component.



Altimeter Measurement Error

(Note that the relevance of this script depends on the beam-width of the altimeter and also the inbuilt firmware of the altimeter in use. A wide beam-width with firmware designed to detect the “first return” would already log the vertical component of the altitude unless the Pitch or Roll were so great as to exceed the beam-width.)



Configuration

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The configuration of this script requires selection of the Pitch and Roll data sources, and the source and destination of the Altitude data.

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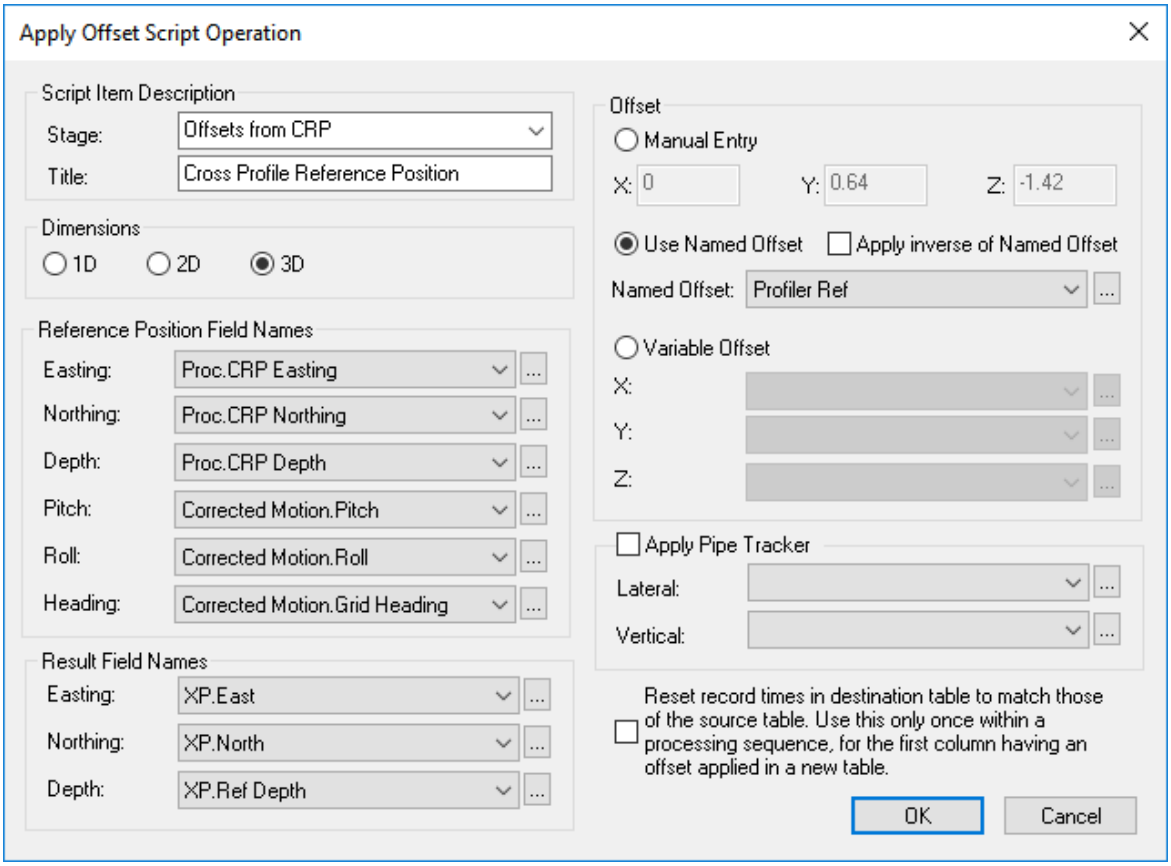
Script – Apply Offset

Description

This script applies a one, two or three dimensional offset from one position to another.

- A one dimensional (1D) offset calculates the Depth of something relative to another known Depth on the same ROV.
- A two dimensional (2D) offset calculates the Easting and Northing of something relative to another known position on the same ROV.
- A three dimensional (3D) offset is used to calculate the Easting, Northing and Depth of something relative to another known position on the ROV.



Configuration

The script requires Pitch, Roll and Heading values from any available data table, and the X, Y and Z offsets from the Reference position to the Result position. The offsets can be typed in as fixed "Manual Entry" values, or you can use a table of "Named Offsets" with their time of measurement. If an item is moved the offsets can be remeasured and the new values can be added to the table using the same name but a different time. A third option allows you to use a "Variable Offset" logged in any data table. This last option may be useful if for example you have a moveable water-jetting arm on a trenching system.

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There is an extra option to apply lateral and vertical ranges from a Pipetracker system so as to calculate the position of Top of Pipe. In this case the selected offset values are applied first, to calculate the location of the Pipetracker hardware reference, and the logged ranges are applied from there to calculate the pipe position.

The example below shows an offset of 0.64m in Y (i.e. 0.64m forward), and -1.42m Z (i.e. 1.42m up) being applied to calculate the 3D position of the Cross-Profiler (XP) reference position from the 3D CRP position.

See also Offset and Motion Conventions 21

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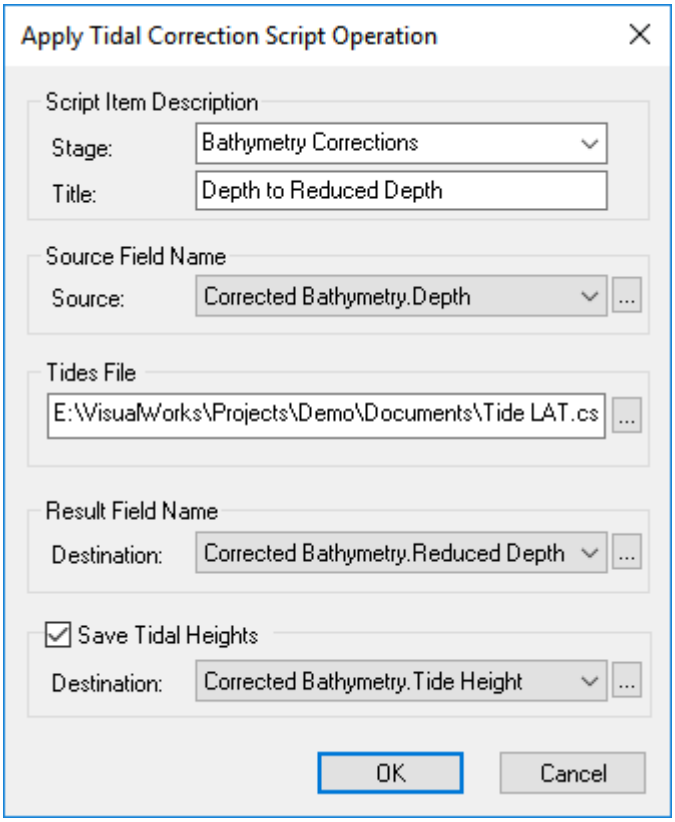
Script – Apply Tidal Correction

Description

This script applies a tidal reduction to a depth value.



Configuration

The script requires source and destination depth fields, which may be the same or different. It also requires a file of tidal heights in a VisualSoft csv format as described below. If you select the box to Save Tidal Heights, the interpolated tide value used for each correction will be saved into a different column so that you can do some easy QC.

VisualSoft Tide File Format

The VisualSoft tide file format is a comma-separated file with three columns: date, time and tidal height.

- Date and time **must be UTC** not local time.
- Date format is **dd/mm/yyyy** and time format is **hh:mm:ss**.
- Tidal height should be in **metres**.

e.g.:

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27/08/2006,0:00:00,0.62
27/08/2006,0:10:00,0.60
27/08/2006,0:20:00,0.58
27/08/2006,0:30:00,0.57
27/08/2006,0:40:00,0.54

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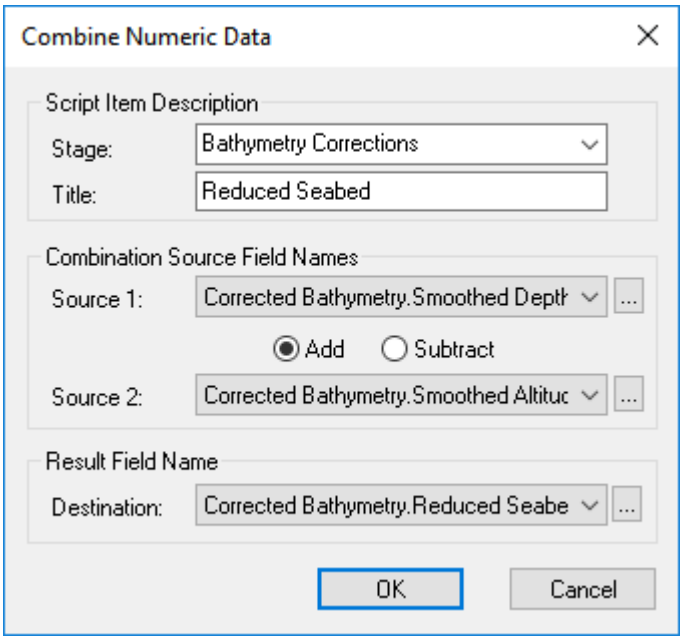
Script – Combine Numeric Data

Description

The Combine script allows you either to add two data fields together or to subtract one from the other. The picture below shows it being used to calculate the seabed depth by adding ROV depth to ROV Altitude. In a similar way this script could be used to calculate freespan heights by subtracting the “Pipe Bottom” depth from the “Mean Adjacent Seabed” depth, or to calculate depth of lowering by subtracting "Mean Seabed" depth from "Top of Pipe" depth.



Configuration

The configuration of the script simply requires the selection of the two source data fields and the specification of whether Source 2 should be added to or subtracted from Source 1.

In this example tidal corrections (or tidal reduction) has already been applied to the Smoothed Depth values, and so the final Seabed depth is also already tidally corrected or "reduced" to the tidal datum.

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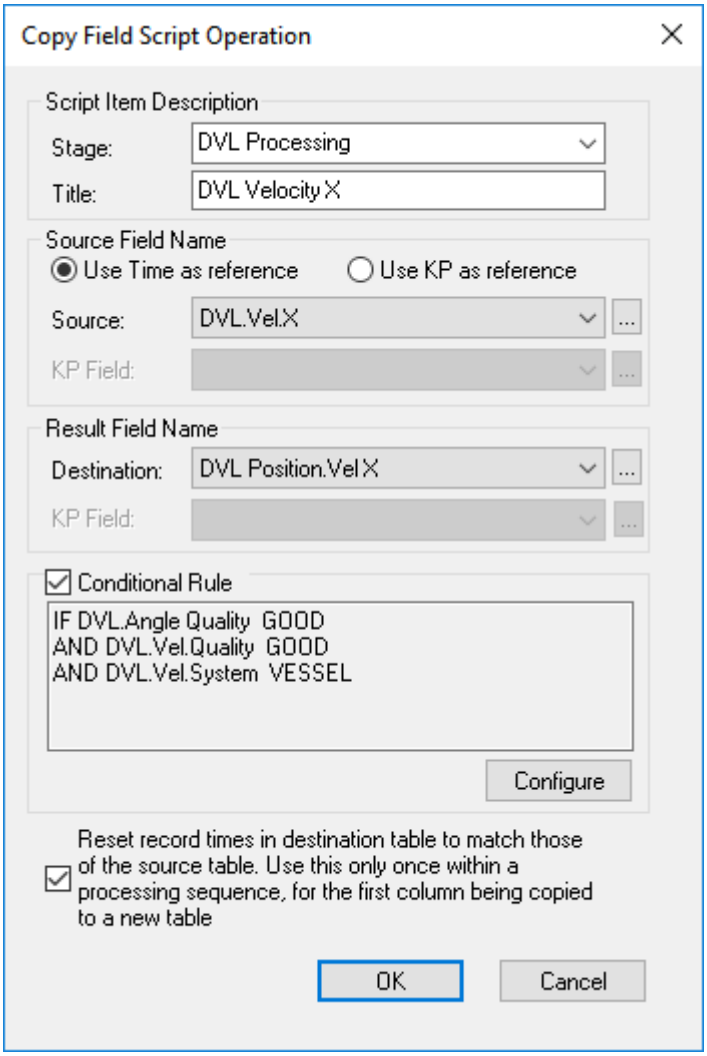
Script – Copy Field

Description

The Copy Data Field script allows you to copy values from one data field to another. If the destination table already has data in it, its time and date values will be used to interpolate data from the source field. If the destination table does not already contain data, new records will be created at the same time interval as the source.



Configuration

Configuration of the Copy script simply requires a source data field and a destination data field as shown below.

You can copy data from one table to another based on either Time or KP.

Optionally you can restrict what is copied by applying a condition. The example below only copies GOOD data and will ignore any bad data.

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The Copy Field script also can be used to initialise a data table using the option to "Reset record times" in the destination table. This will create one record in the destination for each record being copied from the source. This ensures an exact copy with no interpolation of the data. This option destroys and recreates all data in the destination table so it should only be used once per table in a batch sequence.

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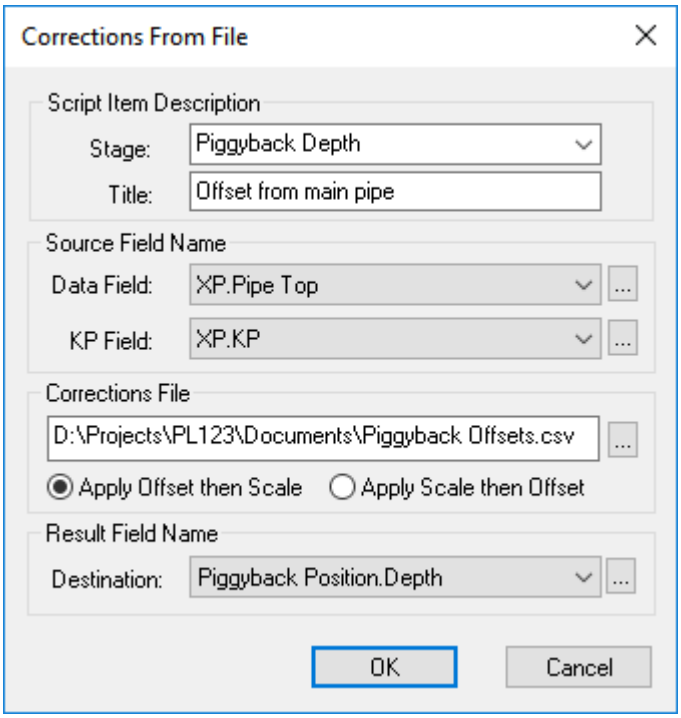
Script – Corrections From File

Description

The Corrections From File script is a method of applying a variable correction to a data field based on KP defined in a CSV file.

The format for the CSV file is KP,SCALE-FACTOR,OFFSET. The KPs must be in ascending order in the file. Examples of using this script include correcting Pipe tracker vertical ranges, or adjusting piggyback Top of Pipe positions relative to the main pipe based on observed piggyback clock positions.



Configuration

The configuration requires the selection of a Data Field containing the values to be corrected, and a KP column that will be used to find the appropriate correction value in the CSV file.

The corrections file should be selected using the Browse button.

There is choice of whether to apply the offset (C-O) before the scale factor, or the other way round.

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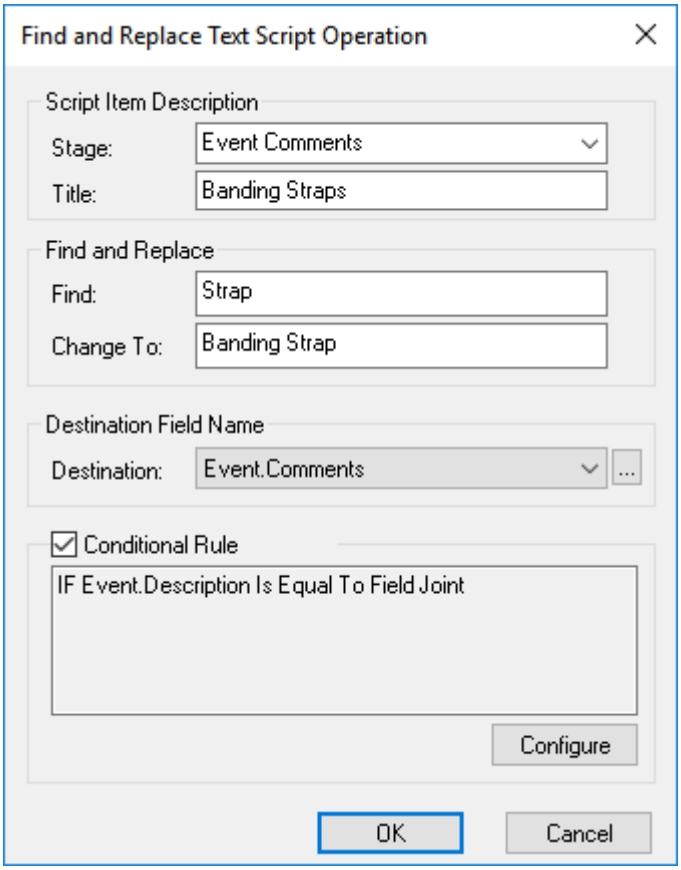
Script – Find and Replace

Description

The Find and Replace script allows changes to be made to text or numeric values within any column of any data table. It can be used to correct frequent spelling mistakes in Event comment fields, or to change any other erroneous data. The script has an option to apply the Find and Replace option based on a condition set by the data



Configuration

To configure the script, enter the text or numbers to be found and replaced, and specify the data table and column to be searched.

If you want to change data only if a particular condition is met, you can select the box for the “Conditional Rule” and then click on Configure to define the required conditions. In the example below the word "Strap" will be changed to "Banding Strap", but only in the comments of Field Joint events. Other types of event where other types of straps might appear will not be changed.

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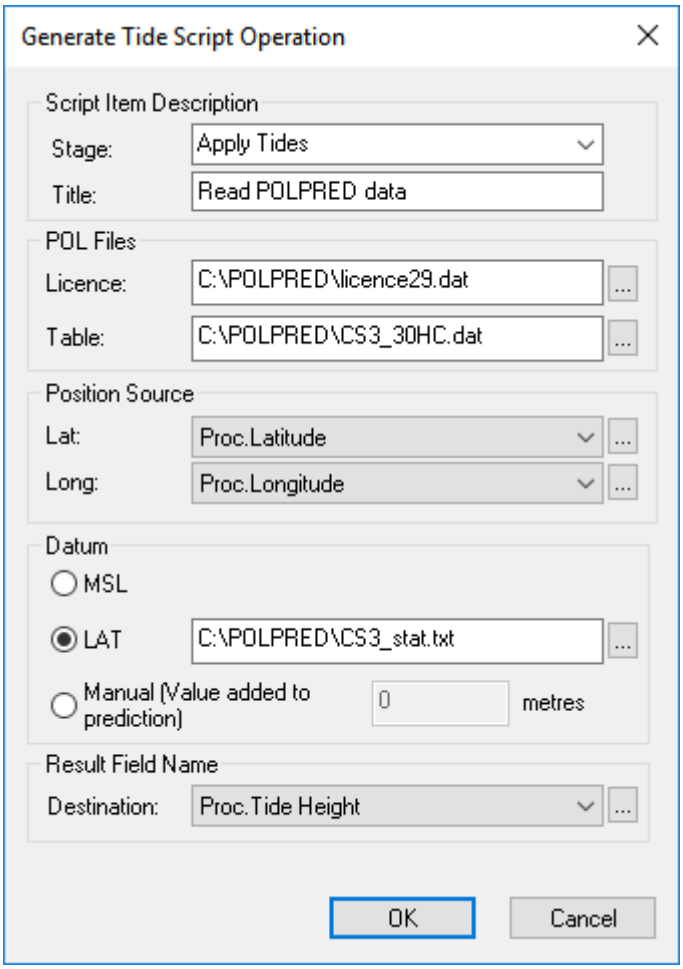
Script – Generate Tide

Description

The Generate Tide script requires that a licensed copy of POLPRED for Windows is installed on the same PC as VisualEdit Professional. The script will read from a POLPRED tidal prediction table and datum file, and optionally from a file defining LAT.



Configuration

The script should be configured with the locations of the POLPRED license file, data table file, and the geographical position (latitude and Longitude) columns for which the tidal correction is to be computed.

If you require tidal corrections to LAT instead of MSL you should select the LAT option and browse to locate the POLPRED LAT definition file for your work area. Alternatively a single vertical offset value may be specified using the Manual option.

The destination column for the tidal height value should be specified. Later you can subtract that saved tidal height from the logged depth readings using the script Combine Numeric Data 238.

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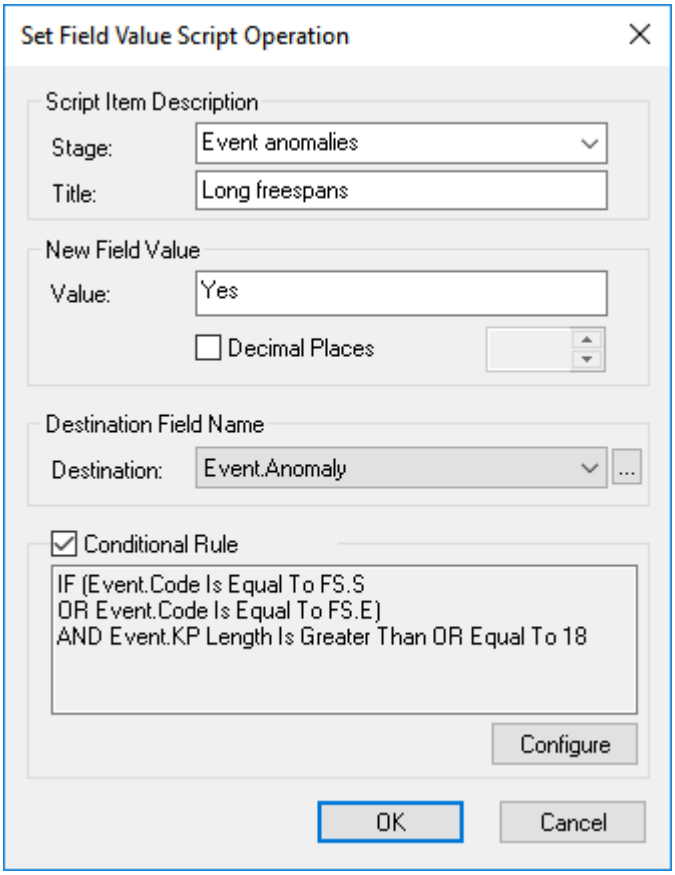
Script – Set Field Value

Description

This allows you to initialise a data field to a specific value, or to set it based on a specific condition relating to the same or any other data field. The script could, for example, be used to set an event anomaly flag using a condition to determine which events are anomalous. In the example below it sets the Anomaly column in the Events table to "Yes" for all Freespan Start or Freespan End events where the calculated KP Length of the span is 18m or longer.



Configuration

The new value may be any text or number, so long as it is appropriate to the data field being set. For numeric values there is an option to define the number of decimal places.

Enabling the “Conditional Rule” allows you to define a condition that must be met by the data. Data that matches the rule will be set to the New Field Value, data that does not match the rule will remain unchanged.

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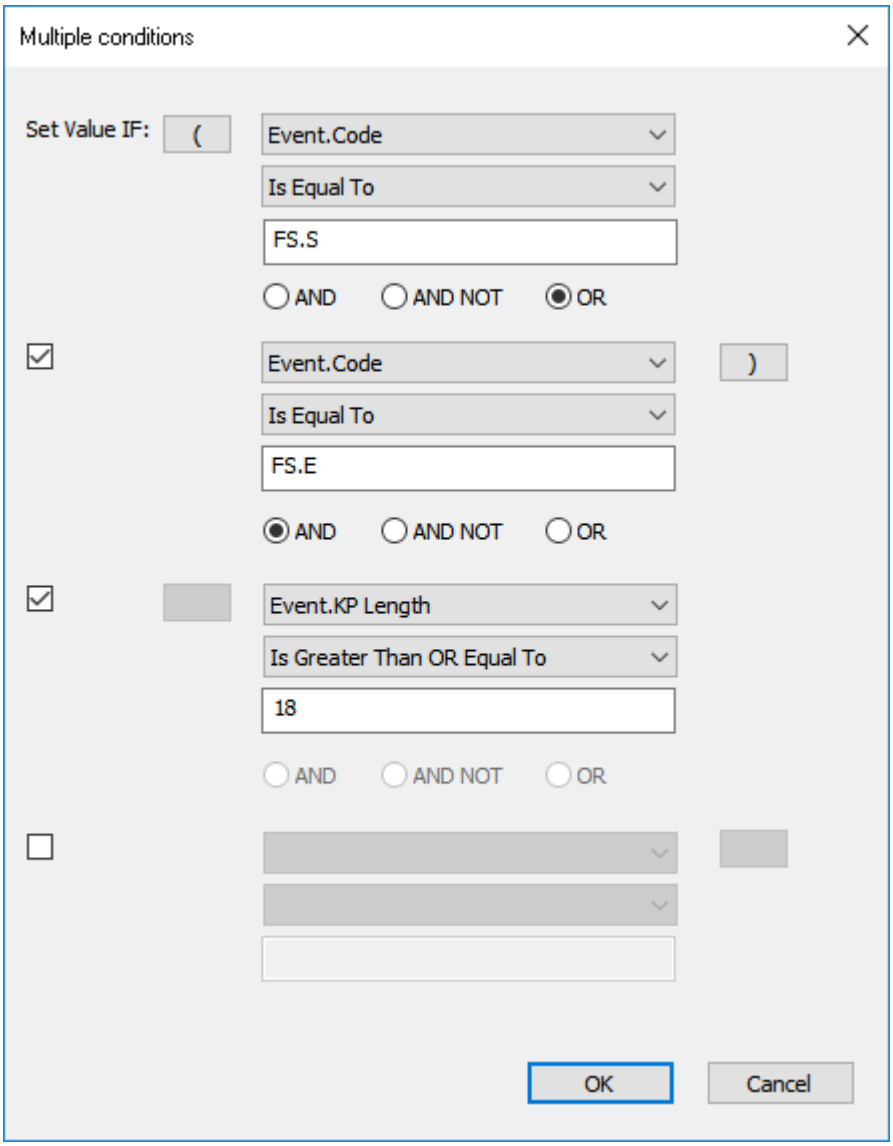

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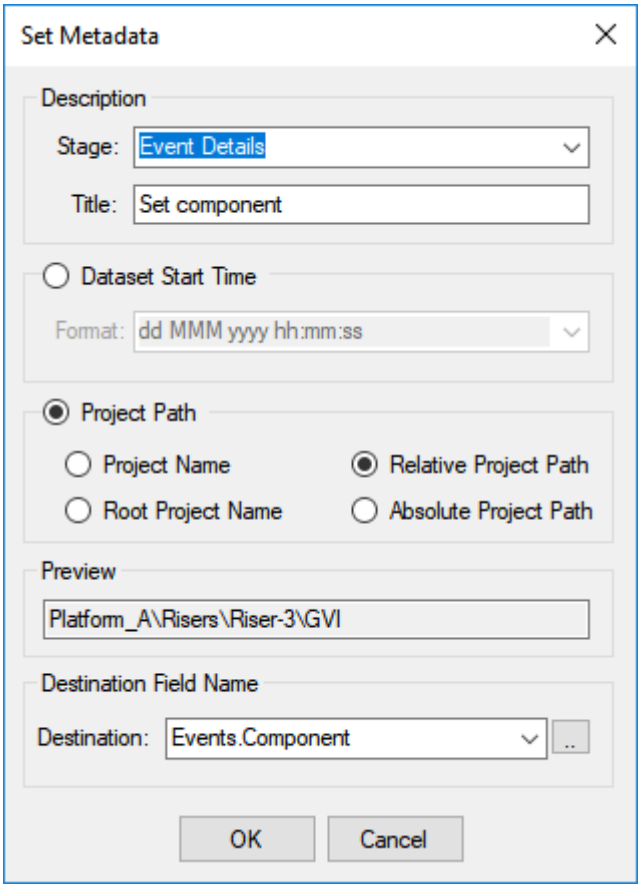
Script – Set Metadata

Description

Use this to add Dataset times or Project details into the data tables as text.



Configuration

Select which details to use, and then choose the required format. The example shown puts the Project and Sub-Project path into a column called Component in the Events listing. There are many different date and time formats available in a drop-down list.

The different Project Path options look like this:

Project name	GVI
Root Project Name	Platform_A
Relative Project Path	Platform_A\Risers\Riser-3\GVI
Absolute Project Path	**E:\VisualWorks\Projects**Platform_A\Risers\Riser-3\GVI

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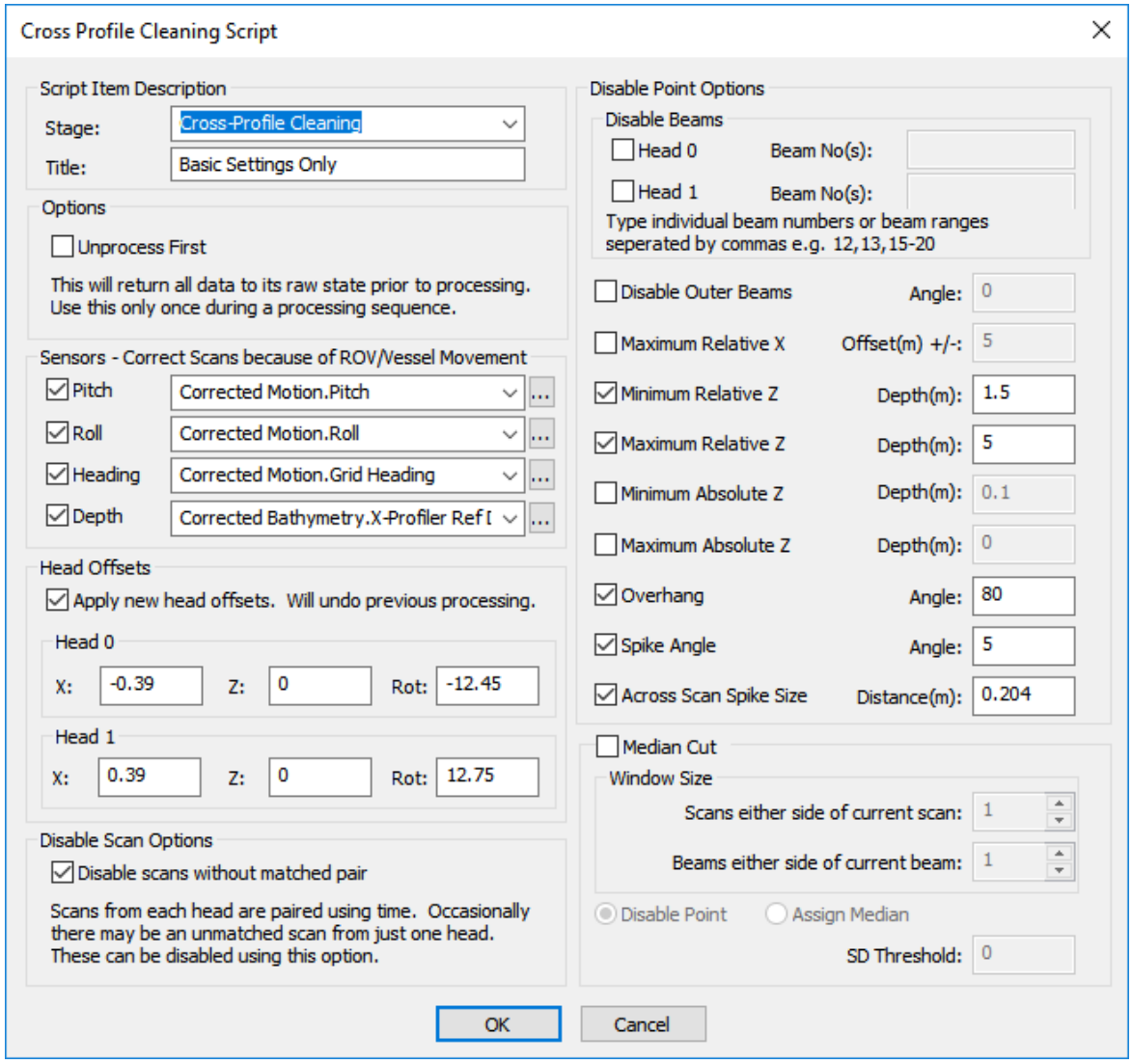
Cross-Profiles

Script – Cross-Profile Cleaning

Description

The Cross Profile Cleaning script provides fast, highly configurable cleaning of multibeam or scanning cross-profiler data.



Configuration

The configuration requires the selection of ROV motion data to be applied to the scans, the head offsets and rotations for each MBE or Profiler head, and the selection of a number of different cleaning or smoothing options.

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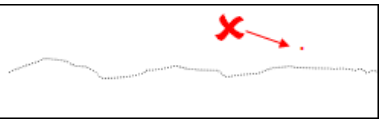
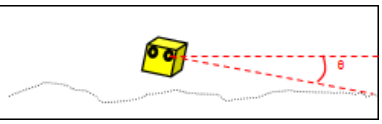
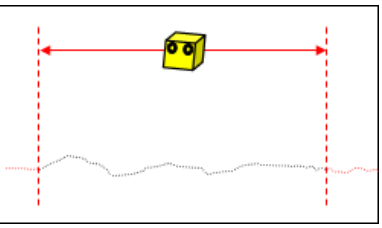
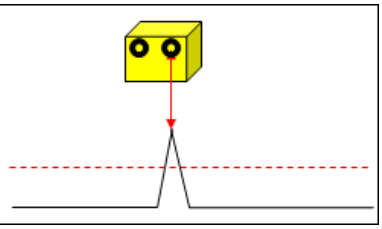
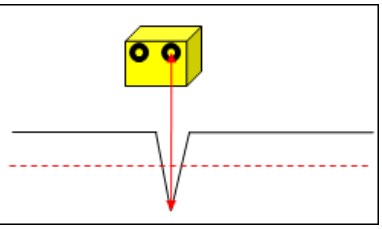
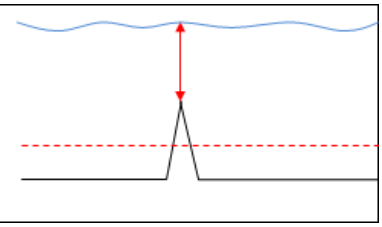
Cleaning Options

Disable individual beams	Disable one or more individual, numbered beams which are giving consistently erroneous data	
Disable outer beams	Disable all beams with an angle from the horizontal (after roll correction) of less than a user defined threshold	
Max relative X	Disable all points with relative X offsets (from the scanning head) greater than a user defined threshold. This can be used to trim the outer edges if outer beams are unreliable, or perhaps just to give a neater 3D view or DTM export	
Min relative Z	Disable all points with relative depths (from the scanning head) less than a user defined threshold	
Max relative Z	Disable all points with relative depths (from the scanning head) greater than a user defined threshold	
Min absolute Z	Disable all points with absolute depths shallower than a user defined threshold	

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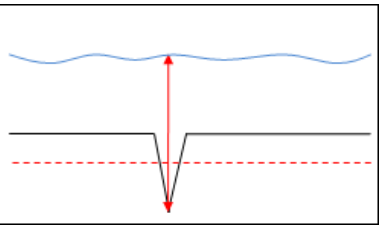
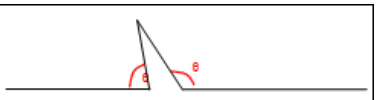
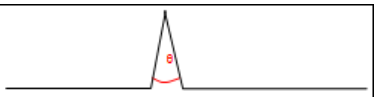
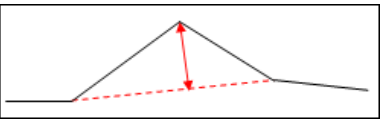
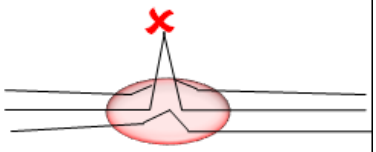
Max absolute Z	Disable all points with absolute depths deeper than a user defined threshold	
Overhang	Disable a point if either of the outer angles formed by joining the point to its neighbours is less than a given angle	
Spike angle	Disable a point if the enclosed angle formed by joining the point to its neighbours is less than a user defined size	
Across scan spike size	Disable a point if it is more than a user defined perpendicular distance from a straight line joining its neighbours	

Cleaning using the Median Cut method will be enabled in a future version.

Median Cut Cleaning	Using a defined window size around the current point, compare its value with that of neighbouring points on the current scan and also their equivalent beams on adjacent scans. If it deviates by more than a user defined SD threshold from the mean, disable it. Typically this would use one beam to either side, and one scan to either side giving a 3x3 window, but this may vary according to relative spacing of adjacent beams versus successive scans.	

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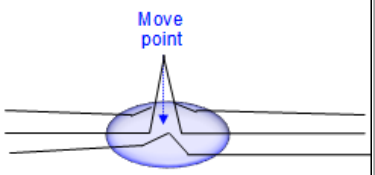
Smoothing Options

Smoothing using the Median Cut method will be enabled in a future version.

Median Cut Smoothing	Using a defined window size around the current point, compare its value with that of neighbouring points on the current scan and also their equivalent beams on adjacent scans. If it deviates by more than a user defined SD threshold from the mean, assign it the median value of the points in the window. Typically this would use one beam to either side, and one scan to either side giving a 3x3 window, but this may vary according to relative spacing of adjacent beams versus successive scans.	

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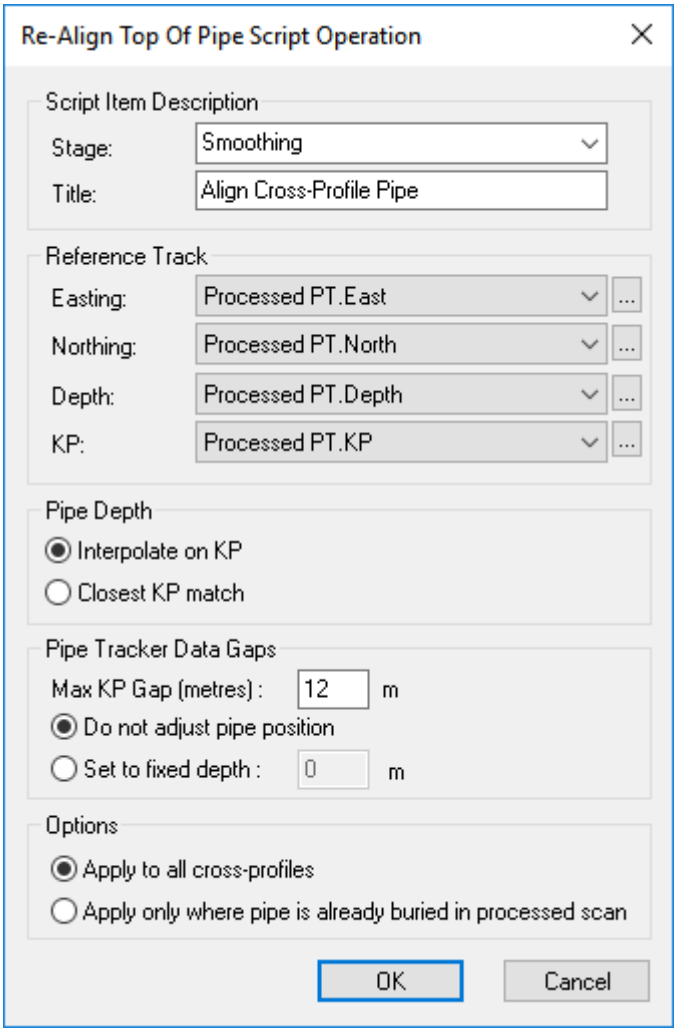
Script – Re-Align Pipe

Description

This script will place or move the pipe in the cross-profile data so that it matches a position from another data table. This is most commonly used to apply pipe-tracker data to cross-profiles, but could also be used with smoothed data, or with data from another phase of a construction project.



Configuration

The script requires a three-dimensional position Dataset, plus a corresponding KP field. This allows the script to link the position data to the profile data using KP, and so overcomes problems such as the pipetracker and the profilers being at different positions on the ROV.

You can decide whether to interpolate the source data and calculate positions for the exact KP of each scan, or instead simply use position data from the record closest to the scan KP.

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If there are gaps in the source data (for example pipetracker data if the pipe goes out of range), you can make choices about what to do. For short gaps that are less than the "Max KP Gap" you can simply interpolate or use the closest value (depending on the previous setting), but if the gap is larger you may prefer to not assign the pipe, or perhaps to set it to a fixed value such as 999 metres so that you can easily find these areas for later QC.

There is a choice to apply the script either to all cross-profiles, or to apply it only to those areas where the pipe is buried.

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Script – Reference XP Display to Video KP

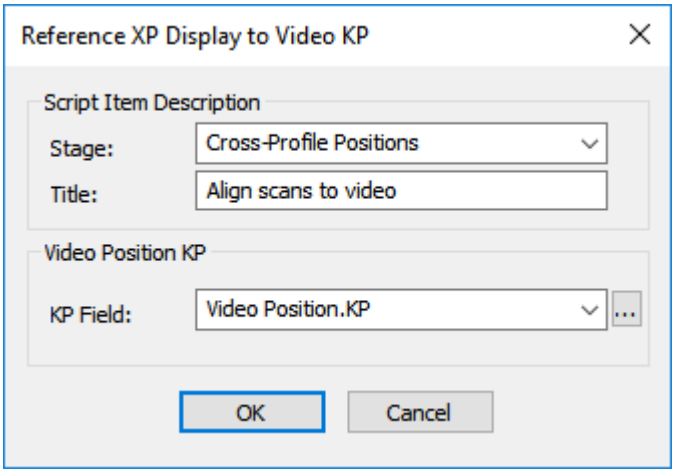
Description

It is often the case that the cameras are at the front of an ROV and the profiler or MBE heads are on the back. Even if both are at the front there can be a gap between the bit of pipe that the cameras are focussed on and the bit of pipe being scanned by the profiler or MBE. When you play the video in VisualEdit or VisualReview most of the windows are synchronised using time, so the cross-profile that would be displayed would be the one logged at the same time as the displayed video frame. It is probably more useful to have the software display the scan that was logged at the same position and KP as the video frame, so that when you see a freespan or a burial transition in the video you also see it it in the cross-profile display and the long profile display. This script will do that for you.

There is a time difference between the time when the cameras are "looking at" a particular KP, and the time when the profilers scan that same KP. That time difference is not fixed because the time taken for the profilers to reach the KP that the camera has already filmed will depend on the speed of the ROV. This script calculates the time offset between the Video position and the Cross-Profiles individually for each cross-profile scan. It uses the KP of the scan to find the time when the cameras were at the same KP and then saves the difference between the two times. This "Join Time" is saved with each scan and is used when working out what to display.

The Reference XP Display to Video KP script allows the cross profile display to be synchronised with the video display based on KP, so that what is displayed in the cross profile view (e.g. a freespan) matches what is seen in the video, irrespective of any offset between profilers and camera view.

This script should be run after the calculation of both the Video Position KP and the Cross-Profile KP, and those two must both use the same sail line. Note, that if you re-calculate either of those KPs you should also re-run this script.



Configuration

The script requires only one field: the KP of the focal point of the video cameras. This is not the KP of the ROV or even of the cameras, but the KP of the point that the cameras are filming. If the ROV has a green laser, it should be the point where that laser line

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crosses the pipeline. Typically this KP will be in the Video Position table, which holds the Easting, Northing, Depth and KP of the point that the cameras are focussed on.

Tip: If you want to undo the effects of this script and reset the cross-profile display to synchronise with the video using the scan logging time instead of the scan KP, run the script Reset Cross-Profile Join Times 258.

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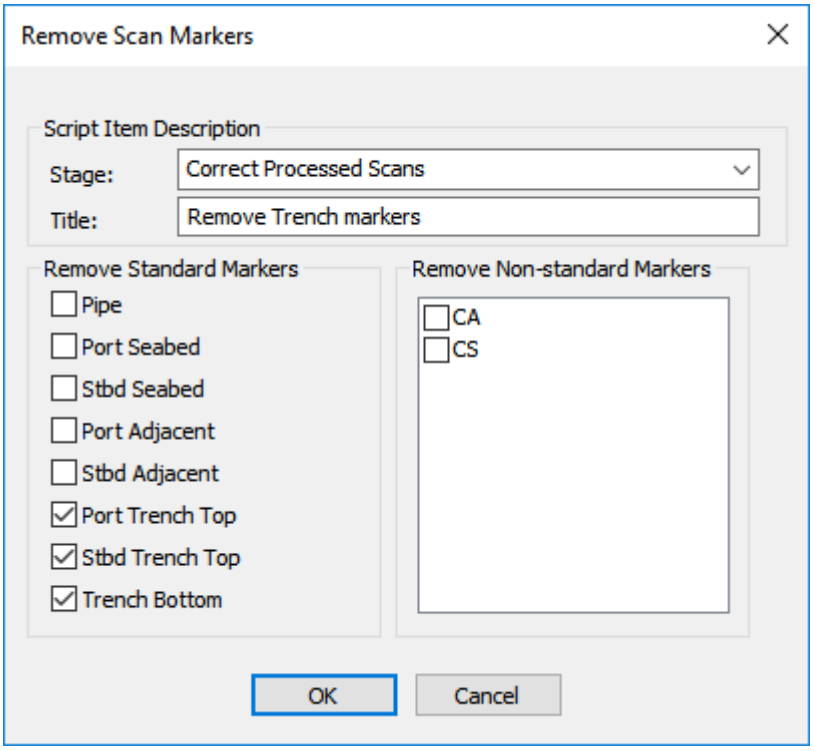
Script – Remove Scan Markers

Description

When you process cross-profiler or MBE data you can assign the pipe position, and also assign seabed level markers. This script allows you to remove some or all of those assigned features from a processed scan.



Configuration

Select the boxes for the markers that you want to remove from the processed scans. On the left is a list of markers that are "standard" in VisualEdit and the VisualSoft file specifications. On the right you will see any "non-standard" markers that might have been included in imported data. In the example below the script is configured to remove the three standard trench markers – perhaps because a processing setup designed for a trenched pipeline was mistakenly run on an area of pipeline with no trench. Instead of having to completely reprocess the data this script lets you quickly remove those unwanted feature markers.

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Script – Rescale Cross-Profiles

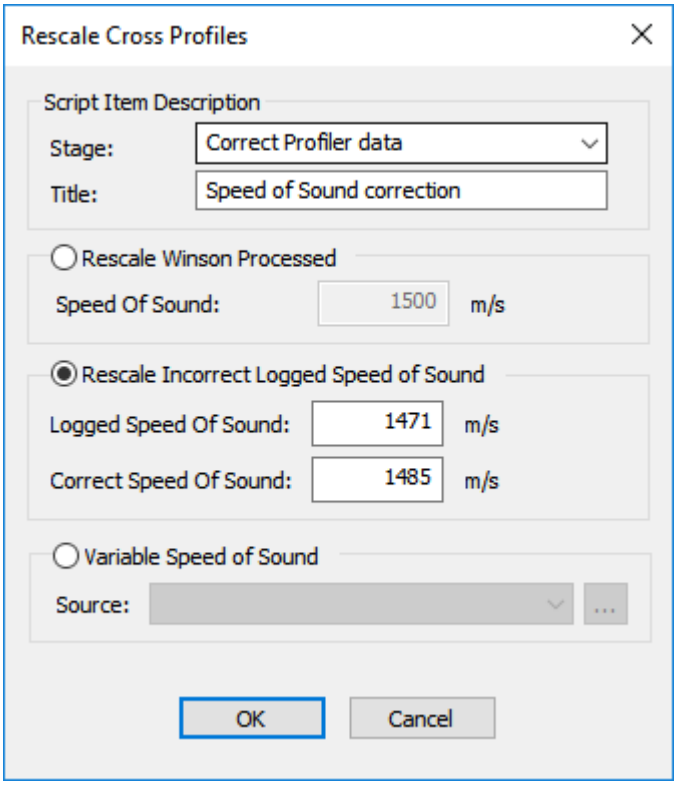
Description

The Rescale Cross-Profile script allows for the correction of cross-profile data logged with the wrong settings. It can be used for data where a Tritech SeaKing system was sending the Winson Processed format instead of the expected Winson Raw format, or it can be used if a profiler or MBE system was configured with the wrong speed of sound.

Scaling may be required for Tritech data which was incorrectly logged using the Winson Processed format (instead of the required Winson Raw format). Winson Processed has range data as a calculated distance unlike Winson Raw which has range data as a two-way return path time.

Secondly, there is the option to correct for cross-profile data logged with an incorrect speed of sound. For both options the correct speed of sound at the time of survey must be known and for the speed of sound correction, the incorrect speed of sound used during the survey must be known.

This operation does not affect the raw cross-profile data, but should be run prior to any processing of the profile data for correct marker placement.



Configuration

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The configuration requires the selection of which type of correction is required and the input of the known speed of sound value or values.

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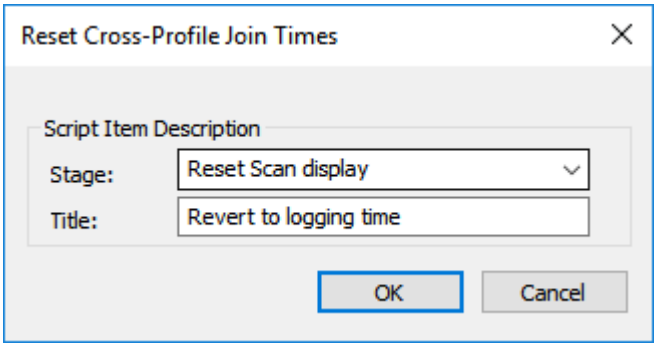
Script – Reset Cross-Profile Join Times

Description

The script Reference XP Display to Video KP 253 calculates a time correction (or Join Time) for the display of each scan so that it is shown when the video is at a matching KP instead of a matching time. If you want to undo that calculation and have the scans displayed based only on logging time not on KP, run this script Reset Cross-Profile Join Times.



Configuration

The script has no configuration options except the Stage and Title which can be used to describe what the script will do.

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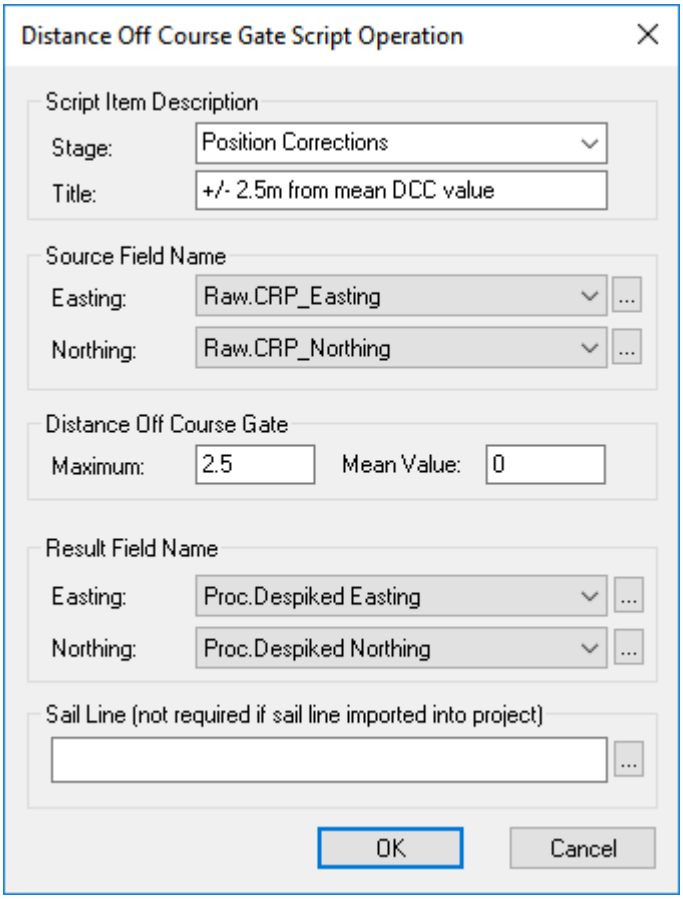
Data Cleaning and Smoothing

Script – Distance Off-Course Gate

Description

The Distance Off-Course Gate is a method of removing “spikes” from position data. The sail-line (i.e. runline or route file) is used to compute the distance of each position data point from the theoretical route. Points which fall too far from the line are moved back onto a best-fit trend line through the adjacent points. How far off the line the points may be is set by the user.

This script is rarely needed because most position data spikes can be more effectively and efficiently removed using the script Remove Spikes Advanced 263.



Configuration

The Distance Off-Course Gate requires a source and result position, defined by selecting the Easting and Northing columns. These source and result data may be the same or different. If the same fields are used, the source data will be over-written with the new values. If the logged data follows the intended sail-line route you would normally expect a mean Distance Cross Course (DCC) of zero metres, with some deviation to either side.

In the example below any points which are more than 2.5m to either side of the mean DCC value of zero will be treated as spikes and will be moved onto the best fit line

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through the other points. In some case you may find that the average position is offset to one side of the sail-line, perhaps running parallel to it with a two or three metre offset. If the data is mostly offset 3m to starboard of the sail-line, put a value of 3 in the Mean Value box. In that case the spikes will be those which have a DCC of less than 0.5 (3 minus 2.5) or more than 5.5 (3 plus 2.5).

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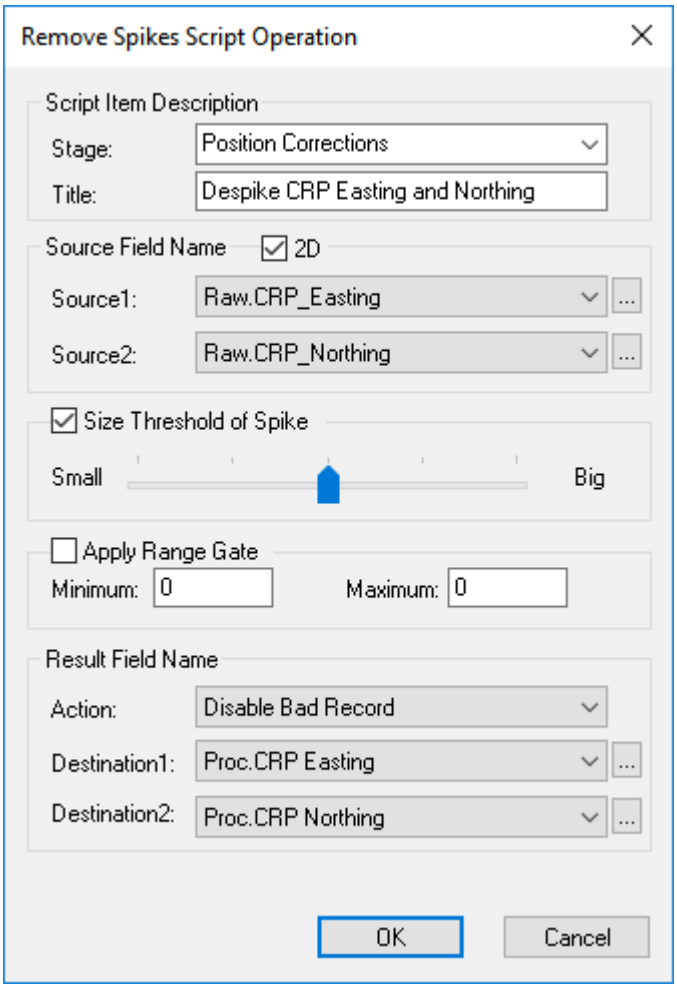
Script – Remove Spikes

Description

This script is used to remove “noise” from data such as USBL derived ROV positions, or Altimeter data.

There are two methods of removing the detected spikes: Disable the data record, or correct the value using interpolation between the adjacent points. Correction of spikes is based on a linear interpolation of the corrected point position using the closest good points either side of detected spike.

This script is rarely needed because most data spikes can be more effectively and efficiently removed using the script Remove Spikes Advanced 263.



Configuration

If running the script on Easting and Northing position data select the 2D option so that you can select two source fields and two result fields like in the example below. If you are removing spikes from depth, altitude or other single column data, deselect the 2D option.

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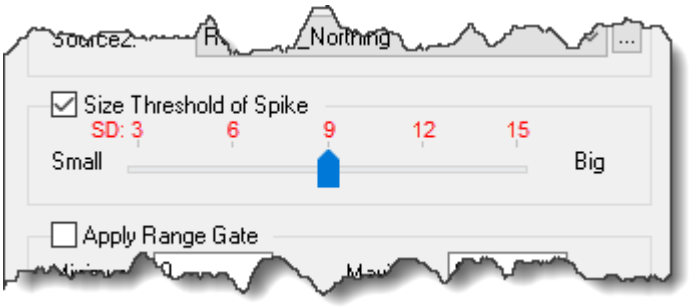
The script for the detection and removal of spikes offers a choice of the Standard Deviation (SD) method described above, or a more simple range gate. The range gate may be appropriate for depth or altitude data where all values may be expected to fall within a fairly narrow range. In some cases you may even wish to run the script twice – once with a range gate to remove the largest spikes, and a second time with an SD threshold.

If you use the "Size Threshold", the detection of spikes is based on a threshold of 3, 6, 9, 12 or 15 times the Standard Deviation of the entire loaded data set. This threshold is set using the "Size Threshold" slider bar:



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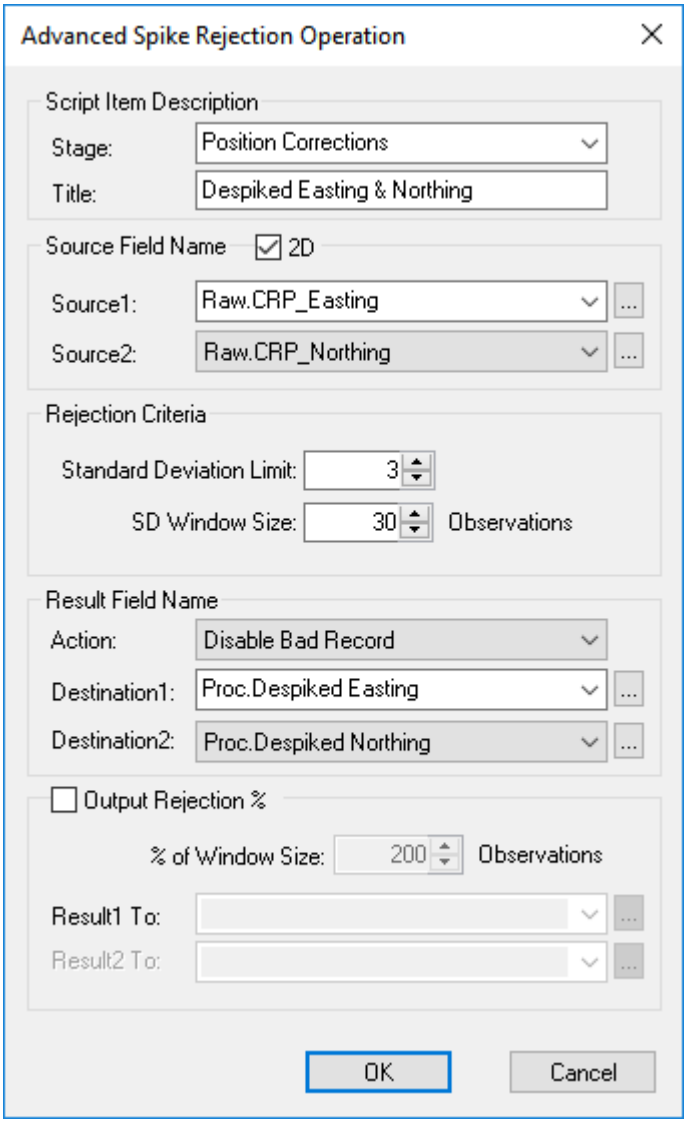
Script – Remove Spikes Advanced

Description

This script is similar to the "Remove Spikes 261" script, but allows you to have full control of the Standard Deviation (SD) threshold used for spike detection, and the size of the data window used to calculate the mean and the SD. The SD window is centred on each data point in turn, moving along the line of data from one end to the other in time order. For each window a mean value and SD of the source column is calculated. If the central point deviates from the mean by more than the chosen SD limit, it will be treated as a spike. Having detected that point as a spike, the script can either disable the point or correct its value.



Configuration

If running the script on Easting and Northing position data select the 2D option so that you can select two source fields and two result fields like in the example below. If you are removing spikes from depth, altitude or other single column data, deselect the 2D option.

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Set the SD limit to a value which finds the spikes without removing lots of points which are perhaps just random noise in the data. With acoustic position data from a HiPAP system you will often find there is lots of small noise in the data, but an obvious trend line through the middle of that noisy data. This is OK and can be corrected with smoothing; what we need to remove first are the less "balanced", less random, larger spikes which might distort the smoothing.

You may get better results if you use a slightly higher SD limit, but run the script more than once, taking the results of the first pass, and running them through another copy of the script. In that way you can first remove the very largest spikes, and then re-analyse what is left, and get rid of the smaller spikes.

The SD Window size used to calculate the mean and SD should not be too large. The window selects a number of rows in the data table to bear in mind how fast the data is updating – if you have ten rows of position data per second, you might want a larger number of points in the window than if you only have one row per second. You might want to think about how that "time window" relates to distance along a route or a pipeline.

There are two methods of removing the detected spikes: Disable the entire data record, or correct the data value. Correction of spikes is based on a linear interpolation against the time of the corrected point position using the closest good point to either side of detected spike.

At the bottom of the configuration window is a section that may be enabled to report what percentage of the data within a given window size exceeds the specified Standard Deviation Limit. Note that it is not necessary for this window size to be the same as that used for spike rejection. The results of this are output to a user specified data field and may be used later for further filtering and rejection of data if this is required. Alternatively you may simply be asked by a client to report these percentage values to provide an indication of the quality the data. This reporting is sometimes specified by an end client, most often for Out-of-Straightness surveys where the client will want to measure the data quality by tracking how much data you had to move or disable in order to make the rest look good.

Note that the “Output Rejection %” should not be turned on if you are using the option to “Disable Bad Record”.

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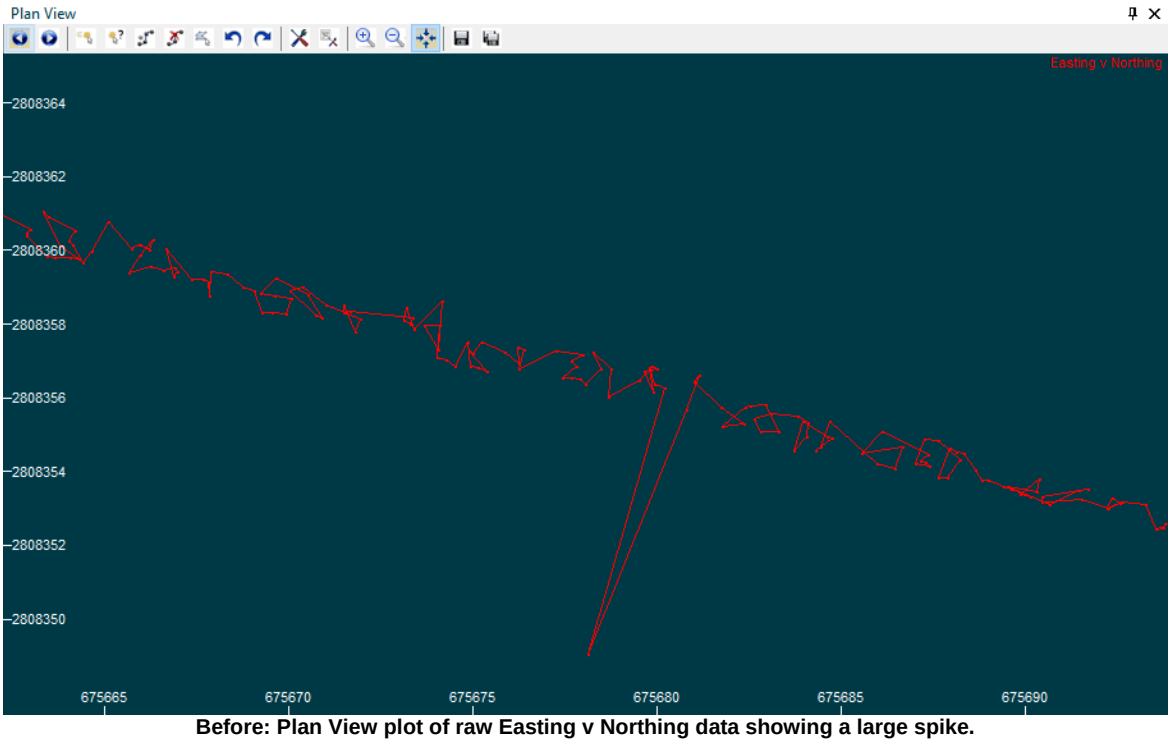
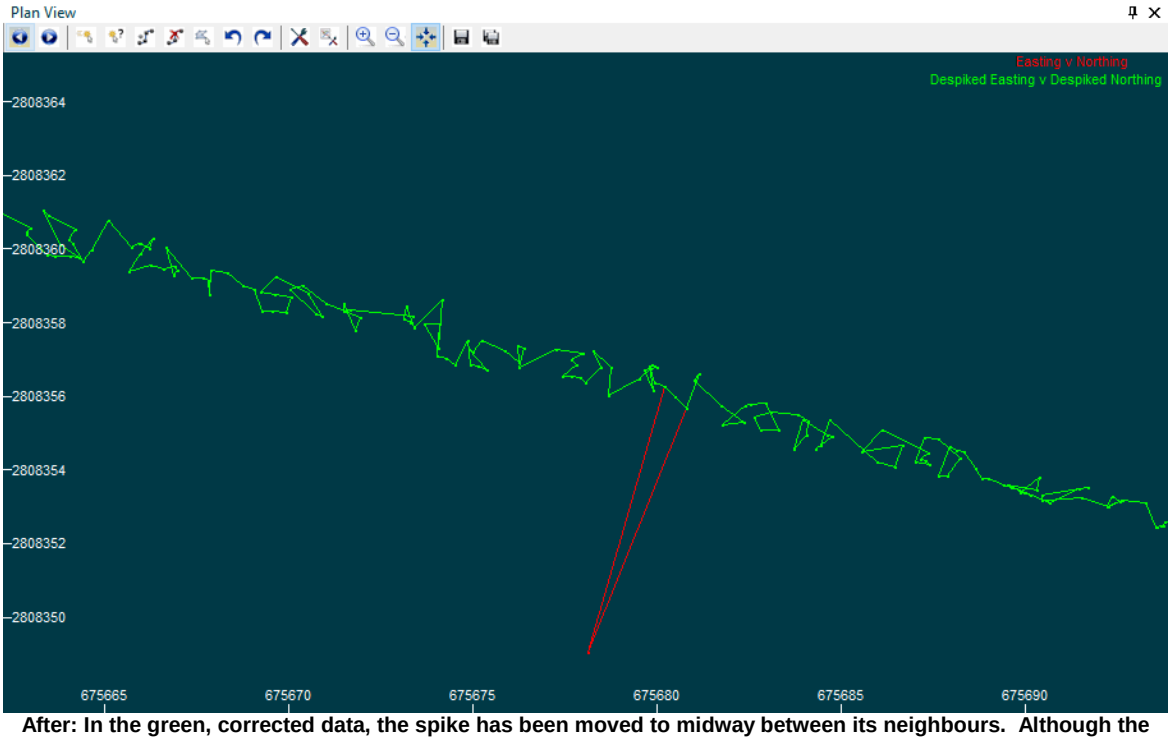


Before: Plan View plot of raw Easting v Northing data showing a large spike.



After: In the green, corrected data, the spike has been moved to midway between its neighbours. Although the remaining green data is still "spiky", these remaining spikes are random "noise" with an obvious trend through the middle, so the data is now suitable for use with a smoothing script.

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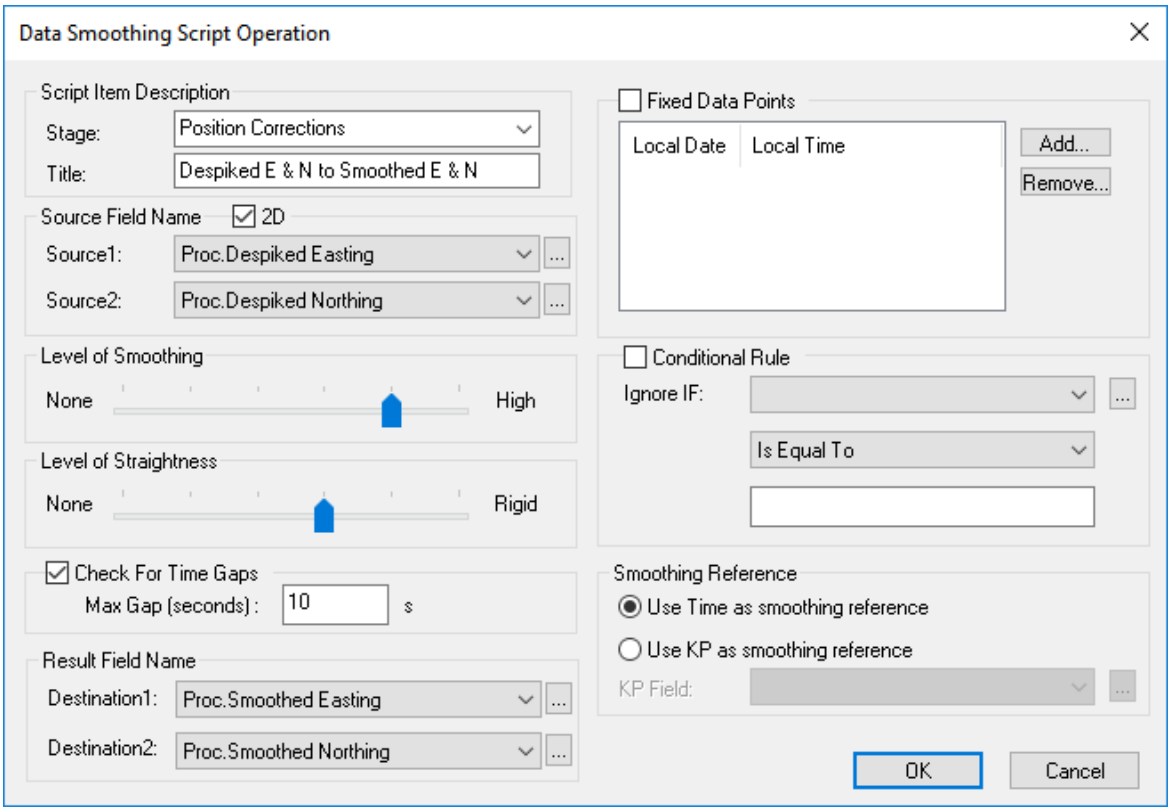
Script – Smooth Using Moving Average

Description

The processing of the data is controlled in two ways: “Level of Smoothing” and “Level of Straightness”. The level of smoothing determines the complexity of the resulting shape, but will allow a best fit line following a curved shape. The Level of Straightness allows the data to be constrained to an approximation of a straight line. If this seems confusing, think about a perfect circle – it is smooth but not straight. If you are working with position data that follows a large pipeline then you might expect a straight line, but if your data follows a more "wiggly" or snake-like path you might expect smoothness but not straightness. The Straightness control is therefore recommended for data which represents a pipeline rather than a free-flying ROV. Data representing pipe positions in cross profiles, or data for an ROV which was on wheels on the top of a large pipeline should use higher levels of Straightness.

For data that is expected to oscillate (like pitch and roll data) or for data that is expected to follow a curvy, winding route you might want to use Smooth Using Polynomials 270 instead of Smooth using Moving Average.



Configuration

If running the script on Easting and Northing position data select the 2D option so that you can select two source fields and two result fields like in the example below. If you are removing spikes from depth, altitude or other single column data, deselect the 2D option.

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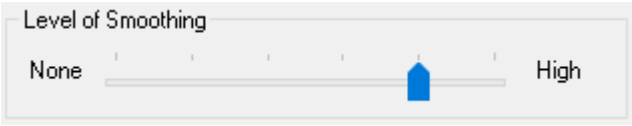
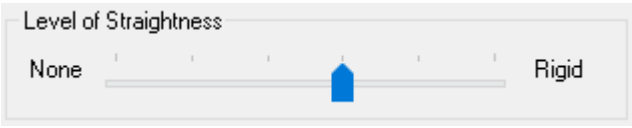
The “Level of Smoothing” slider (shown below) represents the number of data points to consider around a point to be processed. This can be set to 0 (None), 1, 4, 9, 16 or 25 (High). A value of 0 will disable the smoothing.



The Straightness control uses the same window sizes of 0 (None), 1, 4, 9, 16 or 25 (Rigid). For each window of data it computes a best-fit straight line and moves the target point onto that line.



Note that at the two ends of the loaded data, the specified data window sizes may be larger than the number of points available. in these cases the data window size will be reduced to ensure an equal balance of points on each side. The first point in the line cannot be moved because with no points before it, we cannot create a balanced window on each side of the first point. The second point in the line only has one point before it, so a balanced window can only use three points – (1, 2, 3). For smoothing the third data point we can use a window of five points (1, 2, 3, 4, 5), with two before and two after. The fourth point will use a data window of seven points (1, 2, 3, 4, 5, 6, 7). As the smoothing moves further away from the start of the line the window size will gradually increase until it reaches the maximum chosen using the slider bars described above. As the smoothing window nears the end of the line, the window size will gradually reduce again, with the last point not able to be moved.

If you think that the data may include time gaps you can tell the smoothing to treat the areas each side of the gap independently. This means that if you load multiple Datasets, and some of them overlap because the ROV stopped and logging was turned off, and then logging started again with an overlap, you can detect the time gap where the logging was off, and smooth the section before the gap separately from the section logged after the time gap. The same applies if the time gap is also a KP or position gap - perhaps there was an area that could not be accessed. Note that the points close to the gap will be treated like the ends of the lines with the window sizes adjusting as described above. If there is a gap of only one or two seconds you can probably ignore that and smooth across the gap because we can be sure that an ROV did not backtrack for an overlap. If the gap is larger you may want to allow for the possibility of overlaps or gaps in KP. Set the Max Gap to the size that you think appropriate.

An additional option allows certain data points to be “fixed” so that they will not be moved by the smoothing operation. This also has the effect of stopping and restarting the smoothing at each of these points, reducing the window size as the points are approached, as described above for the starts and ends of Datasets. To fix a data point it should be selected in the graphics window before the script configuration window is opened. When the window is opened, ensure that the “Fixed Data Points” box is selected, and then click on the Add button. To add further fixed data points, close the window by clicking the OK button, select the point and then re-open the window by double clicking on the script item in the Batch Processing List. Click the Add button to add the second fixed point to the list. Repeat this sequence until all fixed points have

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been added.

The Conditional Rule allows you to not smooth some of the data. You can use this if you want to use different settings for different areas, perhaps with different levels of straightness before and after a certain KP. Think about a large, straight pipeline that has a spool-piece at the end with 90 degree dog-leg bends. Make two copies of the script, one for the straight section and one for the spool-piece and use the condition so that one version will only affect data up to a certain KP, and the other will only affect data above that KP.

When smoothing most data, and certainly when smoothing raw data you should use Time as the smoothing reference. This means that the points in the data windows will be looked at in time order. With spiky, raw position data it would not make sense to look at the points in KP order because the logged, raw, KPs are calculated from the same spiky positions that we are trying to smooth and correct. At a later stage of the processing you may want to smooth a pipeline position that has been created from processed cross-profiles. In that case, the main ROV position has already been smoothed and the KPs should be correct so you may then want to smooth points in KP order. If you also turn off the Time gap, you can make sure that overlaps are smoothed together not separately, making sure that both survey passes match.

There are lots of decisions to be made in the descriptions above, and this may seem complicated. Remember that if you use the Smart Processing it will make these decisions for you!

The standard smoothing process uses Fourier Transformations. Details of this are as documented in the book “Numerical Recipes in C” (ISBN 0521431085).

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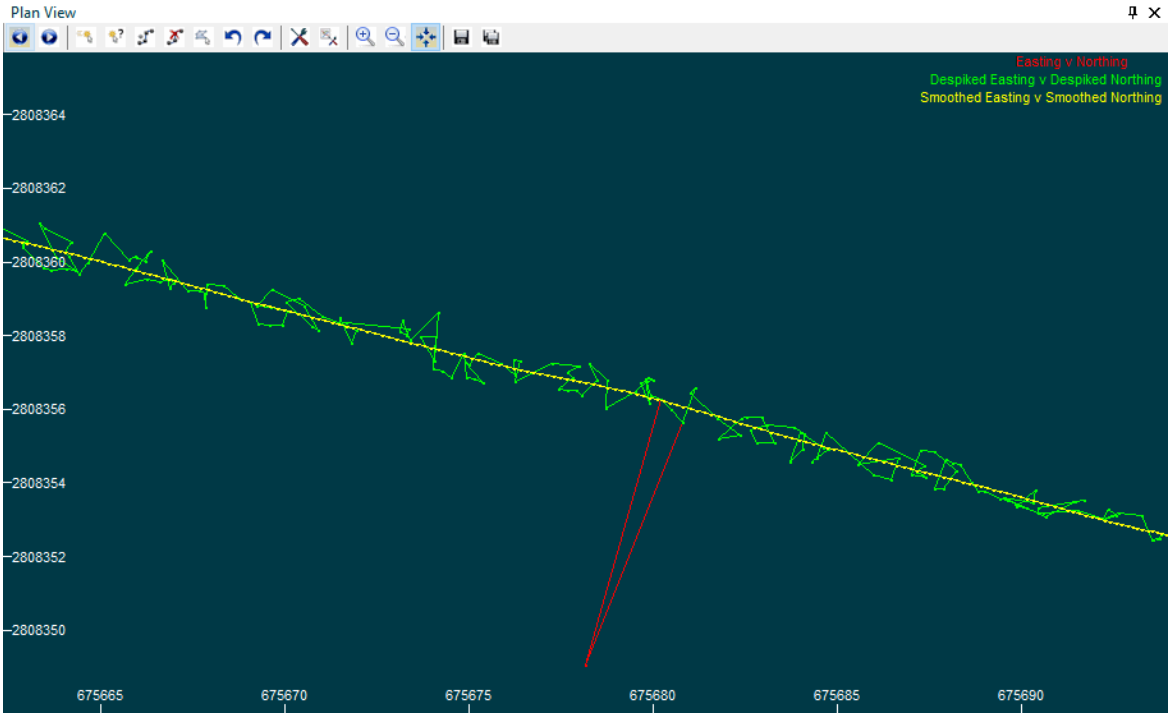
If you use the same data shown in the example images 265 for the script Script – Remove Spikes Advanced 263, and then run Smooth Using Moving Average as configured on the previous page, the result will look like the yellow line in the image below. The large spike was removed from the red line to create the green line, which is then smoothed to give the yellow line.



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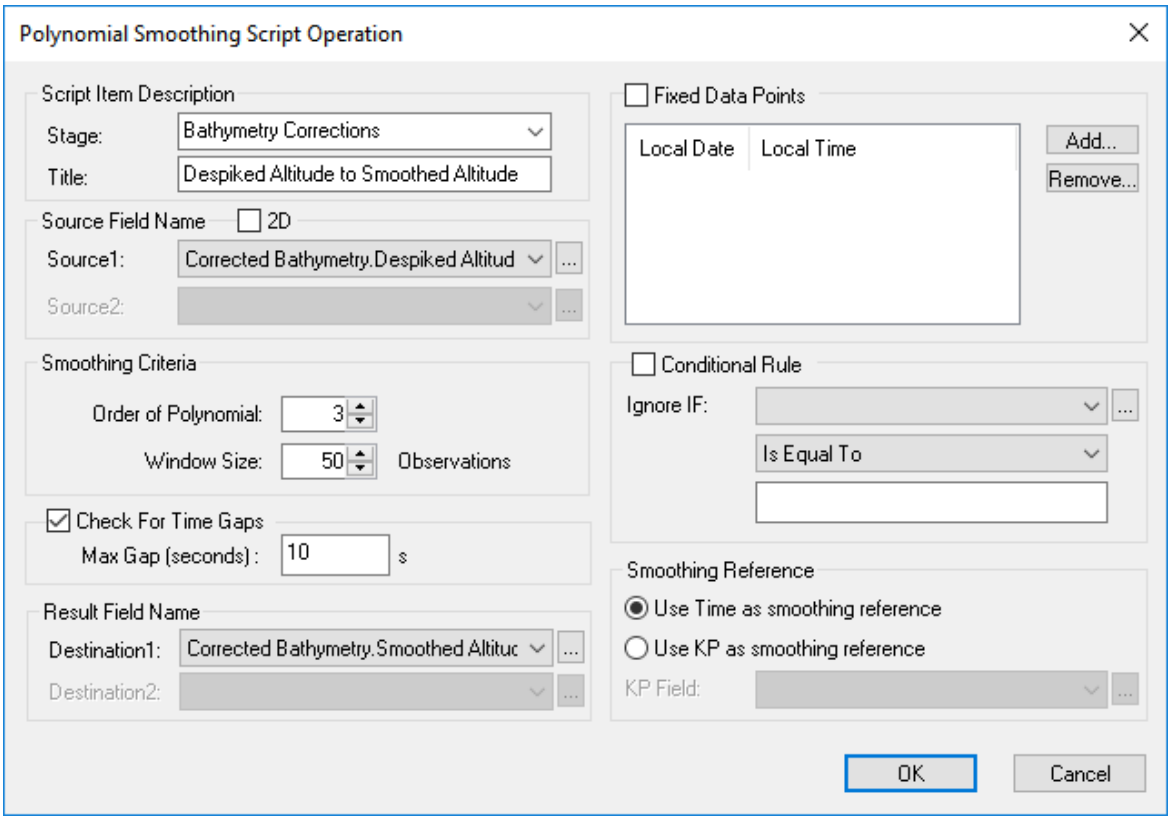
Script – Smooth Using Polynomials

Description

For each data point, this script calculates a best-fit polynomial curve for a window of data around that point, and then moves the central data point onto the calculated polynomial curve.

Smoothing using a polynomial curve is best used with data that oscillates, like pitch or roll data, or for position data that follows a winding snake-like route perhaps like an ROV trying to follow a buried pipeline. For data that follows a more predictably straight and regular route you might want to use Smooth Using Moving Average 266.



Configuration

If running the script on Easting and Northing position data select the 2D option so that you can select two source fields and two result fields like in the example below. If you are removing spikes from depth, altitude or other single column data, deselect the 2D option.

The "order" of the polynomial determines the complexity of the curve. A higher order represents a more complex shape. A typical value for use with survey data is 3. The window size will affect the level of smoothing. The larger the window size, the greater the smoothing effect. In some cases the Polynomial Order and the window size will be specified by the end client – this is especially common for Out-of-Straightness surveys.

If you think that the data may include time gaps you can tell the smoothing to treat the areas each side of the gap independently. This means that if you load multiple Datasets,

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and some of them overlap because the ROV stopped and logging was turned off, and then logging started again with an overlap, you can detect the time gap where the logging was off, and smooth the section before the gap separately from the section logged after the time gap. The same applies if the time gap is also a KP or position gap - perhaps there was an area that could not be accessed. Note that the points close to the gap will be treated like the ends of the lines with the window sizes adjusting as described above. If there is a gap of only one or two seconds you can probably ignore that and smooth across the gap because we can be sure that an ROV did not backtrack for an overlap. If the gap is larger you may want to allow for the possibility of overlaps or gaps in KP. Set the Max Gap to the size that you think appropriate.

An additional option allows certain data points to be “fixed” so that they will not be moved by the smoothing operation. This also has the effect of stopping and restarting the smoothing at each of these points, reducing the window size as the points are approached, as described above for the starts and ends of Datasets. To fix a data point it should be selected in the graphics window before the script configuration window is opened. When the window is opened, ensure that the “Fixed Data Points” box is selected, and then click on the Add button. To add further fixed data points, close the window by clicking the OK button, select the point and then re-open the window by double clicking on the script item in the Batch Processing List. Click the Add button to add the second fixed point to the list. Repeat this sequence until all fixed points have been added.

The Conditional Rule allows you to not smooth some of the data. You can use this if you want to use different settings for different areas, perhaps with different levels of straightness before and after a certain KP. Think about a large, straight pipeline that has a spool-piece at the end with 90 degree dog-leg bends. Make two copies of the script, one for the straight section and one for the spool-piece and use the condition so that one version will only affect data up to a certain KP, and the other will only affect data above that KP.

When smoothing most data, and certainly when smoothing raw data you should use Time as the smoothing reference. This means that the points in the data windows will be looked at in time order. With spiky, raw position data it would not make sense to look at the points in KP order because the logged, raw, KPs are calculated from the same spiky positions that we are trying to smooth and correct. At a later stage of the processing you may want to smooth a pipeline position that has been created from processed cross-profiles. In that case, the main ROV position has already been smoothed and the KPs should be correct so you may then want to smooth points in KP order. If you also turn off the Time gap, you can make sure that overlaps are smoothed together not separately, making sure that both survey passes match.

There are lots of decisions to be made in the descriptions above, and this may seem complicated. Remember that if you use the Smart Processing it will make these decisions for you!

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Script – Least Squares on Track

Description

The “Least Squares on Track” script provides a method of smoothing a position Dataset that is usually better than a simple running-average smoothing.

The data window is from 2 to 10 points on either side of target point so the total number of points used ranges from 5 to 21. For each data point, all selected data sources (i.e. East, North, Depth, and optionally DVL X, Y & Z) are entered as observations into the least-squares calculator. The first pass calculation creates residuals for each observation and these are used to define weightings for each observation so that spikes receive low weighting. The second pass calculation gives the Easting, Northing and Depth for the point being processed.

Note that the observations are equally spaced on either side of the target point. This means that the scale and rotation errors of the DVL can be ignored because they cancel out when entered into the calculation.

At the ends of the Dataset, where the specified window size may be larger than the number of point available to one side, the window will be temporarily reduced to ensure an equal balance of points to either side of the target. As the smoothing moves away from the start of the line the window size will gradually increase up to the specified maximum. As the smoothing nears the end of the line, the window size will gradually reduce.

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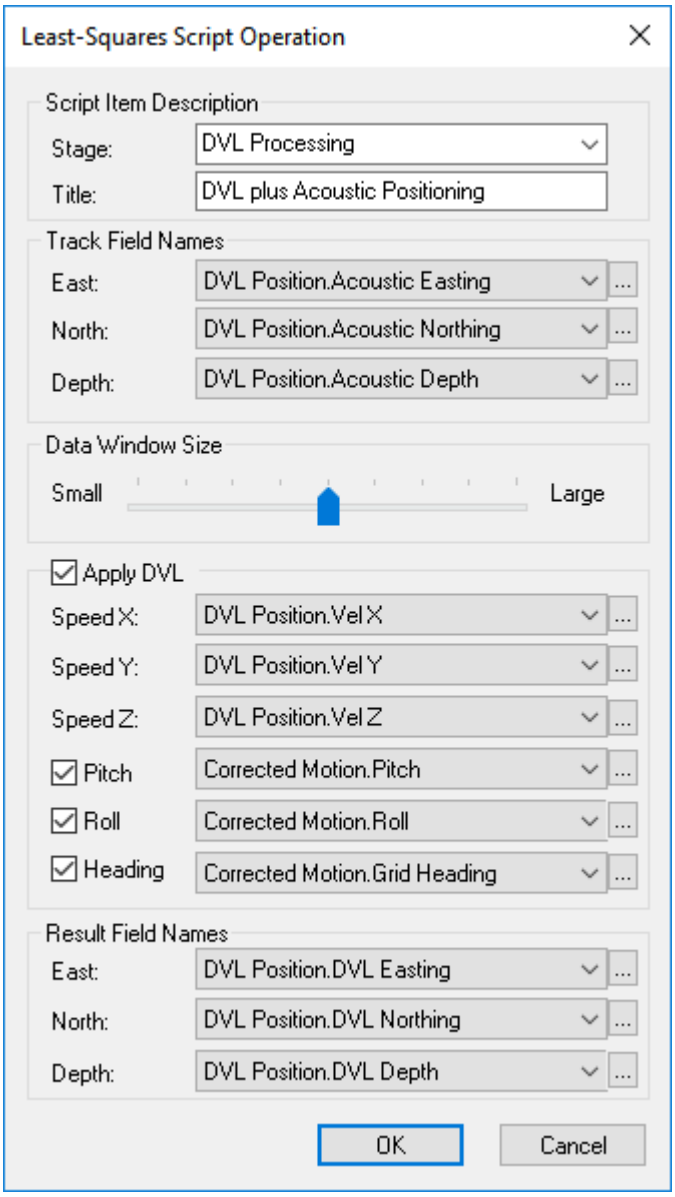
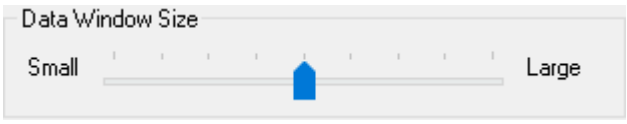


Configuration

The configuration dialog for the Least Squares track smoothing is shown below.

The main input data for the script is a three dimensional position: Easting, Northing and Depth. The result fields are also Easting, Northing and Depth.

The smoothing is applied using a moving data window centred on each point in turn. The size of the window is controlled using a slider bar and ranges from “Small” representing two data points either side of the target, to “Large” representing ten points either side.



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There is an option to also include Doppler Velocity Log (DVL) data in the Least Squares calculation. To use this option, tick the “Apply DVL” box, and select the appropriate data fields for Speed in each of the X, Y and Z directions. A further set of options allows the inclusion of the Pitch, Roll and Heading data associated with the DVL motion sensor. This helps the algorithm to distinguish for example between vertical movement of the DVL device caused by roll and vertical movement of the DVL device caused by true vertical movement of the whole ROV. To use the motion data options, tick the boxes and select the data fields for Pitch, Roll and/or Heading.

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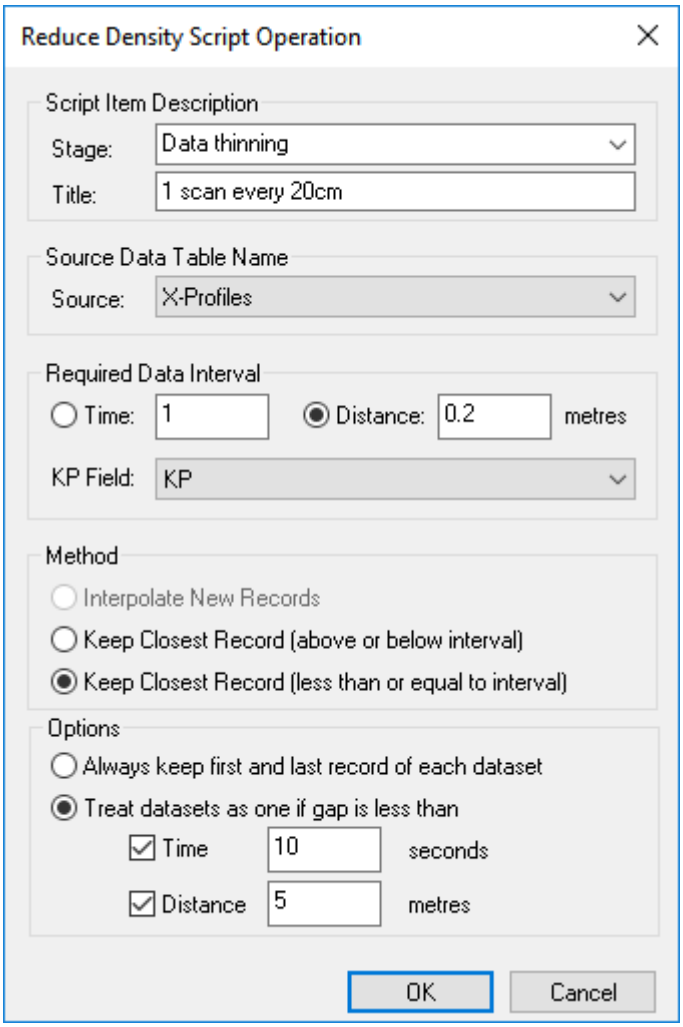
Script – Reduce Density

Description

The Reduce Density script can be used to thin out a Dataset. This can be used to make the processing faster by discarding excess data, or can be used to prepare data for export.

This script should be used with great caution: Reducing the density of the data too early in the processing sequence may reduce the accuracy of the final product. Before reducing the density of imported data you should consider whether the saving in processing time is worth the reduced quality of processed data that results from thinning out the source Dataset. Consider whether you should interpolate or reduce the data records within the export process rather than by discarding the original stored data.



Configuration

The script will reduce the density of an entire data table, and so the configuration simply requires that you select which table to reduce.

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The reduction process can either retain the data records that are closest to the required interval, or the record closest to but not above the specified interval, or it can interpolate records at exactly the desired interval. The example below has an interval of 0.2m, if the closest points to the 0.2m interval are at 0.21m and 0.18m the option used below (less than or equal to interval) would select the point at 0.18m even though 0.21m is closer to the interval of 0.2m.

The specified interval may be either seconds or metres.

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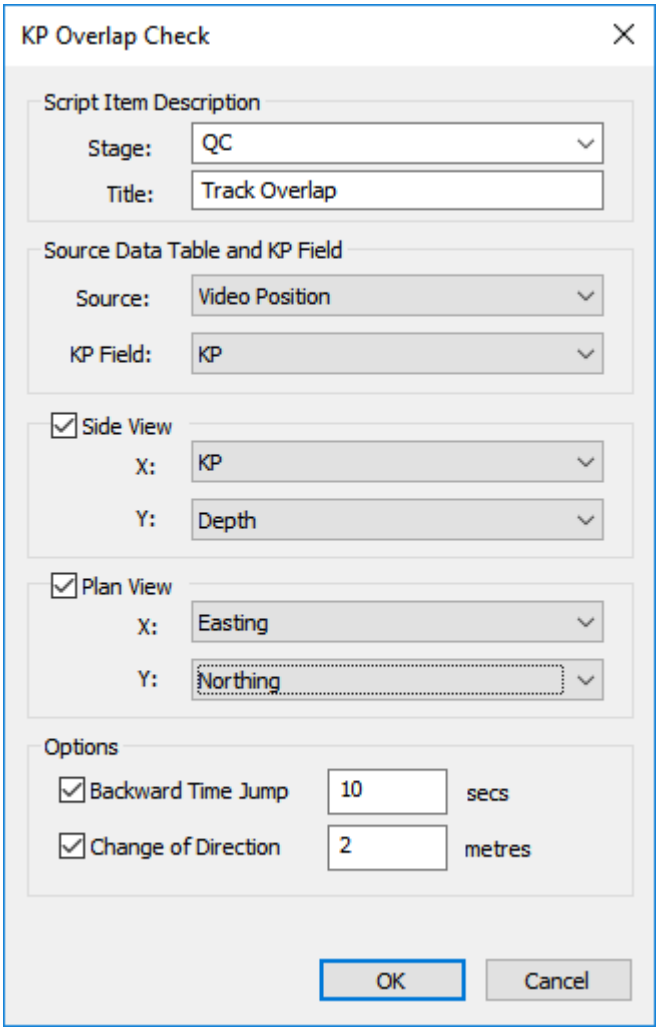
Data QC

Script – KP Overlap Check

Description

The KP Overlap Check script is a QC tool that automatically finds areas of overlap or back-tracking within a data set in both plan and longitudinal views. Such areas can be highlighted based on time jumps (when sorted by KP) and/or change in direction (when sorted by time).

If any areas of overlap are found the Graphical QC window opens. The unwanted section of overlapping data can then be disabled.



Configuration

The script should be configured with a Source Data Table from which a KP field can be specified. The user can then select how the results are presented either in a side view, plan view or both. Lastly, the Options section defines how an overlap should be detected, based on the size of any Backward Time Jump and/or Change of Direction.

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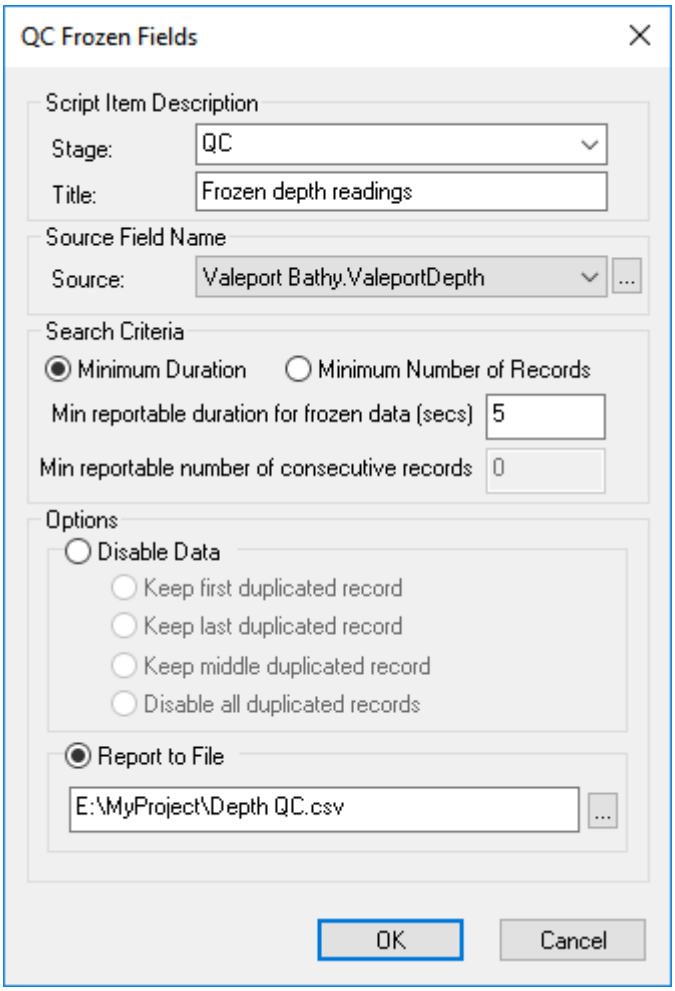
Script – QC Frozen Fields

Description

This QC tool allows you to search a Dataset for any sections where the output from a particular sensor or software application may have stopped updating. It is possible to search for areas defined either by a minimum time, or a minimum number of records.



Configuration

The configuration requires the selection of which data field to run the QC check on, and whether to use a time window or a number of data records. The minimum time or record interval should then be specified as appropriate.

You can either remove the duplicated records, by disabling them with a choice of options, or you can report the QC results to a file so that you can review it before deciding what to do about any problems that are found.

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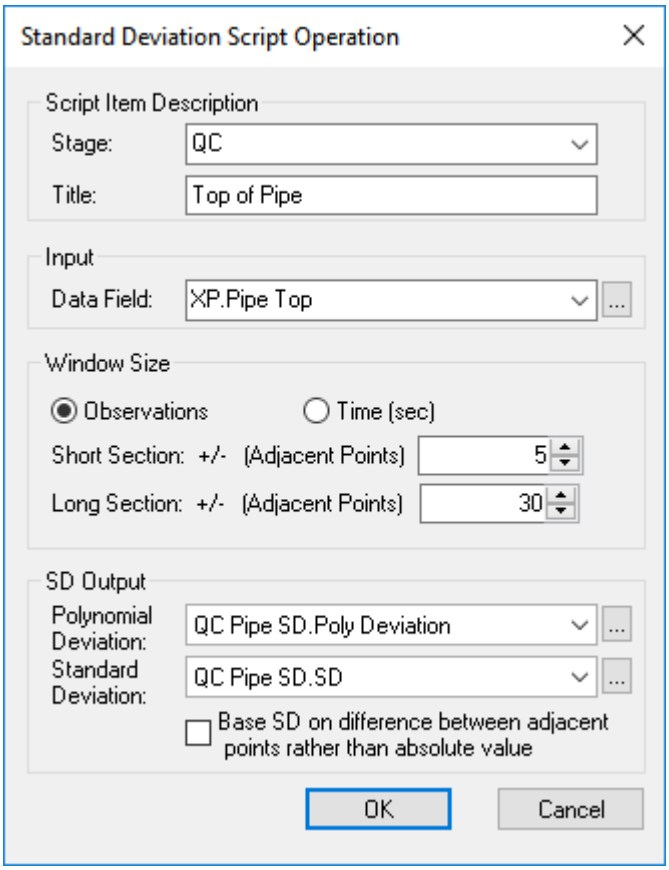
Script – Standard Deviation

Description

This script is a QC tool for Out-of-Straightness (OOS) surveys that computes Standard Deviation (SD) values of a Dataset. To overcome problems of variable data density the values are computed not for individual points but for a “Short Section” or window of data, compared with a “Long Section” defined by a larger window of data points.

The values output as “Polynomial Deviation” are the vertical difference between a Moving Average and a Polynomial. The Moving Average is a mean calculated using the data in the Short Section window. The Polynomial is a best-fit 2nd order polynomial calculated from all points in the Long Section window.

The “Standard Deviation” output is calculated solely using the Short Section window. For each data point the output SD is that of the points within Short Section around that point.



Configuration

The data windows may be defined either in terms of the number of observations, or using a time period in seconds. The window size represents the number of observations or seconds either side of each successive data point.

Two output fields must be selected.

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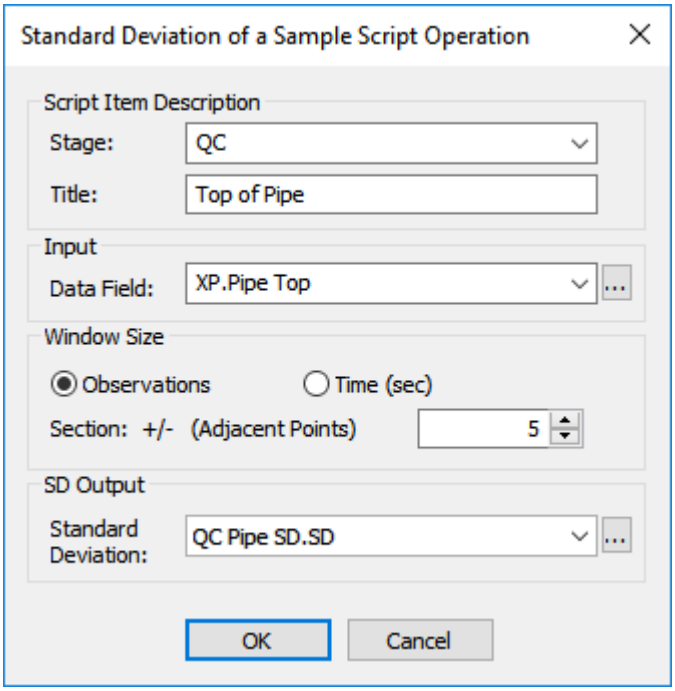
Script – Standard Deviation of a Sample

Description

This script is a QC tool for Out-of-Straightness (OOS) surveys that computes Standard Deviation (SD) values of a Dataset.

The “Standard Deviation” output is calculated using the points in the chosen window. For each data point the calculated SD is that of the points within the window around that point.



Configuration

The data window may be defined either in terms of a number of rows in the data table, or using a time period in seconds. The window size represents the number of observations or seconds either side of each successive data point.

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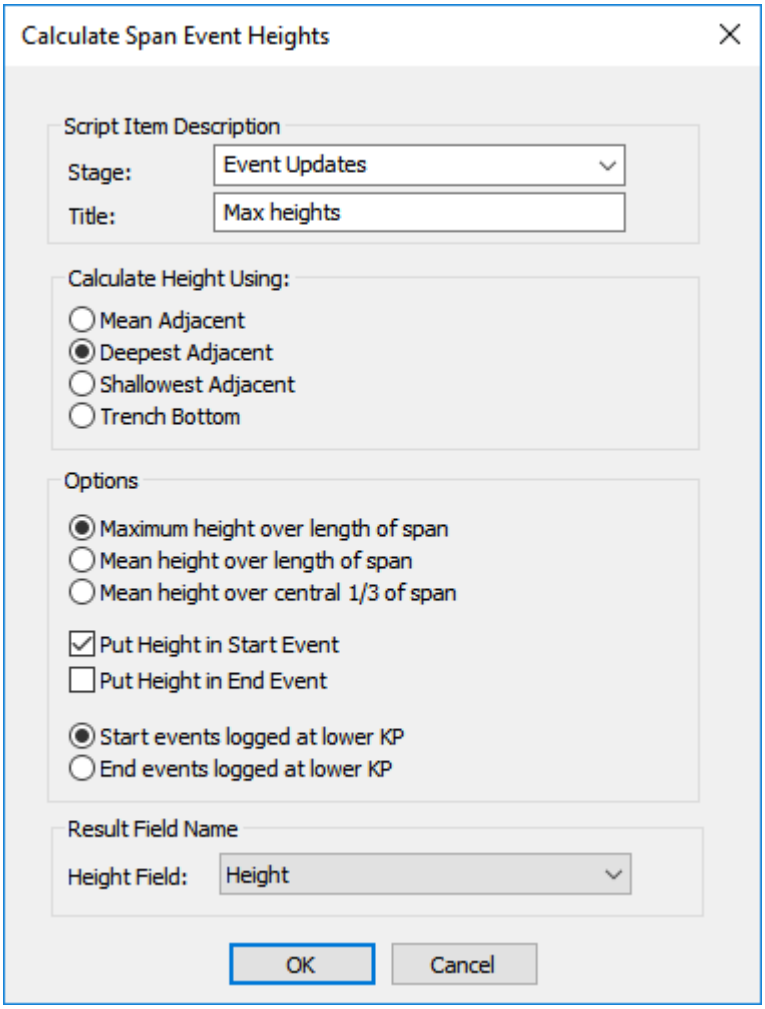
Event Data

Script – Calculate Span Event Heights

Description

This script uses processed cross-profile or MBE data to calculate freespan heights and saves the result into the logged freespan events.



Configuration

The height of each span can be calculated in a number of different ways; all are the distance from the Bottom of Pipe (BoP) to the seabed, but there are different ways to calculate the relevant seabed depth for each scan. Most use the "Adjacent Seabed" values which are the depth of the seabed just beside the pipeline or cable on each side. You can use the mean of these two values, or just one, choosing either the deeper or the shallower of the pair. The last option for calculating the height is to use the depth at the bottom of a trench. Which of these you should use is something that you must decide with your client. You can see in the picture below that the calculated height will be different depending on whether you use the Mean of the two adjacent depths, the Deepest Adjacent (in this case Port), the Shallowest (Starboard in this case), or use the Bottom of Trench depth.

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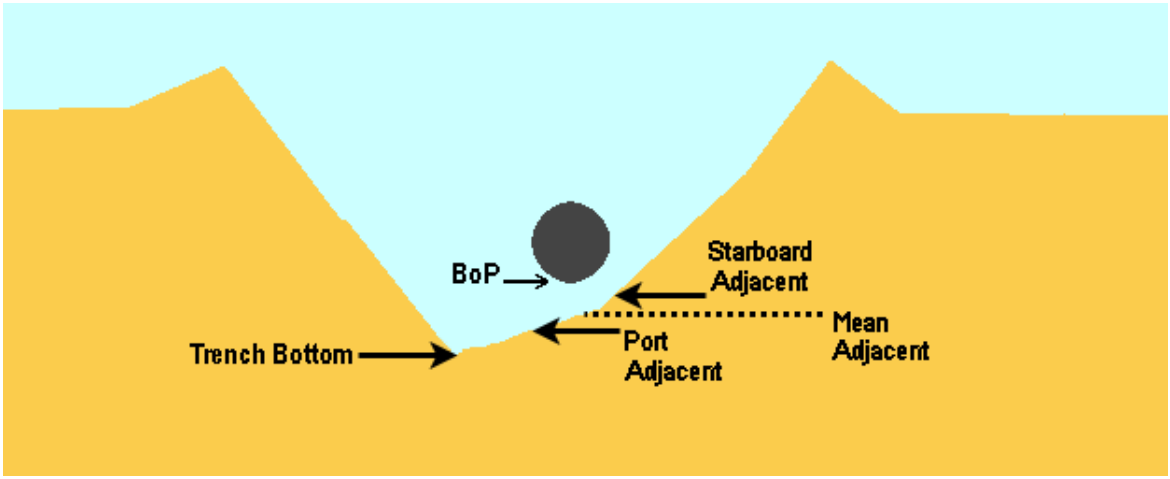
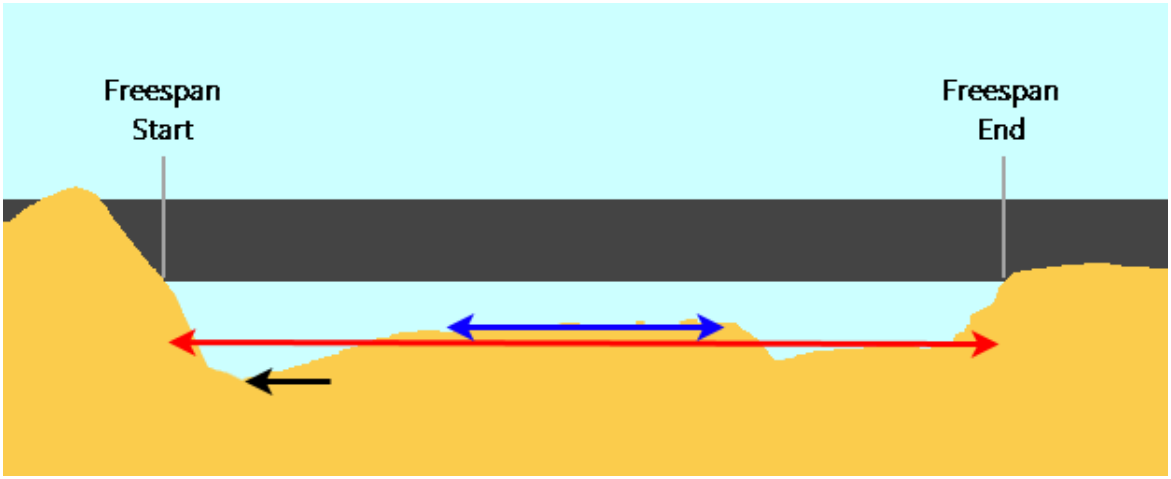


Cross-Profile View

Having decided how best to calculate the span height of each individual scan record, you then need to decide how to use these to calculate the overall height for each freespan. This can be the maximum height value of all scans within the freespan (which is the most common option. In the picture below it would give the height at the point indicated by the black arrow). The second option is to use the mean height of all scans along the whole length of the freespan (indicated by the red arrow in the picture below), and the third option is a mean value for just the central one-third of the freespan length (indicated by the blue arrow in the picture below). You can see in this example that the three results will be quite different, with the mean height in the zone of the blue arrow being less than the mean height along the zone of the red arrow, and both of these mean values being less than the height. The black arrow indicating the scan with the maximum height is the one most often used because it represents the "worst case".



Side View / Longitudinal Profile

The calculated height can be saved to the Freespan Start event, the Freespan End event, or both.

To calculate the heights, the software needs to know what order to look at the data – ascending or descending KP. In most cases the Start event will be at the lower KP, and the End event at the higher KP. If your data goes in the other direction you can change the setting so that the search works the other way round.

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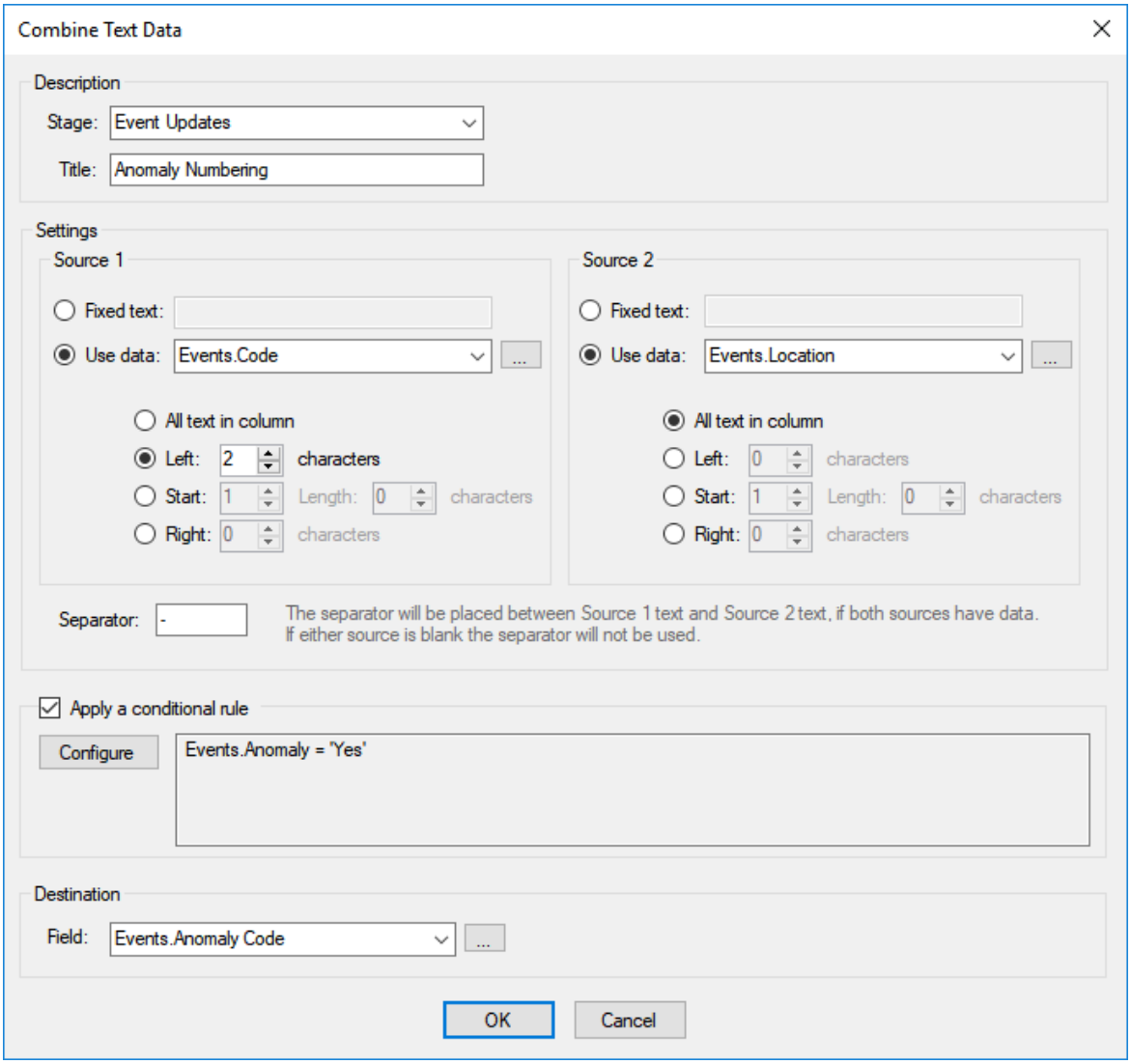
Script – Combine Text Data

Description

This script lets you combine text from two data columns or combine text in a data column with some text that you type.



Configuration

There are two source fields, and each one can either use an existing data column or you can type your own text. If you do not want all of the text from a chosen data column but perhaps just the first or last few characters, or even a section in the middle, you can do that. The two chosen text fields can be separated by any character or characters that you want; dashes, spaces, dashes with spaces either side, etc. If you don't want to separate the two bits of text, leave the separator blank.

If you only want to apply the change for some events but not others, for example to build anomaly numbers only for events where an Anomaly flag column contains the word "Yes", you can do so using "conditional rules".

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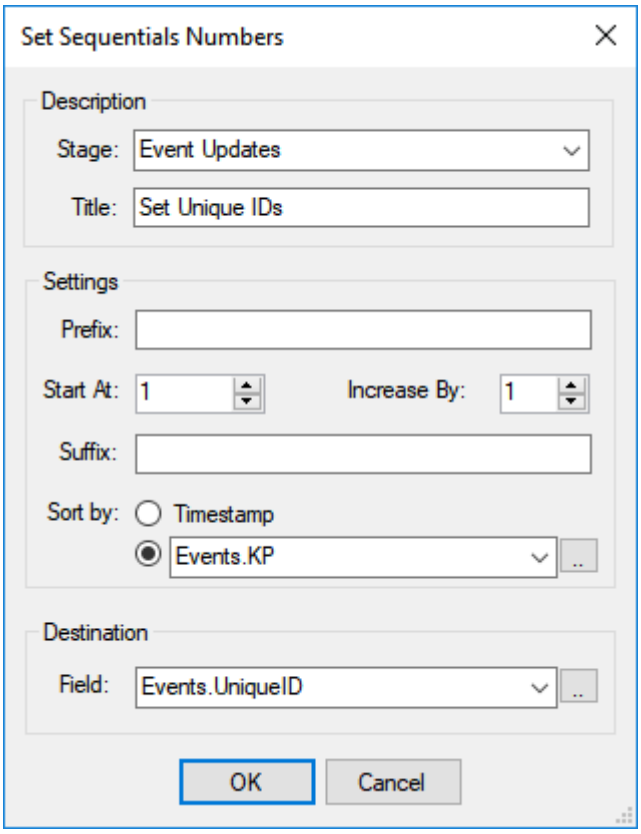
Script – Set Sequential Numbers

Description

This will assign numbers to events, with optional prefixes and suffixes typed by the user. Typically this is used to generate anomaly numbers for inspection events or to number regular features such as Anodes or Field Joints.



Configuration

The example shown above will renumber all events, starting from one, and increasing by one for each event in KP order. If you want to use a prefix, for example "#" or "ID", type that into the Prefix box. Similarly you can have suffix text after the sequential numbers.

If you want to count downwards, use a negative number in the "Increase By" box.

If you are not able to load all of the data in one go, and have to work in sections, you can make a note of the last number used after running the script on the first section, and the use a starting number one higher than that when you run the script on the second section.

If you perhaps only logged every tenth field joint, you can set the numbers to increase by ten instead of by one.

If you need a more complex numbering system, perhaps numbering different types of events in different sequences, or using the Event codes as part of the numbering, use Script – Set Advanced Numbering 285 instead.

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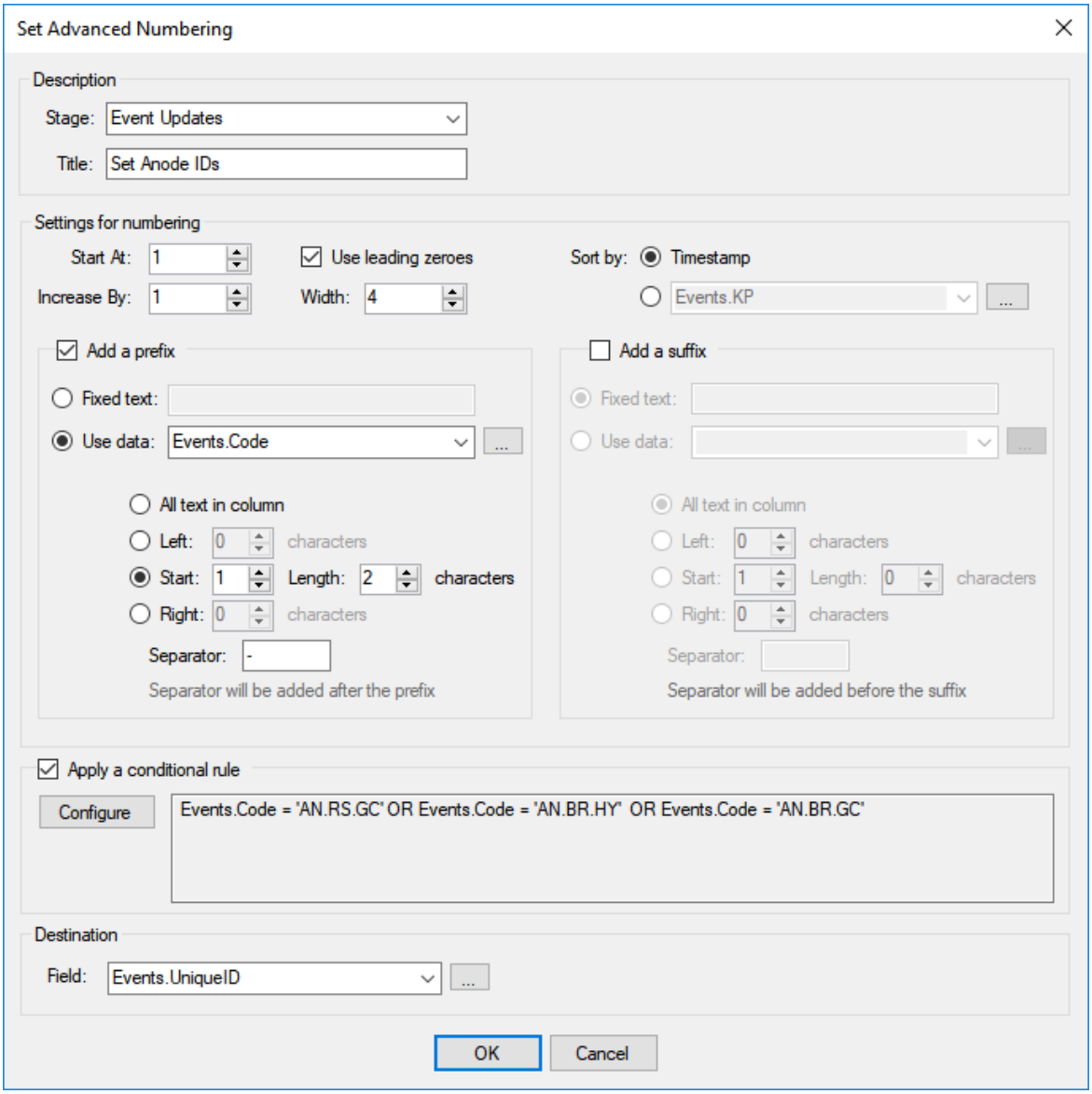
Script – Set Advanced Numbering

Description

This will assign numbers to events, with optional prefixes and suffixes typed by the user. Typically this is used to generate anomaly numbers for inspection events or to number regular features such as Anodes or Field Joints. This script gives your more control than the standard Set Sequential Numbers 284 script. The prefix or suffix can use data columns if you want. The numbers can have a fixed width with leading zeros, giving 001, 002, 003 instead of just 1, 2, 3. You can also use conditional rules so that you can number different types or categories of events in different ways.



Configuration

The example shown above uses the conditional rule so that it will only renumber Anode events. The numbers start from one, and increasing by one for each event in KP order, and in this example they have a width of four, giving 0001, 0002, 0003, etc. If you want to

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use a prefix, for example "#" or "ID", type that into the Prefix box or select a data column. In this example the prefix uses the first two characters of the Event Code. If you want a suffix, it has the same options, for typed text or using some or all of a data column.

If you want to count downwards, use a negative number in the "Increase By" box.

If you are not able to load all of the data in one go, and have to work in sections, you can make a note of the last number used after running the script on the first section, and the use a starting number one higher than that when you run the script on the second section.

If you perhaps only logged every tenth field joint, you can set the numbers to increase by ten instead of by one.

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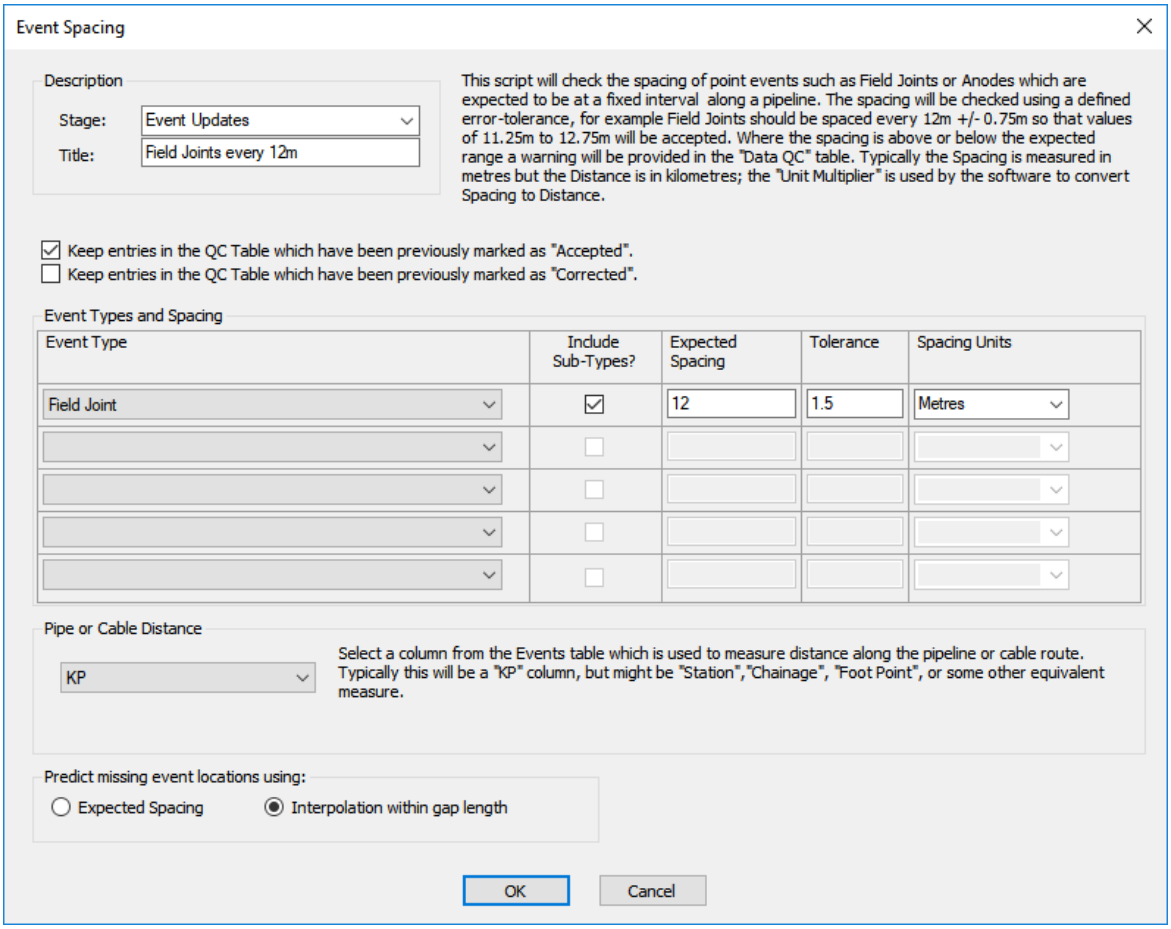
Script – Spacing QC

Description

This helps you check the spacing of regularly spaced events such as Anodes or Field Joints. It provides warnings in the QC table when the spacing is too small or too large. If a gap is so big that a feature has probably been missed, the QC entry will predict the KP and time when the missed event(s) are likely to have occurred. You can then click on the row in the QC table to jump straight to the estimated time and KP of the possible missing event.



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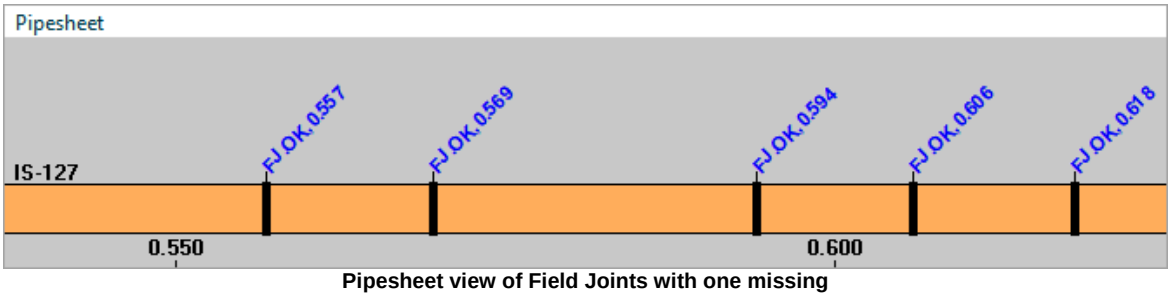
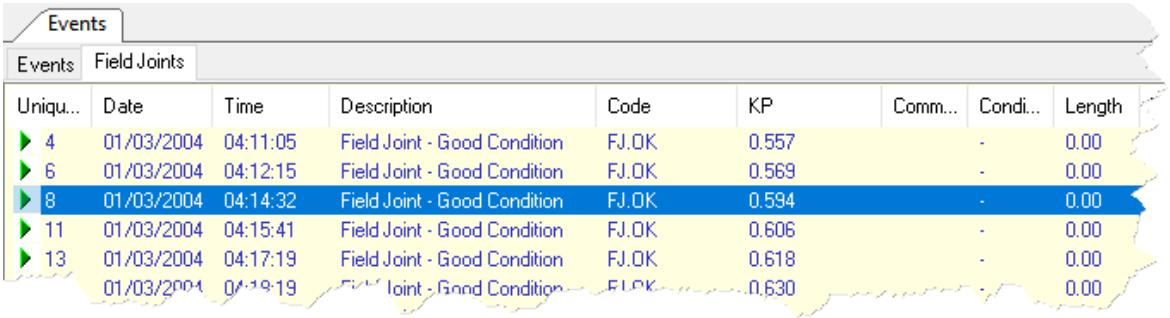
In the example below it is much easier to spot the missing Field Joint by looking at the pipesheet view than by looking at the text view underneath it. If you run the Spacing QC script this will find the 25m gap between KP 0.569 and 0.594. It will work out that if the Field Joints are supposed to be every 12m then one of them is probably missing. Depending on the settings that you configure it can either "predict" the missing Field Joint as being 12m after the start of the gap (giving an estimate of 0.581, or it can estimate it as being half way between the ends of the gap, giving an estimate of 0.5815. After calculating the predicted KP, it then calculates the time when the cameras would have been focussed on that KP, and it adds two rows to the QC Table, one warns you about the 25m gap between two Field Joints, and the other one shows where the missing Field Joint is likely to be. If you click on that "Possible missing Field Joint" row in the QC table, because it has a timestamp matching the expected location, all of the other windows, including the video windows will jump to that time... and hopefully you will see the missing Field Joint so that you can quickly log it.

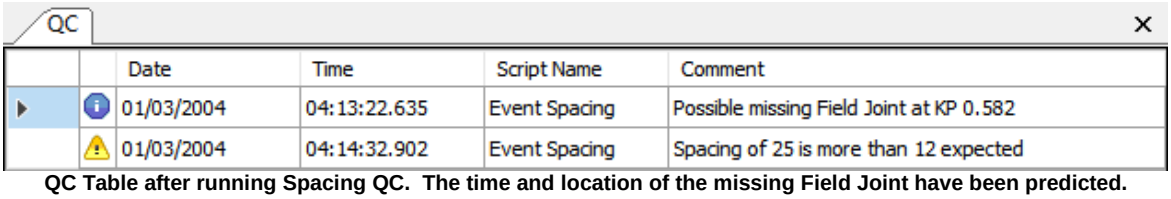


Pipesheet view of Field Joints with one missing



Uniqu...	Date	Time	Description	Code	KP	Comm...	Condi...	Length
4	01/03/2004	04:11:05	Field Joint - Good Condition	FJ.OK	0.557		-	0.00
6	01/03/2004	04:12:15	Field Joint - Good Condition	FJ.OK	0.569		-	0.00
8	01/03/2004	04:14:32	Field Joint - Good Condition	FJ.OK	0.594		-	0.00
11	01/03/2004	04:15:41	Field Joint - Good Condition	FJ.OK	0.606		-	0.00
13	01/03/2004	04:17:19	Field Joint - Good Condition	FJ.OK	0.618		-	0.00
	01/03/2004	04:18:19	Field Joint - Good Condition	FJ.OK	0.630		-	0.00

Data list view of Field Joint events with one missing



	Date	Time	Script Name	Comment
	01/03/2004	04:13:22.635	Event Spacing	Possible missing Field Joint at KP 0.582
	01/03/2004	04:14:32.902	Event Spacing	Spacing of 25 is more than 12 expected

QC Table after running Spacing QC. The time and location of the missing Field Joint have been predicted.

After you have run the script, if there are any detected problems you will see them in the **QC table**. There are warnings with yellow ⚠ icons, and information rows with blue ℹ icons. You should work through the list of warnings, deciding what to do about them. In this example the solution to the warning about a gap, is to add the missing event: Click on the information row, look at the video and add the missing event if it actually exists. Sometimes it may not be possible to find a missing event, perhaps because it is buried or perhaps because it really does not exist. If you could find it, right-click on the associated warning and choose "Mark as Corrected" in the pop-up menu. If you decided that it is not

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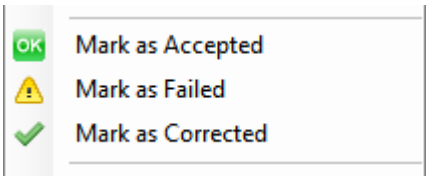
actually a problem – the gap is real and as it should be – you can select "Mark as Accepted".



If you made a mistake, you can change a row back to the yellow warning symbol by choosing "Mark as Failed".

If you run the Spacing QC script a second time, you can tell it to keep these rows that you have marked as "Corrected" or "Accepted". In particular you will probably want to keep the rows that were marked as "Accepted" because this will stop the script adding a new warning for something that you have already checked.

Configuration

You can run the Spacing QC on up to five different event types at a time. If you need to check more than five, just add a second copy of the script. Choose the type or types that you want to scan. You might want to include all Sub-Types so that you can select "Anodes" and "Include Sub-Types" instead of having to select each of the different Anode types and conditions one by one. Type in the expected spacing. For Field Joints this is typically 12m, or more accurately 40 feet which is closer to 12.2m. You can use the Tolerance value to allow for a small acceptable error, especially if the logged KP values have only three decimal places which will cause occasional rounding errors. In most cases the Spacing and Tolerance will be entered in metres, but you can select other units if you wish.

You need to specify which column in the Events table holds the pipe distance information. Typically this will be a KP column, but in the USA it might be a Station value, and in some locations there are other ways of measuring pipe distance such as "Foot Points" or "Chainage".

Tell the software how to work out the expected location of missing events. Do you want to start at one end of the gap and add the expected spacing distance or do you want to interpolate between the event KPs (or Station values) at either end of the gap? For short gaps this will not make much difference, but if you missed two or more records you may find that the interpolation gives a better result. It is very quick and easy try one and then the other and see which is giving you the best prediction.

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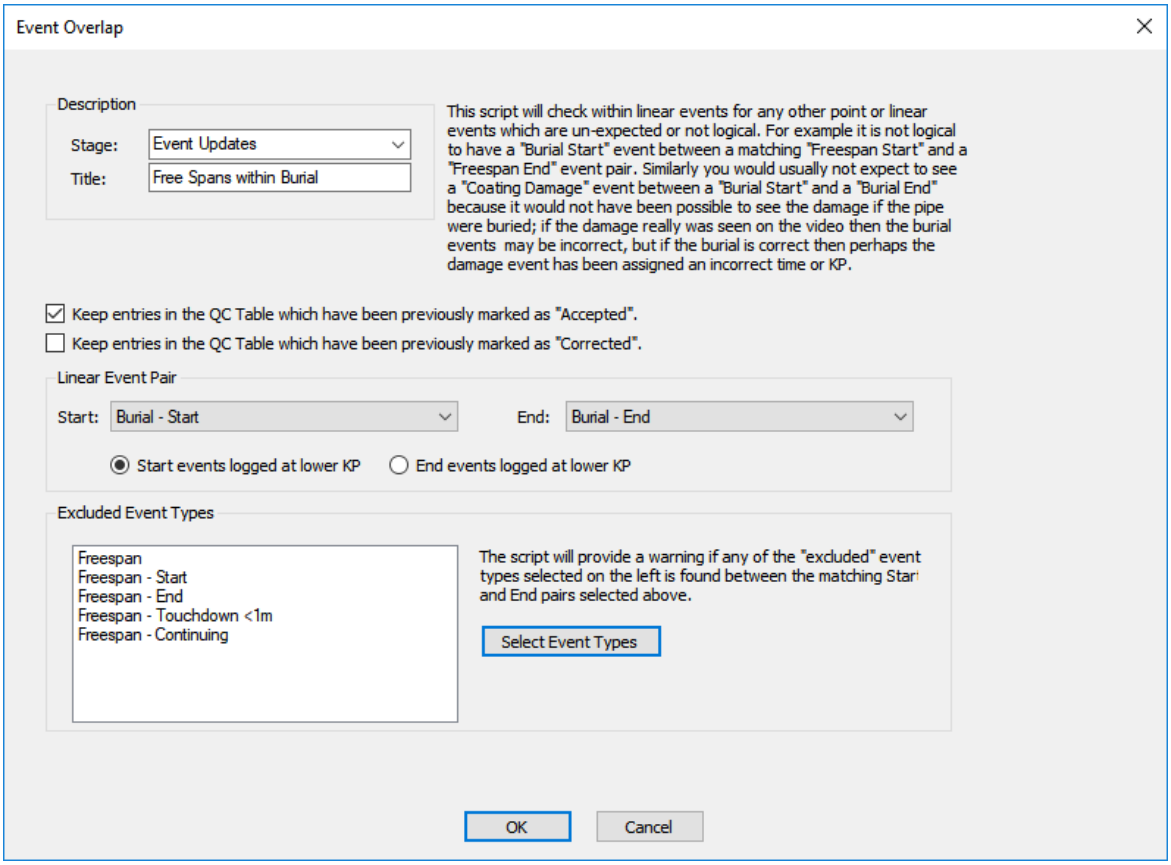
Script – Overlap QC

Description

Detect events which incorrectly overlap with other linear events (with Start/End pairs). The most basic example is that a pipeline cannot be in Free Span and also Buried at the same location. The example shown below will detect this: Between each pair of Burial Start and Burial End events there should be no Freespan events of any type. Depending on the end client or pipeline operator you might often be told that events that you cannot see should not be recorded. In that case, even though you may know that they exist you should not record Field Joints, Anodes or other pipeline features in areas where the pipe is buried. You could therefore add these types to the list of "Excluded Event Types".



Any detected problems will be added to the list in the **QC Table**. If you click on a row in table the data views and video displays all all jump to the relevant time and location. You can then make the necessary changes, and then right-click in the QC list to mark that row as "Corrected" or if the problem cannot be fixed but you don't want to be told about it the next time you run the script, mark it as "Accepted".

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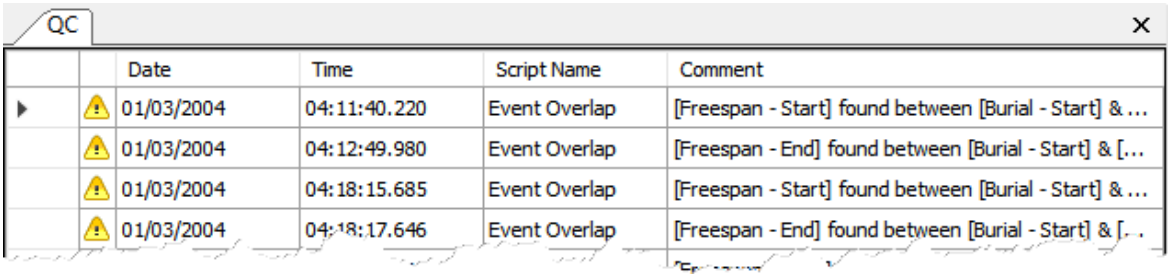

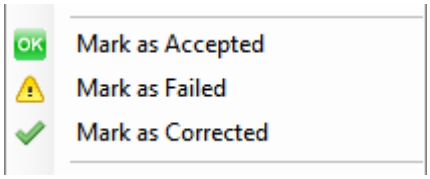

Configuration

First select an event pair that you want to check, and the click on Select Event Types to add to the list of "Excluded Event Types" – the ones that should not happen between the selected Start/End pair.

If you run the Overlap QC script a second time, you can tell it to keep the rows that you have marked as "Corrected" or "Accepted". In particular you will probably want to keep the rows that were marked as "Accepted" because this will stop the script adding a new warning for something that you have already checked.

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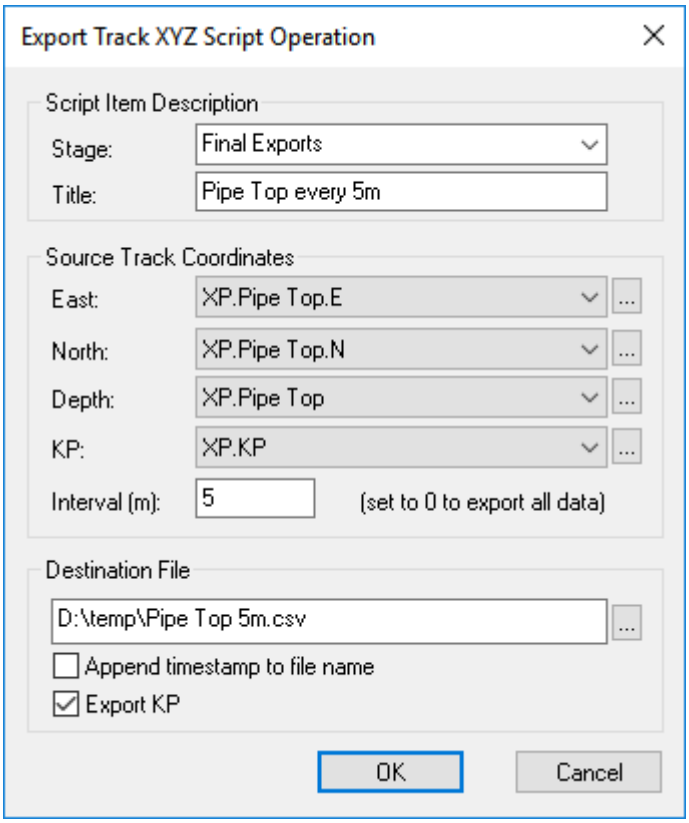
Import and Export

Script – Export Track XYZ

Description

The Export Track XYZ script allows you to output any position Dataset to a comma separated (CSV) ASCII text file. The example below exports the pipe position from the Cross-Profiles (XP) data table. It includes the KP value to give Easting, Northing, Depth, KP and is created at a 5m interval along the pipe route.



Configuration

The configuration allows you to select data fields for Easting, Northing, Depth and KP which is the minimum configuration for the XYZ export. There is an option to also export the KP column by ticking the box at the bottom of the window. (Note that even if the KP field is not included in the exported file you must still select a KP column in the drop-down box for the source data so that it can be used to calculate a data interval. for computation of the reporting interval.

The default export configuration is to list all available data by leaving a value of zero in the “Interval” box. If you want a listing at a regular, interpolated interval, enter a distance in metres in the “Interval” box.

If run as part of a Processing Batch with more than one Dataset selected, the data will all be appended to a single file unless the option “Append timestamp to filename” is selected. If this option is used, the script will create one file per Dataset and will include the date and time of the start of the Dataset in the filename.

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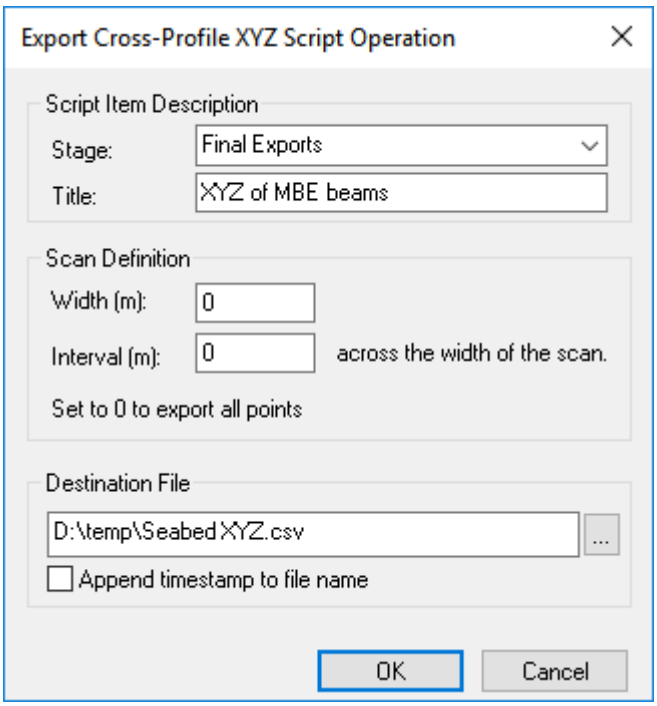
Script – Export Cross-Profile XYZ

Description

The Export Cross-Profile XYZ script allows you to output processed cross-profile data to a comma separated (CSV) ASCII text file.



Configuration

The configuration lets you enter a width value. If you set this to zero as shown above, all beam points across each scan will be exported. This means that the width of the exported scan will change if the height of the ROV above the seabed changes. If you want to export a more regular, fixed-width corridor of data, enter a width in metres. This is the total scan width to be exported, and is centred on the cross-profile reference point. Entering a value of 10m will export 5m either side of the reference.

The Interval works in a similar way across the scans: If you set the Interval to zero, all beams from each scan will be exported. If you only want points at a more regular and reduced spacing across the scan, enter an interval in metres, or fractions of a metre and the script will interpolate points at that fixed interval across the width of the scan.

If run as part of a Processing Batch with more than one Dataset selected, the data will all be appended to a single file unless the option “Append timestamp to filename” is selected. If this option is used, the script will create one file per Dataset and will include the date and time of the start of the Dataset in the filename.

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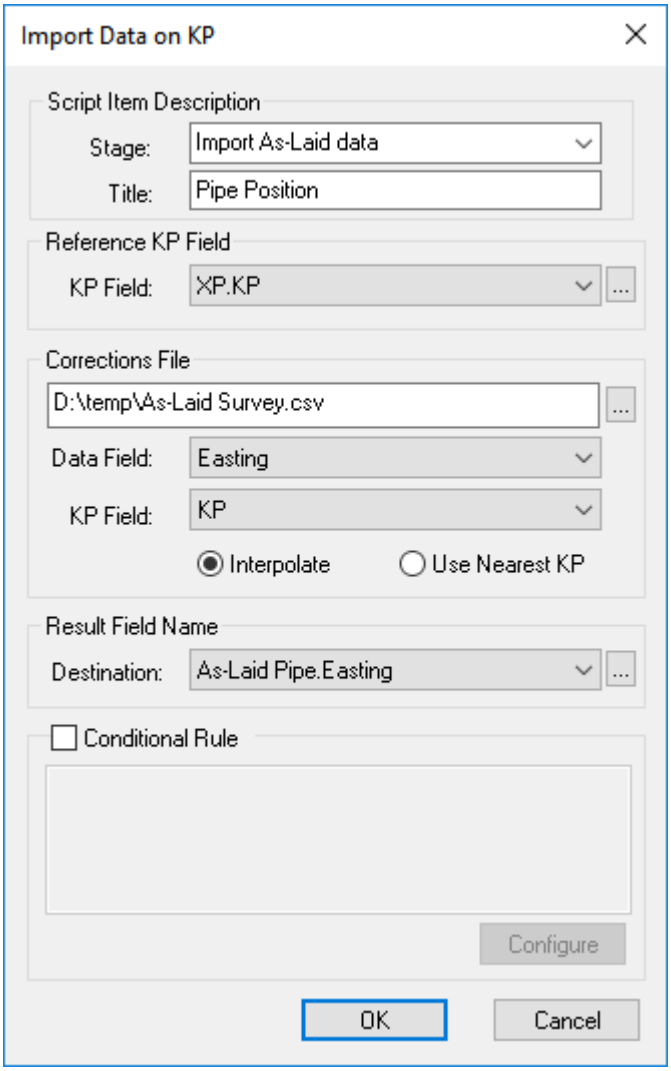
Script – Import on KP

Description

The Import on KP script allows data from other companies or from other surveys to be imported and linked to the current data using KP instead of time. The script reads from a CSV (Comma Separated Values) file. That file must have a header line defining the data columns using a comma separated list of column names e.g.:

Easting, Northing,Depth,KP,DCC
514131.34, 6253647.43, 223.00, 2.876, 0.38
514131.01, 6253647.05, 223.07, 2.877, 0.45
514130.80, 6253646.83, 223.38, 2.877, 0.56
514130.59, 6253646.63, 223.80, 2.877, 0.69
514130.27, 6253646.37, 224.34, 2.878, 0.82
514129.98, 6253646.18, 224.58, 2.878, 0.97
514129.62, 6253646.01, 224.83, 2.878, 0.95
514129.13, 6253645.81, 225.13, 2.879, 0.82



Configuration

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The “Reference KP Field” should be the KP column in the destination data. It is not necessary for this to be in the same table as the Destination data field. In the example above the Reference KP is in the Cross Profiles (XP) data table. This means that data will be imported at the same KP interval as the existing profile scans. Having specified the “Corrections File” to be read from, you then need to choose the “Data Field” which is the column to be imported from the file, and the “KP Field” which is used to import match the file records to the “Reference KP”.

There is an option to import either using a closest KP match, in which case the result in the destination table will equal the source value with the closes KP match, or to interpolate the imported data using records either side of the KP in the destination table.

Tip: This script is not often used now. It may be useful if you need to import just one data column, but if you need to import multiple columns it would probably be quicker and easier to create a User Defined Table (UDT) matching the columns of the file, and then import the whole file into the UDT.

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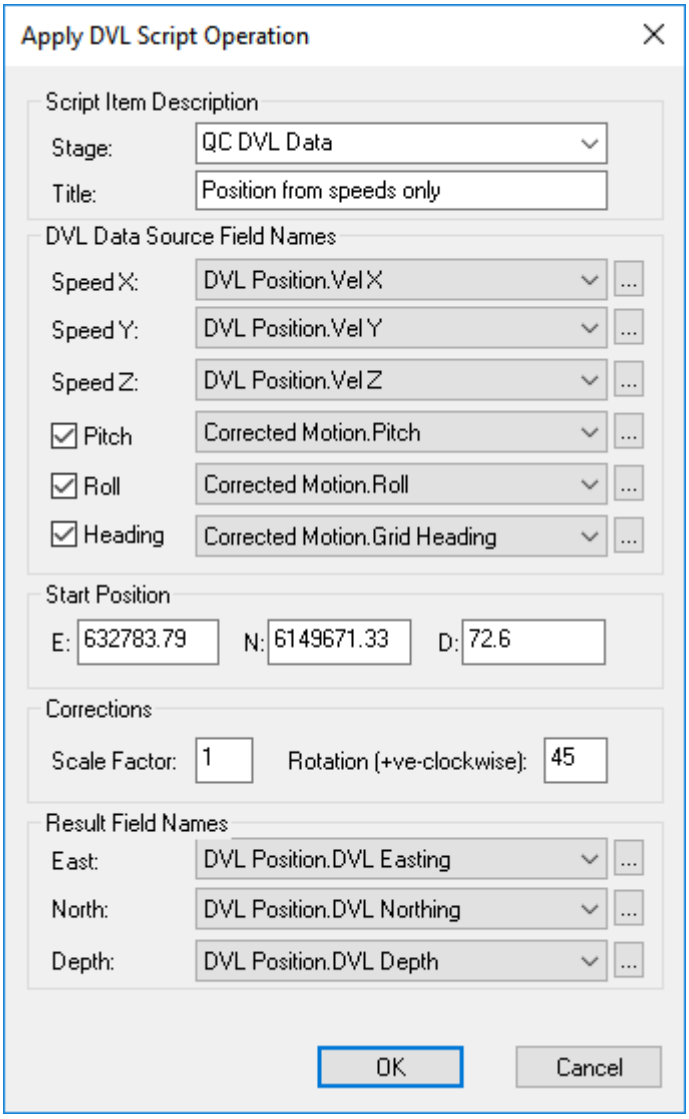
Position Processing

Script – Apply DVL

Description

This script is used to calculate an ROV position based **purely** on the speed data from a Doppler Velocity Log (DVL). The DVL records speed of movement in each of the X, Y and Z directions, and these speeds can be applied from a fixed 3D starting point (of Easting, Northing and Depth) as a means of calculating the changing position of an ROV.



Configuration

The configuration window allows you to specify the source of the speed data. Application of pitch, roll and heading data is optional and depends on the configuration of the DVL device being used. The script requires a Start Position and also (if they are known) the Scale Factor and Rotation correction values from a previous calibration of the DVL. Note that it is typical and recommended for a DVL used on an ROV for pipeline survey to be mounted at a rotation of 45 degrees from the ROV heading.

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If you do not know the scale and rotation values, run the script and compare the calculated positions with the HiPAP or USBL positions. This will allow you to see what corrections might be required. Even without the corrections you will be able to tell if the DVL is giving good data; if you expect a straight line, is that what you see in the computed positions?

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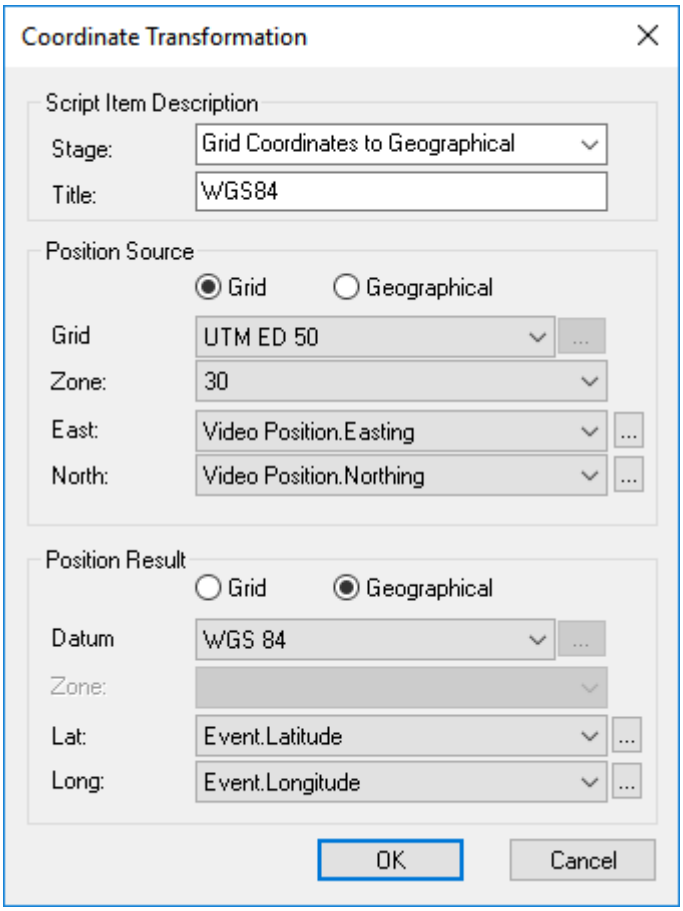
Script – Coordinate Transformation

Description

The Coordinate Transformation script will convert from Geographical coordinates (Latitude and Longitude) to Grid coordinates (Easting and Northing) or the other way around.



Configuration

Configuration of the script requires the selection of the source and destination data, and the geodetic parameters associated with those data fields. A list of common grids and datums is included, and there is also an option to configure user defined settings.

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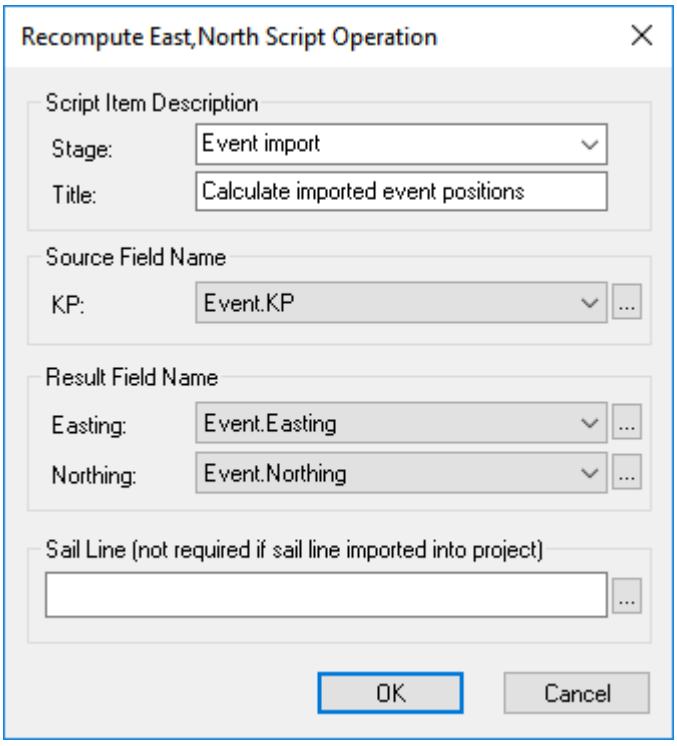
Script – Recompute East North

Caution

This script is not often used during standard survey or inspection work. It will only be needed if you have imported some data that is incomplete, for example lists of inspection events from a previous year or from a different contractor, where the data has KP values but no Easting and Northing positions. It should be used with caution because it will calculate positions that lie exactly on the sail line route and so if the sail line is not an accurate representation of a pipeline's position the calculated positions will not match the pipeline position. You should generally not use this script with design routes, only with as-laid or as-built routes.

Description

This script will calculate Easting and Northing positions from a supplied KP field and sail-line. This will generate positions along a sail-line file and can be used with data imported from a 3rd party source, such as previous pipeline inspection data supplied with event KPs but no positions.



Configuration

The required fields are simply a KP field in the Dataset, and a sail-line.

See also: Script – Recompute KP 300

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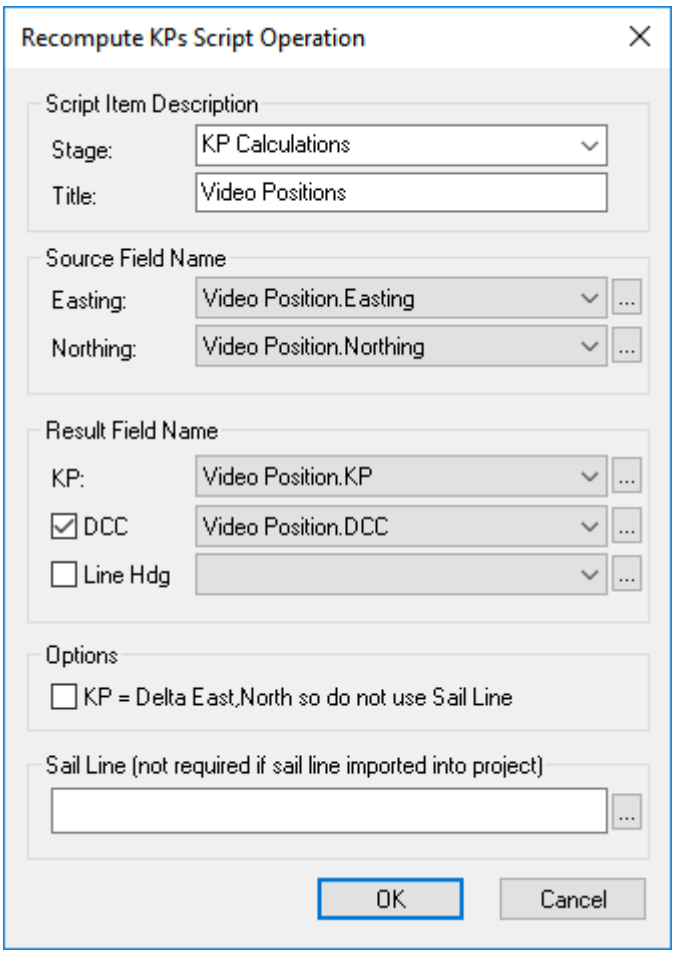
Script – Recompute KP

Description

This script calculates KP and Distance Cross Course (DCC) for each Easting and Northing position in a Dataset.



Configuration

The script requires Easting and Northing source fields, and a KP result field. The DCC (Distance Cross Course) result is optional, but it is recommended that you use it.

You can also save the "Line Heading". For each position record, this will calculate the heading of the Sail Line at that point. This can be used for QC, allowing a comparison of ROV heading against line heading. It is also required for the Pisys Cross-Profile export format, so it is recommended that you use this option when calculating Cross-Profile KPs. There is a Line Hdg column in the X-Profiles data table for this purpose.

In the Options section you can tell the script to ignore the sail-line and instead calculate the KP values based on cumulative distance from point to point along the selected Easting and Northing track.

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If the sail-line has been imported into the Project, the sail-line field at the bottom of the dialog box may be left blank, otherwise the Browse button should be used to select the relevant sail-line.

See also: Script – Recompute East North 299

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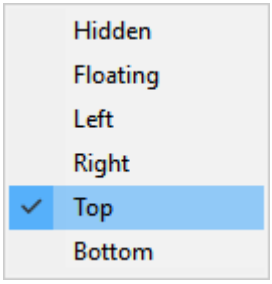
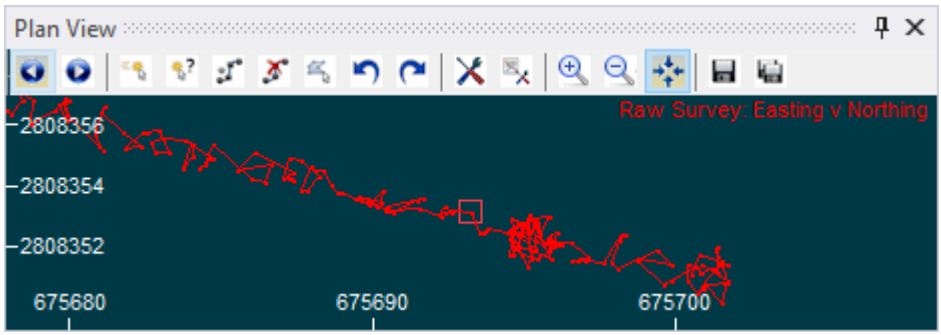
1.27.3 Manual Processing - Positions and Sensors

The Plan view and Side view each has a toolbar that you can open to show some basic, manual data processing tools. You can move points, disable points and smooth the data points. As a general rule these tools are best used after running the automated Processing Scripts and Batches 212, when they can be used for minor corrections to tidy up mathematical anomalies. The manual processing tools are not intended for normal data processing which should always be done using the processing scripts; instead they are form minor tidying up of small errors that cannot be fixed automatically – perhaps to remove small tidal mismatches where two survey runs using predicted tidal data do not quite match. The adjustments that you make with the manual tools should be more about aesthetics of plotted data than about ensuring accurate survey results. Changes should be small and within expected error tolerances.

To open one of the toolbars, right click in the chosen graphics view, either the Plan View or the longitudinal "Side" View, and select an option in the Toolbar sub-menu:



The toolbar can be snapped onto one of the four sides of the window, or it can be free-floating. Be careful of the floating option because you may mix up the Plan View and Side View toolbars; snapping to an edge of the window always makes it clear which toolbar works with which data. Most people find that the Top edge is the most logical place for the toolbar.



Toolbar snapped to top edge of Plan View

On a very high resolution monitor you may decide that the floating toolbar is easier simply because the buttons are a little larger, and easier to see.

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Plan and Side View Manual Processing Tools

Step back: Click to move the centre of the window backwards in time order to a point about one third of the way back through the displayed data.

Step forward: Click to move the centre of the window forwards in time order to a point about one third of the way further through the displayed data.

Move point: Select this tool and then left-click on or near a data point, hold down the left button and drag the point to a new location.

Query point: Select this tool then left-click on a data point to open a window where you can see and change the exact coordinates of that point. You might use this to move a point to a known location – such as moving a sealine flange to a supplied coordinate or moving a known point during construction from a USBL / HiPAP coordinate to a more accurate LBL coordinate. This can be used in conjunction with "Fixed points" in a smoothing script to prevent the known/fixed point being changed.

Smooth data: Select this tool and then left-click on or near a data point, then hold down the left button and drag a line to another point before letting go. Data with times between the points closest to the ends of the line you drew will be smoothed. This is not intended as a regular smoothing method; most smoothing should be done using the available smoothing 266 scripts. This manual tool is intended for "tidying up" small mismatches after normal processing.

Disable points: Select this tool and then left-click on or near a point to disable it. To disable more than one point, left-click on or near a data point, hold down the left button and drag a line to another data point then let go. Data with times between the points closest to the ends of the line you drew will be disabled.

Polygon select: Select this tool and then left-click to draw the first point of a shape, then move and left-click a few times to draw the outline of a shape. Double-click to close the shape, then press the Delete key on your keyboard to disable the points inside the shape that you drew. To re-enable data points draw a polygon with a series of left clicks and a final double-click, then press the Insert key on your keyboard.

Undo: Click to undo the last action performed with the manual editing tools listed here. Click repeatedly to step backwards through a history of previous manual editing actions.

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Redo: Click to redo the last action performed with the manual editing tools listed here. Click repeatedly to step forwards through a history of previously undone actions.

Batch processing: Click to open the Batch Processing configuration 214.

Graphical processing: Select this tool and then left-click on or near a point, hold down the left button and drag a line to another data point then let go. This will then open the Batch Processing window with the KP and time data limits set by the points closest to the ends of the line that you drew.

Zoom in: Click to zoom in on the centre of the window

Zoom out: Click to zoom out

Zoom centre: Select this tool and then left-click on or near a point to recentre the window on the point closest to where your clicked.

Save Processed Survey: Click to save the Processed Survey data table.

Save all modified data: Click to save any and all data tables that have been modified since the last save.

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1.27.4 Cross-Profile Scan Processing

Cross-Profile Scans can be processed manually one at a time, or in a more automated batch process. Normally you might process a few manually to get a feel for the quality of the data and to set some trends about where individual features should be placed, and then switch to the faster automated processing.

Before you do any processing you need to set some parameters such as the pipe diameter, and where other features should be placed relative to that pipe.

After you have configured the processing settings you can process one or more scans by using the other tools on the toolbar.

Cross-Profile Processing Tools

Step back: Click to move the centre of the window backwards in time order to a point about one third of the way back through the displayed data.

Step forward: Click to move the centre of the window forwards in time order to a point about one third of the way further through the displayed data.

Configure Processing: Click to open the processing configuration window.

Process: Click to automatically process the current scan, using the current settings.

Batch Process: Click to automatically process the current scan, and then automatically step though and process all scans in time order, using the current settings. Click again to pause or stop processing.

Undo Processing: Click to undo the processing of the current scan.

Disable points: Select this tool and then left-click on or near a point to disable it. To disable more than one point, left-click on or near a data point, hold down the left button and drag a line to another data point then let go. Data with times between the points closest to the ends of the line you drew will be disabled.

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Polygon select: Select this tool and then left-click to draw the first point of a shape, then move and left-click again to draw the outline of a shape. Double-click to close the shape, then press the Delete key on your keyboard to disable the points inside the shape that you drew. To re-enable data points draw a polygon with a series of left clicks and a final double-click, then press the Insert key on your keyboard.

Place Features: Left click then click on the scan to assign or move pipe and seabed markers. To move a marker left-click on it and hold down the button while dragging it to a new location.

Zoom in: Click to zoom in on the centre of the window

Zoom out: Click to zoom out

Zoom centre: Select this tool and then left-click on or near a point to recentre the window on the point closest to where your clicked.

Save Cross-Profiles: Click to save the X-Profiles data table.

Save all modified data: Click to save any and all data tables that have been modified since the last save.

Recover / Reload Scans: Click to open options for reloading raw or disabled scans.

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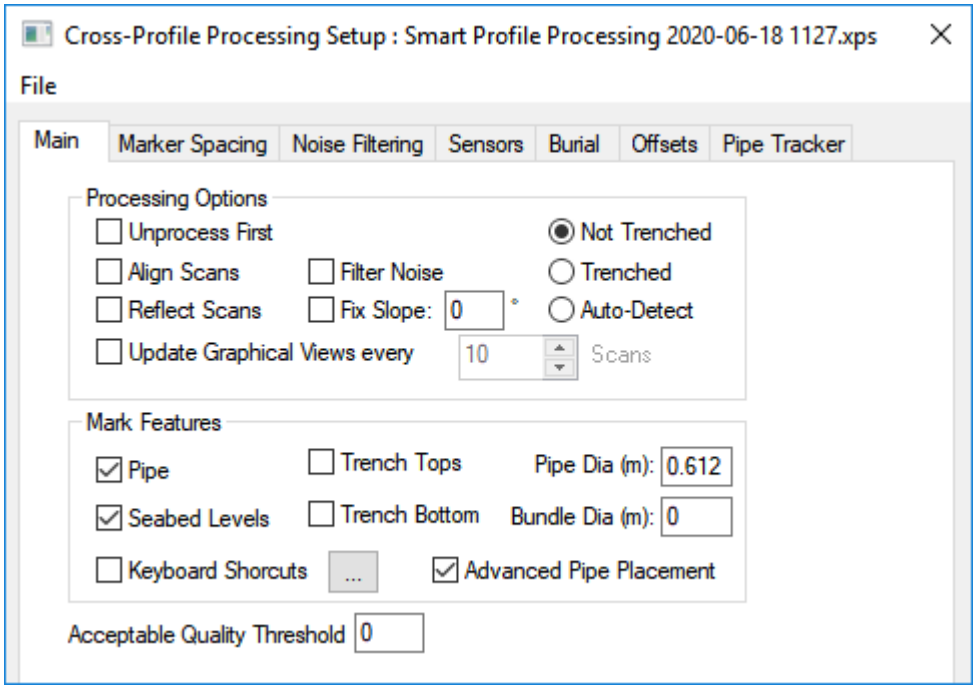
Configure Cross-Profile Processing

The settings for Cross-Profile processing are divided onto multiple different tabs of the settings window.

Some of the settings can be ignored if you already used the batch processing to clean and align the data using the Cross-Profile Cleaning script 247. That script is highly recommended because it will clean and align the beam data many, many times faster than by using the older cleaning methods 311.

Main tab



Processing Options

Unprocess First	This will undo all previous processing including the cross-profile cleaning script. This should NOT normally be used.
Align Scans	Will rotate data from each head to match the other head. Not required for modern profilers or MBE.
Reflect Scans	Swap port and starboard beam arrays if heads are pointing backwards.
Update Graphical Views every N scans	Speed up the processing by not drawing every scan as it is processed.
Filter Noise	Apply the data cleaning options chosen on the Filter Noise Tab. Leave this OFF if you used the Cross-Profile Cleaning 247 script.
Fix Slope	Rotate the scanned seabed to the specified angle relative to horizontal. Used ONLY if an ROV has no roll sensor.
Trenched?	Tell the software whether or not to look for a trench when processing the data. If you know that there is no trench, select Not Trenched so that processing goes faster. If there is sometimes but not always a trench, use Auto-Detect.

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Mark Features

Pipe	Select this to assign a pipe circle in the processed scan
Seabed Levels	Select this to assign four seabed markers: port and starboard immediately adjacent to (or beside) the pipe, and port and starboard "mean" (or natural) seabed
Trench Tops	Select to detect spoil heap mounds either side of a trench
Trench Bottom	Select to detect the lowest point in the trench
Pipe Diameter	EXTERNAL pipe diameter including all coatings
Bundle Diameter	Total combined distance from top of a piggy-back line to bottom of a main pipeline in a piggy-backed bundle. (Measured when the piggy backed line is at the 12 o'clock position directly above the main pipeline.
Keyboard Shortcuts	Set shortcuts for adding or removing pipe and seabed feature markers
Advanced Pipe Placement	See below 310

Quality Threshold

Acceptable Quality Threshold	When scans are automatically processed the pipe placement is assigned a confidence level between zero and one hundred. Yo can tell the software to reject, and unprocess scans below a chosen quality percentage.

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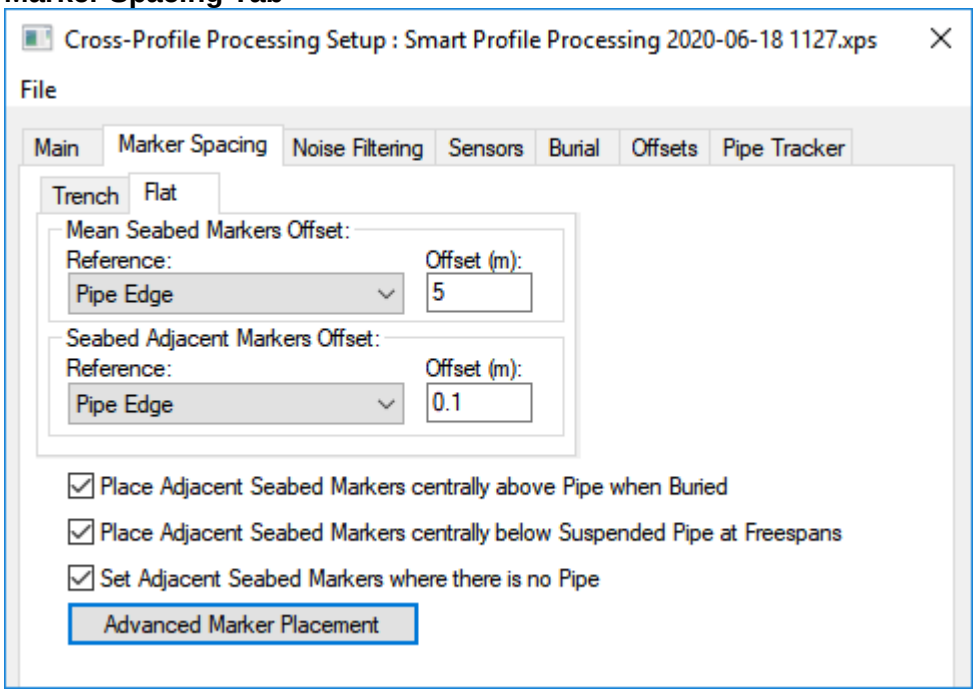
Marker Spacing Tab



Trench / Flat	If you selected Not Trenched on the Main tab, you only need to complete the "Flat" option here. If you selected Trenched, complete the Trench option, and if you selected Auto-Detect, complete both.
Mean Seabed Markers Offset	Specify how far to the side of which reference you want to place the natural (mean) seabed markers.
Seabed Adjacent Markers Offset	Specify how far to the side of which reference you want to place the pipe-adjacent seabed markers.
Place centrally if buried	If the pipe is buried the port and stbd adjacent markers can be both moved to the middle.
Place centrally if freespan	If the pipe is suspended the port and stbd adjacent markers can be both moved to the middle.
Set if no pipe	If the pipe is not found (e.g. pipetracker out of range) should the "adjacent" markers be placed anyway?

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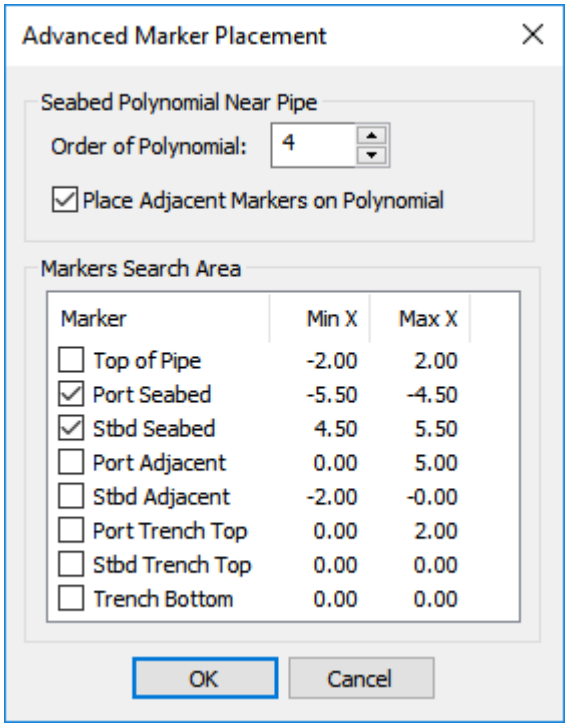
Advanced Marker Placement



Seabed Polynomial Near Pipe - Order	Increase the polynomial order to allow for a more complex seabed shape. A polynomial will be fitted to the data lying between the limits of the port and stbd adjacent markers.
Place adjacent markers on polynomial	Place the markers on the polynomial line, or on an existing beam point.
Min X and Max X	If the data has gaps you can set a range to increase the search area for pipe and seabed markers. This avoids a situation where marker is not set because there was no data at the single defined X value in the marker offset location 309. In this example, instead of the stbd seabed having a single x value of 5m, it uses a range of points from 4.5 to 5.5m

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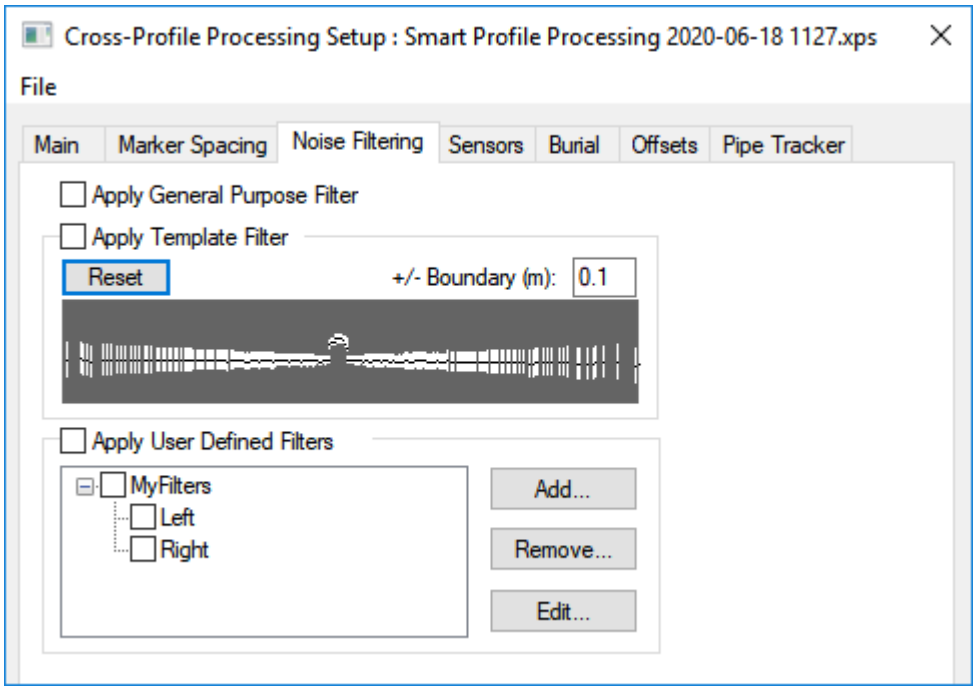
Noise Filtering Tab



NOTE: None of these noise filters should be used if the data has already been cleaned using the faster and better Cross-Profile Cleaning 247 script.

Apply General Purpose Filter	Erase any isolated beam returns with few close neighbours.
Apply Template Filter	Use the current scan as a template for cleaning later scans. Clean the current scan manually, then click apply. The dark line through the middle represents the current scan, with a white buffer zone around it. The buffer is twice as wide at the outside edges.
Apply User Defined Filter	Create a number of circles and erase data within them.

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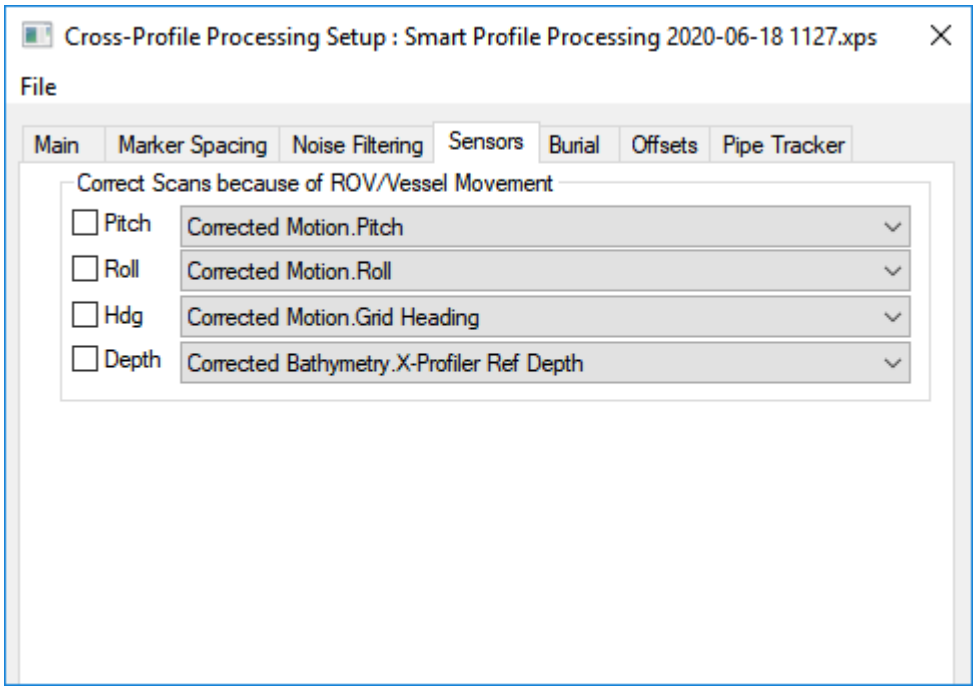
Motion SensorsTab



NOTE: If the data has already been cleaned using the Cross-Profile Cleaning 247 script you should NOT apply motion data here.

Pitch, Roll, Heading, Depth	Select whether to apply or re-apply motion corrections to the scan beams, and if so what data to use. The selected data should be already corrected for any C-O or other calibration values.

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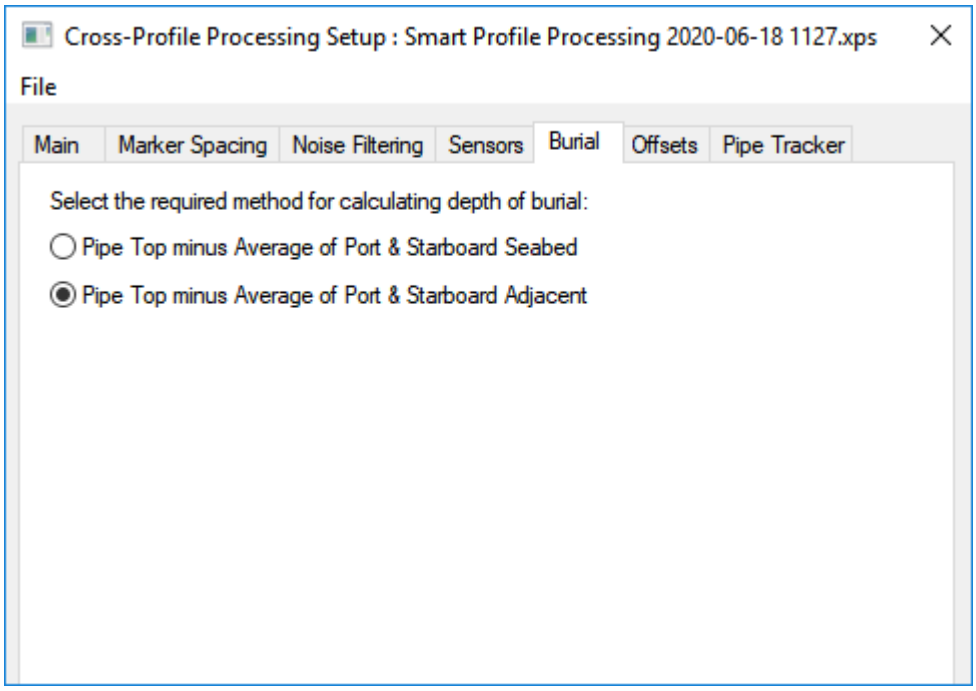
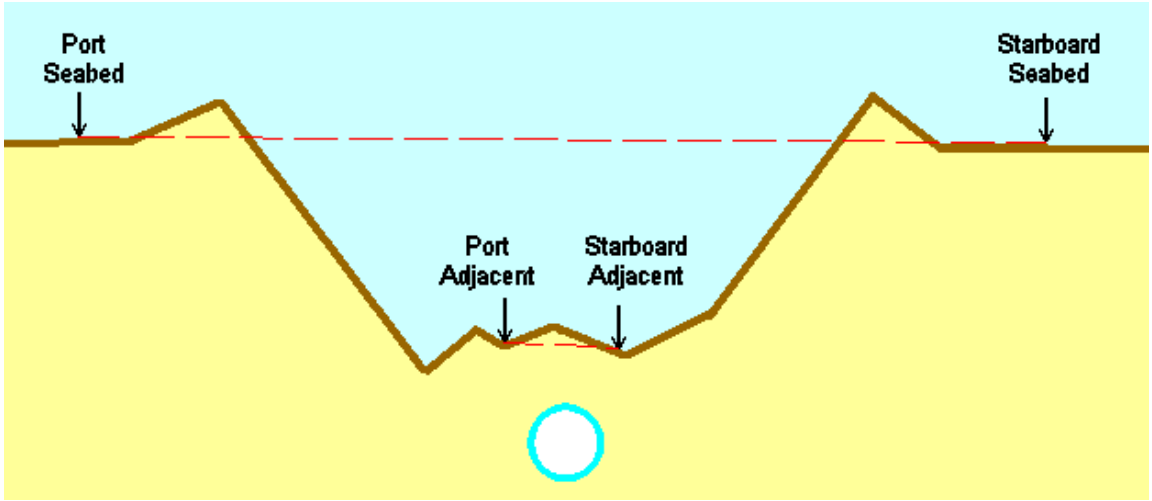
Burial Settings Tab



Specify how depth of burial should be calculated: Use Average of Port & Stbd Seabed for depth of lowering below natural seabed, or Average of Adjacent levels for depth of cover.



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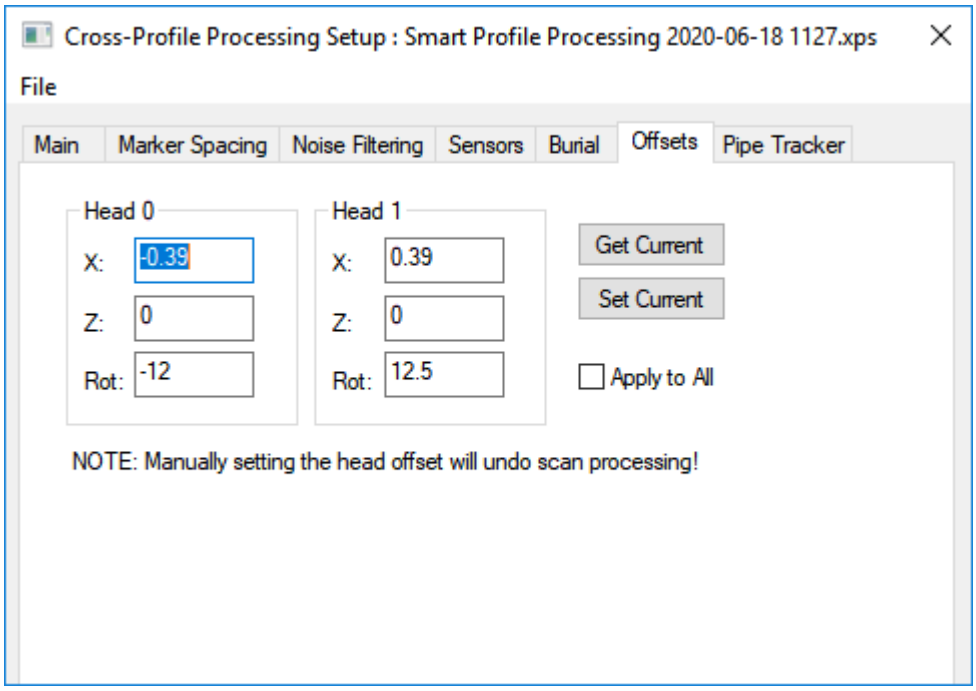
Head Offsets Tab



NOTE: If the data has already been cleaned using the Cross-Profile Cleaning 247 script you should NOT apply any offsets here and should **leave Apply to All turned OFF**.

Select whether to apply or re-apply head offset corrections to the scan beams, and if so what values to use. To apply offset values during batch processing select Apply to all. These offsets are relative to the Cross-Profile Reference Position at the mid-point of the two heads, NOT relative to ROV CRP. Therefore port and stbd X must be equal and opposite, and Z is almost guaranteed to be zero.

With many profiling systems such as Tritech SeaKing a head separation offset is stored with the logged raw data. To read values form the current scan, click Get Current. To change the current scan click Set Current.

Note that using Set Current will undo ALL previous processing of this scan including all beam cleaning and motion corrections.

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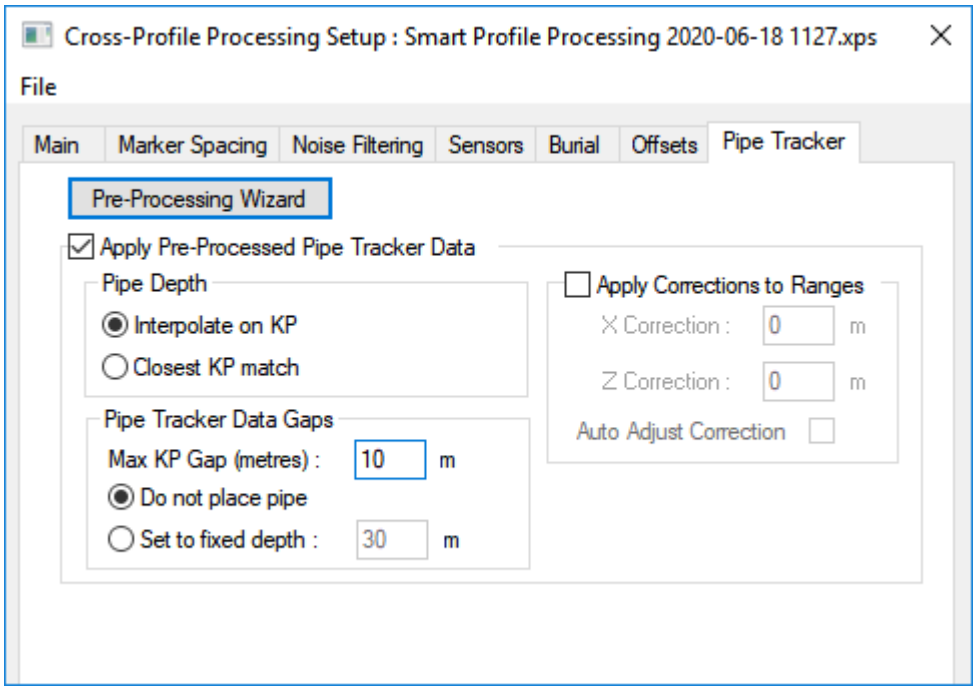
Pipe Tracker Tab



If you have data for Pipe Top in the Easting, Northing, Depth and KP columns of the "Processed PT" data table you can use it to place the pipe into the cross-profile scans. If you do not yet have that processed data run either the Smart Processing or the Pre-Processing wizard to create it.

Pre-Processing Wizard	If you have not yet run processing scripts for pipe tracker data, you can select the Pre-Processing wizard to help write the scripts for you. This is an old and limited version of the Smart Processing wizard and you are strongly advised to use Smart Processing instead.
Apply Pre-Processed Pipe Tracker Data	If you have run processing scripts on your pipe tracker data you can apply that processed data here with the following options.
Pipe Depth	In each scan you can place the pipe by interpolating between the two adjacent Processed PT records (in KP order) or by selecting the exact position of the one closest record with no interpolation.
Pipe Tracker Data Gaps	If there are gaps where you have no processed pipe tracker (Processed PT) data, what do you want to do? You can either not place a pipe circle or else place it at a fixed depth such as 999m so that you can locate these records easily.
Apply Corrections to Ranges	If you know that your pipe tracker data shows a constant error you can correct for it here.
Auto Adjust Correction	Use this to compare known pipe position when exposed with processed pipe tracker data and automatically calculate a correction to apply when the pipe is buried.

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1.28 "Processing Trail" Log File

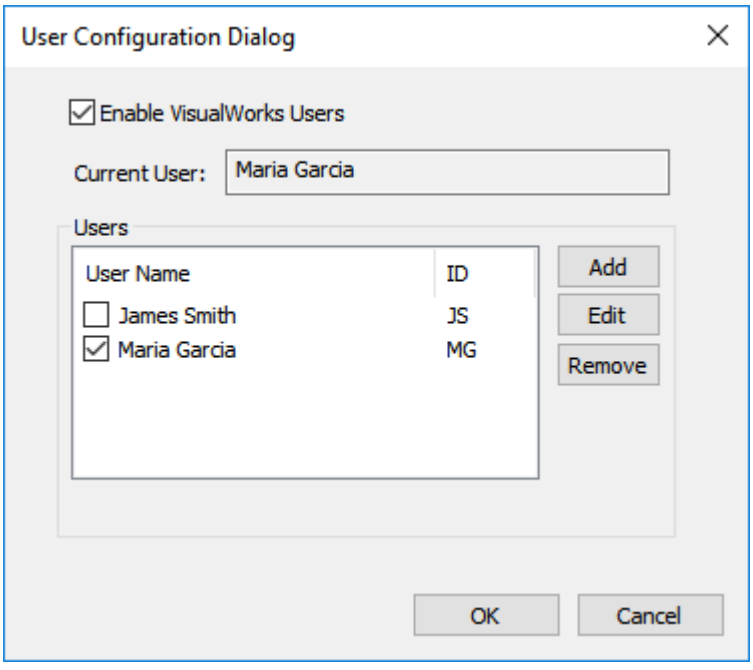
Each Project in VisualEdit can have an associated “Processing Trail” log file. The Processing Trail records the loading, saving and unloading of data, and all processing operations whether they are manual or are part of a configured batch of scripts. Each entry indicates the time at which an action was performed, and the time and KP limits of the data affected by the operation. If user names 316 are enabled, the User ID of the current user will also be recoded alongside each action.

The location of the Processing Trail file is in the Project folder.

If the Processing Trail is not required it may be disabled by opening the Project Properties 26 turning off "Maintain a log of processing operations". This is NOT recommended.

1.29 Data Processor User Names

In combination with the Processing Trail it is possible to turn on user names within VisualEdit so that the Processing Trail keeps a record not only of what was done to the data and when it was done, but also which user was working at the time. On the Options ribbon select Users.



Add to the ;list of users by clicking Add. Type a “Full Name” and also a shorter “User ID” which might be the person’s initials.

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After creating the list of potential users it is then possible to select the “Current User” by ticking the box beside their name – Maria Garcia in the example above. The corresponding name will then be shown as the Current User as can be seen above. When you take over at a shift change remember to open the Users list and select your own name.

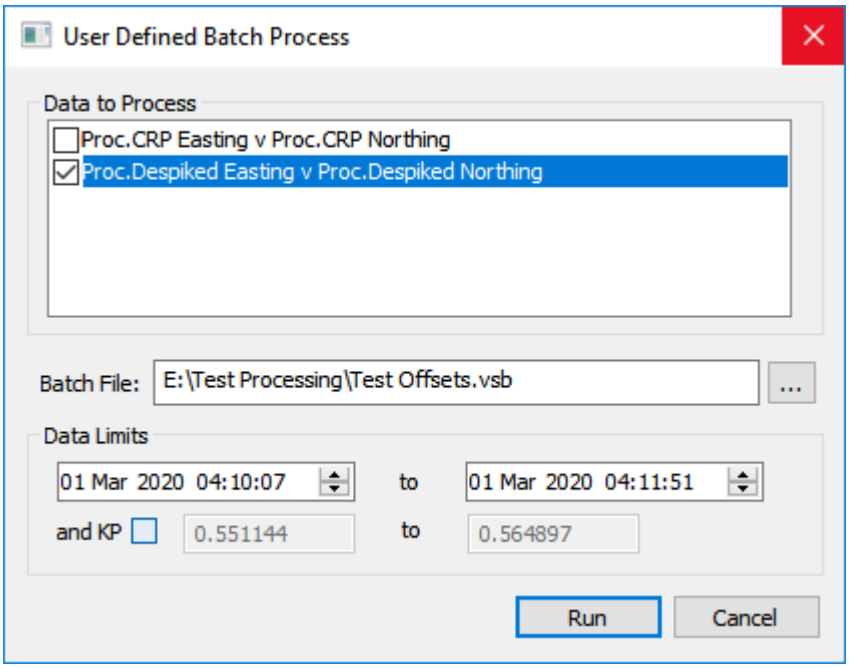
User names can be added, edited or removed as necessary using the buttons on the right.

If a current user is selected their ID will be used in the "Processing Trail" Log File 316.

1.30 Graphical Processing

The Graphical Processing tool provides an alternative way of selecting data for batch processing. It provides a way for users to define their own preferred smoothing to use instead of the manual smoothing 303 tool, or to define a spike removal sequence, etc.

Select data by clicking on the Graphical Processing tool 304 on the Plan View or Side View toolbar and then hold down the left mouse button while drawing a line to select a section of data in the plan or side view. When the mouse button is released a window opens listing the selected data with its data limits.



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Use the ... browse button to select a previously configured data processing batch 212 file. The source and destination data defined in the batch will be edited to use the data columns shown in the "User Defined Batch Process" window (see above).

If you do not want to process all of the data types currently shown in the graphics, you can de-select individual lines using the check boxes on the left of the list.

By default only the time limits of the selected data are enabled. These may be changed if required. You can also enable and change the KP limits if required.

1.31 How To Process Pipe Tracker

There are options within the cross-profile processing to position a pipe in each scan using pipe tracker data. This can be done as shown below, but the easiest way to configure pipe tracker data processing is to include it in the Smart Processing 206.

1. Process the ROV reference track as you would normally.
2. Filter the pipe tracker data using Copy Field 239 with a condition to filter on the QC column.
3. Remove spikes from the pipe tracker data. See Remove Spikes Script Operation 261 or Remove Spikes Advanced 263.
4. Apply an offset to the ROV reference track. See Apply Offset Script Operation. Enter the offset from the ROV reference to the pipe tracker reference. Also select the data source fields for the filtered and cleaned pipe tracker data. This will apply a two part offset, from the CRP to the pipe tracker coils and also from the coils to the pipe, to create a 2D position that represents the top of pipe.
5. If required, smooth the new track. See Smooth Using Moving Average 266 or Smooth Using Polynomials 270..
6. Use the cross-profile processing option to apply pre-processed pipe tracker 315 data.

1.32 Working with 3rd Party Applications

The VisualSoft Suite, including VisualDVR is designed to work alongside other applications from other 3rd party companies. We have offline playback in VisualEdit and VisualReview that can be controlled by, or can control, other companies viewers and inspection systems. We have recording, overlay and image grabbing in VisualDVR that can be controlled by a number of 3rd party applications. The following sections of this user guide describe some of these 3rd party interactions and how to configure them; they should each be read alongside the 3rd party documentation.

If you have a 3rd party application that you think should work with a VisualSoft application, and it is not listed below, please contact VisualSoft Support by email to visualsoft.support@f-e-t.com or by calling our support line 334.

Known 3rd party applications that are compatible with VisualSoft Applications include:

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Application	Compatibility
AiZe's Coabis to VisualDVR Connection 320	Remote control of VisualDVR from Coabis
AiZe's Coabis and VisualOverlay Setup 323	Remote control of VisualDVR's overlay from Coabis
Eiva's NaviModel 327	Remote control of NaviModel from VisualEdit, and event logging from NaviModel into VisualEdit
Fugro's Starfix 331	Remote control of time synchronisation from Starfix, and sending of navigation and event data to VisualDVR
PiSYS	Remote control of, and image grabbing in VisualEdit
QPS's QINSy 30	Data import from QINSy into VisualEdit via pre-defined ASCII files
Wood's NEXUS 333	Compatibility with Wood's *DVR Protocol*, allowing remote control of VisualDVR and overlay

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1.32.1 Aker's Coabis to VisualDVR Connection

From version 12.1 onwards of Coabis you can control VisualDVR from inside Coabis. The following sections describe how to configure this in both the Coabis and VisualSoft applications. You need to setup a few things in Coabis to get a successful connection between Coabis and VisualDVR.

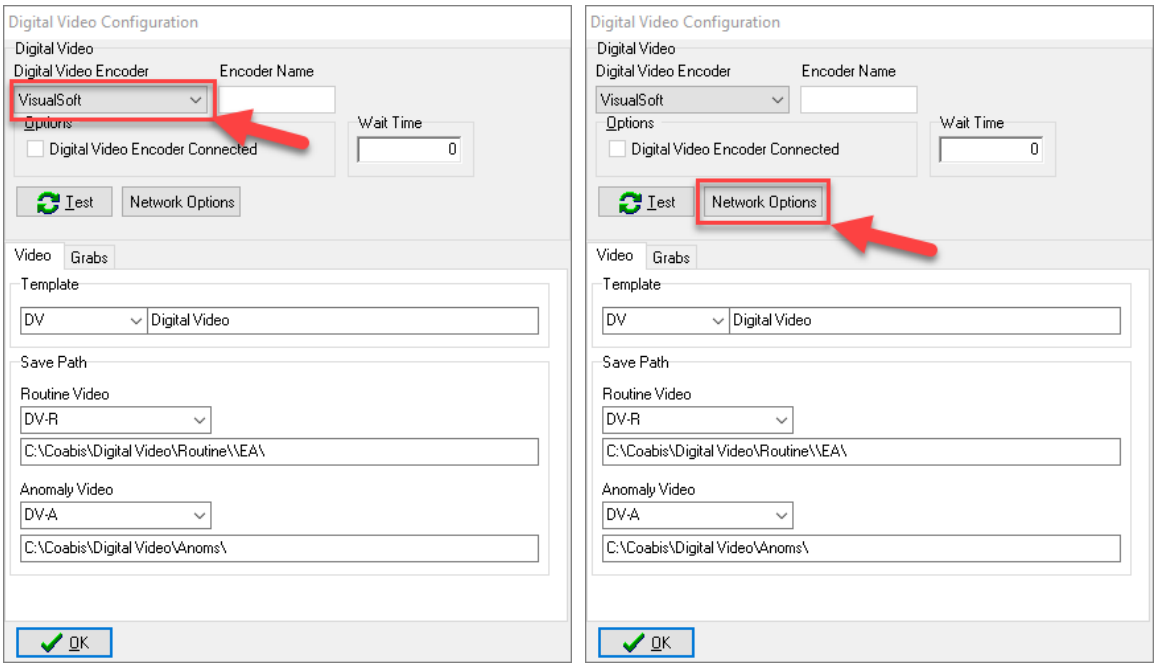
A. Installation

First make sure that you have installed the VS Control add-on, by running VisualSoft's installer "InstallVSControlV10.4.2.exe" (or a later version number of InstallVSControl).

B. Coabis Settings - Start the VisualSoft add-on

In Coabis go to **Site**, then **Tools**, and then **Digital Video Configuration**.

Set the **Digital Video Encoder** type as VisualSoft, and then click the **Network Options** button.



This opens a VisualSoft Network tool in the Windows System Tray notification area at the bottom right of your screen . You may need to click "Show hidden icons" in Windows before you can see it.

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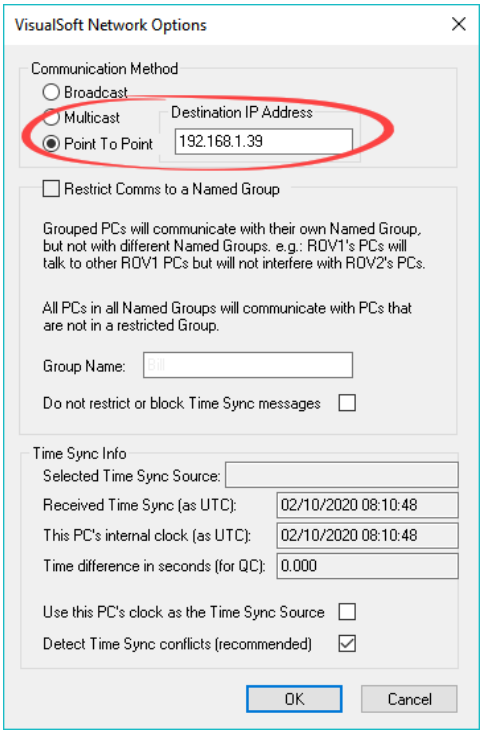
Configure the VisualSoft Network

Click on the VisualWorks Network icon to open the settings window.

Select the Point to Point method so that you only control **one** VisualDVR and do not accidentally interfere with other DVRs or logging application that you or a survey contractor may have on the same network. Enter the IP address of the VisualDVR PC. If the DVR PC has more than one network connection and/or more than one IP address, make sure that you select the one that is in the same subnet range as the IP address of the Coabis PC.

In a typical setup of VisualDVR the time sync will be coming from a navigation data output derived in turn from a GPS or other GNSS time source. In that scenario, do NOT select Use this PC's clock as the Time Sync Source. Only if you want all logging to be synchronised to the internal clock of the Coabis PC should you select "Use this PC's clock". If you do that, you must also ensure that all other logging PCs for survey data sensors are also synchronised to that same source.



Click OK to close the VisualSoft Network options window.

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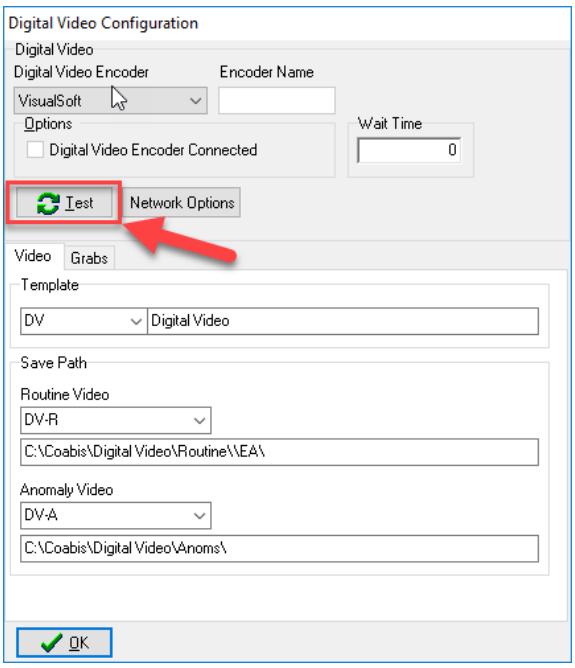
Test the VisualSoft Network

Click the Test button in the Coabis Digital Video Configuration window. If the test is successful the Encoder Name will be filled in with the name of the VisualDVR PC, and a message will pop-up confirming a successful test.



After a successful test, configure other options in the lower part of the window (search for "Digital Video Interface" in Coabis's built-in help for more information), then click OK to close the Video Configuration window.

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1.32.2 Aker's Coabis and VisualOverlay Setup

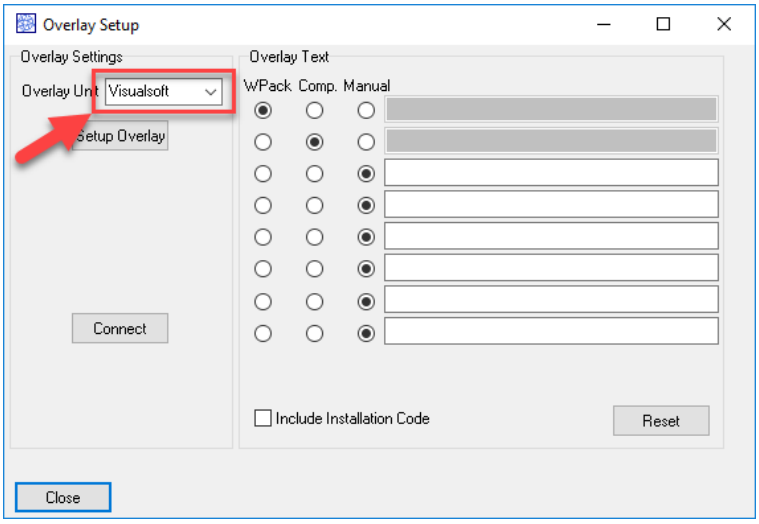
From version 12.1 onwards of AiZe's Coabis you can control VisualDVR's overlay from inside Coabis.

Before setting up the overlay, be sure to setup the configuration for the Coabis to VisualDVR Connection 320

A. Coabis Settings - Overlay Setup

In Coabis go to **Site**, then **Tools**, and then **Video Overlay**.

In Overlay Settings, select the **Overlay Unit** type as VisualSoft, and then click the **Setup Overlay** button. This will prompt you to complete the setup in VisualDVR.



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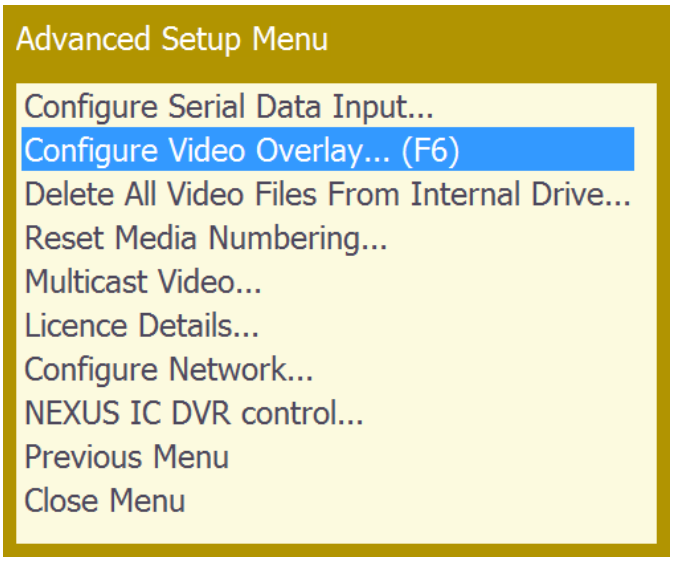
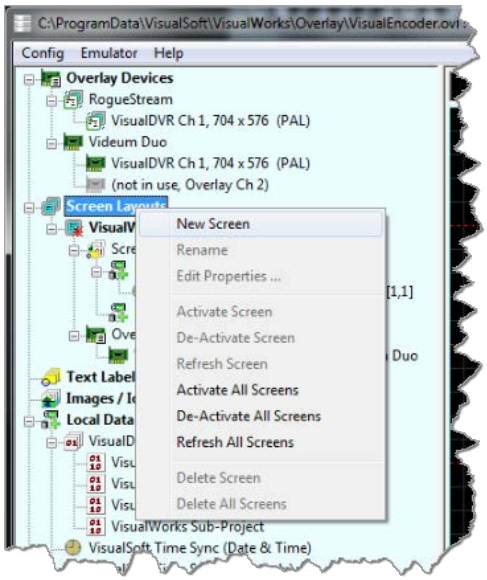
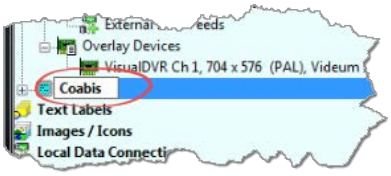
B. VisualDVR Overlay Settings

Open VisualDVR's overlay setup using F6 on the VisualDVR keyboard, or with the VisualDVR menus via left click in the main video window. If you use the menus instead of F6, go to **System Setup & Admin**, then **Advanced**, then **Configure Video Overlay**.

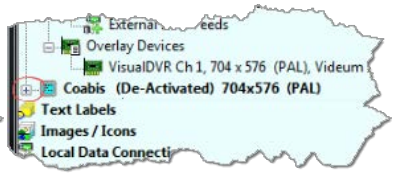




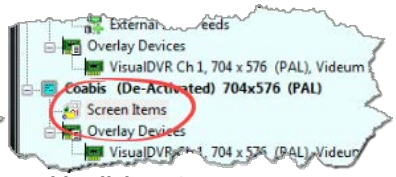
In the overlay window, right-click on **Screen Layouts** and select **New Screen**. Type a name for the new Screen Layout, for example "**Coabis**", then click the + sign next to the new Screen Layout to expand it, then when it is expanded, double-click on **Screen Items** in the newly expanded section, just below the new Screen Layout's name.



Type a name

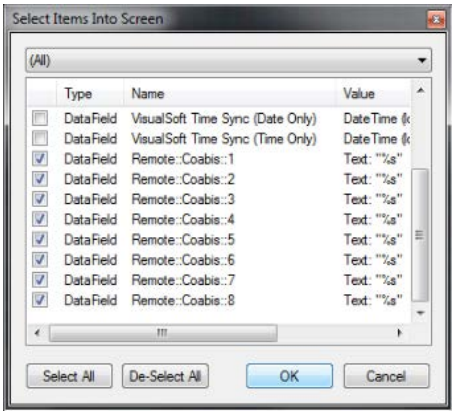


Expand the new Screen Layout



Double-click on Screen Items

When you double-click Screen Items, you will see a window where you can select what you want to add to your overlay. Select the numbered "**Remote::Coabis**" items.



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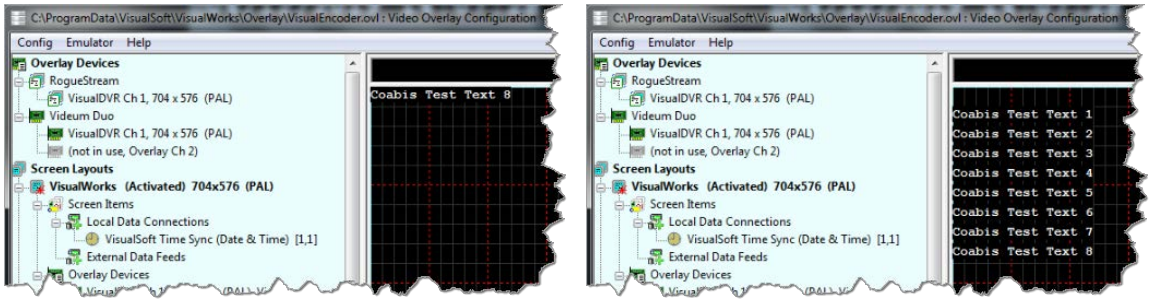
In the preview window on the right, all eight items will appear overwriting each other in the top left. Use drag and drop to move them where you want, then click OK to close the window.



Right-click on the **VisualWorks** Screen Layout in the tree view on the left, and select **"Deactivate" to turn it off**.

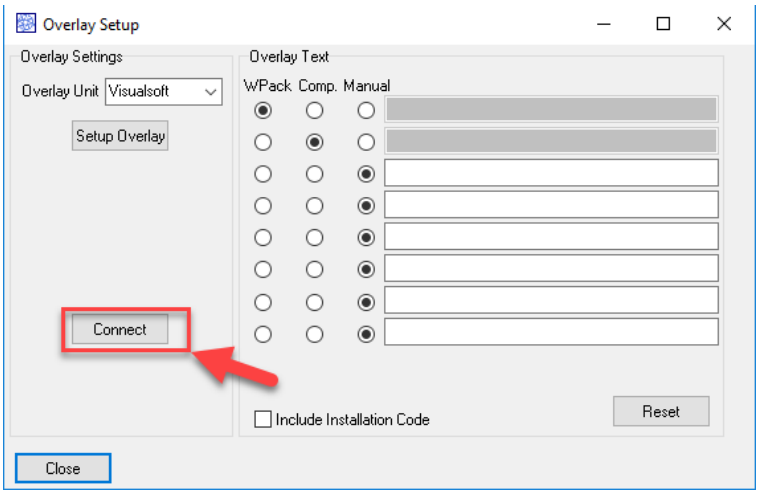
Right-click on the new **Coabis** Screen Layout in the tree view on the left, and select **"Activate" to turn it on**.

If you have more than one channel or camera, or more than one overly device, be sure to add all of the relevant devices to the Coabis Screen Layout. You can do this by dragging and dropping from the list of devices in the tree view on the left.

If you want all of the overlay text to be the same colour and style, right-click again on the new **Coabis** Screen Layout in the tree view on the left, and select **"Properties"**. If you want different items to look different , right-click on the individual items instead of on the Screen Layout. For more details on this see the VisualOverlay User Manual.

C. Test Video Overlay

Make sure that VisualSoft is still selected as the **Overlay Unit** type in Overlay Settings, then click **Connect**.



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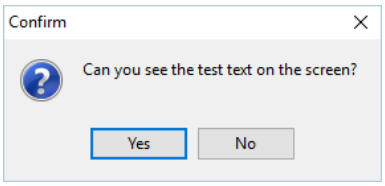
You should see text appear in the overlay preview and in VisualDVR's video window. Click Yes in Coabis to confirm you can see the overlay in VisualDVR, and close Coabis Overlay Setup.



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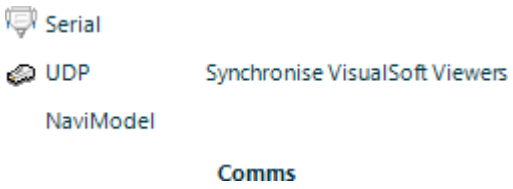
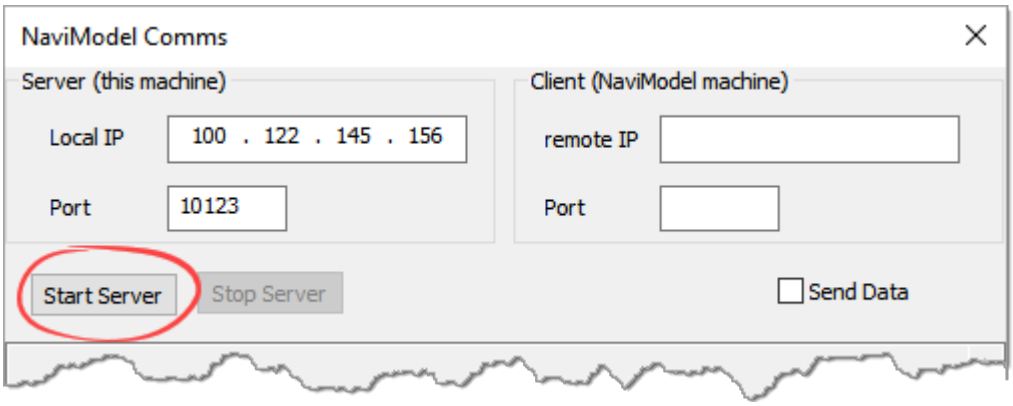
1.32.3 Synchronise Eiva's NaviModel display to VisualEdit playback

You can use VisualEdit to "drive" the 3D display of Eiva's NaviModel so that the position shown in the VIsualEdit windows will be matched by NaviModel. After you load your data in VisualEdit, click on the Options Ribbon and select NaviModel in the Comms section on the left.



This will open a setup window where you should click **Start Server**.



Next, load your Project in NaviModel so that you can see the 3D display with the same survey are that you have in VisualEdit, then open a data connection into NaviModel from VisualEdit. In NaviModel, expand the Project data tree on the left and right-click on **Online**. Select Connect from the pop-up menu.

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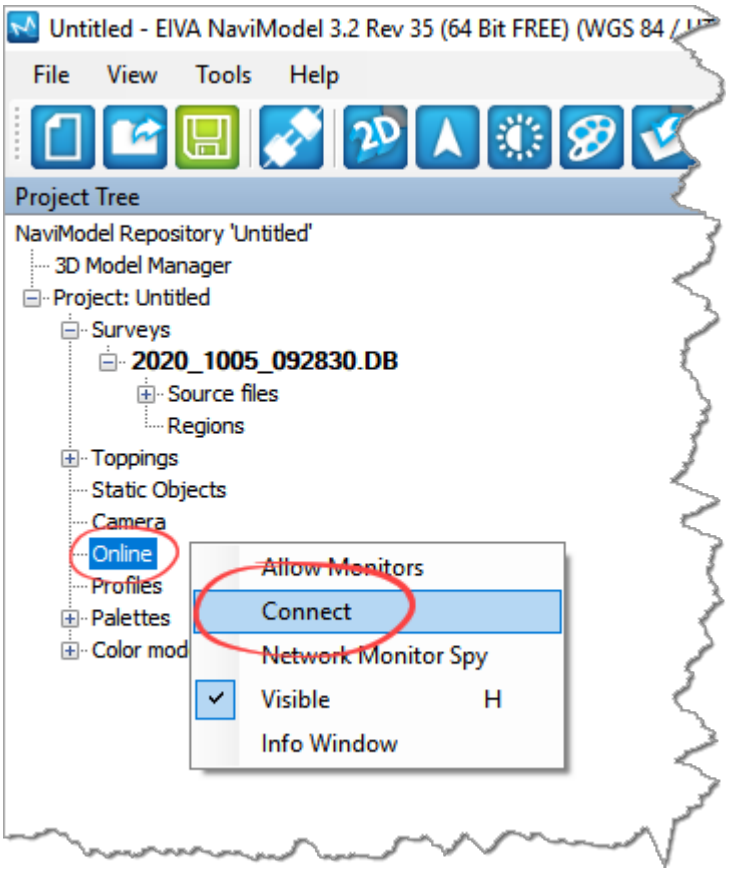
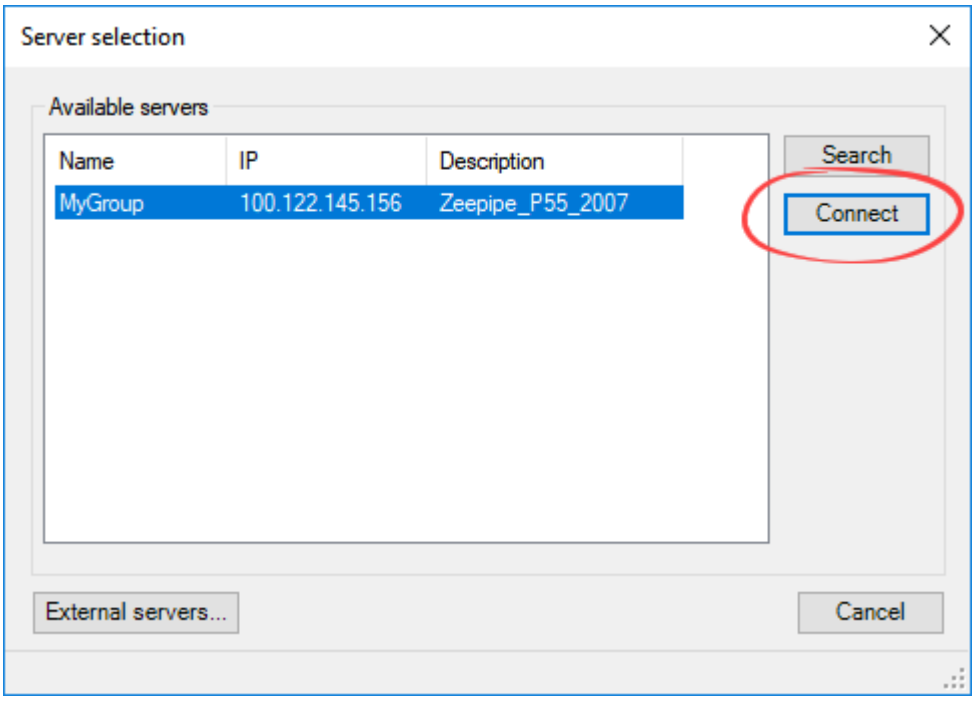


When you click Connect you will see a list of available "online" data servers. This might include a live feed from NaviPac's real-time online survey position, but should also include the VisualEdit server that you just started, which will be shown with the name of the data project loaded in VisualEdit. Select the Project and click Connect.



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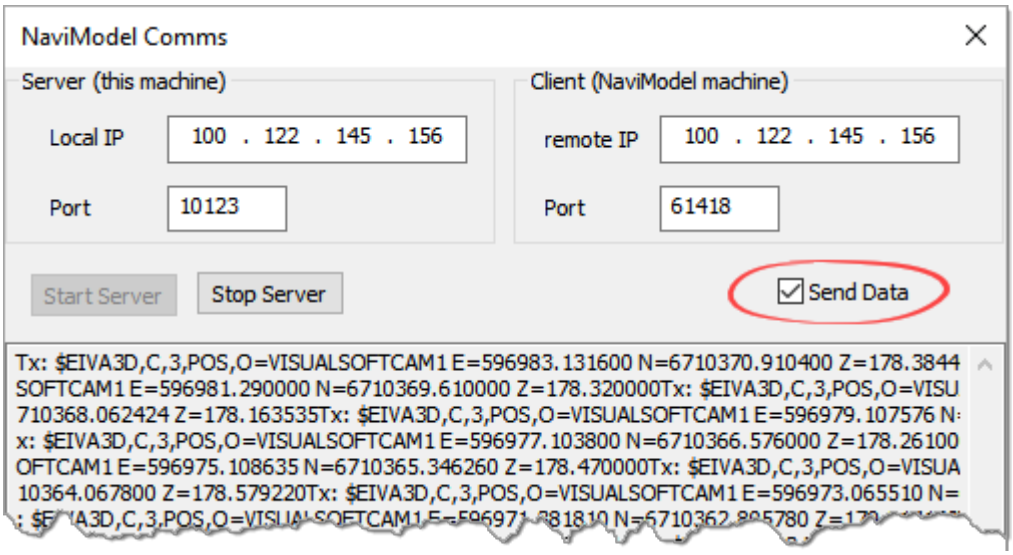
Now that the connection between VisualEdit and NaviModel has been initiated, you should return to the NaviModel Comms window in VisualEdit and select the box to Send Data. You should immediately see the data being sent from VisualEdit.



Click OK to close the NaviModel Comms window.

Position selection in VisualEdit

The default, and intended setup is that the “Video Position” table has data in the standard, pre-defined columns named KP, Easting, Northing and Depth. Which data columns are sent by VisualEdit is determined automatically using the following priority:

- First look in the “Video Position” table. Check that the table is not empty, not full of zero values, and there are KP/East/North/Depth columns available.
- If data is not found in the “Video Position” table, look in the “Processed Survey” table.
- As a last resort, if data is not found in the “Processed Survey” table, look in “Raw Survey”.
- When looking for the data columns the following search is used:
- KP: Check first for a column named exactly “KP” then for one with a name containing “KP” then if for one that contains either “FP”, “MP” or “STA”.
- Easting: Check for a column name containing “East” then for one exactly named just “E”.
- Nothing: Check for a column name containing “North” then for one exactly named just “N”.
- Depth: Check for a column name containing “Depth” then for one exactly named just “D”.

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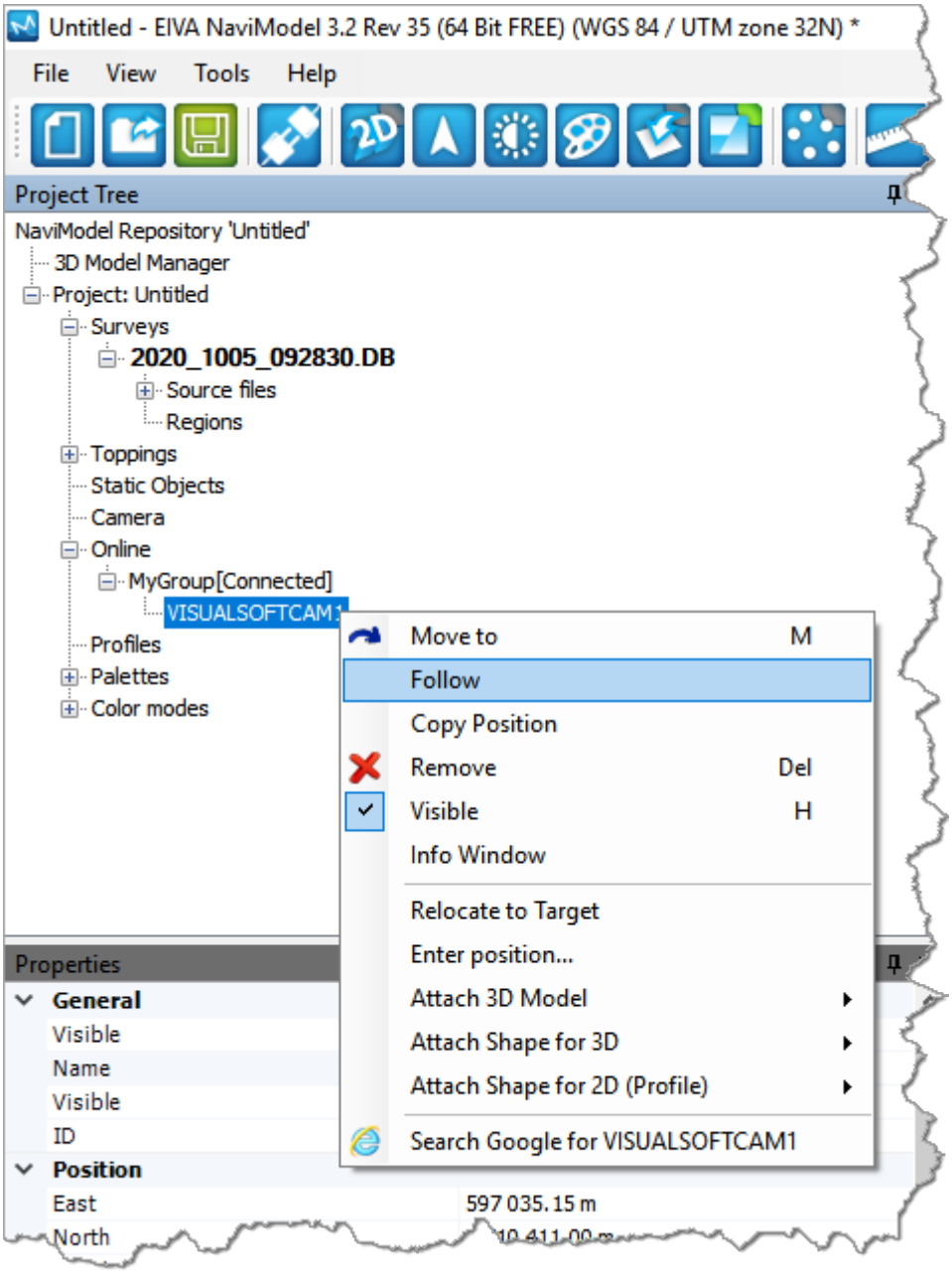
Follow mode in NaviModel

Expand the two Online levels in the NaviModel Project Tree. You should then see a VisualSoft “camera”, VISUALSOFTCAM1.

Right click on the **VISUALSOFTCAM1** and select **Follow**.



The display in NaviModel will now be locked to the current video position in VisualEdit. When you play the video or browse through the data lists in VisualEdit, the NaviModel display will move to the same Easting and northing position.

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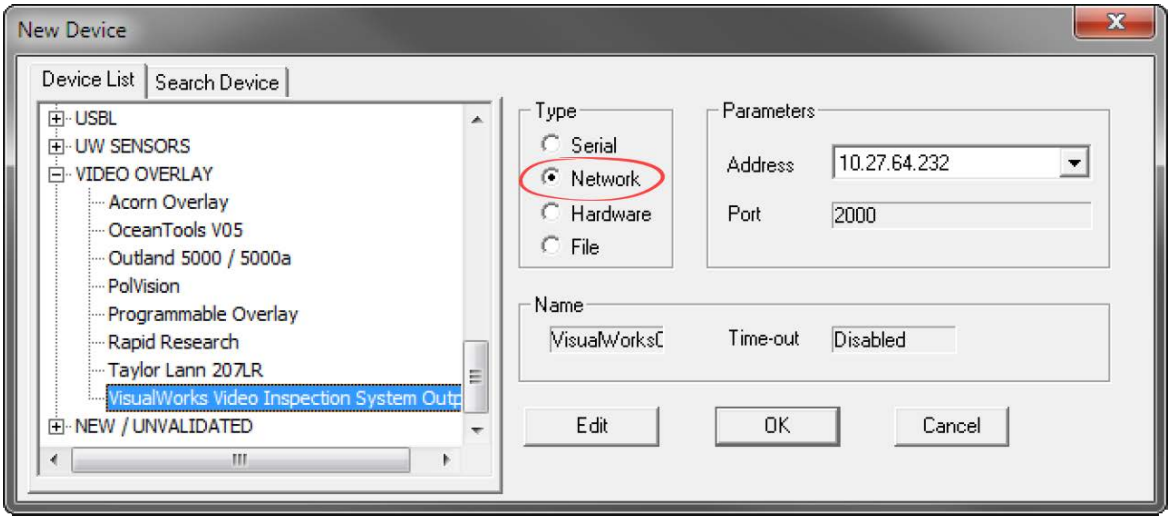
1.32.4 Fugro's Starfix

Starfix.IOWIN can send time and position data to VisualDVR, using the VisualWorks **Video Inspection System Output** in the Video Overlay section of IOWIN.



Set the communication type to Network, as shown above. There is no need to edit the network communication parameters because the actual communications are done through the VisualWorks network comms, (which is similar to Starfix.Message Manager), so although the user can select a port to use, no data is sent to that specific port by this driver. Instead VisualSoft's standard port number will be used automatically.

When the user enters the driver configuration menu they can select which survey information to send to the VisualSoft system. The driver will also send start and stop logging commands from Starfix to the VisualSoft system on receipt of a suitable command via Message Manager. In othert words, Starfix.Logging will provide the driver with these commands via Message Manager so that when Starfix.Logging starts or stops, VisualSoft's VisualDVR will do the same. In effect the IOWIN dll translates Starfix logging commands to VisualSoft logging commands.

Please note – when first started the IOWIN driver will send a default pre-defined configuration to the VisualSoft system. Starting Starfix.Logging will then force the driver to output the correct user configured configuration when you start logging. You may therefore want to start the logging as a brief test to force your configuration through to the VisualSoft system and see the correct column headers in VisualDVR's survey data window.

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1.32.5 QPS's QINSy

VisualEdit can import survey sensor and MBE data from a series of predefined ASCII files exported from QPS' QINSy logging and processing software. See help topic Configurable File Import 30.

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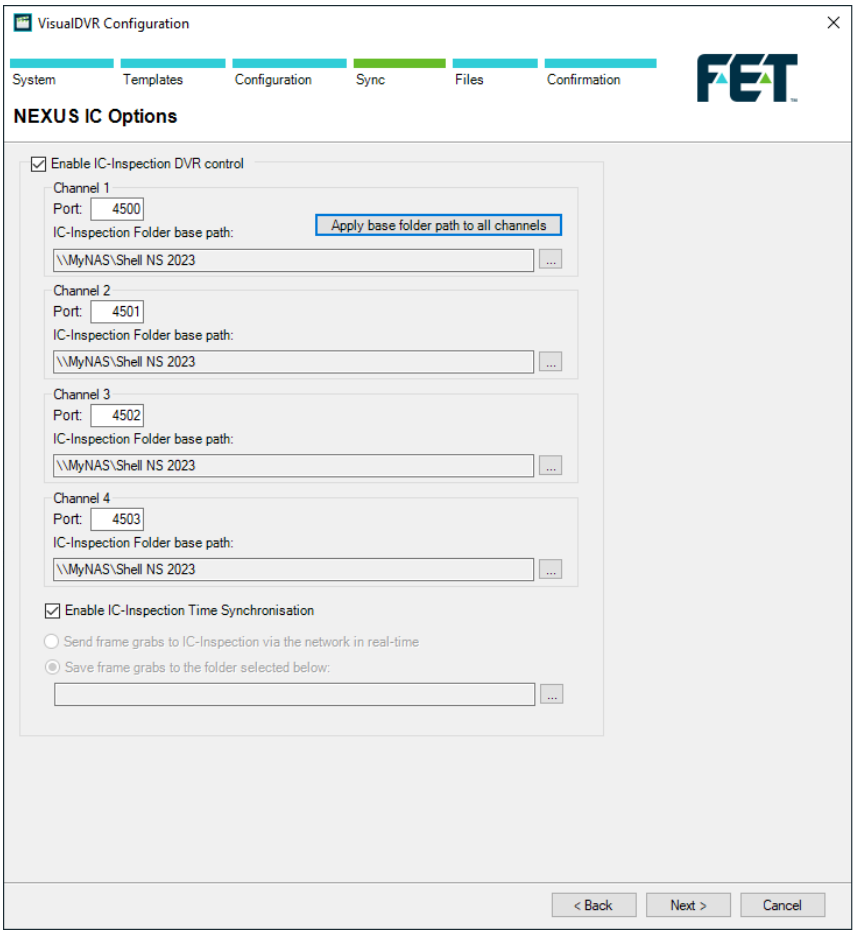
1.32.6 Wood's NEXUS

To use NEXUS IC with VisualDVR you must configure it using the NEXUS IC Options page in the VisualDVR start-up Configuration Wizard.



Enable NEXUS IC-Inspection DVR control: If you are doing an inspection job using Wood Group's NEXUS IC-Inspection software (version 6.4 or above) you must turn on NEXUS IC-Inspection DVR Control on this page. In NEXUS add the VisualDVR as a "Generic DVR" device using its IP address.

IC-Inspection Time Synchronisation: NEXUS IC-Inspection can send a time synchronisation message to VisualDVR. If you turn on this option in IC-Inspection you must also turn it on here so that VisualDVR receives the time sync messages. (As with all VisualSoft time synchronisation options, you must use only one time sync source, so if you turn on NEXUS IC Time Sync, make sure that you turn off time sync in the VisualDVR Survey Data set up and other places such as VisualDataLogger.

IC-Inspection **Base Folder path:** VisualDVR will receive commands from IC-Inspection telling it to start or stop recording, create image grabs and so on. VisualDVR will still record video in the usual way, using the standard file names that are expected by VisualArchive and other VisualSoft applications. It will also make a copy of the video files and image grabs using names and locations requested by IC-Inspection. IC-Inspection will send either a full folder path, or a partial folder path. If IC-Inspection sends a partial file path this is usually based on the component selected for inspection in IC-Inspection. If VisualDVR receives a **partial folder path** it will be added to the "IC-Inspection Folder

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base path" that you specify here. You can use the same base path for all cameras, or have different paths for different cameras. There is a short-cut button to quickly copy the path set for Channel 1 to all other channels. In the example below the base path is "\\My NAS\Shell NS 2019", so if IC-Inspection sends partial folder path "\Pipelines\PL1234", the video files will be sent to the combined path "\\My NAS\Shell NS 2019\Pipelines\PL1234".

Port Numbers: IC-Inspection sends commands to VisualDVR via the network using TCP ports. These port numbers are selected in IC-Inspection for each camera and the same port numbers must be set for each camera here.

IC-Inspection Frame Grabs folder: If you have a VisualDVR with Vitec VMC-7440 HD/SD hardware encoder cards in it, the DVR can send image grabs back to IC-Inspection immediately via the network. If you do not want to use that option, you can choose to save image grabs to a folder instead. Other types of VisualDVR, for example with the older Winnov Videum Duo or Quattro cards, cannot create instant image grabs. Instead they create the grabs when recording of the current file ends. In this case you need to tell it where to save those by selecting an IC-Inspection Frame Grabs folder.

2 Contact Details

Forum Subsea Technologies has offices in many parts of the world. The VisualSoft team is mostly based in Aberdeen in the UK, but we also have regional sales staff and some support services in other parts of the world.

The following pages have details of how to contact either our sales team or our support team, by telephone, email or by post.

2.1 Contact Details – Support

Website: f-e-t.com/visualsoft

Most support questions are most easily answered by email:

Using email gives our support team time to think about your problem before they reply, and time to test the software if necessary. If your question is urgent, do not hesitate to telephone us, but even then it may be best to send an email before you call, even if only a few minutes before you call. Sending us an email will allow you to include screen captures, data files and other things that may make it easier for us to quickly and accurately understand your problems.

Support Email (recommended)	visualsoft.support@f-e-t.com

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Phone: UK & Global, during UK office hours	+44 (0) 1224 744 000
Phone: UK & Global, outside UK office hours Available for clients with a valid support contract. Operates from 17:00 until 08:30 UK time each night Monday to Thursday, and all through the weekend from 17:00 Friday evening until 08:30 Monday morning.	+44 (0) 1224 363 999
Phone: USA, 24/7 During Houston office hours this will connect you to our US team. At other times, or if the US team is busy, it diverts to the UK team.	+1 713 454 7091

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2.2 Contact Details – Sales

Website: f-e-t.com/visualsoft

For address and telephone/fax details, please select the appropriate office for your region:

Aberdeen, UK	FET – VisualSoft Cumberland House Endeavour Drive Arnhall Business Park Westhill Aberdeenshire AB32 6UF UK
Sales and rental enquiries:	visualsoft.sales@f-e-t.com
Telephone:	+44 (0) 1224 744 000

Houston, USA	FET – VisualSoft 10344 Sam Houston Park Drive, Suite 300 Houston TX 77064 USA
Telephone:	+1 713 329 8273

Singapore	FET – VisualSoft Asia Pacific Rental Service
Email	visualsoft.sales@f-e-t.com
Telephone:	+65 9643 7433 / +65 9230 8138

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