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Equipment Performance Review (EPR) v3.0

User Manual

Revision 2

By

in2Dreging Pty Ltd

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Software Program Revision Record

Version	Date	Description of Modifications	Developer	Reviewer(s)
1.0	12 February, 2017	Customised software written for Chevron's Wheatstone Clean-up Dredging Project to perform Quality Assurance tasks on datalogger files by i2D's client TAMS.	Ralph Brevet	Simon Burgmans
1.1	16 February 2017	Included additional requests.	Ralph Brevet	Simon Burgmans
1.2	9 May 2017	Included Trailer Suction Hopper Dredge with additional graphs and conditions.	Ralph Brevet	Simon Burgmans
2.0	28 June, 2017	Rewrote the program in C# using Visual Studio (.NET). Formalised the functionality of QACheck v1.0, developed generic data input file and enhanced the Graphical User Interface (GUI) to facilitate generic data input and charts setup.	Ralph Brevet	Simon Burgmans
2.1	4 September, 2017	Included additional features and split program into two sub versions: a full featured Master version and a limited featured Client version.	Ralph Brevet	Simon Burgmans
2.2	November 2018	• If line has incorrect format, skip line instead of aborting processing • Implemented ability to skip empty lines • Chart Options Ignore zero values was working for y=0. Changed condition to (x=0 or y=0) as per *Table* 11 herein • Added EPR Icon to main form and on taskbar • Fixed Series clear bug that was delaying all runs after the first • Implemented moving average for all series.	Ralph Brevet	Simon Burgmans

Version	Date	Description of Modifications	Developer	Reviewer(s)
3.0	9 October 2020	• Redesigned processing algorithm to improve performance and feed-back to users • Implemented feature for batch processing of multiple logfiles • Implemented various GUI enhancements and new tools • Removed “data export to excel” and “show first 50 lines” from the menu options • Updated manual	Ralph Brevet	Simon Burgmans

Document Revision Notice

This is a managed document. All copies of this document preceding this release are obsolete and shall be destroyed.

This Equipment Performance Review (EPR) v3.0 User Manual document is:

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Revision History:

Revision Number	Date	Modification	Author	Reviewer	Approver
A	12 February 2017	QA Check short user instructions	Ralph Brevet	Simon Burgmans	Ralph Brevet
0	8 September 2017	Release of EPR v2.1 User Manual – Master Version	Ralph Brevet	Grace Dennis, Simon Burgmans	Simon Burgmans
1	8 September 2017	Release of EPR v2.2	Ralph Brevet	Simon Burgmans	Simon Burgmans
2	11 November 2020	Updated documentation to match changes included in EPR v3.0	Ralph Brevet	Simon Burgmans	Simon Burgmans

Table of Contents

1 Introduction

1.1 Background Information

At its inception, Equipment Performance Review (EPR) was a bespoke software tool developed for the dredging contractor TAMS to be used specifically on Chevron's Wheatstone project. EPR v2.1 was a spin-off of this customised software, which was then named QACheck, by in2Dredging in February 2017.

During the above-mentioned Chevron project, large volumes of datalogger data was collected onboard all project vessels. QACheck was then used to flag gaps or errors in the data, and to generate graphs showing track plots of vessels with overlaid speed zones, dumping ground contours, etc. These graphs were then used to instantly and reliably perform quality assurance checks to ensure compliance with speed zone restrictions and dumping ground allocations.

QACheck was tailored to the requirements of the Wheatstone project, and was sufficiently user friendly to enable non-specialist resources to perform the quality assurance tasks.

EPR v2.0 formalised and completely replaced QACheck. EPR v2.0 had all the features of QACheck plus some additional new features. In addition, the user interface was enhanced to facilitate the customisation of the software for any project and for any ASCII logfile formats, as well as to facilitate the creation of new charts to meet any new project requirements.

From version 2.1 onwards, the EPR software was split into a Client version and a Master version. The Master version includes all features necessary to define project template files, while the Client version requires premade template files.

In version 3.0, the processing algorithm was completely re-rewritten to improve performance and provide improved feedback to users. Also included in v3.0 is a batch processing feature which allows users to process multiple logfiles at once. Furthermore, numerous improvements were made to the EPR's Graphical User Interface (GUI).

This manual is for EPR v3.0 version.

1.2 Equipment Performance Review Overview

EPR v3.0 allows i2D to setup customised templates to quickly check and visualise data stored in ASCII logfiles. To access the data held in the logfiles, EPR v3.0 splits the logfile into columns, performs checks on each separate column of data and finally generates user defined charts.

At a minimum, for each column of data a name and a datatype needs to be specified. Optionally, several other flags can also be set to highlight, for example, incorrect datatypes and identical values as well as minimum and maximum values. Two simple data manipulations, i.e. multiplication and offsetting, can also be applied to the data at the project customisation stage. EPR v3.0 then generates statistical information showing minimum, maximum, average and standard deviation values for each column of data.

In addition, required charts can be defined using the above-mentioned data. EPR v3.0 generates charts using the data held within each column. Each line in a chart, called a Series, can be subjected to various plot conditions depending on the value of any other column. Other plot options, such as the use of primary and secondary Y-axes as well as plot minima and maxima, can also be manually defined.

Once all the data and chart specifications have been set, the settings can be saved to a proprietary EPR file. Each individual EPR file, can then be saved as a template to quickly assess many other ASCII logfiles using the same templated format.

EPR v3.0 is a valuable time saving ASCII data viewer, which reduces the number of people required onsite. Even a non-specialist team member can instantly and reliably assess project logfiles and share this assessment with the team. Compliancy or production performance can easily be assessed daily to maintain and create a focussed team.

1.3 Abbreviations

ASCII	American Standard Code for Information Interchange
EPR	Equipment Performance Review
GUI	Graphical User Interface
i2D	in2Dredging Pty Ltd
TAMS	Total AMS Pty Ltd

1.4 About this Manual

This manual describes EPR v3.0's GUI, explains its features and describes the Master version of the software. The chapters in this manual follow the workflow of a typical project application.

The manual's section, table and figure cross references can be clicked to navigate to the relevant information.

2 Using the EPR and EPR Master Software

Clients use the standard EPR software version, which is fully functional, except that it does not include the feature to create customised logfile format specifications. This feature, which is available in the Master version, is disabled in the Client version.

The customised logfile, also called a template file, is created and supplied to clients by in2Dredging. The template file is generated using EPR Master version.

3 Project Customisation of EPR

To customise EPR v3.0 to a particular project's ASCII logfile, a description of each column in the file is required, as per the example shown in *Table 1* below. The columns' description is supplied by the client and used by i2D to specify the logfile's columns in EPR.

Please note that any unused columns in the logfile can be ignored by specifying these as "Dummy".

Table 1: Example Columns specification

Column Number	Column Description	Dummy Column
1	Vessel name	yes
2	Date and time	No
3	Easting	No
4	Northing	No
5	Vessel Speed	No
6	Vessel Draft Fore	No
7	Discharge	No
8	Mixture Density	No
9	Pump Revolutions	No
10	Pump Discharge Pressure	No

Refer to *Section 4.4.2* for further information on specifying data column formats and options in EPR.

3.1 Logfile Specification

Logfiles needing to be uploaded into EPR v3.0 must satisfy the following requirements:

- The logfile must be in ASCII format (text), i.e. not binary;

  Please note that the ASCII logfiles' format must always remain the same for the unique EPR customisation, which is provided to the client by i2D, to remain valid.

  For example, the ASCII logfiles' delimiters (i.e. the character indicating the boundary between the logfile's columns), e.g. space, tab or comma, must never change.

- The logfile must have a consistent number of columns;
- The logfile must contain a consistent header row, if any, which EPR v3.0 can easily identify and ignore;
- There is no preferred or compulsory file extension for the logfile;
- The number of rows, or lines, within the logfile may vary; and
- There are no set limits to the logfile's file size or, the number of rows or lines in the logfile

  Logfile size limits are governed by system hardware restrictions.

  Successful runs have been performed with files containing 300,000 lines.

4 Graphical User Interface (GUI)

EPR v3.0's window contains the following GUI elements.

1. ***Title bar***
2. ***Menu bar***
3. ***Toolbar***

   Contains *File*, *New*, *Open*, *Save* and *Process* buttons

4. ***Chart Tabs***

   These are tabs that display the generated charts

5. ***Specification Tab***

   The Specification Tab's screen, as shown in *Figure 1* below, is divided up as follows:

   a. *Project and Datafile* input section
   b. *Data Columns* input section only available in EPR Master Version
   c. *Output* panel
   d. *Charts* input section

6. ***Status bar***

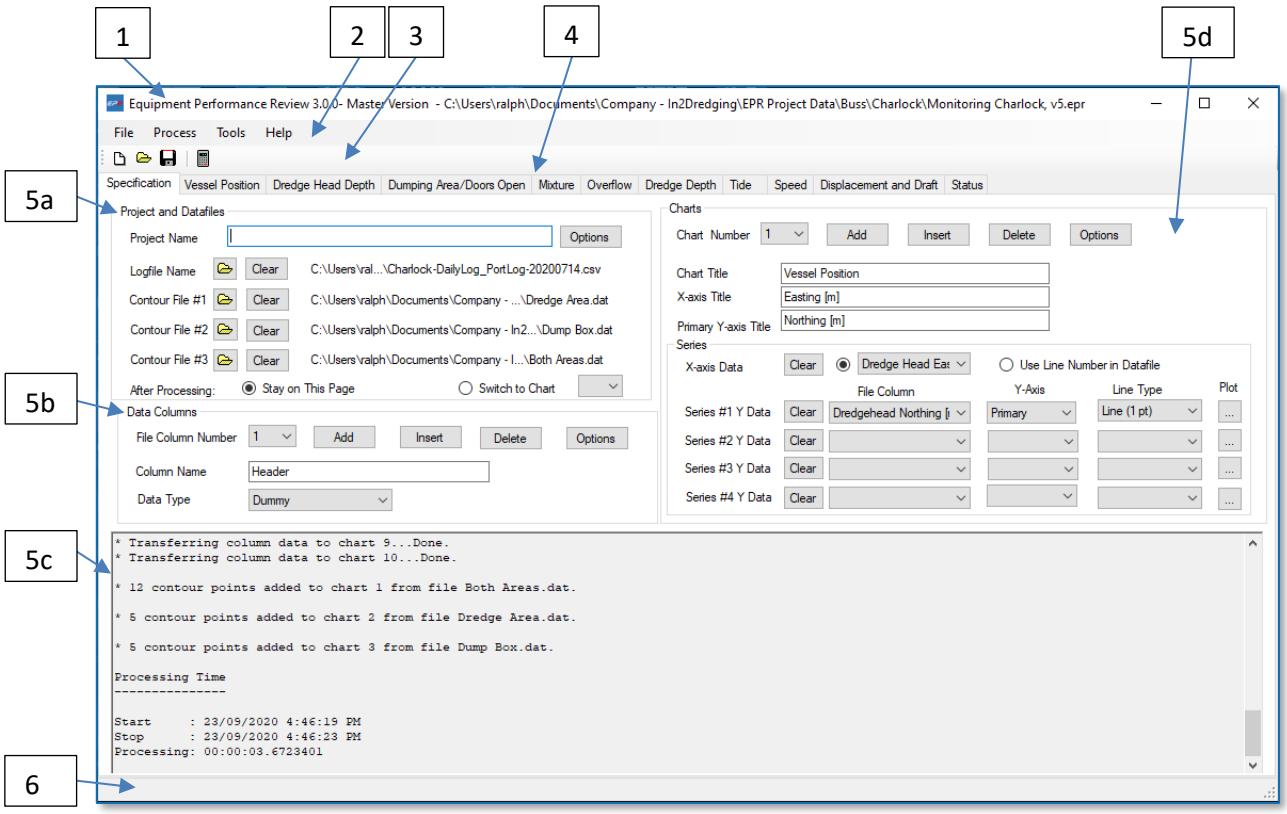

Figure 1: EPR v3.0 Graphical User Interface

Table 2 below lists the main GUI elements of the EPR v3.0 window and provides more detailed information as to their function.

Table 2: GUI elements and their functions

GUI Elements	Description
Menu Bar	Contains all menu commands. Where available, shortcut keys are also shown (see *Table 4* below for a list of these).
Status Bar	Contains the *Progress bar* during processing and displays the word ***MOD*** when input data has changed. If input data has been modified, a dialog box will appear when exiting the program prompting the user to save the inputted data.
Specification Tab	The first tab of the EPR v3.0 window is called *Specification*. It is used to enter specifications to instruct the program how to import, manipulate and sort the data held in the logfile, as well as to define the graphs that need to be generated. The *Specification* tab's screen is divided into three (3) sections. These are the: • ***Project and Datafiles*** section This section is used to input the logfile's import specifications and to specify the contour file's name. Refer to *Section 4.4.1* in this manual for information on how this is done. • ***Data Columns*** section This section is used to define the logfile's data columns and to assign titles and data types to the columns. Refer to *Section* 4.4.2 in this manual for information on how this is done. • ***Charts*** section This section is used to input charting specifications. Refer to *Section 4.4.3* in this manual for information on how this is done. The *Specification* tab's screen also has an ***Output*** panel where processing feedback and error messages are displayed.

4.1 The Menu Bar

The ***Menu bar*** uses mainly standard Windows menu items. In *Section 4.1.1* below the functionality of all EPR's Menu items are described and a table is provided that summarises the shortcut keys available for some of the Menu items.

4.1.1 Menu Items

Table 3: Menu Items

Menu Items	Submenu	Functionality
File	New	Resets the program, clearing all data previously inputted in the GUI frontend.
	Open EPR File	Opens the proprietary EPR file containing user inputted data definitions and charts. EPR users can update the EPR file but are unable to change the logfile format that is accepted by EPR. The default extension for EPR files is ".epr" (optional).
	Open Last Used File	Opens the file that was opened when the last EPR session was closed.
	Save EPR File	Saves the proprietary EPR file, along with all the data inputted in the GUI frontend.
	Save EPR File As	Saves the EPR file under a new name.
	Print Chart	Prints the chart that is currently displayed
	Save All Charts to File	Opens a *File Save* dialog box to save the current charts to file. The charts will be saved with the following naming convention: "*<filename>* - Chart *<chart number>*.png.
	Save Output Panel Contents to File	Opens a *File Save* dialog box to save the current output panel's contents to a text file.
	Exit	Exits the EPR v3.0 program. If any inputted data has changed, the user will be prompted to save the file.
Process		This Menu item reads the logfile, processes the data columns and generates or regenerates specified charts. Charts and contents are not automatically updated when inputted data is modified. They are only updated after processing.

Menu Items	Submenu	Functionality
Tools	Show Column Properties	Generates an overview of the current column(s)' specification in the output panel.
	Show Chart Properties	Generates an overview of the current chart's specification(s) in the output panel.
	Process Only First 25 Lines in Logfile	Processes only the first 25 lines of the specified logfile(s). This option is used during column specification activities, to quickly test the current specifications without generating hundreds or thousands of errors, which is what would happen if the current specifications are incorrect.
Help	User's Manual	Opens this User Manual in pdf format, in a separate window. The pdf version of this manual can be navigated by clicking on the chapter and section numbers.
	About	Shows the *About* dialog box with internet links to in2Dredging's website (click on logo).

Table 4: Menu Shortcut Keys

Menu Item	Shortcut Key
File/Open	Ctrl + o
File/Open Last Used File	Ctrl + l
File/Save	Ctrl + s
File/Exit	Ctrl + x
Process	F9
Help/User Manual	F1

4.2 Tabs

The first tab of the EPR v3.0 window is the *Specification* tab. This tab allows users to input program specifications and is used by the program to provide feedback to the user via the ***Output*** panel.

The remaining tabs on EPR v3.0's window, display the predefined charts.

In the ***Project and Datafiles*** section of the *Specification* tab's screen, the user can select whether to remain on the current tab, or to open the selected chart's tab, after completion of processing. This is done by selecting the respective radio button.

The user may choose to remain on the *Specification* tab's screen after completion of processing to inspect set flags or error messages.

Tips

1. For convenience sake, when in a *Chart* tab, double clicking on the *Chart* tab's title returns the user to the *Specification* tab with the Series parameters already preselected.
2. When deleting a chart, the corresponding tab will also be deleted.
   To recreate the Chart tab, click the **Process** menu item again.

4.3 Charts

Charts can be zoomed and panned as shown in *Figure 2* below. Detailed information on zooming and panning charts is available in *Table 5* overleaf.

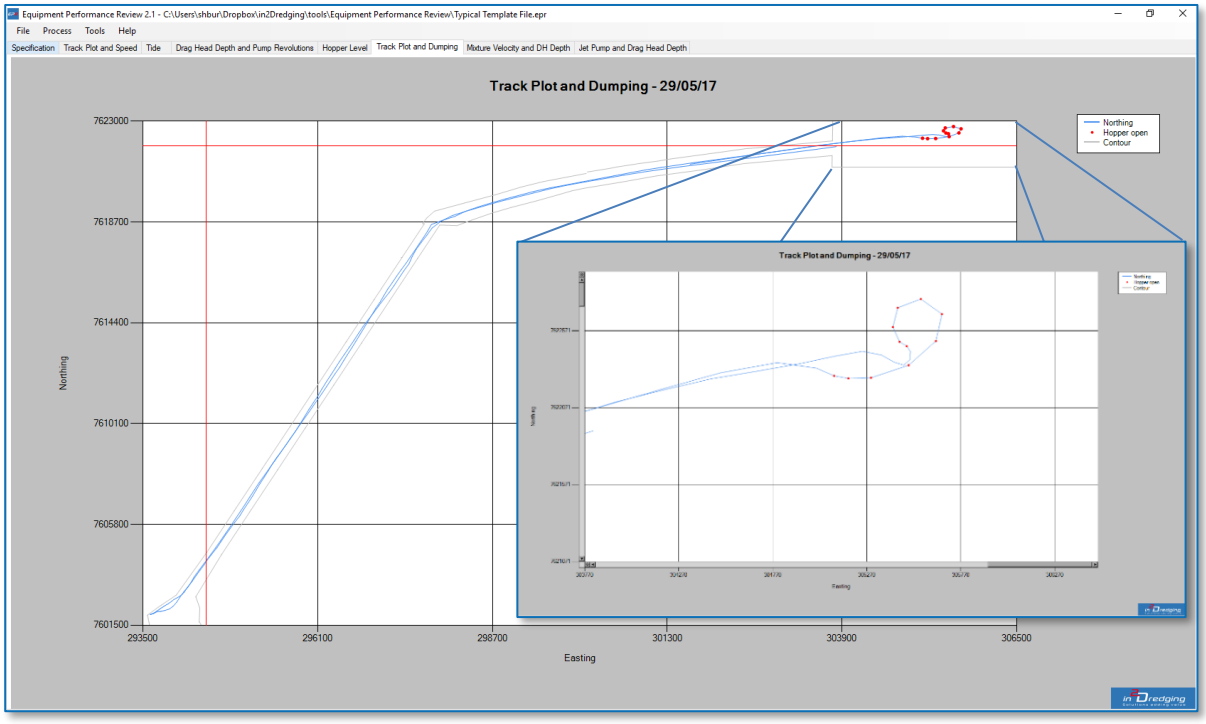

Figure 2: Chart Zooming and Panning example

Table 5: Zoom and Pan

Action	Method of Use
Zoom	A zoom rectangle can be defined by dragging the mouse over the area requiring zooming while keeping the left mouse button depressed.
Pan	When the chart is zoomed in, the scrollbars down the right-hand side and below the chart can be used for panning. Refer to *Figure 2* above for an example of this.
Reset	Pan and zoom actions can be reset to their defaults by pressing the following small button located at the end of both scrollbars. 

4.4 Specification Tab

4.4.1 Project and Datafiles Section

The first section of the *Specification* tab's screen is the ***Project and Datafiles*** section shown in *Figure 3* below. In this section of the screen, the logfile and optional contour files can be imported by clicking the yellow **Open File** buttons. Click the **Clear** button to remove the specified filenames.

In this section, the user may also specify the default chart that will open once processing has completed.

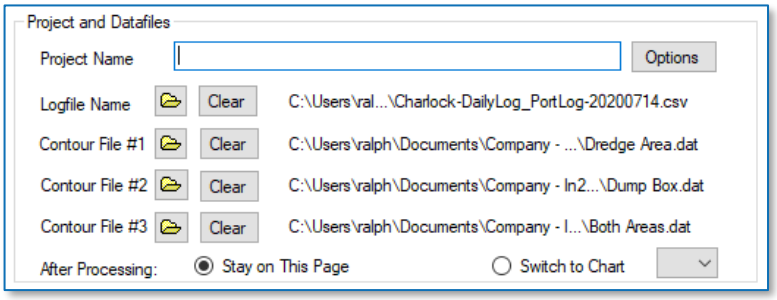

Figure 3: Project and Datafile Input

Detailed information on the *Project and Datafiles* section's various fields and buttons is provided in *Table 6* below.Table 6: Project and Datafile section

Table 6: Project and Datafile section

GUI Element	Description	Default
Project Name field	A random identifier for the currently inputted specification data.	None
Logfile Name field	Name of the ASCII logfile that contains the column data to be processed and charted. Click the **Open File** button to access the ***Open File*** dialog box, from which the required logfile can be selected.	None
Contour File filename fields	An optional contour ASCII file, containing points of a polyline that can be overlaid on a chart, may also be selected. This file can be used to define zone(s) of special significance in a chart. The display of the file's contour line is controlled from the ***Chart Options*** dialog box. Click the following **More** button to access the ***Open File*** dialog box, from which the required contour file can be selected.	None
Stay on This Page radio button	When this radio button is selected, the *Specification* tab will stay visible after completion of processing so that errors and set flags reported in the ***Output*** panel may be investigated.	Default

GUI Element	Description	Default
Switch to Chart radio button	When this radio button is selected, the selected Chart's tab will be opened immediately after completion of processing.	No
Options button	Opens a dialog to specify optional input.	N/A

4.4.1.1 Contour File Specifications

The contour file to be uploaded into EPR v3.0 must satisfy the following requirements:

- Each line in the contour file must contain a pair of X and Y values separated by a comma;
- The file must be in ASCII format (text), i.e. not binary;
- There is no preferred or compulsory file extension; and
- There are no set limits to the contour file's file size or the number of lines in the contour file.

  File size limits are governed by system hardware restrictions.

Figure 4 below shows an example of a typical contour file.

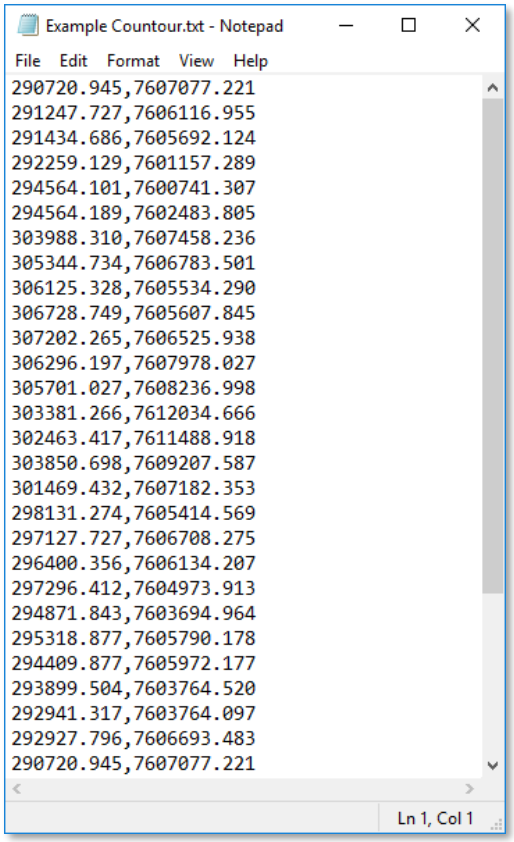

Figure 4: Typical Contour File example

4.4.1.2 Optional Project and Logfile Inputs

Figure 5 below displays the ***Logfile Options*** dialog box which opens when the **Options** button is clicked on the *Options and Datafiles* section of the *Specification* tab's screen.

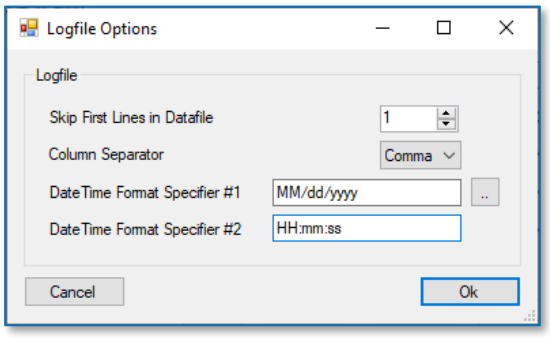

Figure 5: Optional Project and Logfile Inputs dialog box

Detailed information on the *Logfile Options* dialog box's various fields and buttons is provided in *Table 7* below.Table 6: Project and Datafile section

Table 7: Optional Project and Logfile Inputs

GUI Element	Description	Default
Skip First Lines in Datafile field	This option is used to skip the specified number of lines at the beginning of the logfile, before processing starts. Use this option in case the logfile contains, for example, headers or miscellaneous information at the top of the file that does not conform to the format of the data columns.	0
Column Separator dropdown list	This input defines the delimiter used between the columns in the logfile. Valid values are Comma, Space or Tab.	None
DateTime Format Specifier #1 and #2 fields	This input specifies how date and time information in the logfile is interpreted. Clicking the .. button will open the PDF document "DateTime Format Specifiers.pdf", which explains the various DateTime formats available. Please also refer to *Section 5* of this document for information on specifying DateTime formats. The option to specify two (2) DateTime formats is not often used. It is used, for example, when reading a space separated logfile that also has spaces between the date and time entry in a single column. DateTime Format Specifier fields #1 and #2 are functionally identical and either of these two fields may be used as long as the datatype points to the correct format specifier.	Empty

4.4.2 Data Column Section

Figure 6 below depicts the ***Data Column*** section of the *Specification* tab's screen. This menu is only available in EPR Master version for i2D employees.

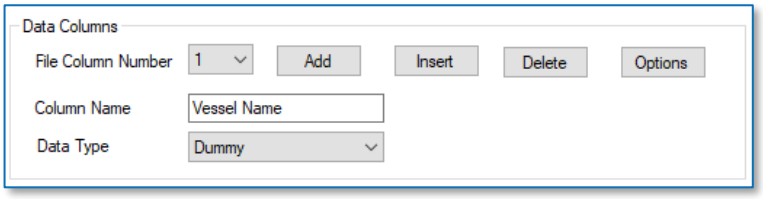

Figure 6: Data Column Input section

Detailed information on the *Data Columns* section's various fields and buttons is provided in *Table* 8 below.Table 6: Project and Datafile section

Table 8: Data Column Input

GUI Element	Description	Default
File Column Number dropdown list	Used to specify the settings for each subsequent column in the logfile. Note, once this GUI element has focus, it can also be controlled by using the up and down arrows on the keyboard.	None
Column Name field	Used to specify the name of each column in the logfile. This is an arbitrary name that is used in charting. It is recommended that a meaningful name be entered in this field, as the name entered will be used in several places during the specification of charts.	"*Column Name*"
Data Type dropdown list	Used to specify the data type for each column in the logfile.	Number
Add button	This button adds a new column to the end of the column list. Note, all other data column controls are disabled when no column is specified.	N/A
Insert button	This button inserts a new column at the current position in the column list. Note, all other data column controls are disabled when no column is specified.	N/A
Delete button	This button deletes the current column's specifications.	N/A
Options button	This button opens the ***Options*** dialog box in which optional Data Column Inputs can be entered, as explained in *Section 4.4.2.1* overleaf.	N/A

4.4.2.1 Optional Data Column Input

Figure 7 below displays the ***Options*** dialog box that opens when the **Options** button is clicked on the *Data Column* section of the *Specification* tab's screen.

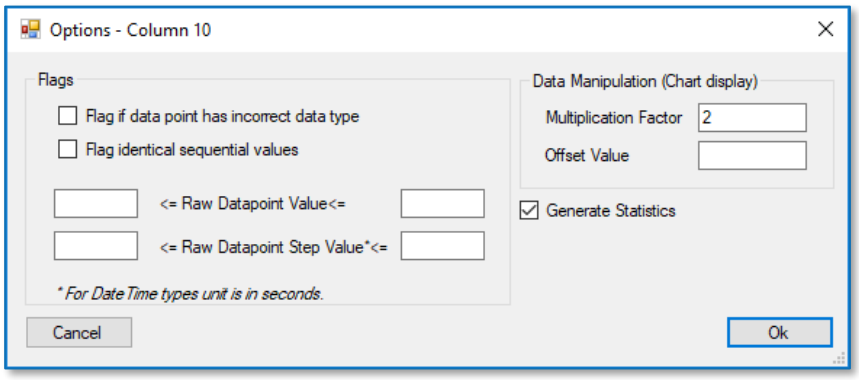

Figure 7 Optional Data Column Input

Detailed information on the *Options* dialog box's various fields is provided in *Table 9* below.Table 6: Project and Datafile section

Table 9: Optional Data Column Input

GUI Element	Description	Default
Flag if data point has incorrect data type field	Flag when a column value cannot be converted to the specified datatype.	Yes
Flag identical sequential values field	Flag when two sequential column values are identical.	No
Raw Datapoint Value fields	Flag when a logfile column value is above, below or equal to the values specified in these fields. **Notes:** • A similar option is available in the *Chart* section's options. This is explained further in the conditional plotting information provided in *Section 0* of this document. • Multiplication and offset values, described in the respective field names below, are not applied to this flag.	None

GUI Element	Description	Default
Raw Datapoint Step Value fields	Flag when the step between two logfile column values is above, below or equal to the values specified in these fields. **Notes:** • For datetime values, the unit of measure is seconds. • Multiplication and offset values, as described in the respective field names below, are not applied to this flag.	None
Multiplication Factor field	The column value in the logfile will be multiplied by the number entered in this field. Used in unit conversion for display in charts, for example. **Notes:** • This multiplication is not applied to the above-mentioned flags or the Raw Datapoint Value and the Raw Datapoint Step Value. • If nothing is entered in the field, the default value is applied.	1
Offset Value field	The value in the logfile will be offset by the number entered in this field. Used in tidal corrections, for example, for display in charts. **Notes:** • This offset is not applied to the above-mentioned flags or the Raw Datapoint Value and the Raw Datapoint Step Value. • If nothing is entered in the field, the default value is applied.	0
Generate Statistics tickbox	When this field is ticked, statistics will be generated for the selected column and shown in the output panel. The following data is shown for both values and steps in the data: • Minimum; • Maximum; • Average, and • Standard deviation. For datetime columns, value statistics are not relevant and only step statistics will be shown.	Unchecked

4.4.3 Charts Section

The image below depicts the ***Charts*** section of the *Specification* tab's screen.

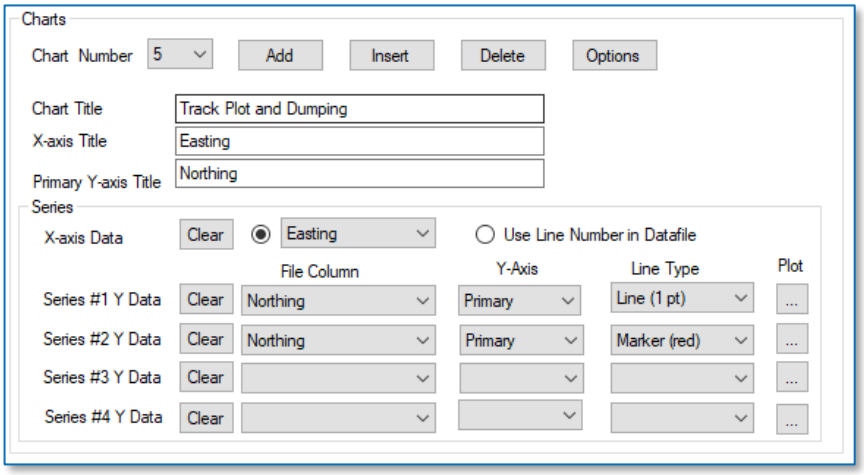

Figure 8: Chart Input section

Detailed information on the *Charts* section's various fields and buttons is provided in *Table 10* below.Table 6: Project and Datafile section

Table 10: Data Columns Input

GUI Element	Functionality	Default
Chart Number dropdown list	Allows users to selects the number of the chart they wish to edit. Note, once this GUI element has focus, it can also be controlled by using the up and down arrows on the keyboard.	N/A
Add button	Adds a new chart tab at the end of the chart tabs.	N/A
Insert button	Inserts a new chart at the current position in the chart tabs.	N/A
Delete button	Deletes the current chart's specifications. All other chart controls are disabled when no chart is specified. When deleting a chart, the corresponding tab will also be deleted. Use the **Process** menu item to recreate Chart tabs.	N/A
Options button	Opens the ***Options - Chart <number>*** dialog box where optional chart data may be inputted. Please refer to *Section 4.4.3.1* in this manual for further information on this dialog box.	N/A

GUI Element	Functionality	Default
Chart Title field	Specifies the title for the current chart. This title will be displayed as the chart tab's title and as the title on the chart itself. It is recommended that the chart name field be completed in such a way as to provide a meaningful title for the chart.	"*Chart Name*"
X-axis Title field	X-axis title to be shown on the chart.	None
Primary Y-axis Title field	Y-axis title to be shown on the chart. This is the title for the primary Y-axis. A title for the secondary Y-axis can be specified with *Chart Options*. Please refer to *Section 4.4.3.1* in this manual for further information.	None
Clear button	Remove column containing X-axis data.	None
X-axis dropdown list	Select column for X-axis	None
Use Line Number in Data File radio button	Select line number as X-axis	None
File Column dropdown list	Select the logfile column to be used	None
Y-axis dropdown list	Select the primary or secondary axis for the data series	Primary
Line Type dropdown list	Select the type of line to be used in the chart	Line (1pt)
Plot Condition button 	Opens the *Plot Condition* dialog box. Please refer to *Section 0* in this manual for further information.	None

4.4.3.1 Chart Options

Clicking the **Options** button located in the ***Chart*** section of the *Specification* tab's screen, brings up the ***Options*** dialog box shown below.

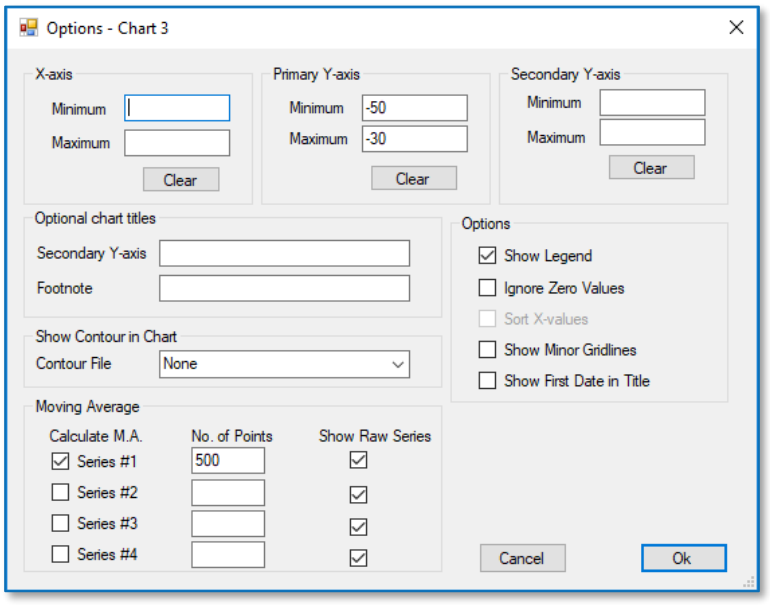

Figure 9: Chart Options

The table below lists the GUI elements available on the ***Options*** dialog box for generating charts.

Table 11: Chart Options

GUI Element	Functionality	Default
X-axis Minimum field	User override for the automatically determined minimum for the X-axis.	Auto
X-axis Maximum field	User override for the automatically determined maximum for the X-axis.	Auto
Primary Y-axis Minimum field	User override for automatically determined minimum for the primary Y-axis*.	Auto
Primary Y-axis Maximum field	User override for automatically determined maximum for the primary Y-axis.*	Auto
Secondary Y-axis Minimum field	User override for the automatically determined minimum for the secondary Y-axis*.	Auto
Secondary Y-axis Maximum field	User override for the automatically determined maximum for the secondary Y-axis*.	Auto

* Adjusting these values can assist in lining up the major and minor gridlines when using both primary and secondary y-axes.

GUI Element	Functionality	Default
Clear button	Deletes axis limits set above.	N/A
Show Legend tickbox	If ticked, displays the legend on the chart. The titles in the legend are taken directly from the logfile's column names or from the labels specified in the *Plot Condition* dialog box. Please refer to *Section 0* in this manual for further information.	Yes
Ignore Zero Values tickbox	If ticked, ignores a point when either the X or the Y value equals zero. Used for filtering out spurious points, for example. Note that this criterion is tested after the multiplication and offset for the column data have been applied, since multiplication and offset are applied when a client's unique project customisation of EPR is created.	No
Sort X-values tickbox	Currently not available.	No
Show Minor Gridlines tickbox	If ticked, displays minor gridlines	No
Show First Date in Title tickbox	If ticked, adds the date of the first data point to the chart's title.	No
Secondary Y-axis Title field	Name of the secondary Y-axis to be plotted on the chart.	No
Footnote field	Adds an arbitrary footnote, defined by the user, to the bottom of the chart.	No
Show Contour File field	Plots the contour from a selected contour file onto the graph. Contour files are selected in the ***Project and Datafile*** section of the *Specification* tab's screen. Please refer to Section *0* in this manual for further information.	No
Calculate M.A. Series #1 to #5 tickboxes	If ticked, calculates the moving average for the particular series number and plots it on the chart.	No
No. of Points fields	Specifies the Window size of the moving average for a particular series number. Must be >1 and <-1000. Note, large Window sizes have a significant performance penalty.	None
Show Raw Series tickboxes	If ticked, both the moving average and the raw data series are shown on the chart. If unticked, only the moving average is shown.	Yes

4.4.3.2 Conditional Plotting

EPR v3.0's Conditional Plotting feature is intended to be used for the following purposes:

- Plot a variable and use a second series that is conditional, such as plot markers, if its Y-value is higher than or lower than a specified value
- Plot a variable and use a second series that is conditional on the value of a different column being higher or lower than a specified value

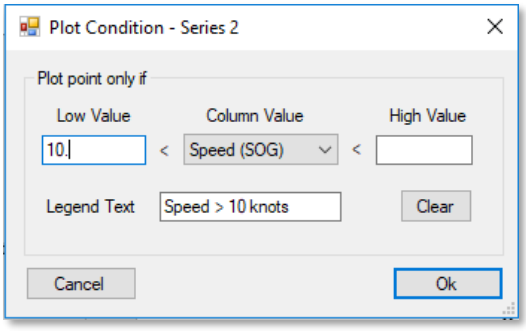

Figure 10: Plot Conditions of Series

The table below provides detailed information regarding the various elements available on the ***Plot Condition*** dialog box.

Table 12: Conditional Plotting

GUI Element	Functionality	Default
Low Value field	Plots if the data in the logfile column specified in the *Column Value* field is higher than the value specified in the *Low Value* field.	N/A
Column Value dropdown list	This is the logfile's data column against which data column values specified in the *Low Value* and the *High Value* fields will be tested. Note that this column can be any column that contains a numeric datatype.	N/A
High Value field	Plots if the data in the logfile column specified in the *Column Value* field is lower than the value specified in the *High Value* field.	N/A
Legend Text field	This text is added to the legend of the chart and can be used to describe the condition that has been used in the chart, e.g. "Speed > 10 knots".	N/A
Clear button	Clears all entered content	N/A

Important Note:

If a multiplication factor or an offset has been specified for the selected column during the creation EPR's unique project customisation (refer to *Section 3* for further information), these will be applied to the raw data before the conditional plotting criteria are applied.

5 DateTime Format Specification

5.1 Introduction

The DateTime format specifier is set in the ***Logfile Options*** dialog box (refer to *Section 4.4.1.2* for further information). This is a powerful option that can be used to define virtually any possible date and time input formats.

The drawback of this flexibility is that it can be confusing when it comes to defining the correct customised format specifier. This section attempts to explain how to do this using several examples.

5.2 Typical Format Specifiers

Table 13 below shows several often-used date and time formats and their associated DateTime format specifier.

Table 13: Examples of DateTime Specifiers

Text in Logfile	Associated Format Specifier	Remark
0:59:58 1:00:58	h:mm:ss	12-hour clock, no leading zero
00:59:58 01:00:58	hh:mm:ss	12-hour clock, with leading zero
12:59:58 AM 1:00:58 AM	h:mm:ss tt	12-hour clock, no leading zero and AM/PM indication
29/05/2017 1:35 29/05/2017 12:35	dd/MM/yyyy m:ss	
29/05/2017 2:00:58 AM	dd/MM/yyyy h:mm:ss tt	

5.3 DateTime Format Specifiers

The table below provides a list of all the standard datetime format specifiers and a description of the specifiers.

Table 14: DateTime Format Specifiers

Format Specifier	Description
d	The day of the month. Single-digit days will not have a leading zero.
dd	The day of the month. Single-digit days will have a leading zero.
ddd	The abbreviated name of the day of the week, as defined in AbbreviatedDayNames.
dddd	The full name of the day of the week, as defined in DayNames.
M	The numeric month. Single-digit months will not have a leading zero.
MM	The numeric month. Single-digit months will have a leading zero.
MMM	The abbreviated name of the month, as defined in AbbreviatedMonthNames.
MMMM	The full name of the month, as defined in MonthNames.
y	The year without the century. If the year without the century is less than 10, the year is displayed with no leading zero.
yy	The year without the century. If the year without the century is less than 10, the year is displayed with a leading zero.
yyyy	The year in four digits, including the century.
gg	The period or era. This pattern is ignored if the date to be formatted does not have an associated period or era string.
h	The hour in a 12-hour clock. Single-digit hours will not have a leading zero.
hh	The hour in a 12-hour clock. Single-digit hours will have a leading zero.
H	The hour in a 24-hour clock. Single-digit hours will not have a leading zero.
HH	The hour in a 24-hour clock. Single-digit hours will have a leading zero.

Format Specifier	Description
m	The minute. Single-digit minutes will not have a leading zero.
mm	The minute. Single-digit minutes will have a leading zero.
s	The second. Single-digit seconds will not have a leading zero.
ss	The second. Single-digit seconds will have a leading zero.
f	The fraction of a second in single-digit precision. The remaining digits are truncated.
ff	The fraction of a second in double-digit precision. The remaining digits are truncated.
fff	The fraction of a second in three-digit precision. The remaining digits are truncated.
ffff	The fraction of a second in four-digit precision. The remaining digits are truncated.
fffff	The fraction of a second in five-digit precision. The remaining digits are truncated.
ffffff	The fraction of a second in six-digit precision. The remaining digits are truncated.
fffffff	The fraction of a second in seven-digit precision. The remaining digits are truncated.
t	The first character in the AM/PM designator defined in AMDesignator or PMDesignator, if any.
tt	The AM/PM designator defined in AMDesignator or PMDesignator, if any.
z	The time zone offset ("+" or "-" followed by the hour only). Single-digit hours will not have a leading zero. For example, Pacific Standard Time is "-8".
zz	The time zone offset ("+" or "-" followed by the hour only). Single-digit hours will have a leading zero. For example, Pacific Standard Time is "-08".
zzz	The full-time zone offset ("+" or "-" followed by the hour and minutes). Single-digit hours and minutes will have leading zeros. For example, Pacific Standard Time is "08:00": The default time separator defined in TimeSeparator. / The default date separator defined in DateSeparator.
% c	Where c is a format pattern, if used alone. The "%" character can be omitted if the format pattern is combined with literal characters or other format patterns.

Format Specifier	Description
\ c	Where c is any character. Displays the character literally. To display the backslash character, use "\\".

6 Batch Processing

6.1 Introduction

An batch processing feature has been included in EPR v3.0. This feature allows users to select multiple logfiles in the *Open Logfile* dialog box, which are then processed together in batch mode.

The process for selecting multiple logfiles in the ***Open Logfile*** dialog box follows standard Windows conventions, i.e.:

- To select multiple files, hold down the **<Control>** key on the keyboard while clicking on the required files on screen
- To select a list of files, click on the first file in the list, then hold down the **<Shift>** key on the keyboard while clicking the last file in the list

Please note that multiple logfiles can only be selected from a single folder.

When multiple logfiles have been selected, instead of the logfile name showing in the *Project and Datafile* input section, the text shown in *Figure 11* below appears.

Figure 11: Multiple Logfiles Selected

By clicking with the **left mouse button** on the text on the right-hand side of the ***Clear*** button, the *Multiple Logfile Selection* dialog box appears (see *Figure 12* below for an example) listing the selected logfiles for the current batch run, including the detected number of lines.

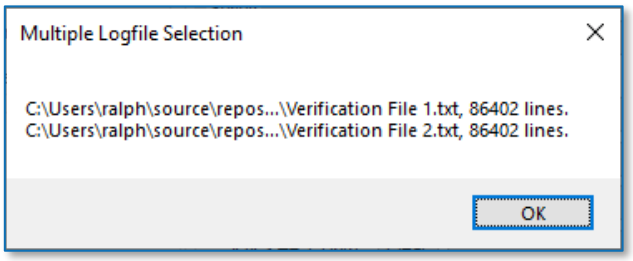

Figure 12: Multiple Logfiles Selected

If many logfiles have been selected, the ***OK*** button to close the above dialog box may be off screen. However, the dialog box can still be closed by pressing the **<Enter>** key on the keyboard.

To batch process all selected logfiles, from the *Menu bar* select the **Process** menu option or press the shortcut key **<F9>** on the keyboard.

Note that the same EPR specifications will be used for all logfiles included in the batch run, i.e. the separator, datetime format and column and chart specifications.

6.2 Location of Batch Run Results

Charts are saved into the same folder as the logfiles. When naming charts the following file naming convention is used:

- Chart *<chart number>* of *<logfile name>*.png".

The processing results of each batch run, as shown in the *Output Panel*, are saved into a single file, which is stored in the same folder as the EPR input file. The contents of this file can be checked to establish whether any errors occurred during the batch run. The file naming convention for this file is:

- Process Results of *<EPR Filename>*.txt.

The EPR input file and logfiles are located in the same folder in order to keep all input and output files together.

7 Software Limitations

Item	Limit	Comments
Number of data columns	25	Arbitrary limit. The modifications required to lift this limit would be straightforward to implement.
Number of charts	10	Arbitrary limit. Any modification would require changes to the GUI.
DateTime formatted data	Limited to X-axis only	Implemented to avoid the problem of multiple series with both number and datetime variables.
Chart Series	4 data series	Arbitrary limit. The number of data series available in one chart have been sufficient to address all requirements encountered to date. Increasing this number will require some work but would not be a major modification. Note that series 5 is reserved for showing contour lines.
Batch run	Not limited	This is a feature and in the current GUI implementation the maximum limit is about 50 logfiles, depending on the screen size. If more logfiles are selected, the dialog box listing all the selected logfiles may not show all files selected and the *OK* button may be off screen. In this instance the dialog box needs to be closed by pressing the **<Enter>** key on the keyboard. Even if not all selected logfiles are shown in the dialog box, the batch run will nonetheless include all selected logfiles in the run.