



## 18 TREND ANALYSIS

The Trend Analysis module is used to track statistics for all available data items throughout the project. For each line in the project the Mean, Maximum, Minimum and Standard Deviation of the selected data item is plotted.

From the main menu select *Execute | Trend Analysis*.

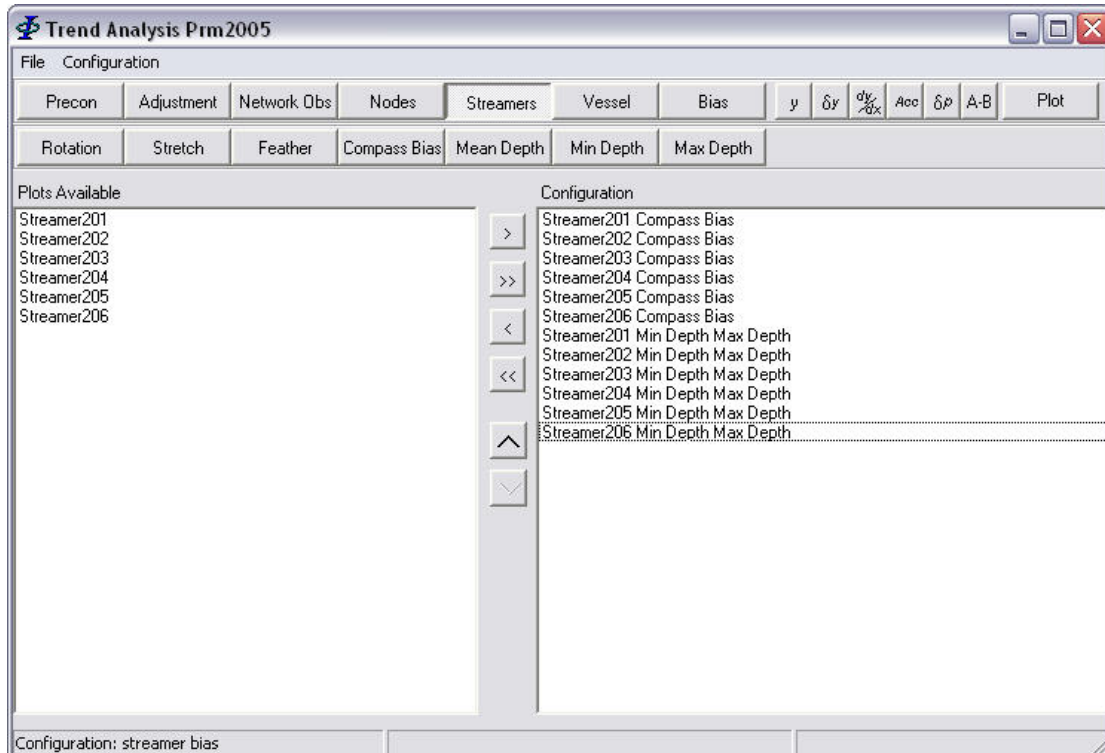


Figure 18-1

Plots are classified by *Group* and *Series*, and can be modified according to *Type*.

**Note:** Saved plot configurations apply to all lines in the project with the same number and ordering of nodes and observations. If the node or observation numbers change a new configuration will be required.



## 18.1 Groups and Series

Plot groups and the series available for each group are given in the table below:

Group	Series
Precon	Raw (time domain) Processed (time domain) Shot Event (shot domain)
Adjustment*	Number of iterations Degrees of freedom Unit variance
Network Observations	Value Residual W Statistic (normalised residual) MDE (marginally detectable error) SD (a priori standard deviation)
Nodes	Across (distance across from pre-plot) Along (distance along from start of line) Easting Northing Position (only used with comparisons) SMA (semi-major axis 95% ellipse) External reliability Number of observations to/from a node
Streamers	Rotation Stretch Feather Compass Bias Mean depth Min depth Max depth
Vessel*	Shot time interval Inter-shot distance – grid or ellipsoid Speed – grid or ellipsoid CMG (course made good) – grid or ellipsoid
Bias	Compass bias

\* With the exception of the *Adjustment* and *Vessel* groups, all the series for each plot can be overlaid. For the *Adjustment* and *Vessel* groups the associated series are plotted as separate plots and are not strictly series in the true sense.



## 18.2 Compass Biases

Compass biases are computed by modelling streamer shape shot-by-shot, and the designated bias is the mean of all shots, i.e. the compass bias is a single value for the whole line.

Plot option 1:

The *Bias* category displays the mean, minimum and maximum value for each selected compass, by serial number, based on its *shot-by-shot* computed bias. The *mean* series is indicative of the actual compass bias. The *maximum* and *minimum* series may be useful as part of an analysis of streamer dynamics, or indicative of compasses which provide grossly inaccurate data over a part of the line.

**Note:** This plot configuration, unlike all others, remains valid through database changes, and can be used to track compass performance based on actual serial number as opposed to compass number.

Plot option 2:

The *Streamers* category contains a series for *Compass Bias* which displays, for each selected streamer, the mean, minimum and maximum of the (mean of all shots) bias of all compasses on that streamer. This plot therefore indicates the value of the most biased compass on that streamer (minimum or maximum), and the mean bias for all compasses, which should approximate zero.

## 18.3 Creating/Modifying a Configuration

When any of the group buttons (see Figure 18-1) are clicked the series toolbar for that group appears, and the *Plots Available* list shows all plots that are available in that group.

The current configuration is shown in the *Configuration* list.

To add to the configuration:

1. Click on the required group button.
2. Select the required plots from the *Available* list. Multiple selections can be made by using the *Ctrl* and *Shift* keys in the usual manner.
3. Click on the > button to add the selected plots, or the >> button to add all plots in the group.
4. For all groups except *Adjustment* and *Vessel*, select the plots in the *Configuration* list and click on the required series button. The series name will be added to the plot name.

### 18.3.1 Series

Each plot can be configured to overlay multiple series. Highlight the required plots in the *Configuration* list and click in turn on each of the required series. Each time a series button is clicked that series will be toggled on or off for all the selected plots for which those series apply. The plot name in the *Configuration* list will be modified

---



accordingly.

### 18.3.2 Types

Each plot can be configured to plot one of the following plot *Types* as indicated in the *Type* toolbar in Figure 18-1:

<i>y</i> :	Normal plot
$\delta y$ :	Delta plot – point to point difference
$dy/dx$ :	Rate of change plot
<i>Acc</i> :	Acceleration plot
$\delta p$ :	Polynomial delta plot – difference from least squares polynomial of specifiable order from 1 to 25 fitted through all good points.
<i>A-B</i> :	Comparison plot

To modify the plot *Type* highlight the required plots in the *Configuration* list and click on the appropriate *Type* button. The plot name(s) will be modified accordingly. Rate of change and delta plots are mutually exclusive but comparisons can be done with all plot *Types*.

To specify a plots highlight the required plots in the *Configuration* list. With the *A-B* button depressed select the required comparison plot in the *Available* list. Both plots must be of the same *Group*. The plot name(s) will be modified accordingly.

Click on the *y* button to reset selected plots to normal and no comparison.

### 18.3.3 Saving/Loading a Configuration

To save the current configuration as appears in the *Configuration* list, select *Configuration | Save* from the menu to display the File Save dialogue box. Enter an appropriate name and click on *Save*. The current page setup is also saved with the configuration.

**Note:** These configurations are compatible with the *Config/Print Plot* configurations.

There is no limit to the number of different configurations which may be saved.

To load a previously saved configuration select *Configuration | Load* from the menu to display the File Open dialogue box and select the required configuration. If the current configuration has not been saved a message box prompting to save will appear.

## 18.4 Shot Range

The shot range for each line is as specified in the project as the FGSP to LGSP. It is therefore important that this range is correct in order to obtain the right results.

---



## 18.5 Plotting

To send the current configuration as appears in the *Configuration* list to the interactive Multiplot module for the selected line click on the *Plot* button.

The line selection dialog appears, sorted by sequence, with all lines selected. At least three lines must be selected.

**Note:** When trend analysis computed for the first time the operation can take several minutes as the relevant database tables are read, depending on how many plots are in the configuration and how many lines have been selected. The trend analysis results for each plot and line are then saved in a summary file (\*.sum) in the Line Database Folder. On subsequent computations, if the particular database table is unchanged and the FGSP-LGSP are unchanged then the summary file is read resulting in a significant time saving.

## 18.6 Output to CSV File

The *Output CSV Dialog* appears after the line selection has been made.

By checking the *Output CSV File* checkbox and entering a file name in, shown in Figure 18-2, all data will be written to a comma separated value (CSV) file in addition to being plotted.

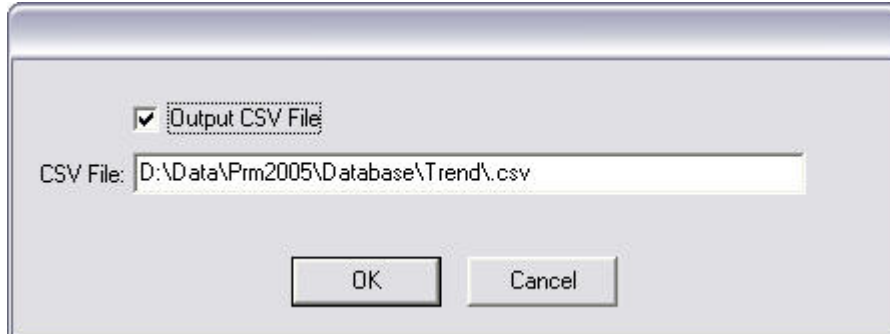


Figure 18-2

Each series will be written to file in a separate column.

**Warning:** Selecting an existing file will overwrite the contents of that file.

## 18.7 Parameters

To save the current window settings and plot configuration select *File | Save Parameters*. Each time the module is subsequently invoked these parameters will be automatically applied.