

CyFlex® XYPlot User Guide

Version 4

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Developed by Transportation Laboratories



Version History

Version	Date	Revision Description
1	1/25/2016	Initial publication
2	7/10/2018	Formatting changes
3	3/26/2020	Retrofit to new template
4	2/1/2024	Rebrand to TRP Laboratories

Document Conventions

This document uses the following typographic and syntax conventions.

- Commands, command options, file names or any user-entered input appear in Courier type. Variables appear in Courier italic type.
 - Example: Select the cmdapp-relVersion-buildVersion.zip file....
- User interface elements, such as field names, button names, menus, menu commands, and items in clickable dropdown lists, appear in Arial bold type.
 - Example: **Type**: Click **Select Type** to display drop-down menu options.
- Cross-references are designated in Arial italics.
 - Example: Refer to Figure 1...
- Click intra-document cross-references and page references to display the stated destination.
 - Example: Refer to Section 1 Overview on page 1.

The clickable cross-references in the preceding example are 1, Overview, and on page 1.

CyFlex Documentation

CyFlex manuals are available at https://cyflex.com/. View Help & Docs topics or use the Search facility to find topics of interest.



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1 Overview

The CyFlex® XYPlot application displays real-time graphs of selected CyFlex variables much like legacy X-Y plotters. The program is one of a suite of CyFlex plotting applications, including Stripchart, LoggerPlot, and History Plot that all operate similarly.

XYPlot displays a column of rectangular *plot areas* in *graphs* that render *traces* of selected variables over time in the standard X-Y graph format. A single XYPlot application may be configured into a stack of up to 8 graphs with up to 8 traces in each graph. Each graph may have an additional "underlay" variable plot that can act as an envelope or contour map.

Each *graph* has an *X axis* across the bottom as well as left and optionally right *Y axes* with selectable ranges. These ranges may also be changed interactively with the mouse to pan or zoom in both X and Y directions.

Various configuration settings may be changed in a floating **Configuration Dialog**, save the configurations, and later reload them as desired. The dialog enables change of a wide variety of plot attributes:

- CyFlex Variables to plot
- Variable line colors, patterns, gridlines, axis scales and increments
- Label fonts and font sizes, etc.

Stored plot data may be exported to a CSV-formatted file for analysis and charting in a standalone spreadsheet.

XYPlot joins the other CyFlex plotting applications to deliver graphics at the test console – graphics that can help to assess the performance characteristics of the test article. It is based on the same graphics software and hardware as the CyFlex **Operator Display** and shares much of its display and user features with the other CyFlex plotting applications.

1.1 Features

XYPlot provides a full complement of graphics functionality, including the following sets of features. These features may be started from either the Menu Bar, the Button Row, or the Configuration Dialog.

1.1.1 XYPlot Uses

- Standalone application that displays selected real-time graphs in a vertical stack
- Application may be started from CyFlex menu or from command line with optional configuration file.
- Plug-in version may be embedded in CyFlex Operator Display.

1.1.2 Plotting Capabilities

- Each instance of XYPlot has 1-8 independently configured graphs.
- Each graph has a total of 1-8 real-time traces of CyFlex Variables
- One of the traces may be a static "underlay" trace of data from a designated file.
- Users may select data sampling and display refresh in either rate [Hz] or interval [sec], [min], etc.



- CyFlex Variables are assigned to traces from a name list of the currently valid CyFlex Variables
- Drag mouse to "pan" (scroll) plot in X and Y directions.
- Drag mouse to "zoom" (magnify) plot in X and Y directions.
- Select the line color, pattern, and thickness of a trace and display a Legend of traces by color on each graph.
- Select an option for a trace to "auto range" adjust the range of the axes assigned to it so that all of its data is displayed.
- Select the range, text label, color, and pattern of each of the axes.
- Select the number of gridlines and tick marks on the grid and their line color, pattern, and thickness.

1.1.3 Configuration Settings

- Configuration settings or "specs" can be saved or loaded by filename.
- Add a trace, remove a trace, or copy/paste a trace by Variable name in each graph.
- Add static "underlay" traces from data files.
- Plot attributes may be changed interactively: right-click anywhere in the XYPlot window to launch the floating Configuration Dialog.
- Change the attributes of the plot traces for each graph, including line color, pattern, and thickness.
- Change the attributes of the gridlines for each graph, including color and pattern.
- Configuration changes may be "applied" (Apply button) on trial in the dialog and then accepted (OK button) or canceled (Cancel button).

1.1.4 Program Utilities

- Launch the Help browser with a persistent, expandable contents tree and help content with cross links.
- Hover the mouse over a window component to display its Tool Tip.
- Export the entire data buffer to a text file formatted for spreadsheets.



1.2 Requirements and Constraints

1.2.1 Requirements

XYPlot requires the following conditions:

- XYPlot operates as part of the CyFlex test automation system. CyFlex must be running on the test system to create the history data files that XYPlot requires for plotting.
- The system hardware must be sufficiently robust to execute the standard CyFlex operations.
- The test system must have graphics hardware adequate to support version 1.3 or later of the OpenGL cross-platform applications programming interface (API) for computer graphics and driver support.
- High-resolution monitors are recommended for display accuracy.

1.2.2 Constraints

The following constraints and limitations must be imposed on the XYPlot configuration and operation:

- Variable types: CyFlex Variables may be selected for plotting by name from the Plot tab of the Configuration Dialog.
 - All currently specified Real, Integer, and Logical Variables are displayed automatically in the CyFlex Variable Names pulldown list.
- **Number of graphs:** XYPlot supports up to eight graphs in its vertical "stack" format.
 - The program ignores attempts to add more than eight graphs in the Configuration Dialog.
- **Number of traces per graph:** XYPlot supports up to eight traces, one for each CyFlex Variable selected in any one graph.
 - Together with the limit of eight graphs per program instance, you may select up to 64 traces at once.
 - The program ignores attempts to add more than eight traces in the Plot tab of the Configuration Dialog.
- **Sample Rates:** XYPlot enforces Data Sample Rates in the range 1 50 [Hz], covering the typical Slow to Fast Channel sample rates.
 - The program ignores attempts to enter values outside this range in the Plot tab of the Configuration Dialog.
- Refresh Rates: XYPlot enforces Display Refresh Rates in the range 0.1 50 [Hz], covering rates from very low computer utilization to refresh faster than any perceptible difference.
 - The program ignores attempts to enter values outside this range in the **Plot** tab of the **Configuration Dialog**.
- **Data Storage:** XYPlot limits the total number of **Data Samples per Trace** to 360,000, the number of samples for a 10 [Hz] channel over an hour.
 - Once the **Data Storage** buffer is full, the program drops the oldest data as it adds the newest.



- The actual clock time covered in the **Data Storage** clearly depends on the **Data Sample Rate**: high rates fill the buffer in less time than lower rates.
- The Export Data to CSV File button in the top left margin of the Graph writes the entire contents of the current Data Storage buffer to a CSV file.

1.3 Terminology

Table 1 describes terms frequently mentioned in this document.

Table 1: Terminology

Term	Description
Main Window	The complete window that appears when the application starts
Configuration	The plot settings that dictate the function and appearance of the Main Window and its <i>Graphs</i> . The settings may be changed in the Configuration Dialog and then saved to and loaded from a configuration file.
Configuration Dialog	A floating dialog window for configuring the various settings that manage the plot functionality and appearance.
Graph	The basic plot display panel that includes the graphical plots, axes, labels, and auxiliary buttons. The XYPlot window is comprised of a column of one or more Graphs, numbered from 1 at the top.
Channel	A CyFlex Variable selected for plotting by its numeric value, name, and units.
Plot Area	The primary rectangular portion of the graph that displays the plot of the selected CyFlex Variable channels, including the value traces, the gridlines and their labels, and the axis titles.
Frame	The border of the Main Window that includes the Title and Subtitle fields at the top and the Note field at the bottom.
Trace	The continuous plot of the numeric values over time for one channel, displayed in the Plot Area .
Axes	The horizontal (X) and vertical (Y) scales at the perimeter of the Plot Area , including numeric value labels and gridlines.
Grid	The set of horizontal and vertical lines in the Plot Area that give numeric reference to the traces.
Button Row	The horizontal row of active buttons above the top left corner of the Plot Area for Pan , Zoom , and Export .
Legend	The horizontal row of trace identifiers above the top right corner of the Plot Area to match CyFlex Variable names with trace colors.
Data Sampling	The periodic acquisition of data from CyFlex shared memory of the current values for the specified Variables, expressed in either frequency [Hz] or interval [msec].
Display Refresh	The periodic refresh of the Graph and its Traces expressed in either frequency [Hz] or interval [msec].





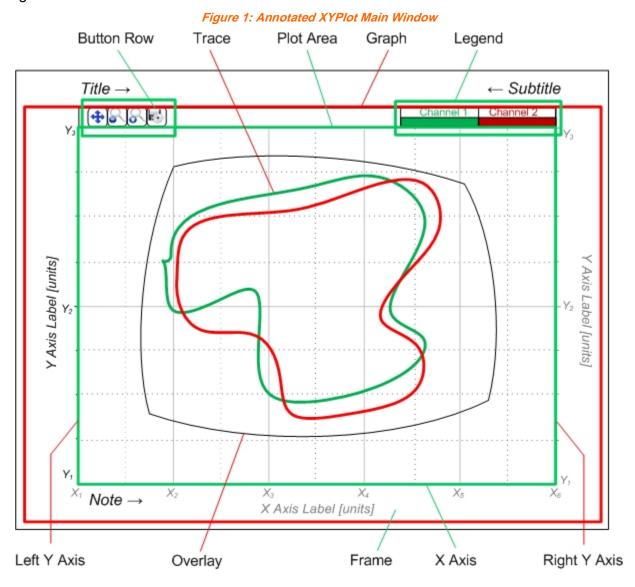
Term	Description
Data Storage	Data collected for each Channel in a Graph since the last Start is stored in the program. It can be saved to a spreadsheet file from the Main Window menu by selecting File -> Export All Data.



2 Main Window Layout

The Main Window is the primary window for the application that is displayed on startup. Other "dialog" floating windows can be launched from it.

Figure 1 shows an annotated XYPlot Main window.



2.1 Graph

The Main Window is composed of a vertical stack of one or more graphs displayed as fixed rectangular panels. Each graph is an independent instance of the basic XYPlot. Their vertical column allows them to align their X Axes and scales. However, the X Axis is displayed in each panel and they may use different CyFlex Variables and/or scales if desired.



2.2 Plot Area

In each graph there is a rectangular Plot Area in which the connected line traces of the chosen CyFlex Variables are rendered across the horizontal Time Axis. It includes horizontal and vertical gridlines and tick marks for the axis scales.

2.3 Overlay

Each Plot Area may include an optional static trace of data stored in a file selected by the user. The trace may be used as an envelope or contour map over which the real-time traces are drawn.

2.4 Menus

The Main Window has standard pulldown menus in the top left window border for **File** and **Help**. The former provides data exporting, saving, and loading configuration settings, and exiting the program. The latter launches the **Help** dialog browser.

2.5 Button Row

Each graph has a row of action buttons at the top left edge of its Plot Area. Select the following:

- Pan to toggle start and stop panning.
- **Zoom** to start successive zoom in, then stepped zoom out or zoom reset, and stop zoom.
- Export to write Data Storage contents for this graph to a spreadsheet file.

2.6 Legend

Each graph has a row of Legend graphics at the top right edge of its Plot Area. Each Legend shows a CyFlex Variable name over the trace color selected for it.

2.7 Frame

The Main Window border area outside of the graphs forms a Frame that can display user-selected text for a **Title**, a **Subtitle**, and a **Note**.



3 Configuration Dialog Layout

The **Configuration Dialog** is a floating dialog window launched from the Main Window to select valid options for plotting attributes. *Figure 2* shows the **Configuration Dialog**.

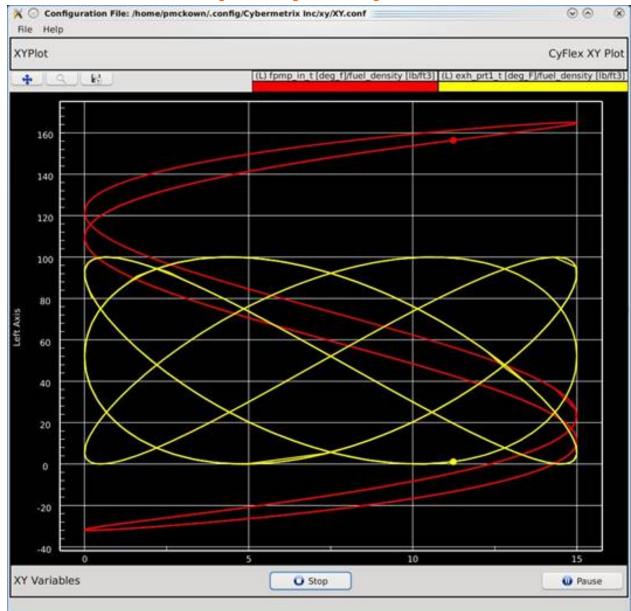


Figure 2: Configuration Dialog Window



3.1 Configuration Dialog Functions

Change the data and display attributes at any time from the **Configuration Dialog**. Right-click anywhere in the Main Window to display the dialog. It is organized in three tabs:

1. Plot

- Set the CyFlex Variables to plot by name, assign to the X or Y Axes, and set the trace color, line type, and thickness.
- Set the screen refresh and data sampling rates or intervals for the Variables.

2. Axes

 Set the plot attributes for the axes: color, enable / disable auto range, minimum and maximum range, numbers of gridlines and tick marks, the axis label, and the gridlines color, line type, and thickness.

3. Frame

- Set the text and font for labels in the frame of the Main Window: Plot Title (top left),
 Plot Subtitle (top right), and Note (bottom left)
- Show / hide the trace Legend at top right of each graph.
- Change the background color of each graph.

The **Plot** and **Axes** tabs include an additional column of tabs along the left margin, one tab for each graph specified. The highlighted tab shows the number of the graph for the currently displayed plot attributes.

3.2 Graph Tabs

The dialog has a column of numbered Graph Tabs on its left margin, one tab for each graph specified, plus an **All** tab to display the attributes of all graphs at once.

3.3 Feature Tabs

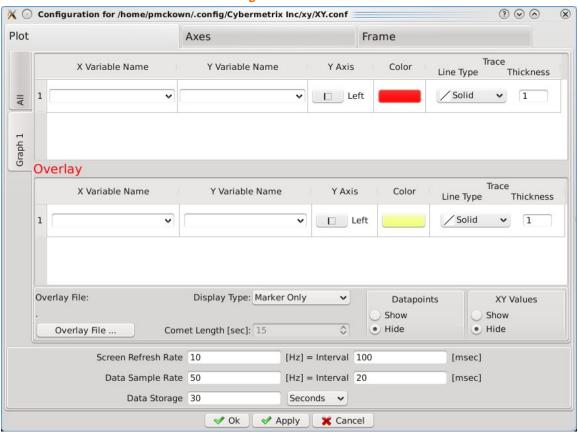
The dialog has a row of three Feature Tabs on its top margin:



3.3.1 Plot Tab

The **Plot** tab is organized as a spreadsheet table.

Figure 3: Plot Tab



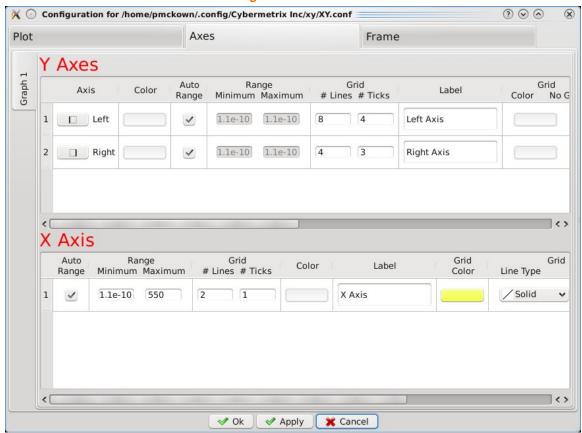
- Each row describes a trace of one CyFlex Variable.
- Each column corresponds to a plot attribute: **Variable Name**, trace **Color**, left or right **Y** axis, etc.
- The lower panel shows screen refresh, data sampling, and data storage settings.



3.3.2 Axes Tab

The Axes tab is organized as a spreadsheet table.

Figure 4: Axes Tab



- The rows describe the vertical Left and Right Y Axes and the horizontal X Axis.
- Each column corresponds to an axis attribute, such as range, color, and number of gridlines.



3.3.3 Frame Tab

The Frame tab displays fields to select the text and font of the Plot Title, Plot Subtitle, and Note in the frame of the Main Window, as well as Show / Hide the Legend and select the Background Color on all graphs.

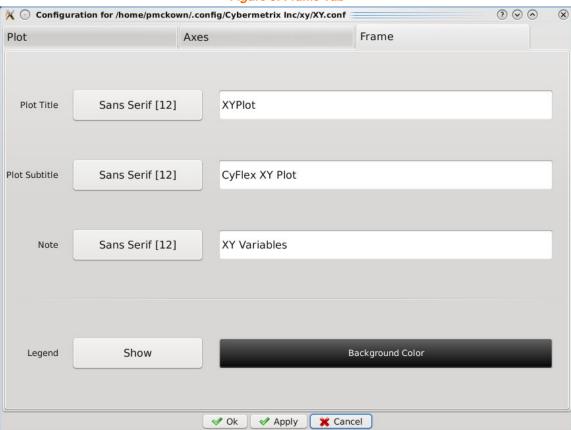


Figure 5: Frame Tab

3.4 Buttons

The dialog has a row of buttons on its bottom margin. Select the following:

- OK to accept the setting changes and close the dialog.
- Apply to apply the setting changes and keep the dialog open.
- Cancel to cancel the setting changes and close the dialog.



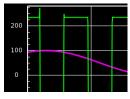
4 Using XYPlot

4.1 Starting and Stopping XYPlot

4.1.1 Starting XYPlot

Use any of the following methods to start XYPlot:

Select the XYPlot icon on the console monitor



- Enter qtxyplot on the command line.
- Use a test mode in a General Purpose gp_test script:

@BACKGROUND_TASK

AT_START "qtxyplot"

Important:

The program will use the default configuration at startup unless a different one is selected in the command line. Refer to *Section 4.9 Saving and Using Configurations* on page 30 for related information.

4.1.2 Stopping XYPlot

1. Select **File -> Exit** from the Menu Bar to terminate XYPlot.

Figure 6: Exiting XYPlot



- 2. The program will prompt to save the current configuration to a file.
- 3. Upon file save, the program will stop and the Main Window will disappear.

4.2 Starting and Stopping Plot

Starting and stopping the plot will also start and stop Data Storage. Starting again will erase any stored data and restart Data Storage.

To keep the stored data and continue collecting it, use the **Pause** and **Resume** button sequence instead. Refer to *Section 4.2.3 Pausing and Resuming Data Plot* on page 14.

To stop the plot and save the stored data to a file, do so before clicking the **Start** button to restart the plot.



(1) Important:

Any sequence of **Stop** and then **Start** will erase all currently stored data.

4.2.1 Starting Data Plot

XYPlot displays channel traces after selecting the channel Variables by name in the **Configuration Dialog**.

The program initially displays the Overlay data if a file has been selected.

4.2.2 Stopping Data Plot

- 1. Click the **Stop** button in the middle of the bottom frame to stop plotting data.
- 2. Data storage also stops.
- 3. The button label will change to Start.

4.2.3 Pausing and Resuming Data Plot

To pause:

- 1. Click the **Pause** button at the right end of the bottom frame.
- 2. Data storage will continue up to the capacity specified in the **Data Storage** field under the **Plot** tab of the **Configuration Dialog**.
- 3. The button label will change to **Resume**.

To resume:

- 1. Click the **Resume** button at the right end of the bottom frame.
- The plot will display the data during the pause and Data Storage has not been interrupted.
- 3. The button label will change to **Pause**.

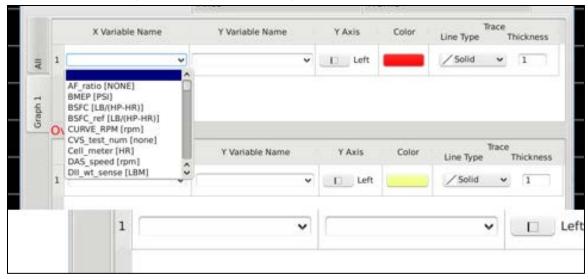


4.3 Plot Settings

4.3.1 Selecting CyFlex Variables to Plot

- 1. Right-click anywhere in the **Plot Area** to launch the **Configuration Dialog**.
- 2. Select the **Plot** tab in the dialog. Each row displays the attributes of one trace.

Figure 7: Configuration Dialog - Plot Tab to Select Variables



- 3. Click in the **X Variable Name** field of the row for the desired trace. The list of CyFlex Variable Names includes all **Real**, **Integer**, and **Logical** Variables currently specified, sorted together alphabetically.
- 4. Select the X Variable Name:
 - a. Click in the X Variable Name field, scroll to your selection, and select it
 or
 - Enter the first few characters of the desired **X Variable Name**. The resulting list will display matching choices to select.
 - b. The name of the selected CyFlex Variable to plot is displayed in the field along with its current units of measure in brackets.
- 5. Repeat steps 3 and 4 to specify a Y Variable Name in for the desired trace.
- 6. Click the **OK** button at the bottom of the **Configuration Dialog** to incorporate the change.

Important:

All traces in one graph have the same X Variable. If you add more than one trace, the same X Variable name is automatically shown. Their X Variable fields cannot be changed

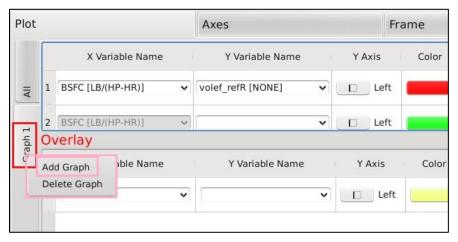


4.3.2 Adding or Removing a Graph on the Main Window

Add or remove an entire graph from the vertical "stack" of graphs in the Main Window from the **Configuration Dialog**:

- 1. Right-click anywhere in the Plot Area.
- 2. Select the Plot tab in the Configuration Dialog.

Figure 8: Plot Tab to Add or Remove a Graph



- 3. Right-click on the bottom (highest number) graph tab in the column on the left margin.
- 4. Add or remove a graph:
 - a. Add a graph at the bottom:
 - i. Select **Add Graph** in the menu to display a new graph with default settings.
 - ii. Select the attributes for the new graph.
 - b. Remove a bottom graph:
 - Select **Delete Graph** in the menu to remove the bottom graph from the Main Window.
- 5. Click the **OK** button at the bottom of the **Configuration Dialog** to incorporate the change.

Important:

A graph may be added only at the bottom. Only the bottom graph may be removed.

4.3.3 Adding or Removing a Trace in a Graph

- 1. Right-click anywhere in the **Plot Area**.
- 2. Select the **Plot** tab in the **Configuration Dialog**.
- 3. Right-click the bottom (highest number) row # button immediately to the left of the CyFlex Variable Name field to show trace options.
- 4. Add or remove a trace:
 - a. Add a trace at the bottom:
 - i. Select **Add Row** in the menu to display a new trace row with default settings.
 - ii. Select the settings for the new trace in the row fields.



- b. Remove a bottom trace:
 - Select Delete Row in the menu to remove the row and its trace in the graph.
- 5. Click the **OK** button at the bottom of the **Configuration Dialog** to incorporate the change.

(1) Important:

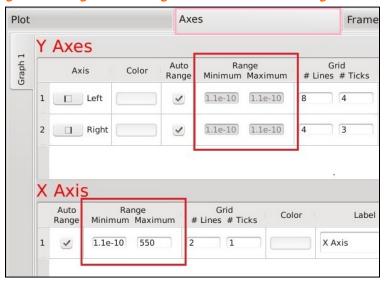
A trace row may be added only at the bottom. Only the bottom trace row may be removed.

4.3.4 Setting Axes Ranges

Set or change the range of values for the X and/or Y Axes of the plot:

- 1. Right-click anywhere in the Plot Area.
- Select the Axes tab as in Figure 9.

Figure 9: Configuration Dialog Axes Tab to Set Axes Ranges



- The Y Axes panel has one row each for the Left and Right axes.
- The X Axis panel has one row for its axis.
- 3. As in Figure 9, select the desired row in the Range Minimum or Maximum field.
- 4. As in *Figure 9*, *e*nter the numeric **Minimum** and **Maximum** values for the CyFlex Variable which you have assigned to the axis. The dialog will verify that the values are numeric and that the **Minimum** value is less than the **Maximum**.
- 5. Click **OK** at the bottom of the **Configuration Dialog** to incorporate the change.

(1) Important:

For a Y Axis (its scale, labels, and gridlines) to be displayed, at least one Variable must be assigned to it in the **Y Axis** column in the **Plot** tab.



4.3.5 Auto-Ranging the Axes

The program can determine the optimum range for the X and/or Y Axes automatically to ensure that all plotted values are visible and no clipping occurs:

- 1. Right-click anywhere in the Plot Area.
- 2. Select the **Axes** tab in the **Configuration Dialog** as in *Figure 10 below*.

Figure 10: Configuration Dialog Axes Tab to Auto-Range the Axes



- The Y Axes panel has one row each for the Left and Right axes.
- The X Axis panel has one row for its axis.
- 3. As in Figure 10, Check the box in the **Auto Range** column for the desired axes.
- 4. Click **OK** at the bottom of the **Configuration Dialog** to incorporate the change.

The program will dynamically adjust the axis ranges so that all of the data is displayed in the **Plot Area**.

When **Auto Range** is set, the **Range Minimum and Maximum** fields display the computed values but cannot be overwritten.

If both Left and Right Y Axes are displayed with **Auto Range**, then changing either one to a different gridline color is recommended.

4.3.6 Automatically Plotting at Startup

Enter the following command to have XYPlot start plotting automatically without having to click the **Start** button:

The -a autostart parameter starts plotting immediately and causes the **Stop** button to be displayed.



4.3.7 Setting Gridlines and Tick Marks

Set or change the number of horizontal and vertical gridlines and tick marks:

- 1. Right-click anywhere in the Plot Area.
- Select the Axes tab in the Configuration Dialog.
 - o The Y Axes panel has one row each for the Left and Right axes.
 - The X Axis panel has one row for its axis.
- 3. Enter the integer number of gridlines to display in the Grid # Lines field in the desired rows. The dialog will verify that the value is a positive integer and will set gridlines at appropriate intervals.
- 4. Enter the integer number of tick marks to display between gridlines in the Grid # Ticks field in the desired rows. The dialog will verify that the value is a positive integer and will set tick marks at appropriate intervals.
- Click **OK** at the bottom of the **Configuration Dialog** to incorporate the change. Major Ticks have horizontal gridlines and are labeled with their numeric values at the axis; Minor Ticks are simple marks.

@Note:

The requested number in **Grid # Lines** *may* not match the number of gridlines actually shown in the Main Window because the program computes the closest match so that the grid intervals are "nice numbers" – multiples of 1, 2, or 5 times a power of 10. The corresponding grid is easy to interpolate as a result.

4.3.8 Changing Background Color of the Plot Area

Optionally change the background color of the **Plot Area** in the graph:

- 1. Right-click anywhere in the Plot Area.
- 2. Select the **Frame** tab in the **Configuration Dialog**.
- Click the Background Color field to display the Select Color dialog as in Figure 11 below.



Figure 11 Select Color Dialog



- Select the background color:
 - a. Click in the color space.
 - b. Select from most recent choices

or

adjust values in the Hue / Saturation / Value or Red / Green / Blue fields.

5. Click **OK** to incorporate the changes.

@Note:

Changing the background color to white is recommended before capturing the Main Window image for printing.

4.3.9 Viewing and Revising Configuration Changes in the Dialog

Change any of the plot attributes and see the effect when the Configuration Dialog is displayed:

- 1. Right-click anywhere in the **Plot Area**.
- 2. Change settings and then click the **Apply** button. Drag the dialog out of the view to see the results in the Main Window.
- 3. Keep or discard the changes:
 - a. To retain the changes, click **OK**. The dialog will close and the changes will be reflected in the Main Window.
 - b. To discard the changes, click **Cancel**. The dialog will close and none of the changes will be made in the Main Window.
- 4. Continue as desired by repeating steps 1 through 3.

4.4 Plot Manipulations

4.4.1 Pan-in the Graph

Use the mouse cursor to shift the current view in the **Plot Area** both horizontally (X) and vertically (Y).

- 1. To start Pan, click the **Pan Start** toggle button in the **Button Row** at top left in the graph.
- 2. Place the cursor in the **Plot Area** and drag it in any direction to "pan" or shift the image.
- 3. To stop Pan, click the **Pan Stop** toggle button.

Notes:

- Hover the mouse over the **Button Row** to view a "tool tip" identifying any of the buttons.
- Pan repeatedly then click the **Pan Stop** button to stop. Pan remains in effect until clicking **Pan Stop**.
- Data are displayed in real-time during pan and no data is lost.
- As desired, launch the Configuration Dialog and change plot attributes during Pan.
- Pan and Zoom cannot be used together. Turn off one before starting the other.



4.4.2 Zoom in the Graph

Use the mouse cursor to magnify the current view in the **Plot Area** both horizontally (X) and vertically (Y) with the mouse cursor:

1. To start Zoom, click the **Zoom Start** toggle button in the **Button Row** at top left in the graph as in *Figure 12*.

Figure 12: Zoom Start



- 2. Place the cursor in the **Plot Area** and drag it diagonally to "zoom in" or magnify the image to the rectangular area of interest.
- 3. To stop Zoom, click the **Zoom Stop** toggle button.

Notes:

- Hover the mouse over the **Button Row** to view a "tool tip" identifying any of the buttons
- Zoom repeatedly then click the **Zoom Stop** button to stop. Zoom remains in effect until clicking **Zoom Stop**.
- Data are displayed in real-time during pan and no data is lost.
- As desired, launch the **Configuration Dialog** and change plot attributes during Zoom.
- Pan and Zoom cannot be used together. Turn off one to enable the other.
- The X and Y Axis scales will be updated and the number of gridlines maintained through the Zoom session.

4.4.3 Zoom-In/Out the Graph

Zoom-In repeatedly for greater graph magnification. An integer step counter tracks the number of Zoom-In events in the current session.

- 1. If in Zoom mode, for each Zoom-In step, drag the cursor diagonally to the desired rectangular area.
- 2. Click the **Zoom Step Out** button each time to display each of the Zoom In steps in reverse, out to the original view. The counter will decrement for each step.
- 3. Click the Zoom Reset button as in *Figure 13* to display the original view.

Figure 13: Zoom Reset



o Notes:

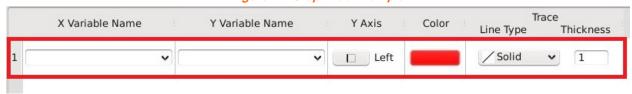
- Hover the mouse over the **Button Row** to view a "tool tip" identifying any of the buttons
- Zoom repeatedly then click the **Zoom Stop** button to stop. Zoom remains in effect until clicking **Zoom Stop**.



4.5 Working in the Plot Tab

Use the **Plot** tab in the **Configuration Dialog** to change the traces displayed in the Main Window. Add or remove traces and change the attributes of their display. If your XYPlot has more than one graph, select the one to change with the numbered **Graph** tabs at the left margin of the dialog. *Figure 14*.shows a selected **Graph** tab example.

Figure 14: Graph Tab Example



Each row of the **Plot** tab indicates the current settings for one trace in the selected graph. Each cell in the row affects one of its display attributes. Change any of these attributes by selecting from the valid choices assigned to each one.

4.5.1 Trace Options

The following trace options apply to an entire row or trace:

- Add
- Delete
- Copy
- Paste
- 1. Right-click the integer # button immediately to the left of the X Variable Name field to display trace options as in *Figure 15*.

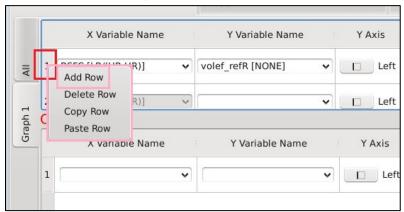


Figure 15: Trace Options

- 2. Select an option for that row:
 - Add Row to add a new below the current rows for a new trace with default values.
 - **Delete Row** to delete the row from the **Plot** tab and its trace from the graph.
 - Copy Row to copy the settings for the current row; use with Add and Paste to add a similar trace row.
 - Paste Row to paste the settings from the previously copied row in the added row; used after Add and Copy.



The sequence to copy a row to a new one is **Add**, **Copy**, and **Paste**. Then edit the settings for the new trace row.

4.5.2 Variable Names

Variable Names are the names assigned in a specs file for the X and Y CyFlex Variables to plot.

X Variable Name Y Variable Name Y Axis 1 [Left v AF ratio [NONE] BMEP [PSI] BSFC [LB/(HP-HR)] BSFC ref [LB/(HP-HR)] OV CURVE RPM [rpm] CVS test num [none] Cell meter [HR] Y Variable Name Y Axis DAS speed [rpm] DII wt sense [LBM] 1 [Left

Figure 16: Variable Names Pulldown List

- Click and scroll in the pulldown lists of valid Variables Names to select an X and Y Variable for each trace. The list includes all current Real, Integer, and Logical Variables.
- 2. If you know the first few characters of the **Variable Name**, click in the field and start to type the name. The pulldown list will appear, starting at the entered characters. Scroll in this filtered list and click your selection.
- 3. The current units of measure are appended in brackets to the **Variable Name**.

4.5,3 Y-Axis

Select to designate **Left** or **Right Y-Axis** for the trace.

- 1. Click on the button to toggle between assigning the **Left** and **Right Y Axis** to the trace.
- 2. If all of the traces in a graph are assigned to the same **Y Axis**, then the other axis will not be displayed, including its scale, label, and gridlines. At least one of the traces must be assigned to an axis to display it.



4.5.4 Color

Select the color for the trace display.

1. Click the color field to open the **Select Color** dialog as in *Figure 17*.

Forty Colors

Add to Custom Colors

Hue: 240* • Red: 0 • Name: -unnamedSaturation: 255 • Green: 0 • Name: -unnamedHTML: #0000FF

Figure 17: Select Color Dialog for Trace Display

- 2. Choose the trace color:
 - a. Click in the color space.
 - Select from most recent choices or

adjust the numeric values in the **Hue / Saturation / Value** or **Red / Green / Blue** fields.

3. Click the **OK** button to incorporate the change.

4.5.5 Trace / Line Type

Select the pattern of the trace line.

Click in the pulldown list to choose one of the following pattern types for the trace line:

- Solid
- Dashed
- Dot
- Dot Dash

4.5.6 Trace / Thickness

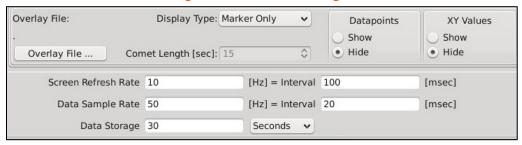
Specify the thickness of the trace line. Enter an integer in the range **1** to **5**, where greater is thicker.



4.5.7 Data Panel

Select settings for data gathering and storage.

Figure 18: Data Panel Settings



- 1. Enter the **Screen Refresh Rate**, the setting that determines how often the screen display is updated:
 - Specify either the Rate [Hz] or the Interval [msec]; the program will compute the other automatically.
 - Valid ranges are 0.1-50 [Hz] or 20-10,000 [msec].
- 2. Enter the **Data Sample Rate**, the setting that determines how often Variable values are sampled for plotting:
 - Specify either the Rate [Hz] or the Interval [msec]; the program will compute the other automatically.
 - o Valid ranges are 0.1-100 [Hz] or 10-10,000 [msec].
- 3. Enter the **Data Storage**, the setting that determines how much data is stored at the **Data Sample Rate** setting) for each Variable:
 - Click the pulldown and specify the time interval for data storage in Seconds,
 Minutes, or Hours.
 - The interval must be greater than 30 [sec].

4.5.8 Datapoints

Display or hide marker symbols • at the recorded datapoints in the **Plot** Area.

Select the **Show** or **Hide** toggle button.

The trace is composed of straight line segments between these datapoints.

4.5.9 XY Values

Display or hide a text display of X and Y values for the datapoint nearest to the cursor in the **Plot** Area.

Select the **Show** or **Hide** toggle button.

The numeric X and Y values of the nearest datapoint are displayed at the cursor and a line segment is drawn to the datapoint.



4.6 Working in the Axes Tab

Use the **Axes** tab in the **Configuration Dialog** to change the axes displayed in the Main Window. Change the settings for either of the vertical **Left** and **Right Y Axes** and the horizontal **X Axis**. If your XYPlot has more than one graph, select the one to change with the numbered graph tabs at the left margin of the dialog as in *Figure 19*.

Each row of the **Axes** Tab indicates the current settings for one axis in the selected **Graph**. Each cell in the row affects one of its display attributes. Change any of these attributes by selecting from the valid choices assigned to each one.

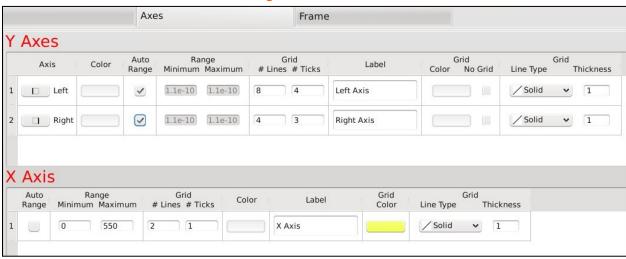


Figure 19: Axes Tab

Select the following in the **Axes** tab columns:

- Axis: select to identify the **Left** or **Right** Y Axis for which the other fields in the row apply.
- Color: select the color for the Y Axis label and scale:
 - a. Click in the color field to display the **Select Color** dialog as in *Figure 20*.

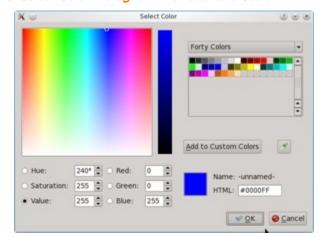


Figure 20: Select Color Dialog for Axis Label and Scale



Select from most recent choices

or

adjust the numeric values in the **Hue / Saturation / Value** or **Red / Green / Blue** fields.

- c. Click **OK** to incorporate the change.
- Auto Range: enable or disable auto ranging to dynamically adjust the axis range so that all data is displayed in the Plot Area.
 - Check the box to start auto ranging and suspend the Range Minimum and Maximum fields.
 - Uncheck the box to stop auto ranging and activate the Range Minimum and Maximum fields.
- Range / Minimum: specify the minimum value for the axis scale.
 Enter the numeric value for the minimum axis scale when auto ranging is disabled.
- Range / Maximum: specify the maximum value for the axis scale.
 Enter the numeric value for the maximum axis scale when auto ranging is disabled.
- Grid / # Lines: specify the number of gridlines to display from the axis.
 Enter the integer number of gridlines to display in the Plot Area perpendicular to the axis.
- **Grid / # Ticks**: specify the number of tick marks to display on the axis scale. Enter the integer number of tick marks to display between each gridline on the axis scale.
- Label: specify the text label displayed next to the axis scale.
 Enter descriptive text for the axis.
- **Grid / Color**: select the color of the horizontal gridlines:
 - a. Click in the color field to display the **Select Color** dialog.
 - b. Select from most recent choices

or

adjust the numeric values in the **Hue / Saturation / Value** or **Red / Green / Blue** fields.

- c. Click **OK** to incorporate the change.
- **Grid / No Grid**: select whether to show or hide gridlines.
 - Check the box to display gridlines.
 - Uncheck the box to hide gridlines.
- **Grid / Line Type**: select the pattern of the gridlines. Click in the pulldown list to choose one of the following pattern types:
 - o Solid
 - o Dashed
 - o **Dot**
 - Dot Dash



Grid / Thickness: specify the thickness of the gridlines. Enter an integer in the range 1 to 5 where greater is thicker.

4.7 Working in the Frame Tab

Change supplemental text in the Main Window margins, show or hide the Legend, and change the background color of the graphs in the **Frame** tab of the **Configuration Dialog**.

4.7.1 Plot Title

Select **Plot Title** to change the text string that appears at top left in the frame of the Main Window:

- 1. Enter the literal text string for the **Plot** Title.
- 2. Click the **Font** button to display the **Font** dialog as in *Figure 21* below.

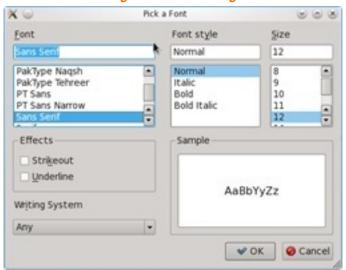


Figure 21: Font Dialog

3. Select the **Font**, **Font Style**, and **Size** of the text in the dialog, then click the **OK** button to incorporate changes.

4.7.2 Plot Subtitle

Select **Plot Subtitle** to change the text string that appears at top right in the frame of the Main Window:

- 1. Enter the literal text string for the **Plot** Subtitle.
- 2. Click the **Font** button to display the **Font** dialog.
- 3. Select the **Font**, **Font Style**, and **Size** of the text in the dialog, then click the **OK** button to incorporate changes.

4.7.3 Note

Select **Note** to change the text string that appears at bottom left in the frame of the Main Window:

- 1. Enter the literal text string for the **Note**.
- 2. Click the **Font** button to display the **Font** dialog.



3. Select the **Font**, **Font Style**, and **Size** of the text in the dialog, then click the **OK** button to incorporate changes.

4.7.4 Legend

Select **Legend** and then select whether to **Show** or **Hide** the text that associates the trace colors with their CyFlex Variable names.

Click the **Show** or **Hide** toggle button to show or hide the **Legend** in each graph.

4.7.5 Background Color

Change the background color of the Plot Area in each graph:

- 1. Click the **Background Color** field to open the **Select Color** dialog.
- 2. Choose the background color for all graphs:
 - a. Click in the color space.
 - b. Select from most recent choices

or

adjust the numeric values in the **Hue / Saturation / Value** or **Red / Green / Blue** fields.

- 3. Click **OK** to select the color.
- 4. Click the **OK** button at the bottom of the **Configuration Dialog** to incorporate the changes.

4.8 Saving Data

4.8.1 Saving Collected Data to a File

To save all of the data currently stored and plotted in a graph to a spreadsheet (.csv) file:

1. Click the **Export Data to CSV File** button in the Button Row at top left in the graph.

Figure 22: Export to CSV Button



- 2. The program will display the Save File As dialog.
- 2. Enter a new filename in the **Name**: field or click one of the existing filenames to overwrite it.
- 3. Keep the default directory /tmp/ for the file or select another directory.
- 4. Click the **Save** button to save the data file.



4.8.2 Saving and Printing Graphs

Save and print a graphical image of the XYPlot Main Window:

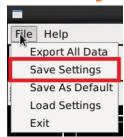
- 1. Pause and optionally pan in the graph to the desired view. Refer to Section 4.4.1 Pan-in the Graph on page 20.
- 2. Press the PrintSC key. The Linux **KSnapshot** dialog appears.
- 3. Select Window Under Cursor in the Capture mode: list.
- 4. Click the **New Snapshot** button. The **KSnapshot** dialog disappears.
- 5. Click the Main Window. The **KSnapshot** dialog appears again.
- 6. Click the **Save As** button. The **Save As KSnapshot** file dialog appears.
- 7. Complete the **filename** and **directory** entries.
- 8. Click the **Save** button to save the image file.
- 9. Print the image directly from the file with any of the standard graphics programs provided in the **KMenu > graphics** list such as **KolourPaint** or **Gwenview**.

4.9 Saving and Using Configurations

Save the current plot settings to either an existing configuration file or a new one from the **File** menu at top left in the Main Window:

Click File > Save Settings as in Figure 23.

Figure 23: Save Settings





2. The program will display the **Save Config File As** dialog as in *Figure 24*.

Save Config File As Maces ند 😬 🕒 4 4 4 C W ▶ Home ➤ .config ➤ Cybermetrix Inc Network m specs Trash opengl.conf Fedora-14-i6... Plotters.conf 37.3 GiB Hard... StripChart.conf StripChart_plugin.conf S /12 test.ui.conf test123.conf test345.conf test123123.conf test_torq1.conf test_torq2.conf • Ы ≦ave ☑ ▼ ② Cancel

Figure 24: Save Configuration File Dialog

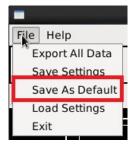
- Enter a new filename in the Name: field or click one of the existing filenames to overwrite it.
- 4. Click the **Save** button at bottom right to incorporate the change.

Automatically select filename extension (.conf)

Optionally, save the current plot settings as the default configuration, the one that is automatically loaded at startup:

Click File > Save as Default as in Figure 25.

Figure 25: Save as Default Configuration



Save As Default is helpful in establishing common starting point or to easily return to the current configuration in the future.



4.9.1 Loading an Existing Configuration

Load plot settings in an existing configuration file from the **File** menu at top left in the Main Window:

1. Click **File > Load Settings** as in *Figure 26*.

Figure 26: Load Configuration File Settings



2. The **Open Config File** dialog is displayed as in *Figure 27*.

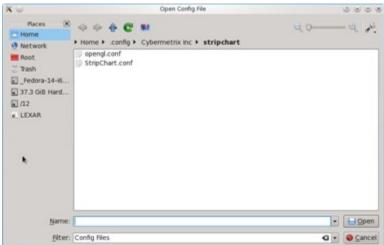


Figure 27: Open Config File Dialog

- 3. Select one of the existing Configuration filenames as indicated by the .conf file extension.
- 4. Click the **Open** button at bottom right to load the settings.

4.9.2 Loading a Configuration at Startup

Use the following command to select the Configuration file to load at program startup:

```
qtxyplot -f [base filename]
```

where the base filename is the Configuration filename without the brackets and without the standard .conf extension.

This format assumes that the Configuration files are in their default directory:

/home/[username]/.config/Cybermetrix Inc/XYPlot/

The program will use its default configuration if no -f file option is used.