



StripTool Users Guide

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Introduction

Overview

StripTool is a Motif application that allows you to view the time evolution of one or more process variables on a strip chart. It is designed to work with EPICS or CDEV and is maintained as an EPICS Extension. There are two main windows: The [Controls Dialog](#) and the [Graph](#). The Controls Dialog allows you to specify and modify the process variable name and the graph parameters corresponding to each curve that is plotted. It also allows you to specify timing parameters and graph properties. The curves are plotted in real time on the Graph. There are buttons on the Graph that allow you to do things like zoom and pan, and there is a popup menu that allows

you to do things like print the graph and save the data in ASCII or [SDDS](#) format.

StripTool was designed for UNIX but also runs on Microsoft Windows 95, 98, ME, 2000, and XP, collectively labeled here as WIN32. An X server and the X and Motif libraries are needed.

For information on obtaining StripTool, consult the [EPICS Documentation](#).

History

An early version of a StripTool was written by Janet Anderson at APS. The StripTool program described here was primarily written by Christopher A. Larrieu at TJNAF, and the basic design as well as most of its features and functionality owe to him. Albert Kagarmanov added zooming and auto-scaling in Y, display of the current value in the legend, and logarithmic scaling. He also added the History feature to allow browsing archived data. These were done at DESY but not incorporated into the main program. Other enhancements were added to one version or another by other members of the EPICS community. The primary responsibility for the program was transferred to APS in 2002, and the two main versions were merged. There is now a single version which may be obtained from CVS at APS. The intention is for APS to coordinate further development so there is a unified version available to all.

Starting StripTool

StripTool is started by typing the following on a command line:

```
StripTool [x-parameters] [Configuration-file] [&]
```

x-parameters	X Windows parameters such <code>-display atlas:0</code>
configuration-file	The name of a configuration file
&	Used on UNIX to run the process in the in the background

The only command-line argument apart from X parameters is the name of the configuration file. Other aspects of the StripTool interface are controlled by X resources. For example, you can cause the [Graph Window](#) to be 500x500 by using:

```
StripTool -xrm 'StripTool.StripGraph.width:500' -xrm 'StripTool.StripGraph.height:500' &
```

or you can set these resources in a configuration file.

Configuration Files

There are two kinds of configuration files, those containing X resources and those containing parameters for a StripTool graph.

X resources may be specified in any of the standard ways, for example, in your `.Xdefaults` file or on the command line. See a book on X Windows for more information. In addition, StripTool will look for a site application defaults file in a full path name specified by the environment variable `STRIP_SITE_DEFAULTS` and for a user defaults file named `.StripToolrc` in the user's home directory on UNIX and in the root directory of the drive on which StripTool is started on WIN32. The site file is read before the user file, but both are read after the standard places and after resources specified on the command line are processed. The last-read resource is the one that is used. Note that StripTool has default resources that should be adequate and preferred in most cases. Only use these mechanisms to specify resources that you specifically want to change.

In the remainder of this document the term "configuration file" will mean a file containing parameters for a StripTool graph. These are text files that are created in StripTool via the [Controls Window](#) and saved via the [File Menu](#). They specify the process variables to be plotted, the curve parameters, the time parameters, and the graph options. By convention, the filename ends in ".stp". They can be edited by hand but are most

conveniently created in StripTool.

If a configuration file is specified on the command line, StripTool will first try to open it as specified. If that is not successful and if the name was not a full path name, then it will look for it (1) relative to the startup directory and then (2) relative to each of the directories specified in the STRIP_FILE_SEARCH_PATH. (See [Environment Variables](#).)

If this process is unsuccessful or if no configuration file is specified on the command line, it will look for a file named StripTool.stp in the startup directory.

If a configuration file is found, StripTool will try to find the process variables and will not present the Controls Window. The Graph Window will appear when the first process variable connects. If none is found, no windows will appear and you will have to kill StripTool manually.

If no configuration file is found, StripTool will display the Controls Window for you to enter a process variable.

Environment Variables

STRIP_SITE_DEFAULTS	The full path name of a site application defaults file. See Configuration Files .
STRIP_FILE_SEARCH_PATH	The search path for finding configuration files that are specified on the command line. See Configuration Files . It is colon-delimited on UNIX and semi-colon delimited on WIN32. If this variable is not specified, the search path is empty.
STRIP_PRINTER_NAME	Specifies the Printer to use for printing. If this variable is not defined, it looks for PSPRINTER below. If neither is defined, it uses a default for both the printer and the device. See Printer Setup .
STRIP_PRINTER_DEVICE	Specifies the Device to use for printing if STRIP_PRINTER_NAME is defined. If STRIP_PRINTER_NAME is defined and this variable is not, it uses a default device. See Printer Setup .
PSPRINTER	Specifies the Printer to use for printing if STRIP_PRINTER_NAME is not defined. If this variable is used, then the Device used is "ps". If neither STRIP_PRINTER_NAME nor this variable is defined, it uses a default for both the Printer and the Device. See Printer Setup .
STRIP_DUMP_TYPE_DEFAULT	Either "ASCII" or "SDDS binary" (without quotes). Specifies the name of the toggle button that is set by default in the File Selection Dialog that appears as a result of picking Dump Data... in the Graph Window. Does nothing if it does not match a name of a toggle button. Not relevant unless SDDS dumping is implemented when StripTool is built.
STRIP_HELP_PATH	The URL of the StripTool help page. If not specified a default is used that should point to this page or a page from which this page may be accessed.
NETSCAPEPATH	The name (full path name if needed) of the browser to be used for help. If not specified, "netscape" will be used on UNIX. On WIN32 this variable is ignored and your default browser will always be used.

The default behavior may be different if StripTool has been [customized](#).

Controls Window

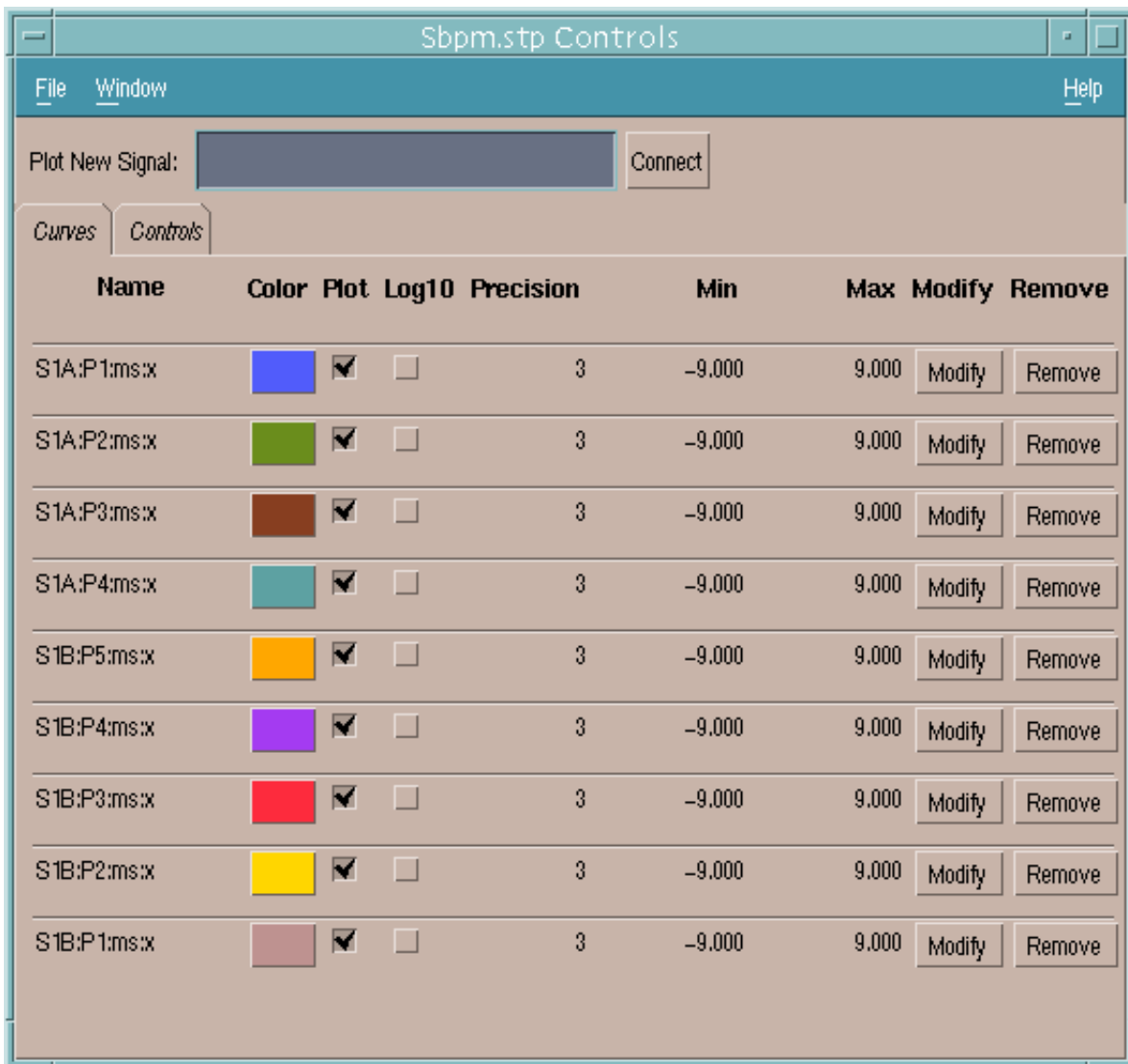
The Controls Window is where you specify the process variables you want to plot and the parameters of the associated curves, as well as time controls and graph options. These parameters may be read from and saved in [configuration files](#). The Controls Window consists of three areas, a place at the top to enter new process variable names, a Curves tab for curve parameters, and a Controls tab for time controls and graph options. Up to 10 curves can be specified.

You can click the Window Manager Close button to dismiss the Controls Window. The location of this button depends on the Window Manager. It is a double click on the box with a single bar to the left of the title bar for Motif and is a single click on the square with an X to the right of the title bar on WIN32. StripTool needs to have at least one of its two main windows open or you would have no way to access it. Consequently, if the Controls Window is the only one open, you cannot close it, and you will be asked if you want to quit instead.

Plot New Signal

To add a new process variable or signal to be plotted, enter its name in the text entry labeled "Plot New Signal:" and click on the Connect button. StripTool will then try to connect it, and it will appear on the Curves tab. If it is not connected, its name will be greyed out.

Curves Tab



For each curve there are places to change:

- The color
- Whether the curve appears on the graph
- Whether the y axis is log10 or linear
- The precision
- The Min value for the y scale
- The Max value for the y scale

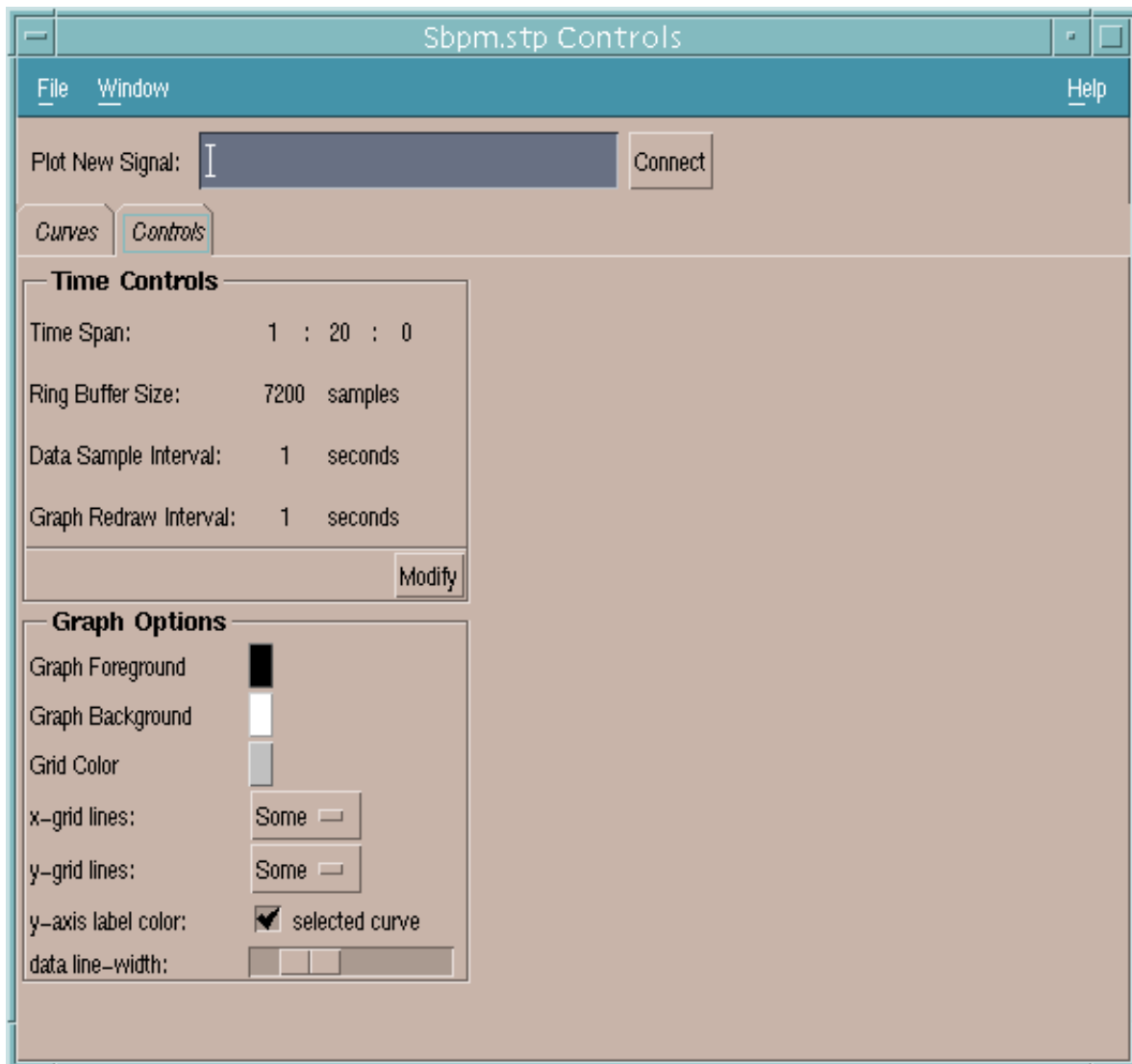
The default colors, in order, are Blue, OliveDrab, Brown, CadetBlue, Orange, Purple, Red, Gold, RosyBrown, and YellowGreen. These are X11 color names. The corresponding RGB values can be found in the rgb.txt color database, usually found in /usr/lib/X11. The color is changed by clicking on the colored button. This brings up the Strip Color Editor, which allows you to pick a new color.

Whether the curve appears and whether the y scale is log10 are check boxes. Changing their status affects the graph immediately. The curve remains in the legend whether it appears on the plot or not.

To modify the remaining curve parameters, you click the Modify button, which turns to Update. The values then appear in text boxes, where you can edit them. The new values are not applied to the graph until you click the Update button.

The Remove button removes this curve from the configuration.

Controls Tab



The Controls tab has two sets of parameters, Time Controls and Graph Options.

To modify the Time Controls, you click the Modify Button, which is replaced by Cancel and Update buttons. The values become text boxes which you can edit. The new values take effect when you click Update. The Time Span is specified in Hours, Minutes, and Seconds. You can also specify the Ring Buffer Size, Data Sample Interval, and Graph Redraw Interval. The Time Span must be greater than or equal to 1 sec. The Ring Buffer Size must be from 7,200 to 65,536 and never decreases. The Data Sample Interval must be greater than or

equal to 0.01 sec. The Graph Redraw Interval must be greater than or equal to 0.1 sec.

You modify the Graph Options individually. The Graph Foreground, Graph Background, and Grid Color are modified by clicking on the colored buttons, which bring up the Strip Color Editor, allowing you to pick a new color. For the x and y grid lines you have choices of None, Some, or All. You can choose whether the y-axis-label color is the color of the selected curve or the foreground color by checking or unchecking the check box. The label reflects the current state. Finally, there is a slider to set the line width of the curves.

Menubar

There are three items on the menubar of the Controls Window: File, Window, and Help.

File

The **Load...** item brings up a File Selection Dialog to let you choose a new [configuration file](#). In that dialog you can choose whether or not you want to use the Timing, Colors, Graph Attributes, and Curve Attributes from the file you choose. The **Save As...** item allows you to save the current configuration with a new name, with the same set of options for which parts you want to save. The **Save** item saves the current configuration in the file from which it was previously loaded or saved. The **Clear** item removes all the curves from the configuration and takes them off the graph. The **Exit Program** item terminates StripTool. Finally, the **Dismiss Window** item dismisses the Controls Window unless it is the only remaining window. Otherwise, it asks you if you want to exit. (At least one window needs to be mapped or you would not be able to control of the program.). This item is at the end so you are less likely to terminate StripTool when you only intended to close the Controls Window.

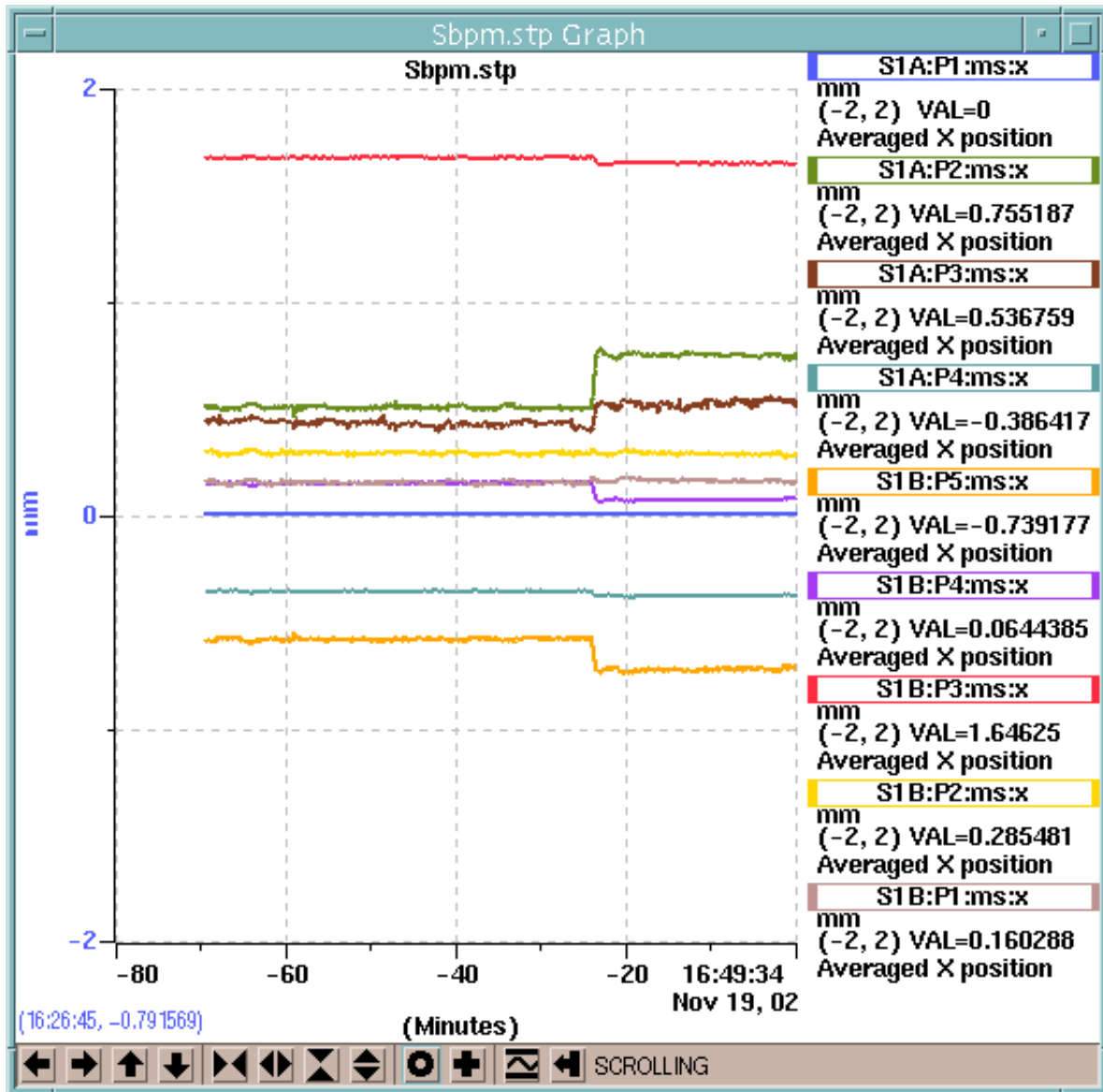
Window

There is only one item, Graph, which pops up the Graph Window.

Help

The **Web Help...** item brings up Netscape, or another browser if you have specified it in the [environment variables](#), displaying the StripTool help page. On UNIX this requires some cooperation from Netscape, which may change as new versions come out. It has been verified to work with Netscape 4.x, 6.x, 7.x, and Mozilla. If Netscape is not currently started, it typically takes an inconveniently long time before it appears, and you may have to wait up to a minute or so. Moreover, in later versions it doesn't always display the StripTool help page the first time. Click the item again after Netscape has come up to fix this. If Netscape is running, it should rapidly come to the front and change to the StripTool help page. It doesn't always come to the front, however. On WIN32 this item should rapidly bring up the StripTool help page in your default browser. The **Help on Help...** item brings up a message window explaining this behavior and giving the StripTool help page URL in case you need to enter it manually into a browser. The **About...** item brings up a window with information about the version of StripTool you are using and the primary authors.

Graph Window



The Graph Window displays the plot of the curves as they change. It consists of a title, the plot area, the x and y axes, the legend, and the toolbar. Each curve is shown in its respective color and with its respective scale. There is only one scale shown on the y axis. By default it is for the first curve. You can change which scale is shown on the y axis by clicking another curve in the legend. This both causes the y axis to show the scale for this curve and to bring this curve to the top. StripTool remembers the order. If you click another curve, it becomes the topmost one and the previous one becomes second topmost, etc.

The graph can be put in either Scrolling or Panning Mode, described in more detail below. Scrolling Mode is the usual behavior, and you can use Panning Mode to investigate a particular interval in time.

You can click the Window Manager Close button to dismiss the Graph Window. The location of this button depends on the Window Manager. It is a double click on the box with a single bar to the left of the title bar for Motif and is a single click on the square with an X to the right of the title bar on WIN32. StripTool needs to have at least one of its two main windows open or you would have no way to access it. Consequently, if the Graph Window is the only one open, you cannot close it, and you will be asked if you want to quit instead.

Other things you can do, such as printing the graph, are available on the popup menu, obtained by right clicking in the graph area. They are described in the section on the [Popup Menu](#).

Graph

The graph area is the part of the window where the curves are plotted. When the cursor is in the graph area, the corresponding time and value using the current scale are shown in the lower left corner. The graph can be zoomed or panned via the [Toolbar](#) buttons. The x or time scale can be changed in the [Controls Window](#) as can the scale for each curve. The name of the current configuration is shown in the title at the top. The axes and title are technically separate from the graph area. Clicking on them, for example, does not bring up the popup menu.


Legend


StripTool displays a legend to the right of the graph area. At a minimum, the legend contains the names of the process variables being plotted in the colors for that curve, the max and min values for the scale, and the current value [VAL]. If the process variable has a non-empty engineering units [EGU] field, the units are shown and also appear on the Y axis when it is the selected curve. If the record has a non-empty description [DESC] field, that is shown also. The precision [PREC] field determines the number of decimal places shown for the VAL. The legend resizes, within reason, to hold the information, taking room from the graph area as needed.


The curves appear in the legend in the order in which they connect. This may be different from the order in the configuration file and Controls Window, but usually is not. Curves that do not connect will not appear in the legend. They will be marked as greyed out in the Curves tab in the Controls Window, however.


Toolbar


The Toolbar appears below the graph. It can be made visible or hidden via the [popup menu](#) for the graph. The Toolbar has buttons, described below, and an indicator that shows whether it is in Scrolling or Panning Mode.


 Pan Right, Left, Up, or Down. Left click on these buttons causes a larger movement, while right click causes a smaller movement. Clicking the left or right panning buttons changes the graph to Panning Mode if it is in Scrolling Mode.

 Zoom Out or In in X or Y. Left click causes a larger zoom, while right click causes a smaller zoom. These buttons can be used in either Panning or Scrolling Mode and do not change the mode.

 This button resets the graph to the current values in the Controls Window, whether these values have been Updated or not.

 This button redraws the curves on the graph.

 This button toggles AutoScale Off or On and has two images. The image that shows is the current setting. With AutoScale On, the Y scale is chosen so each curve extends from the bottom to the top.

 This button toggles Scrolling or Panning Mode and has two images. The image that shows is the current setting. In Scrolling Mode, the latest time value is at the right edge and earlier times are to the left. The current time changes as the graph updates. The Scrolling Mode behavior is like a strip chart, where the paper moves and the pen stays fixed. In Panning Mode, the x axis corresponds to a fixed interval of time, also with earlier times to the left, which doesn't change unless you pan or zoom. Scrolling Mode is the usual behavior, and you can use Panning Mode to investigate a particular interval in time.

Popup Menu

The popup menu for the graph is brought up by right clicking the graph. The menu items are as follows:

Controls Dialog...

Brings up the Controls Window and/or makes it the topmost window..

Toggle Buttons

Makes the toolbar and its buttons be visible or not.

Printer Setup...

Brings up the Printer Selector Dialog. You can specify a Printer and select a Device. The window dump is typically done by Xwd. The Printer is used by the Lp command to specify the printer name. The Device is used by Xpr to format the window dump. (See the man pages for Xpr for more information about devices.)

Depending on how StripTool is built, different programs than Xwd, Xpr and Lp may be used for dumping and printing the window. The printer name should always be given by the value for Printer. If in doubt about the Device, try "ps". You can set the defaults via [environment variables](#) and perhaps avoid using this dialog at all. Not implemented for WIN32. See Print.

Print

Prints the graph without further user intervention using the current print setup. Not implemented for WIN32. For WIN32 you can use Alt-PrintScreen to copy the window to the clipboard, and then paste it into a program, like Paint, that can print it.

Snapshot...

Uses Xwd to make a copy of the graph in another window. Click on the window to dismiss it. Not implemented for WIN32. See Print.

Dump Data...

Brings up a File Selection Dialog for you to choose a file into which to dump the current plot data. If SDDS is implemented, you can choose between ASCII and SDDS formats. Otherwise the file is ASCII. The ASCII dump is of the visible part of the plot. The SDDS dump is of the entire buffer. An existing file will be overwritten without notification.

Retry Connections

Causes StripTool to reissue search requests for unconnected PVs. This should not normally be necessary, as outstanding search requests will happen automatically whenever a server comes up. If StripTool is on a different subnet than the server, often the case when the server is a PV Gateway, then it may not know a server has come up, and this menu item may be useful to cause it to reconnect. It should be used with care as (1) it is a kludge and (2) it can cause unnecessary network traffic.

Quit

Terminates StripTool.

Dismiss

Dismisses the Graph Window unless it is the only remaining window. Otherwise, asks you if you want to exit. (At least one window needs to be mapped or you would not be able to control of the program.)

History

The history features allow you to browse archived data.

Customization

StripTool can be customized by the user by using [environment variables](#). It can be customized when built by changing the values in StripDefines.h or by specifying these values in Makefile.Host. Examples are given in

Makefile.Host.

Acknowledgements

The primary acknowledgement is to Chris Larrieu for developing StripTool. In addition to the people mentioned under [History](#), others have contributed to StripTool as well.

Copyright

Work is in progress in transferring StripTool to the EPICS Public License.

