

9... HYPERPLOT™ GRAPHIC DATA DISPLAY

OVERVIEW

HyperPlot is an integral sub-program of HyperWare that provides graphic data display of 1 to 7 channels of HyperLogger collected data versus time (Figure 9... -1). Autoscaling, zoom/unzoom, data analysis, and bitmap file (*.BMP) generation are all provided features of HyperPlot. HyperPlot displays data from the standard HyperLogger Download file format (*.HLD).

Presented in this chapter is information on launching the HyperPlot program, details on using the various display options, and methods used for outputting graphed data for inclusion into reports or printing.

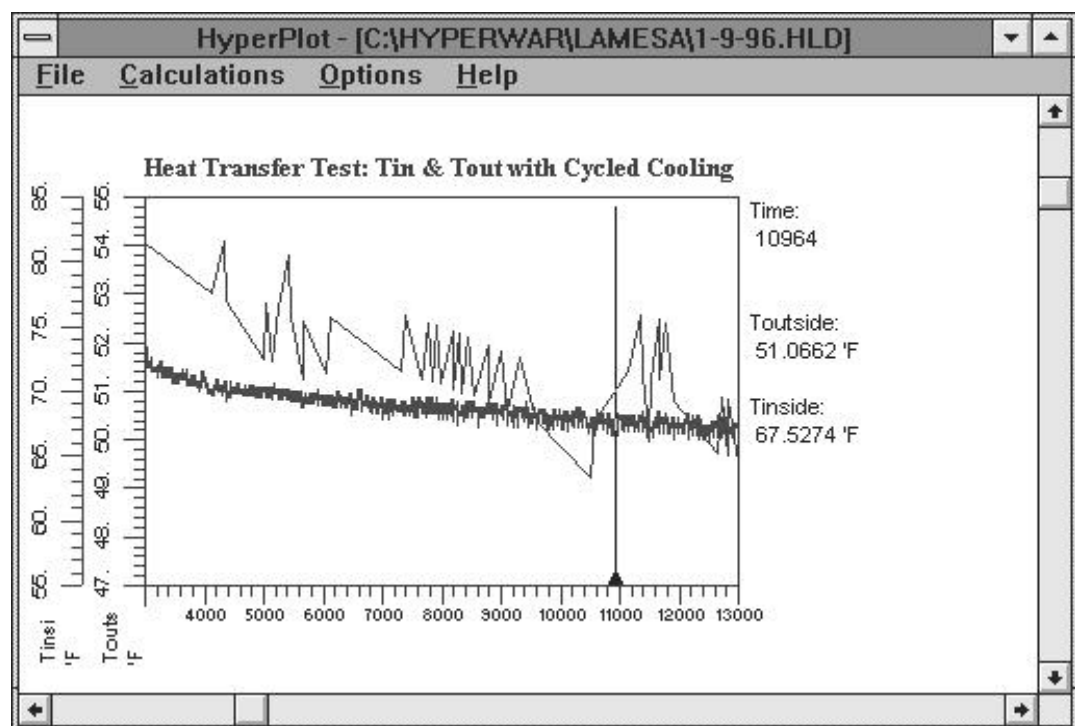


Figure 9... -1: HyperPlot graphic data display

LAUNCHING HYPERPLOT

The HyperPlot program can be launched in a number of different ways:

- ◆ Directly from the HyperComm Window for an immediate review of data just downloaded from the HyperLogger.
- ◆ From the Post-Processing window for general use.
- ◆ After processing of data through a Post-Processing Net

From HyperComm...

After data has been downloaded from a HyperLogger to a HyperLogger Download file (*.HLD) on the PC, the data can be immediately viewed with HyperPlot. After the Download file has been saved to PC disk, a Memory icon will display overlaying the PC graphic in the HyperComm Window. Double-clicking on this Memory icon will immediately launch HyperPlot. The *first seven channels of data* contained within the just Downloaded file will be automatically plotted with auto-scaled time and magnitude axis.

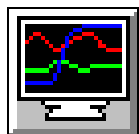


Figure 9...
-2: Launch
HyperPlot
button

From Post-Processing Window

For general use, HyperPlot can be launched from the Post-Processing window of HyperWare. Click on the Post-Processing button from the HyperComm Window and HyperWare will change to the Post-Processing window.

Clicking on the Launch HyperPlot button opens the HyperPlot window, at which time a HyperLogger Download file can be opened (details follow).

From a Post-Processing Net

If a Post-Processing Net is constructed that utilizes a Destination File icon with a *.HLD format, HyperPlot can be launched by double-clicking on the Destination File icon immediately after running the net. HyperPlot will start and the first seven channels of data contained within the Destination File will auto-scaled and plotted.

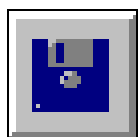


Figure 9... -
3:
Destination
File icon

HYPERPLOT WINDOW OVERVIEW

When HyperPlot starts, the window shown in Figure 9... -1 displays (with or without data graphed). Details on the various components of the HyperPlot window follow.

Time Axis

A horizontal axis is used for display of time. The time can be displayed in elapsed or absolute modes with either linear or logarithmic scaling.

Data Axis

Up to seven vertical axes can be displayed on a single plot, each with unique scaling. At the bottom of each axis is the data channel name and units assigned during construction of the net (to the Memory icon). Upon initial display, the axes are auto-scaled to allow the data to fit on the workspace. If required, scaling may be expressed with scientific notation (engineering format) and the multiplier will appear near the top of the appropriate axis.

Slide Bars

Slide bars are displayed at the right side and the bottom of the window which can be used for panning vertically and horizontally. Drag the slide button or click on the arrows at each end of the slide bars to pan the display.

Zooming

Areas of a plot can be enlarged via the HyperPlot Zooming feature. To zoom into an area of interest, a rectangular outline can be drawn around a region using the mouse and the display will change to fill the window with the outlined plot... auto-scaling time and channel data axes as necessary.

To zoom into a region:

1. Locate the mouse on one corner of the rectangular area to be defined.
2. While holding the left mouse button down, drag a rectangular box around the region to be enlarged.
3. Release the mouse button and the outlined area will fill the screen.

To zoom out, use the *Zoom All* or *Zoom Last* commands under the *Calculations* menu (see following Menu bar details).

Menu Bar

The Menu bar along the top edge of the HyperPlot window provides User control of the plotting features within HyperPlot.

HYPERPLOT MENU BAR

The conventional Windows menu bar techniques are used to load files for plotting, modify plotting parameters, and output plots. Descriptions of the features within each menu follow:

File**Open View**

Loads a new HyperLogger Download file for plotting.

Save as Bitmap

Outputs the *currently displayed screen view* as a Windows bitmap file. The bitmap file format is readily integrated into other software applications. When selected, a filename is requested and the file extension *.BMP is appended.

Print View

Outputs the *currently displayed screen view* to the Windows default printer.

Data File Information

Displays the Title and comments entered into the Download file at the time of Download from the HyperLogger or PCMCIA card. From this window, the Title displayed at the top of Plots can be edited.

Calculations**Zoom All**

Returns the view to show all of the data file.

Zoom Last

Returns the view to show the last level of zoom

Cursor

Brings a vertical cursor onto the view. The cursor shows on the left edge of the screen with a small triangle displaying just above the time axis. The cursor can be moved by locating the mouse cursor over the vertical line (the cursor will change to a double-ended arrow) then clicking the left mouse button and dragging the cursor left and right.

At the right edge of the view, the time and channel values intersected by the cursor will be displayed.

NOTE: When zoomed into a sufficient level that individual data points can be discerned on the screen, the cursor will appear to hop from data point to data point.

If mismatched sampling rates were used during data collection, displayed cursor values not on actual data points will utilize linear interpolation for the value.

Analyze View

Analyze View provides a quick display of the average, minimum value, maximum value, and the time integral for each data channel *for the currently displayed view*. This dialog can be copied to the Windows clipboard (hit <alt> P while the dialog is displayed) and then pasted into another application.

Options

X-Axis

The Time (X-Axis) axis can be displayed in a number of different formats at the User's discretion. Selecting the X-Axis menu results in a dialog box allowing for User specification of the following options.

TIME FORMAT

Selection of the appropriate radio buttons

- ◆ **HH:MM:SS** or **Seconds** Time Base; specifies the time display format for Hours, Minutes and Seconds, or in Seconds only.
- ◆ **Elapsed** or **Absolute** Time display; With **Elapsed** mode, the time display starts with Time 0 as the time of the first data sample. With **Absolute** mode, the time and date when the HyperLogger stored the sample is used.
- ◆ **Linear** or **Logarithmic**; The X-axis is scaled linearly or on a base 10 log scale.

TIME INTERVAL

Using the provided **Time Interval** text box, the time base (essentially a manual time base zoom function) can be manually specified. The entered value in units (approximate) will be used for the time window displayed in a single view. For example, if the value is entered as 60, the HyperPlot view will be time zoomed to display approximately 60 units (seconds, hours, etc) in a single full screen view.

TIME SHIFT

Individual channel plots can be shifted in time from milliseconds to days. Following the example format, in a Channel's text box, enter in the time to shift that plot.

The Time Shift capability can be very convenient for time registering (aligning) plots of data within a *Before / After Merged* file for easy graphic comparison. Refer to Chapter 8 for details on generating a Merged file.

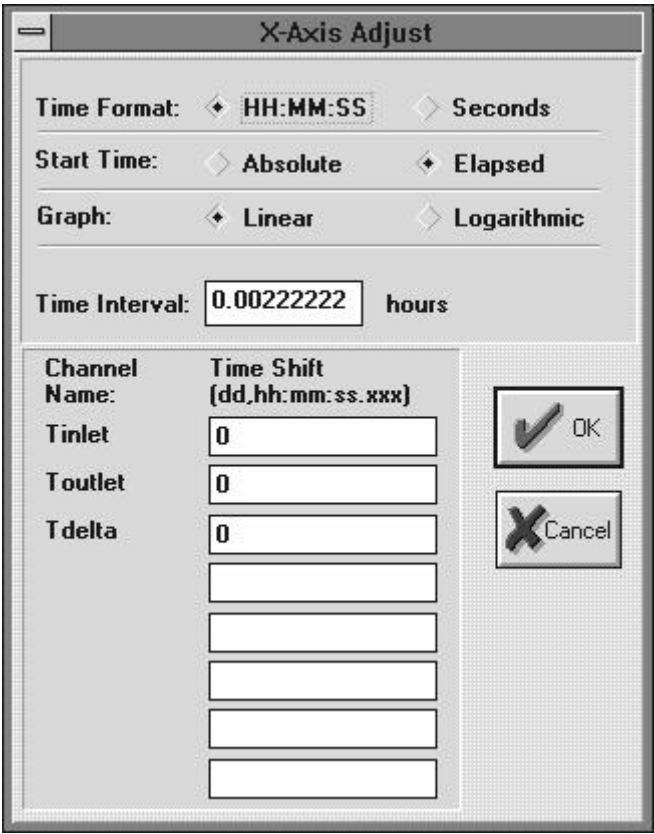


Figure 9... -4: HyperPlot Options / X-axis

Y-Axis

The Y-Axis dialog (Figure 9... -5) provides User control over grids, scaling and symbols used during the plotting of data. Descriptions of User selectable options follow:

CHANNEL NAME

The individual data channel names from the HyperLogger Download file are listed. The names are assigned when developing a HyperNet and/or Post-Processing Net.

DISPLAY CHANNEL

Checking a data channel's checkbox results in that channel being plotted.

Y-Axis Adjust

Channel Name:	Display:				Scaling:		Manual Ranges:		Units:
	Channel	Grid	Y-Axis	Symbols	Auto	Manual	Low	High	
Tinlet	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	0	100	'F
Toutlet	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	40	70	'F
Flow	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	0	200	GPM
Pressure	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="radio"/>	0	100	PSI
	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>			
	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>			
	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>			
	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>			

☐ Grid Off

Figure 9... -5: Y-Axis configuration dialog

DISPLAY GRID

A row of radio buttons specifies to which channel's Y-axis the horizontal grid should be connected.

DISPLAY Y-AXIS

Checking a data channel's Y-Axis checkbox results in that channels Y-Axis being displayed. In many plots, it may only be necessary to display a single Y-axis if the scaling is the same for all channels. For example if four channels of temperature data are being plotted and they all are scaled from 0 to 100F, only a single Y-Axis is required, allowing more area for data display.

DISPLAY SYMBOLS

Check boxes are provided for the enabling of symbols for each displayed channel.

SCALING AUTO / MANUAL

When a HyperLogger Download file is first plotted, all channels are autoscaled to fit on the screen. This auto-scaling feature can be disabled by the User and a manual range specified by clicking the Manual checkbox and entering a High and Low limit in the **Manual Ranges** text boxes. (As a short-cut, editing of the

Manual Range text boxes automatically switches the Auto / Manual checkbox to Manual).

To return to the Auto-scaling mode, merely click on the Auto checkbox and the range will automatically be rescaled to fit the screen.

UNITS

The individual data channel units from the HyperLogger Download file are listed. The units are assigned when developing a HyperNet and/or a Post-Processing Net.

Help

The Help menu provides access to the Help information through the standard Windows techniques.

PLOTTING LARGE FILES WITH HYPERPLOT

If a HyperLogger Download file contains a channel with greater than 20,000 samples, the plot must be broken into two or more pages for plotting. If a file of this size is plotted, an information dialog box will display asking if the User wants to advance to the next page before plotting.

When a page of data (beyond the first page) is selected for plotting, the X-axis will display the time from the start of the file, however data will only be plotted in the right half of the screen. Plotted data can then be expanded to full screen using the conventional Zooming method.

INTEGRATING HYPERPLOTS INTO OTHER SOFTWARE APPLICATIONS

Via Bitmap Files

Through the *File/Save File as Bitmap* menu choice (explained previously) HyperPlots can be saved to a bitmap file format (*.BMP) which can then be utilized in a multitude of other Windows applications.

From within other applications, menu commands are available that allow User's to specify a location and the bitmap file to be integrated. For example, from within Microsoft's Word for Windows, using the Insert Frame and insert Picture commands results in a seamless integration of the plot into a document. Other applications have similar procedures for integrating plots.

HyperPlot bitmap files can also be annotated and/or edited further from within graphic editing applications such as Windows Paintbrush.

Via the Windows Clipboard

For quick and simple integration of plots into other applications, the plot can be captured to the Windows clipboard, then pasted into another document. To perform this procedure, display the plot on the screen, then save the screen to the clipboard by pressing <ALT> and <Print Screen>. Change to the other application and utilize the Paste command to integrate it into the document.

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NOTES: