

10... HYPERTRACK™ REAL-TIME DATA DISPLAY

OVERVIEW

The HyperLogger in conjunction with a PC running HyperWare is capable of operating in a real-time mode called HyperTrack or tracking. HyperTrack provides a real-time graphic trending and/or scrolling numerical display on the connected PC screen of values received from a serially connected HyperLogger. Figure 10... -1 shows real-time tracking in the HyperTrack window. The HyperTrack display occurs concurrently while the HyperLogger is executing its Program Net and logging data.

Graphic trending and Scrolling can be run simultaneously and multiple windows of each function can be open.

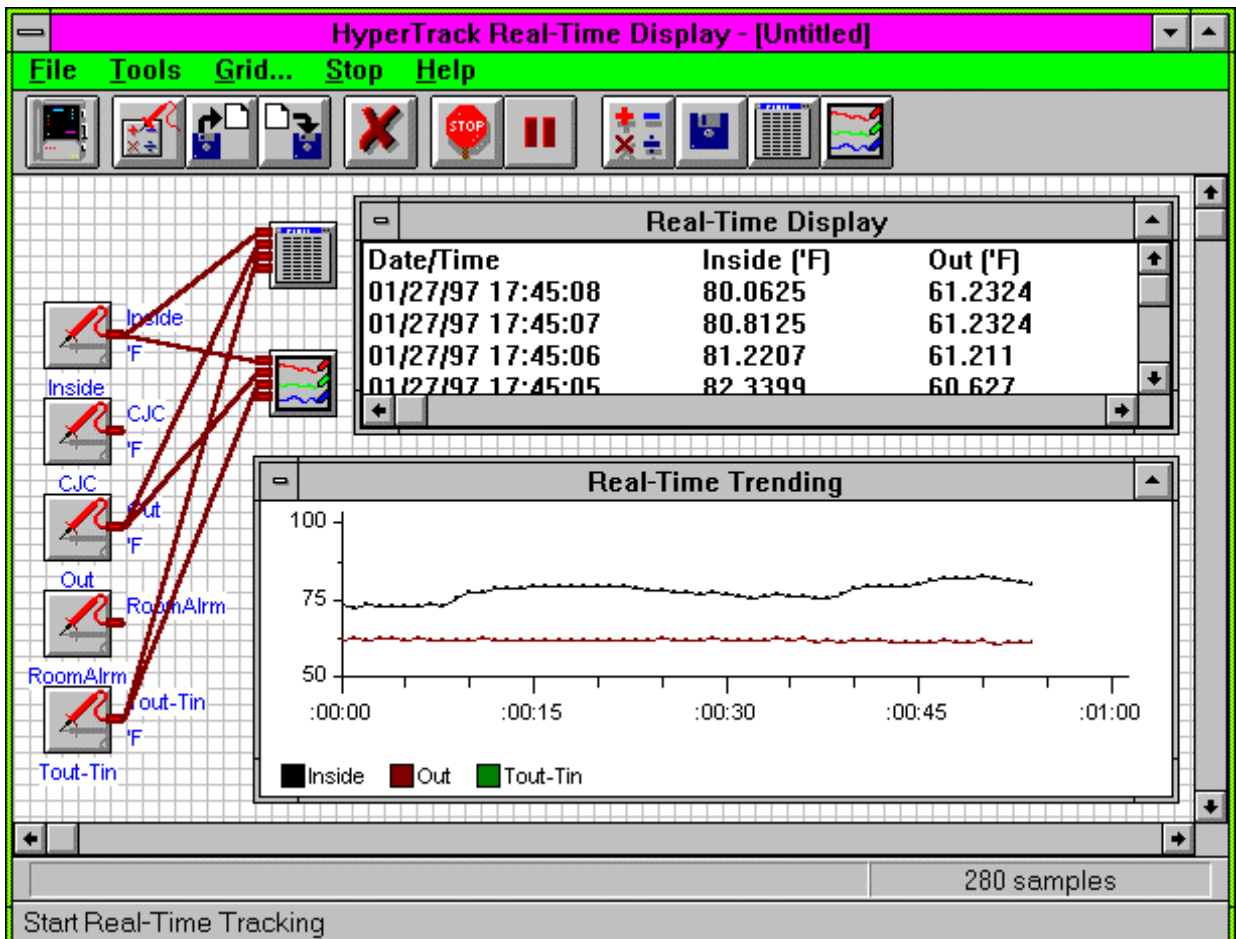


Figure 10... -1: Real-time tracking of data within the HyperTrack window

HyperTrack can operate via RS-232 or modem serial connections, allowing for the real-time monitoring of actual Program Net values from a remotely located HyperLogger.

To utilize the HyperTrack feature within HyperWare, the following steps are performed:

1. Develop and upload to the HyperLogger a Program Net which includes Probe Point icons at the Net nodes to be monitored.

10... HYPERTRACK™ REAL-TIME DATA DISPLAY

2. From within HyperTrack, construct a real-time HyperTrack Net.
(Note that this is a different Net than the Program Net uploaded into the HyperLogger memory. The HyperTrack Net runs on the PC)
3. Establish the serial connection between the PC and the HyperLogger
4. Enable real-time tracking

CONSTRUCTING A HYPERLOGGER PROGRAM NET FOR HYPERTRACK



Figure 10... -
2: Probe
Point icon

A HyperLogger that is to be used in the real-time tracking mode must be programmed with a Program Net that incorporates Probe Point icons. The Probe Point icons are connected to nodes within the Program Net that the User may want to monitor through HyperTrack. Not all nodes with Probe Point icons must be displayed on the PC during HyperTrack, however any node to be monitored must have a Probe Point icon.

Probe Point icons can be given a Name via the conventional icon configuration dialog box. This name is used as a column heading during real-time tracking (see the Master Icon Reference in Appendix A).

Figure 10... -3 shows a simple two thermocouple Program Net that has Probe Point icons to allow HyperTrack display of the two temperatures, Tinlet and Toutlet, and the cooling fan status FanStat.

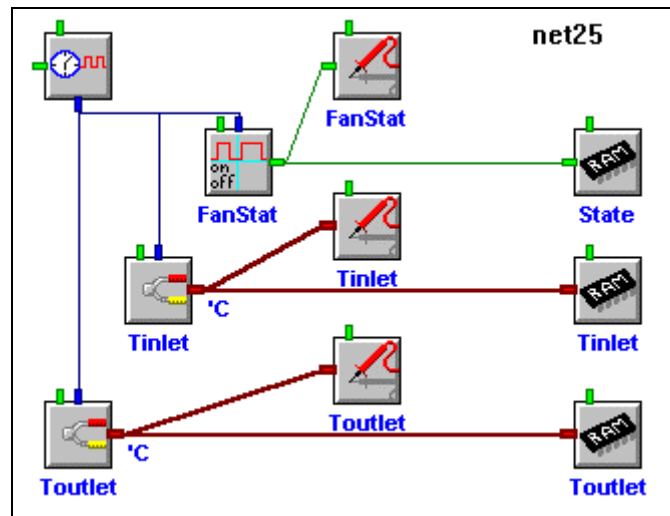


Figure 10... -3: Example Program Net with Probe Point icons connected for tracking (built in HyperNet window)

Nodes within the Program Net to which Probe Point icons are connected can also be displayed on the HyperLogger front-panel LCD real-time. Refer to Chapter 2 for real-time LCD display of Probe Point icons.

After completion of the Program Net, upload it to the HyperLogger memory. Refer to Chapter 7 for Program Net development and uploading procedures.

CONSTRUCTING A HYPERTRACK NET

During a real-time tracking session, the HyperLogger transmits values of the Probe Point icons to the PC via the serial link. These values are then processed through a HyperTrack Net running on the PC (in the HyperTrack window) and displayed.

HyperTrack Nets provide a means to perform additional processing of values from Probe Point icons before they are displayed. HyperTrack Nets can also provide storage of Probe Point icon values to a file on the PC while the real-time data is being received.

The HyperTrack Net is constructed much the same way as a Program Net is developed within HyperNet. The main difference is that a Program Net running in a HyperLogger receives its data from various hardware channels such as thermocouples whereas the HyperTrack Net receives its data from the Probe Point icons contained in the Program Net in an Enabled HyperLogger. Figure 10... -4 shows a completed HyperTrack Net.

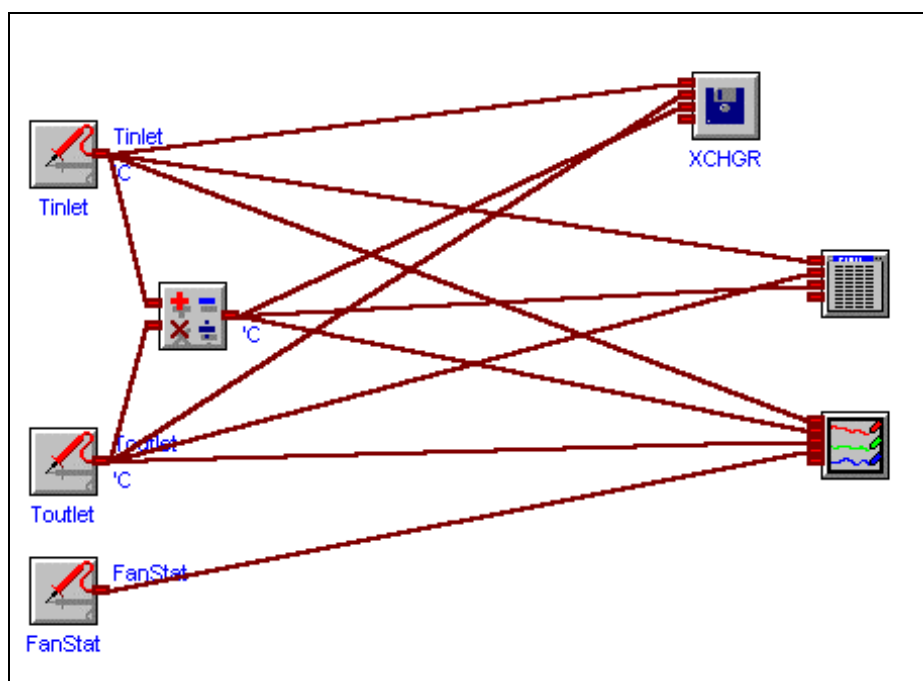


Figure 10... -4: Example HyperTrack Net (developed within the HyperTrack window)

Determining HyperLogger Program Net Probes Information

Before a HyperTrack Net can be developed, the Probe Point icons contained within the associated HyperLogger Program Net must be known. This information can be gained by downloading the Program Net from a serially connected HyperLogger or by opening the Program Net from disk (assuming it was saved after development).

Receiving Probe Point Icons from a serially connected HyperLogger):

1. Establish a serial connection with the HyperLogger to be used during the HyperTrack session. At this time, the HyperLogger has already been programmed with a

10... HYPERTRACK™ REAL-TIME DATA DISPLAY

Program Net that contains the desired Probe Point icons. The HyperLogger may be in either the Enabled or Stopped mode.

2. From the HyperComm Window, click and drag the Program Net icon on the HyperLogger to the PC and release it. The Program Net and Probe Point icon information will be automatically downloaded to the PC and a Probe Point icon will display overlaying the image of the PC. NOTE: If the Probe Point icon does not display on the PC, then the transferred Program Net does not contain Probe Point icon(s) and this Program Net can not be used for tracking. (In this case, develop a new Program Net containing Probe Point icons and upload it to the HyperLogger.)
1. From within the HyperComm Window, click on the HyperTrack button (or double click on the Probe Point icon overlaying the PC) and the HyperTrack window will appear with Probe Point icon(s) displayed on the left edge of the workspace (Figure 10... -5). These icons represent the Probe Point icons detected in the Program Net that was just downloaded to the PC (and which is

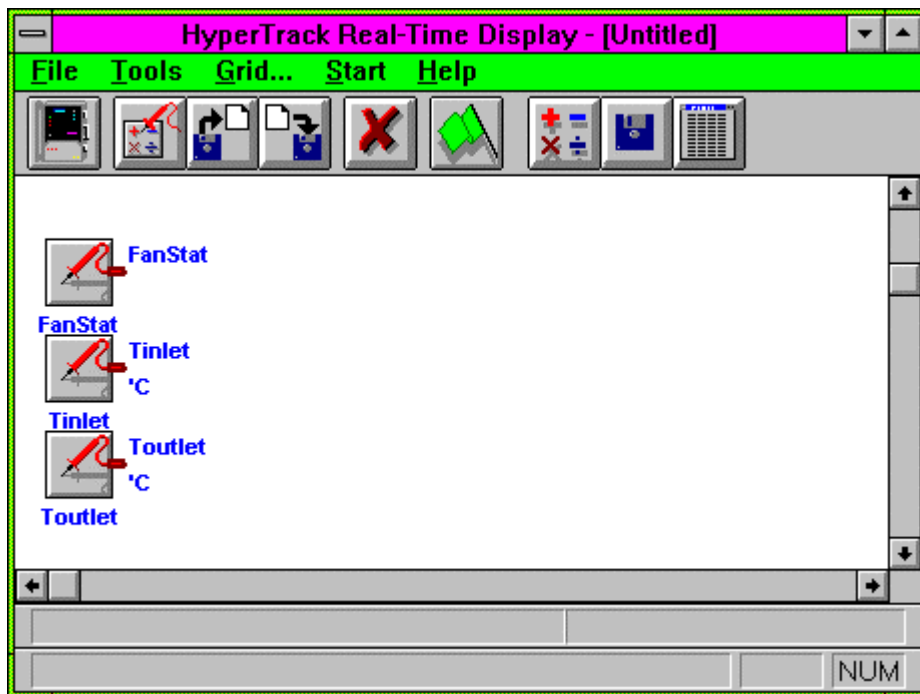


Figure 10... -5: Probe Points detected in the currently loaded Net Program

currently programmed in the HyperLogger's memory).

2. Once this Probe Point icon information is displayed on the workspace, it can be saved to a HyperTrack Net file (the filename extension *.PRB will be appended) by using the *File/Save As* drop-down menu selection. This file can then be used as a starting point for development of additional nets based on the same Program Net.

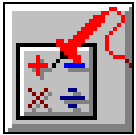
3. The HyperLogger connection can then be disconnected (eg to save long distance charges if connected via modem) while the HyperTrack Net is developed.

Reading Probe Point icons from a Program Net on disk:

If a copy of the Program Net that will be running in the HyperLogger during tracking is available on disk, this Program Net can be opened from disk and the Probe Point icon information will be available for HyperTrack Net development.

This method does not require establishing a serial link with the HyperLogger.

1. Switch to the HyperNet Window by clicking on the HyperNet button.
2. Open the Program Net file
3. Switch to the HyperComm Window by clicking on the HyperComm button, and a Probe Points icon should be overlayed on the PC. (If the Probe Point icon is not displayed, the Program Net selected does not contain any Probe Point icons and a new Program Net should be selected/developed.)
1. From within the HyperComm Window, click on the HyperTrack button (or double click on the Probe Point icon overlaying the PC) and the HyperTrack window will appear with Probe Point icons displayed on the left edge of the workspace. These icons represent the Probe Point icons in the Program Net currently programmed in the HyperLogger's memory.
2. Once this Probe Point icon information is displayed on the workspace, it can be saved to a HyperTrack Net file (the filename extension *.PRB will be appended) by using the *File/Save As* drop-down menu selection. This file can then be used as a starting point for development of additional nets based on the same Program Net.



**Figure 10...
-6:
HyperTrack
button**

Note: The Program Net icon overlaying the PC in the HyperComm Window represents the last Program Net loaded from disk (in the HyperNet Window) or the last Program Net downloaded from a serially connected HyperLogger. If the Program Net currently residing in the PC contains Probe Point icons, then that icon will also show overlaying the PC.

Building the HyperTrack Net

Icons

Three icons are available on the Icon Toolbar for use in construction of the HyperTrack Net, a Math icon, a File icon, and the Real-Time Scrolling Display icon.

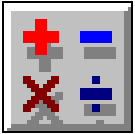


Figure 10... -
7: Math icon

MATH ICON

The Math icon provides algebraic processing of data as it passes from input to output. In Figure 10... -3 above, the Math icon is providing a differential temperature calculation and generating a third data channel, *Tdelta* which is then displayed as well as stored to file.

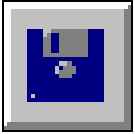


Figure 10... -
8: File icon

FILE ICON

The File icon represents storage to file of all signals connected to its inputs. Multiple inputs can be connected to the File icon and through its configuration dialog box, the data can be stored in an ASCII (*.TXT), HyperLogger Download (*.HLD), or Excel Spreadsheet (*.XLS) format.

Multiple File icons can be connected in a net for simultaneous storage of different signals and/or multiple file formats.

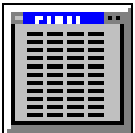


Figure 10... -
9: Real-time
Scroll icon

REAL-TIME SCROLLING DISPLAY ICON

Signals connected to the Scrolling Display icon will be displayed in a scrolling columnar format on the Workspace when tracking is enabled. Up to 8 inputs can be connected to this icon. No configuration dialog is available for this icon, double-clicking on it opens the scrolling display window.

Multiple Scrolling Display icons can be connected in a net allowing multiple HyperTrack windows to be displayed simultaneously for greater channel capability.

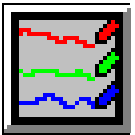


Fig 10... -
10: Real-
time Trend
icon

REAL-TIME GRAPHIC TRENDING DISPLAY ICON REAL-TIME GRAPHIC TRENDING DISPLAY

Signals connected to the Trending Display icon will be displayed in a multi-trace horizontal line graph format within the Workspace when tracking is enabled. Up to 8 inputs can be connected to this icon. No configuration dialog is available for this icon, double-clicking on it opens the scrolling display window.

Multiple Scrolling Display icons can be connected in a net allowing multiple HyperTrack windows to be displayed simultaneously for greater channel capability.

Connecting Icons

Icons are connected using the standard drag and drop connection method used for construction of Program Nets.

Unconnected Probe Point icons will not display.

Other HyperTrack Net Development Options

As in the development of a Program Net from within HyperNet, various tools such as Grid, Snap, and Print Net options are available from the Menu Bar.

Saving the HyperTrack Net

Upon completion of the Net, it can be saved for later use with the menu selection *File/Save Net As* or with the *Save Net* button.

Saved HyperTrack Nets should only be used for real-time tracking with HyperLoggers configured with Program Nets that contain matching Probe Point icons. If mismatched nets are used, channels may be incorrectly titled and displayed in incorrect sequence.

For example: A HyperTrack Net is developed and saved for use with a HyperLogger Program Net that includes 3 Probe Point icons labeled A, B, and C. Accidentally, the HyperTrack Net is used with a HyperLogger running a Program Net that contains only 2 Probe Point icons labeled X and Y. The resulting HyperTrack Net data display will result in two channels labeled A (displaying X data) and B (displaying Y data) and a third channel labeled C that just displays 0.

To avoid this confusion, check the correlation between the HyperTrack Net and the HyperLogger Program Net before Tracking.

STARTING A HYPERTRACK SESSION

Initiation of a HyperTrack session is handled from within the HyperTrack window. Before starting a session, the following conditions must be met:

- ◆ The HyperLogger must be programmed with a Program Net including Probe Point icons
- ◆ A serial connection between the HyperLogger and the PC must be established
- ◆ A compatible HyperTrack Net must be loaded and displayed on the HyperTrack window of HyperWare
- ◆ All File icons included within the HyperTrack Net must have filenames provided
- ◆ The HyperLogger must be Enabled

To start tracking, click on the Green Start button. Clicking on this button commands the connected HyperLogger to start sending out the Probe Point icon values, which are in turn processed by the HyperTrack Net on the PC. The Scrolling Display window(s) will automatically open and begin displaying data. Any Destination File icons will create the specified filenames and begin recording to that file.

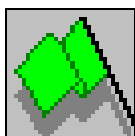


Figure 10... -
11: Start
Tracking
button

HyperTrack Scrolling Display Window

During real-time tracking, data from the signals connected to the Scrolling Display icon is displayed in a columnar format in the pop-up Scrolling Display window.

Channel Display Order

The order of display (left to right) of inputs is set by the order of connection of signals to the Scrolling Display icon. The top connection is displayed on the left and the bottom connection is displayed on the right.

Up to 8 channels can be displayed in the Scrolling Display window. Utilize the slide bar at the bottom of the window to view channels that are out of the window to the left or right.

Data Buffer

As new data is collected, older data will be scrolled down one line. Older data is still accessible after it has scrolled out of the window by clicking on the scroll bar buttons on the right side of the window.

HyperTrack Trending Display Window

During real-time tracking, data from the signals connected to the Trending Display icon is displayed in a multi-pen horizontal format in the pop-up Trending Display window. Time is plotted horizontally and input data amplitude is plotted vertically on a single axis.

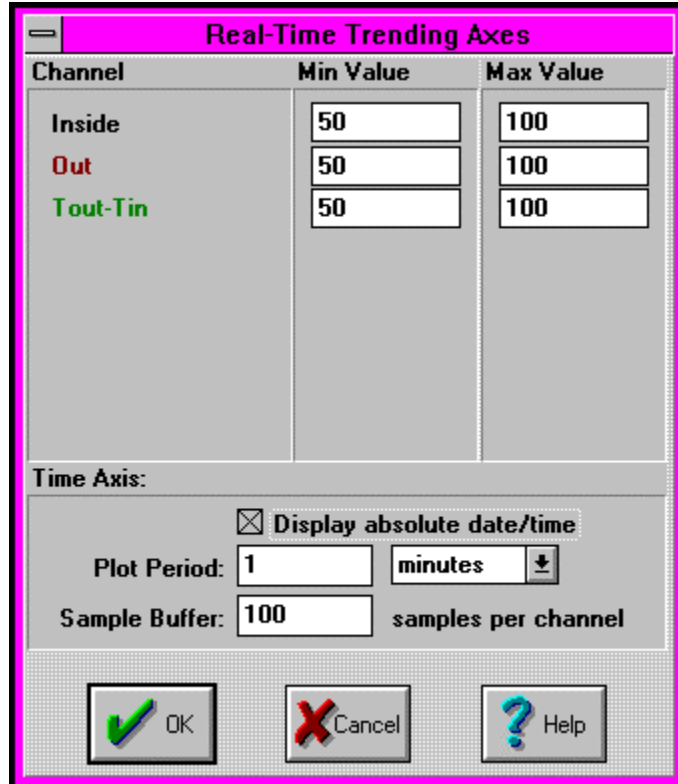
As time progresses, track data is buffered, scrolls off the left edge of the window, and is eventually deleted from the buffer (FIFO) as a function of the User defined settings explained below.

NOTE:

In cases where the HyperLogger is set for very fast sampling rates , the Trending function will put heavy video demands on the connected PC and PC's video card. In some cases, the PC will be unable to handle the high speed incoming data stream and the Trending display will not perform or will update very slowly. If this is the case, decrease the HyperLogger sampling rate or run HyperWare and the Trending function on a faster PC platform.

Trending Configuration Dialog

By double-clicking anywhere on the Trending Display Window, a Configuration Dialog is displayed (Figure 10... -12). This dialog allows for various User settings for the data display.



The dialog box is titled "Real-Time Trending Axes". It contains a table for channel settings and a section for time axis configuration.

Channel	Min Value	Max Value
Inside	50	100
Out	50	100
Tout-Tin	50	100

Time Axis:

☒ Display absolute date/time

Plot Period: 1 minutes

Sample Buffer: 100 samples per channel

Buttons: OK (Green Flag), Cancel (Red X), Help (Blue Question Mark)

Figure 10... -12: Real Time Trending Configuration dialog

NOTE: After changing any of the following settings, the Tracking session must be Stopped (click on the Stop Sign Button) and restarted (Green Flag). Changing any of the following settings during a Tracking session will result in a refresh of the display and clearing of buffered data.

Time Display Formats

Time is displayed on the horizontal axis and can be set for either Elapsed time since the start of the Track session (the default), or Absolute, in which the absolute calendar date and time is displayed. To select Absolute, click on the Display Absolute Date/Time checkbox.

Channel Ranges

The data channels are scaled and plotted per a single amplitude axis on the left edge of the plot. Upon start of a Trend Tracking session, the range for all channels defaults to +/-1000.

A Min. and Max. value for each channel can be set by editing the appropriate text boxes. If all of the channels have the same Min/Max values, then the vertical axis will reflect this range. For example if 4 channels of room temperature are being logged, all of the 4 channels could be set for 50 to 70 and the vertical axis would reflect this approximate range.

If the Channels have different Min/Max settings, the vertical axis will default to display as 0 to 100% of the range specified.

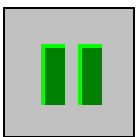
Data Buffer

As data is received by the Trending icon, it is buffered temporarily in PC memory. Eventually, the buffer fills and the oldest data is deleted as new data is added (FIFO). The amount of data that is buffered in the PC is set in the Trending Configuration dialog by editing the Sample Buffer text box.

Plot Period

The amount of data that is displayed in the Trending Window is set by editing the Plot Period setting in the Configuration Dialog. Older data (that has not rolled out of the buffer... see above) is still accessible after it has scrolled out of the window by clicking on the scroll bar buttons on the lower edge of the window.

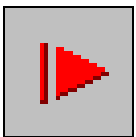
NOTE: Stopping, then restarting a HyperTrack session using a net containing File icons will cause the file information to be overwritten with new data. To save data from consecutive HyperTrack sessions, rename any connected File icon before restarting the HyperTrack session.



**Figure 10... -
13: Pause
button**

PAUSING A HYPERTRACK SESSION

By clicking on the Pause button on the toolbar, a HyperTrack session can be temporarily stopped if the data being recieved is of no concern. Any connected Destination File icons will stop writing to their files, *but will not close*.



**Figure 10... -
14: Resume
button**

RESUMING AFTER PAUSE

When in Pause mode, the Pause button will change into a Resume button. Clicking this button will resume normal Tracking operation and resume writing to any Destination File icons.

STOPPING A HYPERTRACK SESSION

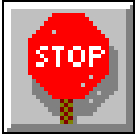


Figure 10... -
15: Stop
Tracking
button

To stop a real-time tracking session, click on the Stop button. Stopping a tracking session does not stop execution of the Program Net within the HyperLogger, it merely commands the HyperLogger to stop sending Probe Point values to the PC.

When a HyperTrack session is stopped, the files associated with any connected File icons are closed and the update of data to the Scrolling Display window stops.

NOTE: Stopping, then restarting a HyperTrack session using a net containing File icons will cause the file information to be overwritten with new data. To save data from consecutive HyperTrack sessions, rename any connected File icon before restarting the HyperTrack session.

10... HYPERTRACK™ REAL-TIME DATA DISPLAY

NOTES:

