

8... POST-PROCESSING OF COLLECTED DATA

OVERVIEW

Once data has been collected by the HyperLogger and downloaded to a HyperLogger Download file on the PC, a number of powerful data analysis and viewing options are available from within HyperWare. (See HyperComm, Chapter 5 for details on downloading data from the HyperLogger).

The Post-Processing window within HyperWare provides the capability to 'post-process' (ie process after collection) data in the following ways:

- ◆ Graphically plot collected data using HyperPlot
- ◆ Merge data from separate logging sessions into a single file for *Before* and *After* type performance comparisons
- ◆ Save HyperPlot graphs to bitmap (*.BMP) files allowing seamless inclusion into other Windows applications such as wordprocessors and spreadsheets
- ◆ Convert collected data into an Excel Version 4 (*.XLS) file
- ◆ Convert collected data into a date/time annotated ASCII (*.TXT) file
- ◆ Algebraically manipulate collected data and save to a new HyperLogger Download, Excel, or text file.

HyperPlot is a powerful graphing module included in HyperWare that can be used for immediate plotting of collected data.

File conversions and algebraic manipulation of collected data are handled by constructing a Post-Processing Net which converts downloaded data from a HyperLogger Download file to another User defined file/format.

POST-PROCESSING NETS

Post-Processing Nets provide a means to convert HyperLogger Download files to various formats and, if desired, perform additional algebraic processing of collected data as it is converted to the new file format.

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A Post-Processing 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

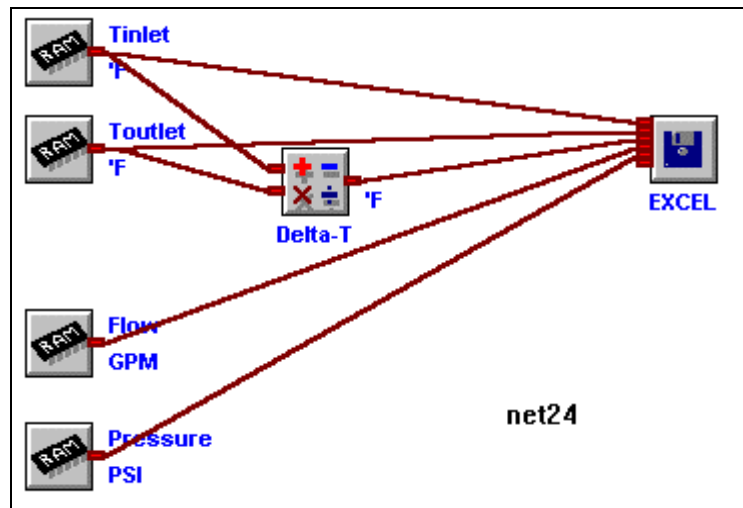


Figure 8... -1: Example Post-Processing Net

HyperLogger receives its data from various hardware channels such as thermocouples, then saves the collected data to HyperLogger memory. In contrast, Post-Processing Net receives its data from a HyperLogger Download file, processes the data, then saves the data in a destination file format. Figure 8... -1 shows a completed Post-Processing Net.

To perform a file conversion and view / analyze the collected data, the following steps are required:

- ◆ Switch to the Post-Processing window
- ◆ Open a HyperLogger Download file and construct a Post-Processing Net with icons and connections
- ◆ Specify the destination file format(s)
- ◆ Start the Post-Processing (ie run the Post-Processing Net)
- ◆ Launch the desired data review/analysis application (eg HyperPlot, Excel, Notepad, etc)

Entering the Post-Processing window

From within the HyperComm Window, click on the Post-Processing button and HyperWare will change to the Post-Processing window, Figure 8... -3.

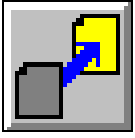


Figure 8...
-2: Post-Processing
button

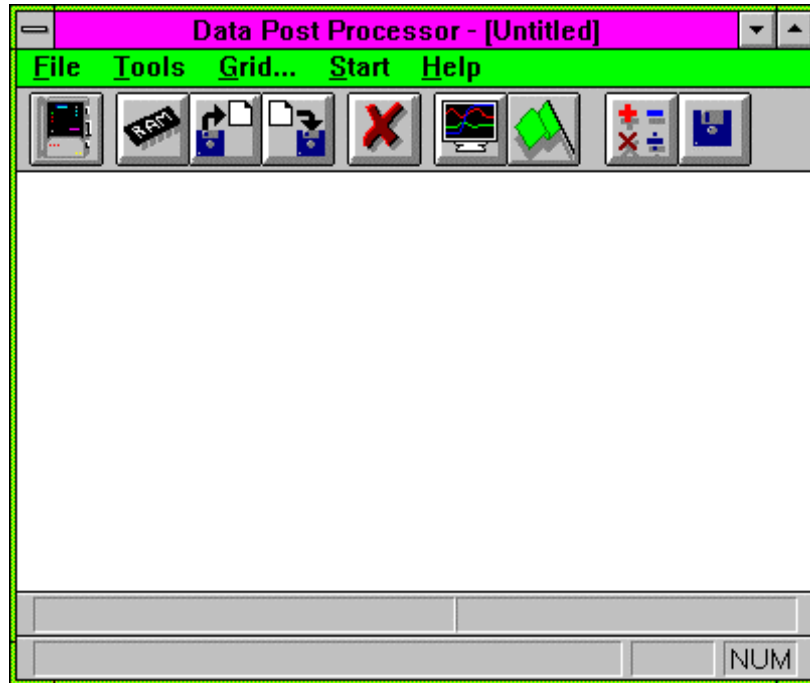


Figure 8... -3: Post-Processing window

Constructing a Post-Processing Net

Post-Processing Net construction utilizes similar icon placement and connection techniques as used during construction of a HyperLogger Program Net (Chapter 7) or a HyperTrack Net (Chapter 10).



Figure 8...
-4: Open
Download
File button

Opening a HyperLogger Download File (*.HLD)

The first step in Post-Processing of a HyperLogger Download file is to open the file to be processed. A source HyperLogger Download file containing the HyperLogger collected data is opened by clicking on the Open HyperLogger Download File button on the toolbar. Selecting the desired file will result in a display of Memory icons on the left side of the Post-Processing workspace. Each of the icons represents a channel of logged data contained within the HyperLogger Download file.

Reviewing File Information

After a Download file has been opened, the File Information entered at the time of Download can be reviewed. To see the Title and comments entered, select *File/Data File Information* from the menu. The comments are read-only and cannot be edited from within this window, however comments can be highlighted and copied/pasted to other documents.

Adding Icons

Two icons are available on the Icon Toolbar for use in construction of the Post-Processing Net; a Math icon and a File icon.

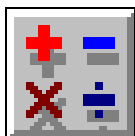


Figure 8...
-5: Math
icon

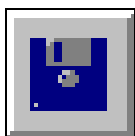


Figure 8... -
6:
Destination
File icon

MATH ICON

The Math icon provides algebraic processing of data as it passes from input to output. In Figure 8... -1, the Math icon is providing a differential temperature calculation and generating a third data channel, *Delta-T*, which is then stored to the destination file.

Double-click on the icon to open its configuration dialog box. See the Master Icon Listing in Appendix A for configuration details.

DESTINATION FILE ICON

The Destination File icon represents storage to file of all signals connected to its inputs. Up to 36 inputs can be connected to the File icon when it is used as an Excel file or 24 when used as an ASCII file. Each time a User adds a connection, an additional input terminal appears.

Double-clicking on the icon opens its Configuration dialog box. With the dialog box, the destination file data format can be specified as ASCII (*.TXT), HyperLogger Download (*.HLD), or Version 4.0 Excel spreadsheet (*.XLS) format. See the Master Icon Listing in Appendix A for configuration details.

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

Connecting Icons

Icons are connected using the standard drag and drop connection method as used for construction of HyperNet Program Nets. The order of connections made to the Destination File icon determines their sequence in the resulting file.

Unconnected Memory icons will not be processed nor included in the Destination File.

Other Post-Processing 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 Post-Processing 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. The saved Post-Processing Net can then be opened at a later time for conversion of additional HyperLogger Download files *that have the same channel configuration and filename*.

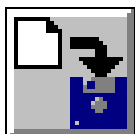


Figure 8...
-7: Save
Net button

An Example: Every day, a HyperLogger is downloaded and the data is run through the same Post-Processing Net which converts the data to an Excel spreadsheet. A Post-Processing Net could be constructed once and saved with the filename CONVERT.PST.

Each day, when the data is downloaded from the HyperLogger, a new filename is given to the HyperLogger Download file (eg Monday.hld, Tuesday.hld, Wednesday.hld, ...).

From within the Post-Processing window, the Post-Processing Net CONVERT.PST can then be opened, the Excel destination filename changed, then run. The Post-Processing Net will automatically check for compatibility, then connect to the open HyperLogger Download file and process the data into the new Excel destination file..

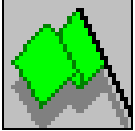


Figure 8...
-8: Start
Processing

STARTING A POST-PROCESSING SESSION

To start the conversion, click on the Green Start button and a Post-Processing status dialog will display as the file conversion proceeds.

VIEWING THE CONVERTED DATA

After the processing of the Net is complete, the converted data file can be viewed immediately by double-clicking on the Destination File icon. The application program (eg Excel, HyperPlot, Notepad, etc) associated with the Destination File type will be launched as specified under the *Options/Paths* menu within the HyperComm window and the converted file will be loaded automatically.

Options / Paths

Selecting the *Options / Paths* menu from the menu-bar in the HyperComm window displays a dialog for User specification of the directory paths and program filenames to use during the viewing of files from within the Post-Processing window. A text window is provided for User entry of the default path and program name for a spreadsheet program (eg Excel for viewing *.XLS destinations files) and for a text editor (eg Notepad for viewing *.txt destination files). Note that the Window Notepad application is for viewing text files smaller than 50K in size. For viewing larger data files, change the text editor to the DOS "EDIT.COM" or another text editor with large file capabilities.

If the Destination File icon has been configured for a HyperLogger Download file format (*.HLD), double-clicking on the icon will launch HyperPlot.

If the destination/converted file has been configured for either an Excel or an ASCII text file, it can also be opened without the use of HyperWare from within the respective application's normal Open file commands

A SHORTCUT TO HYPERPLOT...



Figure 8...
-9:
HyperPlot
button

For immediate graphic review of the first seven channels of data in a HyperLogger Download file, HyperPlot can be used without construction of a Post-Processing Net. Switch to the Post-Processing window, and immediately click on the HyperPlot button in the Tool Bar. The HyperLogger Download file to be viewed can then be selected via the *FILE/Open View* menu.

Detailed use of HyperPlot is explained in Chapter 9.

MERGING OF DOWNLOAD FILES

Through a special function in the Post-Processing Window, two Download files can be merged into a single Destination file. This is a powerful feature that can be used for generating *Before* and *After* type performance plots with HyperPlot.

For example, a pressure and temperature data logging session could be run on a process prior to process improvements being made. After the improvements have been made, the logging session could be repeated (using the same Program Net for comparison consistency). The data from the *Before* and *After* sessions could then be combined into a single file. This resulting file can then be plotted using HyperPlot. From within HyperPlot, individual plots times can be shifted, allowing for registration and comparison of the *Before* and *After* performance data.

The File Merge Process...

Two Download files can be opened and combined (merged) in the Post-Processing window as follows:

1. Open the first Download file in the usual manner by double-clicking on the Open Download File button (or selecting *File/Open Download Data File* from the menu bar).
File Information can be viewed by selecting the File/Data File Information choice from the Menu Bar.
2. Open the second Download file by selecting *File/Open Secondary Data File* from the drop-down Menu Bar. A second group of Memory icons will display within the window.
File Information on this second Source file can be viewed by selecting the File/Data File Information choice from the Menu Bar and clicking on *NO*.
3. Drag and drop a Destination File icon onto the workspace and add connections from the Memory icons (to be included in the Destination File) to the Destination File icon.
Double-click on the Destination File icon and specify a filename and type of file.
4. Click on the Start Post-Processing (green flag) button and the files will be merged into one Destination File.

Merged File Characteristics

After a Merge of two Download files, the resulting file will contain data and Channel Names from both the First and the Second source files. However, additional File Information such as Starting Time/Date, comments, etc. will be pulled from ONLY the first source file. Additionally, both file's channel data will adjusted to start at the same date/time.