
ControlShop™

FTTrend

Version 2.03

By FasTrak SoftWorks, Inc.

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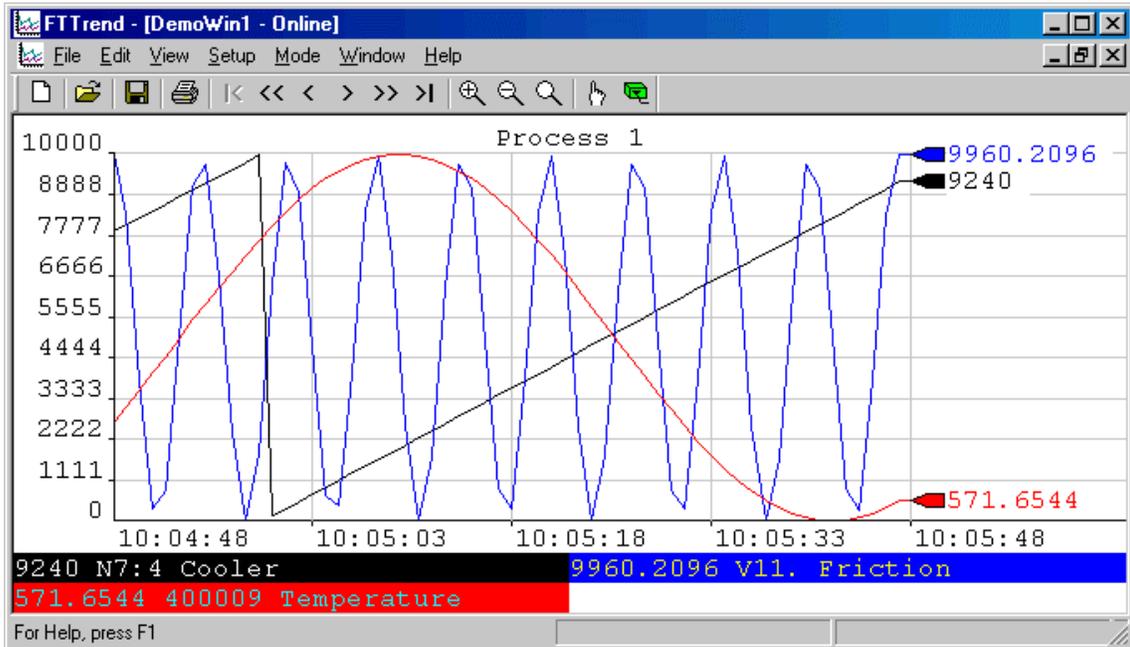
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FTTrend Overview

FTTrend is an application that enables graphical trending of real-time and logged data from multiple devices. A data trend is illustrated by graphing a series of data values collected for a data point over a period of time. A line connects the values to each other. The real-time access to devices is handled through FasTrak or OPC Data Access Version 2.0 communication servers and the logged data comes from a Microsoft Access or SQL database file created by FTLogger or FTTrend.



FTTrend is an MDI (multiple document interface) application - several trend graphs can be open at the same time. All the trend graphs and their settings will be saved into one .trn file (this includes all the data points). All configured devices will be saved into one .cfg file whose name is saved in the .trn file. A second file format (.trh) is available through 'Export'. This file format will represent historical data points in a "read only" environment that have been collected from a prior trend.

Documentation for each configured device is saved to a separate Microsoft Access or SQL database. The database can be shared with other FasTrak applications, such as WorkShop.

Online/Offline

When a trend window is **Online**, real-time data is read from the devices and plotted. When a trend window is **Offline**, real-time data is not read or shown, but the chart still shows logged data. When there are multiple trend windows, each window has a separate online/offline status. I.e. one can be online while another is offline.

To start real time trending, select the **Mode/Online** menu option, or click the toolbar button: 

To stop real time trending, select the **Mode/Offline** menu option, or click the toolbar button: 

NOTE: When plotting logged data, the graph will automatically start after the **Graph Data** dialog box has been configured.

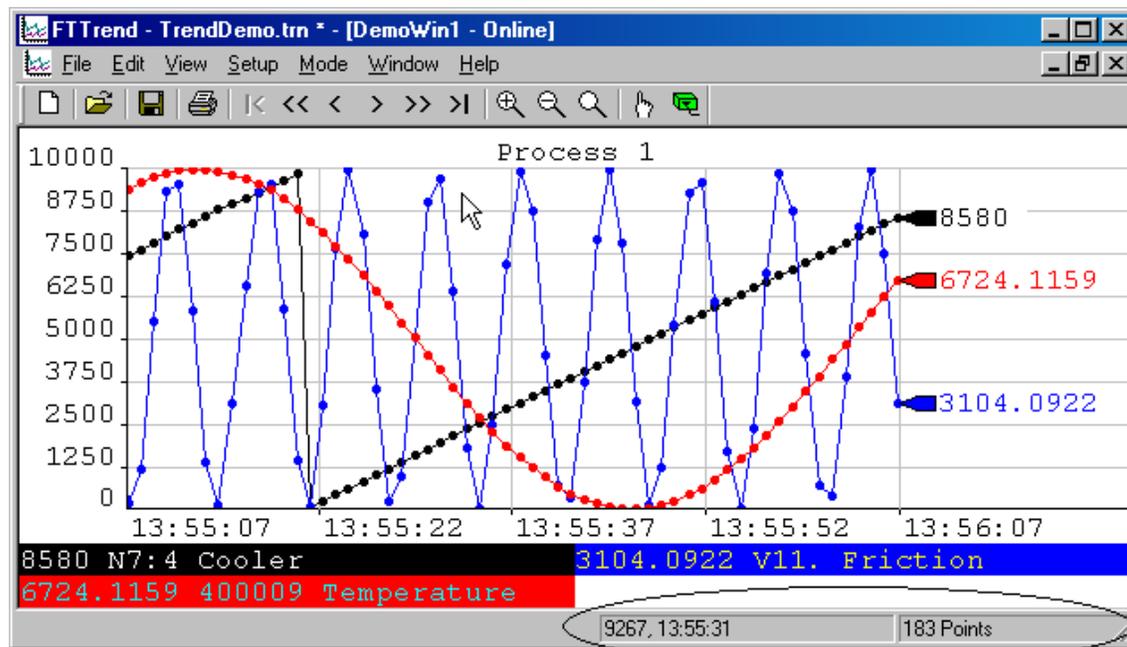
Viewing Time Periods

To view different time periods on a graph, select from the following options under the **View** menu:

- **Graph Begin** (| <): Displays the graph start time/date. This is disabled if neither **Use Start Time** nor **Use Start Date** boxes are checked in the X-Axis tab of the **Graph Settings** property sheet.
- **Prev Page** (< <): Goes one page into the past. The time range on a page is defined in the X-Axis tab of the **Graph Settings** property sheet.
- **Prev Time** (<): Goes one time interval into the past. Vertical grid lines on the graph mark each time interval.
- **Next Time** (>): Goes one time interval into the future.
- **Next Page** (> >): Goes one page into the future. The time range on a page is defined in the X-Axis tab of the **Graph Settings** property sheet.
- **Graph End** (> |): Goes to current time for real-time data trending or end of time period for logged data.
- **Zoom In**: Each time **Zoom In** is selected it cuts displayed time in half starting from the middle time period, effectively showing more detail but not as much time.
- **Zoom Out**: Each time **Zoom Out** is selected it doubles the displayed time starting from the middle time period, effectively showing less detail but more time.
- **Reset Zoom**: Returns the zoom to the data range configured for the X-Axis.

Status Bar

The **status bar** appears at the bottom right corner of the FTTrend window when the mouse cursor is within the x and y axis boundary of a graph.



Status bar

The first section shows the mouse cursor location in graph terms. The first number shows the Y axis value, the second the time. In the image above, the mouse cursor is near the top (10,000) - at 9267, to be precise. The mouse cursor is at the part of the graph representing a time between 13:55:22 and 13:55:37 - 13:55:31, to be precise.

The second shows the number of data points currently displayed. In the image, the data point markers are set to circles. There are 183 of them in this example.

Trend History File

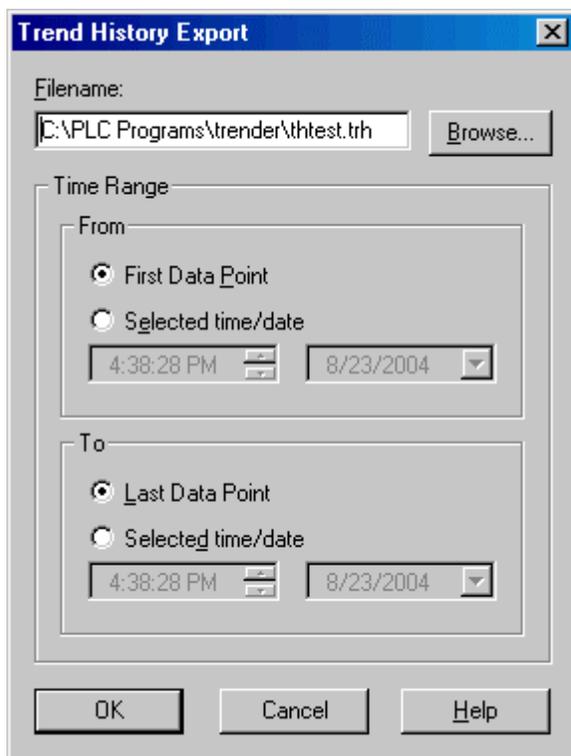
A **trend history file** is an offline, read-only snapshot of a trend graph.

Trend history files are a convenient way to present trend data:

- All information for a trend history file is saved to one .trh file.
- No security key is needed to view trend history files.
- No knowledge of FTTrend is needed to view trend history files. Simply load the file and view the trend.

To create a trend history file:

1. Open a trend project (.TRN file) or create a graph and add one or more data points.
2. When the desired data (real-time or logged) is in the graph, select the **File/Export/Trend History** menu option. Be sure the desired real-time data has not been deleted as a result of the deletion setting on the **database tab**.



3. Select a file name and time range:
 - **Filename:** Select the file name for the trend history file. The extension will be .TRH
 - **Time Range:** Select the data to be stored in the trend history file. Data points in this range will be copied to the trend history file.
 - **First Data Point / Last Data Point:** Automatically select a time range that includes the first/last data point on the graph. Logged data points for addresses that are not on the graph are ignored.

To view a trend history file:

1. Install FTTrend on the computer where the history file will be viewed, if it is not already installed. No security key is needed if the **/readonly** command line option is used.

2. Copy the trend history (.TRH) file to the computer. The .TRH file is self-contained - no other files are needed.
3. Either launch the .TRH file from the Windows Explorer or start FTTrend and use the **File/Open** menu option to open the .TRH file.

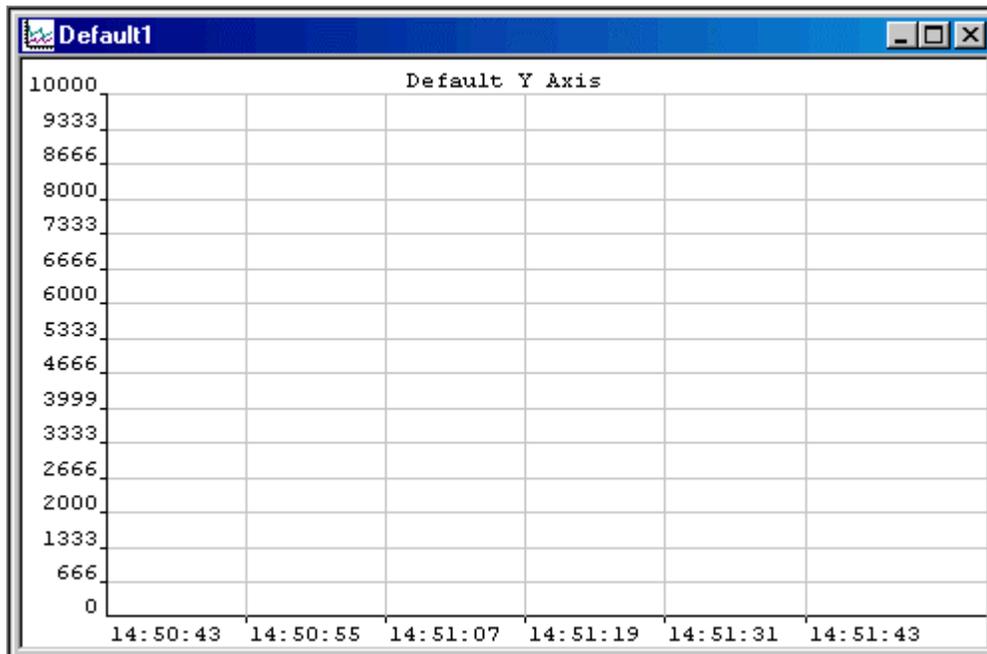
There are several restrictions when using trend history files:

- Trend history files are read only. It is possible to change some of the options while viewing a trend history file, but the changes cannot be saved.
- Trend history files are always offline. You cannot switch to online mode while viewing a trend history file.
- You cannot create a new file while viewing a trend history file.
- Data points cannot be added or deleted.
- The start time and date for a trend history file are fixed.

Creating a Trend Window

To create a new **Trend Window**:

1. Launch FTTrend.
2. Select the **File/New** menu option or click the corresponding toolbar button: 



The next step is to **configure devices**.

Device Source Configuration

Device Source Configuration

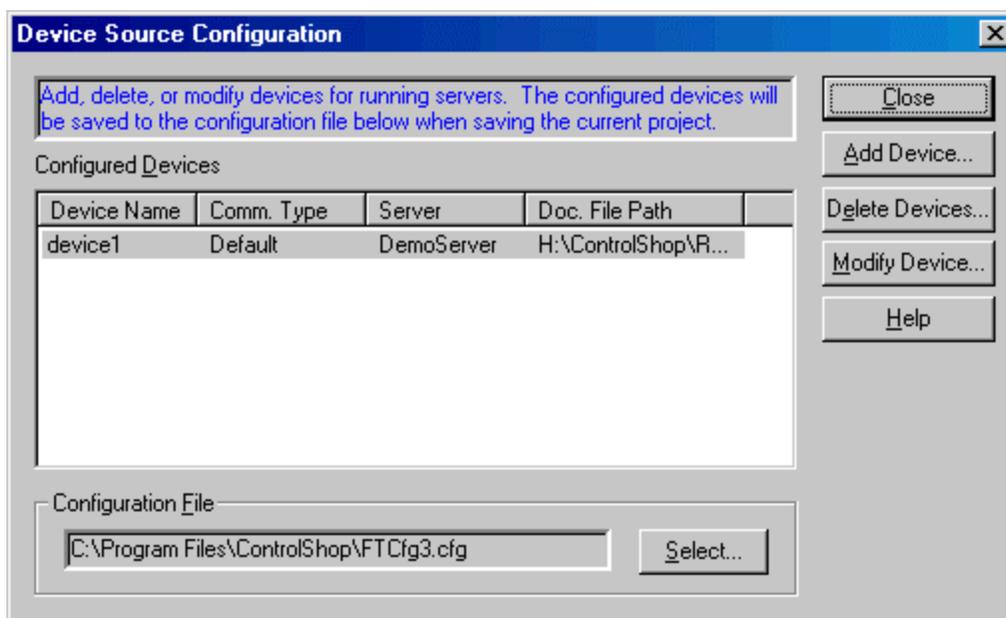
The **Device Source Configuration** dialog allows you to configure the devices from which data points are read.

For each device, FTTrend requires the following information:

- **Device Name:** A name to identify the device.
- **Comm Type:** The communication system - COM port, TCP/IP, etc. The options depend on the device.
- **Server:** Communication servers are shared between FasTrak applications, allowing multiple applications to communicate with the same devices at the same time.
- **Doc File Path:** The documentation database, which holds the address documentation for the device. To share documentation (for example, from the shared documentation database for a WorkShop program) set the **File Path** to the shared documentation database. If you set the **File Path** to a database that does not exist, a new database will be created.
- **Communications parameters:** Configuration for communications between the PC and the device. This information is not shown in the table. See **Communication Setup** for details.

To configure devices:

1. Select the **Setup/Device Source** menu option or the corresponding toolbar button:  The Device Source Configuration dialog appears.



2. Use the buttons to access the configuration actions:
 - **Add Device:** Add a new device to the list.
 - **Delete Devices:** Delete the configuration for one or more devices.
 - **Modify Device:** Edit the highlighted device configuration.

- **Configuration File:** The configuration is saved in a .CFG file, not the .TRN Trend file. Click the **Select** button to select the configuration file where the information will be stored when the trend (.TRN file) is saved.

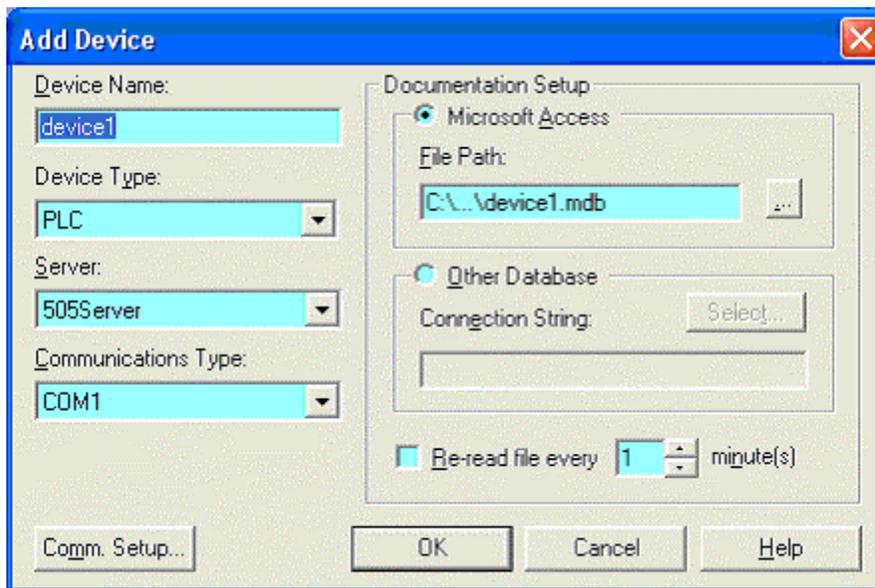
Adding Devices

To add a device to the current configuration:

1. Bring up the **Device Source Configuration** dialog by selecting the **Setup/Device Source** menu item or the corresponding toolbar button:



2. Click the **Add Device** button. The **Add Device** dialog appears.



3. Configure the new device, and click the **OK** button.
 - **Device Name:** Enter a name to identify the device. The device name must be unique.
 - **Device Type:** Select the type of device.
 - **Server:** Select the communication server. Communication servers are shared between FasTrak applications and OPC clients, allowing multiple applications to communicate with the same devices at the same time. The drop-down list shows the communication servers that have been installed on the computer.
 - **Communications Type:** Select the type of communications that connects the PC to the device. The options depend on the communications server selected above.
 - **Comm Setup:** Configure communications between the PC and the device. See **Communication Setup** for details.
 - **Documentation Setup:** Configure the documentation database, which holds the address documentation for the device. To use existing documentation (for example, from the shared documentation database for a Workshop program) set the **File Path** to the shared documentation database. If you set the **File Path** to a database that does not exist, a new database will be created.
 - **Re-read file every:** This option should only be selected when sharing the database with other applications and if the database is under development. To keep documentation up-to-date, check the box and set the number of minutes to control how often the documentation database should be checked for changes.

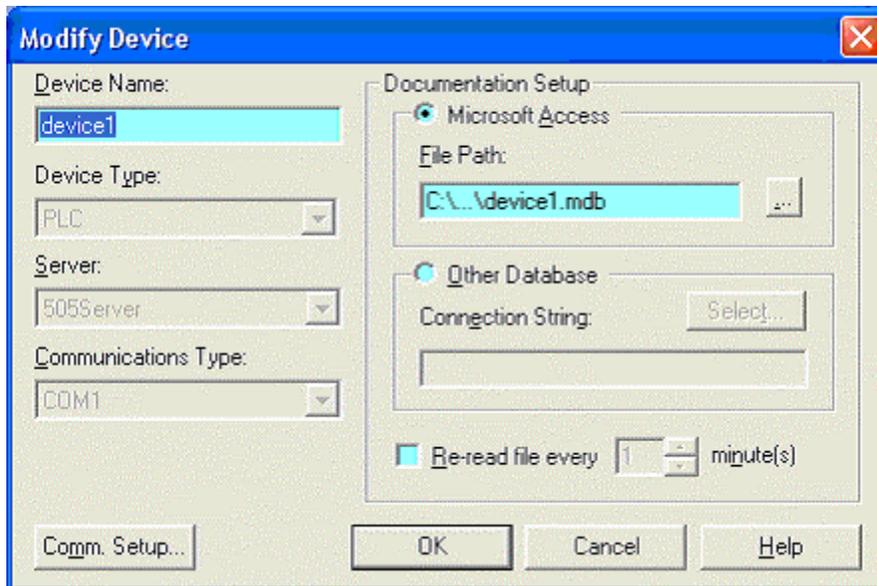
Modifying Devices

To modify a device that is already configured:

1. Bring up the **Device Source Configuration dialog** by selecting the **Setup/Device Source** menu item or the corresponding toolbar button:



2. Highlight the device in the list and click the **Modify Device** button, or double-click the device in the list. The **Modify Device** dialog appears.



3. Modify the device, and click the **OK** button.
 - **Device Name:** Enter a name to identify the device. The device name must be unique. Unlike the **Add Device** dialog, when we modify the device name here, the documentation filename does not change.
 - **Documentation Setup:** Configure the documentation database, which holds the address documentation for the device. To use existing documentation (for example, from the shared documentation database for a **WorkShop** program) set the **File Path** to the shared documentation database. If you set the **File Path** to a database that does not exist, a new database will be created.
 - **Comm Setup:** Configure communications between the PC and the device. See **Communication Setup** for details. If no trend windows are online with this device then the communication settings can also be modified. If the device is online then the communication settings can be viewed but cannot be modified.
 - **Re-read file every:** This option should only be selected when sharing the database with other applications and if the database is under development. To keep documentation up-to-date, check the box and set the number of minutes to control how often the documentation database should be checked for changes.

Deleting Devices

To delete a device from the current configuration:

1. Bring up the **Device Source Configuration dialog** by selecting the **Setup/Device Source** menu item or the corresponding toolbar button:



2. Click the **Delete devices** button. The Delete Devices dialog appears.



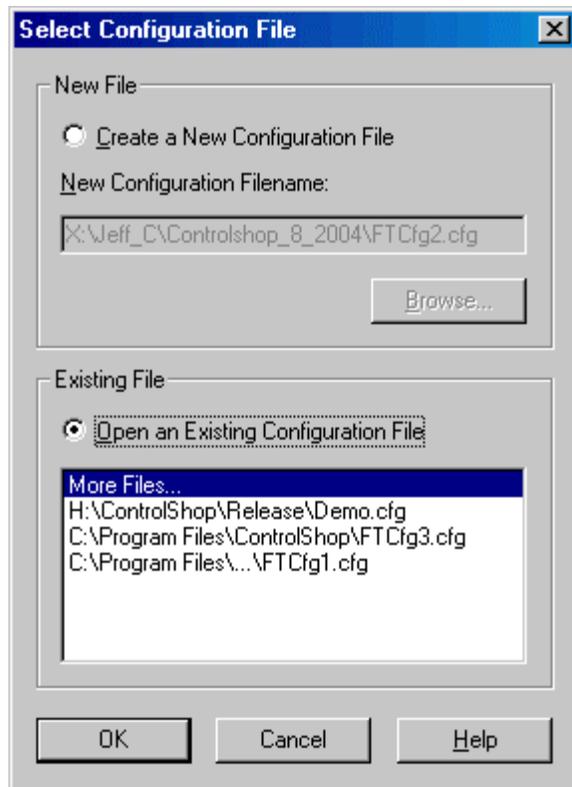
3. Select the **Server** that controls the devices to be deleted. The Device Names list shows the devices configured for that server.
4. Select the device(s) to be deleted. To delete all the devices for a server, click the **Select All** button.
5. Click the **OK** button.

Select Configuration File

The configuration, which holds the device source configuration information, is saved in a .CFG file, not the .TRN Trend file.

To select the configuration file:

1. Select the **Setup/Device Source** menu option or the corresponding toolbar button: 
2. Click the **Select** button in the **Configuration File** area. The **Select Configuration File** dialog appears.



- **New File:** To create a new configuration file, select the **Create New Configuration File** option button and **Browse** for the file name and location.
- **Existing File:** To select an existing file, select the **Open an Existing Configuration File** option button. If the desired file is in the list, click it. Otherwise, click the **More Files** line in the list and browse for the file.

Communication Setup

The **Communication Setup** dialog configures communication between the PC and one of the configured devices. It varies depending on the type of device and the type of communication.

To configure communication:

1. Open the **Device Source Configuration** dialog by selecting the Setup/Device Source menu option or clicking the corresponding toolbar button: 
2. Open the configuration dialog for the device, by clicking the **Add Device** button or selecting the device in the list and clicking the **Modify Device** button. When modifying an existing device, if a data point on the device is used in a graph that is currently online, the communication setup can be viewed but not edited.
3. Select the **Server**, if possible. The **Server** and **Communications Type** cannot be changed in an existing device.
4. Select the **Communications Type**, if possible.
5. Click the **Comm Setup** button.

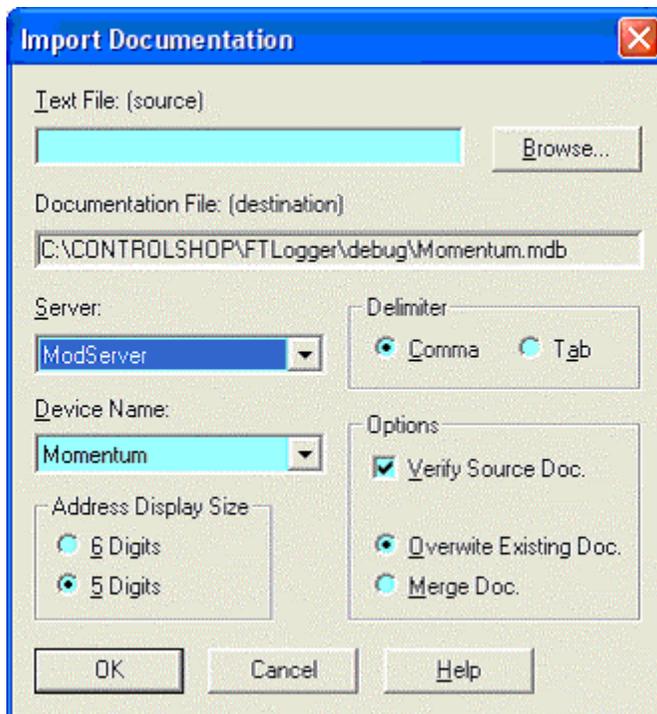
Import/Export Documentation

Import Documentation

Documentation for a device can be imported from a text file into the existing database.

To import documentation:

1. Select the **File/Import Documentation** menu option. The **Import Documentation** dialog appears.



2. Select the source file by typing in the **Text File (source)** field or by clicking the **Browse** button.
3. Select the communication **Server** for the device which will receive the imported documentation. The list shows servers that are registered on the computer.
4. Select the **Device Name**. The list shows device configuration entries that are connected via the server selected above. The documentation database that corresponds to the selected device will be the recipient of the import.
5. If the **Server** is set to **ModServer**, select the option button for either **6 Digits** or **5 Digits**. The options are not visible for other servers.
6. The fields in the text file may be separated by either tabs or commas. Select the **Delimiter** by selecting the appropriate option button.
7. Set the **Options** as desired:
 - **Verify Source Doc:** Check the box to verify tags, addresses, and the source file format. Clear the box for a faster import process.
 - **Overwrite Existing Doc:** When this option is selected, the database is cleared, so the imported documentation is all the documentation. If an address is in the database but not in the imported file, the information in the database is lost.

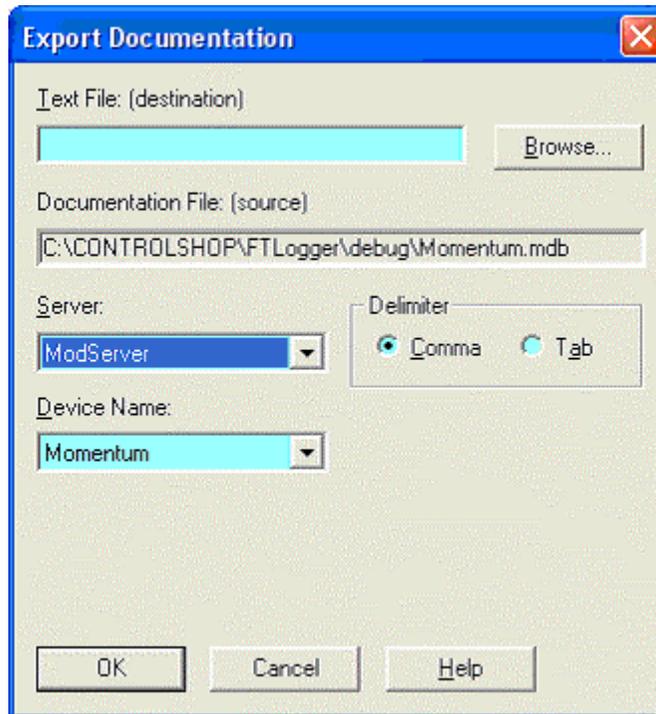
- **Merge Doc:** When this option is selected, the imported documentation is merged into the database. If an address is in the imported file but not in the database, it is added to the database. If an address is in the imported file and already in the database, you will receive a warning. The address in the database will remain. If an address is in the database but not in the imported file, the database information is left as is.

Export Documentation

Documentation for a device can be exported from the database to a text file, for editing in an outside program such as Microsoft Excel, or for import into another application.

To export documentation:

1. Select the **File/Export Documentation** menu option. The **Export Documentation** dialog appears.



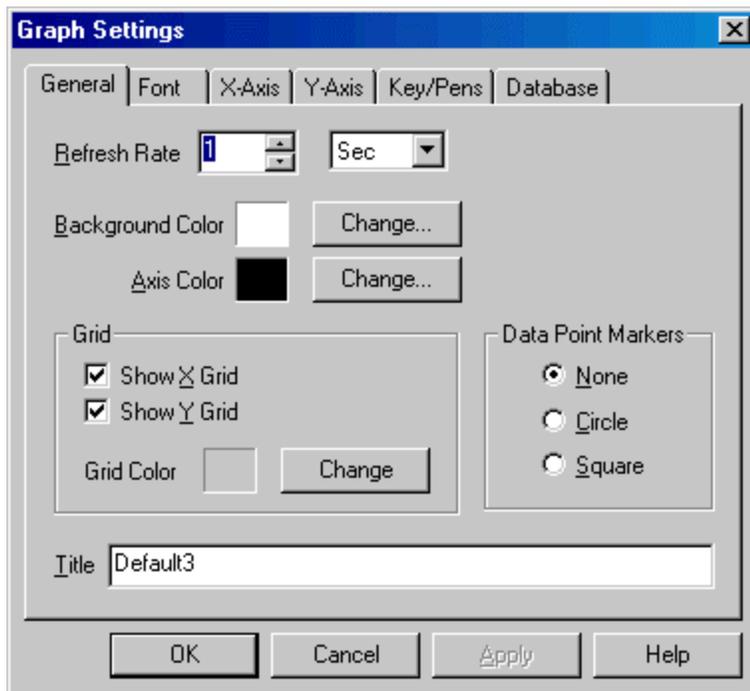
2. Select the destination file by typing in the **Text File (destination)** field or by clicking the **Browse** button.
3. Select the communication **Server** for the device. The list shows servers that are registered on the computer.
4. Select the **Device Name**. The list shows device configuration entries that are connected via the server selected above. the documentation database that corresponds to the selected device will be the source of the exported information.
5. The fields in the text file may be separated by either tabs or commas. Select the **Delimiter** by selecting the appropriate option button.

Graph Settings

Graph Settings

To configure the graph settings:

1. Select the **Setup/Graph** menu option. The **Graph Settings** property sheet is displayed.



The tabs on this property sheet are:

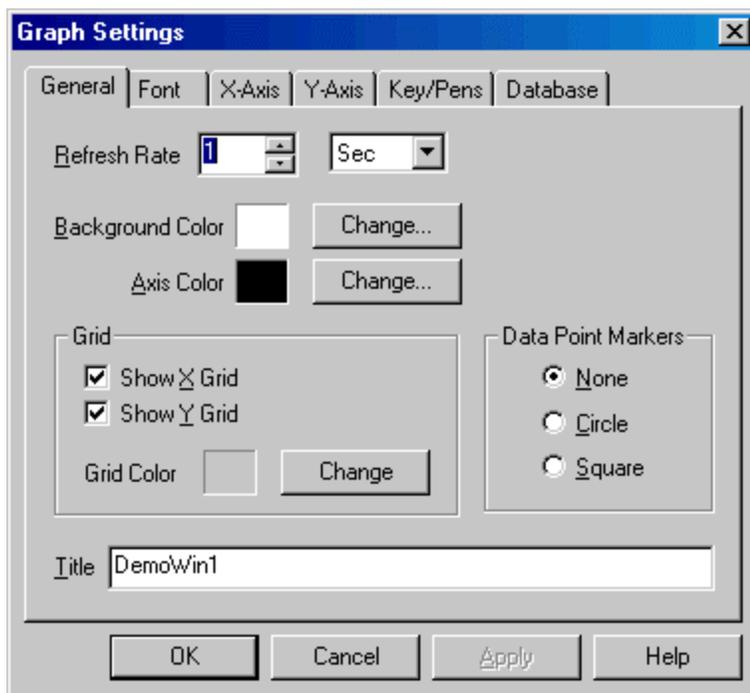
- **General:** This tab configures the general appearance of the graph.
- **Font:** This tab configures the font used for characters in the graph.
- **X-Axis:** This tab configures time scale, and related details, of the graph.
- **Y-Axis:** This tab configures data range, and related details, of the graph.
- **Keys/Pens:** This tab configures how the data is labeled on the graph.
- **Database:** This tab configures the database where data for real-time points is stored.

General Tab

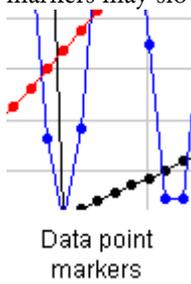
This tab configures the general appearance of the graph.

To configure the graph:

1. Select the **Setup/Graph** menu option.
2. Click the **General** tab.



- **Refresh Rate:** The time between screen updates. This value should not be confused with a data point sample rate, which is configured for each data point.
- **Background Color:** Sets the color of the graph background.
- **Axis Color:** Sets the X and Y-axis color.
- **Grid:** Turns on and off the X and Y reference lines.
- **Grid Color:** Sets the color of the X and Y reference lines.
- **Data Point Markers:** Mark data that has been read from the device. Displaying data point markers may slow the screen update.



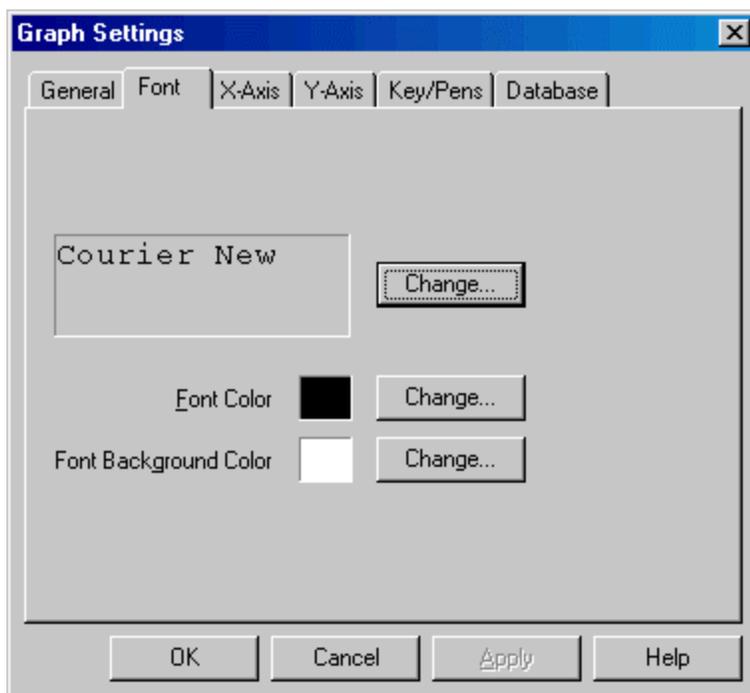
- **Title:** The name of the graph. Any name up to 64 characters can be used.

Font Tab

This tab controls the font used for characters in the graph.

To set the font:

1. Select the **Setup/Graph** menu option.
2. Click the **Font** tab.



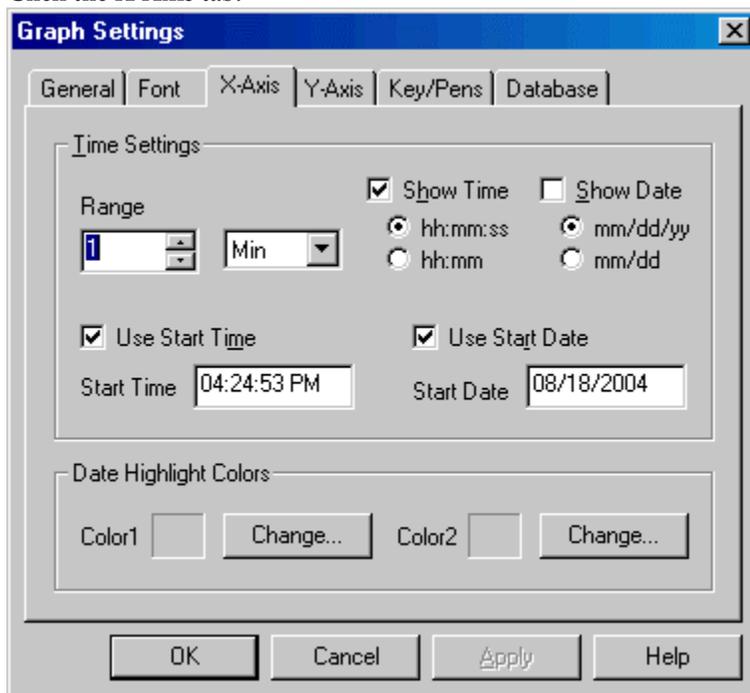
- **Font name (Courier New, by default):** Set the typeface.
- **Font Color:** Set the default color for lettering. In some parts of the graph, the color is controlled by the **Data Point** configuration.
- **Font Background color:** Set the default color to appear behind lettering. In some parts of the graph, the color is controlled by the **Data Point** configuration.

X-Axis Tab

This tab configures the time scale and related details.

To configure the X-Axis:

1. Select the **Setup/Graph** menu option.
2. Click the **X-Axis** tab.



Time Settings

- **Range:** Sets the length of time that is visible at once.
- **Show Time:** If this box is checked, the time is displayed at the bottom of the graph, in the selected format.
- **Show Date:** If this box is checked, the date is displayed at the bottom of the graph, in the selected format.
- **Use Start Time, Use Start Date:** If either of these boxes is checked, the graph will start with the specified date and/or time. The graph will not animate (move so that the current time is at the right edge of the graph).

Date Highlight Colors

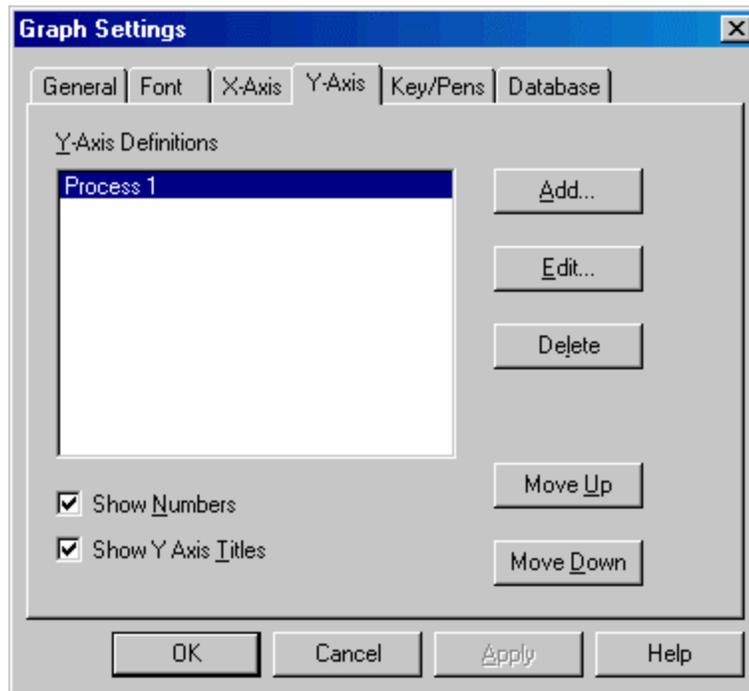
- **Color 1, Color 2:** If the date is shown (the **Show Date** box described above is checked) the dates are shown on alternating color backgrounds. These settings control those background colors.

Y-Axis Tab

This tab configures data range, and related details, of the graph.

To configure the Y-Axis:

1. Select the **Setup/Graph** menu option.
2. Click the **Y-Axis** tab.



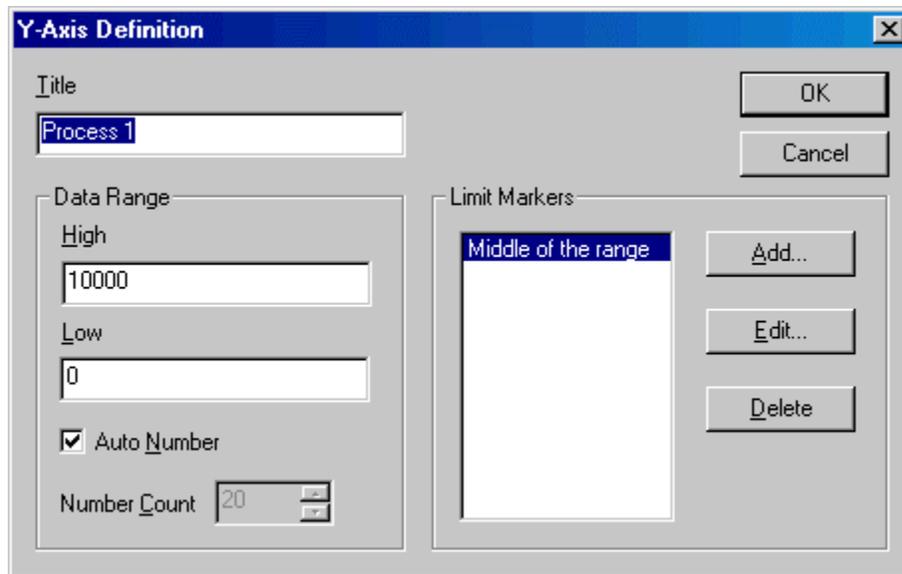
The check boxes apply to the display as a whole:

- **Show Numbers:** Show numbers at the left of the graph, indicating what value each horizontal line represents.
- **Show Y Axis Titles:** Show the title for each Y-Axis at the top of the graph.

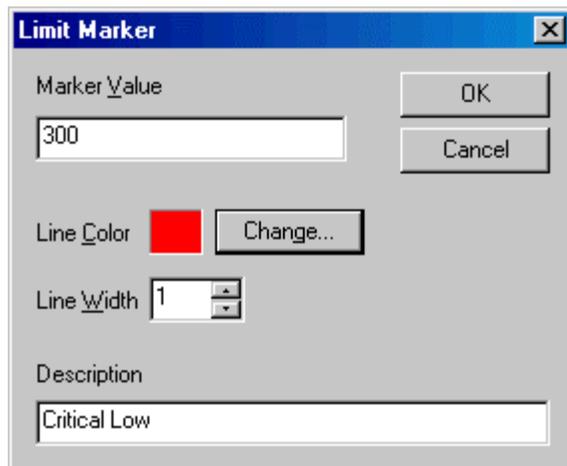
There can be up to 16 different Y-axis definitions per trend graph. The following buttons manage Y-axis definitions:

- **Add:** Add a new Y-axis definition.
- **Edit:** Edit the highlighted Y-axis.
- **Delete:** Delete the highlighted Y-axis.
- **Move Up, Move Down:** Move the highlighted Y-axis in the list. This controls the order in which they appear on the graph.

When you click the **Add** or **Edit** button, the **Y-Axis Definition** dialog appears.



- **Title:** Text to identify this Y-Axis. If the **Show Y Axis Titles** box is checked, the title will appear on the graph.
- **Data Range High, Low:** Specify the values represented by the top and bottom of the Y-Axis. The **High** must be more than the **Low**.
- **Auto Number:** Let FTTrend decide how many lines to divide the range into.
- **Number Count:** Specify the number of lines to divide the range into.
- **Limit Markers:** Static horizontal lines to provide a visual reference for specific values. Click the **Add** button to add a marker, the **Edit** button to edit the highlighted marker, the **Delete** button to remove the highlighted marker. When you click the **Add** button or the **Edit** button, the **Limit Marker** dialog appears.



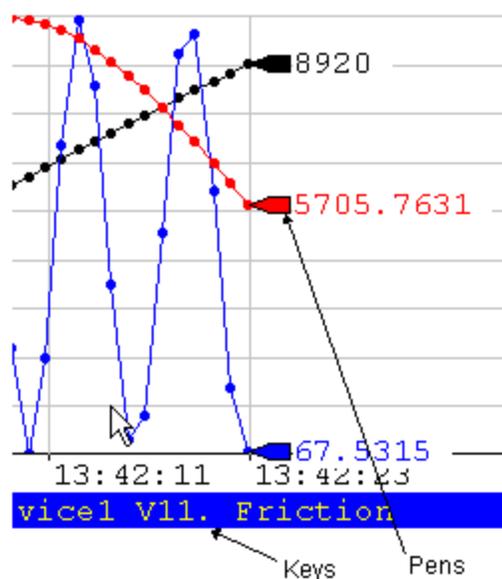
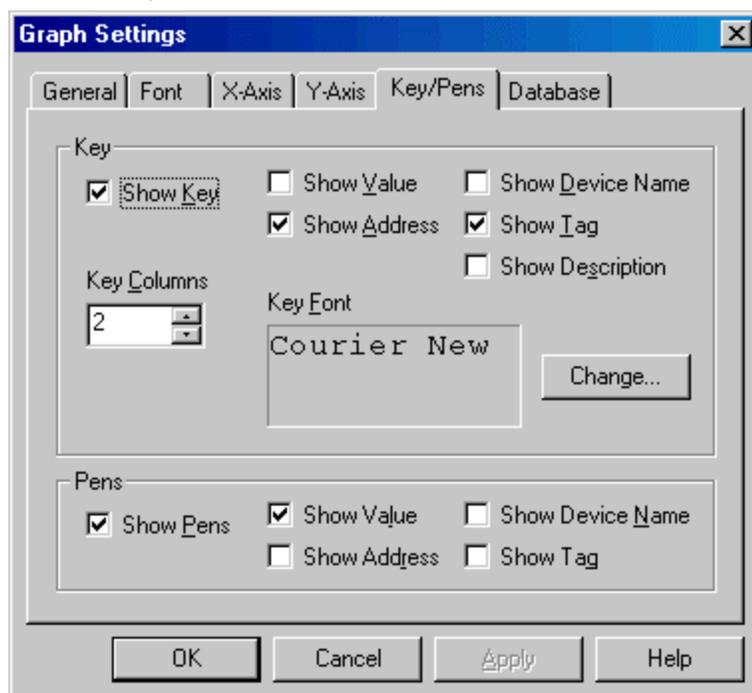
- **Marker Value:** The value that the marker indicated. This number must be within the Y-Axis range.
- **Line Color:** The color of the marker.
- **Line Width:** The width of the marker in pixels.
- **Description:** A text description of the marker. The description appears on the graph. This field is required.

Key/Pens Display

This tab configures how the data is labeled on the graph.

To configure the graph:

1. Select the **Setup/Graph** menu option.
2. Click the **Keys/Pens** tab.



- **Key:** The key is a color-coded label of a specific data point on the graph. The keys appear below the graph.
 - **Show Key:** Determines whether the key will be displayed.

- **Show Value:** The value of the data point being read.
- **Show Address:** The current address being read.
- **Show Device Name:** The name of the device to which communication is established.
- **Show Tag, Show Description:** Address documentation.
- **Key Columns:** Divide the key area into this number of columns.
- **Key Font:** Click the **Change** button to configure the font used in the keys
- **Pens:** Markers showing the current value of each data point at the end of the graph.
 - **Show Pen:** Determines whether the key will be displayed.
 - **Show Value:** The value of the data point being read.
 - **Show Address:** The current address being read.
 - **Show Device Name:** The name of the device which communication is established.
 - **Show Tag:** Address documentation.

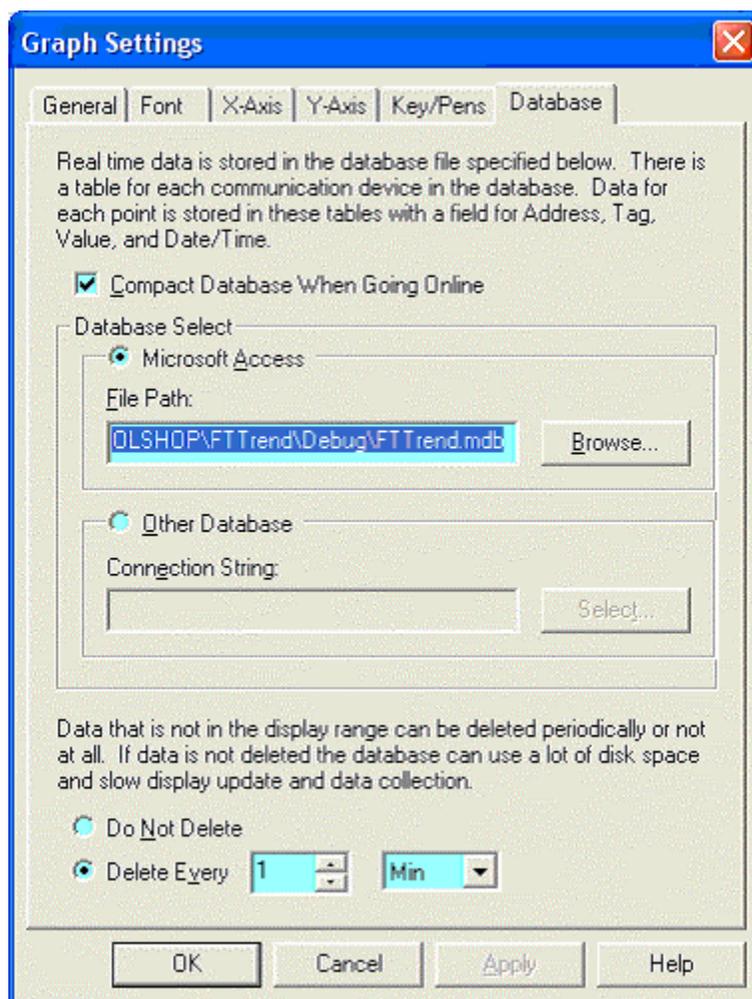
Database Tab

This tab configures the database where data for **real-time points** is stored. For details on the database, see **Real-Time Database**.

NOTE: While this database may be used as a source for **logged points**, FTLogger provides far more functionality and flexibility in logging data.

To access the Database tab:

1. Select the **Setup/Graph** menu option.
2. Click the **Database** tab.



- **Compact Database When Going Online:** Check this box to compact the database as part of the process of going online.

NOTE: Disk space that was occupied by deleted database records is not available until the compact is performed.

- **Database Select:** Specify the database.

- **Microsoft Access:** To build the database in **Microsoft Access** format, select the **Microsoft Access** option button and set the **File Path** to the name of the Access (.MDB) file. If the database does not exist, FTTrend will create it.
- **Other Database:** To build the database in a format other than Microsoft Access (currently, **SQL** is the only option) select the **Other Database** option button and click the **Select** button to configure the **Data Link Properties**. The SQL database must exist prior to the selection.
- **Delete:** Select the **Delete Every** option button and set a number and time unit to delete old data.

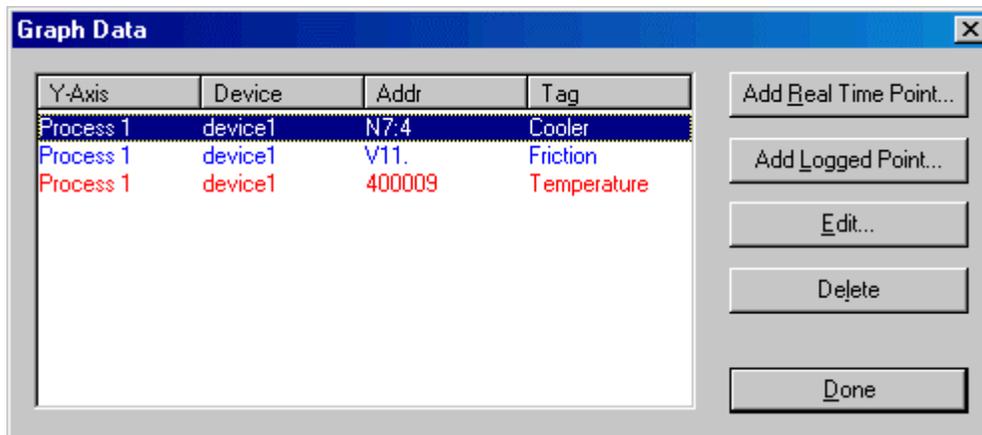
NOTE: When data is deleted from a database, the disk space is not freed until the database is compacted. The database cannot be compacted while FTTrend is online. If the **Compact Database When Going Online** box is not checked, the **Delete Every** option will not reduce the file size.

Configuring Graph Data Points

Configuring Graph Data Points

To configure graph data points to trend:

1. In order to configure a data point, the device from which the data will be read must be defined. See **Configure Devices** for details.
2. Select the **Setup/Data** menu option. The **Graph Data** dialog appears.



3. Use the buttons to access the configuration actions:
 - **Add Real Time Point:** Add a point that reflects the current state of the system, a point that will be read from a device while the trend is online.
 - **Add Logged Point:** Add a point that reflects the state of the system at some point in the past, reading data from a database created by FTLogger or FTTrend.
 - **Edit:** Change the configuration of the highlighted data point.
 - **Delete:** Delete the highlighted data point.

Configure a Real Time Data Point from a FasTrak Server

To configure a real time point from a FasTrak Server:

1. Select the **Setup/Data** menu option.
2. To create a new data point, click the **Add Real Time Point** button. To edit an existing point, select it in the list and click the **Edit** button. Either way, the **Data Point - Real Time** dialog appears.

- **PLC:** Select the device that was configured in the **device source configuration**.
- **OPC:** Select to choose a data point from an OPC server. (See **Configure a Real Time Data Point from an OPC Server** for details.)
- **Address:** Enter the address of the data point, or enter the tag below. If there is a tag for the address in the device documentation database, it appears below.
- **Tag:** Addresses can be specified by tag. To specify the address by tag, select the tag from the Tag drop-down list. The corresponding address appears in the field above.
- **Y-Axis:** Select the **Y-Axis** on which the point will be displayed.
- **Sample Rate:** Select the time unit and number to specify how often data for this point will be collected.

NOTE: Large amounts of data may not be read at the desired sample rate.

- **Data Type:** Select the data type (signed, unsigned, float, size) for the point.
- **Line Properties:** Set the line width and color for the trend line representing the data point.
- **Scaling:** To scale the data, check the **Scale Data** box and enter the appropriate **Min** and **Max** for the **Raw Data**, and the values to **Scale To**. For example, if the values at the specified address range from 0 to 32000, but the graph is on a scale of 0 to 100, set the Raw Data Min to 0, the Raw Data Max to 32000, the Scale To Min to 0, and the Scale To Max to 100.

Configure a Real Time Data Point from an OPC Server

To configure a real time point from an OPC Data Access Version 2.0 Server:

1. Select the **Setup/Data** menu option.
2. To create a new data point, click the **Add Real Time Point** button. To edit an existing point, select it in the list and click the **Edit** button. Either way, the **Data Point - Real Time** dialog appears.
3. Select the **OPC** option button. The modified **Data Point - Real Time** dialog appears.

- **Servers:** Select the OPC server from the drop-down list of locally registered servers.
- **OPC Tag:** Enter the OPC tag or click the **Get Tag** button to select a tag. (See **OPC Tag** for details.)
- **Y-Axis:** Select the **Y-Axis** on which the point will be displayed.
- **Sample Rate:** Select the time unit and number to specify how often data for this point will be collected.

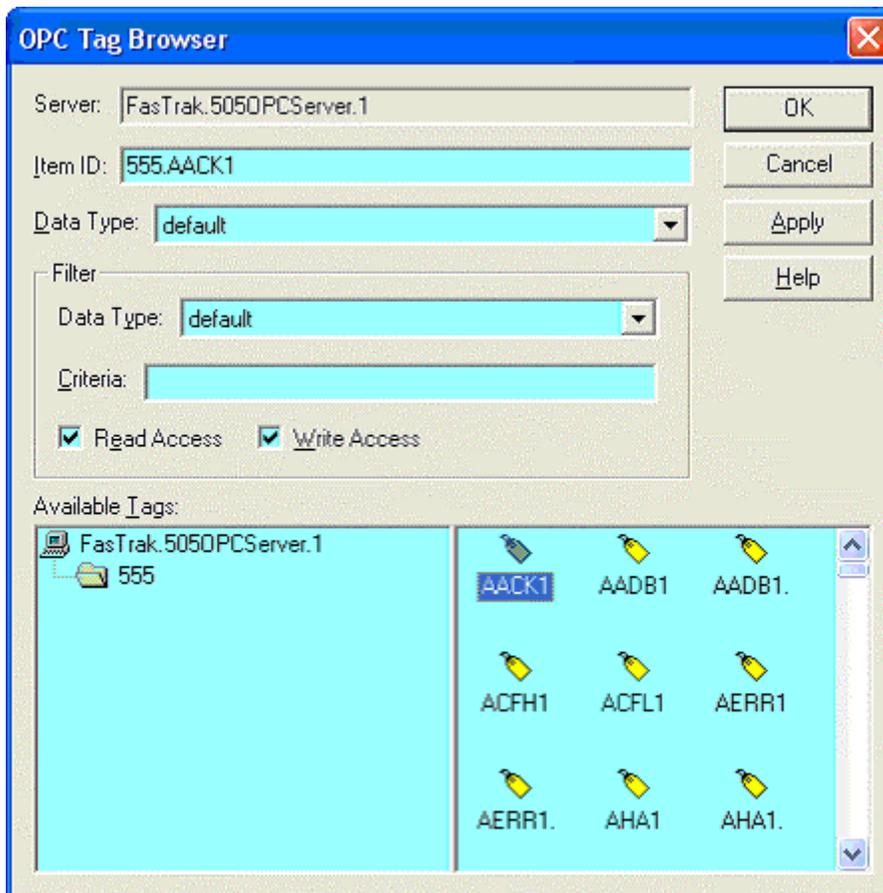
NOTE: Large amounts of data may not be read at the desired sample rate.

- **Data Type:** Select the data type for the point. There are 13 types to choose from including default, byte, short, float, etc.
- **Line Properties:** Set the line width and color for the trend line representing the data point.
- **Scaling:** To scale the data, check the **Scale Data** box and enter the appropriate **Min** and **Max** for the **Raw Data**, and the values to **Scale To**. For example, if the values at the specified address range from 0 to 32000, but the graph is on a scale of 0 to 100, set the Raw Data Min to 0, the Raw Data Max to 32000, the Scale To Min to 0, and the Scale To Max to 100.

OPC Tag

Use the **OPC Tag Browser** to select a tag.

From the modified **Data Point-Real Time** dialog, click to **Get Tag** button. The **OPC Tag Browser** dialog appears.



- **Server:** Lists the server that was selected in the **Data Point - Real Time** dialog.
- **Item ID:** Identifies the tag. Select from the **Available Tags** pane or manually enter or modify.
- **Data Type:** There are 13 different data types to choose from, which will affect how the value is displayed in the graph. The default will display the canonical (native) data type.
- **Filter:** Controls which tags display in the **Available Tags** pane.

Configure a Logged Data Point

To configure a logged point:

1. Select the **Setup/Data** menu option.
2. To create a new logged data point, click the **Add Logged Point** button. To edit an existing point, select it in the list and click the **Edit** button. Either way, the **Data Point - Logged** dialog appears.

- **Database Select:** Select the database containing the logged data. The data must be logged by FTLogger in a row-based database, or by FTTrend.
 - **Microsoft Access:** To select the database in **Microsoft Access** format, select the **Microsoft Access** option button and set the **File Path** to the name of the Access (.MDB) file.
 - **Other Database:** To select the database in a format other than Microsoft Access (currently, **SQL** is the only option) select the **Other Database** option button and click the **Select** button to configure the **Data Link Properties**.
- **PLC:** When logging, the data for each device is stored in a separate table. The name of the table is the name of the device. For OPC, the table name matches the name of the log sheet. Select the table/device name here.

- **Address:** Select the address of the data point. If there is a corresponding tag for the address in the log file, it will automatically be selected in the **Tag Combo** box.
- **Tag:** Addresses can be specified by tag. To specify the address by tag, select the tag from the Tag drop-down list. The corresponding address in the log file will automatically be selected in the **Address Combo** box.
- **Y-Axis:** Select the **Y-Axis** on which the point will be displayed.
- **Time Offset:** Time Offset allows you to offset the time stamp in the database to line up with the current time. This is useful if the user would like to see data trend animation as if it was currently being read from a PLC. For example, If real-time data starts logging at 1 p.m., and logged data started at 11:00 a.m., enter '2' in the 'Hours' edit box to synchronize the time. A time offset is not necessary if the address is currently being logged to the log file via FTLogger.
- **Line Properties:** Set the line width and color for the trend line representing the data point.
- **Search for Spanned Log Files:** FTLogger can be configured to log data to a series of spanned files, instead of one large file. If this box is checked, FTTrend uses data from the series of spanned files. The data appears as one continuous trend.
The selected log file must be the original FTLogger database file, not one of the span files.

Cut, Copy, Paste and Undo

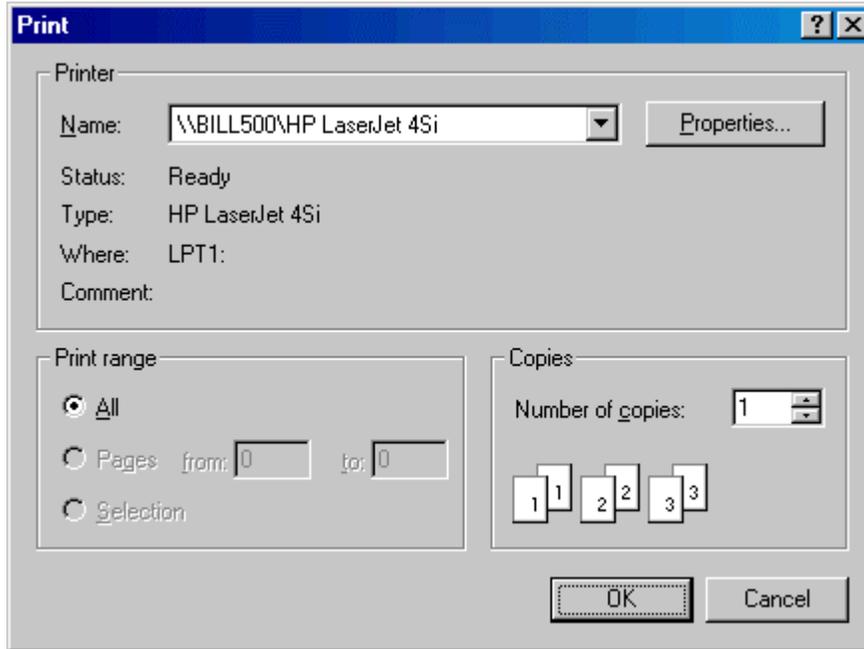
Cut, **Copy**, **Paste** and **Undo** can be performed on trend text selection boxes only. The menu items can be found under the main **Edit** menu along with hot keys. Alternative hotkeys **Shift-Delete**, **Ctrl-Insert**, and **Shift-Insert** are supported for Cut, Copy, and Paste respectively.

Cut, Copy, and Paste will observe highlighted text.

Print

To print a graph:

1. If there are multiple graphs, select the graph to be printed.
2. Select the **File/Print** menu option or click the corresponding toolbar button: 



3. A standard Windows print dialog (which varies depending on your system) appears. Select the printer and configure any other print options as appropriate, then click **OK**.

Command Line Options

/Online

The command line option **/online**, together with a filename, can be used to load a file and immediately go online.

For example, if FTTrend is started using the command line

```
FTTrend.exe demo.trn /online
```

the file "Demo.trn" will be loaded and the mode will be set to **Online**. Files that are loaded without this option will be loaded in offline mode.

For example, if FTTrend is started using the command line

```
FTTrend.exe demo.trn
```

the file "Demo.trn" will be loaded and the mode will be set to **Offline**.

/readonly

The command line option **/readonly** restricts FTTrend to viewing trend history (.TRH) files. When FTTrend is started with the **/readonly** option, security key checks are not performed. The user will not need a security key, and no demo messages will be displayed.

The **/readonly** option can be used with or without a .TRH file. For example, if the command line is

```
FTTrend.exe demo.trh /readonly
```

the file "demo.trh" will be loaded, and FTTrend will not allow the user to open any regular trend (.TRN) files. If the command line is

```
FTTrend.exe /readonly
```

no file will be loaded, but FTTrend will allow the user to open only trend history (.TRH) files.

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