**FLUKE** ®

**Hart Scientific** ®

# 9935

*LogWare II*
*Real-Time Data Acquisition Software*
*User's Guide*

Fluke Corporation, Hart Scientific Division (Hart) warrants this product to be free from defects in material and workmanship under normal use and service for a period as stated in our current product catalog from the date of shipment. This warranty extends only to the original purchaser and shall not apply to any product which, in Hart's sole opinion, has been subject to misuse, alteration, abuse or abnormal conditions of operation or handling.

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# 1 Introduction

## 1.1 What is Log*Ware*

The 9935 Log*Ware* II Software (Log*Ware*) is a real-time data acquisition, storage and analysis program designed specifically for use with the following Hart Scientific's multi-channel digital thermometer readouts:

- 1529, 1529-R, 1529-T 'Chub-E4' Thermometer readouts
- 1560 'Black Stack' Thermometer readout
  - 2560 'SPRT' Module
  - 2561 'HTPRT' Module
  - 2562 'PRTS' Module
  - 2563 'STHR' Module
  - 2564 'THRS' Module
  - 2565 'PTC' Module
  - 2566 'TCS' Module
  - 2567 'RTD' Module
  - 2568 'RTDS' Module
  - 3560 Communication Module
- 1575 'Super Thermometer' readout (**real-time logging only!**)
  - 2575 'Mighty Mux' Multiplexer
- 1575A 'Super Thermometer' readout
  - 2575 'Mighty Mux' Multiplexer
- 1590 'Super Thermometer II' readout
  - Up to five 2590 'Mighty Mux II' Multiplexers

Log*Ware* also provides utilities for:

- Downloading data that has been logged to the thermometer readout's logs or memory.
- Setting logging labels in the thermometer readout (for thermometer readouts that support this feature).
- Synchronizing thermometer readout's clock to the computer's clock.
- Viewing and editing many thermometer readout, module and probe settings including probe coefficients.

This manual is intended to document the use and features of Log*Ware. To ensure correct results, verify that the thermometer readout is properly configured before collecting data. Refer to the individual thermometer readout's User's Guide for specifics pertaining to the instrument. Follow all warnings and cautions documented in the readout's User's Guide.*

## 1.2 License agreement

For information and details regarding the software End User License Agreement (EULA), refer to the online help file's License Agreement topic.

## 1.3 Features

Log*Ware* provides an easy-to-use Windows® interface to acquire, store and analyze data from Hart Scientific's multi-channel digital thermometer readouts. Log*Ware* also provides a method to download readings that are stored in the logs or memory of thermometer readouts. After being acquired or downloaded, the readings are written to a file that can be opened by Log*Ware*, a spreadsheet or other analysis software.

Log*Ware's* data logging features include:

- Quick and easy configuration
- Ability to save and open configuration files
- Selectable sample interval from 1 second to 60 hours (depending on thermometer readout)
- Selectable scan sequence interval from 1 minute to 60 hours
- Selectable delayed start date/time for off-hours logging
- Selectable end log options (to stop session after specified time or number of readings)
- Acquires readings to ASCII text files which can be opened, graphed and printed
- Graphs readings as they are being acquired
- Ability to acquire data in multiple scales simultaneously
- Maintains statistical data for all channels
- Selectable high and low alarm settings with user defined events
  - Can be configured to play .WAV file or launch an application (such as pager software) when an alarm trips
- User-customizable graph settings including titles, legend, grid lines and statistical and trend lines

Log*Ware*'s data analysis features include:

- Can open both real-time log files and downloaded files

- Spreadsheet-style grid to view all acquired readings
- Graph zooming capability
- User-customizable graph settings including titles, legend, grid lines and statistical and trend lines
- Printing graph and acquired readings
- Can have multiple windows open simultaneously
- Can superimpose up to 10 sets of data on the same graph

Log*War*e also provides utilities that allow access to the following digital thermometer readout features (as applicable):

- Downloading data stored in the thermometer readout's logs and/or memory
- Viewing log status and clearing log data
- Synchronizing thermometer readout's date/time with computer's clock
- Changing thermometer readout-specific parameters (filtering, sampling, measurement, calibration constants, etc.)
- Changing probe-specific parameters (serial numbers, conversion type and coefficients, calibration dates, cold junction settings, etc.)

**Version 1.1**

A list of features and enhancements in Version 1.1 follows

- **Simultaneous Logging of All Channels in Real Time -** A feature has been added to allow readings to be taken on all enabled channels of a real-time log session simultaneously (as fast as possible).
- **Download Logged Data from Serial Port on 3560 Communication Module -** A feature has been added to allow logged readings to be downloaded to the serial port on the Model 3560 Communication Module on a Model 1560 'Black Stack' thermometer readout.
- **Write All Real-Time Data to a Single File -** A new feature has been added to allow data from all channels of a real-time log session to be written to the same output file. In these output files, a new column has been added for the channel number.

*Note: Although LogWare is still able to open these files, it does not separate the data for each channel. All readings are plotted on the graph as if all data was from a single channel.*

- **Branding/Logo change -** The logos and graphics displayed in Log*Ware* have been updated.

Also, various features have been added to the software to aid in troubleshooting issues related to real-time log sessions and downloading logged data.

## 1.4     Requirements

Log*Ware* is designed to work with Hart Scientific's multi-channel digital thermometer  readouts. Refer to Section 1.1, What is Log*Ware*, for a complete list of supported thermometer readouts.

### 1.4.1     Communications requirements

The thermometer readout being used with Log*Ware* must be connected to an RS-232 serial port (COM port) on a computer using a "null modem" cable. For more information on this type of cable, refer to the thermometer readout's User's Guide. The baud rate of the thermometer readout must be set to match the baud rate selected in Log*Ware*. Log*Ware* supports a wide choice of baud rate settings, depending on the thermometer readout being used.

Selected features of Log*Ware* can also utilize an IR dongle with thermometer readouts that have an IR port for wireless communications.

### 1.4.2     Computer hardware requirements

The following minimum computer configuration is required to use Log*Ware:*

- IBM Compatible 486 PC or better with 8MB RAM (Pentium® class processor with 16MB RAM or more recommended)
- VGA monitor or better
- CD-ROM drive for installation
- 1 - RS-232 serial (COM) port
- **Optional** - IR dongle

- Minimum of about 25MB of disk space for installation (additional space is required as data is acquired or downloaded)

### 1.4.3     Computer software requirements

*Note: To use LogWare, Windows login accounts must be granted full access to the folder to which the software is installed and all subfolders. If the folder has read-only access, errors will occur when LogWare attempts to access its configuration files.*

The Log*Ware* Software requires one of the following operating systems:

- Windows® 95/98/ME
- Windows® NT with Service Pack 4 or later installed
- Windows® 2000

- Windows® XP

## 1.4.4    Firmware requirements

The thermometer readouts supported by Log*Ware* must have a certain firmware version installed to use the Thermometer Settings option in the Tools menu and the Download Logged Data option in the Download menu. Prior versions of firmware do not fully support these features. Real-time logging can be performed with any firmware version. The required firmware versions are indicated below:

- Model 1529, 1529-R and 1529-T 'Chub-E4' – Requires firmware version 1.35 or later

- Model 1560 'Black Stack' – Requires firmware version 1.31 or later

- Model 1575 'Super Thermometer' – **NOT SUPPORTED BY TOOLS FEATURES!**

- Model 1575A 'Super Thermometer' – Requires firmware version 5.03n or 5.03o or later

- Model 1590 'Super Thermometer II' – Requires firmware version 2.03n or 2.03o or later

## 1.5    Installation

⚠️ *Note: Before installing LogWare, be sure to read the License Agreement and Warranty.*

A backup should always be made of your hard disk drive and registry before installing any software, and all running applications should be closed.

⚠️ *Note: To successfully install LogWare, you must be logged into Windows as an Administrator.*

**Installing Log*Ware***

1. Insert the Log*Ware* CD-ROM into your CD-ROM drive. The Setup program should run automatically.

2. Follow the on-screen instructions to install Log*Ware.*

3. When prompted, enter the product serial number. The serial number is provided on a sticker typically located on the CD pouch on the inside back cover of the Log*Ware* User's Guide.

4. After all files have been installed, a program group is created with icons for the software, the Help file, the README.TXT file, and an icon to uninstall the software. The installation process is complete.

5.  The README.TXT file can be displayed by checking the appropriate check box before the setup program finishes. Read this file for important information that was not available when the User Guide was printed.

**Uninstalling Log*Ware***

To uninstall the software, use the Windows® Add/Remove Programs icon in the Control Panel. Follow the instructions given. The program files that were installed to your system are removed. Any files that were created or saved by users will not be removed from the system. These files, along with the folders that these files are in, must be manually deleted using Windows® Explorer to remove them from your system.

# 1.6      Running Log*Ware*

The following sections describe how to get Log*Ware* up and running quickly.

## 1.6.1      Getting started

The following information is intended to provide a brief overview on how to get Log*Ware* up and running quickly.

**To use this software:**

1.  Click the Start button, then locate and click the icon created by the setup process.

2.  The software will start with the Log Session Settings dialog displayed. If the Log Session Settings dialog is not displayed when the software starts, select the Setup option in the Datalog menu to display the Log Session Settings dialog.

*Note: In order to make the Log Session Settings dialog appear automatically every time Log*Ware *starts, check the "Show Log Session Settings dialog on start-up" check box on the General tab of the Options dialog. The Options dialog can be displayed by selecting the Options option in the Tools menu. Please refer to Section 5.6.4, Options, for more details.*

3.  To start a log session, fill in the information on the Log Session Settings dialog. The following information must be entered before a log session can start:

**Thermometer:**

- Select the model of the thermometer readout to use, enter the serial number and select the session temperature scale from the available choices. The reading resolution may also be selected.

- Select the COM port that the thermometer readout is connected to and choose the baud rate to use.

- Power up the thermometer readout and make sure it is connected to the selected COM port and set to the selected baud rate. Click the Test Communication button to make sure Log*Ware* can communicate with the thermometer readout.

**Log session:**

- Select the interval between readings.
- **Optional** - Enable and select the interval between scan sequences.
- To set a delayed start date/time, click the Delayed Start button and choose the appropriate date and time for the log session to start. Otherwise, the log session will begin when the Start button is clicked.
- Choose the appropriate end log session option and set the other end log settings as required.

**Channels:**

- Query the channels from the thermometer readout by clicking the Query Channels button.
- Enable or disable each channel as needed by selecting each channel in the Channels list and checking or unchecking the Acquire data from this channel box.
- **Optional** - To customize the statistical data for each channel, click the Statistics Settings button.
- **Optional** - To configure alarms for each channel, click the Alarm Settings button.
- Enter the channel name, output filename, and select the trace color for each channel.

These settings can be saved to a configuration file by clicking the Save As button. To open the current configuration file every time the software runs, click the Set as Default button.

After entering this information, click the Start button to start the real-time log session.

## 1.7     Using Log*Ware*

The following sections describe some of the main features of Log*Ware*.

### 1.7.1 Log*Ware* main display

The main display consists of the menus, toolbar, a workspace area and a status bar.
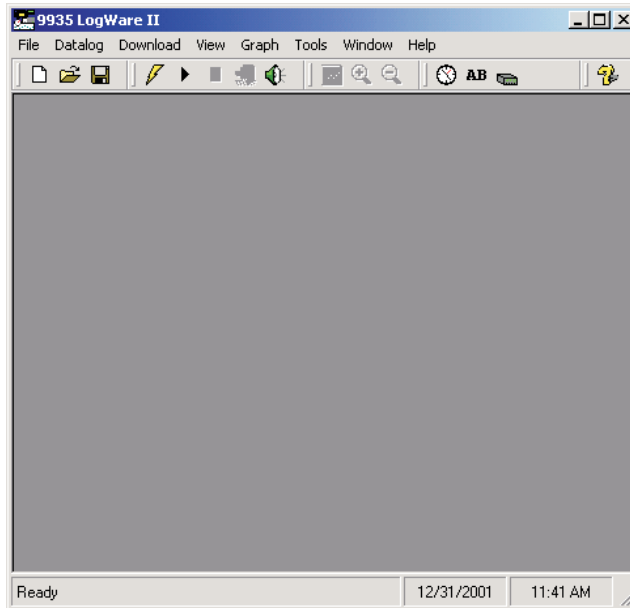


**Figure 1**   9935 LogWare II Main Display

The menus allow access to the various features of the software. A general description of the options in each menu is given below. These menus are described in more detail in Section 5, Menus:

- **File** - Open and save configuration files, print options and exit the software.

- **Datalog** - Setup, Start, Stop and Close real-time log sessions.

- **Download** - Download logged readings and view log status.

- **View** - View alarm log, reading history and open previously logged data files.

- **Graph** - Change graph settings, zoom in and out, and print the current graph.

- **Tools** - Synchronize thermometer readout date/time, access logging labels, configure thermometer readout and probe settings, change Log*Ware* options.

- **Window** - Rearrange and switch between open windows.

- **Help** - Display help topics and About dialog.

The toolbar allows quick access to the most common menu functions. The toolbar is divided into sections that correspond to related functions. Toolbar sections may be rearranged as desired by clicking on the vertical bar on the left side of the section and dragging it to the desired location.

The following toolbars are available:

**File Toolbar**



**Figure 2**  *File Toolbar*

**New** - Create a new real-time log session configuration

**Open** - Open a real-time log session configuration file

**Save As** - Save the current real-time log session configuration to a configuration file

**Datalog Toolbar**



**Figure 3**  *Datalog Toolbar*

**Setup** - Display the Log Session Settings dialog to configure a real-time log session

**Start** - Start a real-time log session

**Stop** - Stop a real-time log session

**Close** - Close the real-time log session window

**Mute All Alarms** - Mute/unmute all audible real-time log session alarms

**Graph Toolbar**



**Figure 4**  *Graph Toolbar*

**Graph Settings** - Change graph settings, add trend lines, alarm lines, titles, captions, etc.

**Zoom In** - Zoom in to view a section of the graph

**Restore (Zoom Out)**  - Restore the graph to its original zoom setting

**Tools Toolbar**



**Figure 5**  *Tools Toolbar*

**Synchronize Date/Time** - Synchronize thermometer readout's date/time with computer

**Logging Labels** - View/change logging labels

**Thermometer Settings** - View/change thermometer readout settings

**Help Toolbar**



**Figure 6**
Help Toolbar

**Help** - Open the Log*Ware* Help file

**Status Bar**

The status bar indicates the function that the software is currently performing as well as the current system date and time.

*Note: The date and time displayed are based on the computer's clock settings and can be modified through the Windows® Control Panel.*

## 1.8    Log*Ware* options

Log*Ware* has many features and settings that can be customized by the user to allow Log*Ware* to operate in certain ways. Many of these settings can also be protected by an administrator passcode to prevent unauthorized persons from changing these settings. For more information on these options, please refer to Section 5.6.4, Options.

# 2 Real-time logging

The main purpose of Log*Ware* is to perform real-time data acquisition from Hart Scientific multi-channel digital thermometer readouts. This section describes in detail how to configure, start and stop a real-time log session. This section also describes the features available during a real-time log session.

## 2.1 File menu

The File menu contains some options for creating a new real-time log session and for opening and saving real-time log session configuration files.

Setup...

Start

Stop

Close

Mute All Alarms
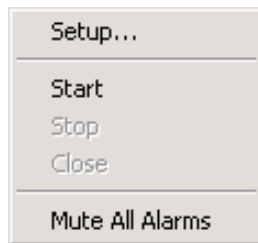
**Figure 7**  *File Menu*

### 2.1.1 New

The New menu option can be used to clear the current real-time log session settings and display the Log Session Settings dialog.

The ⬜ button on the toolbar corresponds to the New menu option.

When selecting the New option, a prompt is displayed to confirm that the current real-time log session settings (if any) will be reset. To abort resetting the current real-time log session settings, click the No button. Otherwise, click the Yes button to reset the current log session settings. The Log Session Settings dialog will be displayed. Please refer to Section 2, Real-Time Logging, for more information on configuring a real-time log session.

### 2.1.2 Open

The Open option allows a real-time log session configuration file to be opened. If the same basic configuration is frequently used to perform real-time logging, saving the log session settings to a configuration file can greatly reduce the time it takes to configure and start a real-time log session.

The 📂 button on the toolbar corresponds to the Open menu option.

⚠️ *Note: When opening a configuration file, LogWare attempts to communicate with the thermometer readout to verify that the settings saved in the configuration file are compatible with the current thermometer readout configuration. Therefore, it is necessary to have the thermometer readout connected and powered on in order to successfully open a configuration file.*

When selecting the Open option, the Windows® Open dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Real-time log session configuration files should have a **.rls** extension. To cancel opening a configuration file, click the Cancel button. Otherwise, select the configuration file to open and click the Open button. For more details about the real-time log session configuration file, refer to Section 7.1.1, Log Session Configuration File. Real-time log session configuration files can also be opened by clicking the Open button on the Log Session Settings dialog.

Log*Ware* then reads the log session settings from the configuration file and verifies that the configuration of the currently connected thermometer readout is compatible with the log session settings. If there are any conflicts, or if Log*Ware* is unable to communicate with the thermometer readout, appropriate messages are displayed.

Once the configuration file has been read in, the Log Session Settings dialog is displayed. If Log*Ware* was unable to communicate with the thermometer readout or any other error occurred, the log session settings may be incomplete.

### 2.1.3    Save as

The Save As option allows the current real-time log session settings to be saved to a configuration file. If the same basic configuration is frequently used to perform real-time logging, saving the log session settings to a configuration file can greatly reduce the time it takes to configure and start a real-time log session. Before attempting to save a real-time log session configuration, use the Log Session Settings dialog to configure the log session.

The 💾 button on the toolbar corresponds to the Save As menu option.

When selecting the Save As option, the Windows® Save As dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Real-time log session configuration files are saved with a **.rls** extension. To cancel saving a configuration file, click the Cancel button. Otherwise, enter the filename for the configuration file and click the Save button. For more details about the real-time log session configuration file, refer to Section 7.1.1, Log Session Configuration File. Real-time log session configuration files can also be saved by clicking the Save As button on the Log Session Settings dialog.

## 2.2　Datalog menu

The Datalog menu is used to access the Log Session Settings dialog, to start, stop and close the real-time log session and to mute audible alarms.

| Setup... |
|----------|
| Start |
| Stop |
| Close |
| Mute All Alarms |
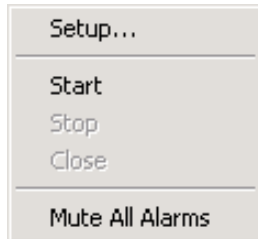
*Figure 8* *Datalog Menu*

### 2.2.1　Setup

The Setup option displays the Log Session Settings dialog. This dialog is used to configure a real-time log session. If a log session has already been configured or a real-time log session configuration file has already been opened, this dialog displays the current log session settings.

The　　　button on the toolbar corresponds to the Setup menu option.

Please refer to Section 2.3, Log Session Settings Dialog, for more details on configuring a real-time log session.

### 2.2.2　Start

The Start option starts a real-time log session. This option is disabled until a log session has been completely configured.

The　　　button on the toolbar corresponds to the Start menu option.

Please refer to Section 2, Real-Time Logging, for more details on a real-time log session.

### 2.2.3　Stop

The Stop option stops the current real-time log session. This option is only enabled when a real-time log session is running. A log session may be stopped at any time by selecting this option.

The　　　button on the toolbar corresponds to the Stop menu option.

When selecting the Stop option, a message is displayed to confirm stopping the log session.

### 2.2.4    Close

The Close option closes the current real-time log session window. This option is only enabled once the real-time log session has stopped and the log session window is still open.

The ⬛ button on the toolbar corresponds to the Close menu option.

### 2.2.5    Mute all alarms

The Mute All Alarms option can be used to mute any audible alarms associated with the current real-time log session. When the alarms are muted, a check mark appears next to this option. Muting the alarms does not prevent alarm events from happening.

The 🔊 button on the toolbar corresponds to the Mute All Alarms menu option.

When alarms are muted, the toolbar button appears as ⬛.

## 2.3    Log session settings dialog

The Log Session Settings dialog is used to configure the real-time log session settings. These settings include the thermometer readout to acquire data from, communications settings, log session sample interval and start and end options, and thermometer readout channel configuration. This dialog can be displayed by selecting the Setup option in the Datalog menu or by clicking the ⚡

button on the toolbar. This dialog is also displayed after opening a log session configuration file.
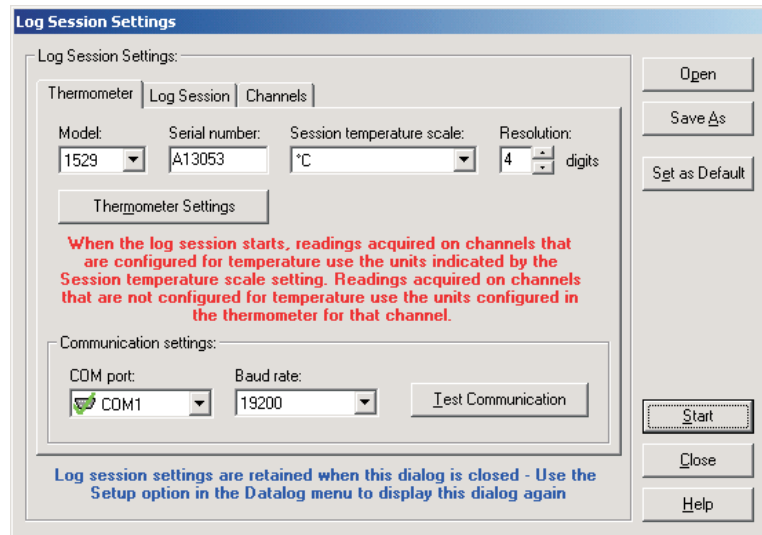


**Figure 9**  *Log Session Settings dialog*

⚠️ *Note: This dialog displays the current real-time log session settings. Clicking the Close button on this dialog does **not** cause these settings to be lost. To display this dialog again, select the Setup option in the Datalog menu.*

This dialog has three tabs: Thermometer, Log Session and Channels. All of the information on each of these tabs must be configured before a real-time log session can be started. The following sections describe in detail each of the settings on these tabs.

Once the log session has been completely configured, the settings can be saved to a configuration file by clicking the Save As button. If these same settings may be used again at a later date, saving the settings to a configuration file greatly reduces the amount of time required to get a log session started.

When clicking the Save As button, the Windows® Save As dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Real-time log session configuration files are saved with a **.rls** extension. To cancel saving a configuration file, click the Cancel button. Otherwise, enter the filename for the configuration file and click the Save button. For more details about the real-time log session configuration file, refer to Section 7.1.1, Log Session Configuration File. Real-time log session configuration files can also be saved by selecting the Save As option in the File menu.

A log session settings configuration file that has been saved previously can be opened by clicking the Open button.

⚠️ *Note: When opening a configuration file, LogWare attempts to communicate with the thermometer to verify that the settings saved in the configuration file are compatible with the current thermometer configuration. Therefore, it is necessary to have the thermometer connected and powered on in order to successfully open a configuration file.*

When clicking the Open button, the Windows® Open dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Real-time log session configuration files should have a **.rls** extension. To cancel opening a configuration file, click the Cancel button. Otherwise, select the configuration file to open and click the Open button. For more details about the real-time log session configuration file, refer to Section 7.1.1, Log Session Configuration File. Real-time log session configuration files can also be opened by selecting the Open option in the File menu.

Log*Ware* then reads the log session settings from the configuration file and verifies that the configuration of the currently connected thermometer readout is compatible with the log session settings. If there are any conflicts, or if Log*Ware* is unable to communicate with the thermometer readout, appropriate messages are displayed.

If Log*Ware* was unable to communicate with the thermometer readout or any other error occurred, the log session settings may be incomplete.

Log*Ware* has a feature which allows a log session configuration file to be defined as the default configuration file. The default configuration file is automatically loaded every time Log*Ware* is started. To set the current configuration as the default configuration, select the Set as Default button. If the current configuration has not been saved yet, a prompt is displayed indicating that the configuration must be saved to a file before it can be set as the default. The next time Log*Ware* is started, the default configuration file will be loaded.

⚠️ *Note: Real-time log session configuration files contain information about the current thermometer readout configuration. If the thermometer readout configuration changes, the configuration file needs to be updated also.*

Once the log session settings are complete, click the Start button to start a log session. Please refer to Section 2.4, Real-Time Log Session, for more details on a real-time log session.

If the log session does not need to be started yet, click the Close button. The Log Session Settings dialog is closed but all settings are retained. To display the Log Session Settings dialog again, select the Setup option in the Datalog menu or click the  button on the toolbar.

Click the Help button to display the appropriate help topic for this dialog.

## 2.3.1    Thermometer tab

The Thermometer tab allows the thermometer readout that will be used to acquire data to be identified and configured.



**Figure 10**  *Log Session Settings - Thermometer tab*

Use the Model drop-down list to select the type of thermometer readout to use to acquire data. All other controls on this tab will be disabled until a valid model is selected.

Enter the serial number of the thermometer readout to use in the Serial number box. The thermometer readout's serial number should be located on a label, generally on the back or bottom of the thermometer readout.

*Note: Optionally, you may use the Thermometer Settings button to automatically determine the serial number of the thermometer readout and fill in this box.*

Select the scale of the readings to be acquired from channels that are configured to read temperature using the Session temperature scale drop-down list. Log*Ware* supports the following temperature scales:

- °C
- °F
- K (Kelvin)

When a log session starts, Log*Ware* will automatically set the thermometer readout's system units to use the selected scale. However, if the <keep existing> option is selected, Log*Ware* will query the thermometer readout to determine the current system units.

*Note: When starting a log session, LogWare checks the conversion setting for each enabled channel. If a channel is configured to read temperature, the units that were selected in the Session temperature scale drop-down list are used. If a channel is not configured to read temperature (i.e. resistance or voltage), LogWare automatically determines the non-temperature units for that channel.*

Enter the resolution (number of digits after the decimal point) that Log*Ware* should use to format all of the measurements acquired. This setting is common to all channels from which measurements are acquired. Where applicable, Log*Ware* will automatically set the thermometer readout's resolution to this setting when a log session starts. Where not applicable, Log*Ware* will round more precise measurements or add 0's to less precise measurements to obtain the desired format.

*Note: The resolution setting should be set prior to configuring the alarm settings for each channel since the alarm values will also use this resolution. Changing the resolution setting after configuring the alarms **does not** reformat the alarm values!!*

Select the COM port on the computer to which the thermometer readout is connected using the COM port drop-down list. Only COM ports that the operating system reports as being available can be used. The following symbols are used to show the status of each COM port:

- ▭ - Indicates a COM port that is currently available.

- ▭ - Indicates the COM port that is currently selected by Log*Ware*.

- ✗ - Indicates a COM port that is currently being used by another application.

- ▭ - Indicates an IR port (virtual COM port) that is currently available.

- ▭ - Indicates an IR port (virtual COM port) that is currently selected by Log*Ware*.

- ✗ - Indicates an IR port (virtual COM port) that is currently being used by another application.

*Note: For a real-time log session, LogWare requires the use of one COM port. An IR port (virtual COM port) cannot be selected as the port to use.*

Select the baud rate that the computer should use to communicate over the COM port with the thermometer readout using the Baud rate drop-down list. The baud rate setting of the thermometer readout must be set to the same value as this setting. For best results, use the maximum allowable baud rate setting when possible.

After the model, COM port and baud rate settings are configured, click the Test Communication button to make sure Log*Ware* is able to communicate with the thermometer readout. At this time, the thermometer readout must be connected to the COM port on the computer using a null modem cable. For more information, please refer to the thermometer readout's User's Guide.

When testing communications with the thermometer readout, there are three possible results:

- The thermometer readout is communicating at the correct baud rate on the selected COM port.
- The thermometer readout is communicating, but possibly at the wrong baud rate or the thermometer readout model does not match the selected model.
- The thermometer readout failed to communicate at all. Check the COM port and baud rate settings, make sure the cable is a null modem cable, and make sure the thermometer readout is plugged in and turned on.

**Optional:** The Thermometer Settings button may be clicked at this time to gain access to various thermometer readout settings as applicable to the selected thermometer readout. This feature is provided solely as a convenience to check the thermometer readout configuration and/or to configure each channel of the thermometer readout with appropriate conversion settings and probe coefficients. The Test Communication button should be clicked prior to clicking the Thermometer Settings button to make sure the thermometer readout is communicating successfully.

*Warning: When using the Thermometer Settings tool, make sure that the thermometer readout is not currently in any menu. Using the thermometer readout's menus while using the Thermometer Settings tool may cause the thermometer readout to fail to accept new settings.*

*Note: When starting a log session, LogWare will override many of the current thermometer readout settings as needed to acquire data from the configured channels using the specified log session settings!!*

*Note: If the serial number and session temperature scale settings have not been configured prior to clicking the Thermometer Settings button, these settings will be configured automatically after successfully viewing the thermometer readout settings dialog.*

### 2.3.2　Log Session tab

After the thermometer readout and communication settings are configured, the log session settings may be configured.
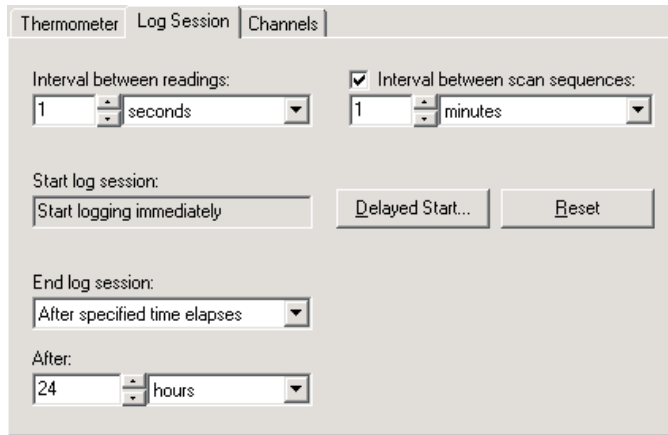


**Figure 11**　*Log Session Settings - Log Session tab*

Select the interval at which Log*Ware* should take readings on subsequent channels using the Interval between readings settings. The range of possible settings is limited by the capabilities of the selected thermometer readout. For most Hart Scientific multi-channel digital thermometer readouts, the minimum sample interval is 2 seconds.

⚠️ *Note: Due to the latency inherent in the measurement process, a thermometer readout may not be able to take readings at the exact selected interval (i.e. the 1560 thermometer readout allows a minimum interval of 2 seconds, but actually takes about 2.3 seconds to make one measurement). For this reason, using the minimum interval supported by the thermometer readout may cause some duplicate readings to be taken. To avoid this problem, see the Wait until new measurement is ready (when applicable) option on the LogWare Options dialog. Please refer to Seciton 5.6.4, Options, for more details.*

If this interval is set to a value of 0, Log*Ware* will attempt to take simultaneous readings on all enabled channels of the thermometer readout. If this feature is used, you should use the Interval between scan sequences setting to limit how often all channels are sampled.

⚠️ *Note: when using this feature, the Wait until new measurement is ready option on the General tab of the Options dialog MUST be disabled (unchecked).*

Typically, Log*Ware* is used to take continuous measurements on all enabled channels. However, Log*Ware* has a feature that allows one measurement to be taken on each enabled channel at a set interval. For example, Log*Ware* could be used to monitor the gradients in a liquid bath using 10 probes at various locations in the bath. To measure gradients, readings should be taken simultaneously, or at least as close together as possible, but maybe a set of readings only needs to be taken once every minute, or once every five minutes. This can be accomplished using Log*Ware* by enabling the Interval between scan sequences option. The Interval between scan sequences settings are then enabled.

A scan sequence is defined by Log*Ware* as taking a single reading on each enabled channel. Select the interval to use. Log*Ware* allows this interval to be set anywhere between 1 minute and 60 hours at 1 minute or 1 hour increments. Leaving this feature disabled causes Log*Ware* to begin a new scan sequence immediately following completion of the previous scan sequence.

The Start log session box indicates the current setting for starting a log session. By default, this setting is configured to start a log session immediately after the Start button is clicked. Log*Ware* may optionally be configured to start a log session unattended on any date at any time. To set the start date and time, click the Delayed Start button. The Delayed Start Date/Time dialog is displayed. Please refer to Section 2.3.4, Delayed Start Date/Time Dialog, for details on using this dialog.

Clicking the Reset button resets the start date/time setting. The log session will start immediately after the Start button is clicked.

The End log session settings allow the log session to be configured to automatically stop logging at a certain time or after a certain number of readings. By default, a log session will continue until manually stopped by the user. Select the method to use to end the log session using the drop-down list. Choices are:

- By user (default)
- After specified number of readings
- After specified time elapses

If the After specified number of readings or After specified time elapses option is selected, the end log criteria must be selected. Enter either the number of readings to acquire on each channel or the desired elapsed time setting. The range of choices is from 1 to 1,000,000 readings (10,000 default) or 1 second to 480 hours (1 hour default).

*Note: If either the After specified number of readings or After specified time elapses option is selected and the Interval between scan sequences feature is enabled, the log session will stop automatically when the end log criteria is met and the current scan sequence is complete.*

### 2.3.3    Channels tab

After the thermometer readout and communication settings are configured, the channels to acquire data from may be configured.
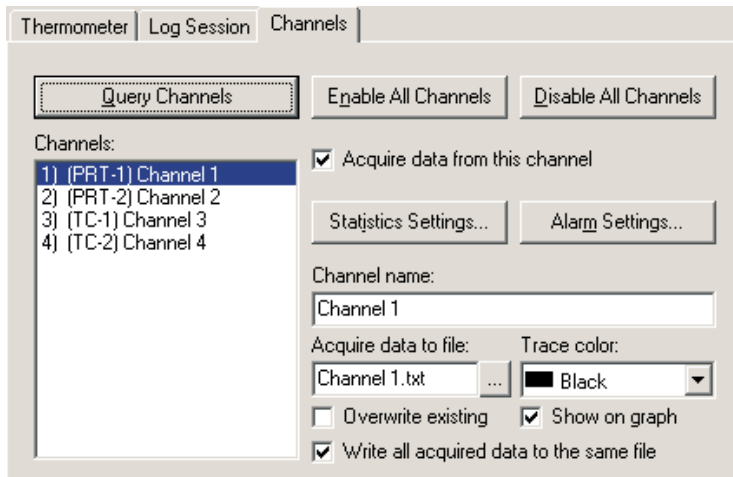


**Figure 12**  *Log Session Settings - Channels Tab*

All controls on the Channels tab (with the exception of the Query Channels button) are disabled until the channel information has been queried from the thermometer readout.

Click the Query Channels button to allow Log*Ware* to communicate with the thermometer readout to collect as much information regarding the current channel configuration as possible.

After querying the thermometer readout for channel information, the Channels list displays one item for each channel on the thermometer readout. The channel number, module name, module channel number and currently assigned channel name are displayed in the list.

By default, all channels are enabled, meaning data should be acquired from all channels. The Enable All Channels and Disable All Channels buttons can be used to enable or disable acquiring data from all channels of the thermometer readout respectively.

To configure a channel, select the channel from the Channels list. The selected channel's settings are displayed in the other controls on this tab.

To acquire data from the selected channel, make sure the Acquire data from this channel box is checked. If this box is not checked, all other channel controls are disabled and data will not be acquired for this channel.

Click the Statistics Settings button to display the Statistics Settings dialog. This dialog is used to specify which statistics are to be maintained and displayed for the selected channel. Please refer to Section 2.3.6, Statistics Settings Dialog, for more details on the Statistics Setting dialog. By default, the statistics that are enabled are: Minimum, Maximum, Spread, Average and Standard deviation.

⚠️ *Note: Statistics are maintained for each channel independent of all other channels. As a result, each channel has its own settings which must be configured separately.*

Each channel can be configured to trip an alarm if the reading on that channel ever exceeds specific low and/or high values. To enable alarms for the selected channel, click the Alarm Settings button. The Alarm Settings dialog is displayed. This dialog is used to specify the alarm values and the actions associated with each alarm. Please refer to Section 2.3.5, Alarm Settings Dialog, for more details on the Alarm Settings dialog. By default, alarms are disabled.

⚠️ *Note: The alarm settings for each channel are independent of all other channels. As a result, each channel must be configured separately.*

Enter the name for the selected channel in the Channel name box. The channel name should be something unique that identifies the purpose, location or other information about the data being acquired on that channel. When a channel name is changed, the Channels list is updated to reflect the change. By default each channel is assigned the generic name 'Channel *n*' (where *n* is the channel number). This name appears in the Channels grid on the real-time log session window while the log session is running.

Enter the filename to which the data acquired from this channel is to be written using the Acquire data to file box. The default filename for each channel is Channel *n*.txt (where *n* is the channel number). The file is saved to the \Output folder or the folder specified for output files on the Log*Ware* Options dialog. The location for this file can be changed by selecting the "…" (Browse) button.

Check the Overwrite existing check box to allow Log*Ware* to automatically overwrite an existing file of the same name in the same folder. If this box is not checked and a file of the same name exists, a prompt is displayed and the option to overwrite the existing file or choose another filename is given.

If you want to write the acquired data for all enabled channels to the same output file, check the Write all acquired data to the same file option. If this option is checked, Log*Ware* will use the filename and path of the first enabled channel for all channels. The header of the output file will then contain information for all enabled channels, and an additional column is added to the file for the channel number for each reading.

⚠️ *Note: This feature should typically only be used if you are using other software to sort and analyze the logged data. The output file created when using this feature can still be opened by LogWare and displayed on-screen, however all readings are displayed on the graph as if they came from the same channel (single trace).*

Select the color to use for this channel's trace on the graph using the Trace color drop-down list. Log*Ware* supports 15 different trace colors. By default, each channel is assigned one of the 15 colors.

If the trace for the selected channel is to be shown on the graph, check the Show on graph check box. Once the log session starts, each channel can be shown or hidden at any time. This setting only determines which channels are shown initially when the log session starts.

Continue configuring the other channels as needed by selecting the next channel in the list and following this process again.

## 2.3.4 Delayed Start Date/Time dialog

The Delayed Start Date/Time dialog allows the real-time log session to be scheduled to start at a future date and/or time.
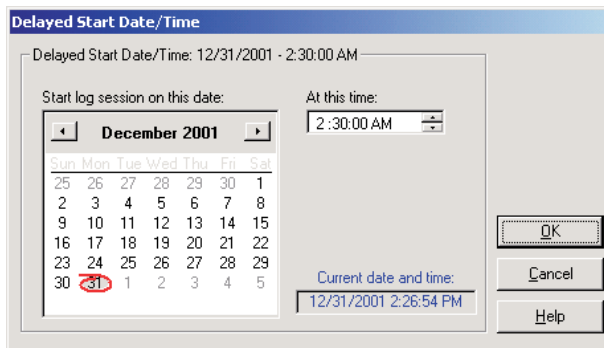


**Figure 13** *Delayed Start Date/Time Dialog*

Select the date on which the log session should start by clicking on the appropriate date in the calendar. Today's date is indicated by the red outline circle. The currently selected date is indicated by a gray filled circle. Use the left and right arrow buttons at the top of the calendar to scroll through the months and years.

Enter the time at which the log session should start using the At this time box.

⚠️ *Note: When using the Delayed Start feature, make sure the Prompt to syn-chronize real-time log session option on the LogWare Options dialog is not checked! Otherwise the log session will not start as expected! Please refer to Section 5.6.4, Options, for more information.*

Once the start date and/or time have been selected, click the OK button to close this dialog.

To cancel setting the delayed start date and/or time, click the Cancel button.

Click the Help button to display the appropriate help topic for this dialog.

### 2.3.5    Alarm Settings dialog

The Alarm Settings dialog is used to configure low and/or high alarms. The current low alarm or high alarm settings can be changed by selecting the Low alarm or High alarm tab respectively. Low and high alarms are independent of each other and must be configured independently.
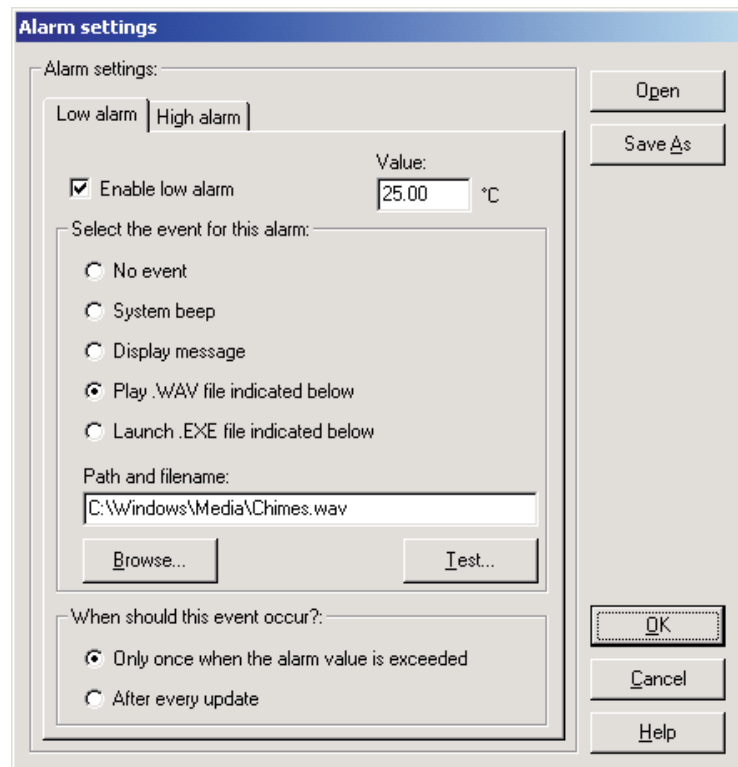


**Figure 14** *Alarm Settings dialog*

The Low alarm tab and High alarm tab indicate the current low alarm and high alarm settings for the selected channel respectively.

To enable an alarm for the selected channel, check the Enable alarm check box on the appropriate tab. If this check box is unchecked, all other settings on the tab are disabled.

Enter the value to be used for this alarm in the Value box. The low alarm will be tripped if the reading on the selected channel meets or drops below the value on the Low alarm tab. The high alarm will be tripped if the reading on the selected channel meets or exceeds the value on the High alarm tab.

Select the event that should occur when each alarm is tripped. The choices are:

- No event
- System beep
- Display message
- Play .WAV file indicated below
- Launch .EXE file indicated below

If either the Play .WAV file indicated below or Launch .EXE file indicated below option is selected, the Path and filename box and Browse button are enabled and the appropriate file must be entered or selected. Use the Browse button to browse for the file. The Test button is enabled once a file has been entered. Select the Test button to make sure the selected file can be played or launched.

*Note: The file entered in the Path and filename box MUST exist! When the OK button is clicked, a search is performed to locate the file. If the file is not found, a warning message is displayed. If the selected file resides on a network resource, the resource must be available and properly connected when the alarm event occurs!*

Log*Ware* ships with a few sample .WAV files that can be used. These files are located in the \Config folder.

The Launch .EXE file indicated below option can be used to launch any application such as pager software which could be configured to dial a phone number automatically and transmit a fixed message to a pager indicating that an alarm has tripped.

⚠️ *Note: It is not recommended that the Launch .EXE file indicated below option be used (especially in conjunction with the After every update option) until the user is familiar with how this feature works. Unless the .EXE file terminates itself automatically (or is limited to a single instance), this software will continue to launch new instances of the .EXE file every time the alarm trips, possibly causing the computer to run out of resources.*

Select when the specified event for each alarm should occur. The choices are:

- Only once when the alarm value is exceeded

- After every update

If the Only once when the alarm value is exceeded option is selected, the chosen event will occur on the first reading that trips the alarm. Subsequent readings that also exceed the alarm value will not cause the event to occur again until one or more readings are taken that are back within the alarm value (alarm reset).

If the After every update option is selected, every reading that is taken that exceeds the alarm value causes the event to happen again.

The alarm settings can be saved to a configuration file. If the same alarm settings are to be used on multiple channels, this provides a method to quickly configure the alarms on subsequent channels.

When clicking the Save As button, the Windows® Save As dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Alarm configuration files are saved with a **.alm** extension. To cancel saving a configuration file, click the Cancel button. Otherwise, enter the filename for the configuration file and click the Save button. For more details about the alarm configuration file, refer to Section 7.1.2, Alarm Configuration File.

An alarm configuration file that has been saved previously can be opened by clicking the Open button.

When clicking the Open button, the Windows® Open dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Alarm configuration files should have a **.alm** extension. To cancel opening a configuration file, click the Cancel button. Otherwise, select the configuration file to open and click the Open button. For more details about the alarm configuration file, refer to Section 7.1.2, Alarm Configuration File.

Once the alarm settings are complete, click the OK button to save these settings and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 2.3.6 Statistics Settings dialog

The Statistics Settings dialog allows specific statistical functions to be enabled or disabled for the selected channel.
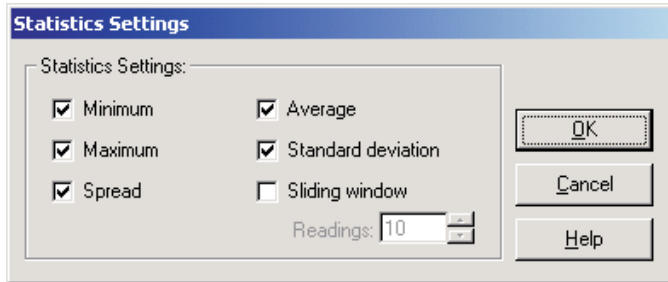


**Figure 15** *Statistics Settings dialog*

To enable a statistical function for the selected channel, check the box next to the appropriate function.

The statistical functions supported are:

- Minimum
- Maximum
- Spread
- Average
- Standard deviation
- Sliding window

If the Sliding window function is enabled, a value must be entered into the Readings box. All other statistical values are calculated based on the most recent *n* measurements as indicated by the value in the Readings box. The readings setting can be set to any value between 10 and 1,000.

If the Sliding window function is disabled, the statistical values are calculated based on **all** readings since the last reset was performed.

Once the statistics settings are complete, click the OK button to save these settings and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

# 2.4    Real-time log session

The Log Session window is displayed when a real-time log session starts. This window is divided into three main sections: channels grid, statistics and graph. These three sections can be resized by dragging the bars that divide the sections with the mouse.
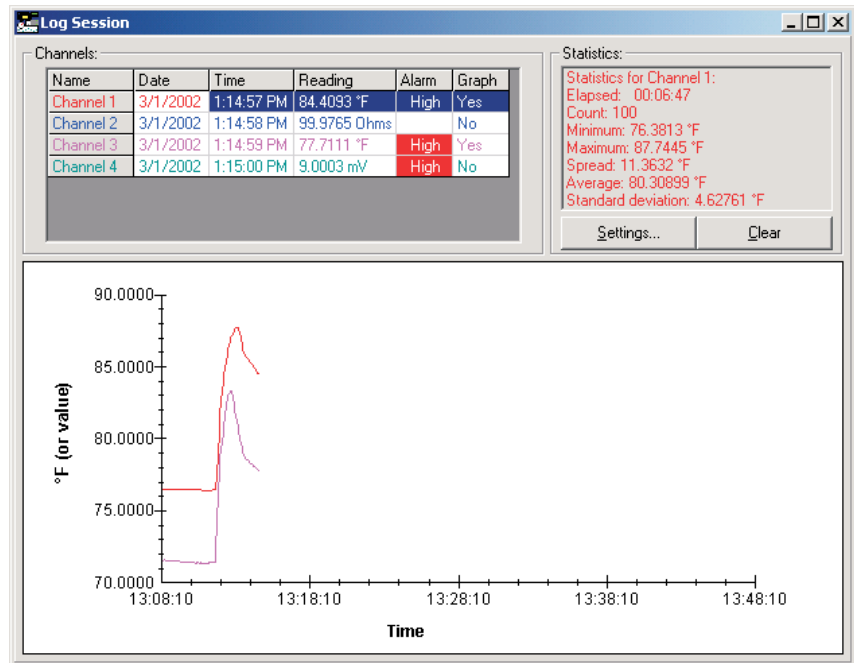


**Figure 16**   *Real-time log session window*

Log*Ware* was designed to communicate with only one thermometer readout at a time. Therefore, only one real-time log session can be running at a time. In order to optimize data acquisition, many menu options are disabled during a real-time log session.

When a log session is started, Log*Ware* prepares to acquire data from the enabled channels. The current conversion settings for each channel and system units are determined at this time. The scale of the readings for each channel depends on the conversion setting for each channel and the session temperature scale as set on the Log Session Settings dialog.

Log*Ware* attempts to create the output file for each enabled channel. If Log*Ware* is unable to create an output file, or if there is an existing file of the same name and the overwrite option was not selected, a prompt is displayed and a new path and/or filename may be entered for the output file.

If a delayed start time was selected, a dialog appears indicating the time that the log session will begin. Otherwise, a dialog appears indicating that the log session will begin momentarily while Log*Ware* initializes the thermometer readout and finishes preparing to start the log session.

⚠️ *Note: If a delayed start time was selected and the Prompt to synchronize real-time log session option is selected on the LogWare Options dialog, a prompt is displayed asking if the synchronize feature should be disabled. If the synchronize feature is not disabled, the log session will not start as expected! For more details, please refer to Section 5.6.4, Options.*

Once logging starts, one measurement is taken on each enabled channel at the interval specified on the Log Session Settings dialog. If the Interval between scan sequences feature was enabled, Log*Ware* then waits the specified time and repeats this process. Otherwise, this process is repeated without delay.

⚠️ *Note: Be aware that selecting any menu option while a real-time log session is running may cause the measurement process to halt temporarily until the menu is closed or the dialog that is displayed is closed! Also, running other applications on the computer while logging real-time data, especially those that require a lot of processing time or that access the disk frequently, may cause the measurement process to halt temporarily while the other application is busy. It is recommended that, once a real-time log session is started, the software and the computer be left alone to log the data without interruption.*

If the log session was configured to stop logging at a specified time or after a specific number of readings, Log*Ware* continues to acquire data until the end log criteria is met. The log session can be stopped manually at any time by selecting the Stop option in the Datalog menu or by clicking the ▇ button on the toolbar.

When a log session is stopped manually, a prompt is displayed asking if the log session window should be closed. The log session window may be closed at this time or left open. In order to start a new log session, the current log session window must be closed. Select Yes to close the log session window immediately or select No to leave the window open.

To close the real-time log session window, select the Close option in the Datalog menu or click the 🔳 button on the toolbar. If the Show Log Session Settings dialog after closing log session option on the Log*Ware* Options dialog is checked, the Log Session Settings dialog is automatically displayed. To prevent Log*Ware* from displaying the Log Session Settings dialog after the log session window is closed, uncheck this option. For more details, please refer to Section 5.6.4, Options.

Once the log session has been stopped, the output file which contains all of the acquired readings can be opened by selecting the Open Previously Logged Data File option in the View menu. For more details on opening previously logged data files, please refer to Section 5.4.7, Open Previously Logged Data File.

## 2.4.1    Channels grid

The Channels grid is located in the upper left corner of the log session window and displays the most recent data for each enabled channel. This data includes the channel name, date, time and value and scale of the most recent reading, the current alarm state and whether or not the trace for the channel is currently displayed on the graph. The color of the data in the Channels grid matches the selected trace color for that channel. The currently selected channel is highlighted.

The first column in the Channels grid indicates the channel names as entered on the Log Session Settings dialog. The second and third columns indicate the date and time that the last reading was taken on each channel. The fourth column indicates the last reading value and scale on each channel. The fifth column indicates the current alarm state and the sixth column indicates whether the trace for each channel is currently shown on the graph. Each of these columns may be resized as desired by dragging the lines that separate each column with the mouse.

The current alarm state is determined by comparing the most recent reading on each channel to that channel's alarm settings. If the low and/or high alarms have been configured, the reading is compared to the alarm values. If the low alarm is enabled and the reading is less than or equal to the low alarm value, the Alarm box in the Channel grid flashes **Low** to indicate the low alarm has "tripped". If the high alarm is enabled and the reading is greater than or equal to the high alarm value, the Alarm box flashes **High** to indicate the high alarm has "tripped". If the reading falls between the low and high alarm values or if the alarms are not enabled, the Alarms box remains blank (alarm reset).

Double-clicking on a row in the Channels grid toggles the state of the trace on the graph. The current state for each channel is indicated in the Graph column.

Right-clicking on the Channels grid displays a popup menu. This menu consists of some of the more common options for working with channels during a

real-time log session. The menu options apply only to the currently selected channel.
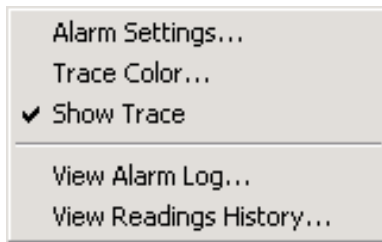


**Figure 17** *Channels popup menu*

The alarm settings for the selected channel can be viewed by selecting the Alarm Settings option in the popup menu, or by selecting the Alarm Settings option in the View menu. If the selected channel does not have any alarms configured, this menu option is disabled. Selecting the Alarm Settings option displays the Current Alarm Settings dialog. Please refer to Section 2.4.4, Current Alarm Settings Dialog, for more information on this dialog.

The graph trace color for the selected channel can be changed while the log session is running by selecting the Trace Color option in the popup menu, or by selecting the Trace Color option in the Graph menu. Please refer to Section 2.4.7, Trace Color Dialog, for more details on using the Trace Color dialog. The color of the channel in the Channels grid, statistics list and the graph trace are all updated to the new color.

The Show Trace option in the popup menu indicates whether the trace for this channel is currently shown on the graph. A check appears next to this menu option is the trace is visible. The Graph column of the Channels grid also indicates whether the trace is currently shown on the graph. To toggle showing the trace for the selected channel on the graph, select the Show Trace option in the popup menu, or select the Show Trace option in the View menu.

The View Alarm Log option in the popup menu displays the alarm log file for this log session. Every time an alarm is tripped or reset, an entry is written to the alarm log file. This file is named "alarms.log" and is located in the default output folder. The alarm log file can also be viewed by selecting the Alarm Log option in the View menu. The alarm log file is displayed in the File Viewer window. Please refer to Section 7.2.3, Alarm Log File, for more information on the contents of the alarm log file. Please refer to Section 2.4.8, File Viewer Window, for more information on using the File Viewer window.

*Note: When viewing the alarm log file while a real-time log session is running, the File Viewer window displays only the information that had been written to the file at the time the file was opened. Click the Refresh button on the File Viewer window to update the file. The alarm log file can also be printed by clicking the Print button on the File Viewer window.*

The output file for each channel can be opened and viewed by selecting the View Readings History option in the popup menu or be selecting the Readings History option in the View menu. The output file contains all of the data that has been logged for the selected channel during the current log session. The output file is displayed in the File Viewer window. Please refer to Section 7.2.1, Output File, for more information on the contents of the output file. Please refer to Section 2.4.8, File Viewer Window, for more information on using the File Viewer window.

*Note: If the data is being acquired using the Write all acquired data to the same file option, the View Readings History feature displays all readings for all channels!*

*Note: When viewing the output file while a real-time log session is running, the File Viewer window displays only the information that had been written to the file at the time the file was opened. Click the Refresh button on the File Viewer window to update the file. To see the statistics for the output file, click the Statistics button on the File Viewer window. The output file can also be printed by clicking the Print button on the File Viewer window or by selecting the Print | Readings option in the File menu.*

## 2.4.2    Statistics list

The Statistics list is located in the upper right corner of the log session window and displays statistical information for the currently selected channel. The color of the statistics data matches the trace color for the selected channel. Each of the statistical settings can be enabled or disabled by clicking the Settings button. Only the enabled statistics are displayed in the Statistics list. Please refer to Section 2.3.6, Statistics Settings Dialog, for more information on the Statistics Settings dialog.

Clicking the Clear button resets all statistical values for the selected channel and begins calculating the statistical data again starting with the next reading acquired on the selected channel.

## 2.4.3    Graph

The graph is located at the bottom of the log session window. The graph gives a visual representation of the readings on all enabled channels.

The trace for each enabled channel can be toggled on or off. The Graph column in the Channels grid indicates the current state of the trace for each channel. To

show or hide the trace for the selected channel, either double-click on the channel, or right-click on the Channels grid and select the Show Trace option in the popup menu or select the Show trace option in the View menu.

The Y-axis of the graph is always labeled in the session temperature scale that was selected on the Log Session Settings dialog. The Y-axis is automatically scaled to keep the entire visible portion of all traces within the graph bounds. As traces are shown and/or hidden, the graph should automatically rescale to maximize the resolution.

*Note: For readings on all channels that are configured for non-temperature units (i.e. Ohms or mV), the units of the Y-axis are assumed to be in the appropriate units for that channel.*

The X-axis of the graph displays the current time according to the computer's clock. As the traces reach the right side of the graph, the traces shift to the left and the left-most part of the traces are pushed off the graph. The graph is set to display 600 readings on the X-axis at a time. This setting is fixed and cannot be changed.

Gridlines can be automatically displayed on the graph by checking the Show gridlines on graphs option of the General tab of the Log*Ware* Options dialog. Please refer to Section 5.6.4.1, General Tab, for more details.

Right-clicking on the graph displays a popup menu. This menu is identical to the Graph menu and consists of options for working with the graph during a real-time log session. Some of the menu options apply only to the currently selected channel.
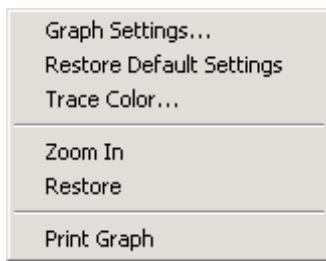


**Figure 18**   *Graph popup menu*

There are many customizable settings for the graph such as titles, a legend, background and text colors, grid lines and trend lines. All of these features can be accessed by selecting the Graph Settings option in the popup menu or in the Graph menu. The default graph settings can be restored by selecting the Restore Default Settings option in the popup menu or in the Graph menu. For more details on customizing the graph settings, please refer to Section 5.5.1, Graph Settings Dialog.

The Zoom In and Restore options are not applicable to a real-time log session and are disabled.

The graph may be printed at any time by selecting the Print Graph option in the popup menu or in the Graph menu, or by selecting the Print | Graph option in the File menu.

### 2.4.4    Current Alarm Settings dialog

The Current Alarm Settings dialog displays the current alarm settings.
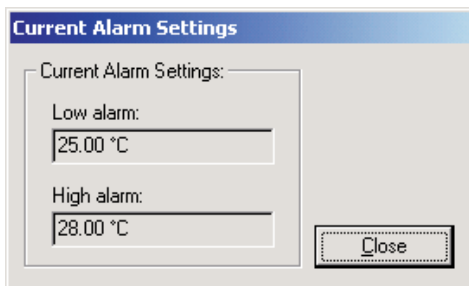


**Figure 19**   *Current Alarm Settings dialog*

The Low alarm box indicates the current low alarm value and units. If the low alarm is not enabled, the Low alarm box is disabled and no value is displayed.

The High alarm box indicates the current high alarm value and units. If the high alarm is not enabled, the High alarm box is disabled and no value is displayed.

Click the Close button to close this dialog.

### 2.4.5    Output file

The data that is acquired during a real-time log session is written to a file, called an output file. This file contains information about the thermometer read-out used to acquire the data, alarm settings (if applicable), and the date, time, value, scale and alarm state for each reading.

To view the contents of an output file during a real-time log session, select the Readings History option in the View menu, or right-click on the Channels grid and select the View Readings History option in the popup menu.

The output file is described in detail in Section 7.2.1, Output File.

### 2.4.6    Alarm log file

During a real-time log session, a log of all alarm activity is recorded in a file call the alarm log. This file contains alarm setting information for each channel

and the date, time, value, scale and alarm state for each time an alarm tripped or reset.

To view the contents of the alarm log file during a real-time log session, select the Alarm Log option in the View menu, or right-click on the Channels grid and select the View Alarm Log option in the popup menu.

The alarm log file is described in detail in Section 7.2.3, Alarm Log File.

### 2.4.7     Trace color dialog

The Trace Color dialog allows a new color to be selected for the graph trace.
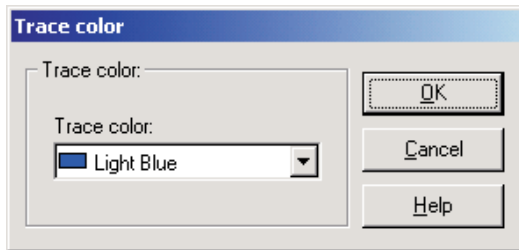


**Figure 20**   Trace color dialog

The current trace color is selected when the dialog is displayed. Select the new color using the Trace color drop-down list.

Click the OK button to save the settings you have selected and to close the dialog.

Click the Cancel button to discard any changes and close the dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 2.4.8    File Viewer window

The File Viewer window displays the contents of the indicated file.
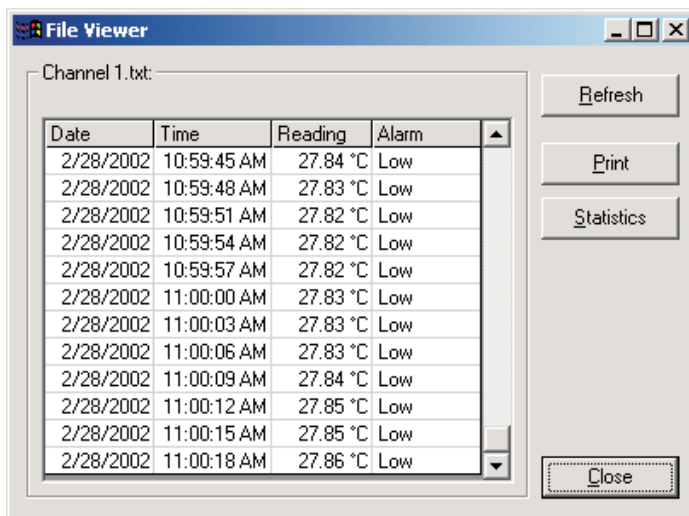


**Figure 21** *File Viewer window*

The data grid displays the contents of the file at the time the viewer window is displayed. The data displayed in the data grid will vary depending on the contents of the file being viewed.

To update the data in the data grid, click the Refresh button. The contents of file will be read in again and the data grid is updated.

To print the contents of the indicated file to the default printer, click the Print button.

The Statistics button is shown if there is statistical data associated with the displayed data. To see the statistical data, click the Statistics button. The Statistics dialog is displayed. Please refer to Section 2.4.9, Statistics Dialog, for more details on this dialog.

The Close button closes this window.

### 2.4.9     Statistics dialog

The Statistics dialog displays the current statistical values. Only the values for the enabled statistics are displayed.
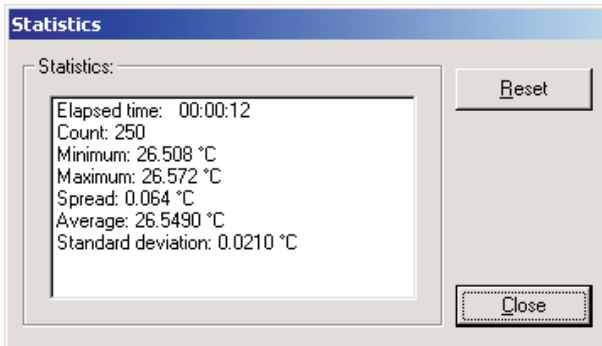


**Figure 22**   Statistics dialog

If the Sliding window statistical setting is enabled, the statistical values are based on the number of readings specified for the sliding window. Otherwise, the statistical values are based on all readings since the statistics were last reset.

Click the Reset button to reset the statistical values.

Click the Close button to close this dialog.

## 2.5     Previous log session

The Previous Log Session window allows multiple output files or download files to be opened and viewed. This window is divided into three main sections:

channels, statistics and graph. These three sections can be resized by dragging the bars that divide the sections with the mouse.
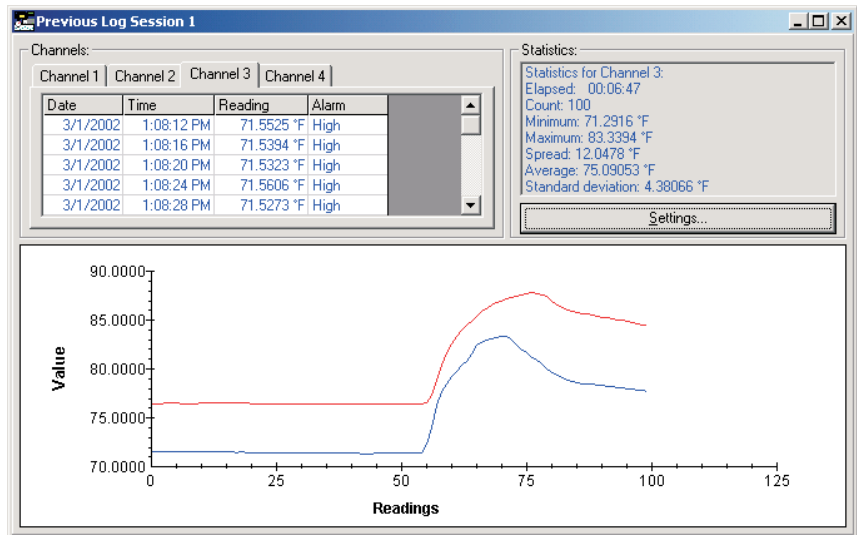


**Figure 23**  *Previous Log Session window*

A Previous Log Session window can be opened by selecting the Open Previously Logged Data File option in the View menu or by selecting one of the files in the Most Recently Used (MRU) section at the bottom of the View menu. Up to 8 Previous Log Session windows can be open at a time.

When selecting the Open Previously Logged Data File option, the Windows® Open dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Both output files and download files can be opened in the Previous Log Session window. These files should have a **.txt** extension. To cancel opening a file, click the Cancel button. Otherwise, select up to 10 files to open and click the Open button. If more than 10 files are selected, only the first 10 files are opened and the rest are ignored. For more details about output files, please refer to Section 7.2.1, Output file. For more details about download files, please refer to Section 7.2.2, Download file.

*Note: If the output file was created using the Write all acquired data to the same file option, it can still be opened by LogWare and displayed on-screen, however all readings are displayed on the graph as if they came from the same channel (single trace).*

A progress dialog is displayed as each of the selected files are read in and analyzed. As each of the files is read in, a tab is created in the Channels section of

the window and statistical data is calculated. Each channel is automatically assigned a trace color that can be changed at any time. The X-axis of the graph automatically grows to accommodate the file with the most readings. The Y-axis of the graph is automatically scaled to display all traces on the graph.

*Note: The graph allows a maximum of 32,767 readings per channel. If any one file contains more readings than that, the first 32,767 readings are read in and the rest are ignored. The graph also limits the total number of data points to 128,000 for all channels. So, for 10 channels, a maximum of 12,800 readings per channel can be displayed.*

To close the Previous Log Session window, click the [×] button in the title bar.

### 2.5.1 Channels

The Channels section is located in the upper left corner of the previous log session window and displays one tab for each file that was opened. Each tab is given the name of the file and the grid on the tab contains all of the data that was read in from the file. Depending on the type of file being opened, this data can include but is not necessarily limited to, the date, time, value and scale of each reading as well as the alarm state at the time that reading was taken.

*Note: When opening files that contain data that was downloaded from some of the thermometers supported by LogWare, no date or time information is available. Download files never contain alarm information.*

Selecting a tab in the Channels section displays the data associated with that channel. The color of the data in the grid matches the graph trace color assigned to this channel.

Right-clicking on any of the channel tabs displays a popup menu. This menu allows channels to be added to or removed from this session, and also allows the trace color to be changed, or the trace can be hidden.
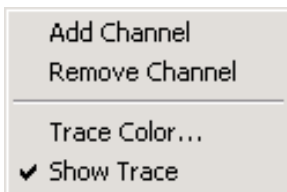


**Figure 24**  *Channels popup menu*

Log*Ware* is capable of opening up to 10 files (channels) in the same Previous Log Session window. To add another channel to the window, select the Add

Channel option in the popup menu. The Windows® Open dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). To cancel opening a file, click the Cancel button. Otherwise, select up to 9 more files to open and click the Open button. Since Log*Ware* only allows a total of 10 files to be opened, any additional files are ignored. The Add Channel option is disabled if the log session already has 10 channels open.

To remove a channel from the Previous Log Session window, select the tab for the channel and select the Remove Channel option in the popup menu. Any channel can be removed **except the first channel**. The first channel cannot be removed. When a channel is removed, the corresponding tab, grid and graph trace are also removed and the graph Y-axis is rescaled as needed.

To change the color of the trace on the graph for any channel, select the tab for the channel and select the Trace Color option in the popup menu, or by selecting the Trace Color option in the Graph menu. The Trace Color dialog is displayed. Please refer to Section 2.4.7, Trace Color Dialog, for more information on this dialog.

The Show Trace option in the popup menu indicates whether the trace for the selected channel is currently shown on the graph. A check appears next to this option if the trace is visible. The trace on the graph for any channel can be toggled on or off at any time. To toggle the trace for any channel, select the tab for the channel and select the Show Trace option in the popup menu or select the Show trace option in the View menu. If a check appears next to this option, the trace is currently shown. If no check appears, the trace is hidden.

## 2.5.2 Statistics list

The Statistics list is located in the upper right corner of the Previous Log Session window and displays statistical information for the currently selected channel. The statistics are calculated when the data is read in from the file. The color of the statistics data matches the trace color for the selected channel.

Each of the statistical settings can be enabled or disabled by clicking the Settings button. Only the enabled statistics are displayed in the Statistics list. Please refer to Section 2.3.6, Statistics Settings Dialog, for more information on the Statistics Settings dialog.

## 2.5.3 Graph

The graph is located at the bottom of the Previous Log Session window. The graph gives a visual representation of the readings on all channels.

The trace for each channel can be toggled on or off. To show or hide the trace for the selected channel, right-click on the tab in the Channels grid and select the Show Trace option in the popup menu or select the Show Trace option in the View menu.

The Y-axis of the graph is automatically scaled to display all visible traces in their entirety. The Y-axis is labeled Value by default and the resolution of the

values is extracted from the data read in from the channels. The X-axis of the graph grows automatically to display the entire trace of the channel with the most readings. The X-axis is labeled Readings by default and is numbered according to the number of readings in each file.

*Note: The graph allows a maximum of 32,767 readings per channel. If any one file contains more readings than that, the first 32,767 readings are read in and the rest are ignored. The graph also limits the total number of data points to 128,000 for all channels. So, for 10 channels, a maximum of 12,800 readings per channel can be displayed.*

Gridlines can be automatically displayed on the graph by checking the show gridlines on graphs option of the General tab of the Log*Ware* Options dialog. Please refer to Section 5.6.4.1, General Tab, for more details.

Right-clicking on the graph displays a popup menu. This menu is identical to the Graph menu and allows quick access to graph-related functions. Some of the options apply only to the currently selected channel.
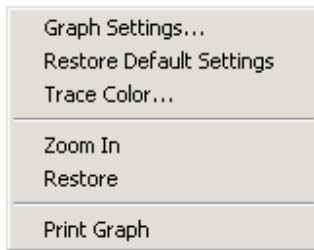


**Figure 25**  *Graph popup menu*

There are many customizable settings for the graph such as titles, a legend, background and text colors, grid lines and trend lines. All of these features can be accessed by selecting the Graph Settings option in the popup menu or in the Graph menu. The default graph settings can be restored by selecting the Restore Default Settings option in the popup menu or in the Graph menu. For more details on customizing the graph settings, please refer to Section 5.5.1, Graph Settings Dialog.

The Zoom In and Restore options are can be used to zoom in to a small section of the graph and to restore the graph to its default state respectively. Please refer to Section 2.5.4, Graph Zooming, for more details on using the graph zooming feature.

The graph may be printed at any time by selecting the Print Graph option in the popup menu or in the Graph menu, or by selecting the Print | Graph option in the File menu.

## 2.5.4     Graph zooming

Log*Ware* allows the graph in the Previous Log Session window to be zoomed to view a small section of the graph in more detail. The zoom feature can be enabled by selecting the Zoom In option in the Graph menu, or by right-clicking on the graph and selecting the Zoom In option in the popup menu, or by click-

ing the [🔍] button on the toolbar. When the zoom feature is enabled, the mouse pointer turns into a crosshair when positioned over the graph, the toolbar button remains depressed and a check mark appears next to the Zoom In option indicating that the graph is now in "zoom mode".
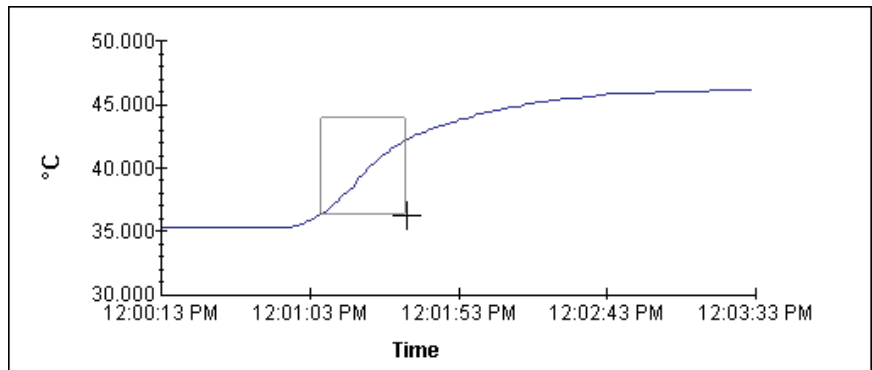


**Figure 26**  *Graph zooming*

To zoom in to a portion of the graph, use the mouse to select the portion of the graph to zoom by clicking the left mouse button and holding it down while dragging the mouse to draw a rectangular box around the desired area. Releasing the mouse button causes the graph to zoom in to the selected area. Repeat this process to zoom in closer and closer.

To restore the graph to its normal state, select the Restore option in the Graph menu, or right-click on the graph and select the Restore option in the popup

menu, or click the [🔍] button on the toolbar. The check mark is then removed in the Zoom In option and the Zoom In toolbar button no longer appears depressed.

# 3 Downloading logged data

Log*Ware* provides tools to download data that has been logged to the thermometer readout's memory or logs and to view the current status of the thermometer readout's logs or memory. These tools are accessible by selecting options in the Download menu. The following sections describe the download and log status dialogs for each of the thermometer readouts supported by Log*Ware*.

## 3.1 Download menu

The Download menu contains options for downloading logged data from the thermometer readout's memory or logs and viewing the current status of the thermometer readout's logs or memory.
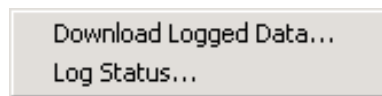


**Figure 27**  *Download menu*

### 3.1.1 Download logged data

The Download Logged Data option can be used to download data that has been logged to the thermometer readout's logs or memory. All thermometer readouts supported by Log*Ware* support logging of some type. Please refer to Section 1.4.4, Firmware Requirements, for more information.

When selecting the Download Logged Data option, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout in order to display appropriate options dialog. Please refer to Section 3.2, Select Model Dialog, for more details.

After the thermometer readout model and communication settings have been selected, the appropriate Download Options dialog for the selected thermometer readout is displayed. The Download Options dialogs are described in more detail in Section 3.3, Download Options Dialogs.

### 3.1.2 Log status

The Log Status option can be used to view the current status of the thermometer readout's logs or memory. This feature is only supported by some of the thermometer readouts supported by Log*Ware*.

When selecting the Log Status option, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout in order to display appropriate status dialog. Please refer to Section 3.2, Select Model Dialog, for more details on the Select Model dialog.

After the thermometer readout model and communication settings have been selected, the appropriate Log Status dialog for the selected thermometer readout is displayed. The Log Status dialogs are described in more detail in Section 3.4, Log Status Dialogs.

## 3.2    Select Model dialog

When any of the Download menu options is selected, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout to interface with.
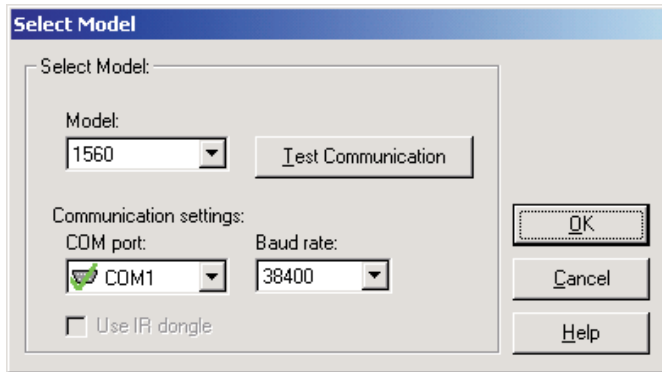


**Figure 28**  *Select Model dialog*

If this dialog has been used previously to select a thermometer readout model and communication settings, the previous settings are restored.

Use the Model drop-down list to select the type of thermometer readout being used. All other controls on this dialog are disabled until a model is selected. The list of available thermometer readouts depends on the Download menu option selected. Only thermometer readouts that support the selected feature are listed.

Select the COM port on the computer to which the thermometer readout is connected using the COM port drop-down list. Only COM ports that the operating system reports as being available can be used. The following symbols are used to show the status of each COM port:

- ▭ - Indicates a COM port that is currently available.
- ✔ - Indicates the COM port that is currently selected by Log*Ware*.
- ✖ - Indicates a COM port that is currently being used by another application.
- ⯊ - Indicates an IR port (virtual COM port) that is currently available.

-  - Indicates an IR port (virtual COM port) that is currently selected by Log*Ware*.

-  - Indicates an IR port (virtual COM port) that is currently being used by another application.

Select the baud rate that the computer should use to communicate over the COM port with the thermometer readout using the Baud rate drop-down list. The baud rate setting of the thermometer readout must be set to the same value as this setting. For best results, use the maximum allowable baud rate setting when possible.

Check the Use IR dongle option to use the thermometer readout's IR port instead of an RS-232 cable. This option is only enabled when the selected thermometer readout has an IR port and the selected download feature allows using the IR port to communicate with the thermometer readout. For more information on using the IR dongle, please refer to Section 6.13, Using an IR Dongle with Log*Ware*.

After the model, COM port, baud rate and/or IR settings are configured, click the Test Communication button to make sure communication with the thermometer readout is successful. At this time, the thermometer readout must be connected to the COM port on the computer using a null modem cable or, if the IR dongle is being used, the IR dongle must be connected to the selected COM port and the dongle must be aligned with the thermometer readout's IR port. For more information, please refer to the thermometer's User's Guide.

When testing communication with the thermometer readout, there are three possible results:

- The thermometer readout is communicating at the correct baud rate on the selected COM port.

- The thermometer readout is communicating, but possibly at the wrong baud rate or the thermometer readout model does not match the selected model.

- The thermometer readout failed to communicate at all. Check the COM port and baud rate settings, make sure the cable is a null modem cable, and make sure the thermometer readout is plugged in and turned on. If using the IR dongle, make sure the dongle is connected to the selected COM port and the dongle is aligned properly with the thermometer readout's IR port.

After all of the settings on this dialog are configured and communication with the thermometer readout is successful, click the OK button to accept the settings and continue.

Click the Cancel button close this dialog and abort using the selected feature.

Click the Help button to display the appropriate help topic for this dialog.

## 3.3 Download options dialogs

Log*Ware* provides a tool to download data from the thermometer readout's memory or logs. This tool is accessible by selecting the Download Logged Data option in the Download menu. The following sections describe the dialogs for each of the thermometer readouts that support this feature.

### 3.3.1 1529 'Chub-E4' download options dialog

The Model 1529 'Chub-E4' Thermometer readout (including models 1529, 1529-R and 1529-T) can store readings in any of two logs: demand log and auto log. Log*Ware* can download the readings from these logs and write the readings into download files. For more information on download files, please refer to Section 7.2.2, Download File. When the Download Logged Data option in the Download menu is selected and the 1529 thermometer readout is selected on the Select Model dialog, the 1529 'Chub-E4' Download Options dialog is displayed (Figure 29).

The Select log to download section allows the log to be specified. The 1529 'Chub-E4' Thermometer readout has two logs: demand log and auto log. The demand log stores up to 100 readings while the auto log stores up to 8,160 readings. For more details on the demand and auto logs, see the 1529 'Chub-E4' Thermometer readout User's Guide.

The Readings section allows the number of readings to be downloaded to be specified.

Selecting the Download all readings from log option indicates that all of the readings in the selected log should be downloaded.

Selecting the Download only readings with this label option allows only readings that are assigned the label indicated below to be downloaded from the selected log. If this option is selected, a list of current labels is read in from the thermometer readout. Use the drop-down list to select the appropriate label.

Enter the resolution to use to format the readings when they are written to the download file in the Resolution box. This value can be set between 0 and 4 digits (places after decimal point).

Select the method to use when writing the downloaded readings to a file using the options in the Files section.

Selecting the Write all readings into a single file option causes all of the down-loaded readings to be written to one file.
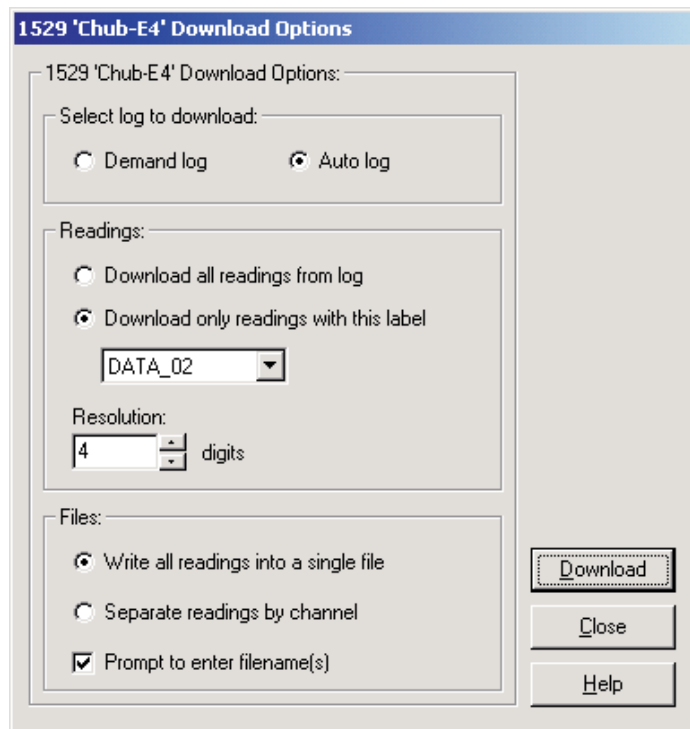


**Figure 29**  *1529 'Chub-E4' Download Options dialog*

Selecting the Separate readings by channel option causes all of the downloaded readings to be separated according to the channel that each reading was taken from and written into separate files.

If the Prompt to enter filename(s) check box is checked, a prompt is displayed after the data is downloaded for each file that needs to be created, depending on the other selections above. If this option is not checked, the default filenames are used.

After selecting the appropriate options on this dialog, click the Download but-ton to start the download process. For more details on the download process, please refer to Section 8, Download Process.

To close this dialog, click the Close button.

Click the Help button to display the appropriate help topic for this dialog.

### 3.3.2    1560 '*Black Stack*' download options dialog

The Model 1560 'Black Stack' Thermometer readout stores the values of up to
the last 1,000 readings taken in the thermometer readout's memory, and is re-
ferred to by Log*Ware* as the history log. Log*Ware* can download the readings
from the history log and write the readings into download files. For more infor-
mation on download files, please refer to Section 7.2.2, Download File. When
the Download Logged Data option in the Download menu is selected and the
1560 'Black Stack' Thermometer readout is selected on the Select Model dia-
log, the 1560 'Black Stack' Download Options dialog is displayed.
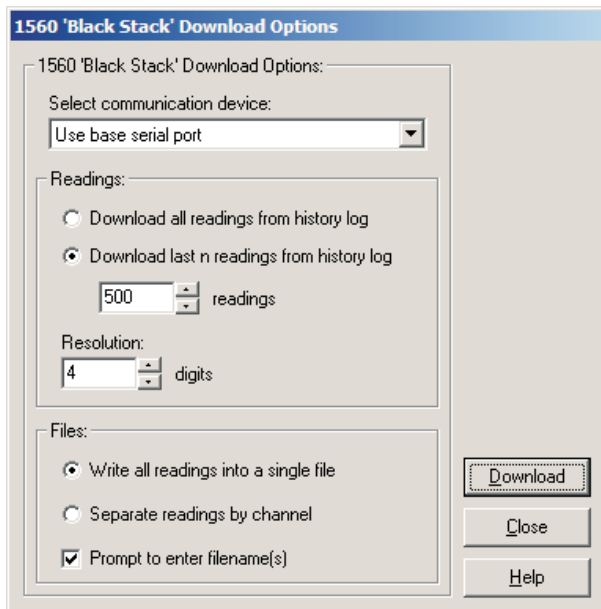
**Figure 30**   1560 'Black Stack' Download Options dialog

The Select communication device setting determines the device (serial port) to
which the readings will be downloaded.

- **Use base serial port -** Select this option if the serial cable is connected to
  the serial port on the base unit of the 1560 (immediately behind the dis-
  play).
- **Use communication module serial port -** Select this option if the serial
  cable is connected to the serial port on the Model 3560 Communication
  Module.

The Readings section allows the number of readings to be downloaded to be
specified. The history log can contain up to 1,000 readings.

*Note: The actual number of readings in the history log depends on the number of channels on the thermometer readout. Typically, the history log can hold 1,000 readings as long as there are not more than 63 total input channels on the thermometer readout. For every channel over 63, the number of readings that the history log can hold decreases by approximately 16.*

Selecting the Download all readings from history log option indicates that the entire history log should be downloaded.

Selecting the Download last n readings from history log option allows a specific number of readings to be downloaded from the history log. If this option is selected, enter the number of readings to download in the readings box. This value can be set between 1 and the total number of readings in the history log.

Enter the resolution to use to format the readings when they are written to the download file in the Resolution box. This value can be set between 0 and 12 digits (places after decimal point).

Select the method to use when writing the downloaded readings to a file using the options in the Files section.

Selecting the Write all readings into a single file option causes all of the downloaded readings to be written to one file.

Selecting the Separate readings by channel option causes all of the downloaded readings to be separated according to the channel that each reading was taken from and written into separate files.

If the Prompt to enter filename(s) check box is checked, a prompt is displayed after the data is downloaded for each file that needs to be created, depending on the other selections above. If this option is not checked, the default filenames are used.

*Note: When downloading data from the 1560, the measurement process in the thermometer readout is halted until downloading is complete!*

After selecting the appropriate options on this dialog, click the Download button to start the download process. For more details on the download process, please refer to Section 8, Download Process.

To close this dialog, click the Close button.

Click the Help button to display the appropriate help topic for this dialog.

### 3.3.3 1575A 'Super Thermometer' download options dialog

The Model 1575A 'Super Thermometer' readout can store readings in any of two logs: history log and memory log. Log*Ware* can download the readings from these logs and write the readings into download files. For more information on download files, please refer to Section 7.2.2, Download File. When the

Download Logged Data option in the Download menu is selected and the 1575A 'Super Thermometer' readout is selected on the Select Model dialog, the 1575A 'Super Thermometer' Download Options dialog is displayed.
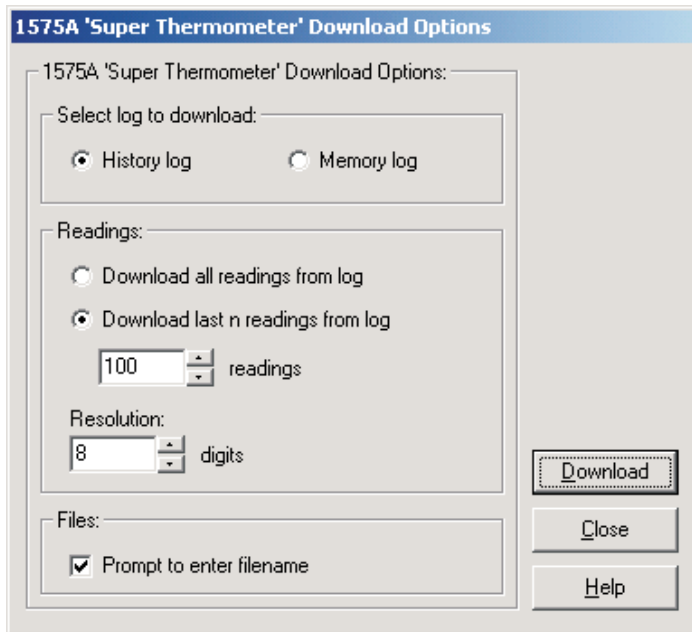


**Figure 31**   1575A 'Super Thermometer' Download Options dialog

The Select log to download section allows the log to be specified. The 1575A 'Super Thermometer' readout has two logs: history log and memory log. The history log stores the most recent 100 readings taken by the thermometer readout. The memory log can be used to store up to 100 readings manually. For more details on the history and memory logs, see the 1575A 'Super Thermometer' readout User's Guide.

The Readings section allows the number of readings to be downloaded to be specified.

Selecting the Download all readings from log option indicates that all of the readings in the selected log should be downloaded.

Selecting the Download last n readings from log option allows a specific number of readings to be downloaded from the selected log. If this option is selected, enter the number of readings to download in the readings box. This value can be set between 1 and 100.

⚠ *Note: It is not possible for LogWare to determine exactly how many readings are currently stored in the memory log. Therefore, memory locations that do not have a value stored in them always return a value of 0 °C.*

Enter the resolution to use to format the readings when they are written to the download file in the Resolution box. This value can be set between 0 and 8 digits (places after decimal point).

Select the options regarding the file to create in the Files section.

If the Prompt to enter filename check box is checked, a prompt is displayed after the data is downloaded for the file that needs to be created. If this option is not checked, the default filename is used.

After selecting the appropriate options on this dialog, click the Download button to start the download process. For more details on the download process, please refer to Section 8, Download Process.

To close this dialog, click the Close button.

Click the Help button to display the appropriate help topic for this dialog.

### 3.3.4    1590 'Super Thermometer II' download options

The Model 1590 'Super Thermometer II' readout can store readings in any of two logs: history log and memory log. Log*Ware* can download the readings from these logs and write the readings into download files. For more information on download files, please refer to Section 7.2.2, Download File. When the Download Logged Data option in the Download menu is selected and the 1590 'Super Thermometer II' readout is selected on the Select Model dialog, the 1590 'Super Thermometer II' Download Options dialog is displayed (Figure 32).

The Select log to download section allows the log to be specified. The 1590 'Super Thermometer II' readout has two logs: history log and memory log. The history log stores the most recent 100 readings taken by the thermometer readout. The memory log can be used to store up to 100 readings manually. For more details on the history and memory logs, see the 1590 'Super Thermometer II' readout User's Guide.

The Readings section allows the number of readings to be downloaded to be specified.

Selecting the Download all readings from log option indicates that all of the readings in the selected log should be downloaded.

Selecting the Download last n readings from log option allows a specific number of readings to be downloaded from the selected log. If this option is selected, enter the number of readings to download in the readings box. This value can be set between 1 and 100.

⚠️ *Note: It is not possible for LogWare to determine exactly how many read-ings are currently stored in the memory log. Therefore, memory locations that do not have a value stored in them always return a value of 0 °C.*

Enter the resolution to use to format the readings when they are written to the download file in the Resolution box. This value can be set between 0 and 8 dig-its (places after decimal point).



**Figure 32** *1590 'Super Thermometer II' Download Options dialog*

Select the options regarding the file to create in the Files section.

If the Prompt to enter filename check box is checked, a prompt is displayed af-ter the data is downloaded for the file that needs to be created. If this option is not checked, the default filename is used.

After selecting the appropriate options on this dialog, click the Download but-ton to start the download process. For more details on the download process, please refer to Section 8, Download Process.

To close this dialog, click the Close button.

Click the Help button to display the appropriate help topic for this dialog.

## 3.4 Log status dialogs

Log*Ware* provides a tool to view the status of the thermometer readout's memory or logs. This tool is accessible by selecting the Log Status option in the Download menu. The only thermometer readouts supported by Log*Ware* that have this feature are the 1529 'Chub-E4' Thermometer readout and the 1560 'Black Stack' Thermometer readout. The following section describes the dialogs for viewing the log status for each supported thermometer readout.

### 3.4.1 1529 'Chub-E4' log status dialog

The Model 1529 'Chub-E4' Thermometer readout (including models 1529, 1529-R and 1529-T) can store readings in any of two logs: demand log and auto log. Log*Ware* can display the current status of these logs and provides a way to clear all readings from these logs. When the Log Status option in the Download menu is selected and the 1529 'Chub-E4' Thermometer readout is selected on the Select Model dialog, the 1529 'Chub-E4' Log Status dialog is displayed.
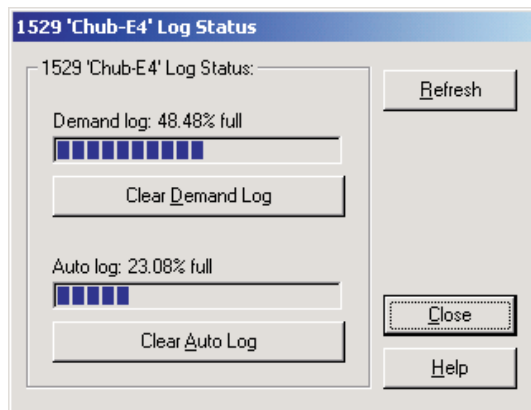


**Figure 33**   *1529 'Chub-E4' Log Status dialog*

The Demand log progress bar indicates the current status of the demand log. The demand log in the 1529 'Chub-E4' Thermometer readout can hold up to 100 readings.

To clear all readings from the demand log, click the Clear Demand Log button.

The Auto log progress bar indicates the current state of the auto log. The auto log in the 1529 'Chub-E4' Thermometer readout can hold up to 8,160 readings.

To clear all readings from the auto log, click the Clear Auto Log button.

To refresh the log status information on this dialog, click the Refresh button. The log status is read in from the thermometer readout again and the dialog is updated.

To close this dialog, click the Close button.

Click the Help button to display the appropriate help topic for this dialog.

### 3.4.2    1560 'Black Stack' log status dialog

The Model 1560 'Black Stack' Thermometer readout stores the values of up to the last 1,000 readings taken in the thermometer's memory, and is referred to by Log*Ware* as the history log. Log*Ware* can display the current status of the history log. When the Log Status option in the Download menu is selected and the 1560 'Black Stack' Thermometer readout is selected on the Select Model dialog, the 1560 'Black Stack' Log Status dialog is displayed.
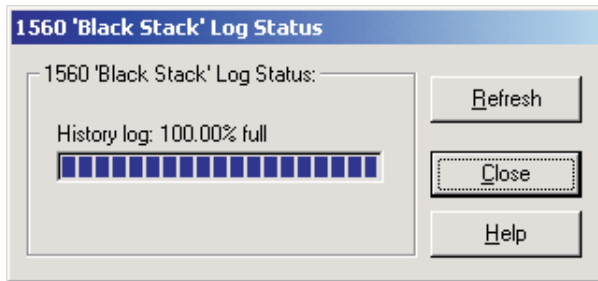


**Figure 34**   *1560 'Black Stack' Log Status dialog*

The history log progress bar indicates the current state of the history log. The history log in the 1560 'Black Stack' Thermometer readout stores the values of up to the last 1,000 readings taken. The history log of the 1560 'Black Stack' Thermometer readout will nearly always indicate 100% full. It is not possible for Log*Ware* to clear the history log.

*Note: The actual number of readings in the history log depends on the number of channels on the thermometer readout. Typically, the history log can hold 1,000 readings as long as there are not more than 63 total input channels on the thermometer readout. For every channel over 63, the number of readings that the history log can hold decreases by approximately 16.*

To refresh the log status information on this dialog, click the Refresh button. The log status is read in from the thermometer readout again and the dialog is updated.

To close this dialog, click the Close button.

Click the Help button to display the appropriate help topic for this dialog.

# 4      Tools

Log*Ware* provides tools to synchronize the thermometer readout's clock, view/modify logging labels and view/modify various thermometer readout settings including filtering, sampling, measurement, calibration, module, channel and probe settings. These tools are accessible by selecting options in the Tools menu. The following sections describe the dialogs for these tools for each of the thermometer readouts supported by Log*Ware*.

## 4.1      Tools menu

The Tools menu contains options for synchronizing the thermometer readout's clock, viewing/modifying logging labels and viewing/modifying thermometer readout settings.
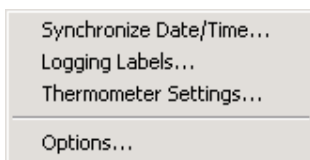


**Figure 35**   *Tools menu*

### 4.1.1      Synchronize date/time

The Synchronize Date/Time option can be used to synchronize the thermometer readout's clock to the computer's clock. All thermometer readouts supported by Log*Ware* support this feature.

When selecting the Synchronize Date/Time option, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout in order to send the proper commands to synchronize the thermometer readout's clock. Please refer to Section 4.2, Select Model Dialog, for more details on the Select Model dialog.

After the thermometer readout model and communication settings have been selected, the appropriate commands are sent to the thermometer readout to update its date and time settings (as applicable to the selected thermometer readout). After the commands have been sent, a message is displayed indicating that the thermometer readout's clock has been updated.

⚠️ *Note: Before synchronizing the thermometer readout's clock, make sure the computer's clock is accurate. Use the Windows® Control Panel to adjust the date and time as necessary.*

> ⚠️ *Note: The thermometer readout's display may not immediately reflect the updated time.*

## 4.1.2    Logging labels

The Logging Labels option can be used to view and/or modify the labels that the thermometer readout assigns to readings that are stored in the thermometer readout's log(s). This feature is only supported by the 1529 'Chub-E4' Thermometer readout.

When selecting the Logging Labels option, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout. Please refer to Section 4.2, Select Model Dialog, for more details on the Select Model dialog.

After the thermometer readout model and communication settings have been selected, the Logging Labels dialog for the selected thermometer readout is displayed. The Logging Labels dialog is described in more detail in Section 4.3, Logging Labels Dialogs.

## 4.1.3    Thermometer settings

The Thermometer Settings option can be used to view and/or modify many thermometer readout, module, and probe settings including filtering, sampling, measurement, calibration, and conversion settings. All thermometer readouts supported by Log*Ware* support this feature. Please refer to Section 1.4.4, Firmware Requirements, for more information.

When selecting the Thermometer Settings option, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout in order to display the appropriate thermometer readout settings dialogs. Please refer to Section 4.2, Select Model Dialog, for more details on the Select Model dialog.

After the thermometer readout model and communication settings have been selected, the appropriate Thermometer Settings dialog for the selected thermometer readout is displayed. The Thermometer Settings dialogs are described in more detail in Section 4.4, Thermometer Settings Dialogs.

> ⚠️ *Warning: When using the Thermometer Settings tool, make sure that the thermometer readout is not currently in any menu. Using the thermometer readout's menus while using the Thermometer Settings tool may cause the thermometer readout to fail to accept new settings.*

## 4.2    **Select Model dialog**

When any of the Tools menu options is selected, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout to interface with.
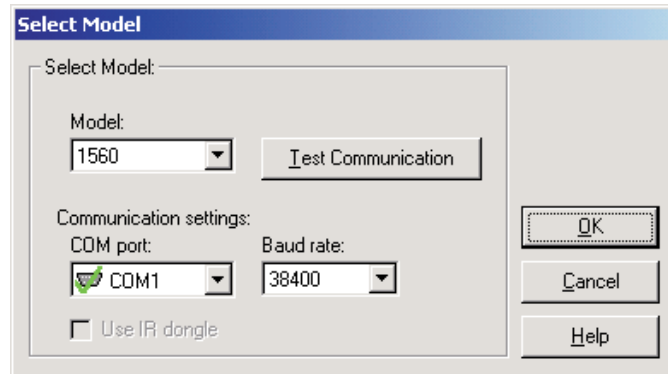


**Figure 36**   *Select Model dialog*

If this dialog has been used previously to select a thermometer readout model and communication settings, the previous settings are restored.

Use the Model drop-down list to select the type of thermometer readout being used. All other controls on this dialog are disabled until a model is selected. The list of available thermometer readouts depends on the Tools menu option selected. Only thermometer readouts that support the selected feature are listed.

Select the COM port on the computer to which the thermometer readout is connected using the COM port drop-down list. Only COM ports that the operating system reports as being available can be used. The following symbols are used to show the status of each COM port:

- ▭ - Indicates a COM port that is currently available.

- ▭ - Indicates the COM port that is currently selected by Log*Ware*.

- ✖ - Indicates a COM port that is currently being used by another application.

- ▭ - Indicates an IR port (virtual COM port) that is currently available.

- ▭ - Indicates an IR port (virtual COM port) that is currently selected by Log*Ware*.

-  - Indicates an IR port (virtual COM port) that is currently being used by another application.

Select the baud rate that the computer should use to communicate over the COM port with the thermometer readout using the Baud rate drop-down list. The baud rate setting of the thermometer readout must be set to the same value as this setting. For best results, use the maximum allowable baud rate setting when possible.

Check the Use IR dongle option to use the thermometer readout's IR port instead of an RS-232 cable. This option is only enabled when the selected thermometer readout has an IR port and the selected feature allows using the IR port to communicate with the thermometer readout. For more information on using the IR dongle, please refer to Section 6.13, Using an IR Dongle with Log*Ware*.

After the model, COM port, baud rate and/or IR settings are configured, click the Test Communication button to make sure communication with the thermometer readout is successful. At this time, the thermometer readout must be connected to the COM port on the computer using a null modem cable or, if the IR dongle is being used, the IR dongle must be connected to the selected COM port and the dongle must be aligned with the thermometer readout's IR port. For more information, please refer to the thermometer readout's User's Guide.

When testing communication with the thermometer readout, there are three possible results:

- The thermometer readout is communicating at the correct baud rate on the selected COM port.
- The thermometer readout is communicating, but possibly at the wrong baud rate or the thermometer readout model does not match the selected model.
- The thermometer readout failed to communicate at all. Check the COM port and baud rate settings, make sure the cable is a null modem cable, and make sure the thermometer readout is plugged in and turned on. If using the IR dongle, make sure the dongle is connected to the selected COM port and the dongle is aligned properly with the thermometer readout's IR port.

After all of the settings on this dialog are configured and communication with the thermometer readout is successful, click the OK button to accept the settings and continue.

Click the Cancel button close this dialog and abort using the selected feature.

Click the Help button to display the appropriate help topic for this dialog.

## 4.3      Logging labels dialogs

Log*Ware* provides a tool to view and/or modify the labels that the thermometer readout assigns to readings that are stored in the thermometer readout's log(s). This tool is accessible by selecting the Logging Labels option in the Tools menu.

The only thermometer readout supported by Log*Ware* that supports this feature is the 1529 'Chub-E4' Thermometer readout. The following section describes the dialog for viewing and/or modifying logging labels for this thermometer readout.

### 4.3.1      1529 'Chub-E4' logging labels

The Model 1529 'Chub-E4' Thermometer readout (including models 1529, 1529-R and 1529-T) can store readings into logs. When readings are stored in a log, a label can be assigned to each reading or set of readings to indicate the reason, purpose or to otherwise identify the reading(s). Log*Ware* provides a tool that can be used to view and/or modify the current logging label settings. When the Logging Labels option in the Tools menu is selected and the 1529 'Chub-E4' Thermometer readout is selected on the Select Model dialog, the 1529 'Chub-E4' Logging Labels dialog is displayed.
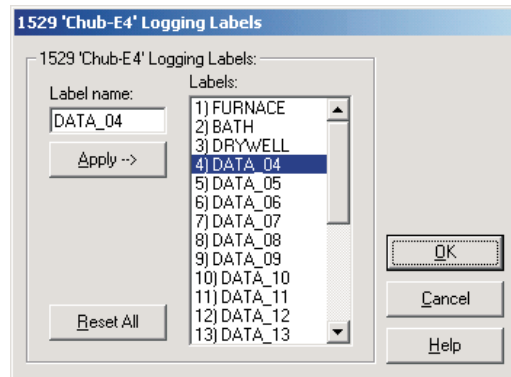


**Figure 37**   *1529 'Chub-E4' Logging Labels dialog*

When the Logging Labels dialog is displayed, the current logging labels are read in from the thermometer readout. The Labels list indicates the current logging labels. The 1529 'Chub-E4' Thermometer readout has 25 logging labels.

To modify any of one of the labels, click on the appropriate label in the Labels list. The Label name box indicates the name of the label that is currently selected. Enter the new name for the selected label and press the Enter key or click the Apply --> button. The Labels list is updated to reflect the change. If the Enter key was pressed, the next label in the list will automatically be selected and the name of the next label can be entered in the Label name box.

Repeat this process for all labels that need to be modified.

To reset all labels to their default names, click the Reset All button. The Labels list is updated to show the default names for all labels.

After all labels have been modified as needed, click the OK button to write the new label names to the thermometer readout. A progress dialog is displayed while the new label names are being written to the thermometer readout.

If no labels were modified, or to close this dialog without writing the new label names to the thermometer readout, click the Close button.

Click the Help button to display the appropriate help topic for this dialog.

## 4.4　Thermometer settings dialogs

Log*Ware* provides tools to view and/or modify various thermometer readout settings including filtering, sampling, measurement, calibration, module, channel, and probe settings. These tools are accessible by selecting the Thermometer Settings option in the Tools menu. The following sections describe the dialogs for each of the thermometer readouts that support this feature.

### 4.4.1　1529 'Chub-E4' settings dialog

The 1529 'Chub-E4' Settings dialog displays information about the thermometer readout including model number, serial number, identification information,

and the total number of channels. It also allows many thermometer readout settings to be viewed and/or modified.
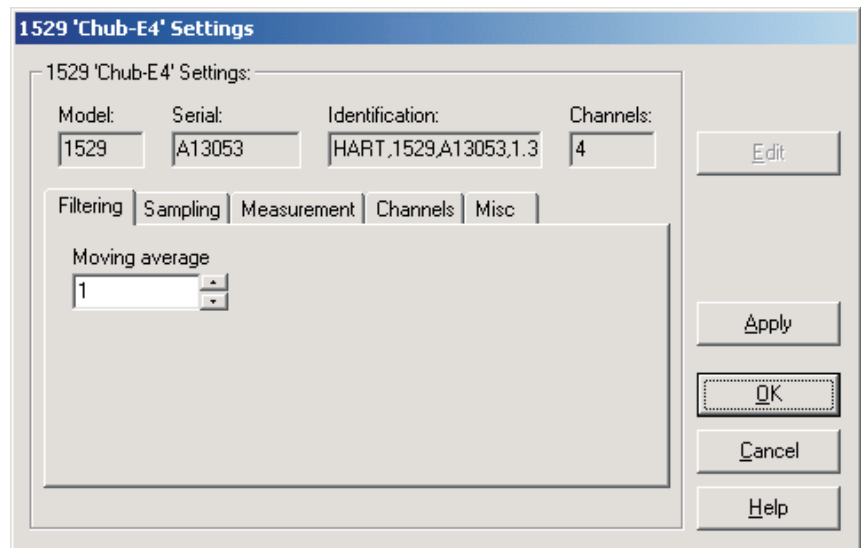


**Figure 38** *1529 'Chub-E4' Settings dialog*

The 1529 'Chub-E4' must be connected to an available COM port or IR dongle and the communication settings must be properly configured so that this information can be read in from the thermometer readout. If communication with the thermometer readout is not successful, an error message is displayed and this dialog is blank. A progress dialog is displayed while the current thermometer readout settings are being read in.

The Model box indicates the model number of the thermometer readout. The Serial box indicates the serial number assigned to this thermometer readout. The Identification box indicates the manufacturer name, model number, serial number, and firmware version installed in this thermometer readout. The Channels box indicates the total number of input channels on this thermometer readout.

The filtering settings can be viewed and modified by selecting the Filtering tab. The sampling settings can be viewed and modified by selecting the Sampling tab. The measurement settings can be viewed and modified by selecting the Measurement tab. The Channels tab displays a list of channels and allows access to channel and probe settings dialogs. The settings on each of these tabs are described in detail in the following sections. For more details on these settings, please refer to the thermometer readout's User's Guide.

Some of the settings on the 1529 'Chub-E4' Settings dialog may be passcode protected. If they are, a message appears at the bottom of the dialog and the Edit button is displayed. The controls for the passcode protected settings are

disabled. To edit the protected settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the thermometer readout settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

### 4.4.1.1 Filtering tab

Select the Filtering tab to view and/or modify the filter settings.
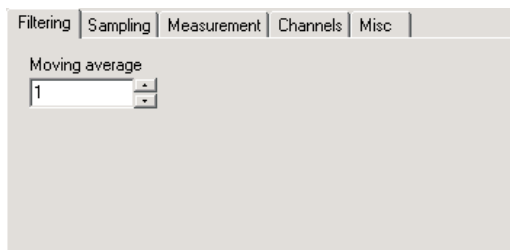


**Figure 39** *1529 'Chub-E4' Settings - Filtering tab*

The Moving average setting is sometimes also called a sliding window filter. Enter the number of readings to average (size of window) in the box provided. Setting this option to any value other than 1 causes the thermometer readout to display the average of the last *n* readings on a specific channel as the current reading for that channel. If the moving average is set to 1, the most recent measurement on each channel is displayed as the current reading. The moving average can be set to any value between 1 and 10.

**4.4.1.2**     **Sampling tab**

Select the Sampling tab to view and/or modify sampling settings.



**Figure 40**   *1529 'Chub-E4' Settings - Sampling tab*

Select the units to use when displaying readings in temperature using the Units drop-down list. Temperature readings can be displayed in either °C, °F or K. This setting applies to all channels that are configured to display readings in temperature.

Select the resolution for the readings using the Resolution drop-down list. The resolution can be set to any value between 0 and 4, or Auto.

Select the time interval between subsequent measurements using the Sample interval drop-down list. The sample interval can be set to any one of the following settings:

- 0.1, 0.2 or 0.5 seconds
- 1, 2, 5, 10 or 30 seconds
- 1, 2, 5, 10 or 30 minutes
- 1 hour

*Note: Setting the sample interval to 0.1 or 0.2 seconds causes the 1529 to enter a special "fast" sampling mode. Please refer to the 1529 'Chub-E4' User's Guide for more information on using sample interval settings of less than 0.5 seconds.*

Select the decimal format character using the Decimal format drop-down list. The 1529 'Chub-E4' Thermometer readout supports using either the period (.) or comma (,) as the decimal separator.

Select the date format using the Date format drop-down list. The 1529 'Chub-E4' Thermometer readout supports displaying the date in one of four formats:

- MM-DD-YY
- MM-DD-YYYY

- DD/MM/YY

- DD/MM/YYYY

Select the time format using the Time format drop-down list. The 1529 'Chub-E4' Thermometer readout supports displaying the time in either 12-hour or 24-hour format.

Checking the Stamp all measurements with date and time option causes the 1529 'Chub-E4' Thermometer readout to always send date and time information with the measurement when querying measurements using an RS-232, IR, or IEEE interface.

### 4.4.1.3 Measurement tab

Select the Measurement tab to view and/or modify measurement related settings.
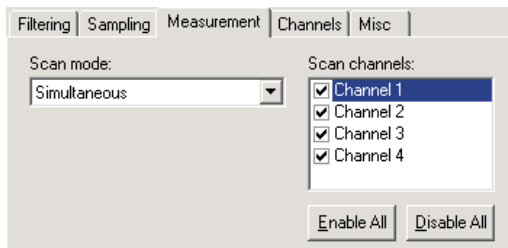


**Figure 41** 1529 'Chub-E4' Settings - Measurement Tab

Select the scan mode for the 1529 'Chub-E4' Thermometer readout using the Scan mode drop-down list. The scan mode can be set to one of the following options:

- Scan

- Simultaneous

Select the channels that the thermometer readout should measure. Each channel can be enabled or disabled by checking or unchecking the box next to the channel number independent of all other channels.

To enable all channels, click the Enable All button. This causes the box next to every channel to be checked.

To disable all channels, click the Disable All button. This causes the box next to every channel to be unchecked.

### 4.4.1.4 Channels Tab

Select the Channels tab to view a list of channels and to access the channel and

probe settings dialogs to view and/or modify channel and probe specific settings.
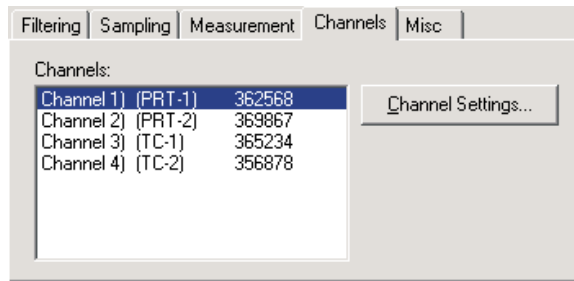


**Figure 43**  *1529 'Chub-E4' Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number, channel type and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate Channel Settings dialog. When this button is clicked, the settings for the selected channel and probe are read in from the thermometer readout. The Channel Settings dialogs are described in detail in Section 4.4.1.6, 1529 'Chub-E4' PRT/Thermistor Channel Settings Dialog and Section 4.4.1.7, 1529 'Chub-E4' Thermocouple Channel Settings Dialog.

#### 4.4.1.5    Misc tab

Select the Misc tab to view and/or modify other miscellaneous thermometer readout settings.
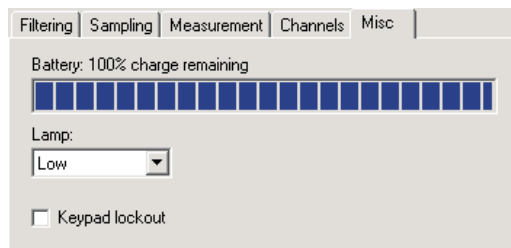


**Figure 42**  *1529 'Chub-E4' Settings - Misc tab*

The Battery indicator displays the remaining charge available in the battery.

Select the setting for the lamp on the thermometer readout's display using the Lamp drop-down list. The lamp can be set to one of the following settings:

- Off

- Low

- Medium

- High

To prevent the buttons on the front panel of the thermometer readout from being used to view and/or modify thermometer readout settings, check the Keypad lockout box. Leaving this box unchecked allows the buttons on the front panel to be used to view and/or modify thermometer readout settings.

### 4.4.1.6    1529 'Chub-E4' PRT/thermistor channel settings dialog

The 1529 'Chub-E4' PRT/Thermistor Channel Settings dialog displays information about the selected PRT/Thermistor channel.
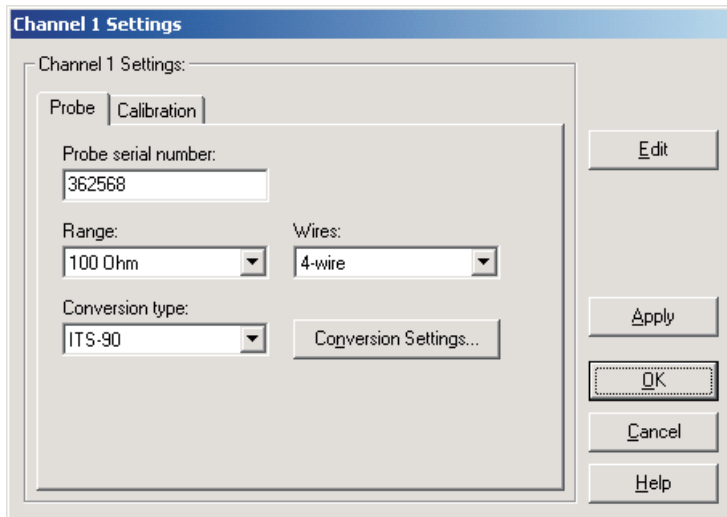


**Figure 44**   1529 'Chub-E4' PRT/thermistor channel settings dialog

Some or all of the settings on this dialog may be passcode protected. If so, a message appears at the bottom of the Probe tab and/or Calibration tab and the Edit button is displayed. The protected controls are disabled. To edit the protected settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the protected controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is

clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the channel settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the channel settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.1.6.1      Probe tab**

Select the Probe tab to view and/or modify probe settings.



**Figure 45**   *1529 'Chub-E4' PRT/thermistor channel settings - Probe tab*

Enter the serial number of the probe attached to this channel in the Probe serial number box. The serial number can be any combination of numbers and/or letters up to 8 characters in length. The underscore "_" character can also be used in serial numbers.

Select the resistance range for this channel using the Range drop-down list. The choices for the resistance range are 100 Ohm or 10K Ohm.

Select the wires for this channel using the Wires drop-down list. The choices for the wires setting are 2-wire, 3-wire or 4-wire.

Select the conversion type to use for the probe on this channel. The Model 1529 'Chub-E4' Thermometer readout supports the following conversion types:

- ITS-90

- ITS-SR5 (ITS-90 subrange 5 only)
- CVD (Callendar-Van Dusen)
- PT100
- R(T)
- T(R)
- YSI-400

- Ohms

Refer to the Report of Calibration for the probe for information on the conversion type that the probe was calibrated for.

If the selected conversion type requires coefficients or other settings, the Conversion Settings button is enabled. Click the Conversion Settings button to display the dialog for the selected conversion type. Otherwise, the Conversion Settings button is disabled. Please refer to Section 9, Conversion Settings Dialogs, for a detailed description of the Conversion Settings dialogs.

*Note: The conversion settings are not written to the thermometer readout until the Apply or OK button is clicked on this dialog!*

**4.4.1.6.2**          **Calibration tab**

Select the Calibration tab to view and/or modify channel calibration informa-
tion.



**Figure 46**   *1529 'Chub-E4' PRT/thermistor channel
settings - Calibration tab*

⚠️   *Caution: Do not change these values unless this channel has been
recalibrated or unless these values do not match the values located on the
latest Report of Calibration for this channel! Changing these values voids
the current calibration!*

Select the date this channel was last calibrated using the drop-down calendar or
by entering the date. This date should be located on the Report of Calibration
for this channel.

Select the date this channel is due for recalibration using the drop-down calen-
dar or by entering the date.

Enter the values for the calibration constants in the boxes provided. The cali-
bration constants required by a PRT/Thermistor channel are: C0, C100, C400,
C0K, C10K and C100K. The values of these constants should be located on the
Report of Calibration for this channel.

**4.4.1.7**       **1529 'Chub-E4' thermocouple channel settings**

The 1529 'Chub-E4' Thermocouple Channel Settings dialog displays information about the selected thermocouple channel.
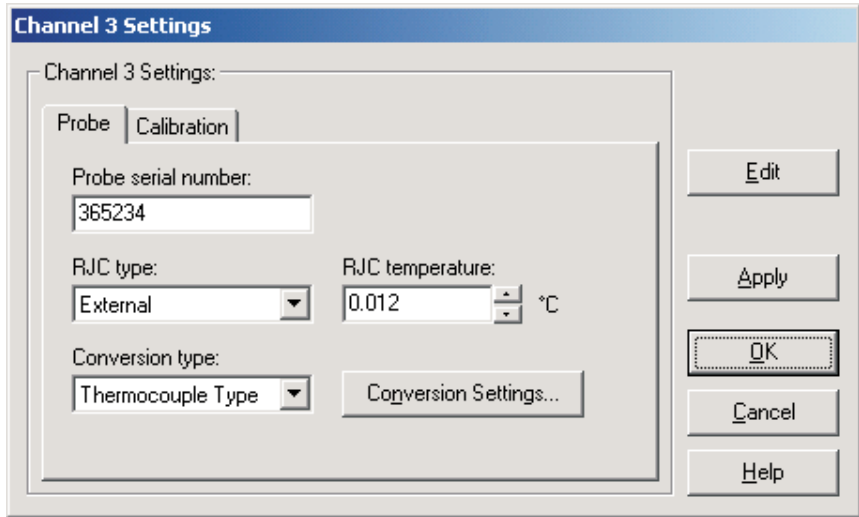


**Figure 47**   *1529 'Chub-E4' Thermocouple channel settings dialog*

Some or all of the settings on this dialog may be passcode protected. If so, a message appears at the bottom of the Probe tab and/or Calibration tab and the Edit button is displayed. The protected controls are disabled. To edit the protected settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the protected controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the channel settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the channel settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.1.7.1**      **Probe tab**

Select the Probe tab to view and/or modify probe settings.



**Figure 48**   *1529 'Chub-E4' thermocouple channel
settings - Probe tab*

Enter the serial number of the probe attached to this channel in the Probe serial
number box. The serial number can be any combination of numbers and/or let-
ters up to 8 characters in length. The underscore "_" character can also be used
in serial numbers.

Select the type of reference junction compensation to use on this channel using
the RJC type drop-down list. Available choices are Internal and External. If Ex-
ternal is chosen as the RJC type, the external RJC temperature must be entered
in the RJC temperature box.

Enter the external RJC temperature value in the RJC temperature box. This box
is disabled if the RJC type is set to Internal.

⚠️ *Note: The RJC temperature value must always be in °C!*

Select the conversion type to use for the probe on this channel. The Model
1529 'Chub-E4' Thermometer readout supports the following conversion types:

- Polynomial
- Thermocouple Type (B, E, J, K, N, R, S, T or AuPt)
- Volts

Refer to the Report of Calibration for the probe for information on the conver-
sion type that the probe was calibrated for.

If the selected conversion type requires coefficients or other settings, the Con-
version Settings button is enabled. Click the Conversion Settings button to dis-
play the dialog for the selected conversion type. Otherwise, the Conversion

Settings button is disabled. Please refer to Section 9, Conversion Settings Dialogs, for a detailed description of the Conversion Settings dialogs.

⚠️ *Note: The conversion settings are not written to the thermometer readout until the Apply or OK button is clicked on this dialog!*

**4.4.1.7.2**     **Calibration tab**

Select the Calibration tab to view and/or modify channel calibration information.



**Figure 49**   *1529 'Chub-E4' thermocouple channel settings - Probe tab*

⚠️ *Caution: Do not change these values unless this channel has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this channel! Changing these values voids the current calibration!*

Select the date this channel was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this channel.

Select the date this channel is due for recalibration using the drop-down calendar or by entering the date.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by a Thermocouple channel are: C0, C100 and CRJ. The values of these constants should be located on the Report of Calibration for this channel.

## 4.4.2     1560 'Black Stack' settings dialog

The 1560 'Black Stack' Settings dialog displays information about the thermometer readout including model number, serial number, identification infor-

mation, and the total number of channels. It also allows many thermometer readout settings to be viewed and/or modified.
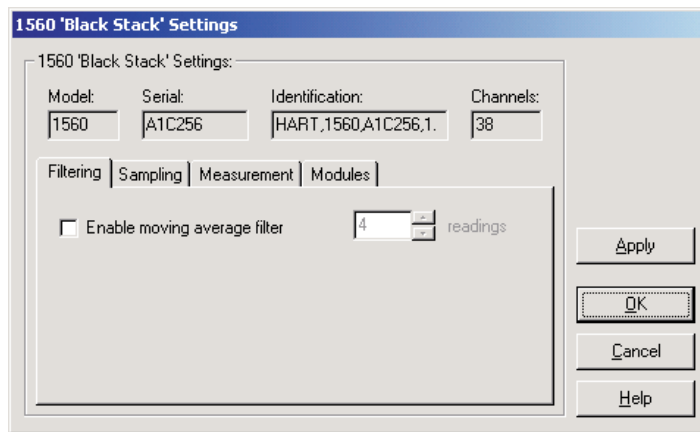


**Figure 50**  *1560 'Black Stack' Settings dialog*

The 1560 'Black Stack' must be connected to an available COM port and the communication settings must be properly configured so that this information can be read in from the thermometer readout. If communication with the thermometer readout is not successful, an error message is displayed and this dialog is blank. A progress dialog is displayed while the current thermometer readout settings are being read in.

The Model box indicates the model number of the thermometer readout. The Serial box indicates the serial number assigned to this thermometer readout. The Identification box indicates the manufacturer name, model number, serial number, and firmware version installed in this thermometer readout. The Channels box indicates the total number of input channels on this thermometer readout.

The filtering settings can be viewed and/or modified by selecting the Filtering tab. The sampling settings can be viewed and/or modified by selecting the Sampling tab. The measurement settings can be viewed and/or modified by selecting the Measurement tab. The Modules tab displays a list of modules currently attached to this thermometer readout and allows access to module settings dialogs. The settings on each of these tabs are described in detail in the following sections. For more details on these settings, please refer to the thermometer readout's User's Guide.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

LogWare has a feature that causes all of the thermometer readout settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

### 4.4.2.1    Filtering tab

Select the Filtering tab to view and/or modify the filter settings.
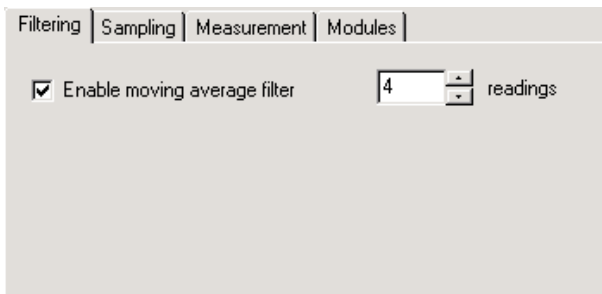


**Figure 51**   1560 'Black Stack' settings - Filtering tab

Check the Enable moving average filter box to enable the moving average filter. This filter is sometimes also called a sliding window filter. When this box is checked, the number of readings to average (size of window) must be entered in the box provided. Enabling this option causes the thermometer readout to display the average of the last *n* readings on a specific channel as the current reading for that channel. If this feature is disabled, the most recent measurement on each channel is displayed as the current reading. The moving average filter can be set to any value between 1 and 10.

**4.4.2.2** **Sampling tab**

Select the Sampling tab to view and/or modify sampling settings.
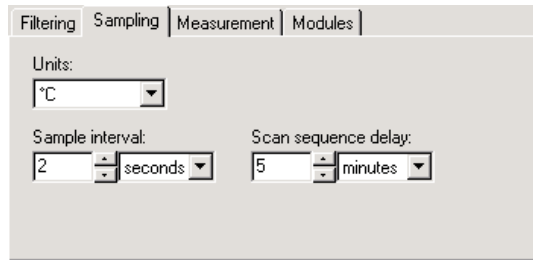


***Figure 52*** *1560 'Black Stack' Settings – Sampling tab*

Select the units to use when displaying readings in temperature using the Units drop-down list. Temperature readings can be displayed in either °C, °F or K. This setting applies to all channels that are configured to display readings in temperature.

Select the time interval between subsequent measurements using the Sample interval controls. The sample interval can be set to any value from 0 to 32,767 seconds (0 to 546 minutes or 0 to 9 hours).

*Note: Setting the sample interval to 0 seconds or 1 second is equivalent to setting it to 2 seconds because the 1560 'Black Stack' cannot sample at a rate faster than once every 2 seconds. This is the default behavior of the 1560 'Black Stack' Thermometer readout.*

Select the time interval between subsequent scans through a scan sequence using the Scan sequence delay controls. The scan sequence delay can be set to any value from 0 to 10,000 seconds (0 to 166 minutes or 0 to 2 hours).

*Note: Setting the scan sequence delay to an interval of less than the setting of the sample interval multiplied by the number of channels in the scan sequence effectively disables the scan sequence delay feature.*

**4.4.2.3**   **Measurement tab**

Select the Measurement tab to view and/or modify measurement related settings.
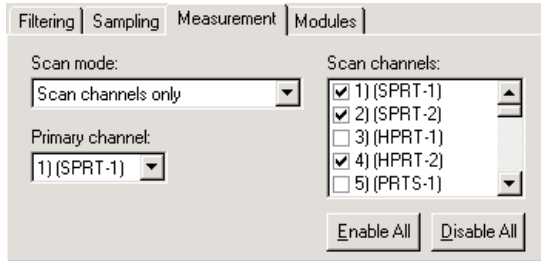


**Figure 53**   *1560 'Black Stack' settings - Measurement tab*

Select the scan mode for the 1560 'Black Stack' Thermometer readout using the Scan mode drop-down list. The scan mode can be set to one of the following options:

- Primary channel only

- Alternate scan/primary channels

- Scan channels only

If the Primary channel only option is selected, the thermometer readout will be set to measure only the channel selected in the Primary channel drop-down list below.

If the Alternate scan/primary channels option is selected, the thermometer readout will be set to alternate measurements on the primary channel and each of the enabled scan channels.

If the Scan channels only option is selected, the thermometer readout will be set to scan through each of the enabled channels in the Scan channels list.

Select the channel to set as the primary channel using the Primary channel drop-down list. This list indicates the channel number, module name and module input number for all channels on the thermometer readout. The primary channel setting is only enabled if the scan mode setting is set to the Primary channel only or the Alternate scan/primary channels option.

Select the channels to include in the thermometer readout's scan sequence. The Scan channels list indicates the channel number, module name and module input number for all channels on the thermometer readout. Each channel can be enabled or disabled by checking or unchecking the box next to the channel number independent of all other channels. The Scan channels list is only en-

abled if the scan mode setting is set to either the Alternate scan/primary channels or the Scan channels only option.

To include all channels in the scan sequence, click the Enable All button. This causes the box next to every channel to be checked.

To exclude all channels from the scan sequence, click the Disable All button. This causes the box next to every channel to be unchecked.

### 4.4.2.4 Modules tab

Select the Modules tab to view a list of modules currently attached to the 1560 'Black Stack' and to access the Module Settings dialogs to view and/or modify module specific settings.
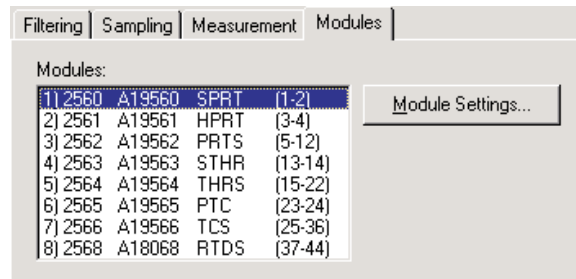
**Figure 54**  *1560 'Black Stack' settings - Modules tab*

Select the module to view and/or modify from the Modules list. This list indicates the module positions, model numbers, serial numbers, module names and the range of channels on each module.

Click the Module Settings button to display the appropriate Module Settings dialog. When this button is clicked, the settings for the selected module are read in from the thermometer readout. The Module Settings dialogs are described in detail in the following sections.

### 4.4.2.5 2560 'SPRT' Module Settings Dialog

The 2560 Module Settings dialog displays information about the 2560 module including model number, serial number, identification information and the

number of channels on this module. It also allows many module specific settings to be viewed and/or modified.



**Figure 55**  *2560 'SPRT' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

General module settings can be viewed and modified by selecting the General tab. The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.2.5.1**     **General tab**

Select the General tab to view and/or modify general module settings.
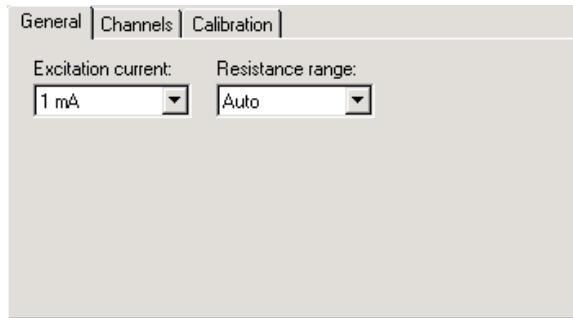


***Figure 56***  *2560 'SPRT' Module Settings - General tab*

Select the excitation current for this module using the Excitation current drop-down list. The 2560 module can use either a 1 mA or a 1.414 mA excitation current. This setting applies to all channels on this module.

Select the resistance range for this module using the Resistance range drop-down list. The 2560 module allows the selection of either Auto, High or Low. This setting applies to all channels on this module.

**4.4.2.5.2**     **Channels tab**

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.



***Figure 57***  *2560 'SPRT' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate Channel Settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.14, 1560 'Black Stack' PRT/Thermistor Channel Settings Dialog.

### 4.4.2.5.3    Calibration tab

Select the Calibration tab to view and/or modify module calibration information.



**Figure 58**   *2560 'SPRT' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

⚠ *Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by the 2560 module are: 0 ADJ, 100 ADJ and 400 ADJ. The values of these constants should be located on the Report of Calibration for this module.

**4.4.2.6**      **2561 'HPRT' Module Settings dialog**

The 2561 Module Settings dialog displays information about the 2561 module including model number, serial number, identification information and the number of channels on this module. It also allows many module specific settings to be viewed and/or modified.
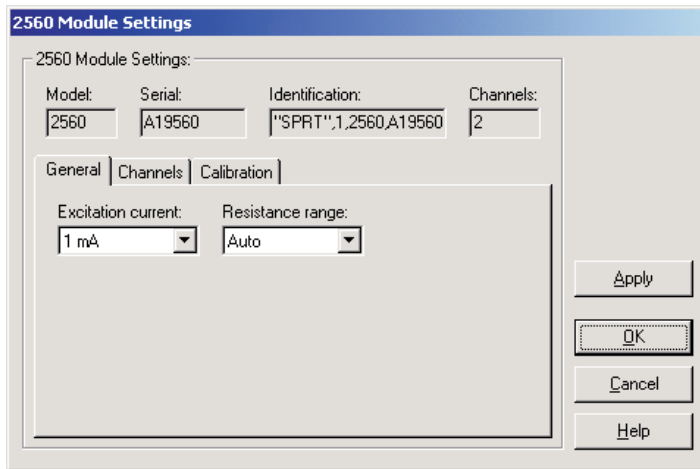


**Figure 59**   *2561 'HPRT' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

General module settings can be viewed and modified by selecting the General tab. The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

#### 4.4.2.6.1 General tab

Select the General tab to view and/or modify general module settings.



**Figure 60** *2561 'HPRT' Module Settings - General tab*

Select the excitation current for this module using the Excitation current drop-down list. The 2561 module can use either a 3 mA or a 5 mA excitation current. This setting applies to all channels on this module.

#### 4.4.2.6.2 Channels tab

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.



**Figure 61** *2561 'HPRT' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.
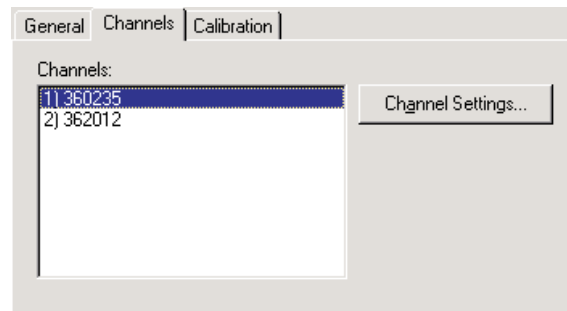
Click the Channel Settings button to display the appropriate Channel Settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.14, 1560 'Black Stack' PRT/Thermistor Channel Settings Dialog.

**4.4.2.6.3    Calibration tab**

Select the Calibration tab to view and/or modify module calibration information.
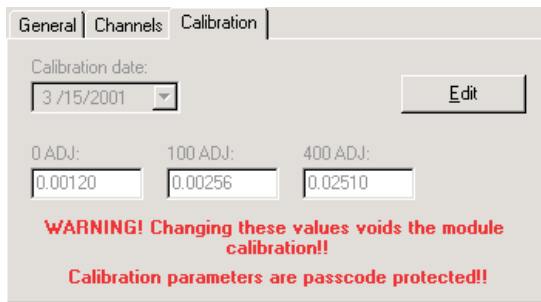


**Figure 62**   *2561 'HPRT' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

⚠ *Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by the 2561 module are: 0 ADJ and 10 ADJ. The

values of these constants should be located on the Report of Calibration for this module.

### 4.4.2.7    2562 'PRTS' Module Settings dialog

The 2562 Module Settings dialog displays information about the 2562 module including model number, serial number, identification information and the number of channels on this module. It also allows many module specific settings to be viewed and/or modified.
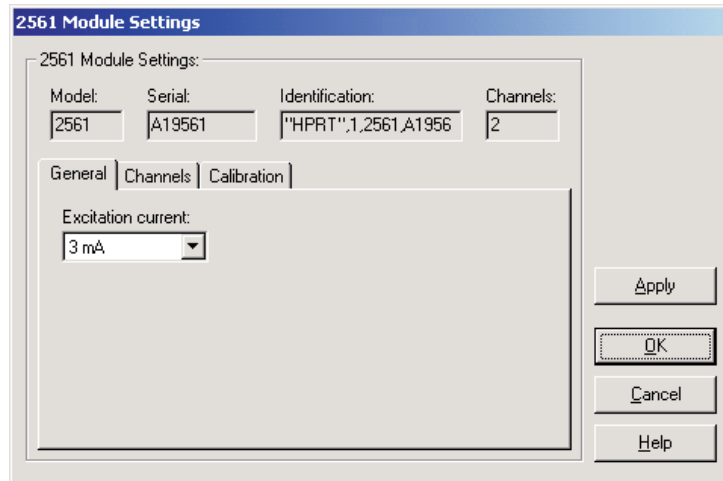


**Figure 63**   *2562 'PRTS' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number, and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

General module settings can be viewed and modified by selecting the General tab. The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new set-

tings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

### 4.4.2.7.1    General tab

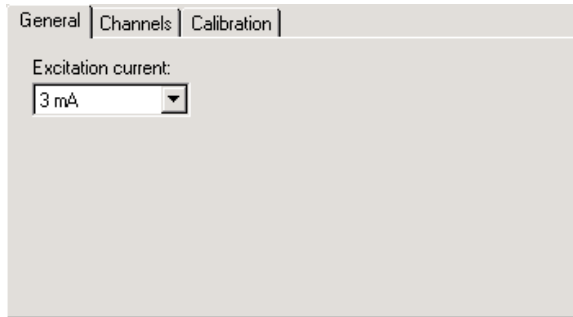Select the General tab to view and/or modify general module settings.



**Figure 64**  *2562 'PRTS' Module Settings - General tab*

Select the excitation current for this module using the Excitation current drop-down list. The 2562 module can use either a 1 mA or a 1.414 mA excitation current. This setting applies to all channels on this module.

Select the resistance range for this module using the Resistance range drop-down list. The 2562 module allows the selection of either Auto, High or Low. This setting applies to all channels on this module.

Select the front row wires option for this module using the Front row wires drop-down list. The 2562 module allows the selection of either 4-wire or 3-wire. This setting applies only to the four channels on the front row of this module.

Select the rear row wires option for this module using the Rear row wires drop-down list. The 2562 module allows the selection of either 4-wire or 3-wire. This setting applies only to the four channels on the rear row of this module.

**4.4.2.7.2    Channels tab**

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.
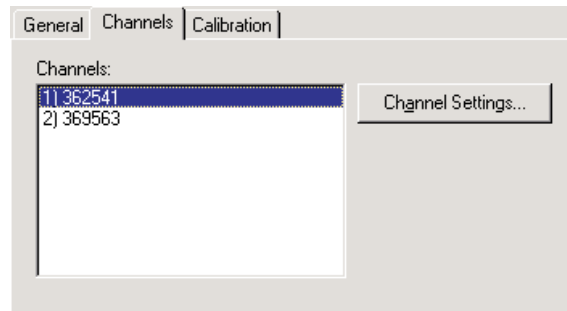


*Figure 65*  2562 'PRTS' Module Settings - Channels
tab

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate Channel Settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in  Section 4.4.2.14, 1560 'Black Stack' PRT/Thermistor Channel Settings Dialog.

**4.4.2.7.3    Calibration tab**

Select the Calibration tab to view and/or modify module calibration information.



*Figure 66*  2562 'PRTS' Module Settings - Calibration
tab

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is dis-

played. The other controls on this tab are disabled. To edit the calibration pa-
rameters, click the Edit button and enter the current passcode for the
thermometer readout. If the correct passcode is entered, the calibration parame-
ter controls are enabled and the values may be changed. The controls remain
enabled until this dialog is closed or until the current changes are applied by
clicking the Apply button.

⚠️ *Caution: Do not change these values unless this module has been
recalibrated or unless these values do not match the values located on the
latest Report of Calibration for this module! Changing these values voids
the current calibration!*

Select the date this module was last calibrated using the drop-down calendar or
by entering the date. This date should be located on the Report of Calibration
for this module.

Enter the values for the calibration constants in the boxes provided. The cali-
bration constants required by the 2562 module are: 0 ADJ, 100 ADJ and 400
ADJ. The values of these constants should be located on the Report of Calibra-
tion for this module.

### 4.4.2.8    2563 'STHR' Module Settings dialog

The 2563 Module Settings dialog displays information about the 2563 module
including model number, serial number, identification information and the
number of channels on this module. It also allows many module specific set-
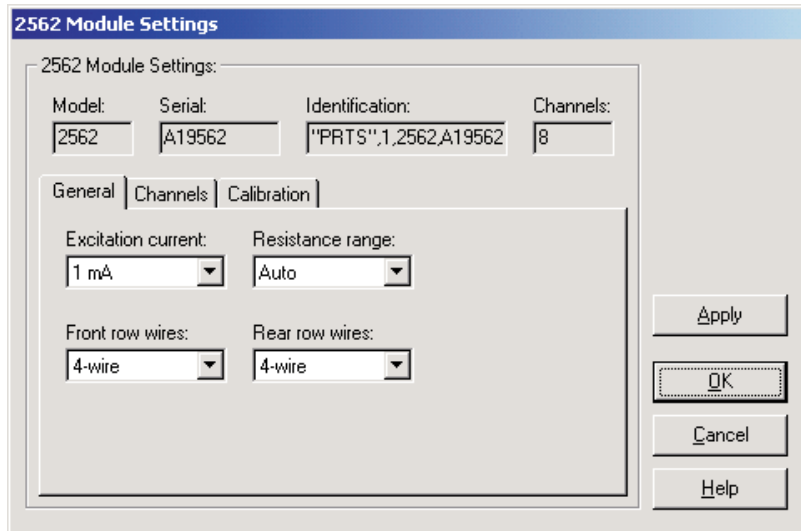tings to be viewed and/or modified.



**Figure 67**  *2563 'STHR' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

General module settings can be viewed and modified by selecting the General tab. The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.2.8.1    General tab**

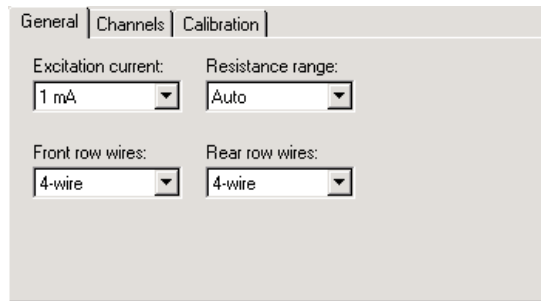Select the General tab to view and/or modify general module settings.



**Figure 68**  *2563 'STHR' Module Settings - General tab*

Select the excitation current for this module using the Excitation current drop-down list. The 2563 module can use either a 2 μA or a 10 μA excitation current, or Auto. This setting applies to all channels on this module.

Select the resistance range for this module using the Resistance range drop-down list. The 2563 module allows the selection of either Auto, High or Low. This setting applies to all channels on this module.

**4.4.2.8.2    Channels tab**

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.


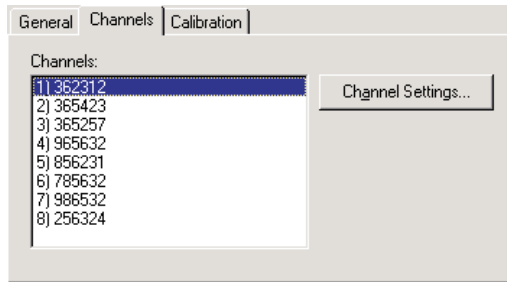
**Figure 69**  *2563 'STHR' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.14, 1560 'Black Stack' PRT/Thermistor Channel Settings Dialog.

### 4.4.2.8.3 Calibration tab

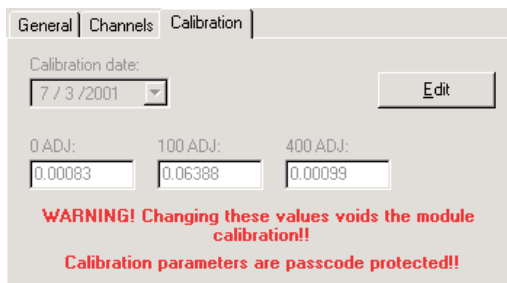Select the Calibration tab to view and/or modify module calibration information.



**Figure 70** *2563 'STHR' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

*Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by the 2563 module are: 0 ADJ, 10K ADJ and 100K ADJ. The values of these constants should be located on the Report of Calibration for this module.

**4.4.2.9     2564 'THRS' Module Settings dialog**

The 2564 Module Settings dialog displays information about the 2564 module including model number, serial number, identification information and the number of channels on this module. It also allows many module specific settings to be viewed and/or modified.
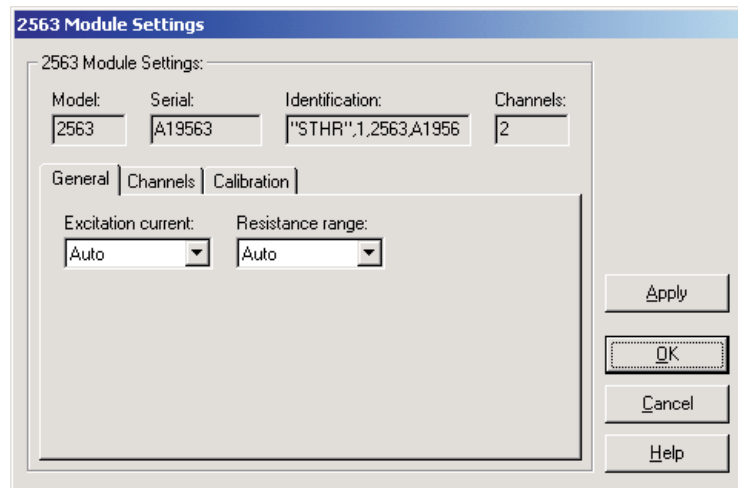


**Figure 71**   *2564 'THRS' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

General module settings can be viewed and modified by selecting the General tab. The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

### 4.4.2.9.1    General tab

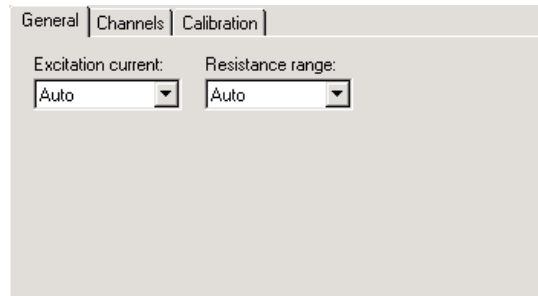Select the General tab to view and/or modify general module settings.
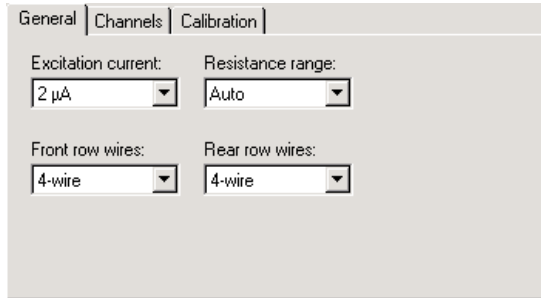


**Figure 72**   2564 'THRS' Module Settings - General tab

Select the excitation current for this module using the Excitation current drop-down list. The 2564 module can use either a 2 µA or a 10 µA excitation current, or Auto. This setting applies to all channels on this module.

Select the resistance range for this module using the Resistance range drop-down list. The 2564 module allows the selection of either Auto, High or Low. This setting applies to all channels on this module.

Select the front row wires option for this module using the Front row wires drop-down list. The 2564 module allows the selection of either 4-wire or 3-wire. This setting applies only to the four channels on the front row of this module.

Select the rear row wires option for this module using the Rear row wires drop-down list. The 2564 module allows the selection of either 4-wire or 3-wire. This setting applies only to the four channels on the rear row of this module.

**4.4.2.9.2** **Channels tab**

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.
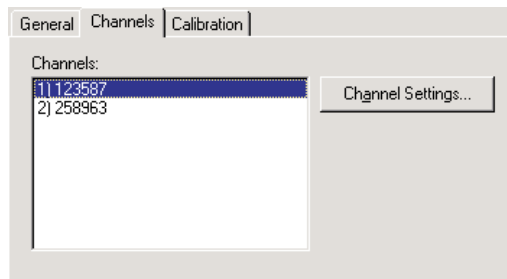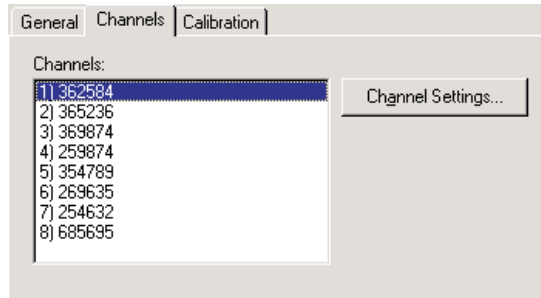


**Figure 73** *2564 'THRS' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.14, 1560 'Black Stack' PRT/Thermistor Channel Settings Dialog.

**4.4.2.9.3** **Calibration tab**

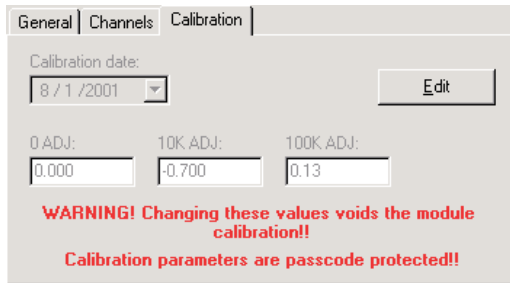Select the Calibration tab to view and/or modify module calibration information.



**Figure 74** *2564 'THRS' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

⚠️ *Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by the 2564 module are: 0 ADJ, 10K ADJ and 100K ADJ. The values of these constants should be located on the Report of Calibration for this module.

### 4.4.2.10    2565 'PTC' Module Settings dialog

The 2565 Module Settings dialog displays information about the 2565 module including model number, serial number, identification information and the

number of channels on this module. It also allows many module specific settings to be viewed and/or modified.
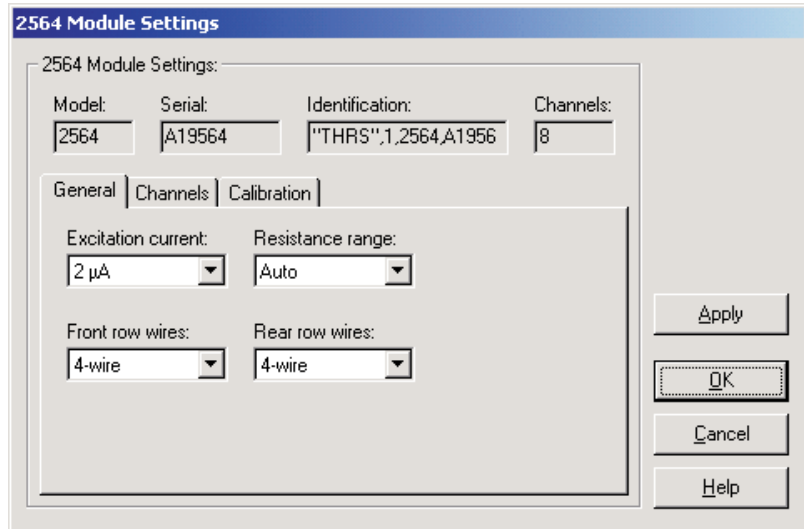


**Figure 75**  *2565 'PTC' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.2.10.1** **Channels tab**

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.



**Figure 76** *2565 'PTC' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.15, 1560 'Black Stack' Thermocouple Channel Settings Dialog.

**4.4.2.10.2**     **Calibration tab**

Select the Calibration tab to view and/or modify module calibration information.



**Figure 77**   *2565 'PTC' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration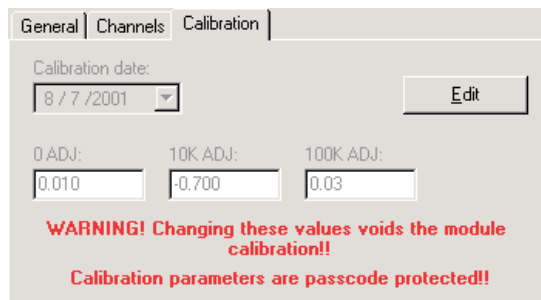 tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

⚠️ *Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

The AMP GA constant should always be set to 1 and cannot be changed.

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by the 2565 module are: OS 1, GA 1 and CJ 1 (for channel 1) and OS 2, GA 2 and CJ 2 (for channel 2). The values of these constants should be located on the Report of Calibration for this module.

#### 4.4.2.11 2566 'TCS' Module Settings dialog

The 2566 Module Settings dialog displays information about the 2566 module including model number, serial number, identification information and the number of channels on this module. It also allows many module specific settings to be viewed and/or modified.
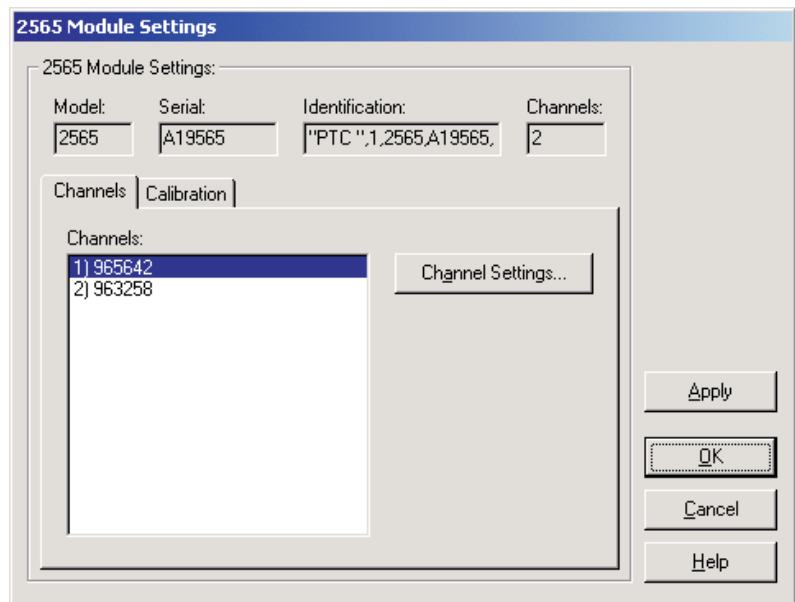


**Figure 78** *2566 'TCS' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and/or modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply

button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.2.11.1**     **Channels tab**

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.
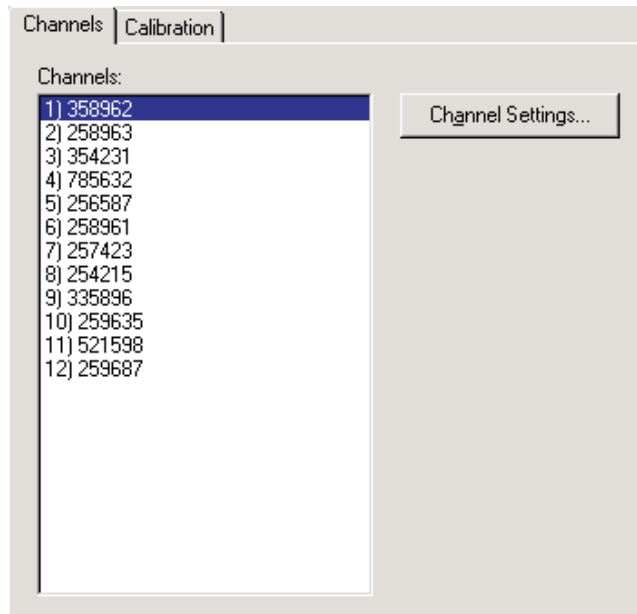


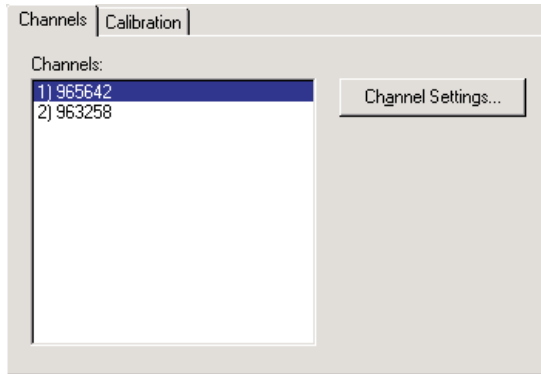**Figure 79**   *2566 'TCS' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read

in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.15, 1560 'Black Stack' Thermocouple Channel Settings Dialog.

**4.4.2.11.2        Calibration tab**

Select the Calibration tab to view and/or modify module calibration information.



**Figure 80**   *2566 'TCS' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

⚠️ *Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

The AMP GA constant should always be set to 1 and cannot be changed.

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

The calibration constants for this module are divided onto two tabs: Inputs 1 to 6 and Inputs 7 to 12.

4.4.2.11.2.1    Inputs 1 to 6 tab

Select the Inputs 1 to 6 tab to view and/or modify the calibration constants for inputs (channels) 1 to 6 (front row) of this module.



**Figure 81**   2566 'TCS' Module Settings - Inputs 1 to 6 tab

Enter the values for the calibration constants for inputs 1 to 6 in the boxes provided. The calibration constants required by the 2566 module are: OS 1, GA 1, CJ OS 1, CJ OS 2, CJ OS 3, CJ OS 4, CJ OS 5 and CJ OS 6. The values of these constants should be located on the Report of Calibration for this module.

4.4.2.11.2.2    Inputs 7 to 12 tab

Select the Inputs 7 to 12 tab to view and/or modify the calibration constants for inputs (channels) 7 to 12 (rear row) of this module.



**Figure 82**   2566 'TCS' Module Settings - Inputs 7 to 12 tab

Enter the values for the calibration constants for inputs 7 to 12 in the boxes provided. The calibration constants required by the 2566 module are: OS 2, GA 2, CJ OS 7, CJ OS 8, CJ OS 9, CJ OS 10, CJ OS 11 and CJ OS 12. The values of these constants should be located on the Report of Calibration for this module.

## 4.4.2.12    2567 'RTD' Module Settings dialog

The 2567 Module Settings dialog displays information about the 2567 module including model number, serial number, identification information and the

number of channels on this module. It also allows many module specific settings to be viewed and/or modified.
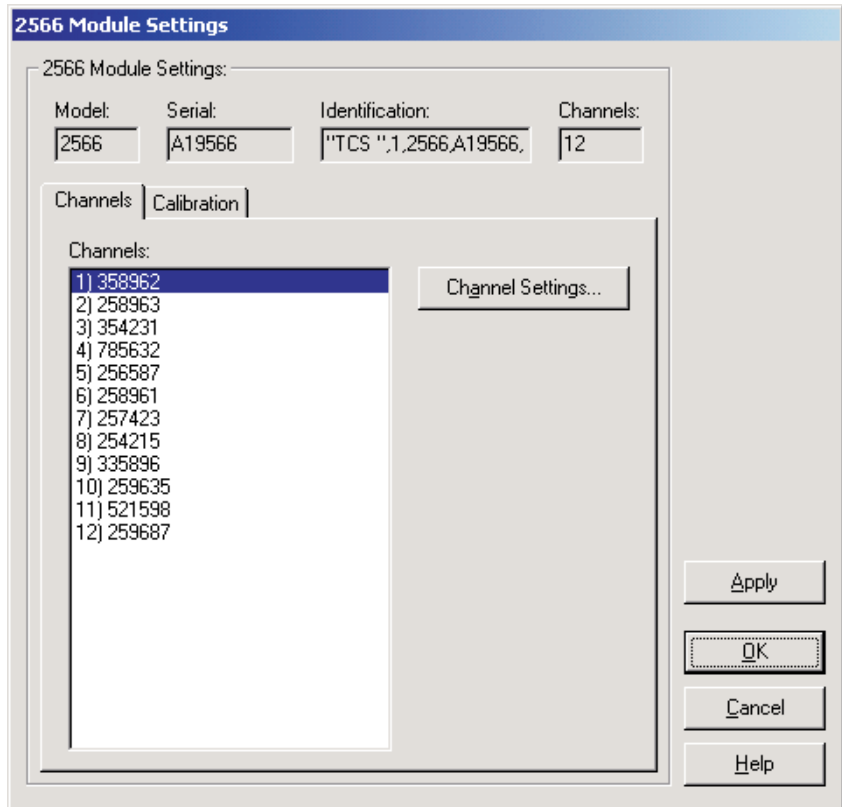


**Figure 83** *2567 'RTD' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

General module settings can be viewed and/or modified by selecting the General tab. The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and/or modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

#### 4.4.2.12.1 General tab

Select the General tab to view and/or modify general module settings.



**Figure 84** *2567 'RTD' Module Settings - General tab*

Select the excitation current for this module using the Excitation current drop-down list. The 2567 module can use either a 0.05 mA or a 0.1 mA excitation current. This setting applies to all channels on this module.

Select the resistance range for this module using the Resistance range drop-down list. The 2567 module allows the selection of either Auto, High or Low. This setting applies to all channels on this module.

#### 4.4.2.12.2 Channels tab

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.



**Figure 85** *2567 'RTD' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.14, 1560 'Black Stack' PRT/Thermistor Channel Settings Dialog.

**4.4.2.12.3    Calibration tab**

Select the Calibration tab to view and/or modify module calibration information.



*Figure 86    2567 'RTD' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

⚠️ *Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by the 2567 module are: 0 ADJ, 1K ADJ and 4K

ADJ. The values of these constants should be located on the Report of Calibration for this module.

### 4.4.2.13    2568 'RTDS' Module Settings

The 2568 Module Settings dialog displays information about the 2568 module including model number, serial number, identification information and the number of channels on this module. It also allows many module specific settings to be viewed and/or modified.
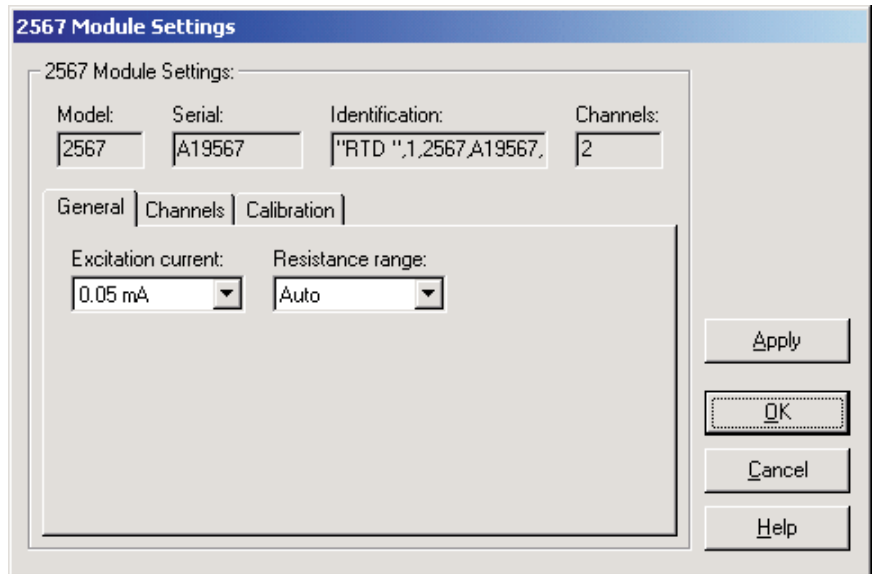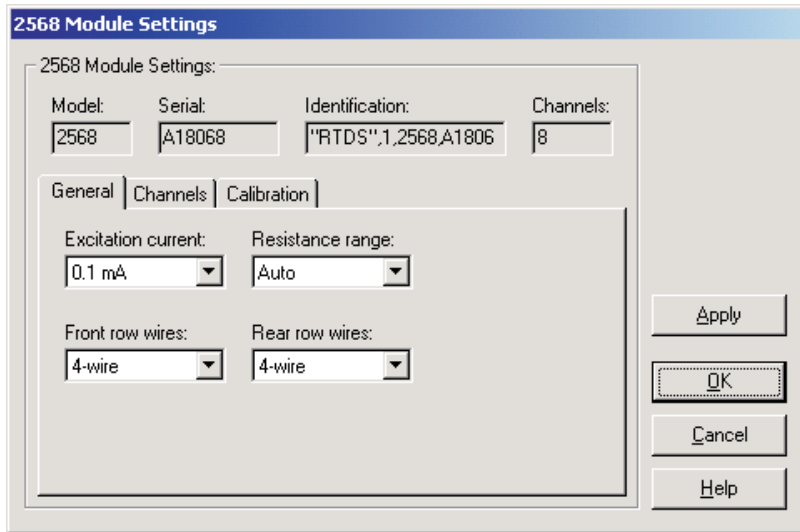


**Figure 87**   *2568 'RTDS' Module Settings dialog*

The Model box indicates the model number of this module. The Serial box indicates the serial number assigned to this module. The Identification box indicates the module name, number of devices, model number, serial number, and firmware version installed in this module. The Channels box indicates the number of input channels on this module.

General module settings can be viewed and/or modified by selecting the General tab. The Channels tab displays a list of the channels on this module and allows access to channel settings dialogs. The module calibration information can be viewed and/or modified by selecting the Calibration tab.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new module settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the module settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful

to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the module settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.2.13.1     General tab**

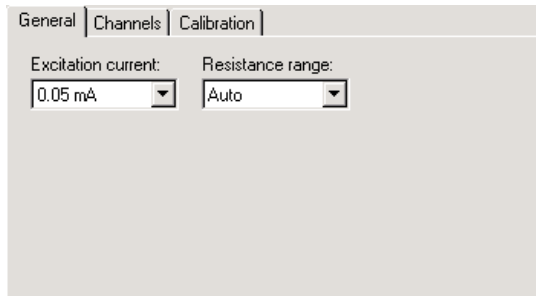Select the General tab to view and/or modify general module settings.
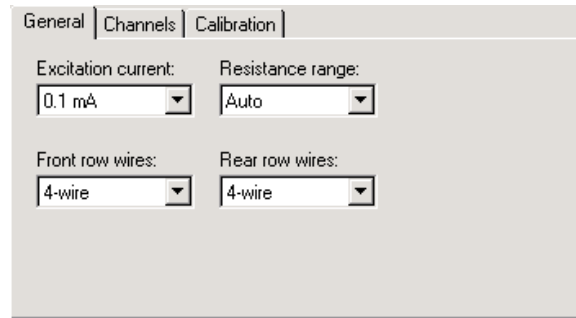


**Figure 88**   *2568 'RTDS' Module Settings - General tab*

Select the excitation current for this module using the Excitation current drop-down list. The 2568 module can use either a 0.05 mA or a 0.1 mA excitation current. This setting applies to all channels on this module.

Select the resistance range for this module using the Resistance range drop-down list. The 2568 module allows the selection of either Auto, High or Low. This setting applies to all channels on this module.

Select the front row wires option for this module using the Front row wires drop-down list. The 2568 module allows the selection of either 4-wire or 3-wire. This setting applies only to the four channels on the front row of this module.

Select the rear row wires option for this module using the Rear row wires drop-down list. The 2568 module allows the selection of either 4-wire or 3-wire. This setting applies only to the four channels on the rear row of this module.

**4.4.2.13.2        Channels tab**

Select the Channels tab to view a list of channels on this module and to access the channel settings dialogs to view and/or modify channel specific settings.
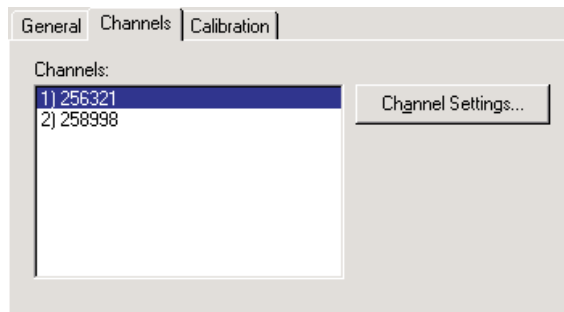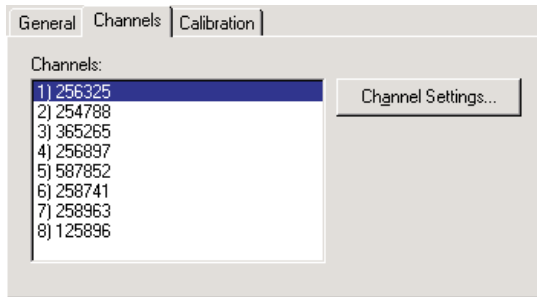


**Figure 89**   *2568 'RTDS' Module Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number (with respect to this module) and the serial number of the probe on each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.2.14, 1560 'Black Stack' PRT/Thermistor Channel Settings Dialog.

**4.4.2.13.3        Calibration tab**

Select the Calibration tab to view and/or modify module calibration information.
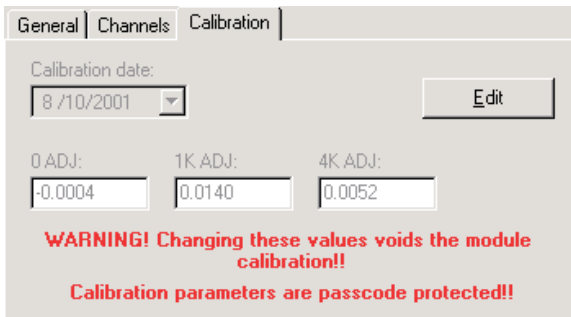


**Figure 90**   *2568 'RTDS' Module Settings - Calibration tab*

The settings on the Calibration tab may be passcode protected. If they are, a message appears at the bottom of the Calibration tab and the Edit button is displayed. The other controls on this tab are disabled. To edit the calibration parameters, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the calibration parameter controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

⚠️ *Caution: Do not change these values unless this module has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this module! Changing these values voids the current calibration!*

Select the date this module was last calibrated using the drop-down calendar or by entering the date. This date should be located on the Report of Calibration for this module.

Enter the values for the calibration constants in the boxes provided. The calibration constants required by the 2568 module are: 0 ADJ, 1K ADJ and 4K ADJ. The values of these constants should be located on the Report of Calibration for this module.

### 4.4.2.14   1560 'Black Stack' PRT/Thermistor Channel Settings dialog

The 1560 'Black Stack' PRT/Thermistor Channel Settings dialog displays information about the selected channel.
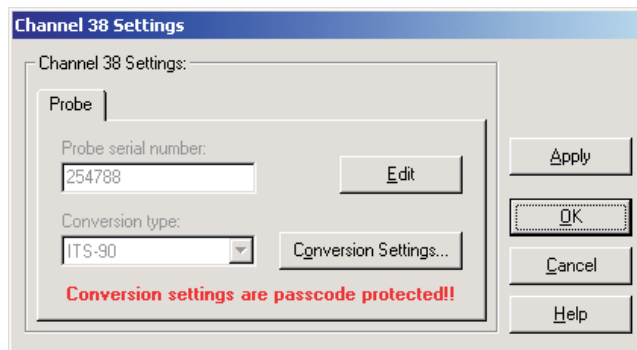


**Figure 91**   *1560 'Black Stack' PRT/Thermistor Channel Settings dialog*

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

LogWare has a feature that causes all of the channel settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the channel settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

#### 4.4.2.14.1    Probe tab

Select the Probe tab to view and/or modify probe settings.



**Figure 92**   *1560 'Black Stack' PRT/Thermistor Channel Settings - Probe tab*

The settings on the Probe tab may be passcode protected. If they are, a message appears at the bottom of the Probe tab and the Edit button is displayed. The other controls on this tab are disabled except the Conversion Settings button. If the selected conversion type does not have any settings, this button should also be disabled. To edit the probe settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the probe setting controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

Enter the serial number of the probe attached to this channel in the Probe serial number box. The serial number can be any combination of numbers and/or letters up to 8 characters in length. The dash "-" character can also be used in serial numbers.

Select the conversion type to use for the probe on this channel. Available conversion types will vary depending on the module that this channel belongs to. Refer to the Report of Calibration for the probe attached to this channel for information on the conversion type that the probe was calibrated for.

If the selected conversion type requires coefficients or other settings, the Conversion Settings button is enabled. Click the Conversion Settings button to display the dialog for the selected conversion type. Otherwise, the Conversion

Settings button is disabled. Please refer to Section 9, Conversion Settings Dialogs, for a detailed description of the Conversion Settings dialogs.

⚠️ *Note: The conversion settings are not written to the thermometer readout until the Apply or OK button is clicked on this dialog!*

### 4.4.2.15    1560 'Black Stack' Thermocouple Channel Settings dialog

The 1560 'Black Stack' Thermocouple Channel Settings dialog displays information about the selected channel.
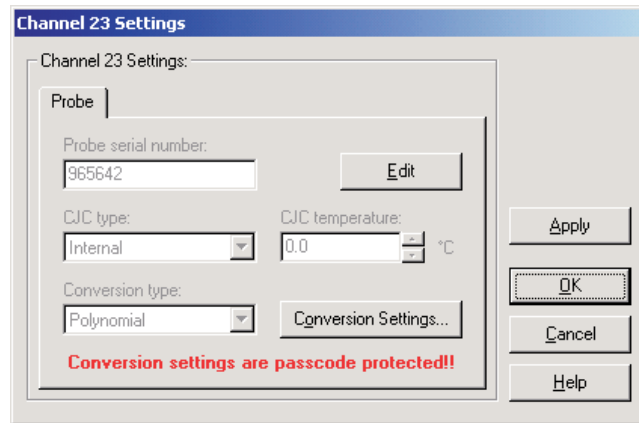


**Figure 93**   *1560 'Black Stack' Thermocouple Channel Settings dialog*

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the channel settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the channel settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.2.15.1** **Probe tab**

Select the Probe tab to view and/or modify probe settings.



**Figure 94** *1560 'Black Stack' PRT/Thermistor Channel Settings - Probe tab*
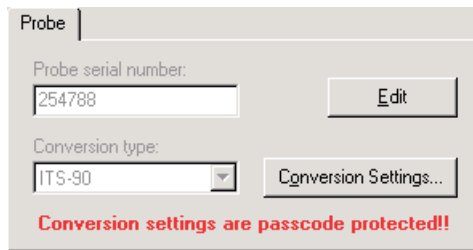
The settings on the Probe tab may be passcode protected. If they are, a message appears at the bottom of the Probe tab and the Edit button is displayed. The other controls on this tab are disabled except the Conversion Settings button. If the selected conversion type does not have any settings, this button should also be disabled. To edit the probe settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the probe setting controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

Enter the serial number of the probe attached to this channel in the probe serial number box. The serial number can be any combination of numbers and/or letters up to 8 characters in length. The dash "-" character can also be used in serial numbers.

Select the type of cold junction compensation to use on the selected channel using the CJC type drop-down list. Available choices are Internal and External. If External is chosen as the CJC type, the external CJC temperature must be entered in the CJC temperature box.

Enter the external CJC temperature value in the CJC temperature box. This box is disabled if the CJC type is set to Internal.

⚠️ *Note: The CJC temperature value must always be in °C!*

Select the conversion type to use for the probe on this channel. Available conversion types will vary depending on the module that this channel belongs to. Refer to the Report of Calibration for the probe attached to this channel for information on the conversion type that the probe was calibrated for.

If the selected conversion type requires coefficients or other settings, the Conversion Settings button is enabled. Click the Conversion Settings button to display the dialog for the selected conversion type. Otherwise, the Conversion Settings button is disabled. Please refer to Section 9, Conversion Settings Dialogs, for a detailed description of the Conversion Settings dialogs.

⚠️ *Note: The conversion settings are not written to the thermometer readout until the Apply or OK button is clicked on this dialog!*

### 4.4.3    1575A 'Super Thermometer' Settings

The 1575A 'Super Thermometer' Settings dialog displays information about the thermometer readout including model number, identification information and the total number of channels. It also allows many thermometer readout settings to be viewed and/or modified.
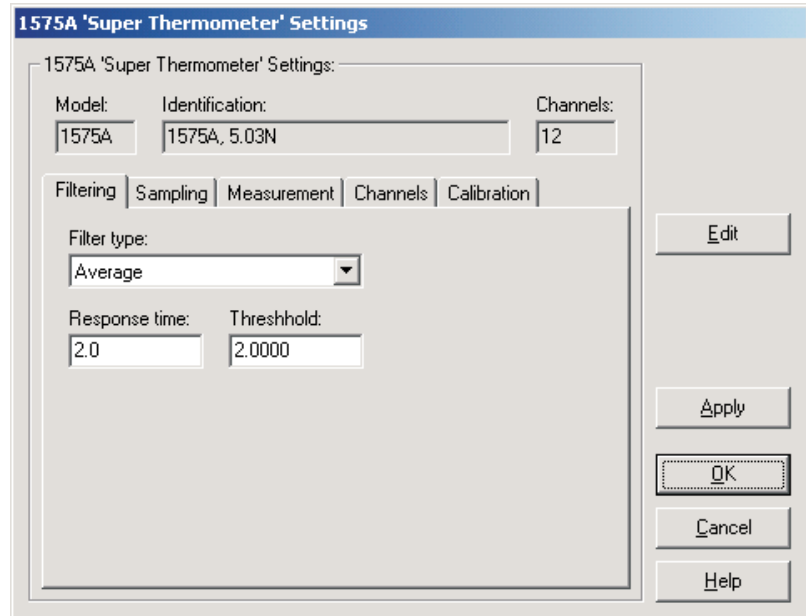


**Figure 95**   *1575A 'Super Thermometer' Settings dialog*

The 1575A 'Super Thermometer' readout must be connected to an available COM port and the communication settings must be properly configured so that this information can be read in from the thermometer readout. If communication with the thermometer readout is not successful, an error message is displayed and this dialog is blank. A progress dialog is displayed while the current thermometer readout settings are being read in.

The Model box indicates the model number of the thermometer readout. The Identification box indicates the model number and firmware version installed in this thermometer readout. The Channels box indicates the total number of input channels on this thermometer readout.

The filtering settings can be viewed and modified by selecting the Filtering tab. The sampling settings can be viewed and/or modified by selecting the Sampling tab. The measurement settings can be viewed and/or modified by selecting the Measurement tab. The Channels tab displays a list of channels and allows access to channel settings dialogs. The thermometer readout calibration information can be viewed and/or modified by selecting the Calibration tab. The settings on each of these tabs are described in detail in the following sections. For more details on these settings, please refer to the thermometer readout's User's Guide.

If any of the settings on the 1575A 'Super Thermometer' Settings dialog are passcode protected, a message appears at the bottom of the appropriate tab and the Edit button is displayed. The controls for the passcode protected settings are disabled. To edit the protected settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.
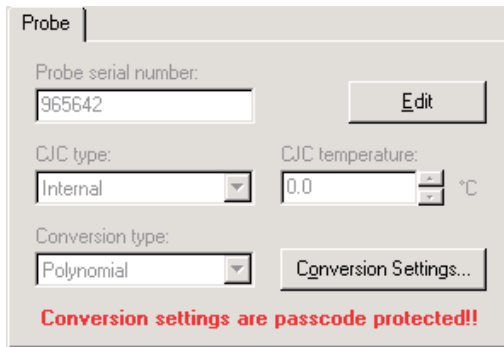
Log*Ware* has a feature that causes all of the thermometer readout settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.3.1**          **Filtering tab**

Select the Filtering tab to view and/or modify the filter settings.



**Figure 96**   *1575A 'Super Thermometer' Settings -*
*Filtering tab*

Use the Filter type drop-down list to select the type of filtering to use. The filter type can be set to one of the following options:

- None
- Average
- Exponential

If the filter type is set to None, the Response time and Threshold settings are not applicable and are disabled. If the filter type is set to Average or Exponential, the Response time and Threshold settings are enabled.

Enter the response time for the filter in the Response time box. The response time can be set to any value between 2 and 200 seconds.

Enter the threshold to use for the selected filter in the Threshold box. The threshold can be set to any value between .0001 and 1,000,000.

#### 4.4.3.2 Sampling tab

Select the Sampling tab to view and/or modify sampling settings.



**Figure 97** *1575A 'Super Thermometer' Settings -*
*Sampling tab*

Select the units using the Units drop-down list. Readings can be displayed in either °C, °F, K, Ohms, Ratio or W.

⚠️ *Note: This setting may override the selected conversion type for each channel. Please refer to the thermometer readout's User's Guide for more information on setting the system units.*

Select the sample action from the Sample action drop-down list. The sample action can be set to one of the following options:

- Run
- Stop
- Sample *n*

If the sample action is set to Run or Stop, the Sample *n* setting is not applicable and is disabled. If the filter type is set to Sample *n*, the Sample *n* setting is enabled.

If the sample action is set to Sample *n*, enter the number of samples in the Sample *n* box. The Sample *n* setting can be set to any value between 1 and 32,000.

The Sample timing controls allow the thermometer readout's sample timing settings to be viewed and/or modified. The sample timing settings include the Sample interval, Integration time and Conversion time.

Enter the sample interval value in the Sample interval box provided or use the up/down buttons. The sample interval can be set to any value between 2 and 99,999 seconds.

*Note: The sample interval must be greater than or equal to the integration time, which in turn must be greater than or equal to the conversion time. If the sample interval is set to a value that is less than the current integration time, the integration time and conversion time settings are automatically set to match the sample interval setting!*

Enter the integration time value in the Integration time box provided or use the up/down buttons. The integration time can be set to any value between 2 and 9,999 seconds.

*Note: The integration time must be greater than or equal to the conversion time. If the integration time is set to a value that is less than the current conversion time, the conversion time setting is automatically set to match the integration time setting!*

Enter the conversion time value in the Conversion time box provided or use the up/down buttons. The conversion time can be set to any value between 2 and 10 seconds.

The Resolutions controls allow the thermometer readout's resolution settings to be viewed and/or modified. The resolution settings include the Temperature, Resistance and Ratio settings.

Enter the resolution for temperature readings in the Temperature box provided or use the up/down buttons. The temperature resolution can be set to any value between 0 and 8 digits (places after decimal point).

Enter the resolution for resistance readings in the Resistance box provided or use the up/down buttons. The resistance resolution can be set to any value between 0 and 8 digits (places after decimal point).

Enter the resolution for ratio readings in the Ratio box provided or use the up/down buttons. The ratio resolution can be set to any value between 0 and 8 digits (places after decimal point).

**4.4.3.3**      **Measurement tab**

Select the Measurement tab to view and/or modify measurement settings.
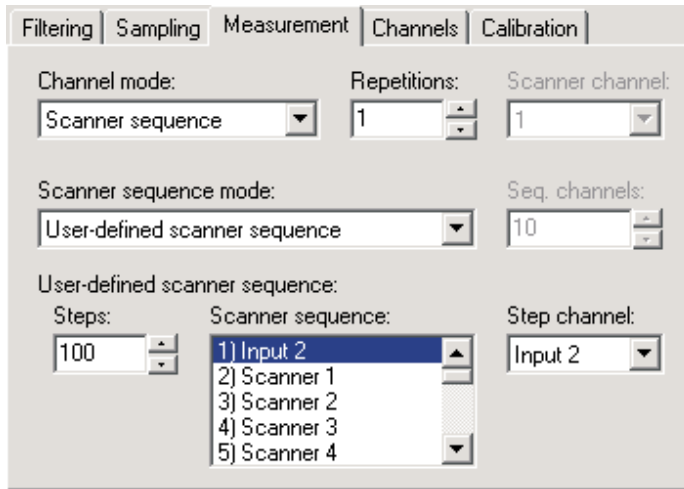


**Figure 98**   1575A 'Super Thermometer' Settings - Measurement tab

Use the Channel mode drop-down list to select the channels to take measurements from. The channel mode can be set to one of the following options:

- Alternate input 1/input 2
- Input 1
- Input 2
- Scanner channel **(only if Model 2575 'Mighty Mux' Multiplexer is connected)**
- Scanner sequence **(only if Model 2575 'Mighty Mux' Multiplexer is connected)**

If the channel mode is set to Alternate input 1/input 2, Input 1 or Input 2, the scanner channel and scanner sequence mode settings are not applicable and are disabled. If the channel mode is set to Scanner channel, the Scanner channel setting is enabled. If the channel mode is set to Scanner sequence, the scanner sequence mode setting is enabled.

Enter the repetitions setting in the Repetitions box provided or use the up/down buttons. The repetitions can be set to any value between 1 and 32,000 readings.

If the channel mode is set to Scanner channel, select the scanner channel to activate using the Scanner channel drop-down list.

If the channel mode is set to Scanner sequence, select the scanner sequence mode using the Scanner sequence mode drop-down list. The scanner sequence mode can be set to on of the following options:

- Scanner channels only
- Input 2 and scanner channels
- Alternate input 2/scanner channels
- Alternate scanner channel 1/scanner channels
- User-defined scanner sequence

If the scanner sequence mode is set to Scanner channels only, Input 2 and scanner channels, Alternate input 2/scanner channels or Alternate scanner channel 1/scanner channels, the Seq. channels setting must be set and is enabled. If the scanner sequence mode is set to User-defined scanner sequence, the user-defined scanner sequence settings must be set and are enabled.

If the scanner sequence mode is set to Scanner channels only, Input 2 and scanner channels, Alternate input 2/scanner channels or Alternate scanner channel 1/scanner channels, enter the number of scanner channels to include in the scanner sequence in the Seq. channels box provided or use the up/down buttons.

If the scanner sequence mode is set to User-defined scanner sequence, the user-defined scanner sequence can be configured using the Steps, Scanner sequence and Step channel controls.

Enter the number of steps in the user-defined scanner sequence in the Steps box provided or use the up/down buttons. The number of steps in a user-defined scanner sequence can be set to any value between 1 and 100.

The Scanner sequence list indicates the current channel assignments for each step in the user-defined scanner sequence. To change the current channel assigned to a step, select the step in the list. The current channel assignment appears in the Step channel control.

Select the channel assignment for the currently selected step using the Step Channel drop-down list.

### 4.4.3.4    Channels tab

Select the Channels tab to view a list of channels on the 1575A 'Super Ther-

mometer' readout and to access the channel settings dialogs to view and/or modify channel specific settings.
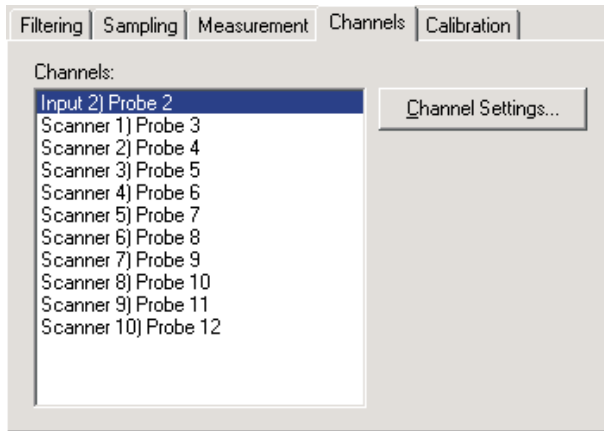


***Figure 99*** *1575A 'Super Thermometer' Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number and the current probe that is assigned to each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.3.6, 1575A 'Super Thermometer'/2575 'Mighty Mux' Channel Settings Dialog.

**4.4.3.5** **Calibration tab**

Select the Calibration tab to view and/or modify thermometer readout calibration information.



**Figure 100** *1575A 'Super Thermometer' Settings - Calibration tab*

⚠️ *Caution: Do not change these values unless this thermometer readout has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this thermometer readout! Changing these values voids the current calibration!*

Enter the value of the external reference resistor in the External resistor box provided. If no external reference resistor is being used, the value in this box is ignored by the thermometer readout.

Enter the values for the internal reference resistors in the boxes provided. The Model 1575A 'Super Thermometer' readout has four internal reference resistors: 1 Ohm, 10 Ohm, 100 Ohm and 10K Ohm. The values of these reference resistors as well as the ADC constant value should be located on the Report of Calibration for this thermometer readout.

Select the state of the internal reference resistor oven using the Oven drop-down list. The oven can either be turned On or Off. Typically, the oven should be set On.

#### 4.4.3.6 1575A 'Super Thermometer'/2575 'Mighty Mux' Channel Settings

The 1575A 'Super Thermometer'/2575 'Mighty Mux' Channel Settings dialog displays information about the selected PRT/Thermistor channel.
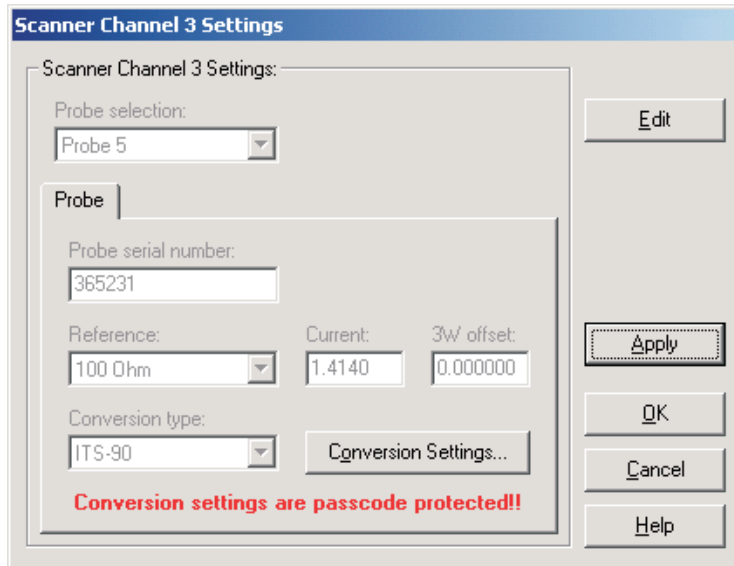


**Figure 101** *1575A 'Super Thermometer'/2575 'Mighty Mux' Channel Settings dialog*

Some or all of the settings on this dialog may be passcode protected. If so, a message appears at the bottom of the Probe tab and/or Calibration tab and the Edit button is displayed. The protected controls are disabled. To edit the protected settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the protected controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

Select the probe to be assigned to this channel using the Probe selection drop-down list. The Model 1575A 'Super Thermometer' readout can hold information for up to 16 probes simultaneously. Any one of these probes can then be assigned to any channel.

When a new probe is selected, the current settings for that probe are read in from the thermometer readout. A progress dialog is displayed while the probe settings are being read in.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the channel settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the channel settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

#### 4.4.3.6.1 Probe tab

Select the Probe tab to view and/or modify probe settings.



**Figure 102** *1575A 'Super Thermometer'/2575 'Mighty Mux' Channel Settings - Probe tab*

Enter the serial number of the selected probe in the Probe serial number box. The serial number can be any combination of numbers and/or letters up to 8 characters in length. The dash "-" character can also be used in serial numbers.

Select the reference resistor for the selected probe using the Reference drop-down list. The choices for the reference resistor are:

- External resistor
- 1 Ohm
- 10 Ohm
- 100 Ohm
- 10K Ohm

*Note: The External resistor option is not available for Input 2 because the external reference resistor must be connected to Input 2!*

Enter the excitation current for the selected probe in the Current box provided. The excitation current can be set to any value between 0.0001 and 21.0 mA.

Enter the 3-wire offset value for the selected probe in the 3W offset box provided. The 3-wire offset can be set to any value between 0 and 1,000,000 ohms.

Select the conversion type to use for the selected probe. The Model 1575A 'Super Thermometer' readout supports the following conversion types:

- ITS-90
- IPTS-68
- CVD (Callendar-Van Dusen)
- W(T90)
- R(T)
- T(R)
- Polynomial
- Ohms
- Ratio

Refer to the Report of Calibration for the selected probe for information on the conversion type that the probe was calibrated for.

If the selected conversion type requires coefficients or other settings, the Conversion Settings button is enabled. Otherwise, the Conversion Settings button is disabled. Click the Conversion Settings button to display the dialog for the selected conversion type. Please refer to Section 9, Conversion Settings Dialogs, for a detailed description of the Conversion Settings dialogs.

*Note: The conversion settings are not written to the thermometer readout until the Apply or OK button is clicked on this dialog!*

### 4.4.4    1590 'Super Thermometer II' Settings dialog

The 1590 'Super Thermometer II' Settings dialog displays information about the thermometer readout including model number, identification information

and the total number of channels. It also allows many thermometer readout settings to be viewed and/or modified.
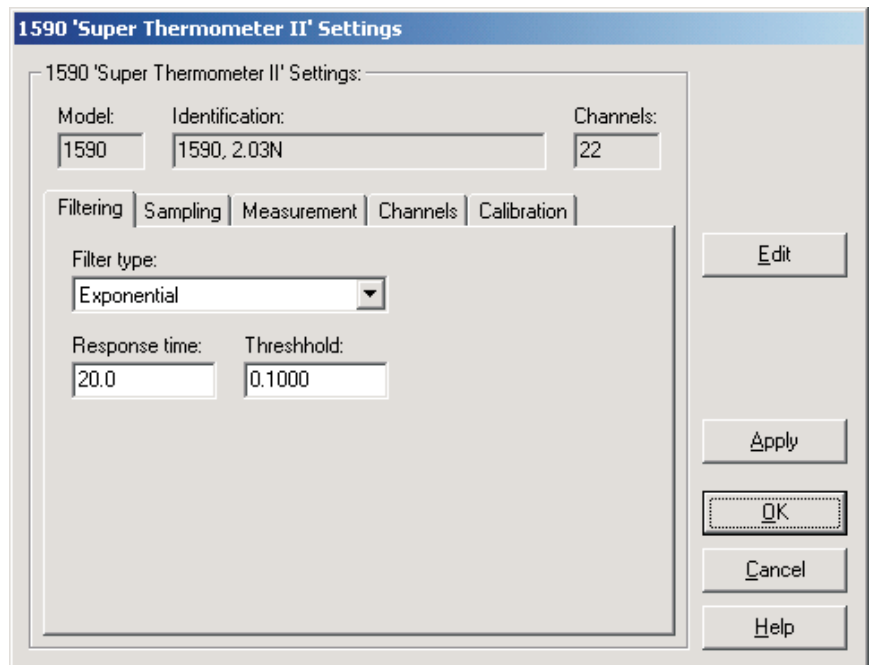


*Figure 103*  1590 'Super Thermometer II' Settings dialog

The 1590 'Super Thermometer II' readout must be connected to an available COM port and the communication settings must be properly configured so that this information can be read in from the thermometer readout. If communication with the thermometer readout is not successful, an error message is displayed and this dialog is blank. A progress dialog is displayed while the current thermometer readout settings are being read in.

The Model box indicates the model number of the thermometer readout. The Identification box indicates the model number and firmware version installed in this thermometer readout. The Channels box indicates the total number of input channels on this thermometer readout.

The filtering settings can be viewed and/or modified by selecting the Filtering tab. The sampling settings can be viewed and/or modified by selecting the Sampling tab. The measurement settings can be viewed and/or modified by selecting the Measurement tab. The Channels tab displays a list of channels and allows access to channel settings dialogs. The thermometer readout calibration information can be viewed and/or modified by selecting the Calibration tab. The settings on each of these tabs are described in detail in the following sec-

tions. For more details on these settings, please refer to the thermometer readout's User's Guide.

If any of the settings on the 1590 'Super Thermometer II' Settings dialog are passcode protected, a message appears at the bottom of the appropriate tab and the Edit button is displayed. The controls for the passcode protected settings are disabled. To edit the protected settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the thermometer readout settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

### 4.4.4.1 Filtering tab

Select the Filtering tab to view and/or modify the filter settings.
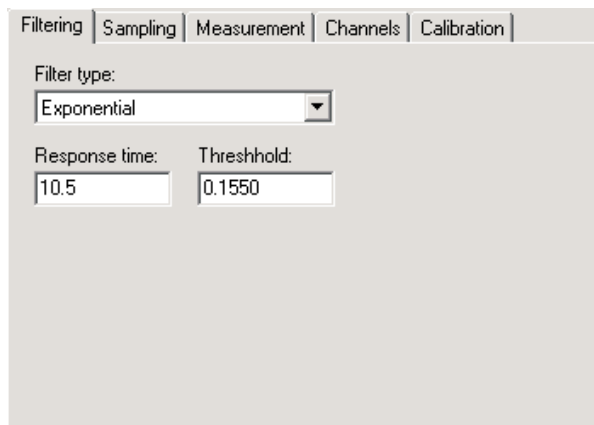


**Figure 104** 1590 'Super Thermometer II' Settings - Filtering tab

Use the Filter type drop-down list to select the type of filtering to use. The filter type can be set to one of the following options:

- None
- Average
- Exponential

If the filter type is set to None, the Response time and Threshold settings are not applicable and are disabled. If the filter type is set to Average or Exponential, the Response time and Threshold settings are enabled.

Enter the response time for the filter in the Response time box. The response time can be set to any value between 2 and 200 seconds.

Enter the threshold to use for the selected filter in the Threshold box. The threshold can be set to any value between .0001 and 1,000,000.

### 4.4.4.2    Sampling tab

Select the Sampling tab to view and/or modify sampling settings.



**Figure 105**   *1590 'Super Thermometer II' Settings -
Sampling tab*

Select the units using the Units drop-down list. Readings can be displayed in either °C, °F, K, Ohms, Ratio or W.

*Note: This setting may override the selected conversion type for each channel. Please refer to the thermometer readout's User's Guide for more information on setting the system units.*

Select the sample action from the Sample action drop-down list. The sample action can be set to one of the following options:

- Run

- Stop

- Sample *n*

If the sample action is set to Run or Stop, the Sample *n* setting is not applicable and is disabled. If the filter type is set to Sample *n*, the Sample *n* setting is enabled.

If the sample action is set to Sample *n*, enter the number of samples in the Sample *n* box. The Sample *n* setting can be set to any value between 1 and 32,000.

The Sample timing controls allow the thermometer readout's sample timing settings to be viewed and/or modified. The sample timing settings include the Sample interval, Integration time and Conversion time.

Enter the sample interval value in the Sample interval box provided or use the up/down buttons. The sample interval can be set to any value between 2 and 99,999 seconds.

⚠️ *Note: The sample interval must be greater than or equal to the integration time, which in turn must be greater than or equal to the conversion time. If the sample interval is set to a value that is less than the current integration time, the integration time and conversion time settings are automatically set to match the sample interval setting!*

Enter the integration time value in the Integration time box provided or use the up/down buttons. The integration time can be set to any value between 2 and 9,999 seconds.

⚠️ *Note: The integration time must be greater than or equal to the conversion time. If the integration time is set to a value that is less than the current conversion time, the conversion time setting is automatically set to match the integration time setting!*

Enter the conversion time value in the Conversion time box provided or use the up/down buttons. The conversion time can be set to any value between 2 and 10 seconds.

The Resolutions controls allow the thermometer readout's resolution settings to be viewed and/or modified. The resolution settings include the Temperature, Resistance and Ratio settings.

Enter the resolution for temperature readings in the Temperature box provided or use the up/down buttons. The temperature resolution can be set to any value between 0 and 8 digits (places after decimal point).

Enter the resolution for resistance readings in the Resistance box provided or use the up/down buttons. The resistance resolution can be set to any value between 0 and 8 digits (places after decimal point).

Enter the resolution for ratio readings in the Ratio box provided or use the up/down buttons. The ratio resolution can be set to any value between 0 and 8 digits (places after decimal point).

**4.4.4.3** **Measurement tab**

Select the Measurement tab to view and/or modify measurement settings.
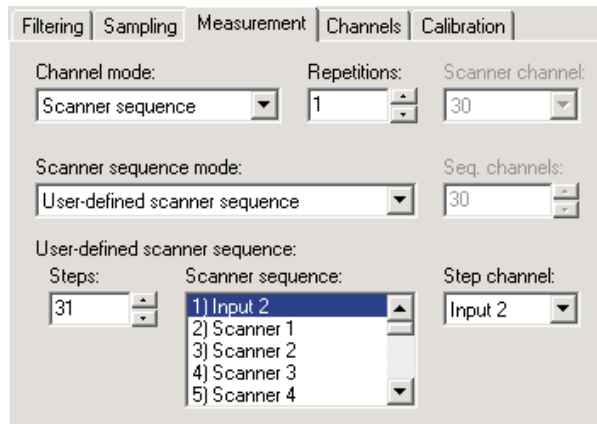


**Figure 106** *1590 'Super Thermometer II' Settings - Measurement tab*

Use the Channel mode drop-down list to select the channels to take measurements from. The channel mode can be set to one of the following options:

- Alternate input 1/input 2
- Input 1
- Input 2
- Scanner channel **(only if Model 2590 'Mighty Mux II' Multiplexer(s) is/are connected)**
- Scanner sequence **(only if Model 2590 'Mighty Mux II' Multiplexer(s) is/are connected)**

If the channel mode is set to Alternate Input 1/Input 2, Input 1 or Input 2, the scanner channel and scanner sequence mode settings are not applicable and are disabled. If the channel mode is set to Scanner channel, the Scanner channel setting is enabled. If the channel mode is set to Scanner sequence, the scanner sequence mode setting is enabled.

Enter the repetitions setting in the Repetitions box provided or use the up/down buttons. The repetitions can be set to any value between 1 and 32,000 readings.

If the channel mode is set to Scanner channel, select the scanner channel to activate using the Scanner channel drop-down list.

If the channel mode is set to Scanner sequence, select the scanner sequence mode using the Scanner sequence mode drop-down list. The scanner sequence mode can be set to on of the following options:

- Scanner channels only
- Input 2 and scanner channels
- Alternate input 2/scanner channels
- Alternate scanner channel 1/scanner channels
- User-defined scanner sequence

If the scanner sequence mode is set to Scanner channels only, Input 2 and scanner channels, Alternate input 2/scanner channels or Alternate scanner channel 1/scanner channels, the Seq. channels setting must be set and is enabled. If the scanner sequence mode is set to User-defined scanner sequence, the user-defined scanner sequence settings must be set and are enabled.

If the scanner sequence mode is set to Scanner channels only, Input 2 and scanner channels, Alternate input 2/scanner channels or Alternate scanner channel 1/scanner channels, enter the number of scanner channels to include in the scanner sequence in the Seq. channels box provided or use the up/down buttons.

If the scanner sequence mode is set to User-defined scanner sequence, the user-defined scanner sequence can be configured using the Steps, Scanner sequence, and Step channel controls.

Enter the number of steps in the user-defined scanner sequence in the Steps box provided or use the up/down buttons. The number of steps in a user-defined scanner sequence can be set to any value between 1 and 100.

The Scanner sequence list indicates the current channel assignments for each step in the user-defined scanner sequence. To change the current channel assigned to a step, select the step in the list. The current channel assignment appears in the Step channel control.

Select the channel assignment for the currently selected step using the Step Channel drop-down list.

### 4.4.4.4    Channels tab

Select the Channels tab to view a list of channels on the 1590 'Super Ther-

mometer II' readout and to access the channel settings dialogs to view and/or modify channel specific settings.
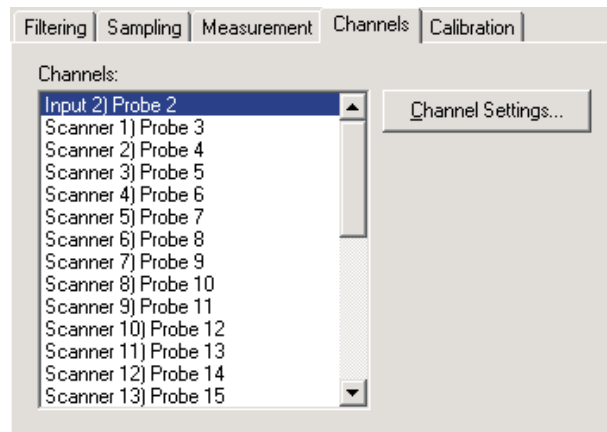


**Figure 107**  *1590 'Super Thermometer II' Settings - Channels tab*

Select the channel to view and/or modify from the Channels list. This list indicates the channel number and the current probe that is assigned to each channel.

Click the Channel Settings button to display the appropriate channel settings dialog. When this button is clicked, the settings for the selected channel are read in from the thermometer readout. The Channel Settings dialog is described in detail in Section 4.4.4.6, 1590 'Super Thermometer II'/2590 'Mighty Mux II' Channel Settings Dialog.

#### 4.4.4.5 Calibration tab

Select the Calibration tab to view and/or modify thermometer readout calibration information.



**Figure 108** *1590 'Super Thermometer II' Settings -
Calibration tab*

⚠️ *Caution: Do not change these values unless this thermometer readout has been recalibrated or unless these values do not match the values located on the latest Report of Calibration for this thermometer readout! Changing these values voids the current calibration!*

Enter the value of the external reference resistor in the External resistor box provided. If no external reference resistor is being used, the value in this box is ignored by the thermometer readout.

Enter the values for the internal reference resistors in the boxes provided. The Model 1590 'Super Thermometer II' readout has four internal reference resistors: 1 Ohm, 10 Ohm, 100 Ohm and 10K Ohm. The values of these reference resistors as well as the ADC constant value should be located on the Report of Calibration for this thermometer readout.

Select the state of the internal reference resistor oven using the Oven drop-down list. The oven can either be turned On or Off. Typically, the oven should be set On.

**4.4.4.6** **1590 'Super Thermometer II'/2590 'Mighty Mux II' Channel Settings dialog**

The 1590 'Super Thermometer II'/2590 'Mighty Mux II' Channel Settings dialog displays information about the selected PRT/Thermistor channel.
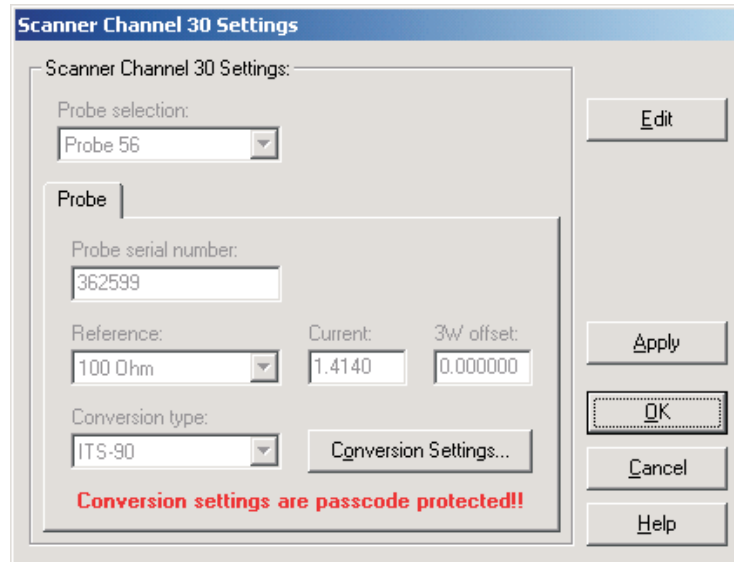


**Figure 109** *1590 'Super Thermometer II'/2590 'Mighty Mux II' Channel Settings dialog*

Some or all of the settings on this dialog may be passcode protected. If so, a message appears at the bottom of the Probe tab and/or Calibration tab and the Edit button is displayed. The protected controls are disabled. To edit the protected settings, click the Edit button and enter the current passcode for the thermometer readout. If the correct passcode is entered, the protected controls are enabled and the values may be changed. The controls remain enabled until this dialog is closed or until the current changes are applied by clicking the Apply button.

Select the probe to be assigned to this channel using the Probe selection drop-down list. The Model 1590 'Super Thermometer II' readout can hold information for up to 56 probes simultaneously. Any one of these probes can then be assigned to any channel.

When a new probe is selected, the current settings for that probe are read in from the thermometer readout. A progress dialog is displayed while the probe settings are being read in.

After modifying any of the settings on this dialog, click the Apply or OK button to write the new settings to the thermometer readout. If the Apply button is

clicked, this dialog remains open. If the OK button is clicked, this dialog closes after writing the settings.

Log*Ware* has a feature that causes all of the channel settings to be read back in from the thermometer readout after the Apply button is clicked and the new settings have been written to the thermometer readout. This feature can be useful to verify that the desired settings were properly applied to the thermometer readout. To enable or disable this feature, see Section 5.6.4, Options.

To close this dialog without writing the channel settings to the thermometer readout, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**4.4.4.6.1** **Probe tab**

Select the Probe tab to view and/or modify probe settings.
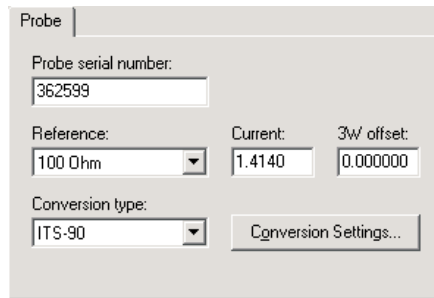


**Figure 110** *1590 'Super Thermometer II'/2590 'Mighty Mux II' Channel Settings - Probe tab*

Enter the serial number of the selected probe in the Probe serial number box. The serial number can be any combination of numbers and/or letters up to 8 characters in length. The dash "-" character can also be used in serial numbers.

Select the reference resistor for the selected probe using the Reference drop-down list. The choices for the reference resistor are:

- External resistor
- 1 Ohm
- 10 Ohm
- 100 Ohm
- 10K Ohm

*Note: The External resistor option is not available for Input 2 because the external reference resistor must be connected to Input 2!*

Enter the excitation current for the selected probe in the Current box provided. The excitation current can be set to any value between 0.0001 and 21.0 mA.

Enter the 3-wire offset value for the selected probe in the 3W offset box provided. The 3-wire offset can be set to any value between 0 and 1,000,000 ohms.

Select the conversion type to use for the selected probe. The Model 1590 'Super Thermometer II' readout supports the following conversion types:

- ITS-90
- IPTS-68
- CVD (Callendar-Van Dusen)
- W(T90)
- R(T)
- T(R)
- Polynomial
- Ohms

- Ratio

Refer to the Report of Calibration for the selected probe for information on the conversion type that the probe was calibrated for.

If the selected conversion type requires coefficients or other settings, the Conversion Settings button is enabled. Otherwise, the Conversion Settings button is disabled. Click the Conversion Settings button to display the dialog for the selected conversion type. Please refer to Section 9, Conversion Settings Dialogs, for a detailed description of the Conversion Settings dialogs.

*Note: The conversion settings are not written to the thermometer readout until the Apply or OK button is clicked on this dialog!*

# 5 Menus

Log*Ware*'s features and tools are all accessible through menu options. This section describes each of Log*Ware*'s menus.

## 5.1 File menu

The File menu provides options for creating a new real-time configuration, opening and saving real-time configuration files, printing and exiting Log*Ware*.

| | |
|---|---|
| New... | Ctrl+N |
| Open... | Ctrl+O |
| Save As... | |
| Print | ▶ |
| Exit | |
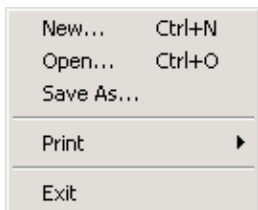
**Figure 111**   *File menu*

### 5.1.1 New

The New option can be used to clear the current real-time log session settings and display the Log Session Settings dialog.

The [ ] button on the toolbar corresponds to the New option.

When selecting the New option, a prompt is displayed to confirm that the current real-time log session settings (if any) will be reset. To abort resetting the current real-time log session settings, click the No button. Otherwise, click the Yes button to reset the current log session settings. The Log Session Settings dialog will be displayed. Please refer to Section 2.3, Log Session Settings Dialog, for more information on configuring a real-time log session.

The New option and toolbar button are disabled while a real-time log session window is open.

### 5.1.2 Open

The Open option allows a real-time log session configuration file to be opened. If the same basic configuration is frequently used to perform real-time logging, saving the log session settings to a configuration file can greatly reduce the time it takes to configure and start a real-time log session.

The [ ] button on the toolbar corresponds to the Open option.

> ⚠️ *Note: When opening a configuration file, LogWare attempts to communicate with the thermometer readout to verify that the settings saved in the configuration file are compatible with the current thermometer readout configuration. Therefore, it is necessary to have the thermometer readout connected and powered on in order to successfully open a configuration file.*

When selecting the Open option, the Windows® Open dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Real-time log session configuration files should have a **.rls** extension. To cancel opening a configuration file, click the Cancel button. Otherwise, select the configuration file to open and click the Open button. For more details about the real-time log session configuration file, refer to Section 7.1.1, Log Session Configuration File. Real-time log session configuration files can also be opened by selecting the Open button on the Log Session Settings dialog.

Log*Ware* then reads the log session settings from the configuration file and verifies that the configuration of the currently connected thermometer readout is compatible with the log session settings. If there are any conflicts, or if Log*Ware* is unable to communicate with the thermometer readout, appropriate messages are displayed.

Once the configuration file has been read in, the Log Session Settings dialog is displayed. If Log*Ware* was unable to communicate with the thermometer readout or any other error occurred, the log session settings may be incomplete.

The Open option and toolbar button are disabled while a real-time log session window is open.

### 5.1.3    Save as

The Save As option allows the current real-time log session settings to be saved to a configuration file. If the same basic configuration is frequently used to perform real-time logging, saving the log session settings to a configuration file can greatly reduce the time it takes to configure and start a real-time log session. Before attempting to save a real-time log session configuration, use the Log Session Settings dialog to configure the log session.

The ⊟ button on the toolbar corresponds to the Save As option.

When selecting the Save As option, the Windows® Save As dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Real-time log session configuration files are saved with a **.rls** extension. To cancel saving a configuration file, click the Cancel button. Otherwise, enter the filename for the configuration file and click the Save button. For more details about the real-time log session configuration file, refer to Section 7.1.1, Log Session Configuration File. Real-time log session configuration files can also be saved by selecting the Save As button on the Log Session Settings dialog.

The Save As option and toolbar button are disabled while a real-time log session window is open.

### 5.1.4    Print

The Print option allows the current graph or log file to be printed. The Print option has 2 submenu options: Readings and Graph. The submenu options are disabled if there is no real-time or previous log session window open.

#### 5.1.4.1    Readings

The Readings option allows the output file for the currently selected channel to be printed. This option applies to both real-time and previous log sessions.

#### 5.1.4.2    Graph

The Graph option allows the graph in the currently selected window to be printed. This option applies to both real-time and previous log sessions.

The graph can also be printed by selecting the Print Graph option in the Graph menu.

### 5.1.5    Exit

The Exit option closes the Log*Ware* Software.

The Exit option is disabled while a real-time log session window is open.

## 5.2    Datalog menu

The Datalog menu provides options for working with configuring, starting, stopping and closing a real-time log session.
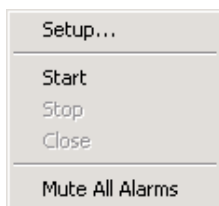


**Figure 112**  *Datalog menu*

### 5.2.1    Setup

The Setup option displays the Log Session Settings dialog. This dialog is used to configure a real-time log session. If a log session has already been configured or a real-time log session configuration file has already been opened, this dialog displays the current log session settings.

The ⚡ button on the toolbar corresponds to the Setup option.

Please refer to Section 2.3, Log Session Settings Dialog, for more details on configuring a real-time log session.

This option is disabled while a real-time log session window is open.

### 5.2.2 Start

The Start option starts a real-time log session. This option is disabled until a log session has been completely configured.

The ▶ button on the toolbar corresponds to the Start option.

Please refer to Section 2.4, Real-Time Log Session, for more details on a real-time log session.

### 5.2.3 Stop

The Stop option stops the current real-time log session. This option is only enabled when a real-time log session is running. A log session may be stopped at any time by selecting this option.

The ■ button on the toolbar corresponds to the Stop option.

When selecting the Stop option, a message is displayed to confirm stopping the log session.

### 5.2.4 Close

The Close option closes the current real-time log session window. This option is only enabled once the real-time log session has stopped and the log session window is still open.

The button on the toolbar corresponds to the Close option.

### 5.2.5 Mute all alarms

The Mute All Alarms option can be used to mute any audible alarms associated with the current real-time log session. When the alarms are muted, a check mark appears next to this option. Muting the alarms does not prevent alarm events from happening.

The 🔊 button on the toolbar corresponds to the Mute All Alarms option.

When alarms are muted, the toolbar button appears as .

## 5.3    Download menu

The Download menu contains options for downloading logged data from the thermometer readout's memory or logs and viewing the current status of the thermometer readout's logs or memory.

Download Logged Data...
Log Status...
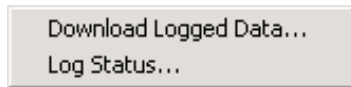
**Figure 113**  *Download Menu*

### 5.3.1    Download logged data

The Download Logged Data option can be used to download data that has been logged to the thermometer readout's logs or memory. All thermometer readouts supported by Log*Ware* support logging of some type. Please refer to Section 1.4.4, Firmware Requirements, for more information.

When selecting the Download Logged Data option, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout in order to display appropriate options dialog. Please refer to Section 3.2, Select Model Dialog, for more details on the Select Model dialog.

After the thermometer readout model and communication settings have been selected, the appropriate Download Options dialog for the selected thermometer readout is displayed. The Download Options dialogs are described in more detail in Section 3.3, Download Options Dialogs.

This option is disabled while a real-time log session is running.

### 5.3.2    Log status

The Log Status option can be used to view the current status of the thermometer readout's logs or memory. This feature is only supported by some of the thermometer readouts supported by Log*Ware*.

When selecting the Log Status option, the Select Model dialog is displayed. Log*Ware* needs to know the model of the thermometer readout in order to display appropriate status dialog. Please refer to Section 3.2, Select Model Dialog, for more details on the Select Model dialog.

After the thermometer readout model and communication settings have been selected, the appropriate Download Options dialog for the selected thermometer readout is displayed. The Log Status dialogs are described in more detail in Section 3.4, Log Status Dialogs.

This option is disabled while a real-time log session is running.

## 5.4      View menu

The View menu provides options for showing or hiding the toolbar and status
bar, viewing current alarm settings, showing or hiding graph traces, viewing
output and alarm log files, and for opening download files or output files from
previous log sessions.
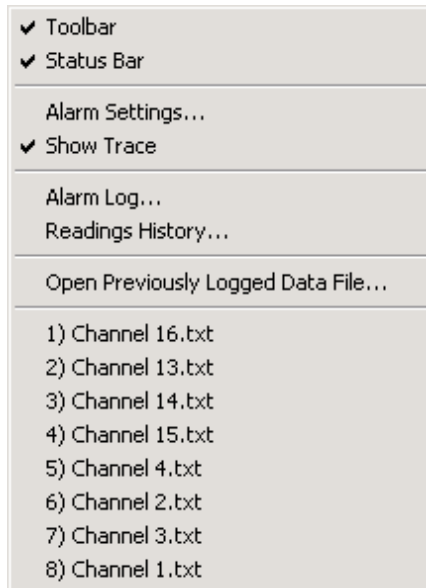


**Figure 114**   *View Menu*

### 5.4.1      Toolbar

The Toolbar option toggles the display of the toolbar at the top of the main
window. A check mark appears next to this option if the toolbars are currently
displayed.

### 5.4.2      Status bar

The Status bar option toggles the display of the status bar at the bottom of the
main window. A check mark appears next to this option if the status bar is cur-
rently displayed.

### 5.4.3      Alarm settings

The Alarm Settings option displays the current alarm settings for the selected
channel. This option only applies to channels in a real-time log session.

If no alarms were configured for the selected channel, this option is disabled.

### 5.4.4        Show trace

The Show Trace option toggles displaying the trace on the graph for the selected channel. This option applies to both real-time and previous log session windows. A check mark appears next to this option if the trace for the selected channel is currently displayed.

This option is only enabled when a real-time or previous log session window is displayed.

### 5.4.5        Alarm log

The Alarm Log option displays the alarm log for the current real-time log session. Please refer to Section 7.2.3, Alarm Log File, for more details on alarm log files.

This option is only enabled while a real-time log session window is open.

### 5.4.6        Readings history

The Readings History option displays the output file for the selected channel of a real-time log session. Please refer to Section 7.2.1, Output File, for more details on output files.

This option is only enabled while a real-time log session window is open.

### 5.4.7        Open previously logged data file

The Open Previously Logged Data File option allows file(s) containing logged or downloaded data to be opened. Please refer to Section 2.5, Previous Log Session, for more information on opening previous log session files.

When selecting the Open Previously Logged Data File option, the Windows® Open dialog is displayed. The \Config folder should be selected by default (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Both output files and download files can be opened in the Previous Log Session window. These files should have a **.txt** extension. To cancel opening a file, click the Cancel button. Otherwise, select up to 10 files to open and click the Open button. If more than 10 files are selected, only the first 10 files are opened and the rest are ignored. For more details about output files, please refer to Section 7.2.1, Output File. For more details about download files, please refer to Section 7.2.2, Download File.

### 5.4.8        MRU list

The View menu MRU list indicates up to the last 8 output or download files that were opened in a Previous Log Session window. Click on an item to open that file in a new Previous Log Session window.

## 5.5        Graph menu

The Graph menu provides options for customizing graph settings, changing the graph trace colors, accessing graph zooming features and printing the graph.

Graph Settings...
Restore Default Settings
Trace Color...

Zoom In
Restore

Print Graph
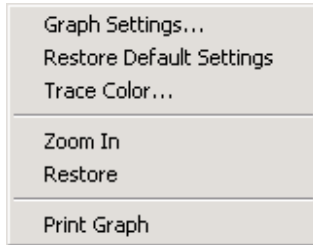
**Figure 115**   *Graph Menu*

## 5.5.1        Graph settings dialog

The Graph Settings option displays the Graph Settings dialog.

The ⌊🗠⌋ button on the toolbar corresponds to the Graph Settings option. The Graph Settings dialog allows many of the graph settings to be changed including titles, axis settings, grids, colors, trend lines and legends. The Graph Settings option applies to the current log session window.

The Graph Settings option and toolbar button are only enabled if a real-time or previous log session window is open.

The following sections describe in detail each of the customizable graph settings.

After modifying any of the settings on this dialog, click the Apply Now or OK button to apply the new settings to the graph. If the Apply Now button is clicked, this dialog remains open. If the OK button is clicked, this dialog closes.

To close this dialog without saving new settings, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

### 5.5.1.1        Titles tab

The Titles tab can be used to enter the titles to appear on the top, bottom, left and right sides of the graph.
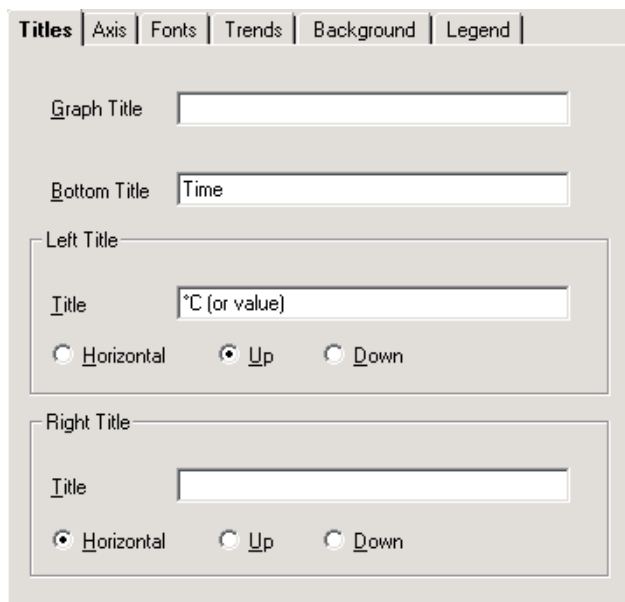


**Figure 116**  *Graph Settings - Titles tab*

When you enter text for a title, the Graph control adjusts the rest of the graphing window to provide space—either redrawing the graph and associated objects at a smaller size or decreasing the space between objects. When you clear the text box for a title, you disable it and provide more space for the rest of the graph.

If you enter a title that's too long to appear in a single line, the Graph control automatically word-wraps it. If a title doesn't display at all, it's because the Graph control can't make the font small enough to fit all the text in the space provided. Increase the size of the graphing window to make the title appear.

⚠️ *Note: To restore the titles to their default settings, select the Restore Default Settings option in the Graph menu.*

Enter the top title for the graph in the Graph Title box. The graph title can contain up to 80 characters. This title appears centered at the top of the graph. By default, the graph title is blank.

Enter the bottom title for the graph in the Bottom Title box. The bottom title can contain up to 80 characters. This title appears centered at the bottom of the

graph and is generally used to denote the scale of the X-axis. By default, this title is set to "Time".

Enter the title for the left Y-axis of the graph in the Left Title box. The left title can contain up to 80 characters. This title appears centered vertically on the left side of the graph and is generally used to denote the scale of the Y-axis. The title can be displayed horizontally or vertically running up or down. By default, this title is set to the Readings Scale with the Up orientation option selected.

Enter the title for the right Y-axis of the graph in the Right Title box. The right title can contain up to 80 characters. This title appears centered vertically on the right side of the graph and is generally used to denote the scale of a secondary Y-axis. The title can be displayed horizontally or vertically running up or down. By default, the right title is blank.

*Note: LogWare only supports on Y-axis, on the left side of the graph. However, a title can still be placed on the right side of the graph.*

**5.5.1.2**          **Axis tab**

The Axis tab can be used to customize the graph's X- and Y-axis settings, colors, ticks and gridlines.
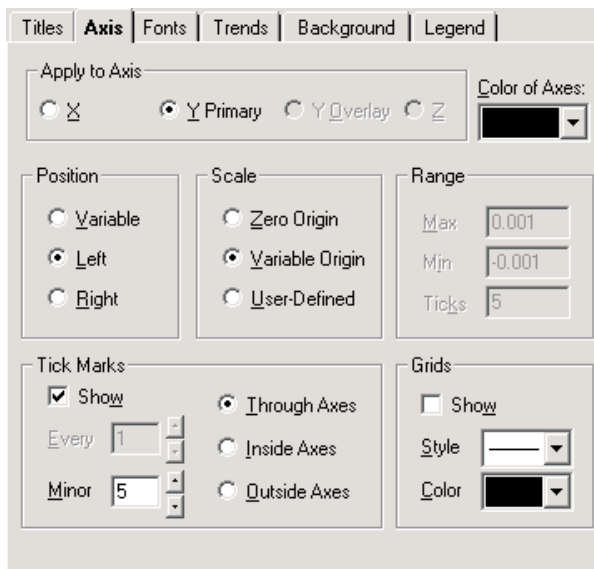


**Figure 117**  *Graph Settings - Axis tab*

⚠ *Note: To restore the axes to their default settings, select the Restore Default Settings option in the Graph menu.*

Select the axis for which changes are to be made using the Apply to Axis option. The other controls on this tab change to reflect the current settings of the selected axis. By default, the Y Overlay and Z axes options do not apply to the graph and are not enabled.

Select the color for the X-and Y-axes by selecting a color bar from the Color of Axes drop-down list. This setting applies to both axes and is therefore independent of the current Apply to Axis setting. By default, this option is set to black.

The Position options allow the X-axis to be positioned on either the top or bottom of the graph and the Y-axis to be positioned on either the left or right side of the graph. Selecting the Variable option allows the graph itself to determine whether to position the axes on the top, bottom, left or right side.

By default, the X-axis is set to Bottom and the Y-axis is set to Left.

The Scale options allow the user to determine the minimum and maximum values for an axis. Each option is described below:

- **Zero Origin** - This option draws the selected axis including the origin (zero) and extending far enough in the positive and negative directions to include all of the graph's values

- **Variable Origin** - Select this option to have the axis "zoom in" on the range of the graph's actual values, whether or not that range includes zero.

- **User-Defined** - This option allows the user to set values for the minimum, maximum, and number of ticks for the axis. When this option is selected, the settings in the Range group are enabled

By default, the X-axis and Y-axis are both set to Variable Origin.

*Note: Changing the Scale settings (especially for the X-axis) while acquiring real-time data could possibly cause graphing problems to occur. Therefore, it is recommended that these settings **NOT** be changed by the user when acquiring real-time data.*

The Range options are only enabled if the User-Defined option is selected in the Scale options for the selected axis. Enter the Maximum and Minimum values for the selected axis. The selected axis is rescaled to the settings entered.

The Ticks option allows the user to determine how many major tick marks should be displayed between the minimum and maximum values on the selected axis. Each major tick mark is labeled with the appropriate value. The tick marks themselves are only displayed if the Show check box in the Tick Marks controls is checked.

By default, these settings are not used by the software because of the default Scale settings.

The Tick Marks options allow the user to specify whether or not to show tick marks on the selected axis. To show tick marks, check the Show check box. If this check box is not checked, the tick marks are not shown on the selected axis. Valid settings are between 1 and 1,000.

The Every option is only enabled for the X-axis. This option determines how often major tick marks appear on the X-axis. When acquiring real-time data, the graph displays the most recent 600 readings acquired. The Every option is set to 150 meaning that a major tick mark appears every 150 readings, or 600 divided by 150 = 4 major tick marks appear on the X-axis. When analyzing previously acquired data, the Every option is calculated by the software depending on the number of readings being displayed. The X-axis must end with a tick mark. If you set an Every value that doesn't include the last value on the axis, the graph will extend the X-axis so that it ends on a tick mark.

The Minor option allows the user to determine how many minor tick marks appear between each major tick mark. By default, the X-axis and Y-axis are set to display 5 minor tick marks between major tick marks. Valid settings are between 0 and 100.

The Through Axes, Inside Axes and Outside Axes options allow the user to specify how the tick marks should be drawn on the axis. By default, both the X-axis and Y-axis are set to Through Axes.

The Grids options allow the user to specify whether or not to display grid lines on the graph. To show the grid lines for the selected axis, check the Show check box. Select the list Style and Color for the grid lines. Both axes are set to the same style and color, but each axis can be set to show or hide grid lines independent of the other.

By default, grid lines are not shown on the graph.

### 5.5.1.3    Fonts tab

The Fonts tab can be used to change the typefaces and sizes of fonts used on the graph.
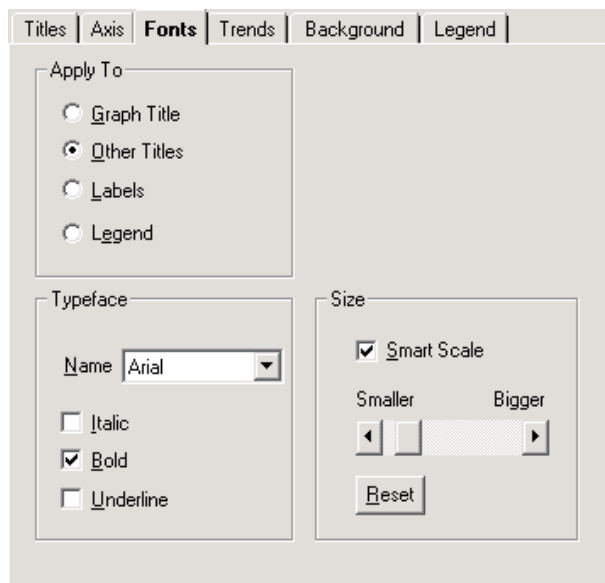


**Figure 118**  *Graph Settings - Fonts tab*

⚠️ *Note: To restore the fonts to their default settings, select the Restore Default Settings option in the Graph menu.*

Select the title, label or legend option to which the font settings are to be applied using the Apply To option. The Typeface and Size controls display the current settings for the selected option.

Select the font name from the Typeface drop-down list and choose the styles to apply to the selected title, label or legend.

Select the font size to apply to the selected title, label, or legend by clicking on the scroll bar or dragging the scroll bar's thumb. Selecting the Smart Scale option allows the graph to automatically reduce the size of the selected font if the dimensions of the graph become too small to display the title, label or legend in the selected font size. Click the Reset button to restore the size to its default setting.

### 5.5.1.4    Trends tab

The Trends tab can be used to superimpose trend lines (Min, Max, Average, etc.), curve fit and limit (alarm) lines on the graph.
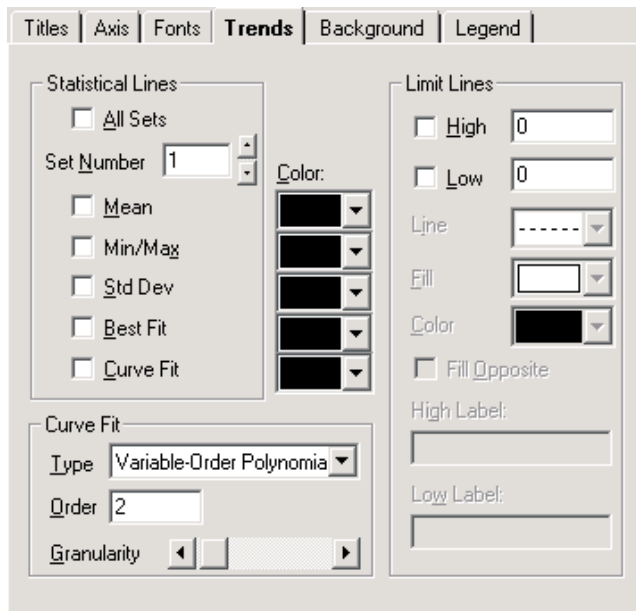


**Figure 119**   *Graph Settings - Trends tab*

*Note: To restore the trend settings to their default settings, select the Restore Default Settings option in the Graph menu.*

The Statistical Lines options allow the user to specify which statistical lines should be displayed on the graph.

Check the All Sets option to apply the statistical lines settings to all of the sets (traces) on the graph. When this check box is checked, the Set Number controls are disabled.

The Set Number box allows the user to select which set (trace) to which to apply the statistical lines settings. This setting can only be changed if the All Sets check box is not checked.

*Note: This software only has one set of data. When acquiring real-time data, this set is the data being acquired. When analyzing previously acquired data, this set is the data which was previously acquired.*

Check the Mean check box to enable a mean line, which is drawn horizontally through the average value of all data points in the selected set.

Check the Min/Max check box to enable min and max lines, which are drawn horizontally through the lowest and highest data points in the selected set.

Check the Std Dev check box to enable a pair of standard-deviation lines, which are drawn horizontally through the standard deviation from the mean (in both the positive and negative directions) for the selected set.

Check the Best Fit check box to enable a best-fit line, which is a straight line indicating the trend of data points (a first-order polynomial curve) for the selected set.

Check the Curve Fit check box if you want to fit a curve through your data points for the selected set. You can choose the type, order and granularity of the curve in the Curve Fit options below. These settings will apply to all curve fit lines drawn on the graph.

By default, no trend lines are enabled.

Select the Curve Fit options for the curve fit statistical line. The following options are available:

| Curve type | Description/formula |
|---|---|
| Variable-Order Polynomial | Polynomial curve of variable order |
| Logarithmic | $y = a + b * \log(x)$ |
| Exponential 1 | $y = a * \exp(b * x)$ |
| Exponential 2 | $y = a * x * \exp(-b * x)$ |
| Power | $y = a * (x \wedge b)$ |
| Inverse 1 | $y = a + b / x$ |
| Inverse 2 | $y = a / (b + x)$ |
| Inverse 3 | $y = 1 / (a + b * x)$ |
| Inverse 4 | $y = x / (a * x + b)$ |
| Inverse 5 | $y = 1 / (a + b * x) \wedge 2$ |
| Spline | Spline fit through all points |
| Moving Average Mid | Moving average plotted at midpoint of averaged group |
| Moving Average End | Moving average plotted at end point of averaged group |

The Order option applies only to three curve types:

- For variable-order polynomial curves, Order is the order of the polynomial used in curve fitting. A setting of 1 produces a straight line (the same as a best-fit line); a setting one less than the number of points produces a curve that passes through every point.

- For moving-average mid and moving-average end curves, Order is the range of data points over which moving averages are averaged, beginning with the first point.

The Granularity scroll bar sets the granularity of all curve types except moving-average. The granularity is the number of "steps," or straight line segments, making up the curve. Higher values create smoother curves, but require more drawing time. The default Granularity setting is 50 curve steps, which generally creates a smooth-looking curve at a high drawing speed. Each click to the left decreases the number of steps by 2 (to a minimum of 10), and each click to the right increases the number of steps by 2 (to a maximum of 1000). With spline curves, you generally need higher granularities than normal—up to 10 times the number of points in the graph.

Select the colors for each of the statistical lines to display on the graph using the Color drop-down lists. The selected color for each statistical line applies to that statistical line for all sets of data.

Select the limit (alarm) lines options to display on the graph using the Limit Lines options. To display the high alarm line, check the High check box. To display the low alarm line, check the Low check box.

*Note: Changing the low and high limit line settings on this dialog **DOES NOT** change the low and high alarm settings entered on the Alarm Settings dialog and therefore does not affect the alarm events options. These settings are only used to display the alarm lines on the graph. Only change these settings if absolutely necessary.*

Select the line style for the limit (alarm) lines using the Line drop-down list. A fill pattern can also be selected using the Fill drop-down list. Select the color of the limit (alarm) lines and the fill pattern using the Color drop-down list.

Select the Fill Opposite check box to fill the area between the High and Low limit (alarm) lines with the selected pattern. If this option is not checked, the areas above the High limit value and below the Low limit value are filled in with the selected pattern.

Enter the text to appear as a label on the High and Low limit (alarm) lines in the High Label and Low Label boxes. By default, these labels are set to "High Alarm" and "Low Alarm" respectively.

*Note: Unlike statistical lines, the graph can only display one set of limit (alarm) lines for all sets of data (traces).*

**5.5.1.5**          **Background tab**

The Background tab can be used to set the background colors of titles, the legend and the graph itself.
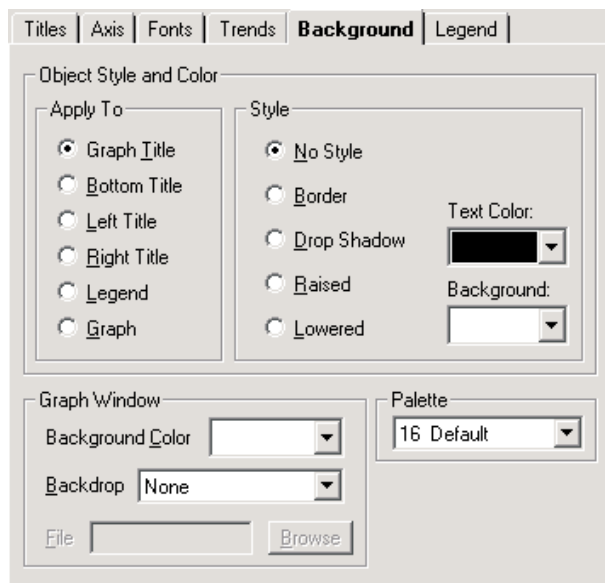


**Figure 120**   *Graph Settings - Background tab*

⚠️ *Note: To restore the background settings to their default settings, select the Restore Default Settings option in the Graph menu.*

Select the title, legend, or graph option to which the background settings are to be applied using the Apply To options. The other controls on this tab change to show the current settings for the selected item.

Select the background style options to apply to the selected title, legend or graph using the Style options. Select the text and background color for the selected item using the drop-down lists provided.

Select the background options for the graph window using the Graph Window options. Use the Background Color drop-down list to select the background color for the plotting area of the graph.

The Backdrop option can be used to display a graphic (.BMP or .WMF) file such as a company logo or texture pattern behind the graph. If any other option except "None" is selected, the File and Browse button controls are enabled. Enter the name of the file or browse for the filename using the Browse button.

Select the color palette to use using the Palette drop-down list. Using this drop-down list, choose a 16-color or 128-color palette for the screen. All of the Color drop-down lists for the graph settings use this palette to determine the available choices.

- 16-color palettes consist of 16 differentiated colors—default, pastel, or grayscale

- 128-color palettes always consist of the 16 colors from the default palette, followed by 96 colors that vary according to the palette you select. The graph reserves 16 additional colors for special graphic needs. These colors cannot be selected

By default, the "16 Default" palette is selected.

⚠ *Note: Selecting any other palette will invalidate the Trace Color option on the Log Session Settings dialog. The Palette option should NOT be changed.*

### 5.5.1.6 Legend tab

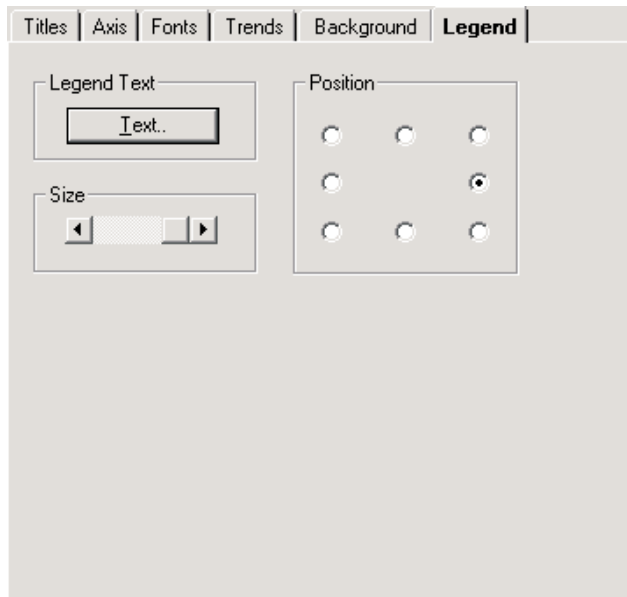The Legend tab can be used to add a legend to the graph.



**Figure 121** *Graph Settings - Legend tab*

⚠ *Note: To restore the legend settings to their default settings, select the Restore Default Settings option in the Graph menu.*

Click the Text button to enter the labels for each set (trace) of data on the graph. By entering text into the boxes provided, the legend will automatically appear on the graph. To hide the legend, remove the text from all of the boxes.

By default, all of the legend text boxes are empty causing the legend to be hidden.

Select the position with respect to the graph to place the legend using the Position options.

Select the size of the legend using the Size options. To change the font or style that the legend uses, see the Fonts tab. To set the legend colors, see the Background tab.

## 5.5.2 Restore default settings

The Restore Default Settings option restores the graph to its default settings and applies to the current log session window.

The Restore Default Settings option and toolbar button are only enabled if a real-time or previous log session window is open.

## 5.5.3 Trace color

The Trace Color option allows the trace color for the selected channel to be changed. Please refer to Section 2.4, Real-Time Log Session, for more details on changing the trace color for real-time log sessions and Section 2.5, Previous Log Session, for more details on changing the trace color for previous log sessions.

The Trace Color option is only enabled if a real-time or previous log session window is open.

## 5.5.4 Zoom in

The Zoom In option allows the graph to be zoomed in.

The ⊕ button on the toolbar corresponds to the Zoom In option. Please refer to Section 2.5.4, Graph Zooming, for more details on using this feature.

The Zoom In option and toolbar button are only enabled if a previous log session window is open.

## 5.5.5 Restore

The Restore option restores the graph to its default zoom state.

The ⊖ button on the toolbar corresponds to the Restore option. Please refer to Section 2.5.4, Graph Zooming, for more details on using this feature.

The Restore option and toolbar button are only enabled if a previous log session window is open.

### 5.5.6    Print graph

The Print Graph option prints the current graph on the selected printer.

The graph can also be printed by selecting the Print | Graph option in the File menu.

## 5.6    Tools menu

The Tools menu provides options for synchronizing the thermometer readout's clock, viewing and/or modifying logging labels, viewing and/or modifying thermometer readout settings and configuring Log*Ware*'s options.
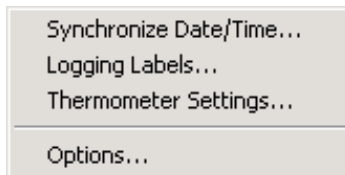


**Figure 122**   *Tools Menu*

### 5.6.1    Synchronize date/time

The Synchronize Date/Time option provides a utility to synchronize the thermometer readout's clock to the computer's clock.

The [clock icon] button on the toolbar corresponds to the Synchronize Date/Time option. Please refer to Section 4.1.1, Synchronize Date/Time, for a description of this feature.

The Synchronize Date/Time option and toolbar button are disabled while a real-time log session is running.

### 5.6.2    Logging labels

The Logging Labels option provides a utility to view and/or modify logging labels.

The **AB** button on the toolbar corresponds to the Logging Labels option. Please refer to Section 4.3, Logging Labels Dialogs, for a description of this feature.

The Logging Labels option and toolbar button are disabled while a real-time log session is running.

### 5.6.3    Thermometer settings

The Thermometer Settings option provides a utility to access the thermometer readout settings dialogs.

The ⬛ button on the toolbar corresponds to the Thermometer Settings option. Please refer to Section 4.4, Thermometer Settings Dialogs, for a description of these dialogs.

The Thermometer Settings option and toolbar button are disabled while a real-time log session is running.

### 5.6.4    Options

The Options option displays the Log*Ware* Options dialog to view and/or modify Log*Ware*'s default settings.
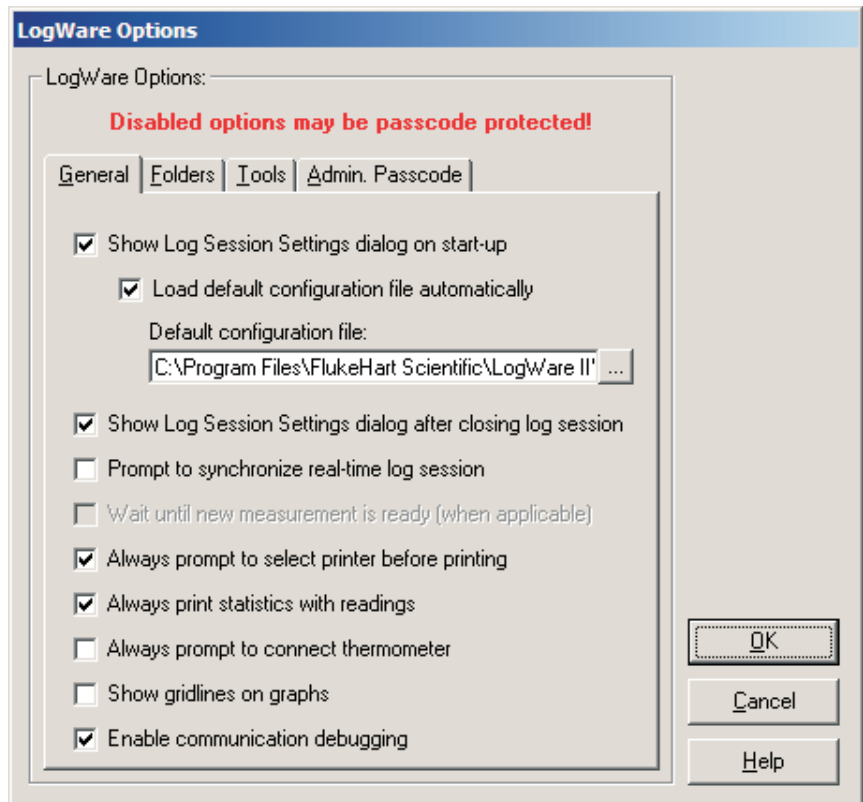


**Figure 123**   *LogWare Options Dialog*

The Options option is disabled while a real-time log session is running.

The following sections describe in detail each of the Log*Ware* Options settings.

After modifying any of the settings on this dialog, click the OK button to save the new settings and close the dialog.

To close this dialog without saving new settings, click the Cancel button.

Click the Help button to open the appropriate help topic for this dialog.

**5.6.4.1    General tab**

The General tab displays options pertaining to the behavior of the Log*Ware* software in general.
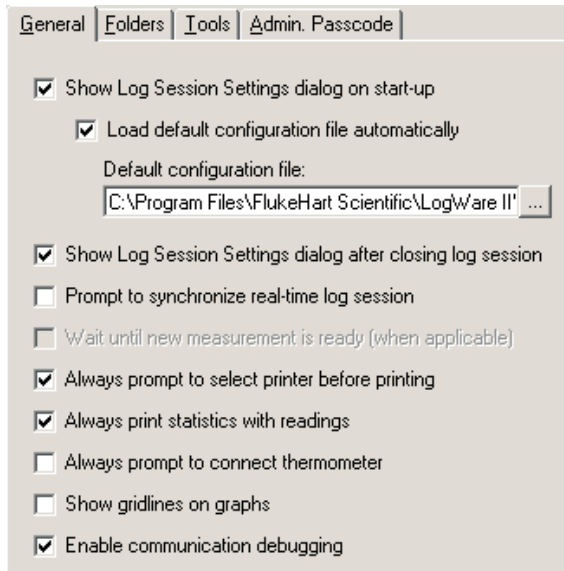


**Figure 124**   *LogWare Options - General tab*

The Show Log Session Settings dialog on start-up option causes Log*Ware* to automatically display the Log Session Settings dialog every time Log*Ware* starts up. If checked, the Log Session Settings dialog is displayed immediately after Log*Ware* starts up. If not checked, Log*Ware* does not display the Log Session Settings dialog on start-up and the other options on this tab are disabled.

The Load default configuration file automatically option allows Log*Ware* to automatically load the specified configuration file every time Log*Ware* starts up. This option is useful if the same hardware configuration is used repeatedly to perform real-time log sessions. When this option is checked, the configuration file to load must be specified.

The Default configuration file box indicates the configuration file that will be loaded automatically every time Log*Ware* starts up. The configuration file will

only be loaded if the Show Log Session Settings dialog on start-up and Load default configuration file automatically options are both checked. Use the "…" (Browse) button to locate the configuration file to be used as the default configuration file.

The Show Log Session Settings dialog after closing log session option determines whether the Log Session Settings dialog is displayed after the real-time log session window is closed. All real-time log session settings are still active in Log*Ware* after a log session is closed. To access the Log Session Settings dialog, select the Setup option in the Datalog menu. If this option is not checked, this dialog is not displayed when the log session window is closed.

The Prompt to synchronize real-time log session option determines whether or not a prompt is displayed when the real-time log session is initialized and ready to start acquiring data. This prompt can be used to facilitate synchronizing Log*Ware* with another process or application. If this option is not checked, Log*Ware* begins acquiring data immediately after initialization of the session is complete.

⚠️ *Note: When using the delayed start feature of LogWare to start a log session unattended, make sure this setting is not checked! Otherwise, the log session may not start as expected!*

The Wait until new measurement is ready (when applicable) option determines whether Log*Ware* should always wait until the thermometer readout indicates a new measurement is ready on the current channel before querying the measurement during a real-time log session. If this option is not checked, Log*Ware* always queries the last measurement taken on the current channel.

Not all thermometers supported by Log*Ware* support waiting until a new measurement is ready. For these thermometer readouts, Log*Ware* always queries the last measurement taken on the current channel.

⚠️ *Note: This option is protected by the administrator passcode. To change this setting, the correct administrator passcode must be entered. For more information, see Section 5.6.4.4, Admin. Passcode Tab.*

The Always prompt to select printer before printing option determines whether the Print Setup dialog is displayed when printing. The Print Setup dialog allows the printer to be selected as well as the paper size, source and orientation settings (as supported by the selected printer driver). If this option is not checked, Log*Ware* always prints to the default printer using that printer's default settings.

The Always print statistics with readings option determines whether Log*Ware* appends statistical data to the end of the readings when printing an output file. If this option is checked, the statistical data is printed.

⚠️ ***Note:*** *LogWare allows the readings history to be printed with or without statistics while a real-time log session is running. However, when printing the readings history during a real-time log session, be aware that the statistical values may not exactly match the printed readings, since the statistics may get updated after the readings have already been printed. For best results, only print the readings AFTER the real-time log session has stopped.*

The Always prompt to connect thermometer option determines whether Log*Ware* displays a prompt before attempting to communicate with the thermometer readout. These prompts are intended to be a reminder to the user to connect the thermometer readout so that the software can communicate with it. If the thermometer readout is frequently disconnected from the computer, this option may be left checked. If the thermometer readout is always connected to the computer, these prompts may become bothersome. In this case, uncheck this option so that the prompts are not displayed.

The Show gridlines on graphs option determines whether gridlines are enabled on the real-time log session and previous log session graphs by default. The gridlines can be enabled or disabled for a specific graph at any time using the Grids controls on the Axis tab of the Graph Settings dialog. Please refer to Section 5.5.1.2, Axis Tab, for more details.

The Enable communication debugging option is used to enable debugging features in Log*Ware.* This option should remain unchecked unless otherwise directed by a Customer Service representative.

**5.6.4.2**          **Folders tab**

The Folders tab displays options pertaining to the default folders to which Log*Ware* saves various types of files.
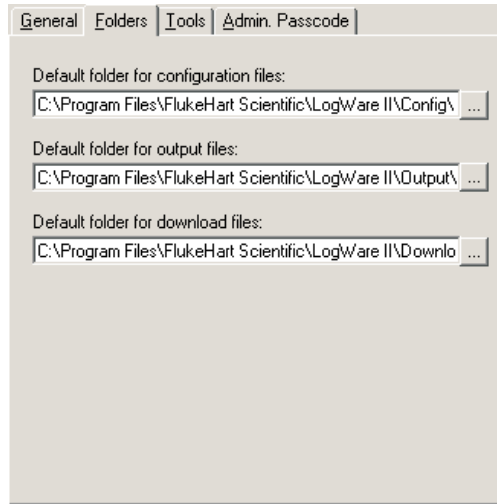


**Figure 125**  *LogWare Options - Folders tab*

The Default folder for configuration files option allows the default folder to which configuration files are saved to be specified. Log*Ware* allows many types of configuration files to be saved including real-time log session (**.rls**), alarm (**.alm**) and conversion types (**.i90, .i68, .cvd, .ply, .hpt, .w90, .thr, .tcp, .tct, .tcx**). Use the "…" (Browse) button to select an existing path.

The Default folder for output files option allows the default folder to which output files are saved to be specified. Output files are the files created by a real-time log session and typically have the extension **.txt**. Use the "…" (Browse) button to select an existing path.

The Default folder for download files option allows the default folder to which download files are saved to be specified. Download files are the files created when data is downloaded from the memory or log(s) of a thermometer readout and typically have the extension **.txt**. Use the "…" (Browse) button to select an existing path.

### 5.6.4.3    Tools tab

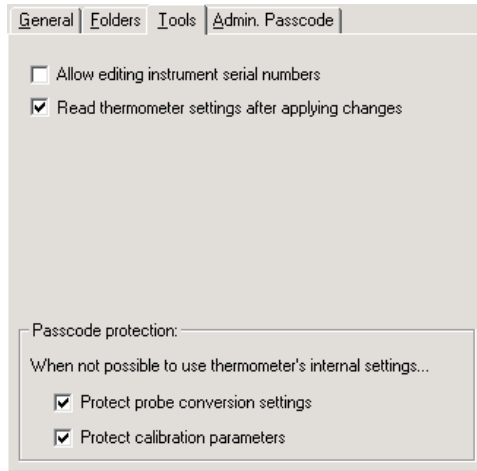The Tools tab displays options pertaining to the Tools menu options.



**Figure 126**  *LogWare Options - Tools tab*

The Allow editing instrument serial numbers option determines whether Log*Ware* will allow the serial number of the thermometer readouts to be changed using the Thermometer Settings option in the Tools menu. If this option is checked, the Serial number boxes on the thermometer settings dialogs are enabled (where applicable) and the serial number of the thermometer readout can be changed.

*Note: Many Hart Scientific thermometer readouts save the thermometer readout's serial number in its memory. However, many thermometer readouts still have their serial number set to 0. This option can be used to allow the thermometer readout's serial number to be set. Once the serial number is set, this option should always be left off to prevent the serial number from being changed to an incorrect setting.*

*Note: This option is protected by the administrator passcode. To change this setting, the correct administrator passcode must be entered. For more information, see Section 5.6.4.4, Admin. Passcode Tab.*

The Read thermometer settings after applying changes option determines whether Log*Ware* will query the thermometer readout for current settings after new settings have been applied. This option is used on the thermometer settings dialogs which are accessible from the Thermometer Settings option.

The Protect probe conversion settings option determines whether probe conversion settings (including coefficients) should be passcode protected if Log*Ware* is unable to determine the protection settings of the thermometer readout or if the thermometer readout does not support passcode protection. The thermometer readout's protection settings are always used where possible.

⚠️ *Note: This option is protected by the administrator passcode. To change this setting, the correct administrator passcode must be entered. For more information, see Section 5.6.4.4, Admin. Passcode Tab.*

The Protect thermometer calibration parameters option determines whether thermometer readout calibration parameters should be passcode protected if Log*Ware* is unable to determine the protection settings of the thermometer readout or if the thermometer readout does not support passcode protection. The thermometer readout's protection settings are always used where possible.

⚠️ *Note: This option is protected by the administrator passcode. To change this setting, the correct administrator passcode must be entered. For more information, see Section 5.6.4.4, Admin. Passcode Tab.*

### 5.6.4.4    Admin. Passcode tab

The Admin. Passcode tab allows options pertaining to the administrator passcode to be selected.
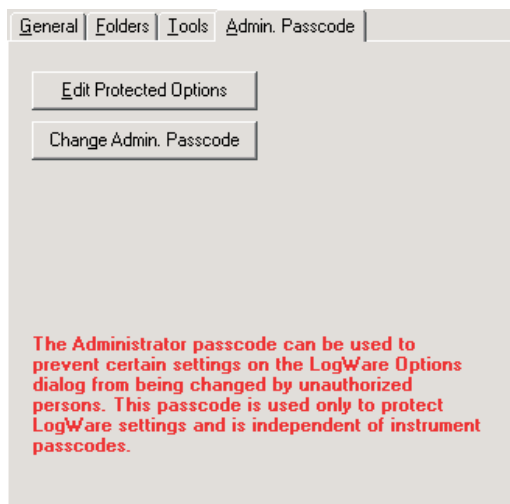


**Figure 127**   *LogWare Options - Admin. Passcode tab*

The Edit Protected Options button allows the user to change the settings of the passcode protected options. This button is disabled if an administrator passcode

has not been setup or if the correct passcode has been entered since the Log*Ware* Options dialog was displayed.

Clicking the Edit Protected Options button displays the Enter Passcode dialog. The current administrator passcode must be entered to enable changing the protected options.
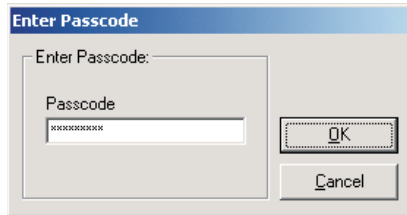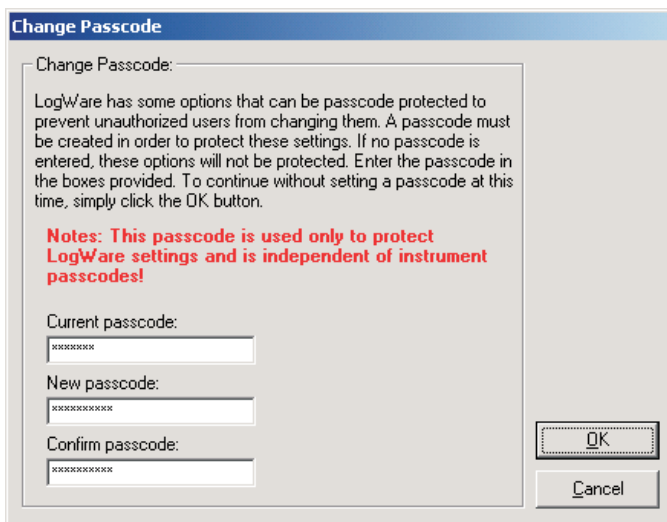


**Figure 128**  *Enter Passcode dialog*

Enter the current administrator passcode and click the OK button to continue. If the passcode entered does not match the current administrator passcode, a message is displayed and access is denied. Otherwise, if the correct passcode is entered, the Edit Protected Options button becomes disabled and all passcode protected options on the Log*Ware* Options dialog become enabled. These options remain enabled until the Log*Ware* Options dialog is closed or until the user attempts to change the administrator passcode.

The Change Admin. Passcode button allows the administrator passcode to be setup or changed.



**Figure 129**  *Change Passcode dialog*

⚠️ *Note: The administrator passcode in LogWare is completely independent of the thermometer readout passcodes. The administrator passcode is used by LogWare to protect certain LogWare options and default settings on the LogWare Options dialog only! Thermometer readout passcodes are specific to the thermometer readout being used and are required to change certain settings in the thermometer readout itself.*

If an administrator passcode has already been setup, the current passcode is required to gain access to the Change Passcode dialog and clicking the Change Admin. Passcode button displays the Enter Passcode dialog first. The current administrator passcode must be entered to enable changing the administrator passcode. Enter the current administrator passcode and click the OK button to continue. If the passcode entered does not match the current administrator passcode, a message is displayed and access is denied. Otherwise, if the correct passcode is entered, the Change Passcode dialog is displayed.

To change the current administrator passcode, enter the new passcode in the New passcode box. Then confirm the new passcode by entering the passcode again in the Confirm passcode box. Click the OK button to save the new passcode. To disable passcode protection, simply leave the New passcode and Confirm passcode boxes blank and click the OK button. To cancel changing the current passcode, click the Cancel button.

## 5.7    Window menu

The Window menu provides options for arranging the open log session windows and for switching between open log session windows.
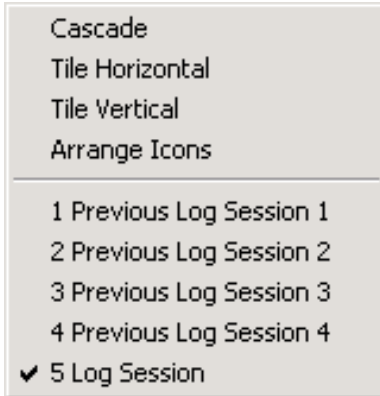


**Figure 130**   *Window menu*

### 5.7.1    Cascade

The Cascade option cascades all open windows.

### 5.7.2    Tile horizontal

The Tile Horizontal option tiles all open windows horizontally.

### 5.7.3    Tile vertical

The Tile Vertical option tiles all open windows vertically.

### 5.7.4    Arrange icons

The Arrange Icons option arranges the icons for all minimized windows along the bottom of Log*Ware*'s main display.

### 5.7.5    Window list

This is a list of all currently open windows. To switch to a window, click on the appropriate item in the window list. A check mark appears next to the currently selected window.

## 5.8      Help menu

The Help menu provides options for opening the Log*Ware*'s online help and for displaying information about Log*Ware*.
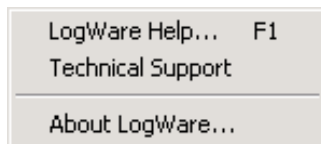


**Figure 131**   *Help menu*

### 5.8.1      Log*Ware* help

The Log*Ware* Help option opens the Log*Ware* help file.

### 5.8.2      Technical support

The Technical Support option opens the Log*Ware* help file to the Technical Support topic. For technical support information, please refer to Section 10.1, Technical Support.

### 5.8.3      About Log*Ware*

The About Log*Ware* option displays the About Log*Ware* dialog.
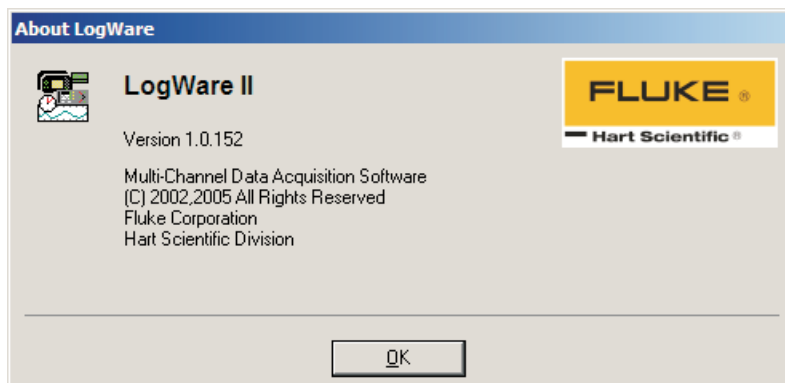


**Figure 132**   *About LogWare dialog*

The About Log*Ware* dialog displays specific information about the currently installed version of Log*Ware*. The software's name, version, build, and copyright information are displayed.

# 6      How to

The following sections describe in detail how to perform certain tasks using Log*Ware*.

## 6.1      Setting up and starting a real-time log session

The main purpose of Log*Ware* is to perform real-time data acquisition. In order to do this, Log*Ware* must be configured to acquire data on the channels of the thermometer readout to be used. Log*Ware* needs to know what data to acquire, when to acquire it and when to stop.

**To configure a real-time log session:**

1.   Select the New option in the File menu.

2.   This will clear any current log session settings and display the Log Session Settings dialog.

3.   Configure the Thermometer, Log Session and Channels settings according to the needs of this session.

4.   Once configured, either click the Start button on the Log Session Settings dialog or click the Close button, then select the Start option in the

     Datalog menu or click the ▶ button on the toolbar. This will start the real-time log session and the Log Session window is displayed.

5.   If a delayed start time was selected, the real-time log session will begin at the selected time. Otherwise, the log session will start immediately.

Please refer to Section 2, Real-Time Logging, for more information.

## 6.2      Starting a real-time log session unattended (delayed start)

The main purpose of Log*Ware* is to perform real-time data acquisition. Many times, the technician is present when a log session starts. However, sometimes it is necessary or desirable to start a real-time log session at off hours when the technician is out.

By default, a real-time log session starts immediately when the Start button on the Log Session Settings dialog is clicked or when the Start option in the Datalog menu is selected. However, Log*Ware* has a feature called the Delayed Start which allows a real-time log session to start at a predefined date and time.

**To set the delayed start date and time:**

1.   Select the Setup option in the Datalog menu.

2.   The Log Session Settings dialog is displayed.

3. Select the Log Session tab.

4. Click the Delayed Start button.

5. The Delayed Start Date/Time dialog is displayed.

6. Choose the date and time that the real-time log session should start. Since the computer's clock will be used to determine when the log session starts, make sure the computer's clock is accurate. Click the OK button to accept the selected date and time.

⚠️ *Note: To cause the real-time log session to start immediately when clicking the Start button after having set a delayed start date and time, click the Reset button.*

7. Click the Start button on the Log Session Settings dialog to start the log session.

8. Log*Ware* displays a message indicating the date and time the real-time log session will start.

9. To cancel the delayed start, click the Cancel button at any time.

After a real-time log session ends, the delayed start time is reset so that the next real-time log session will start immediately when the Start button on the Log Session Settings dialog is clicked or when the Start option in the Datalog menu is selected. To set a new delayed start time for the next real-time log session, follow the steps above.

⚠️ *Note: Every effort has been made to make the real-time log session take its first reading at the selected date and time. However, LogWare may or may not be able to do so depending on the processor speed of the computer, amount of available memory, free hard disk space, other running applications, etc.*

Please refer to Section 2, Real-Time Logging, for more information.

## 6.3    Stopping a real-time log session automatically

The main purpose of Log*Ware* is to perform real-time data acquisition. Many times, the technician is present when a log session needs to be stopped. However, sometimes it is necessary or desirable to stop a real-time log session when the technician is busy with another task, or at off hours when the technician is out.

The End Log feature of Log*Ware* provides three methods for stopping a real-time log session:

- By user
- After specified number of readings

- After specified time elapses

The first method, By user, is the default setting.

**To stop the real-time log session automatically:**

1. Select the Setup option in the Datalog menu

2. The Log Session Settings dialog is displayed.

3. Select the Log Session tab.

4. Select the method to use to stop the real-time log session using the End log drop-down list:
   - By user – Log session stops when the Stop option in the Datalog menu is selected.
   - After specified number of readings – Log session stops automatically when number of readings specified have been acquired on each channel.
   - After specified time elapses – Log session stops automatically after the specified time has elapsed.

5. Specify the End Log criteria:
   - If the After specified number of readings option was selected, enter the number of readings to be acquired on each channel in the After box.
   - If the After specified time elapses option was selected, enter the amount of time to elapse in the After box.

6. Click the Start button on the Log Session Settings dialog to start the log session.

7. When the selected end log criteria are met, logging will stop automatically.

Please refer to Section 2, Real-Time Logging, for more information.

## 6.4 Opening a configuration file automatically on start-up

Log*Ware* is designed to be flexible in the thermometer readouts that it can use and the features it supports. However, most users of Log*Ware* will probably always use the same thermometer readout, scale and communication settings to do all or most of their data acquisition.

For this reason, Log*Ware* allows the real-time log session settings to be saved to a configuration file. Opening the configuration file restores the settings, therefore eliminating the need to manually configure Log*Ware* every time a new log session is started.

Configuration files save the following information about a real-time log session:

- Thermometer readout model, serial number, session temperature scale and resolution settings
- Communications COM port and baud rate settings
- Interval between readings and interval between scan sequences
- Start log session and End log session settings
- Channel configurations including statistical and alarm settings

In addition to allowing configuration files to be saved and opened, Log*Ware* optionally allows one configuration file to be opened automatically every time Log*Ware* runs. This configuration file can be specified in one of two ways: using the Log*Ware* Options dialog or using the Log Session Settings dialog.

**To specify the default configuration file using the Log*Ware* Options dialog:**

1.  Select the Options option in the Tools menu.

2.  The Log*Ware* Options dialog is displayed.

3.  Select the General tab.

4.  Check the Show Log Session Settings dialog on start-up check box.

5.  Check the Open default configuration file automatically check box.

6.  Click the "…" (Browse) button to select the configuration file to open or type the path and filename in the Default configuration file box.

7.  Click the OK button to save the changes.

*Note: The real-time log session settings must already be saved to a configuration file in order to accomplish these steps.*

**To specify the default configuration file using the Log Session Settings dialog:**

1.  Select the Setup option in the Datalog menu.

2.  The Log Session Settings dialog is displayed.

3.  Fill in all of the information on this dialog.

4.  Click the Set as Default button. A prompt is displayed indicating that the current settings must be saved to a configuration file. Click the Yes button to save the current settings to a configuration file.

5.  The Windows® Save As dialog is displayed to save the current settings to a configuration file. Enter the filename for this configuration file and click the OK button to save the settings to the file.

6.  A prompt is then displayed indicating that this configuration file will be made the default configuration file. Click the Yes button to set this configuration file as the default. A message is displayed indicating the current configuration is now set as the default.

7.  Click the Close button to close the Log Session Settings dialog.

Test this feature to make sure it works properly by closing Log*Ware* and running it again. The thermometer readout must be connected and powered on when opening a configuration file so that Log*Ware* can verify that the information in the configuration file matches the thermometer readout configuration. The Log Session Settings dialog should be displayed with all of the configuration information filled in.

To disable opening the configuration file on start-up, uncheck the Open default configuration file automatically check box on the Log*Ware* Options dialog.

Please refer to Section 5.6.4, Options, for more information.

## 6.5 Changing thermometer and probe settings

Log*Ware* provides a feature which allows many of the thermometer readout and probe settings to be read in, viewed, modified and written back out to the thermometer readout. These settings vary from thermometer readout to thermometer readout but include:

-   Filtering (averaging)
-   Resolution
-   Calibration and recalibration dates
-   Calibration constants
-   Probe serial number
-   Probe wires and excitation current
-   Probe calibration and recalibration dates
-   Probe conversion type and calibration coefficients

⚠️ *Note: In order to use this feature of LogWare, the thermometer readout must have a recent firmware version. If your thermometer readout does not have a recent firmware version, it may be upgraded. For more details, contact Hart Scientific Technical Support. Please refer to Section 1.4.4, Firmware Requirements, for more details.*

**To view, modify and write thermometer and probe settings:**

1.  Select the Thermometer Settings option in the Tools menu.

2.  The Select Model dialog is displayed. Select the thermometer readout model. Also, select the COM port to which the thermometer readout is connected and the baud rate to use. Make sure Log*Ware* can communi-

cate with the thermometer readout by clicking the Test Communication button. Click the OK button when communication is successful.

3. The thermometer readout settings are then read in and displayed in the thermometer settings dialog. The thermometer settings dialog is specific to the selected thermometer readout.

4. If applicable, to view the settings for a specific module, select the module from the Modules list and click the Module Settings button.

5. To view the settings for a specific channel, select the channel from the Channels list and click the Channel Settings button.

6. The settings can be modified at this time. Some settings may be passcode protected. Passcode protected settings can be viewed, but can only be modified after entering the correct passcode.

    a. Click the Edit button.

    b. The Enter Passcode dialog is displayed. Enter the passcode for the connected thermometer readout and click the OK button.

    c. If the correct passcode was entered, the passcode protected settings are enabled and may be modified.

7. To write the changes that have been made to the thermometer readout, click the OK button on any and/or all dialogs.

8. To close the dialogs without writing the new settings to the thermometer readout, click the Cancel button on any of the dialogs.

*Note: The passcode for the thermometer readout is completely independent of the administrator passcode in LogWare. The administrator passcode is used by LogWare to protect certain LogWare options and default settings on the LogWare Options dialog only! Thermometer passcodes are specific to the thermometer readout being used and are required to change certain settings in the thermometer readout itself. Please refer to Section 4.4, Thermometer Settings Dialogs, for more information.*

## 6.6    Importing logged data into a spreadsheet

The data logged by Log*Ware* is saved into ASCII text files referred to as output files. These files can be opened and graphed by Log*Ware* by selecting the Open Previously Logged Data File option in the View menu.

However, these files may also be imported into spreadsheet software such as Microsoft® Excel for graphing or analysis.

**To import an output file into Excel:**

⚠️ *Note: This example uses Microsoft® Excel XP. These steps may or may not apply if using a different version of Excel or another spreadsheet software package.*

1.  In Excel, select the Open option in the File menu to display the Open dialog.

2.  In the Files of type box at the bottom of the open dialog, select the Text Files (\*.prn;\*.txt;\*.csv) option.

3.  Navigate to the folder where the output file is located. Select the output file to open and click the Open button.

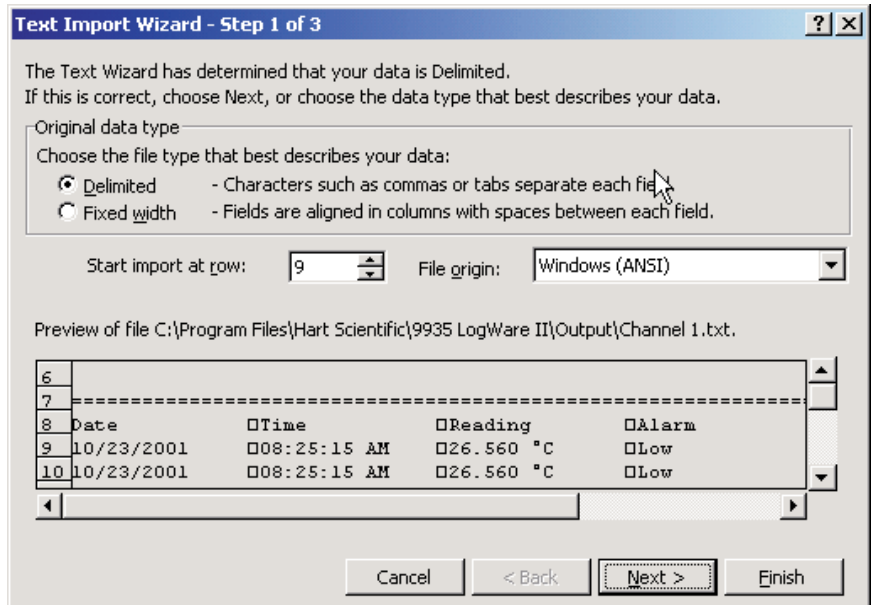4.  The Text Import Wizard – Step 1 of 3 dialog appears.



**Figure 133** *Excel XP Text Import Wizard – Step 1 of 3*

5.  Make sure the Original data type option is set to Delimited. If the thermometer and probe information is not needed, set the Start import at row option to the first row containing the logged readings (row 9 in this example). Set the File Origin option to Windows (ANSI) and click the Next button.

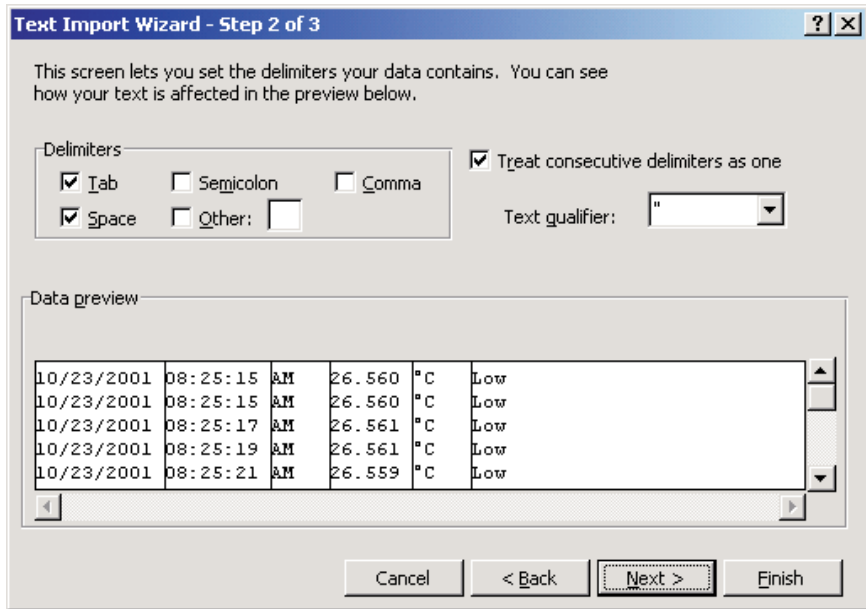6.    The Text Import Wizard – Step 2 of 3 dialog appears.



**Figure 135**   *Excel XP Text Import Wizard – Step 2 of 3*

7.    In the Delimiters box, select the Tab and Space options. Make sure the Treat consecutive delimiters as one check box is checked and click the Finish button.

8.    The output file is displayed in the spreadsheet. Resize the columns so the contents of each cell are visible.

9.    Select the Date, Time, and Reading columns by clicking on the gray column headers while holding down the control key labeled A, B and D, as shown below:



**Figure 134**   *Excel XP data*

10. In the Insert menu of Excel, select the Chart option. The Chart Wizard –
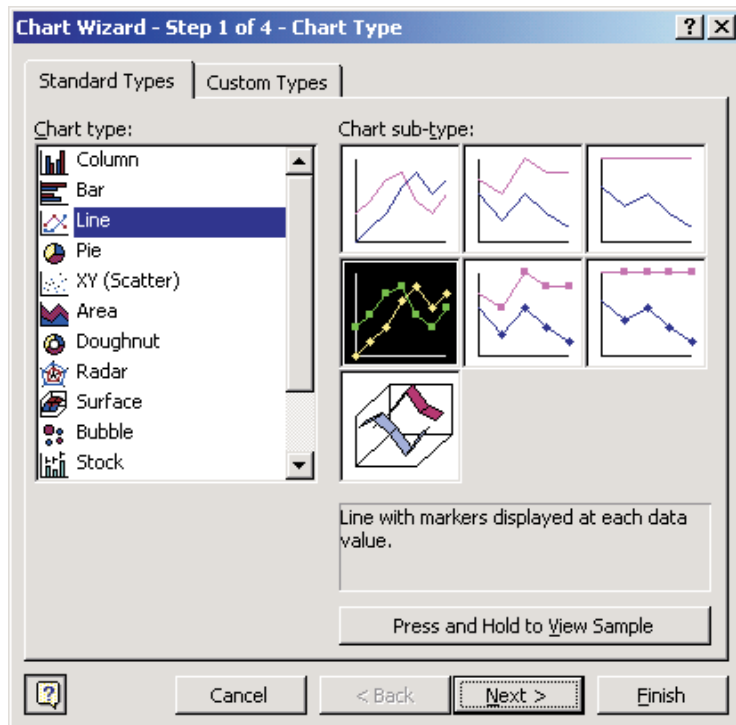    Step 1 of 4 – Chart Type dialog is displayed.



**Figure 136** *Excel XP Chart Wizard – Step 1 of 4 – Chart Type*

11. In the Chart type list, select Line and click the Finish button.
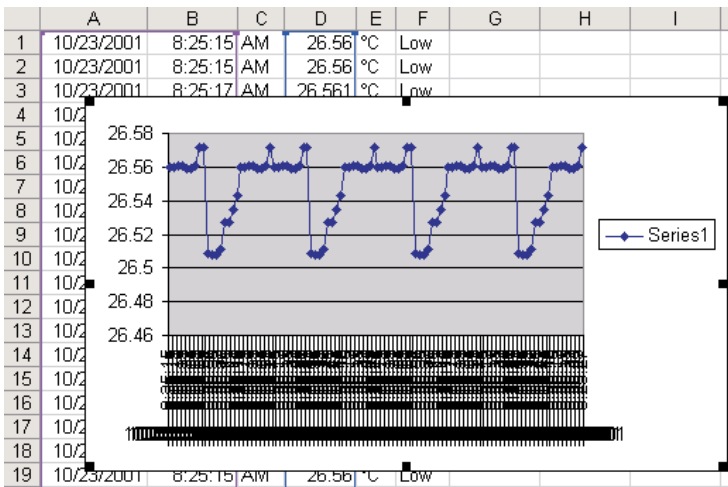
12. The graph should be displayed as shown below:

13. Format and size the graph as desired.

## 6.7 Synchronizing the thermometer readout's clock to the computer

The thermometer readouts supported by Log*Ware* have an internal clock. Log*Ware* provides a utility to synchronize the thermometer readout's clock with the clock on the computer.

⚠️ *Note: LogWare itself does not use the clock on the thermometer readout at all. All dates and times associated with readings acquired by LogWare use the computer's clock.*

Before synchronizing the thermometer readout's clock, make sure the computer's clock is accurate. Use the Windows® Control Panel to adjust the date and time as necessary.

**To synchronize the thermometer readout's clock with the computer's clock:**

1. Select the Synchronize Date/Time option in the Tools menu or click the

   🕐 button on the toolbar.

2.  The Select Model dialog is displayed. Select the thermometer readout model. Also, select the COM port to which the thermometer readout is connected and the baud rate to use. Make sure Log*Ware* can communicate with the thermometer readout by clicking the Test Communication button. Click the OK button when communication is successful.

3.  Log*Ware* attempts to set the thermometer readout's clock to match the clock on the computer.

Please refer to Section 4.1.1, Synchronize Date/Time, for more information.

## 6.8 Protecting calibration parameters and probe conversion settings

Some of the thermometer readouts supported by Log*Ware* have built-in passcode protection for calibration parameters and/or probe conversion settings (including probe characterization coefficients). These settings are typically protected because altering their values changes the calibration and/or readout accuracy of the thermometer readout. Some thermometer readouts, however, lack this protection.

Log*Ware* includes a feature that allows these settings to be passcode protected (for thermometer readouts that do not inherently include this protection) using an administrator passcode to prevent unauthorized users from changing the current values.

**To protect calibration parameters and probe conversion settings:**

1.  Select the Options option in the Tools menu.

2.  The Log*Ware* Options dialog is displayed.

3.  Select the Tools tab. The Tools tab contains options that pertain to the thermometer settings dialogs.

4.  In the Passcode Protection section there are two options:

    - Protect probe conversion settings
    - Protect calibration parameters

*Note: If these settings are disabled, an administrator passcode has been setup. The administrator passcode is required to change these settings. For more information on gaining access to the options protected by the administrator passcode, see Section 6.9, Setting up an administrator passcode.*

*Note: The administrator passcode in LogWare is completely independent of the thermometer readout passcodes. The administrator passcode is used by LogWare to protect certain LogWare options and default settings on the LogWare Options dialog only! Thermometer readout passcodes are specific to the thermometer readout being used and are required to change certain settings in the thermometer readout itself.*

5.  To passcode protect probe conversion settings, check the Protect probe conversion settings box.

6.  To passcode protect thermometer readout calibration parameters, check the Protect calibration parameters check box.

*Note: These options only apply to thermometer readouts that do not have built-in passcode protection for these features. For thermometer readouts that do have built-in passcode protection, the thermometer readouts settings override these settings.*

Please refer to Section 5.6.4, Options, for more information.

## 6.9　Setting up an administrator passcode

Log*Ware* allows the user to setup an administrator passcode to protect some of the features and options of the Log*Ware* software. Some of these features include:

- Ability to set thermometer readout and/or module serial numbers
- Ability to specify passcode protection settings
- Real-time measurement process settings

The administrator passcode can be setup or changed at any time by following the process below.

*Note: The administrator passcode in LogWare is completely independent of the thermometer readout passcodes. The administrator passcode is used by LogWare to protect certain LogWare options and default settings on the LogWare Options dialog only! Thermometer readout passcodes are specific to the thermometer readout being used and are required to change certain settings in the thermometer readout itself.*

**To setup or change the administrator passcode:**

1.  Select the Options option in the Tools menu.

2.  The Log*Ware* Options dialog is displayed.

3.  Select the Admin. Passcode tab.

4.  Click the Change Admin. Passcode button to setup or change the administrator passcode.

5.  If a passcode has already been setup, the current passcode is required and must be entered. The Enter Passcode dialog is displayed. Enter the current administrator passcode in the Passcode box and click OK to continue.

6.  The Change Passcode dialog is displayed. Enter the new administrator passcode in the New passcode box. Enter the passcode again in the Confirm passcode box. Click the OK button to accept the new passcode or click Cancel to abort setting the new passcode.

⚠️ *Note: DO NOT FORGET THE ADMINISTRATOR PASSCODE! Write it down and keep it in a safe place. Only reveal the passcode to users who are authorized to change the protected settings!*

Once an administrator passcode has been configured, certain features and settings are disabled and can only be changed after the administrator passcode has been entered.

**To gain access to passcode protected settings:**

1.  Select the Options option in the Tools menu.

2.  The Log*Ware* Options dialog is displayed.

3.  Select the Admin. Passcode tab.

4.  Click the Edit Protected Options button to enter the administrator passcode.

5.  The Enter Passcode dialog is displayed. Enter the current administrator passcode in the Passcode box and click the OK button to continue.

6.  If the entered passcode is correct, the features and settings on the Log*Ware* Options dialog are enabled and may be changed. These settings are only enabled until this dialog is closed.

The administrator passcode can also be removed from Log*Ware*, which permits anyone to change any of Log*Ware*'s options.

**To remove the administrator passcode:**

1.  Select the Options option in the Tools menu.

2.  The Log*Ware* Options dialog is displayed.

3.  Select the Admin. Passcode tab.

4.  Click the Change Admin. Passcode button to setup or change the administrator passcode.

5. The Enter Passcode dialog is displayed. Enter the current administrator passcode in the Passcode box and click the OK button to continue.

6. The Change Passcode dialog is displayed. Leave the New passcode box Confirm passcode boxes empty. Click the OK button. A message is displayed warning that passcode protection is about to be disabled. Confirm disabling passcode protection by clicking the Yes button.

Please refer to Section 5.6.4, Options, for more information.

## 6.10 Viewing remaining memory for logging data

Some thermometer readouts that are supported by Log*Ware* allow readings to be logged to the memory of the thermometer readout. Log*Ware* provides a feature that indicates how much of the thermometer readout's memory is already used.

**To view the status of the thermometer readout's log(s):**

1. Select the Log Status option in the Download menu.

2. The Select Model dialog is displayed. Select the thermometer readout model. Also, select the COM port to which the thermometer readout is connected and the baud rate to use. Make sure Log*Ware* can communicate with the thermometer readout by clicking the Test Communication button. Click the OK button when communication is successful.

3. The Log Status dialog for the selected thermometer readout is displayed indicating how much of the thermometer readout's memory is already used. This dialog is specific to the selected thermometer readout.

4. Click the Close button to close the Log Status dialog when finished.

Refer to Section 3.4, Log Status Dialogs, for more information.

## 6.11 Downloading logged data from the memory of a thermometer readout

The thermometer readouts that are supported by Log*Ware* allow readings to be logged to the memory of the thermometer readout. Log*Ware* provides a feature to download the logged readings from the memory of the thermometer readout and save them to a text file (or files) on the computer.

**To download readings from the memory of a thermometer readout to a text file:**

1. Select the Download Logged Data option in the Download menu.

2. The Select Model dialog is displayed. Select the thermometer readout model. Also, select the COM port to which the thermometer readout is connected and the baud rate to use. Make sure Log*Ware* can communi-

cate with the thermometer readout by clicking the Test Communication button. Click the OK button when communication is successful.

3.   The Download Options dialog is displayed. This dialog is specific to the selected thermometer readout.

4.   Select the appropriate download options and click the Download button to download the readings.

5.   Click the Close button to close the Download Options dialog when finished.

Please refer to Section 3, Downloading Logged Data, for more information.

## 6.12    Saving probe coefficients to a configuration file

Log*Ware* provides a feature that allows probe coefficients to be saved to a configuration file.

**To save probe coefficients to a configuration file:**

1.   Select the Thermometer Settings option in the Tools menu.

2.   The Select Model dialog is displayed. Select the thermometer readout model. Also, select the COM port where the thermometer readout is connected and the baud rate to use. Make sure Log*Ware* can communicate with the thermometer readout by clicking the Test Communication button. Click the OK button when communication is successful.

3.   The thermometer readout settings are then read in and displayed in the Thermometer Settings dialog. This dialog is specific to the selected thermometer readout.

4.   If applicable, to view the settings for a specific module, select the module from the Modules list and click the Module Settings button.

5.   To view the settings for a specific channel, select the channel from the Channels list and click the Channel Settings button.

6.   To view the coefficients for the probe on the selected channel, select the Conversion Settings button.

7.   The conversion settings dialog for the selected conversion type is displayed.

8.   Click the Save As button on the conversion settings dialog to save the coefficients for the selected channel to a configuration file.

9.   The Windows® Save As dialog is displayed. Enter a filename and click the OK button to save the coefficients.

Please refer to Section 9, Conversion Settings Dialogs, for more information.

## 6.13      Using an IR dongle with Log*Ware*

Some of the features of Log*Ware* allow an IR dongle to be used to communicate with thermometer readouts that have an IR port instead of using an RS-232 cable.

⚠️ *Note: Hart Scientific thermometer readouts with an IR port use a proprietary protocol for communication. Because of this proprietary protocol, LogWare is not able to use IR ports that are built into a computer. Instead, LogWare requires the use of an IR dongle which can be connected to a standard RS-232 port on the computer. No special software or drivers are required to use the IR dongle. All necessary communication protocols and drivers are built into the LogWare software. To purchase an IR dongle, contact Hart Scientific Technical Support.*
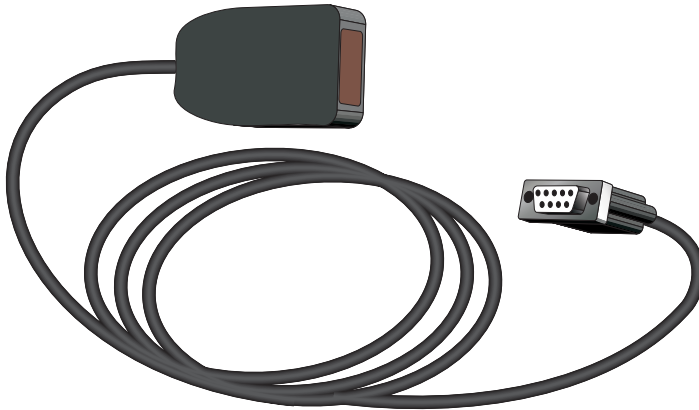


**Figure 138**   IR dongle

Log*Ware* provides support for communicating over an IR port with these thermometer readouts. However, the support is limited to the following features:

- Downloading logged data from the thermometer readout
- Checking the thermometer readout's log status
- Writing the thermometer readout's logging labels
- Synchronizing the thermometer readout's date and time to the computer's clock
- Accessing the thermometer readout's settings

Log*Ware* does not support using the IR port for performing real-time log sessions.

**To use an IR dongle with Log*Ware:***

1.  Locate a 9-pin or 25-pin COM (RS-232) port on the computer. Connect the IR dongle to the COM port. If the COM port has a 25-pin connector, use a 9-25 pin adapter to connect the IR dongle.

2.  Select the appropriate menu option for the feature of Log*Ware* to use.

3.  When selecting one of these menu options, the Select Model dialog appears.

4.  Select the model of the thermometer readout to use and the COM port to which the IR dongle is connected.

5.  If the selected feature and the selected thermometer readout model support using the IR dongle, the Use IR dongle check box is enabled. Check the Use IR dongle check box.

6.  Before continuing, make sure the thermometer readout's IR port and the IR dongle are in close proximity and the path between them is unobstructed. For more details on placement of the IR dongle, refer to the thermometer readout's User's Guide.

7.  Click the Test Communication button on the Select Model dialog. If Log*Ware* succeeds in communicating with the thermometer readout using the IR dongle, a success message is displayed. Otherwise, a failure message is displayed. In case of failure, check the following:

    ⬥ The dongle is connected to the selected COM port.

    ⬥ The thermometer readout is powered up and operating.

    ⬥ The dongle is within the required range of the thermometer readout's IR port.

    ⬥ The path between the thermometer readout's IR port and the IR dongle is not obstructed.

    ⬥ The thermometer readout's IR baud rate matches the baud rate setting on the Select Model dialog.

    ⬥ The thermometer readout's IR mode is set properly to send/receive commands (see thermometer readout User's Guide).

    ⬥ Shut the thermometer readout's power off, then back on again.

## 6.14    Changing logging label names

Some of the thermometer readouts supported by Log*Ware* have labels that can be assigned to data that is logged in the thermometer readout's memory. Log*Ware* provides a utility to view and/or change the names of these logging labels.

**To view and/or modify the thermometer readout's logging labels:**

1. Select the Logging Labels option in the Tools menu or click the

   **AB** button on the toolbar.

2. The Select Model dialog is displayed. Select the thermometer readout model. Also, select the COM port where the thermometer readout is connected and the baud rate to use. Make sure LogWare can communicate with the thermometer readout by clicking the Test Communication button. Click the OK button when communication is successful.

3. LogWare displays the Logging Labels dialog and attempts to read in the current logging label settings. This dialog is specific to the selected thermometer readout.

4. Modify the labels as desired on the Logging Labels dialog.

5. To write the new logging label settings to the thermometer readout, click the OK button.

Please refer to Section 4.3, Logging Labels Dialogs, for more information.

## 6.15    Unlocking a demo version of Log*Ware*

When Log*Ware* is purchased, a serial number is supplied on a sticker typically located on the CD pouch on the inside back cover of the Log*Ware* User's Guide. When Log*Ware* is installed, a dialog appears and asks for the serial number. If a valid serial number is entered, Log*Ware* is installed as a "full working" version. If an invalid serial number is entered, Log*Ware* is installed as a demo version.

The demo version of Log*Ware* never "expires". The demo version is identical to the "full working" version with the following exceptions:

- Performs real-time log session, but does not write acquired data to file(s).
- Downloads data from thermometer readout log(s), but does not write downloaded data to file(s).
- Allows thermometer readout settings to be viewed, but does not write new settings to thermometer readout.
- Allows logging labels to be viewed, but does not write new logging labels to thermometer readout.
- Some example data files are installed to provide examples of the files that demo version does not write to.

The demo version of Log*Ware* may be freely distributed and installed and is available for download on Hart Scientific's website for no charge.

The demo version may be "unlocked" at any time after obtaining a valid serial number from Hart Scientific Technical Support without having to reinstall the software.

**To "unlock" a demo version of Log*Ware*:**

⚠️ *Note: To successfully unlock a demo version of LogWare, you must be logged into Windows as an Administrator.*

1.  Select the Unlock option in the Help menu. The Unlock option only appears in the Help menu for the demo version of Log*Ware*. The Unlock Code dialog appears.
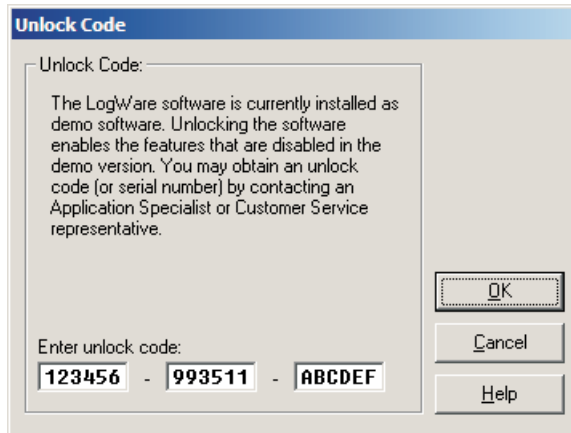
**Unlock Code**

Unlock Code:

The LogWare software is currently installed as demo software. Unlocking the software enables the features that are disabled in the demo version. You may obtain an unlock code (or serial number) by contacting an Application Specialist or Customer Service representative.

<u>O</u>K

<u>C</u>ancel

<u>H</u>elp

Enter unlock code:

123456 - 993511 - ABCDEF

*Figure 139   Unlock Code dialog*

2.  Enter the serial number provided in the Enter unlock code boxes at the bottom of the dialog. The serial number must have the format: XXXXXX - 9935XX - XXXXXX.

3.  Click the OK button to accept the unlock code. If the serial number entered is a valid serial number, a message is displayed indicating Log*Ware* has been unlocked. Log*Ware* MUST be closed and restarted at this point!

4.  If the serial number entered is invalid, Log*Ware* will NOT be unlocked.

5.  Click the Cancel button to close this dialog without unlocking the demo verison.

## 6.16    Setting up Log*Ware* to read multiple scales

Log*Ware* was designed primarily to acquire temperature readings from digital thermometer readouts. However, Log*Ware* is capable of acquiring temperature, resistance, and voltage readings simultaneously. This can be accomplished by configuring each channel on the thermometer readout to read in the desired units prior to starting a real-time log session.

**To configure a thermometer readout to read different units on each channel:**

1. Select the Setup option in the Datalog menu to display the Log Session Settings dialog.

2. Select the Thermometer tab.

3. Select the thermometer readout model using the Model drop-down list.

4. Select the COM port, and baud rate using the drop-down lists in the Communication settings section.

5. Click the Thermometer Settings button to display the Thermometer Settings dialog for the selected thermometer readout.

6. On the Thermometer Settings dialog, select the desired system units using the Units drop-down list. Click the Apply button to write the new system units setting to the thermometer readout.

*Note: If a non-temperature setting is selected for the system units (i.e. Ohms, Volts, Ratio, or W), this setting will override any conversion type setting for all channels that would otherwise cause reading to be displayed in temperature!! Therefore, it is recommended that the system units be set to a temperature setting (i.e. °C, °F, K, etc.) and the conversion type be used to configure channels that are to read non-temperature values.*

7. On the Thermometer Settings dialog, navigate to the first channel to configure.

   a. For thermometer readouts that support modules, select the Modules tab, select the module from the Modules list that the desired channel is on and click the Module Settings button. The Module Settings dialog is displayed. Continue with step b. below.

   b. Select the Channels tab, select the desired channel from the Channels list and click the Channel Settings button. The Channel Settings dialog is displayed.

8. To configure the selected channel to read temperature, set the Conversion type to the desired setting and enter the coefficients to use (as applicable) to convert the readings on that channel to temperature by clicking the Conversion Settings button.

9. To configure the selected channel to read resistance, voltage, ratio or W, set the Conversion type appropriately. Refer to the thermometer readout's User's Guide for more details on the conversion types supported by the thermometer readout.

10. Click the OK button on the Channel Settings dialog to write the new settings to the thermometer readout.

11. Repeat steps 3 to 6 for the other channels that need to be configured.

12. Click the OK button on the Thermometer Settings dialog when finished.

13. Note that the Serial number and Session temperature scale boxes are filled in automatically when returning to the Log Session Settings dialog.

14. Set the Session temperature scale to <keep existing> using the drop-down list.

15. Finish setting up the remainder of the settings on the Log Session Settings dialog for this log session.

16. When the log session starts, Log*Ware* will query the thermometer read-out to determine the system temperature units (Session temperature scale) and the conversion setting of each enabled channel. The system temperature units are then automatically applied to all channels that are configured to read temperature. All other channels use the appropriate scale depending on their conversion type setting.

Please refer to Section 2, Real-Time Logging, for more information.

# 7    Files

This section describes all of the files that Log*Ware* creates and/or uses. The first section describes Log*Ware*'s configuration files and the second section describes Log*Ware*'s data files.

## 7.1    Configuration files

Configuration files are intended to facilitate the configuration process. By default, all configuration files are saved to the \Config folder (or the folder that is specified for configuration files on the Log*Ware* Options dialog). Log*Ware* supports many types of configuration files:

- Real-Time Log Session configuration files
- Alarm configuration files
- Conversion configuration files

⚠ *Warning: Do not attempt to manually modify the contents of any configuration file! Files that have been modified may not be able to be read by LogWare!*

### 7.1.1    Log session configuration file

The log session configuration file is used to save the current real-time log session settings.

⚠ *Warning: Do not attempt to manually modify the contents of any configuration file! Files that have been modified may not be able to be read by LogWare!*

A log session configuration file contains ALL configuration information required to start a real-time log session. This information includes the thermometer information, communication settings, sample interval settings, start and end log session settings, channel, statistics and alarm settings.

Log session configuration files must always have an extension of **.rls** and can be saved and opened from any of the following locations:

- Open and Save As buttons on the Log Session Settings dialog
- Open and Save As options in the File menu
- Open and Save As buttons on the toolbar

⚠ *Note: Opening a log session configuration file overwrites ALL current log session settings!*

For more information on opening and saving real-time log session files, see Section 2, Real-Time Logging.

## 7.1.2    Alarm configuration file

The alarm configuration file is used to save the current alarm settings of a single channel.

⚠ *Warning: Do not attempt to manually modify the contents of any configuration file! Files that have been modified may not be able to be read by LogWare!*

An alarm configuration file contains configuration information for low and high alarms on a single channel. This information includes the alarm state (enabled or disabled), alarm values, events, and other options.

Alarm configuration files must always have an extension of **.alm** and can be saved and opened from the Alarm Settings dialog.

⚠ *Note: Opening an alarm configuration file overwrites the current alarm settings!*

## 7.1.3    Conversion configuration files

Conversion configuration files are useful for saving probe coefficients to a file. Conversion configuration files contain information concerning a single conversion type including coefficients and any other information specific to that conversion type.

Conversion configuration files have an extension that matches the type of conversion as described below:

| Conversion Type | File Extension |
| --- | --- |
| Callendar-Van Dusen | .cvd |
| High Temperature PRT | .hpt |
| IPTS-68 | .i68 |
| ITS-90 | .i90 |
| W(T90) | .w90 |
| Polynomial | .ply |
| Thermistor | .thr |
| Thermocouple Polynomial | .tcp |
| Thermocouple Table | .tct |
| Thermocouple Type | .tcx |

⚠️ *Note: Opening a configuration file overwrites the current conversion settings.*

Conversion configuration files can be opened and/or saved from the appropriate conversion settings dialog. For more information on conversion settings dialogs, please refer to Section 9, Conversion Settings Dialogs.

## 7.2 Data files

Data files are created by Log*Ware* either during a real-time log session or when data is downloaded from a thermometer readout. Log*Ware* creates the following types of data files:

- **Output files** – Created during real-time log session and contains acquired data for a single channel
- **Alarm Log file** – Created during real-time log session and contains information about alarms
- **Download files** – Created when data is downloaded from a thermometer readout

⚠️ *Warning: Do not attempt to manually modify the contents of any data file! Files that have been modified may not be able to be read by LogWare!*

### 7.2.1 Output file

Log*Ware* saves the readings acquired during a real-time log session to an output file. Output files also contain information about the thermometer readout, probe, and alarm settings that were configured for the log session.

During a real-time log session, the acquired readings are displayed in the Channels grid and graphed on the real-time graph. The output file can be viewed during a real-time log session by selecting the Readings History option in the View menu or by right-clicking on the Channels grid on the real-time Log Session window and selecting the View Readings History option in the popup menu.

After a real-time log session has been stopped and/or closed, the output file can be opened by selecting the Open Previously Logged Data File option in the View menu. All of the readings that were acquired are displayed in a spreadsheet-style grid and on the graph. Output files can also be opened in other analysis software packages such as spreadsheets and text editors.

The following is an example of an output file created by Log*Ware*:

```
Channel 1.txt

Thermometer Model: 1529 Thermometer Serial: A13053       Thermometer Channel: 1
Session temperature scale: °F

Channel name: Channel 1

Low Alarm: 79.0000
High Alarm: 80.0000
================================================================================
Date           Time              Reading        Alarm
3/1/2002        1:08:10 PM       76.4617 °F      Low
3/1/2002        1:08:14 PM       76.4690 °F      Low
3/1/2002        1:08:18 PM       76.4729 °F      Low
3/1/2002        1:08:22 PM       76.4802 °F      Low
3/1/2002        1:08:26 PM       76.4814 °F      Low
3/1/2002        1:08:30 PM       76.4751 °F      Low
3/1/2002        1:08:34 PM       76.4674 °F      Low
3/1/2002        1:08:38 PM       76.4710 °F      Low
3/1/2002        1:08:42 PM       76.4672 °F      Low
3/1/2002        1:08:47 PM       76.4695 °F      Low
3/1/2002        1:08:51 PM       76.4754 °F      Low
3/1/2002        1:08:55 PM       76.4760 °F      Low
3/1/2002        1:08:59 PM       76.4797 °F      Low
3/1/2002        1:09:06 PM       76.4839 °F      Low
```

**Figure 140**   *Output file example*

The output file contains a header indicating the filename, thermometer readout and sessioin temperature scale information, the channel name and alarm settings (if any).

The data is formatted into columns and consist of the date, time, reading value and alarm state.

⚠️ *Note: If the output file was created using the Write all acquired data to the same file option, the header of the output file will then contain information for all enabled channels, and an additional column is added to the file for the channel number for each reading. This feature should typically only be used if you are using other software to sort and analyze the logged data. The output file created when using this feature can still be opened by LogWare and displayed on-screen, however all readings are displayed on the graph as if they came from the same channel (single trace).*

Optionally, the statistical data for the readings may be appended to the end of the file when the output file is printed. Statistics are only appended if this feature is enabled on the Log*Ware* Options dialog. Please refer to Section 5.6.4, Options, for more details.

## 7.2.2    Download file

Log*Ware* includes a feature that allows readings that are stored in the memory of thermometer readouts that support this feature to be downloaded and written into text files, called download files.

To download readings from the memory of a thermometer readout, see the Download Logged Data option in the Download menu.

Download files can be opened by this software by selecting the Open Previously Logged Data Files option in the View menu. They can also be opened in other analysis software packages such as spreadsheets and text editors.

The format of a download file is very similar to and follows the same general format as an output file. The actual content of a download file, however, will vary slightly depending on the thermometer readout that the data was downloaded from. See the example below:

```
download1.txt

Thermometer Model: 1529
Channel: 1
==============================================================================
Date           Time          Reading           Label
11/02/2002     10:26:28      20.3548 °C        DATA_04
11/02/2002     10:26:29      20.3529 °C        DATA_04
11/02/2002     10:26:30      20.3539 °C        DATA_04
11/02/2002     10:26:31      20.3536 °C        DATA_04
11/02/2002     10:26:32      20.3531 °C        DATA_04
11/02/2002     10:26:33      20.3534 °C        DATA_04
11/02/2002     10:26:34      20.3525 °C        DATA_04
11/02/2002     10:26:35      20.3536 °C        DATA_04
```

**Figure 141**  *Download file example*

The download file contains a header indicating the filename, thermometer readout model and channel (optional). The data is formatted into columns and consist of the date, time, reading value, label and/or channel information.

## 7.2.3    Alarm Log File

When a real-time log session is started, Log*Ware* creates a file called "alarms.log". This file is located in the \Output folder by default. The purpose of this file is to maintain a history of readings that caused the alarms to trip or reset.

The alarm log file can be viewed during a real-time log session by selecting the Alarm Log menu option in the View menu or by right-clicking on the Channels grid on the real-time Log Session window and selecting the View Alarm Log option in the popup menu.

The following is an example of an alarm log file created by Log*Ware*:

```
alarms.log

Alarm Settings:
Channel: 1      Channel 1       Low Alarm:      28.00 °C        High Alarm:     30.00 °C
Channel: 2      Channel 2
Channel: 3      Channel 3

==============================================================================
Date            Time            Name                    Alarm           Reading
2/28/2002       10:49:38 AM     Channel 1               Low             25.59 °C
2/28/2002       10:49:59 AM     Channel 1               Reset           28.44 °C
2/28/2002       10:50:14 AM     Channel 1               High            30.04 °C
2/28/2002       10:50:59 AM     Channel 1               Reset           29.99 °C
```

**Figure 142**  *Alarm log file example*

The alarm log file contains a header indicating the filename and alarm settings for all enabled channels.

The data is formatted into columns and consist of the date, time, channel name, alarm state and reading value.

# 8      Download process

The following sections describe in detail the download process for each of the thermometer readouts supported by Log*Ware*.

## 8.1      1529 'Chub-E4' download process

The download process for the 1529 'Chub-E4' Thermometer readout consists of 3 main steps:

1.    Download the data from the thermometer readout

2.    Parse the data

3.    Write the data to download file(s)

When the download process starts, a progress dialog appears to indicate the download progress. To abort downloading the data from the thermometer readout, click the Cancel button on the progress dialog.

If the Prompt to enter filename(s) option was selected, the Windows® Save As dialog is displayed to get the name of the file(s) that the data should be saved to once all of the data has been downloaded. The \Download folder should be selected by default (or the folder that is specified for download files on the Log*Ware* Options dialog).

- If the Write all readings into a single file option was selected, all readings will be written to the specified file. By default, the filename is "download.txt".

- If the Separate readings by channel option was selected, a prompt appears for every channel. By default, the filenames are "download*n*.txt" where *n* is the channel number.

Accept the default filename(s) or enter new filename(s) and click the Save button to continue. If a file with the selected filename already exists, confirm overwriting the existing file or enter a new filename. Clicking the Cancel button on the Windows® Save As dialog aborts the download process.

If the Prompt to enter filename(s) option was not selected, the data is saved to file(s) with the default filename(s).

Once all of the downloaded data has been saved into the specified file(s), the names of all of the files are displayed on the Downloaded Files dialog.



**Figure 143** *Downloaded Files dialog*

To open a file that downloaded data was written to, double-click the appropriate entry in the list. The file will be opened in the File Viewer window. For more details on the File Viewer window, please refer to Section 2.4.8, File Viewer Window.

To print a file, check the Send file(s) directly to default printer when double-clicked option. Double-clicking an entry in the list will then cause the file to be sent to the current default printer.

Click the OK button to close this dialog.

## 8.2    1560 'Black Stack' download process

The download process for the 1560 'Black Stack' Thermometer readout consists of 3 main steps:

1.    Download the data from the thermometer readout

2.    Parse the data

3.    Write the data to download file(s)

When the download process starts, a progress dialog appears to indicate the download progress. To abort downloading the data from the thermometer readout, click the Cancel button on the progress dialog.

*Note: When downloading data from the 1560, the measurement process in the thermometer readout is halted until downloading is complete!*

If the Prompt to enter filename(s) option was selected, the Windows® Save As dialog is displayed to get the name of the file(s) that the data should be saved to once the data has been downloaded. The \Download folder should be selected by default (or the folder that is specified for download files on the Log*Ware* Options dialog).

- If the Write all readings into a single file option was selected, all readings will be written to the specified file. By default, the filename is "download.txt".

- If the Separate readings by channel option was selected, a prompt appears for every channel. By default, the filenames are "download*n*.txt" where *n* is the channel number.

Accept the default filename(s) or enter new filename(s) and click the Save button to continue. If a file with the selected filename already exists, confirm overwriting the existing file or enter a new filename. Clicking the Cancel button on the Windows® Save As dialog aborts the download process.

If the Prompt to enter filename(s) option was not selected, the data is saved to file(s) with the default filename(s).

Once all of the downloaded data has been saved into the specified file(s), the names of all of the files are displayed on the Downloaded Files dialog (see Figure 143 on page 200).

To open a file that downloaded data was written to, double-click the appropriate entry in the list. The file will be opened in the File Viewer window. For more details on the File Viewer window, please refer to Section 2.4.8, File Viewer Window.

To print a file, check the Send file(s) directly to default printer when double-clicked option. Double-clicking an entry in the list will then cause the file to be sent to the current default printer.

Click the OK button to close this dialog.

## 8.3    1575A 'Super Thermometer' download process

The download process for the 1575A 'Super Thermometer' readout consists of 3 main steps:

1. Download the data from the thermometer readout

2. Parse the data

3. Write the data to download file

When the download process starts, a progress dialog appears to indicate the download progress. To abort downloading the data from the thermometer readout, click the Cancel button on the progress dialog.

If the Prompt to enter filename option was selected, the Windows® Save As dialog is displayed to get the name of the file that the data should be saved to once the data has been downloaded. The \Download folder should be selected by default (or the folder that is specified for download files on the Log*Ware* Options dialog). Accept the default filename or enter new filename and click the Save button to continue. If a file with the selected filename already exists, confirm overwriting the existing file or enter a new filename. Clicking the Cancel button on the Windows® Save As dialog aborts the download process.

If the Prompt to enter filename option was not selected, the data is saved to a file with the default filename 'download.txt'.

Once all of the downloaded data has been saved into the specified file, the filename is displayed on the Downloaded Files dialog (see Figure 143 on page 200).

To open the file that downloaded data was written to, double-click the entry in the list. The file will be opened in the File Viewer window. For more details on the File Viewer window, please refer to Section 2.4.8, File Viewer Window.

To print a file, check the Send file(s) directly to default printer when double-clicked option. Double-clicking an entry in the list will then cause the file to be sent to the current default printer.

Click the OK button to close this dialog.

## 8.4    1590 'Super Thermometer II' download process

The download process for the 1590 'Super Thermometer II' readout consists of 3 main steps:

1.    Download the data from the thermometer readout

2.    Parse the data

3.    Write the data to download file

When the download process starts, a progress dialog appears to indicate the download progress. To abort downloading the data from the thermometer readout, click the Cancel button on the progress dialog.

If the Prompt to enter filename option was selected, the Windows® Save As dialog is displayed to get the name of the file that the data should be saved to once the data has been downloaded. The \Download folder should be selected by default (or the folder that is specified for download files on the Log*Ware* Options dialog). Accept the default filename or enter new filename and click the Save button to continue. If a file with the selected filename already exists, confirm overwriting the existing file or enter a new filename. Clicking the Cancel button on the Windows® Save As dialog aborts the download process.

If the Prompt to enter filename option was not selected, the data is saved to a file with the default filename 'download.txt'.

Once all of the downloaded data has been saved into the specified file, the file-name is displayed on the Downloaded Files dialog  (see Figure 143 on page 200).

To open the file that downloaded data was written to, double-click the entry in the list. The file will be opened in the File Viewer window. For more details on the File Viewer window, please refer to Section 2.4.8, File Viewer Window.

To print a file, check the Send file(s) directly to default printer when double-clicked option. Double-clicking an entry in the list will then cause the file to be sent to the current default printer.

Click the OK button to close this dialog.

# 9    Conversion settings dialogs

The following sections describe in detail the conversion settings dialogs supported by Log*Ware*. Each of these dialogs may appear slightly different depending on the features and settings supported by the thermometer readout being used.

⚠️ *Note: Some conversion type settings do not have an associated dialog (i.e. Ohms, Volts, Ratio, W, etc.).*

## 9.1    ITS-90 Settings dialog

The ITS-90 Settings dialog allows the RTPW, Low Range, and High Range coefficients to be entered.



**Figure 144**  *ITS-90 Settings dialog*

If the ITS-90 coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Enter the RTPW coefficient in from the Report of Calibration in the RTPW box. This box must contain a valid value.

Select the Low Range tab to select the low range and enter low range coefficients. Select the High Range tab to select the high range and enter high range coefficients.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains ITS-90 coefficients. Select the Save As button to display the Windows® Save As dialog to save the current ITS-90 coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.1.1　Low Range tab

Select the Low Range tab to select the low range and enter low range coefficients. If the thermometer readout being used does not support ITS-90 low ranges, this tab is not displayed.
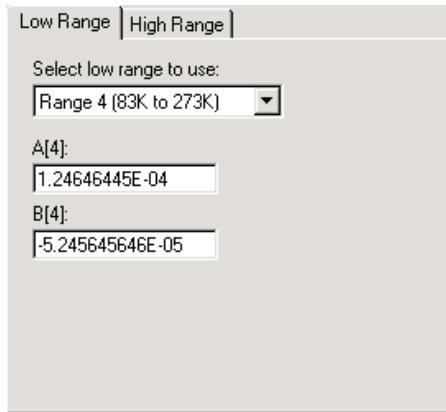


**Figure 145**　*ITS-90 Settings – Low Range tab*

Select the low range to use from the Select low range to use drop-down list. Low range choices include Range 1 to Range 5 but may be limited depending on the thermometer readout being used.

Enter the low range coefficients from the Report of Calibration in the boxes provided. The boxes displayed depend on the currently selected low range. If a coefficient is not used, set its value to 0.0.

## 9.1.2　High Range tab

Select the High Range tab to select the high range and enter high range coeffi-

cients. If the thermometer readout being used does not support ITS-90 high ranges, this tab is not displayed.



**Figure 146**  *ITS-90 Settings – High Range tab*

Select the high range to use from the Select high range to use drop-down list. High range choices include Range 6 to Range 11 but may be limited depending on the thermometer readout being used.

Enter the high range coefficients from the Report of Calibration in the boxes provided. The boxes displayed depend on the currently selected high range. If a coefficient is not used, set its value to 0.0.

## 9.2 IPTS-68 settings dialog

The IPTS-68 Settings dialog allows the Scale, R0, ALPHA, DELTA, A4 and C4 coefficients to be entered.
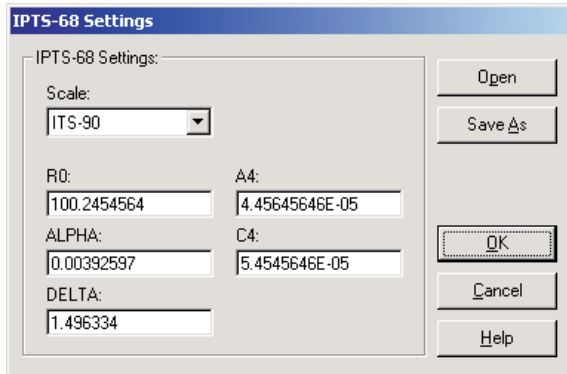


**Figure 147** *IPTS-68 Settings dialog*

If the IPTS-68 coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Select the scale to use from the Scale drop-down list. Scale choices include IPTS-68 and ITS-90. If the thermometer readout being used does not support the Scale setting, this drop-down list is not displayed.

Enter the R0, ALPHA, DELTA, A4, and C4 coefficients from the Report of Calibration in the boxes provided. All boxes must contain valid values.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains IPTS-68 coefficients. Select the Save As button to display the Windows® Save As dialog to save the current IPTS-68 coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.3　　Callendar-Van Dusen Settings dialog

The Callendar-Van Dusen Settings dialog allows the R0, ALPHA, DELTA, and BETA coefficients to be entered.
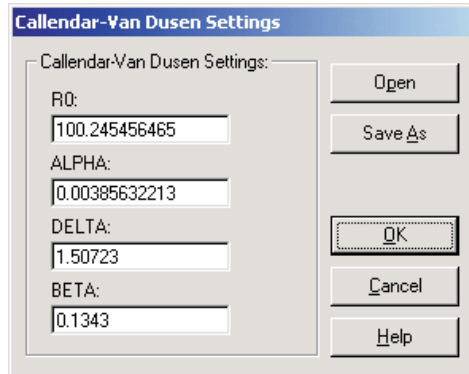


**Figure 148**　*Callendar-Van Dusen Settings dialog*

If the Callendar-Van Dusen coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Enter the R0, ALPHA, DELTA, and BETA coefficients from the Report of Calibration. All boxes must contain valid values.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains Callendar-Van Dusen coefficients. Select the Save As button to display the Windows® Save As dialog to save the current Callendar-Van Dusen coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.4　High-Temperature PRT Settings dialog

The High Temperature PRT Settings dialog allows the RTPW, A and B coefficients to be entered.
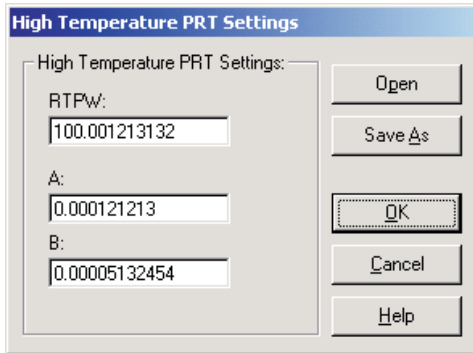


**Figure 149**　*High-Temp PRT Settings dialog*

If the High Temperature PRT coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Enter the RTPW coefficient from the Report of Calibration in the RTPW box. This box must contain a valid value.

Enter the values for the A and B coefficients from the Report of Calibration in the boxes provided.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains High Temperature PRT coefficients. Select the Save As button to display the Windows® Save As dialog to save the current High Temperature PRT coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.5 Polynomial Settings dialog

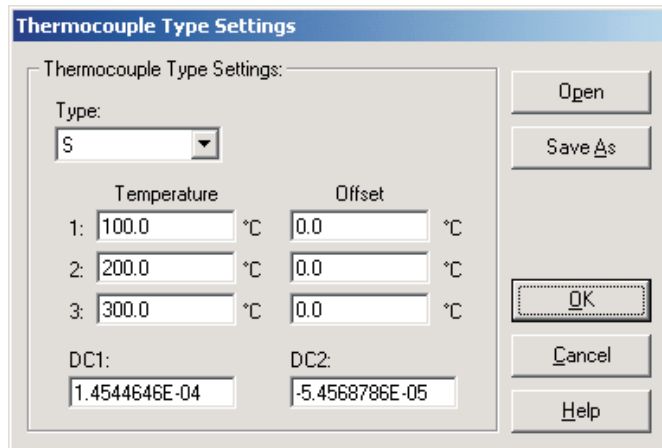The Polynomial Settings dialog allows the A0, A1, A2,… A10 coefficients to be entered.
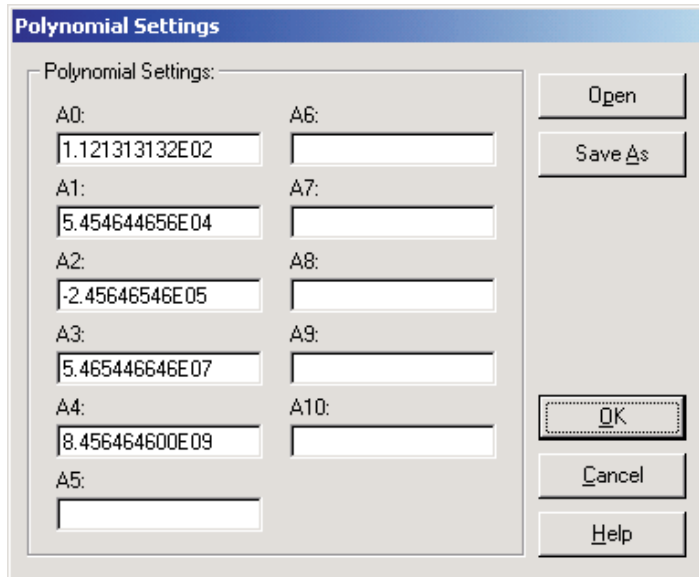


**Figure 150** *Polynomial Settings dialog*

If the Polynomial coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Enter the values for all polynomial coefficients from the Report of Calibration in the boxes provided. If any coefficients are not used, leave the boxes blank or set the values to 0.0. The actual number of boxes displayed depends on the thermometer readout being used.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains Polynomial coefficients. Select the Save As button to display the Windows® Save As dialog to save the current Polynomial coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.6 W(T90) Settings dialog

The W(T90) Settings dialog allows the RTPW coefficient to be entered.
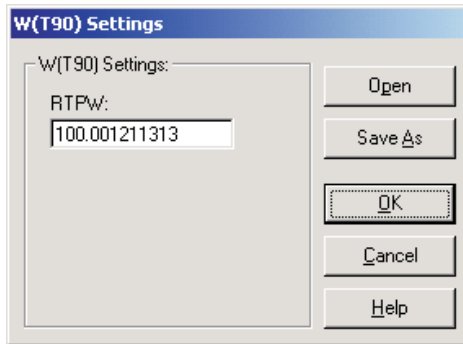


**Figure 151** *W(T90) Settings dialog*

If the W(T90) coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Enter the RTPW coefficient from the Report of Calibration in the RTPW box. This box must contain a valid value.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains W(T90) coefficients. Select the Save As button to display the Windows® Save As dialog to save the current W(T90) coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.7 Thermistor Settings dialog

The Thermistor Settings dialog allows the Thermistor T(R) or Thermistor R(T) coefficients to be entered.

If the Thermistor coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains Thermistor coefficients. Select the Save As button to display the Windows® Save As dialog to save the current Thermistor coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.7.1  Thermistor T(R) Settings dialog

If the selected conversion type is T(R), the Thermistor T(R) Settings dialog is displayed.
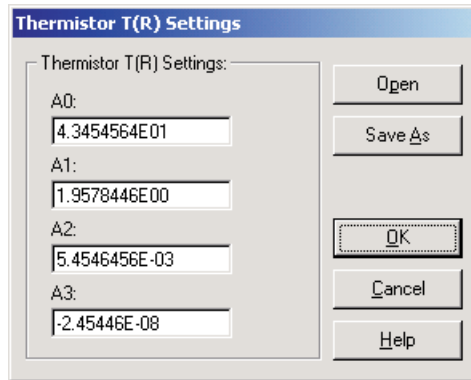


**Figure 152**  *Thermistor T(R) Settings dialog*

Enter the values for all Thermistor T(R) coefficients from the Report of Calibration in the boxes provided. If any coefficients are not used, leave the boxes blank or set the values to 0.0.

### 9.7.2 Thermistor R(T) Settings dialog

If the selected conversion type is R(T), the Thermistor R(T) Settings dialog is displayed.
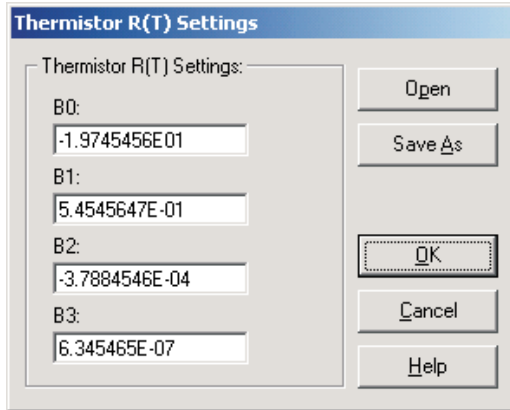


**Figure 153**  *Thermistor R(T) Settings dialog*

Enter the values for all Thermistor R(T) coefficients from the Report of Calibration in the boxes provided. If any coefficients are not used, leave the boxes blank or set the values to 0.0.

## 9.8        Thermocouple Polynomial Settings dialog

The Thermocouple Polynomial Settings dialog allows the mV (25C), C0, C1, C2,… C15 coefficients to be entered.



**Figure 154**   *Thermocouple Polynomial Settings dialog*

If the Thermocouple Polynomial coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Enter the voltage of the thermocouple probe (in millivolts) at 25°C from the Report of Calibration in the mV (25C) box. If this value is not applicable to the thermometer readout, this box is disabled.

Enter the values for all thermocouple polynomial coefficients from the Report of Calibration in the boxes provided. If any coefficients are not used, leave the boxes blank or set the values to 0.0. The actual number of boxes displayed depends on the thermometer readout being used.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains Thermocouple Polynomial coeffi-

cients. Select the Save As button to display the Windows® Save As dialog to save the current Thermocouple Polynomial coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.9 Thermocouple Table Settings dialog

The Thermocouple Table Settings dialog allows the Number of points and Temperature and Voltage values to be entered.
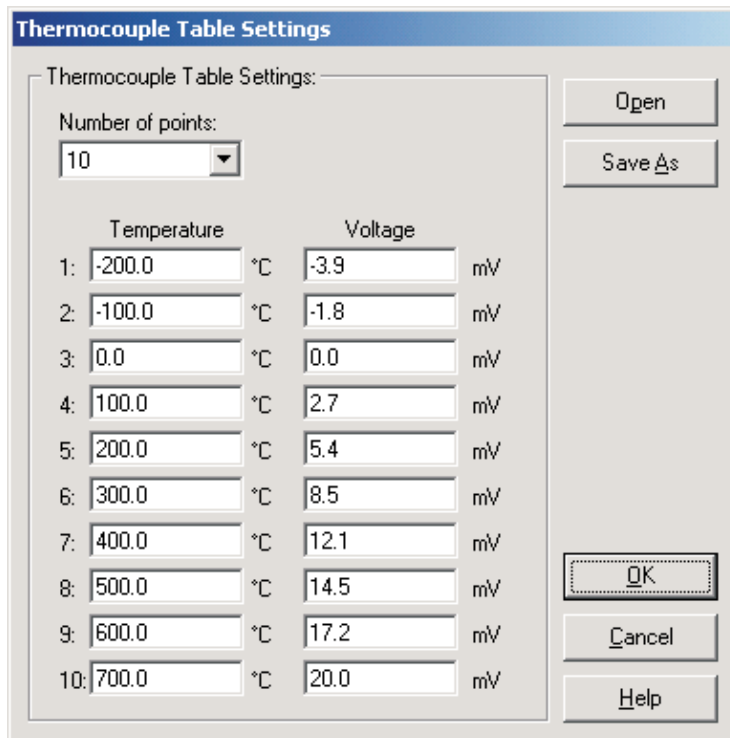


**Figure 155**  *Thermocouple Table Settings dialog*

If the Thermocouple Table coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values.

Select the number of points to use for the Temperature/Voltage table using the Number of points drop-down list. The choices are from 1 to 10 but may be limited depending on the thermometer readout being used.

Up to ten Temperature/Voltage pairs can be entered. Enter the temperature and voltage values at each temperature in the boxes provided. The units for the temperature and voltage values are indicated next to each box.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains Thermocouple Table coefficients. Select the Save As button to display the Windows® Save As dialog to save the current Thermocouple Table coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

## 9.10    Thermocouple Type Settings dialog

The Thermocouple Type Settings dialog allows the Type, Temperature and Offset values, and DC1 & DC2 coefficients to be entered.



**Figure 156**  *Thermocouple Polynomial Settings dialog*

If the Thermocouple Type coefficients were read in from the thermometer readout, the boxes are filled with the current coefficient values and settings.

The Type drop-down list allows the standard thermocouple type to be selected. Thermocouple types include: B, E, J, K, N, R, S, T and AuPt. The choices in

the list may be limited depending on the thermocouple types supported by the thermometer readout being used.

The Temperature and Offset boxes provide a method to use an offset table with this thermocouple type. Up to three Temperature/Offset pairs can be entered. If no offset table is to be used, make sure the values in the Offset boxes are all set to 0.0.

*Note:* If any one of the temperature values is set to 0°C, that point is ignored because the voltage on a thermocouple at 0°C is always assumed to be 0mV.

If the selected thermocouple type is type S or type R, the DC1 and DC2 boxes are displayed. The DC1 and DC2 values are delta ($\Delta$) values for the standard C1 and C2 polynomial coefficients. Enter the values for DC1 and DC2. These values should be located on the Report of Calibration.

Select the Open button to display the Windows® Open dialog to open a previously saved configuration file which contains Thermocouple Type coefficients. Select the Save As button to display the Windows® Save As dialog to save the current Thermocouple Type coefficients to a configuration file.

Click the OK button to accept the current coefficients and close this dialog.

Click the Cancel button to discard any changes you have made and close this dialog.

Click the Help button to display the appropriate help topic for this dialog.

# 10     Troubleshooting

The following sections describe in detail some troubleshooting topics, possible causes, and solutions.

## 10.1     Technical support

Please contact one of the following authorized Service Centers to coordinate service on your product:

**Fluke Corporation, Hart Scientific Division**

    799 E. Utah Valley Drive

    American Fork, Utah 84003-9775

    USA

    Phone: +1.801.763.1600

    Toll Free: +1.800.438.4278

    Fax: +1.801.763.1010

    E-mail: support@hartscientific.com

**Fluke Nederland B.V.**

    Customer Support Services

    Science Park Eindhoven 5108

    5692 EC Son

    NETHERLANDS

    Phone: +31-402-675300

    Telefax: +31-402-675321

    E-mail: ServiceDesk@fluke.nl

**Fluke Int'l Corporation**

    Service Center - Instrimpex

    Room 2301 Sciteck Tower

    22 Jianguomenwai Dajie

    Chao Yang District

    Beijing 100004, PRC

    CHINA

    Phone: +86-10-6-512-3436

Telefax: +86-10-6-512-3437

E-mail: xingye.han@fluke.com.cn

**Fluke South East Asia Pte Ltd.**

Fluke ASEAN Regional Office

Service Center

60 Alexandra Terrace #03-16

The Comtech (Lobby D)

118502

SINGAPORE

Phone: +65-737-2922

Telefax: +65-737-5155

E-mail: antng@singa.fluke.com

Check our website on the Internet regularly for answers to Frequently Asked Questions, software updates, and Service Releases.

Before calling for Technical Support, check the Help file or User Guide topics listed below to see if the problem you are having is described there:

- Requirements
- Installation
- Running Log*Ware*
- How do I... topics

When calling or sending a fax, please send or have the following information ready:

- Name of Software (Log*Ware* II)
- Software version and build as found on the About Log*Ware* dialog
- Detailed description of the problem
- What you were doing when the problem arose
- The exact wording of any error message you received
- Any other information that may help to solve the problem

## 10.2      Troubleshooting common problems

The following table outlines some possible problems that may arise when using Log*Ware* and some possible solutions to those problems:

**Table 1**   *Troubleshooting Common Problems*

| Problem | Possible Cause | Solution |
|---|---|---|
| **Communication Problems** | | |
| Cannot select correct COM port | Another application is using the COM port | Close all other applications that use COM ports (including Hot Sync manager, modem software, etc.) |
| | COM port is not enabled or configured correctly | Use Windows® Device Manager to check COM port settings |
| Unable to communicate with thermometer readout using RS-232 cable | Wrong COM port selected | Make sure the RS-232 cable is connected to the correct COM port |
| | Wrong type of RS-232 cable being used | Make sure the RS-232 cable is a "null modem" cable |
| | Wrong baud rate setting | Make sure the thermometer readout is set to the correct baud rate |
| | Bad RS-232 cable | Try using another RS-232 cable |
| | Thermometer readout is not turned on | Connect power to thermometer readout and turn it on |
| Unable to communicate with thermometer readout using IR dongle | Wrong COM port selected | Make sure the IR dongle is connected to the selected COM port |
| | Incompatible IR dongle being used | Contact an Applications Specialist or Customer Service representative to purchase a compatible IR dongle |
| | Built-in IR port being used | Log*Ware* is not designed to use built-in IR ports; A dongle must be used |
| | Obstructed path between IR dongle and IR window on thermometer readout | Make sure the path between the IR dongle and IR window on the thermometer readout is unobstructed |
| | Distance between IR dongle and IR window too great | Place IR dongle as close to IR window as possible |
| **Real-Time Logging Problems** | | |
| Log*Ware* beeps and the reading on a single channel is always 0.0 | Poor communication | See Communication Problems above |
| | Bad probe connection | Make sure the probe on the channel exhibiting this problem is properly connected |
| | Probe coefficients not correct | If attempting to read temperature, make sure the conversion coefficients for the probe have been properly into the correct channel |

| Problem | Possible Cause | Solution |
|---|---|---|
| Log*Ware* beeps and the reading on a random channel is always 0.0 | Poor communication | See Communication Problems above |
| | Computer may be too slow or not have enough resources available | Upgrade computer to faster processor, add more memory and/or free up some hard drive space; optionally, reduce the rate at which Log*Ware* acquires data |
| Log*Ware* beeps and the reading on all channels is always 0.0 | Poor communication | See Communication Problems above |
| Log*Ware* gets duplicate readings on a channel | Sample rate too fast | Reduce the sample rate (Interval between channels) setting |
| Cannot zoom or scroll graph | By design | Log*Ware* does not allow the real-time graph to be zoomed or scrolled by the user |
| Cannot print the readings or graph | Printer not installed | Make sure a printer driver is installed for the printer to print to |
| | Printer not connected or online | Make sure the printer is connected, turned on and ready; fill the paper tray if necessary; Print a test page from the printer's Property pages to make sure it is working |
| Scale of readings on one or more channels is incorrect | Channel(s) not configured properly prior to starting log session | Make sure each channel is configured to read the proper units/scale before starting the log session |
| **Previous Log Session Problems** | | |
| Unable to successfully open output or download file | File is corrupt | There is no solution to this problem |
| | File has been modified | Make sure the file follows the required format; NEVER MANUALLY MODIFY THESE FILES!! |
| | File is too large | |
| Cannot print the readings or graph | Printer not installed | Make sure a printer driver is installed for the printer to print to |
| | Printer not connected or online | Make sure the printer is connected, turned on and ready; fill the paper tray if necessary; Print a test page from the printer's Property pages to make sure it is working |
| **Downloading Problems** | | |
| Unable to download readings | Poor communication | See Communication Problems above |
| | No readings in memory or selected log | Make sure the memory or selected log has one or more readings in it |

## 10.3　Communication error

If Log*Ware* is unable to communicate with the thermometer readout for any reason, a communication error occurs. To resolve the communication error, please check the following:

**If you are using an RS-232 cable:**

- Is the COM port in use? – Make sure that the COM port is not currently being used by another application. If there is a hot sync adapter for a PDA connected to your computer, make sure the software that uses the adapter is closed or that it is not trying to use the same COM port.

- Is the correct COM port selected? – Make sure that the communication cable is connected to the selected COM port on the computer.

- Is the thermometer readout set to the right baud rate? – Make sure that the thermometer readout's baud rate matches the baud rate selected in Log*Ware*. Refer to the thermometer readout's User's Guide for more details on how to set the thermometer readout's baud rate.

- Is the right type of cable being used? – Log*Ware* requires that a "null modem" cable be used to communicate with thermometer readouts. Refer to the Digital Communication section of the thermometer readout's User's Guide for more details on the correct type of cable to use.

- Is the thermometer readout turned on? – Make sure that the thermometer is turned on. Use the buttons on the front panel of the thermometer to exit from any open menu.

- Is the correct model selected? – Make sure that the selected thermometer readout model matches the model of the thermometer readout being used. Each thermometer has its own set of commands and some thermometer readouts do not recognize the commands for other thermometer readouts.

**If using the IR dongle:**

- Is the IR dongle connected to the correct COM port? – Make sure that the IR dongle is connected to the selected COM port.

- Is the correct type of IR dongle being used? – Make sure the correct type of IR dongle is being used. Log*Ware* cannot use IR ports that are built into the computer. Refer to Using an IR dongle with Log*Ware* for more details.

- Is the path between the IR dongle and the IR window of the thermometer readout unobstructed? – Make sure that the IR dongle is placed in close proximity of the thermometer readout's IR window and that there are no objects between them that could obstruct the signal. Refer to the IR communication section of the thermometer readout's User's Guide for more details on the placement of the IR dongle.

- Is the thermometer readout's IR communication mode set properly? – The IR port on some thermometer readouts can be configured to operate in different modes. Log*Ware* requires that the IR port be set to operate in

COMMAND mode. Refer to the IR communication section of the thermometer readout's User's Guide for more details on IR modes supported by the thermometer readout.

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