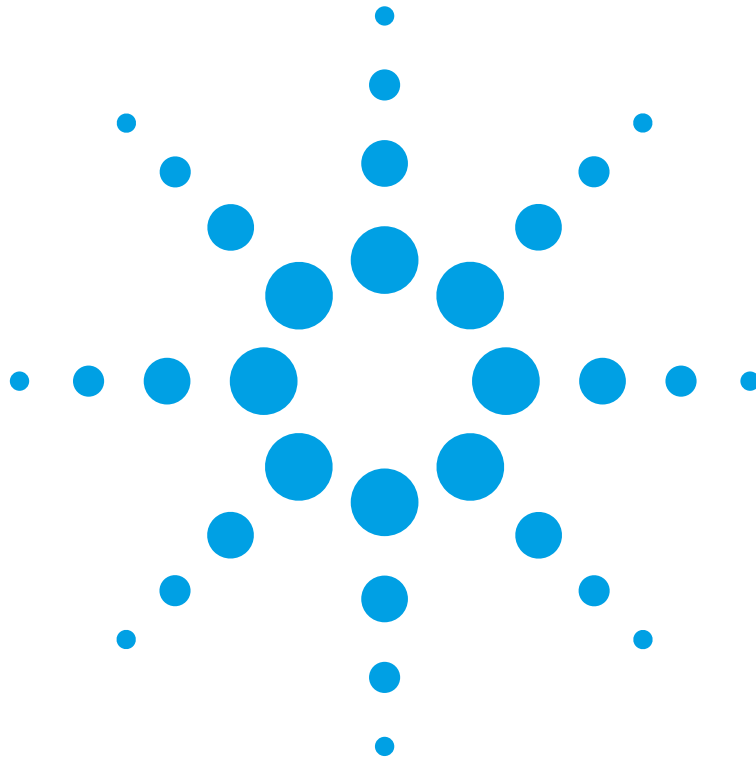Agilent Technologies

Distributed Temperature System Configurator

PC Software
User's Guide

Agilent Technologies

Notices

Manual Part Number

N4385-90011

Edition

Second Edition, February 2007

Subject Matter

The material in this document is subject to change without notice.

Agilent Technologies *makes no warranty of any kind with regard to this printed material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.*

Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Printing History

New editions are complete revisions of the guide reflecting alterations in the functionality of the instrument. Updates are occasionally made to the guide between editions. The date on the title page changes when an updated guide is published. To find out the current revision of the guide, or to purchase an updated guide, contact your Agilent Technologies representative.

Warranty

This Agilent Technologies instrument product is warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Agilent will, at its option, either repair or replace products that prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by Agilent. Buyer shall prepay shipping charges to Agilent and Agilent shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to Agilent from another country.

Agilent warrants that its software and firmware designated by Agilent for use with an instrument will execute its programming instructions when properly installed on that instrument. Agilent does not warrant that the operation of the instrument, software, or firmware will be uninterrupted or error free.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

No other warranty is expressed or implied. Agilent Technologies specifically disclaims the implied warranties of Merchantability and Fitness for a Particular Purpose.

Exclusive Remedies

The remedies provided herein are Buyer's sole and exclusive remedies. Agilent Technologies shall not be liable for any direct, indirect, special, incidental, or consequential damages whether based on contract, tort, or any other legal theory.

Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products. For any assistance contact your nearest Agilent Technologies Sales and Service Office.

Certification

Agilent Technologies Inc. certifies that this product met its published specifications at the time of shipment from the factory.

Agilent Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, NIST (formerly the United States National Bureau of Standards, NBS) to the extent allowed by the Institutes's calibration facility, and to the calibration facilities of other International Standards Organization members.

ISO 9001 Certification

Produced to ISO 9001 international quality system standard as part of our objective of continually increasing customer satisfaction through improved process control.

Getting Started

Using DTS Configurator

Users

1

Getting Started

Introduction

DTS Configurator provides an easy-to-use graphical user interface to the DTS instrument and can be used as the basic application for handling configurations and traces.

It enables calibrating the sensor, creating configurations, creating measurement sequences, starting measurements, and saving and viewing traces.

NOTE   Some features (creating/modifying schedules, running scheduled measurements) will be implemented in later releases. In the current version, these features are disabled or inactive.

NOTE   This guide assumes you are already familiar with your instrument's operation and parameters. For details on the DTS instrument refer to *Agilent N4385A/N4386A Distributed Temperature System User's Guide*.

Installation

Requirements

DTS Configurator runs on Windows 2000/XP operating systems. Windows 95, ME, and NT operating systems are not supported.

Software requirements:

- Microsoft .NET Framework version 1.1
- Agilent IO Libraries Suite
  Agilent IO Libraries Suite is needed for communication with the DTS device. It is downloadable from http://www.agilent.com/find/iosuite

Hardware requirements:

- Pentium III, 700 MHz CPU
- 256 MB RAM
- 15 MB free disk space
- Ethernet or USB (refer to *Agilent N4385A/N4386A Distributed Temperature System User's Guide*).

Installing DTS Configurator

To install the DTS Configurator, insert the installation CD into your CD-ROM drive and run `setup.exe`.

The installation wizard will guide you through the installation procedure. Read the license agreement carefully before agreeing and then follow the wizard to select the destination folder and complete the installation.

N O T E   After installation, there are no predefined users and the application will work in the anonymous mode (no authentication is required). For instructions on how to add users, refer to chapter "Users" on page 43.

User Interface

DTS Configurator is a standard Windows based application. It works as any common Windows application with menus, toolbars, navigation and visualization.

When you start the application the window for instrument discovery opens first, where you need to perform instrument discovery (see "DTS Instrument Discovery" on page 15).

The application window is divided into four main areas. On the left are the *File Explorer* pane (above) and the *Properties* pane (below). On the right side is the *Data Visualization* pane. The bottom part of the window contains the *Instrument* pane. Refer to Figure 1 on page 4.

All described areas can be resized, moved, and customized. To move a pane, double-click its title bar and the pane will detach from the window and you can move it to a place of your choice. To put the pane into its original position double-click its title bar again.

To select which panes you want to view open the **View** menu and select the panes you want to view.

Figure 1 Graphical User Interface
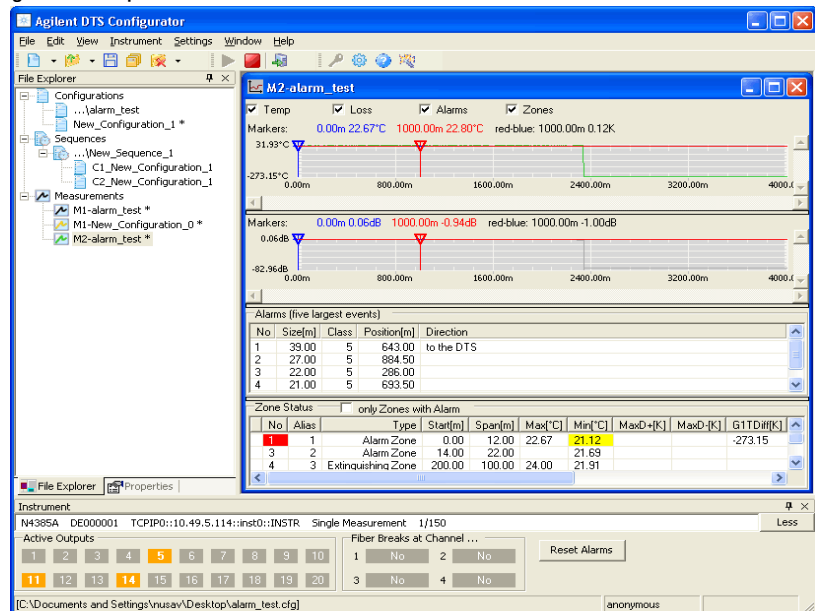
File Explorer Pane

File Explorer pane contains the list of configurations, sequences, and trace files.

Naming of entries

- Each new entry is marked with * until saved.

- When an entry is saved it receives *..\ * prefix.

- When a saved entry is modified it receives * next to the name until it is saved again.

Editing options are available in the context menu for each list entry. To access the context menu, right-click an entry.

Configuration context menu contains:

- **Edit**; opens the *Configuration Editor* dialog box. For more information see chapter "Configurations" on page 21.

- **Clone**; creates a clone of the selected configuration. The name of the clone is marked with C and the number of clone, created for the selected configuration, e.g. C1-configuration_name.

Sequence context menu contains:

- **Edit**; opens the *Sequence Editor* dialog box. For more information see chapter "Sequences" on page 31.

- **Clone**; creates a clone of the selected sequence. The name of the clone is marked with C and the number of clone, created for the selected sequence, e.g. C1-sequence_name.

Sequence/Configuration context menu contains:

- **Edit**; opens the *Configuration Editor* dialog box. For more information see chapter "Configurations" on page 21.

- **Remove**; removes the selected configuration from the sequence.

Trace context menu contains:

- **Visible**; if ticked, the trace is visible in the *Data Visualization* pane.

- **Markers**; if ticked, the markers are visible in the *Data Visualization* pane

- **Show graph**; opens the graph of the selected trace in the *Data Visualization* pane.

- **Extract Configuration**; extracts the configuration from the trace file and displays it in the list of configurations.

- **Clone**; creates a clone of the selected trace. The name of the clone is marked with C and the number of clone, created for the selected trace, e.g. C1-trace_name.
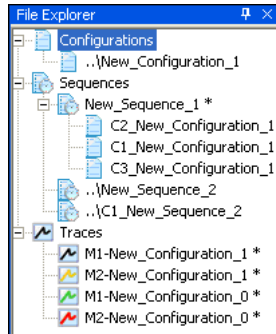
Figure 2 File Explorer Pane

Properties Pane

Properties pane displays information about markers, measurements and sensors.

- *General* section displays general data of the selected trace file, e.g. trace alias and name of the configuration file.

- *Measurement* section displays measurement data for the selected configuration or for the configuration of the selected trace.

- *Sensor* section displays sensor information and sections information for the selected configuration or for the configuration of the selected trace. To view section information select the section entry and click the button next to it.

- *Alarms* section displays data about alarm settings in the selected trace file. To view zones or fire classes information select the Zones or Fire Classes entry and click the button next to it.

Figure 3 Properties Pane

Data Visualization Pane

Data Visualization pane displays a chart with measurement values for the selected configuration or for the configuration of the selected trace. The visualization pane is named after the trace of the measurement that is currently in progress. Markers are displayed only when a trace is selected and if the markers are ticked in the context menu of the trace.

You can zoom in on a part of the chart by clicking and dragging the mouse over the area you want to magnify.

Editing options are available in the context menu. To access the context menu, right-click the chart. The menu contains the following actions: *AutoScale*, *Zoom*, *Undo Zoom*, *Print*, *Copy*, *Save*, and *Properties*.

Select *Temp*, *Loss*, *Alarm*, and/or *Zone* to track selected data and display any of the selected status panes.

Figure 4 Data Visualization Pane
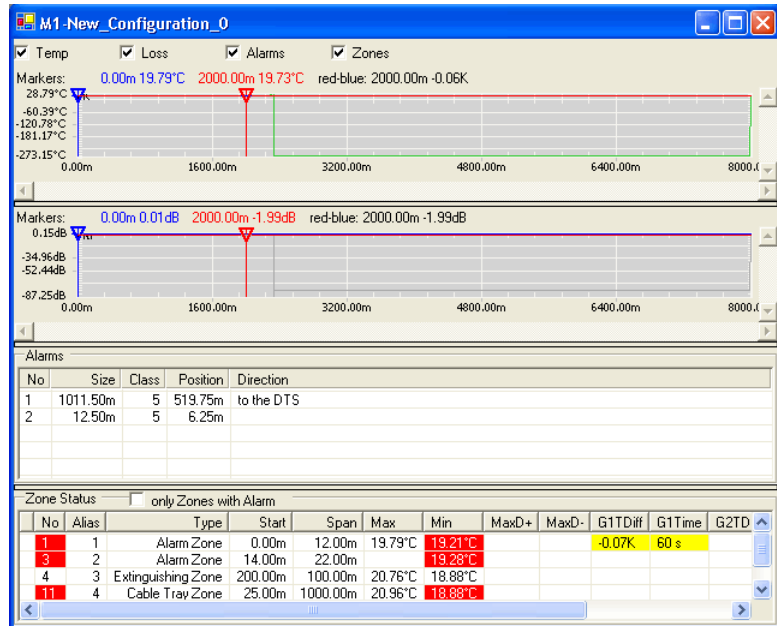
Loss Status Pane

Loss Status pane displays information about losses occurred during the measurement process.

Alarm and Zone Status Panes

Alarm and *Zone Status* panes display information about fires, raised alarms and zones in which the fires occurred.

NOTE   *Alarm* and *Zone Status* panes are available only when alarm handling for selected configuration is enabled.

In the *Alarms* list the five biggest fires that occurred in the selected configuration are listed. For the biggest fire the direction of the fire is also given.

Zone Status list displays either all zones or only zones with alarms (if *only Zones with Alarm* is checked). Zones and parameters are coded with colors:

· red in case the parameter raised a new alarm,

· yellow in case the parameter raised an alarm since the last reset but is currently without a raised alarm,

· orange in case of a fiber break in this or any previous zone (data is unavailable),

· white if none of the parameters raised an alarm.

Figure 5 Alarm and Zone Status Pane

Instrument Pane

Instrument pane displays information about the active instrument, active outputs, and fiber breaks.

- *Instrument* section displays data about the active instrument (e.g. default instrument, connection type, instrument status, number of measurements during the measurement process) and connection status. If connection fails the instrument handles the device connection automatically.

N O T E   The next sections are available only when alarm handling for selected configuration is enabled, otherwise the **More** button is disabled.

- *Active Outputs* section displays list of outputs. Outputs marked with orange color have been activated since the last alarm reset.

- *Fiber Breaks* section displays information if fiber breaks occurred on a sensor or not.

- *Reset Alarms* button clears all alarms from all zones.

Figure 6 Instrument Pane

Menu Bar

The *Menu Bar* provides mouse driven access to many high level functions related to DTS measurements, along with administrative functions, application settings and help.

Menu Bar contains the following menus:

- **File** - Standard Windows file operations (Open, Save, Close...) and application exit.

- **Edit** - Access to configuration, sequence, schedule, and trace settings.

- **View** - Used for selecting toolbars, for opening *File Explorer*, *Properties*, and *Instrument* panes, for opening graph comparison of temperatures and losses, and for centering markers.

- **Instrument** - Instrument settings, instrument discovery, starting and stopping of measurement for the selected configuration or sequence, access to downloading of configurations and traces, access to the log file.

- **Settings** - User management (login/logout), language settings, and application settings.

- **Window** - Four basic types of window arrangement. Useful when viewing more than one measurement trace graph.

- **Help** - Application Help and information.

Tool Bar

The *Tool Bar* consists of three option groups and offers shortcuts to operations mentioned in the Menu Bar chapter:

- **File Menu Actions** - Create New, Open, Save, and Close.

- **Measurement Menu Actions** - Start Measurement, Stop Measurement, and DTS Discovery.

- **Settings Menu Actions** - Login, Options, Show Help, and Center Markers.

Application Settings

You can customize the DTS Configurator settings. To change application settings, select **Options** in the *Settings* menu. The *Program Options* dialog box opens, where you can set or change the settings.

General Application Settings

Select *Applications* where you can set the general application settings. Refer to Table 1 on page 11.

Table 1 Application Settings

Option	Description
Show login on app. start	This option controls whether the *Login* dialog box opens when the application is started. You can set the time interval after which it automatically closes.
Ask before rebooting instrument	This option controls whether the warning before instrument reboot appears or not (in *Instrument Properties* window, under **Settings**, **Instrument**).
Open configuration edit dialog on new configuration	
Default text editor	This option enables you to set the default text editor for viewing log files.
Default folder	This option enables you to select the default destination folder for all configuration, schedule, and trace files.
Layout	This option saves you application layout settings.

Units

You can set the view to US customary units or metric units. Select temperature and distance units that will be used throughout the interface: meters or feet and degrees Celsius or Fahrenheit.

Select the axis on which you would like the data to display in graphs. If you select the X axis the graph will be displayed along the X axis. If you select the Y axis, the graph will be displayed along the Y axis.

Traces Settings

Select *Traces* where you can set the trace settings. Refer to Table 2 on page 12.

Table 2 Traces Settings

Option	Description
Save multiple traces in single file	This option enables you to save multiple traces in a single trace file. If the option is not selected, each trace will be saved in a separate file.
Hide invalid values	This option enables you to hide the invalid temperature/loss values, like the ones when fiber break occurs (temperatures of -273.15°C and loss of -80 dB).
Auto Save	Enable or disable autosave. All trace files will be stored into the specified folder with the filename prefix which is a combination of the configuration name and a prefix defined in the **Filename prefix** setting.
	NOTE:
	Depending on the measurement settings, enabling AutoSave may consume a large portion of disk space.
	Enabling AutoSave option together with Save multiple traces in single file option, could result in very large trace files and could slow down the application.
Memory	Free memory space for saving files can span from 30 to 100 MB. If less than required is available, the traces will not be saved.
Memory/Maximum number of traces in memory	Maximum number of traces in the application.
Memory/Maximum number of stored traces per measurement	Traces above the defined number will be handled according to the selected handling of excess traces.
Show warning when...	Enable or disable warning notification.

Users Settings

For instructions on how to set the user settings, refer to chapter "Users"

2
Using DTS Configurator

Introduction

DTS Configurator enables management of measurement configurations and reviewing measurement traces.

In addition, it provides a user interface to the connected DTS instruments. You can set instrument specific data, calibrate the sensor, start and stop measurements, save results (traces), and manage connected instrument.

NOTE   Some actions require user authentication and you should log in to be able to perform them (for example, starting, stopping measurements, configuring the DTS instrument). For more information about user authentication, refer to chapter "Users" on page 43.

File Management

DTS Configurator provides a common file management system for managing configurations, sequences, and traces. You can add new files, open existing ones and modify them, copy them and save them.

You can also open multiple files and close them one by one (using the *Close* option in the *File* menu) or all at once (using the *Close All* option in the *File* menu).

The same principle applies for saving the files. You can use the *Save* option in the *File* menu to save the currently selected file, or *Save All* to save all open files.

NOTE   The destination folder for new and copied files is defined under the *Settings –> Options* menu in the *Program Options* dialog box under *Application –> Default Folder*.

DTS Instrument

Managing the DTS instrument involves the following:

- performing DTS instrument discovery
  Refer to chapter "DTS Instrument Discovery" on page 15.

- calibrating the instrument sensor
  Refer to chapter "Calibrating Instrument Sensor" on page 17.

DTS Instrument Discovery

NOTE   If user authorization mode is set, you must be logged in before you can find and add an instrument.

DTS Configurator enables you to find and add available DTS instruments. You can also connect to the global VISA database, which contains the instruments previously discovered using the *Agilent Connection Expert*.

NOTE   The application retains information on all discovered instruments, but connects to only one instrument at a time.

To perform DTS instrument discovery, follow the procedure below:

1 In the *Instrument* menu click **Discovery**. The *DTS* dialog box opens.

2 You can find an instrument in two ways:

- Click **Quick Find** to list all instruments, which were already discovered by *Agilent Connection Expert*. Instruments are listed in a tree. Each instrument can have up to 4 different entries, one for each type of connection.

Figure 7 DTS Instrument Discovery - Quick Find
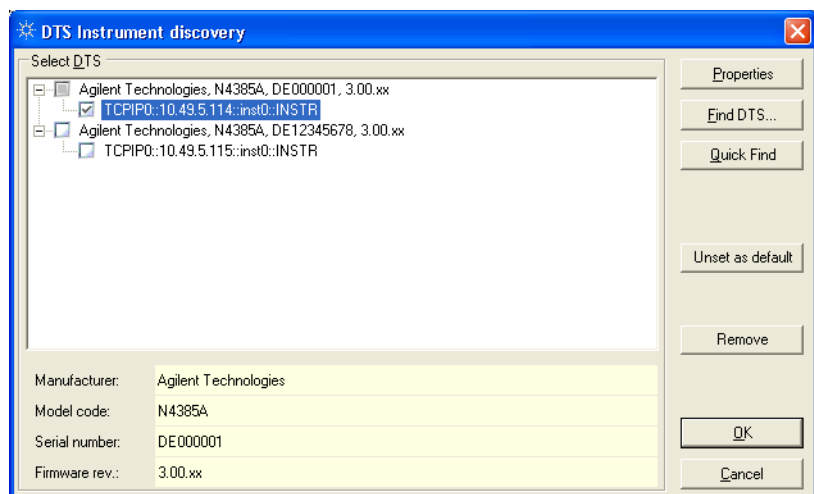
- Click **Find DTS** to search for a new instrument. The **Find DTS** dialog box opens, where you can search for the instrument by hostname, IP address, or VISA address. Select the appropriate option and enter required information. When searching by hostname or IP address, you can also specify advanced search options.

Figure 8 Finding Specific Instrument

3   Set the default instrument and click **OK**.

A user can remove an instrument by selecting it and clicking the **Remove** button. If the removed instrument was set as default instrument, the user must select another default instrument.

An instrument can be connected in more than one way (e.g. via LAN and USB). Such instrument is listed twice in the list of instruments. The two insertions can be differentiated by the data in the VISA address column.

Instrument Properties

NOTE   If user authorization mode is set, you must be logged in before you can modify the instrument properties.
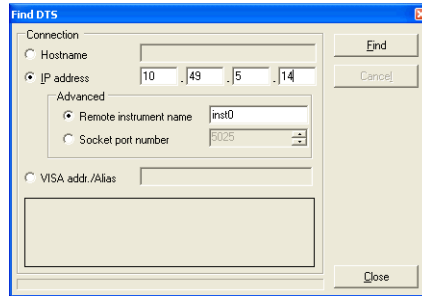
To open the *Instrument Properties* window, go to **Instrument** and **Discovery**. In the **DTS** window select the instrument and click **Properties** button. In this window you can:

- set general instrument data (*General*)
- set communication between instrument host and network domain (*Communication*)
- test inputs and outputs (*Electrical In/Out*)
- set number of traces before the alarm or select *Restart Measurement automatically after Power On* (*Misc*)
- restart the network or reboot the instrument.

Figure 9 Instrument properties
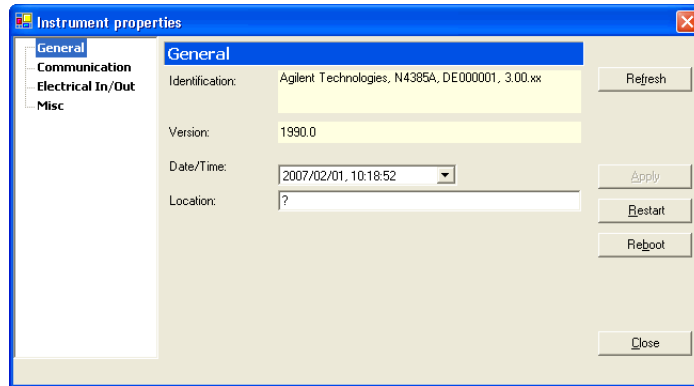
Changed properties can be saved by clicking the **Apply** button.

Calibrating Instrument Sensor

Sensor calibration data is part of a configuration and can be obtained using the *Sensor Calibration Wizard*. The Wizard guides you through the steps of the calibration procedure and helps you determine the sensor calibration values (gain, offset and linearity).

To calibrate the sensor perform the following steps:

1 From the *File Explorer* pane select a configuration and right-click it.

2 Click *Edit* and in the **Configuration Editor** window select **Sensor**.

3 Click **Calibration Wizard** button to open the wizard. On the first page all steps that follow are listed.

Figure 10 Sensor Calibration Wizard
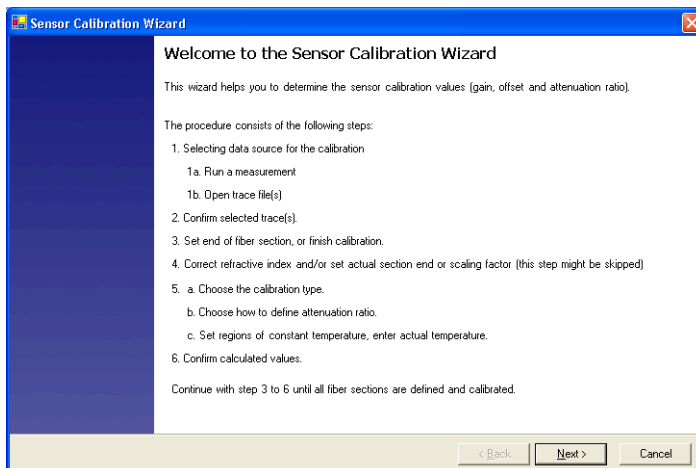
4   On the *Selecting Data Source* page of the wizard, you can select one of the following options:

  •   *Two reference regions per section*
      You can run one measurement with two reference regions (known temperature-points) per sensor section. In this case select either *run a measurement* or *open trace file*.

  •   *One reference region per section*
      In this case select two trace files.

N O T E   Loaded measurement is rejected in case it holds at least two sections with different attenuation ratio. User is prompted with an error message.
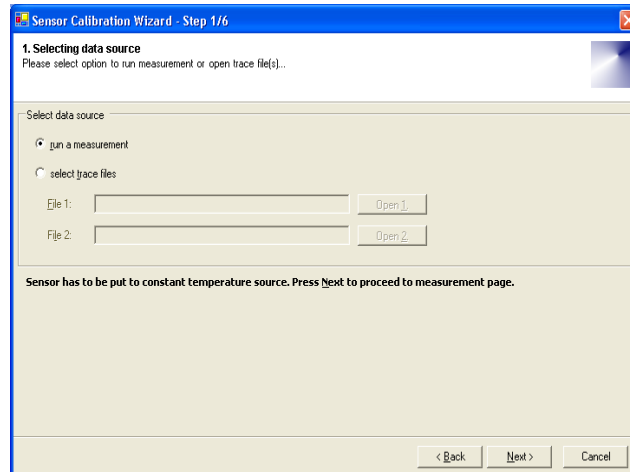
N O T E   Configurations included in the sequence and marked as dual-ended can only be calibrated with dual ended traces or with a new measurement from the sensor calibration wizard. Otherwise calibrations can be performed only with single-ended traces.

Click **Next** to continue.

Figure 11 Selecting Data Source

5   According to the previous selection there are two possibilities:

  •   If you selected *run a measurement* you need to define measurement time and click **Start**. The measurement will start.

  •   If you selected one or two trace files the traces are displayed in the **Confirm Selected Traces** window. Click **Next** to continue.

6   In the *Set end of fiber section or finish calibration* window do one or all of the following steps in the same order as described below:

  •   Move the cursor to select the end of the first fiber section or

  •   Click **Set length** button to correct the refractive index, set accurate length, or set the scaling factor. Confirm with **Enter** and click **Next**.

N O T E   To move between **Set Refractive Index** and **Set Section End** fields use **Back** and **Next** buttons.

- Click **Set Temp** to choose calibration type and to set the attenuation ratio, temperature gain, and temperature offset.

- In the *Choose Calibration Type* window the *Gain and Offset Calibration* is already selected if you selected two trace files in *Step 1* window. If you selected only one trace file, you can choose between *Gain and Offset Calibration* and only *Offset Calibration*. Click **Next**.

- The selected section is displayed in the *Set Attenuation Ratio* window. With black cursors select region 1, with green cursors select region 2. To calculate the attenuation ratio select which region to include and click **Calculate** and **Next**.

NOTE   You can insert the attenuation ratio manually.

- On the *Set the Actual Temperature* page click **Calculate** to get the measured temperatures and then insert the actual temperatures that occur in the selected regions. Click **Next** to get *Gain*, *Offset* and *Attenuation ratio* results and click **Next** to confirm.

- Once a fiber section is added you can finish calibration by clicking the **Finish** button, create a new sensor section by clicking the **Add** button or change the data of the last section. You can add and calibrate up to 16 sections.

NOTE   You can change only the last calibration section in order to keep section junctures untouched. To change the first section you must delete all the following sections first.

Figure 12 Set end of fiber section or finish calibration
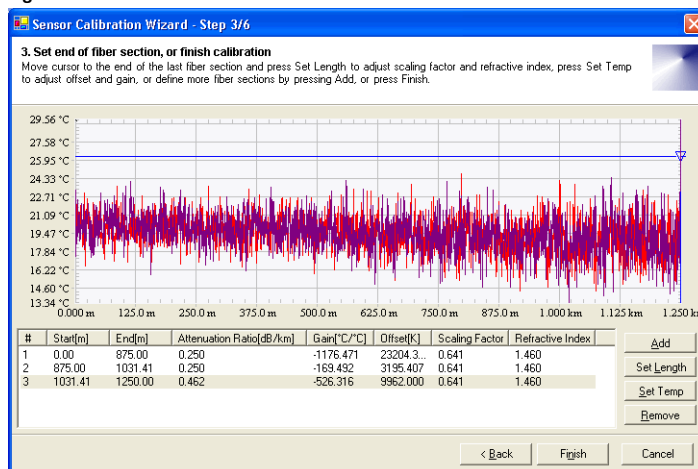
7   When you click **Finish**, the changes are saved into the configuration for which you created the calibration. The changes are visible in the *Configuration* dialog box (Edit -> Configuration -> Sensor).

Log File

Log file contains information about all actions that happened on an instrument.

To view the log file select **Log File** in the *Instrument* menu. A new window with contents of the log file will open.

NOTE   If you already have a log file open and you open another log file from the *Instrument* menu, the old log file will close and the new will open.

Configurations

Managing measurement configurations involves the following:

- creating new configurations
  Refer to chapter "Creating a New Configuration" on page 21.

- modifying existing configurations
  Refer to chapter "Modifying a Configuration" on page 28.

- copying existing configurations
  Refer to chapter "Copying a Configuration" on page 28.

- extracting configuration from trace file
  Refer to chapter "Extracting a Configuration from a Trace" on page 28.

Creating a New Configuration

To create a new configuration, follow the procedure below:

1 In the *File* menu click **New** and select **Configuration**. A new configuration item is added in the File Explorer.

2 Select the new configuration and then in the *Edit* menu click **Configuration**. The *Configuration Editor* dialog box opens. The window opens also if you double-click the configuration or right-click it and select **Edit**.

3 Select *Measurement* and specify the required settings. Refer to Table 3 on page 21.

Table 3 The Configuration Measurement Settings

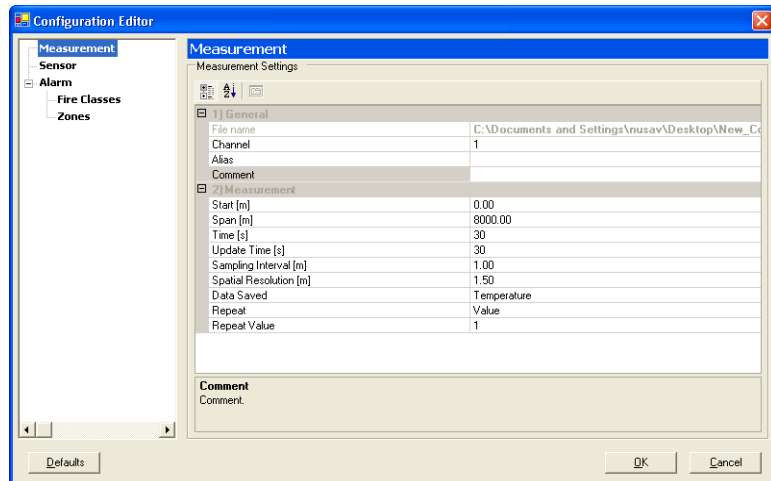| Option	Description
File Name	Name of the configuration file
Channel	Number of the channel
Alias	Name of the channel (up to 79 characters)
Comment	Additional description or comments (up to 79 characters)
Start	Start distance of measurement results
Span	End distance of measurement results
Time (s)	Duration of the measurement in seconds
Update Time (s)	The intermediate trace update time in seconds
Sampling Interval	The distance between samples in the measurement result trace.

Table 3 The Configuration Measurement Settings

Option	Description
Spatial Resolution	Spatial resolution setting for the instrument
Data Saved	The sort of data to collect
Repeat	Setting for repeating the measurement
Repeat Value	Number of measurement repetitions

NOTE *Channel Number* and *Channel Alias* are used only for systems with optical switch.
For additional information on different options, refer to ***Agilent N4385A/N4386A Distributed Temperature System User's Guide***.

Figure 13 Configuration Measurement Settings

4   Select *Sensor* and specify the settings as required. Refer to Table 4 on page 22.

Table 4 Configuration Sensor Settings

Option	Description
Start Point Offset	The distance from the measured material
Temperature Offset	The temperature offset from the measured material
Sensor Sections	Sensor calibration sections as determined in the calibration process. You can edit section settings manually by double-clicking the entry in the *Temperature Calibration Data* list.

Figure 14 Configuration Sensor Settings

5   To modify the section settings, double-click the entry in the list. The *Sensor Section* dialog box opens, where you can specify the section options as required. Refer to Table 5 on page 23.

Table 5 Section Settings

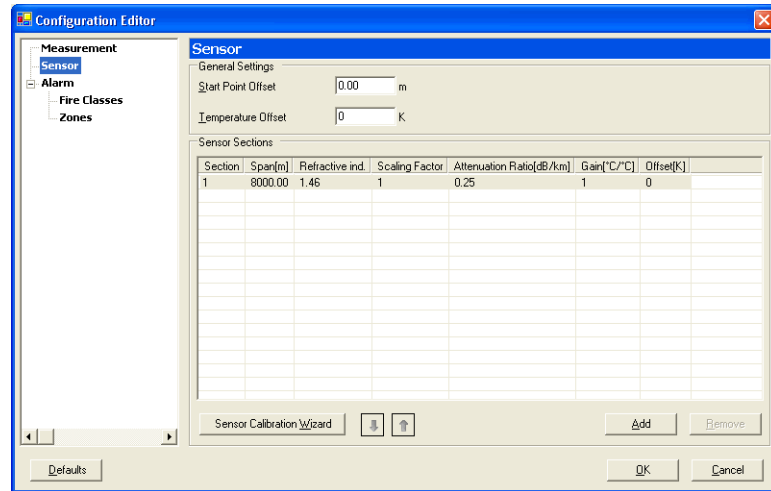| Option	Description
Span	The length of the section
Refractive Index	The refractive index
Scaling Factor	The scaling factor
Attenuation Ratio (dB/km)	The attenuation ratio
Gain	The gain correction
Offset (K)	The temperature offset

Figure 15 Section Settings
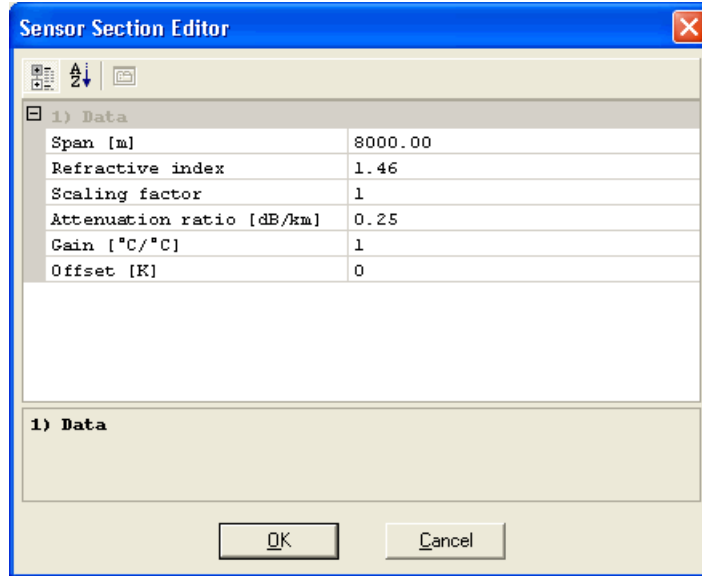
6   Select *Alarm* and specify the settings as required. Refer to Table 6 on page 24.

Table 6 Configuration Alarm Settings

Option	Description
Enable Alarm Handling	Flag to activate or deactivate alarms
Point of Return	Destination where the fiber changes the direction back to the instrument.
Confirmation Cycles	Number of alarm criteria repetitions before an alarm is raised
Reset Inputs	Through the selected inputs the alarms are reset.

7   Select *Alarm/Fire Classes* and specify the settings as required. Refer to Table 7 on page 24.

Table 7 Configuration Fire Class Settings

Option	Description
Fire Class Definition	Classes of fire where the fire sizes and the outputs that must be notified in case of individual fire class are defined.

Figure 16 Configuration Alarm Settings
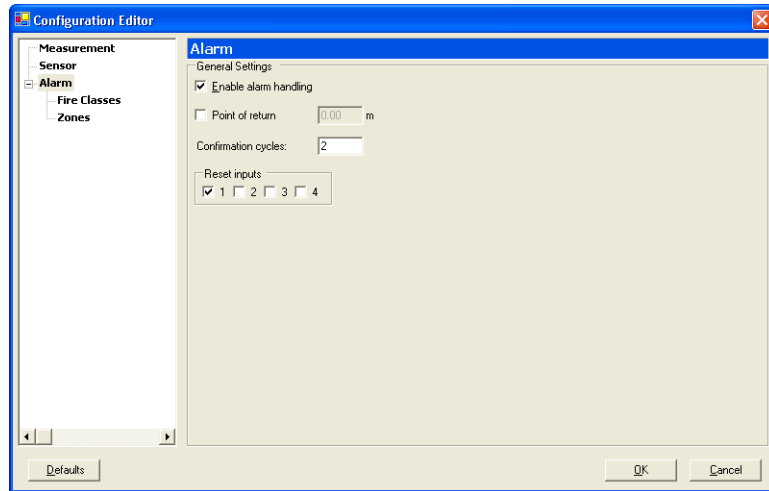
8   To modify the fire class settings, double-click an entry in the list. The *Fire Class Collection Editor* window opens. Specify properties of the selected fire class. Refer to Table 8 on page 25.

Table 8 Fire Class Settings

Option	Description
Size	The size of the fire
Outputs	The output that is going to be notified in case of a fire of defined size

Figure 17 Fire Class Settings
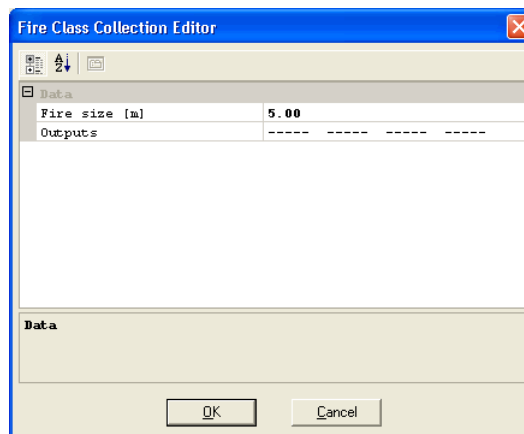
9   Select *Alarm/Zones* and specify the settings as required.

10 Click **Add**. The *Alarm Zone Editor* window opens. Specify the settings in this window as required. Refer to Table 9 on page 26.

Table 9 Configuration Alarm Zone Settings

| Option	Description
Alias	The name of the zone
Start	The zone start.
Span	The length of the zone. Alarm Zones with Span = 0 are ignored when running a measurement.
Zone Type	Zone types can be modified in the *AlarmZoneTypes.txt* file in the *DTS Configurator* folder. A new alarm type can also be added directly through GUI but will not be saved into the txt file for further use.
Maximum Check	Checking of maximum temperature at any point in the zone area is either enabled (true) or disabled (false).
Maximum Value	Maximum temperature that can be reached at any point of the zone before raising an alarm. The value is given in actual degrees (either C or F).
Minimum Check	Checking of minimum temperature at any point in the zone area is either enabled (true) or disabled (false).
Minimum Value	Minimum temperature that can be reached at any point of the zone before raising an alarm. The value is given in actual degrees (either C or F).
Positive Check	Checking of maximum positive differentiation of temperature to zone average before raising an alarm is either enabled (true) or disabled (false).
Positive Difference (K)	Maximum positive differentiation of temperature to zone average before raising an alarm. The value is given in kelvins.
Negative Check	Checking of maximum negative differentiation of temperature to zone average before raising an alarm is either enabled (true) or disabled (false).
Negative Difference (K)	Maximum negative differentiation of temperature to zone average before raising an alarm. The value is given in kelvins.

Table 9 Configuration Alarm Zone Settings

Option	Description
G1/2/3 Check	Checking of the G1/G2/G3 is either enabled (true) or disabled (false).
G1/2/3 Temperature (K)	The temperature can rise or fall for the defined number of kelvins in a specified time before raising an alarm.
G1/2/3 Time (s)	The temperature can rise or fall for the defined number of kelvins in a specified time before raising an alarm.
Outputs	The outputs that will be notified about an alarm in the defined zone.
FiberBreak Outputs	The outputs that will be notified in case of a fiber break in the selected zone.

Figure 18 Alarm Zone Settings
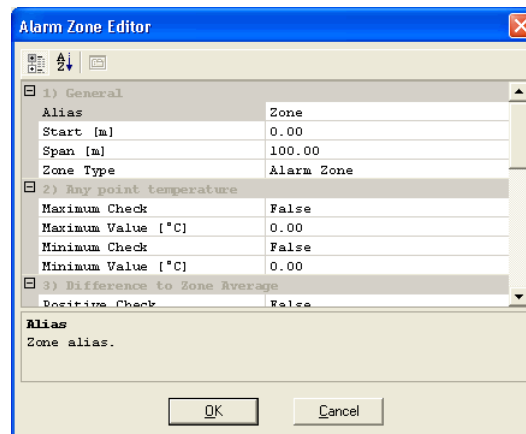
NOTE   Fiber break can be detected only in zone area; if it is required to detect a fiber break outside of the standard alarm area you must set up a zone through out the entire fiber length.

11 Click **OK** to save the settings.

12 Select a zone from the table and click **Clone** to create another zone with the same characteristics.

13 To modify the zone settings, double-click an entry and specify the settings in the *Alarm Zone Editor* window. Refer to Table 9 on page 26.

14 To delete a zone, select the zone from the list and click **Remove**.

15 To change the order of zones select a zone and move it by clicking the arrows below the list.

16 Click **OK** to save all configuration settings.

Modifying a Configuration

To modify an existing configuration you first need to select it and then in the *Edit* menu click **Configuration**. The *Configuration Editor* dialog box opens, where you can modify the measurement, sensor, and alarm settings. Refer to chapter "Creating a New Configuration" on page 21.

NOTE   The configuration files have the `.cfg` extension.

After changing the configuration attributes in the *Configuration Editor* edit dialog box, save your changes.

Copying a Configuration

To copy a configuration select the configuration you want to copy and perform one of the following:

- In the *File* menu select **Save As**. Specify a new name for the copy and click **OK**. The configuration is saved to the disk and renamed in the *File Explorer* pane. The original configuration is still stored on the disk.

- In the *Edit* menu select **Clone Configuration**. This option creates an exact copy of the currently selected configuration file.

Extracting a Configuration from a Trace

Trace files also contain the information about the configuration with which a measurement was initiated.

The DTS Configurator enables you to extract a configuration from a trace. This option creates a new Configuration file based on settings contained in a Trace file.

To extract a configuration, open the trace you want to use and in the *Edit* menu select **Extract Configuration**.

Downloading Configurations

The application also enables you to download configurations from the DTS instrument. To download a configuration follow the procedure below:

1 In the *Instrument* menu select **Download** and **Configurations**. The *Download Configurations* dialog box opens.
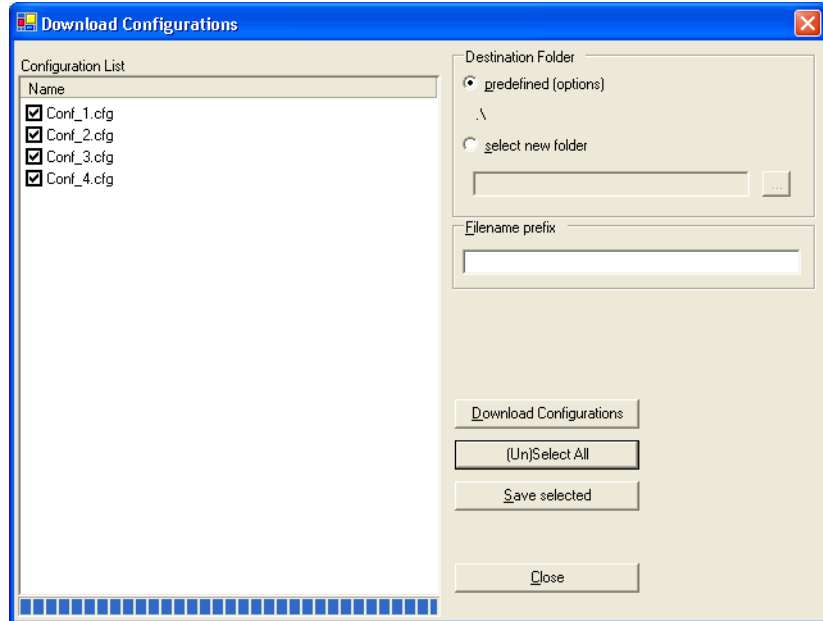
Figure 19 Download Configurations
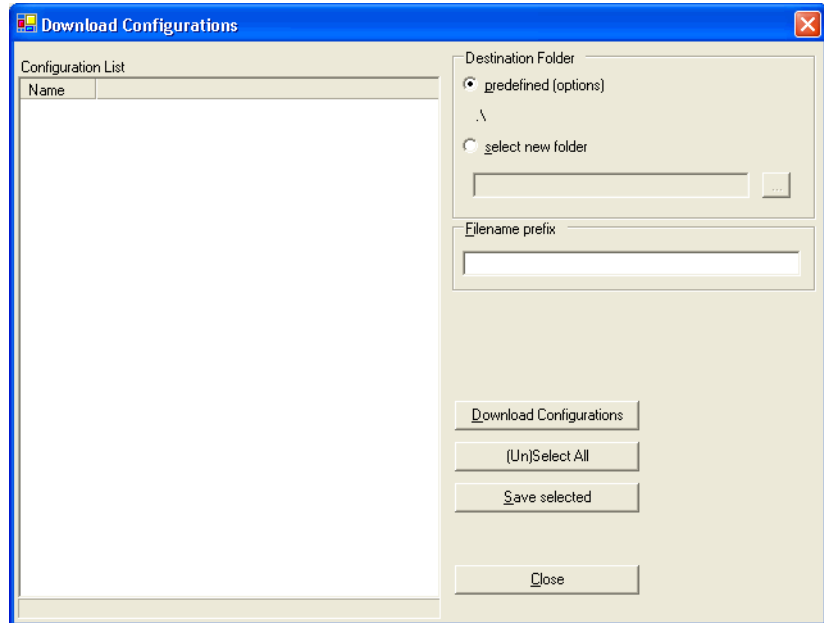
2 Click **Download Configurations** to start downloading configurations. You can monitor download progress and each downloaded configuration is added to the *Configuration List*.

NOTE   Invalid configurations will not be downloaded.

Figure 20 Save Downloaded Configurations

3   You can save downloaded configurations. Select the configurations you want to save by clicking the corresponding check-boxes.

4   Select the destination folder. You can save configurations to the default (predefined) folder, or select a different folder.

5   In the *Filename Prefix*, enter the prefix for the filenames. You can also leave this field empty. All configurations are saved under the filename consisting of the prefix you entered and their original name.

6   Click **Save Selected** to save the configurations.

To exit the *Download Configurations* dialog box, click **Close**.

Sequences

A sequence is a group of configurations that are a part of the same measurement process. When a sequence measurement is started measurements of all configuration in the list are triggered in the same order as the configurations are listed in the sequence.

Managing sequences involves the following:

- creating new sequences
  Refer to chapter "Creating a New Sequence" on page 31.

- adding configurations into a sequence
  Refer to chapter "Adding Configurations to a Sequence" on page 32

- modifying existing sequences
  Refer to chapter "Modifying a Sequence" on page 34.

- copying existing sequences
  Refer to chapter "Copying a Sequence" on page 34.

Creating a New Sequence

To create a new sequence of configurations, follow the procedure below:

1 In the *File* menu click **New** and select **Sequence**. A new sequence item is added in the File Explorer.

2 Select the new sequence and then in the *Edit* menu click **Sequence**. The *Sequence Editor* dialog box opens. The window opens also if you double-click the sequence or right-click it and select **Edit**.

3 Select *General* and specify the required settings. Refer to Table 10 on page 31.

Table 10 The Sequence Settings

Option	Description
Repeat	Frequency of repeated sequence measurements. Each measurement cycle starts with the first configuration and ends with the last configuration in the sequence.

4 Select *Files* and specify the configuration files that will be a part of the new sequence. Refer to Table 11 on page 32.

Table 11 The Sequence Files

Option	Description
Files	The list of configuration files that are included into the sequence (see "Adding Configurations to a Sequence" on page 32).

Adding Configurations to a Sequence

To add a configuration to a sequence:

1   Open the *File Explorer* pane.

2   Click on a configuration and drag the configuration into a sequence. You can put up to four configurations into a sequence.

NOTE   Each added sequence receives a name prefix C1. If you add the same configuration twice the second added configuration will be renamed with prefix C2, C3, etc.
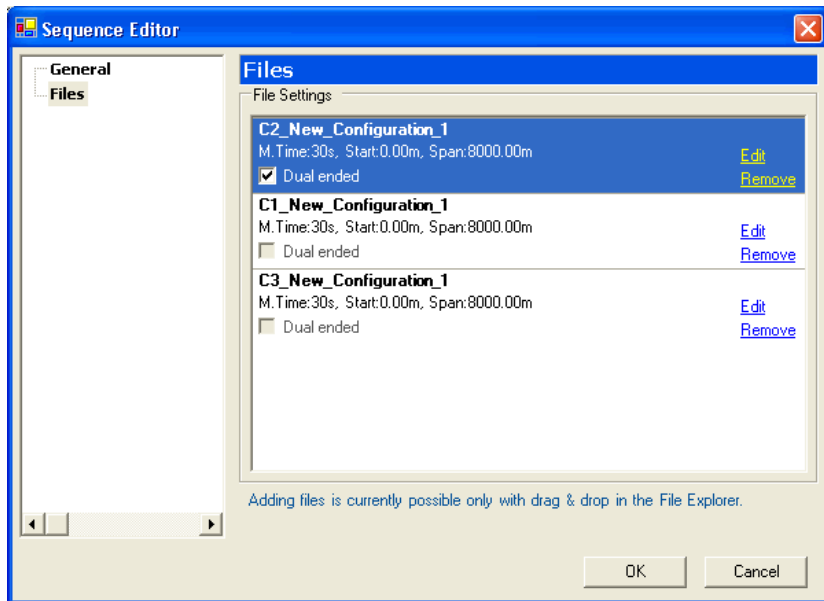
Dual-Ended Configuration Within a Sequence

One sequence can contain up to four configurations or up to two dual ended configurations. To define whether a configuration is dual-ended or not:

1   Double-click a sequence.

2   Select *Files* and check the dual-ended check box for the dual-ended configuration, meaning the dual-ended measurement is enabled.

Possible combinations of configurations are:

•   Up to four single-measurement configurations

•   One dual-ended and up to two single-measurement configurations

•   Two dual-ended configurations

Figure 21 Dual-Ended Configurations

Modifying Configuration Within a Sequence

In the *Sequence Editor* window you can also edit configurations or remove them from a sequence. To modify a configuration:

1   Double-click a sequence.

2   Select *Files* and click Edit. See "Modifying a Configuration" on page 28 for more details.

3   Click **OK** to save the changes.

4   When you change a configuration within a sequence you do not save the actual configuration but you need to save the sequence.

5   To rename a configuration within the sequence select the configuration, click the name of the configuration and insert new name.

6   To change the order of configurations click and drag aconfiguration into the desired position.

N O T E   You can drag the configuration from a sequence into the **Configurations** folder where its name receives a prefix C1.

Modifying a Sequence

To modify an existing sequence select it and then in the *Edit* menu click **Sequence**. The *Sequence Editor* dialog box opens, where you can modify the settings. Refer to chapter "Creating a New Sequence" on page 31.

NOTE   The configuration files have the `.seq` extension.

After changing the sequence attributes in the *Sequence Editor* edit dialog box, save your changes.

Copying a Sequence

To copy a sequence select the sequence you want to copy and perform one of the following:

·   In the *File* menu select **Save As**. Specify a new name for the copy and click **OK**. The sequence is saved to the disk and renamed in the *File Explorer* pane. The original sequence is still stored on the disk.

·   In the *Edit* menu select **Clone Sequence**. This option creates an exact copy of the currently selected sequence file.

Measurements

Managing measurements involves the following:

- starting measurements
  Refer to chapter "Starting a Single Measurement" on page 35.

- viewing and saving measurement traces
  Refer to chapter "Viewing a Running Measurement Trace" on page 36.

Starting a Single Measurement

You can start a single measurement with new or existing configurations.

NOTE   If user authorization mode is set, you must be logged in before you can start a measurement.

To start a single measurement perform the following steps:

1 Create a new configuration or select an existing configuration.

2 In the *Instrument* menu click **Start Measurement**.

NOTE   A measurement can be started only if the default DTS instrument is specified. Refer to chapter "DTS Instrument Discovery" on page 15.

When a measurement starts, a new item appears under *Traces* in the *File Explorer* pane, indicating a running measurement.

Once the application is started it starts to pick up the actual traces of a running measurement. The running measurement must be started previously by any user.

To stop the measurement click **Stop Measurement** in the *Instrument* menu.

When connected to the particular DTS instrument, all running measurements are monitored and visualized. In the following scenarios a new running trace is automatically created and the visualization begins as soon as the next trace data arrive:

1 The DTS instrument is measuring and the DTS Configurator has just been started.

2 The DTS Configurator is running and someone starts a measurement from another connection to the DTS instrument (DTS instruments support more than one connection, i.e. connection types).

Starting a Sequence Measurement

You can start a sequence measurement with new or existing configurations.

NOTE   If user authorization mode is set, you must be logged in before you can start a measurement.

To start a sequence measurement perform the following steps:

1   Create a new sequence or select an existing sequence (see "Creating a New Sequence" on page 31).

2   In the *Instrument* menu click **Start Measurement**. For each configuration of the sequence a trace graph will be displayed in the *Data Visualization* pane.

Viewing a Running Measurement Trace

While a measurement is in progress, you can view the measurement trace and measurement status.

In the *Instrument* pane you can track the progress of the measurement. The number of created traces and the status of the measurement are displayed.

Figure 22 Measurement Data in the Instrument pane

The *Visualization* pane enables you to:

•   zoom in and out

•   pan the view

•   save picture

•   send the graph to the printer

These options are available in the graph context menu. To access the context menu, right-click in the graph area.

To zoom in on a specific part of the graph, click and drag a rectangle in the area you want to view. To view markers on the zoomed-in part of the graph click the Center Markers icon. The markers will display on the graph only if the graph contains at least two intersection points.

Figure 23 Zooming In
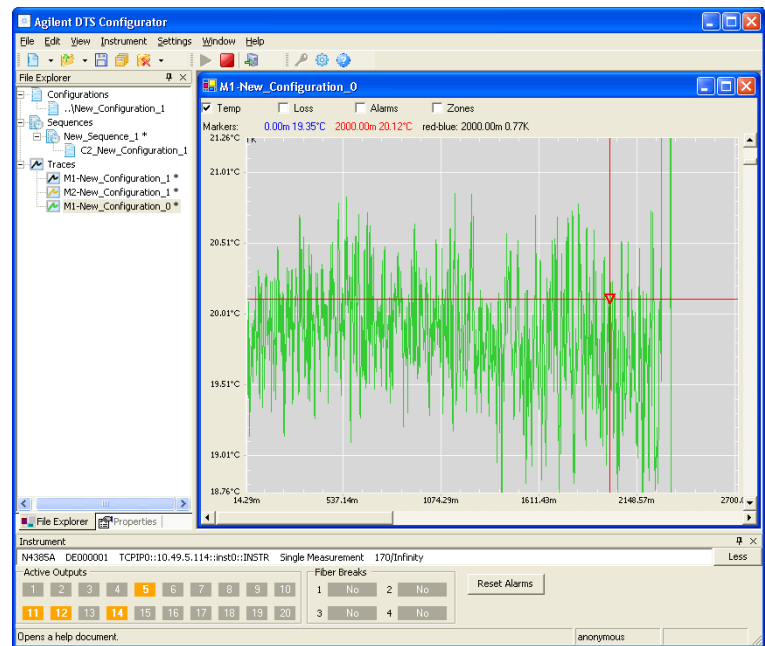
During a measurement you can define what kind of data you want to track.

1 Select a trace of a running measurement.

2 Select *Temp*, *Loss*, *Alarm*, and/or *Zone* to track selected data and display any of the selected status panes.

NOTE   The type of data you defined in the **Data Saved** property in the **Configuration settings** (see "Creating a New Configuration" on page 21) is always tracked.

There are two types of traces:

• **Intermediate trace** is a trace that occurs during the measurement and is marked with red color. This measurement is not saved, it is displayed only as intermediate information. The interval for intermediate trace is set in the *Configuration* settings, under *Measurement -> Update Time* (see "Creating a New Configuration" on page 21).

• **Measurement trace** is a final trace, displayed when the measurement is finished. This measurement is marked with black color. The interval for measurement trace is set in the *Configuration* settings, under *Measurement -> Time (min)* and *Time (s)*.

When a measurement finishes, you can save the measured results in the trace file. Select the finished trace in the *Traces* tree and in the *File* menu click **Save**.

Traces

Managing traces involves the following:

- creating new traces
  Refer to chapter "Creating a New Trace" on page 38.

- viewing a trace
  Refer to chapter "Viewing a Trace" on page 38.

- copying existing traces
  Refer to chapter "Copying a Trace" on page 39.

- downloading traces
  Refer to chapter "Downloading Traces" on page 40.

Creating a New Trace

A new trace is automatically created with each new measurement. When a measurement starts, a new trace item is added in the *Traces* tree in the *File Explorer* pane. The newly created trace automatically inherits the configuration settings with which the measurement was started.

Viewing a Trace

To view a trace of a measurement:

1 In the *File* menu right-click a trace and select **Show Graph**. The measurement graph will open in the *Data Visualization* pane.

2 To view another trace of a measurement, repeat the above with another trace. Both graphs are now visible in the *Data Visualization* pane. You can simultaneously view up to 4 graphs.

N O T E   If more than one graph window is open and you selected a full page view (by maximizing a graph window) select another open window by pressing ctrl + tab key.
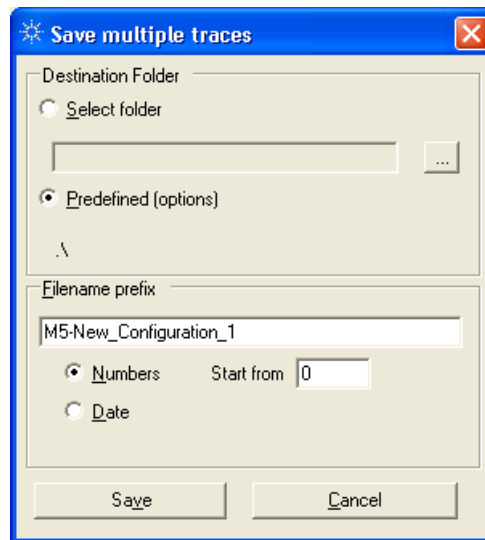
Saving Multiple Traces

Manual saving of multiple traces is possible only when the following settings are set:

- In *Settings* – > *Options* go to **Traces** and leave the *save multiple traces in single file* check box unchecked.

- In *Settings* – > *Options* go to **Traces/Auto Save** and leave the *enable* check box unchecked.

To save multiple traces:

1 When a measurement is finished, click the **Save** button and *Save Multiple Traces* window appears.

Figure 24 Save Multiple Traces

2 Select the folder or leave default folder, define the document prefix and according to which data the traces should be saved.

3 Click **Save** to save multiple traces.

Copying a Trace

To copy a trace, open the trace you want to copy and perform one of the following:

- In the *File* menu select **Save As**. Specify a new name for the copy and click **OK**. The trace is saved to the disk and renamed in the *File Explorer* pane.

- In the *Edit* menu select **Clone Trace**. This option creates an exact copy of the currently selected trace file.

Downloading Traces

The application also enables you to download measurement traces from the DTS instrument. To download a trace follow the procedure below:
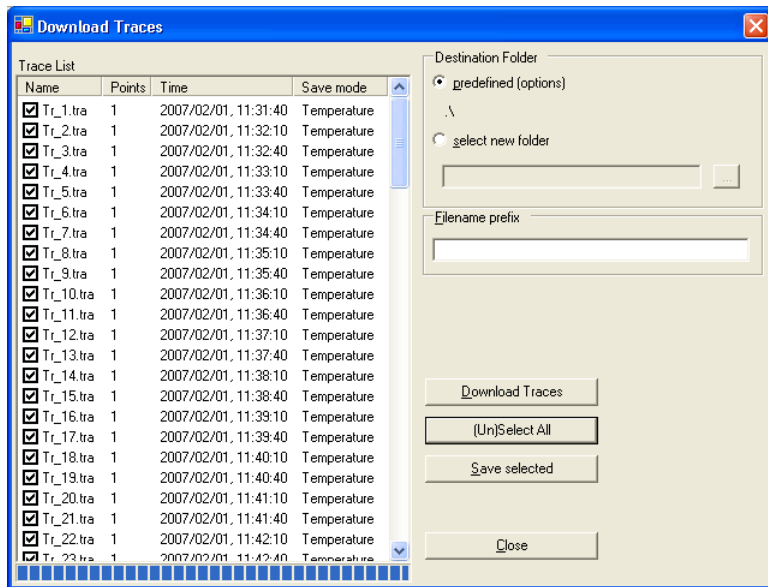
1 In the *Instrument* menu select **Download** and **Traces**. The *Download Traces* dialog box opens.

Figure 25 Download Traces
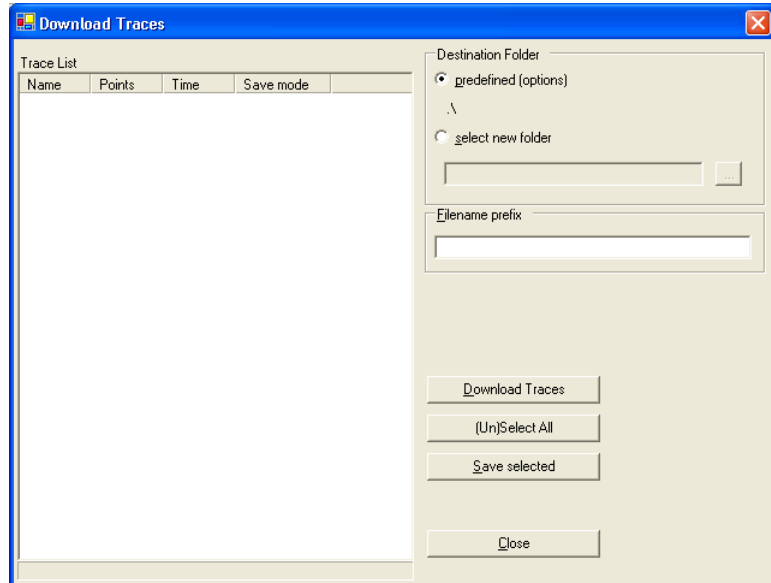
2 Click **Download Traces** to start downloading traces. You can monitor download progress and each downloaded trace is added to the *Trace List*.

Figure 26 Save Downloaded Traces

3 You can save downloaded traces:

a Select the traces you want to save by clicking the corresponding check-boxes.

b Select the destination folder. You can save traces to default (predefined) folder, or select a different folder.

c In the *Filename Prefix* enter the prefix for the filenames. You can also leave this field empty. All traces are saved under the filename, consisting of the prefix you entered and their original name.

d Click **Save Selected** to save the traces.

4 To exit the *Download Traces* dialog box, click **Close**.

3
Users

Introduction

DTS Configurator features a multi-user management and login system.

The purpose of this feature is to provide a secure environment for instrument discovery, instrument modification, and for starting or stopping the measurements. Only registered users (users with a username and password) have access to these functionalities.

Logging In

The application can run in two modes:

- anonymous mode
- user authorization mode

When you first install the application, there are no predefined users and the application will work in the anonymous mode (no authentication is required).

As soon as the first user is configured, the application starts working in user authorization mode and authorization is required.

N O T E   If you want to switch from user authentication mode back to anonymous mode, you have to delete all configured users.

In the user authorization mode you need to log in to perform the following actions:

- start a measurement
- stop a measurement
- configure the DTS instrument (perform DTS discovery, set instrument settings)

To log in, perform the following procedure:

1   In the **Settings** menu, select **Login** to open the *Login* dialog box or click the **Login** icon on the toolbar.

2   Enter your username and password and click **OK**.

N O T E   If the *Auto logout after x minutes* checkbox is enabled, you will be automatically logged out when the specified time in minutes elapses.

Figure 27 Login Dialog Box
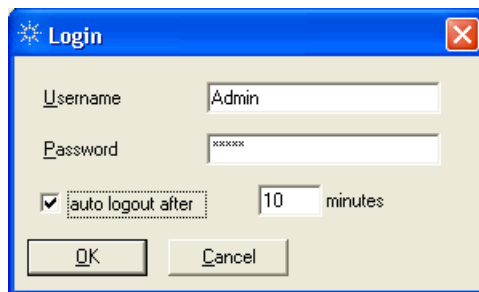
T i p :   If you are not logged in and want to start or stop a measurement, or configure the DTS instrument, the *Login* dialog box opens automatically.

Administering Users

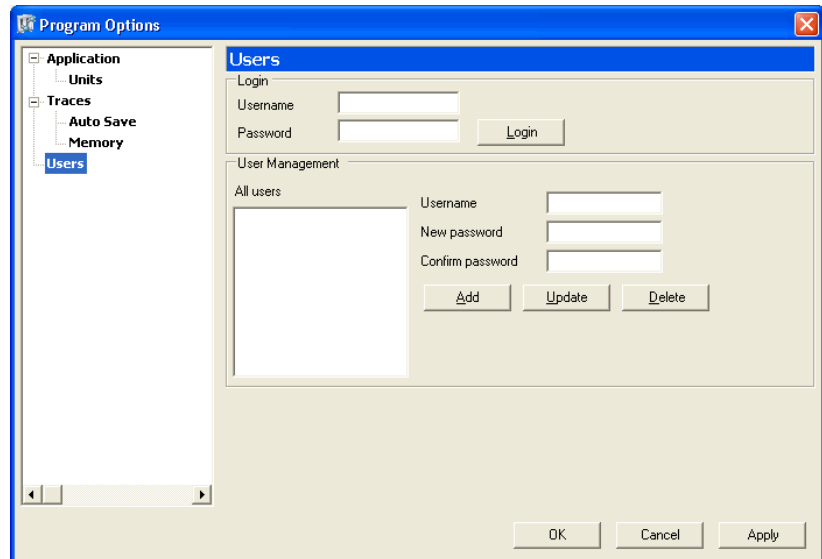All registered users can add, modify and delete other users.

For user administration perform the following:

1 In the **Settings** menu select **Options** to open the *Program Options* dialog box.

2 Select **Users** from the tree.

This dialog box enables you to:

- Add users
  Enter a new username and password, and reenter the password in the *Confirm Password* field. Click **Add** to save this user.

- Modify users
  You can only change the user password. In the list double-click the user you want to modify or insert username in the *Username* field, enter a new password and confirm password. Click **Update**.

- Delete users
  In the list select the user you want to delete and click **Delete**.

Figure 28 User Administration