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Welcome to TSI Detection Management Software (DMS) and Functionality

TSI Detection Management Software DMS is used to record, report, chart and analyze data collected for assessment of select occupational health hazards in the workplace. Designed for dosimetry, sound level measurements, heat stress assessments and environmental monitoring, the software helps safety and occupational professionals:

- Retrieve, download, share and save instrument data
- Generate insightful charts and reports
- Export and share recorded data
- Perform “What If” analysis and recalculate data based on selected time intervals
- Set up instruments and check for firmware updates

Supporting Instrumentation

DMS is a robust data management software program which enables the end-user to analyze data downloaded from the TSI Quest’s instrument family. The following instruments are supported:

	<p>Noise Dosimetry: All NoisePro models DL, DLX, DLX-1 and the Edge 3/4 and the Edge 5</p>
	<p>Sound Level Meters: the SoundPro SL/DL Series and the Sound Examiner Series SE-401/SE-402</p>
	<p>Environmental monitoring and Air Quality: The EVM Series EVM-7, EVM-4, EVM-3</p>
	<p>Heat Stress monitoring: QUESTemp^o 34/36, QUESTemp^o 44/46/48N, QUESTemp II (Personal Heat Stress Monitor).</p>

System Requirements

DMS requires the following minimum specifications:

<ul style="list-style-type: none"> • Pentium 4, 3 GHz or later • Windows® XP SP3, Windows® Vista, Windows® 7, Windows® 8.1, and Windows® 10 (both 32 & 64-bit) operating systems • 70 to 135 MB of disk space, depending on installed components • 2 GB RAM • 1280 x 1024 pixels x 32-bit color display or better • Keyboard and mouse (or pointing device) • Microsoft .Net V4.0 Framework (Automatically installed if not present) 	<ul style="list-style-type: none"> • Supported languages: <ul style="list-style-type: none"> ○ English ○ Spanish ○ Chinese (Simplified) ○ Korean ○ Portuguese ○ German ○ French ○ Italian ○ Russian ○ Japanese ○ Turkish ○ Czech ○ Polish ○ Swedish ○ Norwegian.
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DMS Updates

DMS updates are released periodically as new items are added and changes are made to the software. When DMS is started, it checks for a new release and will display an update banner on the Start page when found.

NOTE: To check the version you are currently running, click **Help** and then select **About TSI Detection Management Software** from the main menu bar.



Update banner:
Click to install the update.

- 1 To install the new release, click on the banner and the update installer will be downloaded via your web browser.
- 2 Save the installer to your local file system.
- 3 Close DMS.
- 4 Start the installer and follow the prompts. (Allow a few minutes for the update.)

Start Page Overview

About Detection Management Software

The Start page is the first screen you visit when you open/launch DMS. The Start page features the **Setup**, **Download**, and **Data Finder** buttons enabling you to quickly access the major functions of the software. These functions include configuring instrument setup, downloading data, viewing your data, and customizing reports, just to name a few.

Navigation

Setup and Download

When either the Setup or Download buttons (see ① and ②) are clicked, the instrument communications page will open. The primary functions there include:

- **Instrument Setup** (or Configuration) for customization of setup parameters
- **Instrument Download** for downloading/retrieving session data from the instrument, and
- Access to “**Quick Setup**” for primarily date/time setting.

NOTE: Depending on the instrument selected, there may be other selectable Quick Setup parameters.

Data Finder

When the **Data Finder** button (see ③) is clicked, the data finder page will open to provide you access to your downloaded data files. The page is organized in a tabular format by instrument family (sound level meters, dosimetry, heat stress, and environmental monitoring.) session data and study data. (See “[Glossary](#)” for session and study data terms.)

Recent Sessions

The bottom of the screen displays **Recent Sessions** (see ④) for accessing your previously accessed data files.

Start Page Button

A button with the DMS logo is located on each of the navigational pages: instrument communications (setup & download) data finder, and session/data pages. This is used to quickly return to the start page to navigate to DMS features.

Help prompts

The DMS quick help viewer screen provides a summary of the main screen/button components on each page. For additional information, access the online help manual by clicking on **Help | Content**.

Primary navigation:

- (1) **Setup**
- (2) **Download**
- (3) **Data Finder** (look at your session data or use Quick Report feature)
- (4) **Recent Sessions**

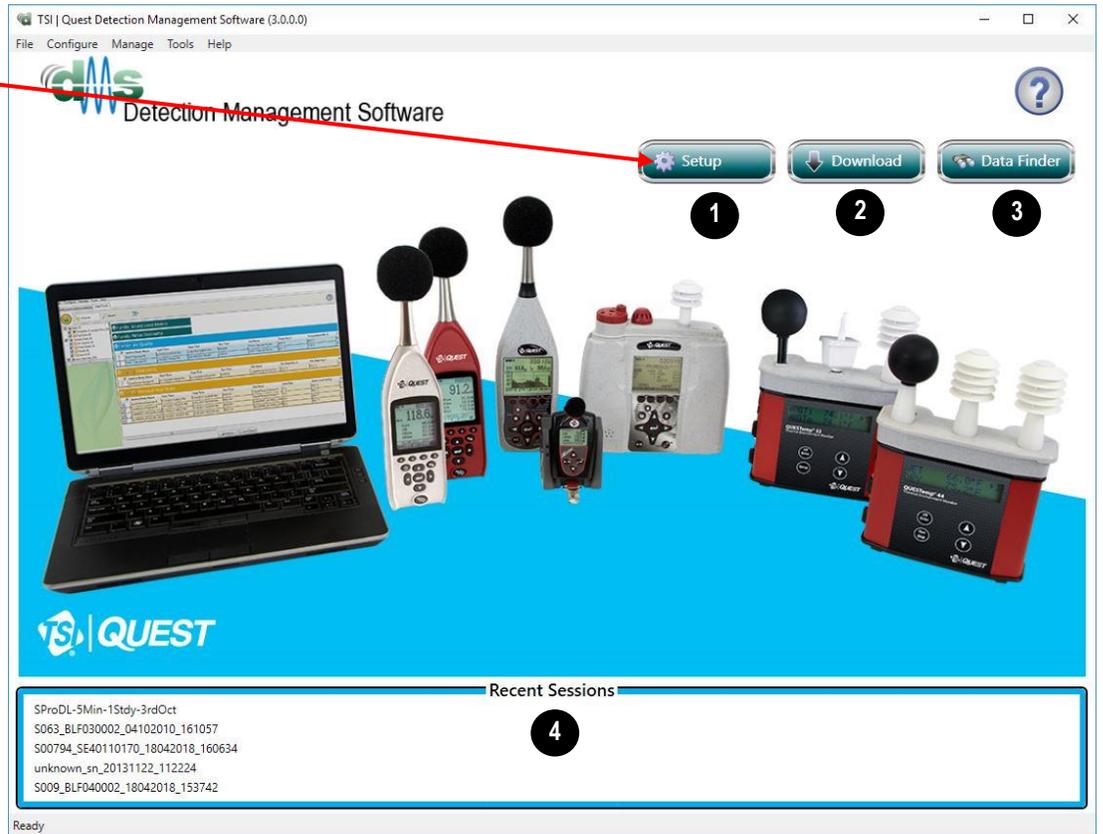


Figure 1-1: Start up screen

Instrument Setup/Download

The Instrument Communications' screen is used to configure your instrument's parameters, download/retrieve instrument data, and configure quick setup options (such as the time and date settings).

Instrument Communications Layout

The screen is organized by a family of instruments (see ❶), instrument type (see ❷), and model (see ❸). Once appropriate instrument and model is selected from the left-hand panel, expand either the **Setup** panel for setup parameters (see ❹), the **Download** panel to retrieve your instrument data (see ❺), and/or the **Miscellaneous Setup** panel for simplistic instrument parameters (see ❻).

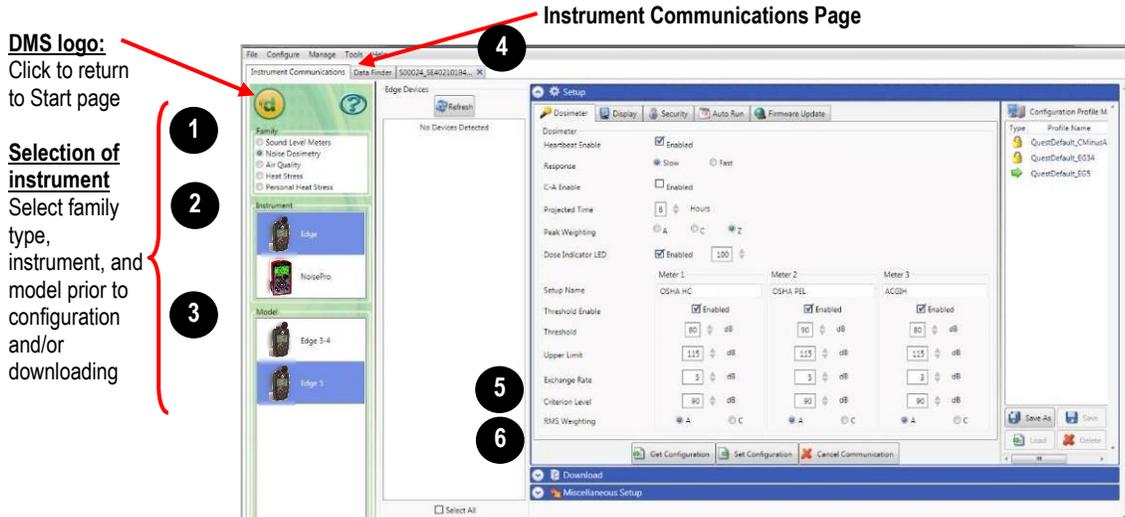


Figure 1-2: Instrument communications overview

Opening the Instrument Communications Page

The Instrument Communications' screen is accessible via the or buttons accessed from the start page.

Once opened, the setup, download, and/or miscellaneous setup panels are selectable via the / (expand/collapse) buttons. A general overview of each panel is explained below.

Setup

When the **Setup** button is selected from the Start page, the setup panel is expanded and viewable. The setup screen is organized with setup tabs. When selected, the tab will list a set of features which can be selected, saved, and sent to the instrument. (Please refer to the specific instrument model for details on instrument setup.)

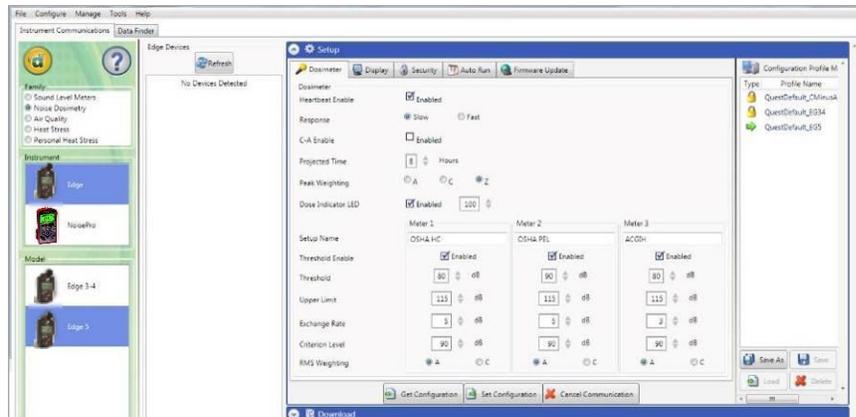


Figure 1-3: Setup panel

Download

When you download the data via the the download feature, the data is stored and viewable via the data finder page with advanced charting, tables, and reporting capability. The information is viewed in customizable tables and/or charts in the panel layout page.

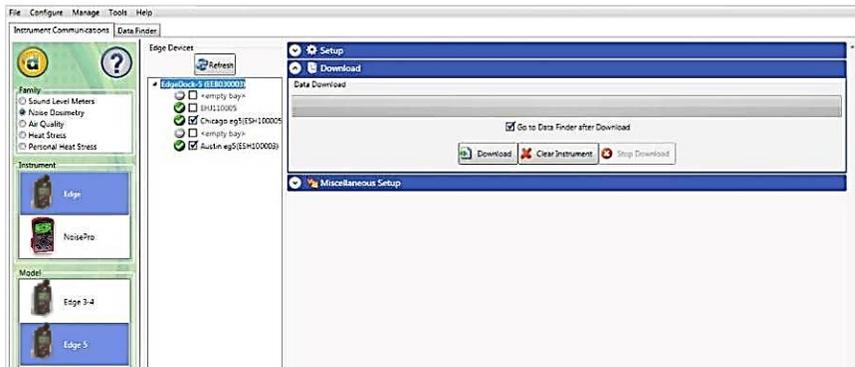


Figure 1-4: Download panel

Miscellaneous Setup

"Miscellaneous Setup" panel features are specific to the currently selected instrument (see 1). It provides an express setup method for simplistic setup parameters, such as time and date configuration. Expand the **Miscellaneous Setup** title bar to access this page.

NOTE: To expand, click on the  icon in the panel header.

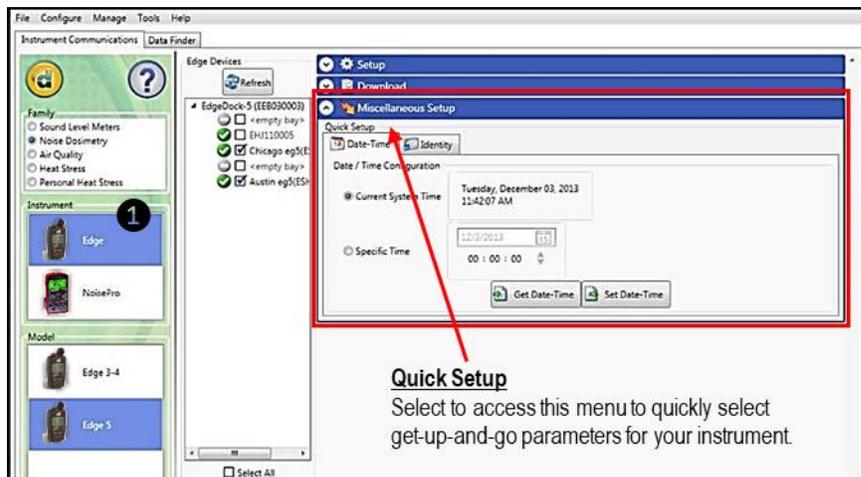


Figure 1-5: Miscellaneous setup

Data Overview and Data Finder Page

The Data Finder page stores all of your data after the instrument data files are downloaded into the software. The default page displays the data in a tabular format sorted by family products including acoustics (SLM), dosimetry (Noise), heat stress, and environmental monitoring (EVM) as displayed below.

- **About the data table:** the data table headings can be used as a guide to understand your data. In the Figure 1-6, you may want to view specific measurement information from a SLM study with a run-time of 25+ hours and a start date of 4/21/2011. Using the table, you can quickly scan to the run-time and start time fields and locate the specific study.

Selecting your Data in the Data Finder Page Details View

The explanation below describes how to select your data from the default “Details” view.

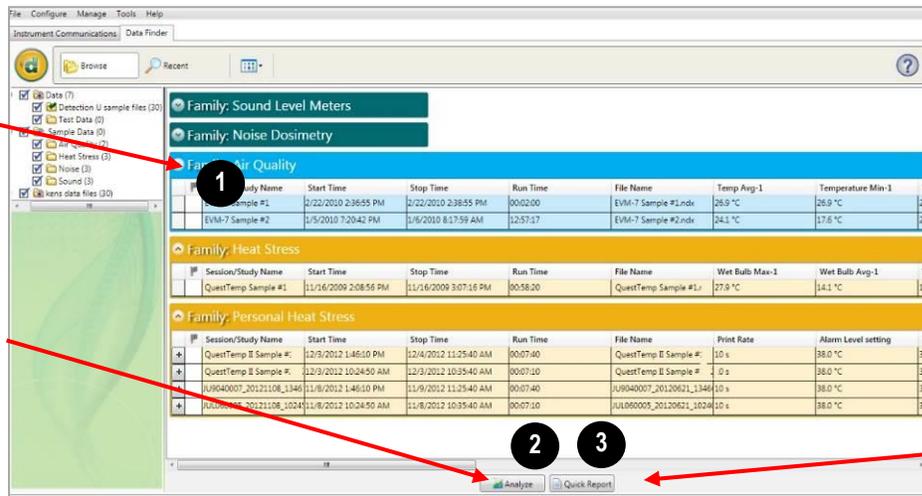
1. In the **Data Finder** page, select your data by expanding the table with the desired instrument family heading.
2. (Optional) Expand the session data to view the study details via the **+** button.
3. To select the data and/or review a report, do one of the following:
 - **Double-click** on a Session/Study (see **1**).
 - Select a Session/ and click the **Analyze** button (see **2**).
 - Select a Session/Study and click the **Quick Report** button (see **3**).

Selecting session data

Double-click and a new window will open presenting your data in customizable charts and tables.

Analyze

Opens to the data page with charts and tables organized into panels.



Data Table Headings

Each menu is customized with “base” attributes per specific family. Optional functions: the table headings can be sorted and rearranged similar to Microsoft® Excel® spreadsheet program.

Quick Report

Figure 1-6: Selecting your data in the Data Finder Page

Data Finder Page and Customizing Views

The Data Finder page has two primary viewing features to help you quickly navigate to your data which include: Browse and Recent. At any time, click on the **Browse** button (see **1**) to return to the **Start** page or select the **Instrument Communications** tab (see **2**) for setup or downloading data.

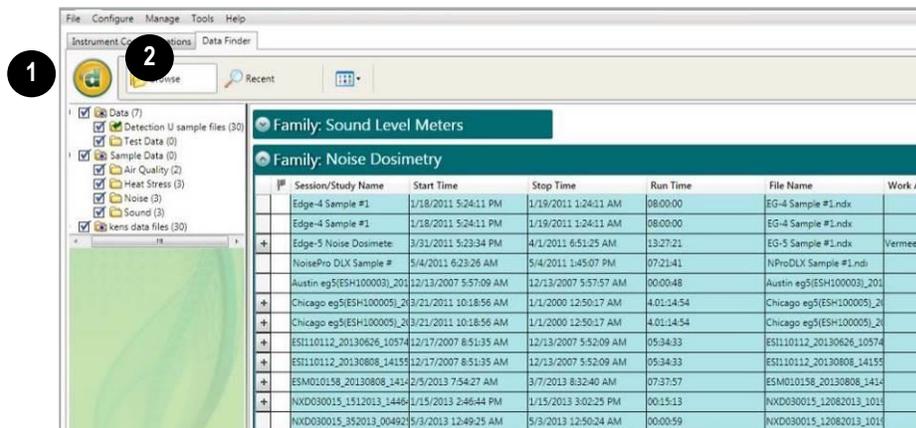


Figure 1-7: Data finder page view

Browse

The **Browse** viewing feature is used to find your data based on a folder tree with selectable checkboxes (see **1**). Click on the checkbox to the left of a folder to select/clear its selection. When a folder is selected, the files located in that folder will be shown in the main data area. The number in parentheses following each folder name indicates the number of data files in that folder. You may “attach” additional folders to the folder tree by right-clicking in a blank area near the folder tree and selecting **Attach Folder**. You may also right-click on an individual folder and obtain a context menu presenting additional folder-related functions such as selecting/deselecting subfolder, adding new subfolders, refreshing folders, and rebuilding folders.

While using Data Finder, the following three views are available to organize your data. Click on the **Views** drop-down menu to select a view (see **2**). Details view is the initial default view when DMS is first run. For subsequent runs, DMS will display the last-used view.

NOTE: These three views are also available in the **Recent** viewing feature of Data Finder.

- **Details view (see **3**)**

Details view is the initial default view when DMS is first run. It is a table-formatted view sorted by family, instrument, and session/study data. It also provides some summary data information enabling you to quickly scan through the measurement values/data.

Session/Study Name	Start Time	Stop Time	Run Time	File Name	U
Sound Examiner Sample	1/2/2011 10:09:14 AM	1/2/2011 3:14:28 PM	05:05:14	Sound Examiner Sample	
LabTest #1 x	7/20/2011 4:57:31 PM	7/20/2011 4:58:40 PM	00:01:09	LabTest #1.ndx	61
S00006_SE40210194_12072	10/22/2012 10:45:38 AM	10/22/2012 10:46:34 AM	00:00:56	S00006_SE40210194_12072	27
S00007_SE40210194_12072	11/7/2012 10:37:06 AM	11/7/2012 10:37:24 AM	00:00:18	S00007_SE40210194_12072	
S00008_SE40210194_12072	11/7/2012 10:37:28 AM	11/7/2012 10:38:28 AM	00:01:00	S00008_SE40210194_12072	
S00009_SE40210194_12072	11/13/2012 12:16:27 PM	11/13/2012 12:16:28 PM	00:00:01	S00009_SE40210194_12072	86
S00010_SE40210194_12072	11/13/2012 12:16:29 PM	11/13/2012 12:16:32 PM	00:00:03	S00010_SE40210194_12072	
S00011_SE40210194_12072	11/14/2012 9:42:35 AM	11/14/2012 9:43:57 AM	00:01:22	S00011_SE40210194_12072	
S00012_SE40210194_12072	11/14/2012 9:45:56 AM	11/14/2012 9:46:31 AM	00:00:35	S00012_SE40210194_12072	

Figure 1-8: Data finder page sorted by details (default)

- **Icon view (see **1**)**

Icon view displays each file with a large instrument family icon along with the name of the instrument (or serial number) sorted alphabetically.

NOTE: If you cursor over the icons, it will display the file location and the filename (ending in an .ndx extension).

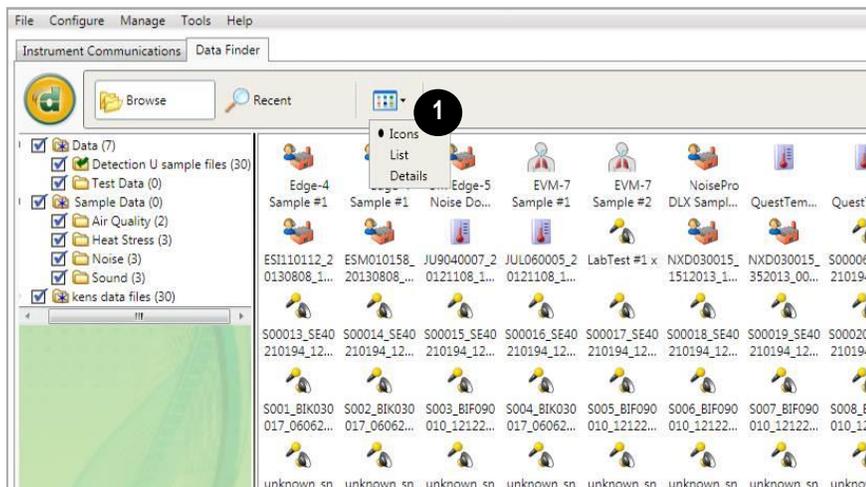


Figure 1-9: Data finder: sorted by icons

- **List view (see 1)**

List view displays a small instrument family icon along with the name of the instrument (or serial number) sorted alphabetically.

NOTE: If you cursor over the icons, it will display the file location and the file name (ending in an .ndx extension).

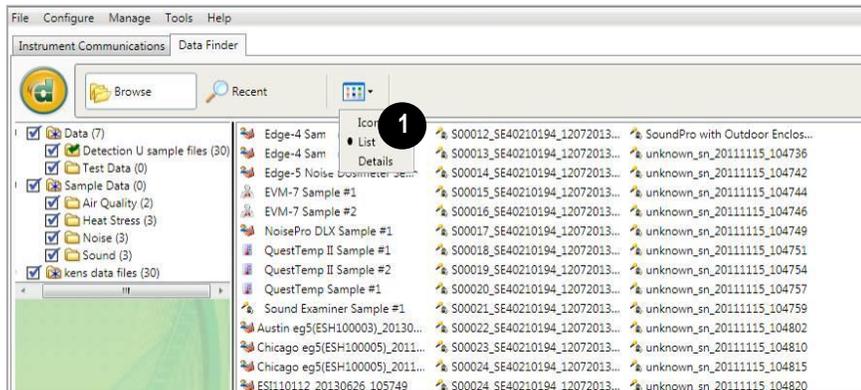


Figure 1-10: Data finder: sorted by list view

Recent

The **Recent** viewing feature is used to find your data based on “age filter” criteria (see 1) that includes the file creation time (or the time it was downloaded into the software) and the start time.



Figure 1-11: Viewing recent data

Data Management

Anytime you open a data/session file for analysis or reporting, a new page will be created for it in the same tab control containing the Instrument Communications and Data Finder pages. The data/session files will remain open until you close them by clicking on the “x” on the right side of the tab. The examples below display two data/session tabs opened for viewing and analysis (although not simultaneously).

Data and Charts Overview

When you open or view the downloaded data, charts are created automatically. Different charts are available for different types of instruments. Also, different charts are available for file summaries and for individual tests (noted as “Sessions”) within a data file. The charts and tables are explained below.

Chart/Tables	Explanation
Information Panel	Shows “general” information related to the test/session. Some examples include the start and stop time, the instrument/device name, and the instrument/device model. These parameters are customizable via the button.
General Data Panel	Shows summary data with configured setting parameters. As an example for noise dosimetry files, you may display average, maximum, minimum, and peak values with log rate time and run-time. These parameters are customizable via the button.
Logged Data Chart/Table	Shows the logged measurements over the run-time in a chart or table format (also called time history data). Measurement parameters are selectable via the button. For example, in noise dosimetry files, a history chart shows noise exposure levels over time. In heat stress data files, a history chart shows heat stress exposure levels over time. History charts are available in all types of data files.

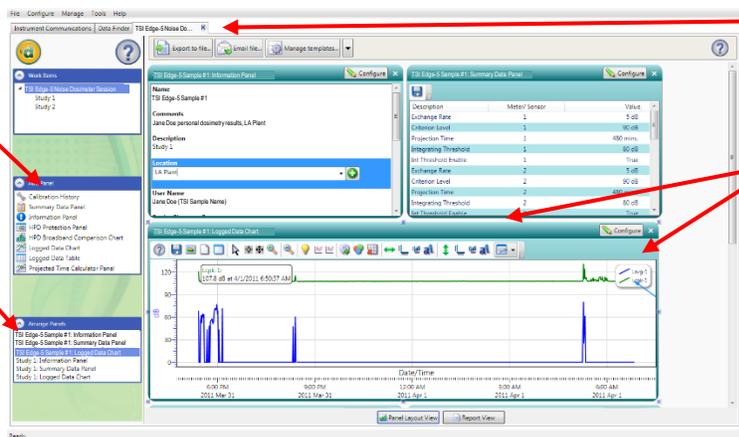
Chart/Tables	Explanation
Statistics Chart/Table	Shows the amplitude distribution for noise data which is the percentage of samples that occurred at each sound level measured. (You can also think of this as the percentage of time that noise was recorded at a particular decibel level.) Statistics chart and tables are available in noise and sound data files. These parameters are customizable via the  button.
Exceedance Chart/Table	Shows the percentage of time that samples occurred above a particular decibel level. Exceedance charts and tables are available in noise and sound data files. This is customizable via the  button.
Filter Summary Chart/Table	Shows summary data in each filter band for advanced sound level measurements. NOTE: The measurement type is selectable. For example, if Leq is selected, it will display the data in each octave band if applicable.

Data View

The data view page is designed with the flexibility and quick customization to add charts and tables via the **Add Panels** palette. The **Arrange Panels** palette is used to view the opened panels and allows you to click and drag them into different positions. Another option to rearrange the order of the charts and tables is to click, drag, and drop the panels into different positions in the panel section of the screen.

When a session or study file is opened, it will display in the **data view page**. The page is organized into session panels which reside in the main section of the screen. The palettes on the left-side of the screen are used to select, add tables and/or charts, and view the arrangement of panels.

NOTE: The data view is sized into different dimensions to fit your needs such as 2x2, 2x3 1x1 by clicking, dragging, and dropping a panel when the title bar is selected.



Chart/Tables:

- Add panel

Arrange panels

Data sessions opened display on the top tab control with type of chart/table title.

Data arranged in panels

Figure 1-12: Data layout page

Adding Data Panels

Adding a chart or a table to view, analyze, and report your measurement data is one of the most robust tools of DMS. With the “Add Data Panel” palette, you have the ability to add and customize the data to fit your needs. To add a panel, please follow below:

1. Double-click a chart or table type listed in the **Add Panel** palette. Once added it will append to the bottom of panels.
NOTE: The Arrange Panels displays the order of the tables and charts (or panels).
2. Click on a chart or table and press **Enter** (from your keyboard). It will add to the end of the page.

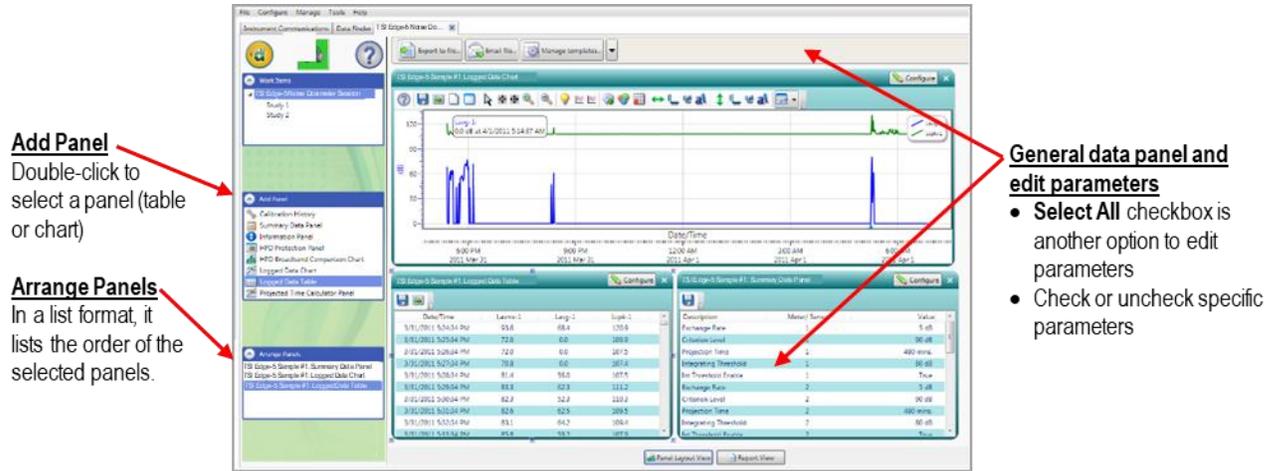


Figure 1-13: Panel layout page and adding panels

Managing Templates (saving templates, remember settings, reset)

The Manage Templates button located on the Data View page may be used to save the layout of the panels (charts and tables). As discussed above, you may customize the data and position them in a specific order by using the Add and Arrange panels features. Once you have customized the layout, typically users will save this as a template and apply it as the main data page in order to apply these same panels each time with the same instrument. Additionally, you can save multiple templates to help save time and re-use for future reporting and analysis capabilities with each of the instruments (if applicable).

1. To save, remember settings, and/or reset, click on the **Manage Templates**  button.

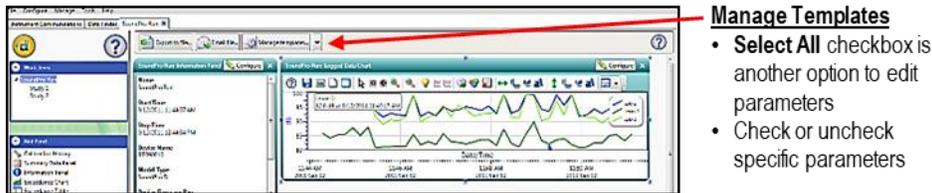


Figure 1-14: Manage Templates button

2. The Manage Templates box will appear. Select the appropriate option to save/apply.

- To create a new template, type in a name in the Template Name field and click the **Save Current Layout As Template**. Then click **Apply Template**.
- When more than one template is created, the **Set Selected as Default Template** may be added. To change and apply a saved template, click one from your list.
- To import templates from other users, click the **Import** button. Navigate through windows explorer and select the appropriate folder.

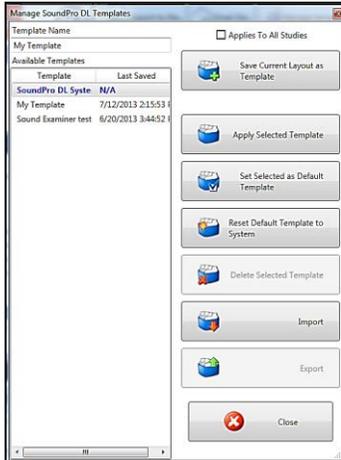


Figure 1-15: Manage Templates dialog box

Exporting to a File (i.e., Microsoft® Excel® spreadsheet program)

The export to a file option allows you to export data when viewing/analyzing downloaded data. The program will save the data with all the displayed panels into one of the selected formats: Microsoft® Excel® (.xls), Rich Text Format (.rtf), XML (.xml), and Comma separated values (.csv). Below explains how to export a file.

1. From the Data View, click on the  button. Select the appropriate file type and place it in one of your folders. To view in the exported program, open Windows® Explorer® and double-click on the file. The data will display in the designated program (such as Microsoft® Excel® spreadsheet program).

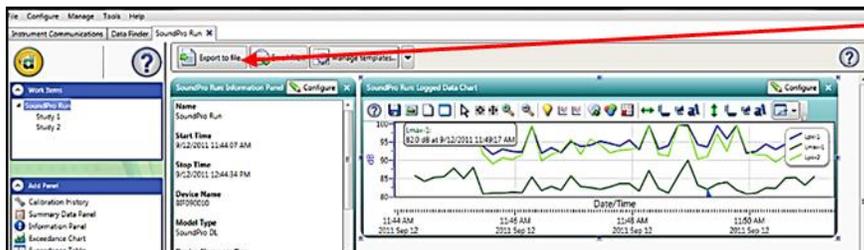


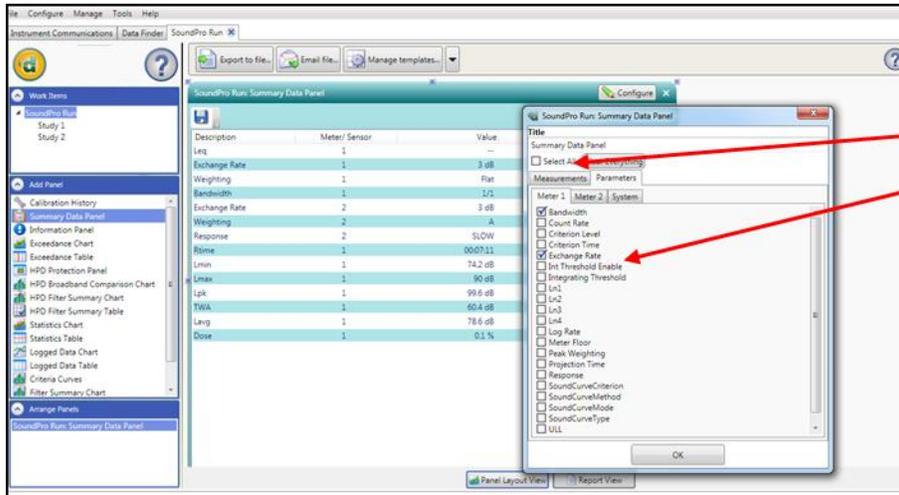
Figure 1-16: Export to File in data view

Customizing your Data in a Chart or Table

When the Configure icon  is selected, an items dialog box appears and is used to add or delete parameters to the selected table or chart.

The example below displays the General Data Panel and the selectable parameters.

1. To modify or change, click on the **Configure** button.
2. In the configure selection box, click in **Meter 1/Meter 2** checkboxes to select a parameter. To deselect, uncheck checkboxes.
3. Click **OK** to save your selections.



General data panel and edit parameters

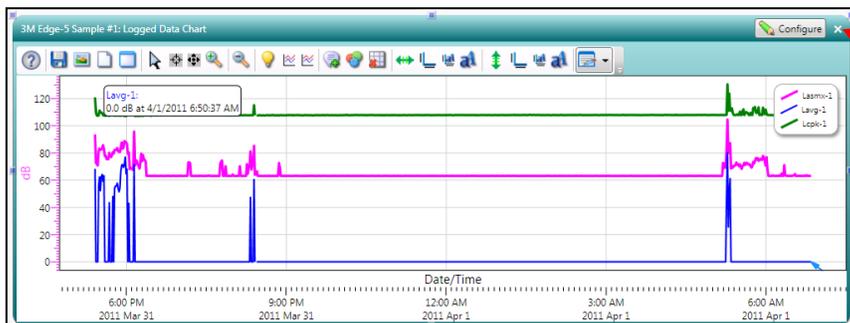
- **Select All** checkbox is another option to edit parameters
- Check or uncheck specific parameters

Figure 1-17: General data screen and selecting parameters via the configure icon.

Deleting/Closing Data Panels

The panels that appear in the data layout page, are used to view and print reports via the  button. The sequence of the panels will automatically compile and report in the order displayed in this view when report view is selected. With the delete panels feature, you can delete charts or tables not needed for your analysis and reporting needs.

1. To delete, click on the  on the chart or table. This will close (or delete) the panel (chart/table) from the data page layout.
2. Alternatively, select a panel in the **Arrange Panels** palette and press the **Delete** key.



Delete/close a panel

Figure 1-18: Deleting/closing data panels

Migrating Data: QSP-II Data to DMS

This section only applies to users who previously used QSP-II. When a QSP-II user decides to move to DMS, you may want to migrate/move the data into DMS for storage and analysis purposes. The basic process is to create backup files for a particular data node in QSP-II and then make DMS aware of the files. The following instructions describe how to perform the data migration:

1. Open QSP-II and right-click on the session or organizer node you want to migrate to DMS.
2. Right-click on the  **Backup Node** from the context menu.

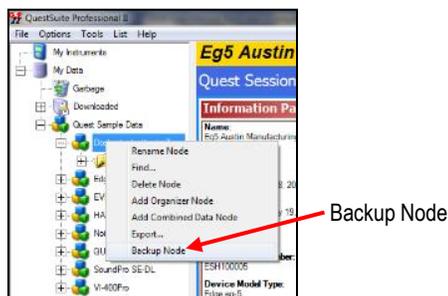


Figure 1-19: Migrating data example from QSP-II

3. In the **Browse for Folder** dialog that opens, select an existing folder, or create a new folder using the **Make New Folder** button, where you would like your backup data to be placed. Click **OK**.

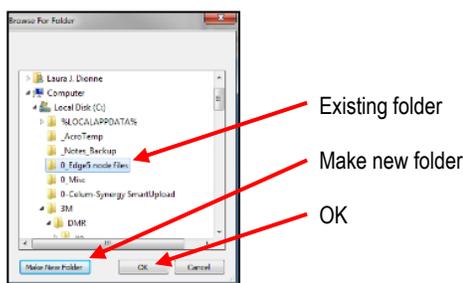


Figure 1-20: Browse for folder example

NOTE: The backup data for the session will be written to a ".q3f" file in the selected folder. When backing up an organizer node, a recursive backup is performed. What this means is that, first, all session nodes in that organizer node are backed up, and second, if there are any child organizer nodes in that organizer node, a subfolder is created for each and backup files are created for each session node in those child organizer nodes. This recursion continues until all organizer nodes are backed up at each sublevel of the selected organizer node's tree.

4. Open DMS.
5. Click the  **Data Finder** button on the Start page.
6. Look to see if the Browse Folders tree in the left column contains the folder selected above when in Browse view (click on  **Browse** if not displayed).
 - If it does, skip ahead to Step 9.
 - If not, right-click on any open space in the folder tree area and click **Attach Folder** from the context menu.
7. In the **Browse for Folder** dialog that opens, select the folder where you placed the files from QSP-II.
8. Click **OK**. DMS will add the folder (and any subfolders) to the tree.

- Place a checkmark in the folder and then right-click on the folder. Then click **Rebuild Folder** from the context menu. DMS will convert the QSP-II data files (".q3f") to its native format (".ndx"). (See Figure below.)

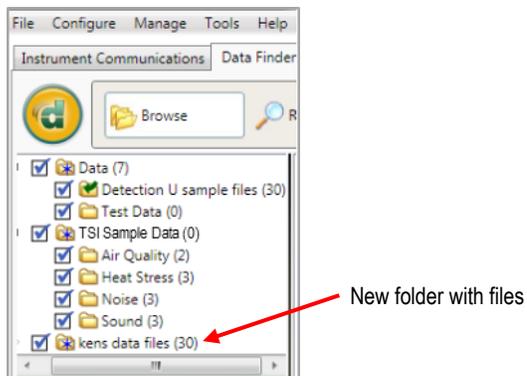


Figure 1-21: Example of migrated data

Distributing Data with Studies to Sessions

The distributing data function allows you to move downloaded studies from one session into other sessions which may be created and named. This may be beneficial if for example, you conducted measurement tests (or sessions/studies) at different locations or at one site with various work areas. With the distribute feature, you can add, move, or delete the data studies to/from sessions and organize them in order to analyze/report in specific work areas/locations.

NOTE: By default, this dialog box will appear after all instrument downloads that have more than one study. To skip this feature in the future, click on the "Skip dialog in the future (Reset in Preferences)" checkbox. (See step 2 below).

Below, an example is shown with an Edge dosimeter that had 13 studies recorded. In this example, new sessions were created and some of the 13 studies were moved to new sessions.

- Ensure the **Skip Distribute Studies to Sessions** dialog option is unchecked by clicking on **Configure > Preferences > Miscellaneous** tab.

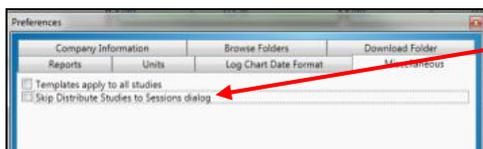


Figure 1-22: Configure and preferences tab

- Download your instrument's files (see downloading for more details) and the Distribute dialog box will appear.

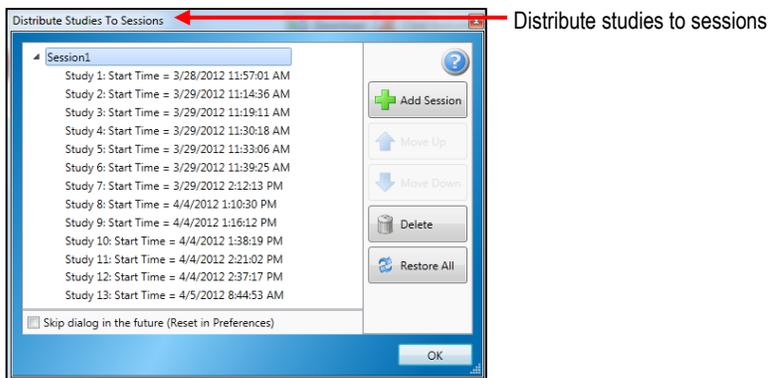


Figure 1-23: Distribute studies example

- Click the **Add Session** button to create a new folder/session (if desired).
 - The Distribute box above displays 13 studies. Studies may be selected and moved into new sessions (or folders).
- Select the studies you want to move to the new session while holding control to select more than one file then click **Move Down** button.

5. Continue to add/move studies into sessions as needed using the **Add Session**, **Move Up**, **Move Down** buttons as displayed below.
 - The example below illustrates how Studies 5 to 9 can be moved into Session 2 (new session) and Studies 10 to 13 into Session 3 (new session). Initially, **Add Session** was clicked once to create an empty Session 2. Studies 5 to 9 were then selected and the **Move Down** button was clicked once. **Add Session** was again clicked once to create an empty Session 3. Studies 10 to 13 were then selected and the **Move Down** button was clicked twice.

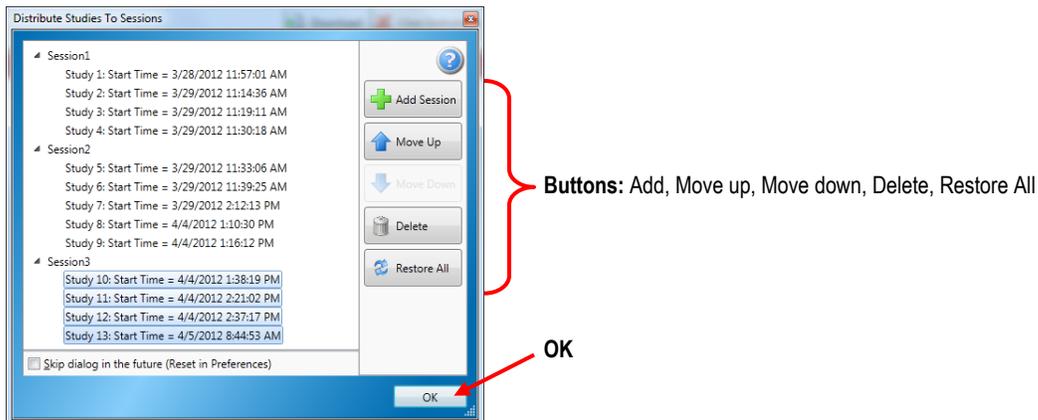


Figure 1-24: Organized sessions and studies example

6. Click **OK** when complete (or click **Restore All** to undo this operation).

Managing Instruments/Supported Instruments

The main buttons on the start page are used to download, setup, and view your data.

The following families of instruments are managed and supported in DMS:

- Noise Dosimetry family includes the Edge models eg3, eg4, eg4P, and eg5, and the NoisePro models
- Sound Level Meter family includes the SoundPro SE/DL models and the Sound Examiner SE-400 Series
- Environmental and air quality monitoring family includes the EVM-7 series
- Heat Stress family includes the QUESTemp^o 34/36 and the QUESTemp^o 44/46/48N instruments
- Personal Heat Stress family includes the QUESTemp^o II instrument



Figure 1-25: DMS Welcome screen Instrument Setup/Download Overview

The Edge Personal Noise Dosimeter



Edge: Communication Setup

The communication setup is an important starting point with your instrument and DMS. Once communicating, you have the option to download data, configure instrument parameters, and configure quick setup features, such as the time and date settings. The following explains the Edge communication setup steps.

Connecting the Edge to the Computer and Selecting the Edge in DMS

1. Dock the Edge on the EdgeDock and **turn on** the dosimeter by pressing the  key.
NOTE: You should not be in run mode or it will not communicate.
2. Plug the **USB cable** into the computer and plug the opposite end into the **docking station**.



Figure 1-26: The Edge and communicating to the PC

NOTE: You may connect multiple EdgeDocks to the computer if more than one USB port is available.

3. From the Start page, select the  or  button. (This will open the Instrument Communications screen.)
4. Select the instrument by first selecting the **Noise Dosimetry** family in the left column. Next, select **Edge** under Instrument, and finally, select the appropriate model (e.g., **Edge 5**, identified on the back label).
5. In the Edge Devices tree, select the specific instruments to configure by clicking in the checkboxes.
NOTE: A Green checkmark icon  indicates that the Edge is powered on and docked in the specific bay. A gray dash icon   **<empty bay>** signifies that there is not an instrument in the bay. A red 'X' icon  signifies that there is an unknown instrument in the bay. Other conditions such as instrument in run mode, not powered on, not plugged in properly, or not docked in the bay properly are other reasons the  icon may appear.
NOTE: If a specific bay entry is gray and disabled, it is because the instrument there is not of the model type selected in the left column. To select a disabled bay for configuration, change the Model selection to the appropriate type and wait briefly until the dock is scanned again.
6. After the devices are selected, see the following download or setup sections to learn more about working with the Edge.



Edge: Downloading Files

The Instrument Download feature enables you to download your files from the dosimeter into the software for review and analysis of the data. There are two modes for selecting the devices to be downloaded. In **“Selected Edge Devices Only”** mode, the download will be performed on only the devices that have been selected in the Edge Devices tree. In **“All Edge Devices”** mode, the download will be performed on all devices appearing in the tree regardless of model and selection checkboxes. Once the files are downloaded and if **“Go to Data Finder after Download”** is checked, DMS will open the Data Finder window.

NOTE: The Data Finder window stores all of the downloaded data by instrument, session, and study. There are three different views which enable you to analyze and/or print the data.

To download the Edge data, please follow the steps below:

1. From the Start page, select the  button.
2. Ensure your device is communicating properly and that the correct family, instrument, and model have been selected. (See [“Communication Setup”](#) for details.)
3. *Optional:* To view your session/study information after the download, click on the **“Go to Data Finder after Download”** checkbox (see **1**).
4. Choose the download selection mode: either **“Selected Edge Devices Only”** or **“All Edge Devices”** (see **2**).

NOTE: Both modes require that the Edge Devices tree be loaded with the devices currently placed in the dock(s). Click **Refresh** above the Edge Devices tree to reload it (see **3**).

5. If using **“Selected Edge Devices Only”** mode, select the Edge devices that you want to download data from by clicking the associated **checkboxes** in the Edge Devices tree (see **4**). If using **“All Edge Devices”** mode, it is not necessary to select Edge devices because all devices will be downloaded.
6. Press the **Download** button (see **5**). DMS will report the sessions loaded and the date of completion with the most recent on top (see **6**). If using **“Selected Edge Devices Only”** mode, a dialog will appear after each device is downloaded asking if you would like to clear the instrument memory (see **7**). If using **“All Edge Devices”** mode, the **Clear After Download All** dialog will appear before downloading begins (Figure 1-28). This dialog gives you three options for how to clear device memory following downloads.

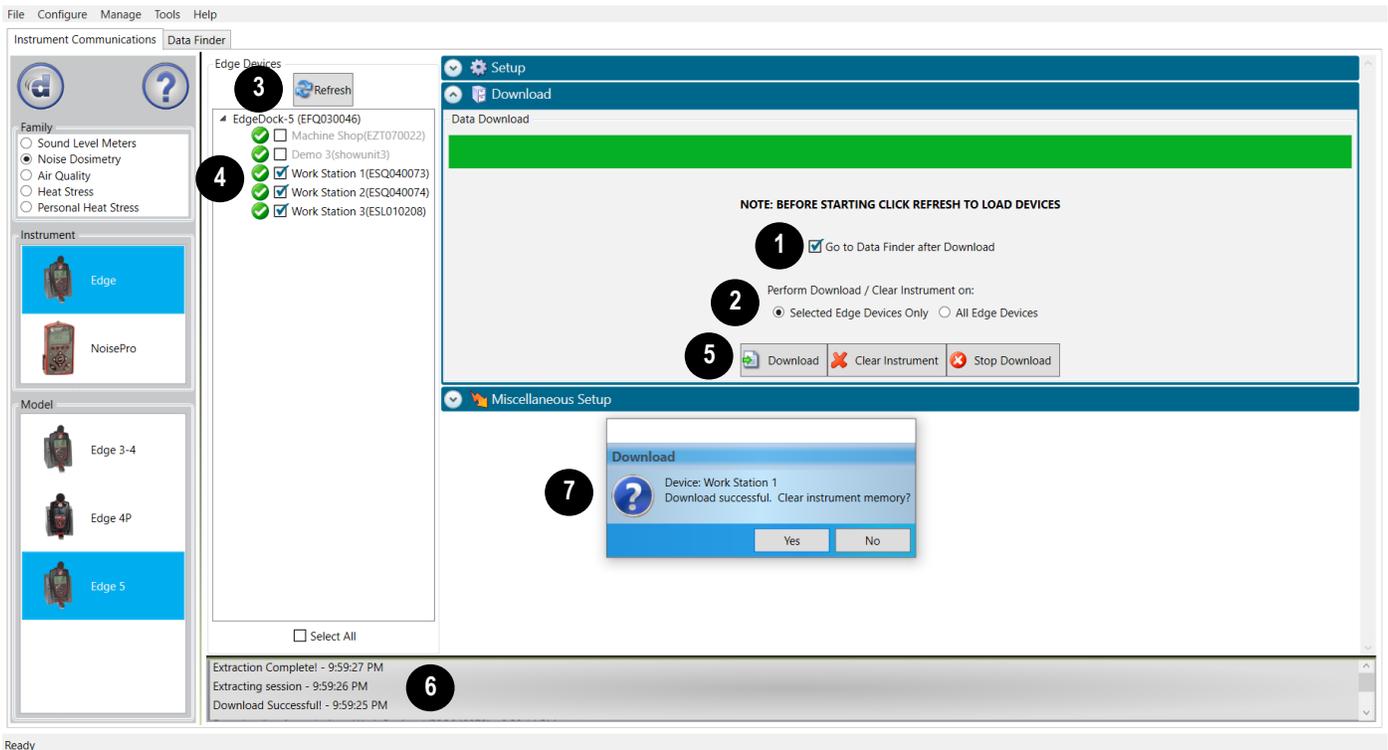


Figure 1-27: Edge download screen

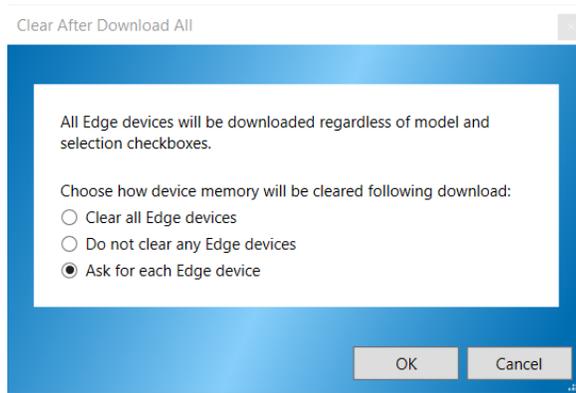


Figure 1-28: Clear After Download All dialog



Edge: Clearing Instrument Memory

You are prompted to choose how to clear device memory after downloading data. The Clear Instrument feature allows the device memory to be cleared without having to download the data. There are two modes for selecting the devices to be cleared. In **“Selected Edge Devices Only”** mode, only the memory of the devices that have been selected in the Edge Devices tree will be cleared. In **“All Edge Devices”** mode, the device memory will be cleared for all of the devices appearing in the tree regardless of model and selection checkboxes.

To clear device memory, follow the steps below:

1. From the Start page, select the  button.
 2. Ensure your device is communicating properly and that the correct family, instrument, and model have been selected. (See [“Communication Setup”](#) for details.)
 3. Choose the Clear Instrument selection mode: either **“Selected Edge Devices Only”** or **“All Edge Devices”** (see **1**).
- NOTE:** Both modes require that the Edge Devices tree be loaded with the devices currently placed in the dock(s). Click **Refresh** above the Edge Devices tree to reload it (see **2**).
4. If using **“Selected Edge Devices Only”** mode, select the Edge devices that you wish to clear by clicking the associated **checkboxes** in the Edge Devices tree (see **3**). If using **“All Edge Devices”** mode, it is not necessary to select Edge devices because all devices will be cleared.
 5. Press the **Clear Instrument** button (see **4**). A confirmation dialog appears asking if you are sure about clearing the instrument memory (see **5**).

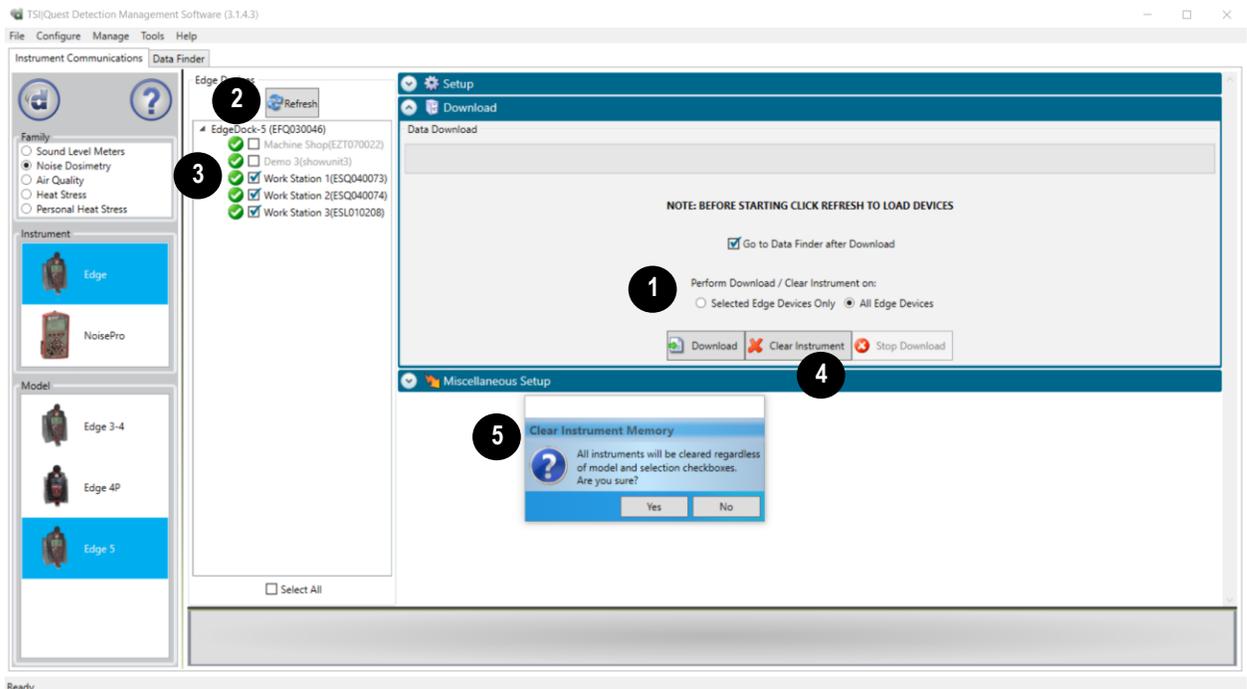


Figure 1-29: Clear Instrument feature



Edge: Viewing Data

The following section outlines how to work with the Edge sessions/data in the data finder page.

Selecting a Session/Study

To view downloaded data from the welcome page, click on the  button and the data finder screen will appear.

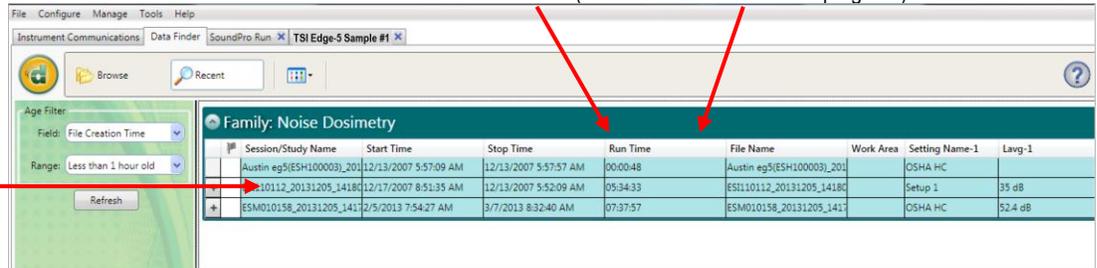
1. Select a session by either double-clicking on data (see **1** below) or select the  button.

NOTE: The example below illustrates a dosimetry session with logged data.

2 Parameters and measurements

The table headings and columns are customizable by a quick click, drag, and drop to a new column location (similar to Microsoft® Excel® program.).

- 1** Session/Study
Double-click to open in the panel layout view



Session/Study Name	Start Time	Stop Time	Run Time	File Name	Work Area	Setting Name-1	Lavg-1
Austin eg5(ESH100003)_201	12/13/2007 5:57:09 AM	12/13/2007 5:57:57 AM	00:00:48	Austin eg5(ESH100003)_201	OSHA HC	Setup 1	35 dB
ES1110112_20131205_14180	12/17/2007 8:51:35 AM	12/13/2007 5:52:09 AM	05:34:33	ES1110112_20131205_14180	OSHA HC	Setup 1	35 dB
ESM010158_20131205_141	2/5/2013 7:54:27 AM	3/7/2013 8:32:40 AM	07:37:57	ESM010158_20131205_141	OSHA HC	Setup 1	52.4 dB

Figure 1-30: Data Finder and Noise Dosimetry sessions



Edge: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

- Panel Layout View is divided into **Work Items** (see **A**), **Add Panel** (see **B**), and **Arrange Panels** (see **C**) palettes, as well as data panels (see **D**).
 - Work Items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
 - Add Panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
 - Arrange Panels (C)** – displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.
 - Data Panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: Use the Configure button to customize parameters.
 - Toolbar icons and Configure button (E)** – the toolbar and configure button are used to customize or select different measurement parameters.

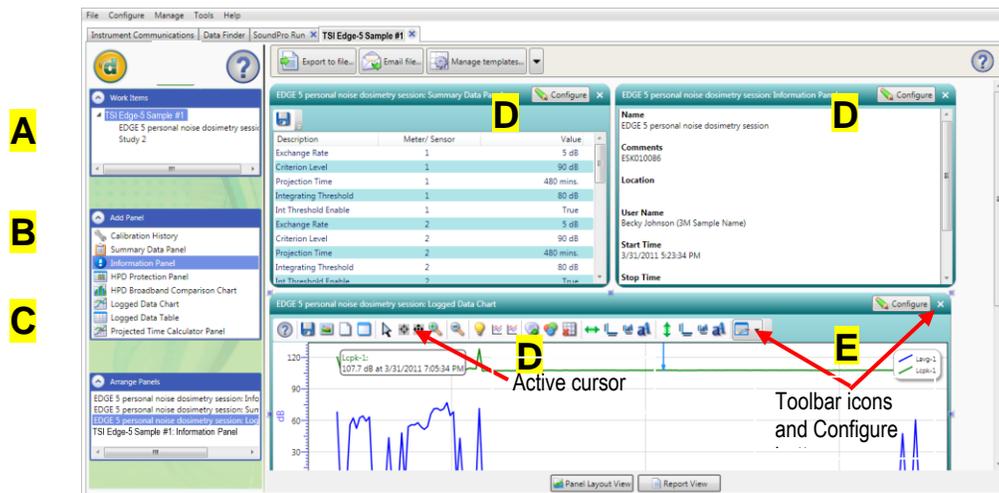


Figure 1-31: Edge and panel layout page

- To change the chart/table data parameters, click on the  button. Depending on the chart/table you are working on there are selectable measurements that may be chosen for further data analysis.
- To view the data as a report, click the  button.

NOTE: The panels will print in the order in which they are displayed in the panel layout page.
- The quick tips below explain how to customize the panels:
 - To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.
 - To move the panel**, click on the panel's header and drag and drop to the appropriate position.

NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.
 - To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.

NOTE: It will span the numbers up or down depending on how you drag the mouse.

- **To save a layout, right-click outside the panel area as displayed below. Click Remember Setting.**

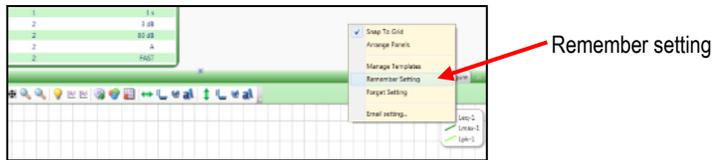
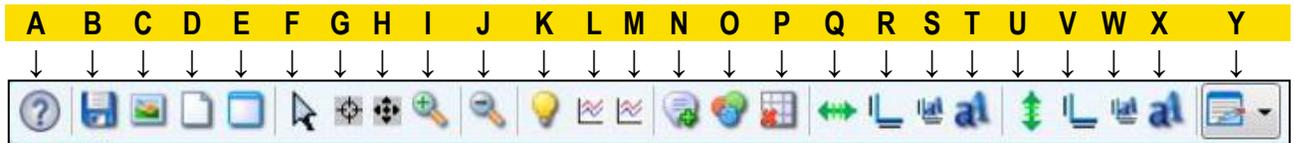


Figure 1-32: Save a layout, remember setting

5. To change the parameters on the logged data chart using the toolbar, please follow below:



	A.	Quick Help Icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc.).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed). NOTE: If the icon is yellow and the reset is clicked, the measurements on the logged data chart will appear as you cursor over the chart.
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	G.	Select Cursor icon: Click to select values for calculation for Lavg or Leq measurements. This is used for an advanced calculation referred to as data editing/recalculation. To select values, click icon then left-click and hold the mouse pointer over the points you want to edit. To deselect values that have been selected, hold the "Shift" key down while left-clicking and dragging the mouse.
	H.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	I.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	J.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart. Repeat if applicable.
	K.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the icon. Hint –sometimes value label is not visible, if this occurs click the icon and make sure the Normal cursor is selected.
	L.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	M.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	N.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click delete.
	O.	Chart Properties icon: Click to change the color of the chart attributes.
	P.	Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.

	<p>Q.</p>	<p>X Axis Range icon: Click and select range parameters for the logged data chart x axis.</p> <p>NOTE: When selected, a Set Axis Range dialog box will appear (see image below). For the date setting, either click on the date and type in a value or select the  icon to choose a date from a calendar box. Choose start and stop date settings. For the time, select either the hours, minutes, or seconds and click the  arrows to change the time settings.</p> <p>Select Apply to exit the dialog box.</p> <div data-bbox="446 346 982 577" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center; font-size: small;">Set Axis Range</p> <p>Start: 1/18/2011  17 : 01 : 15 </p> <p>Stop: 1/19/2011  01 : 48 : 08 </p> <p style="text-align: center;"> <input type="button" value="Apply"/> <input type="button" value="Cancel"/> </p> </div> <p style="text-align: center; font-weight: bold; font-size: small;">Figure 1-33: Edge and setting axis range</p>
	<p>R.</p>	<p>X Axis Title icon: Click this icon to change the title of the x axis on the logged data chart.</p> <p>NOTE: When selected, the cursor will appear at the end of the title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box.</p>
	<p>S.</p>	<p>X Axis Title Font icon: Select the x axis title font icon to change the font style and size of the x axis title.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>T.</p>	<p>X Axis Font icon: Select this icon to change the font style and size of the numeric values of the x axis. When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>U.</p>	<p>Y Axis Range icon: Click to change the range of the y axis. (For example, you may only want to view decibel levels between 95 dB and 120 dB.)</p> <p>NOTE: When selected, a Set Axis Range dialog box will appear. Enter range Start and Stop values for the y axis. Select Apply to exit the dialog box.</p>
	<p>V.</p>	<p>Y Axis Title icon: Click this icon to change the y axis title on the logged data chart (listed as dB).</p> <p>NOTE: When selected, the cursor will appear at the end of the y axis title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box..</p>
	<p>W.</p>	<p>Y Axis Title Font icon: Select this icon to change the font style and size of the y axis title.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>X.</p>	<p>Y Axis Font icon: Select this icon to change the font style and size of the numeric values of the y axis.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>Y.</p>	<p>Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE.</p>

Edge and Logged Data: Chart Selecting and Recalculating

The logged data chart provides a view of the integrating measurements over the run time. There may be situations, such as a non-typical sudden burst of noise, in which you would like to analyze a specific range of data points while ignoring all other data points. On the logged data chart, this is a feature referred to as recalculating your data. When selected, the feature provides calculations of **Lavg/Leq, TWA, Dose, and Dose[8]**. Please follow the steps below.

1. On the Logged Data Chart, click on the  button in the panel header and select either Lavg or Leq.
2. To select specific ranges of the chart data for calculation, click the **Use Select Cursor**  button on the toolbar.

NOTE: The tooltip  indicates the name of the icon "Use Select cursor."

3. Move the mouse pointer to the starting point for the data selection, left-click and drag the mouse to the right
 - Shading will appear over the selected data range (see **A** below).
 - A calculation box will appear (see **B** below) above the chart showing the calculations.
 - *Optional:* To deselect (exclude) specific ranges of a current data selection, hold down the **Shift** key, left-click, and drag the mouse over the data to be deselected. Alternatively, all selected ranges and the calculation box can be cleared by selecting the **Clear**  icon.
4. To change which options and additional calculations are displayed in the calculation box, right-click on the box and a context menu will appear (see **C** below). Select your desired options: **Show Total Calculations** (a combined calculation of all selected ranges), **Show Individual Calculations** (an individual calculation for each selected range), and/or **Show Excluded Calculations** (a combined calculation of all non-selected ranges). Select your desired additional calculations: **Show TWA Calculation**, **Show Dose Calculation**, and/or **Show Dose[8] Calculation**.

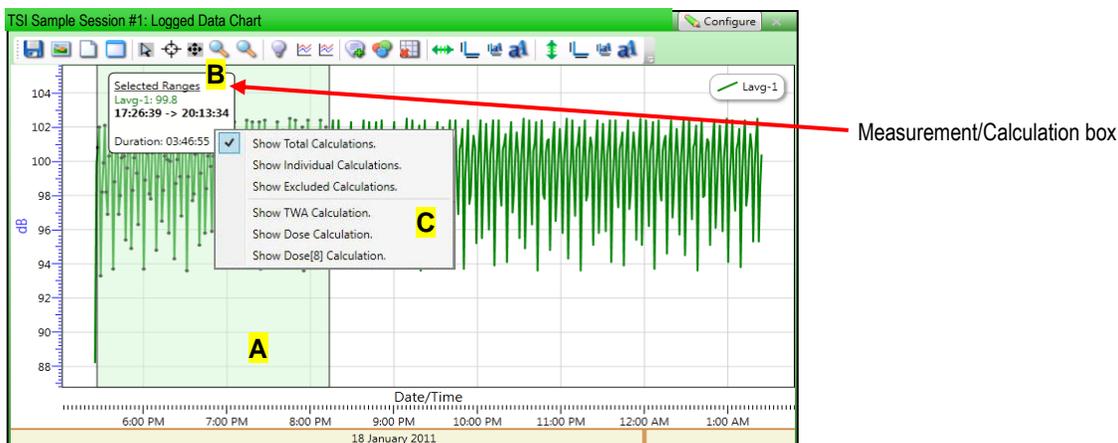


Figure 1-34: Edge and logged data chart

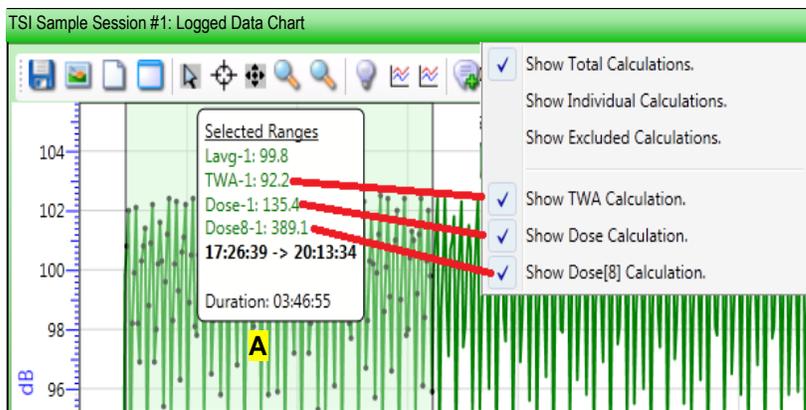


Figure 1-35: Edge and logged data chart with calculations

5. To view this in a report, click on the  button at the bottom of the page. To get back to the panel layout view, click the  button.



Edge: Distributing Data

Edge Measurements: Distributing/Organizing Data with Studies to Sessions

With the Edge measurements, you have the option to distribute/organize studies to sessions. This may be beneficial if, for example, you conducted a few dosimeter tests at different locations or at one site with various work areas and you want to separate the data to view in individual reports. With the distribute feature, you may move the studies into new sessions enabling you to organize (or separate) the data and then create individual reports for each site/area.

To distribute Edge data:

1. From the DMS menu bar, click on **Configure > Preferences > Miscellaneous** tab (see a). Uncheck the “Skip Distribute Studies to Sessions” dialog checkbox (see b) and click **OK**.

a. DMS Menu bar:

Select **Configure** and click on **Preferences**
Select **Miscellaneous** tab.

b. Uncheck box below:

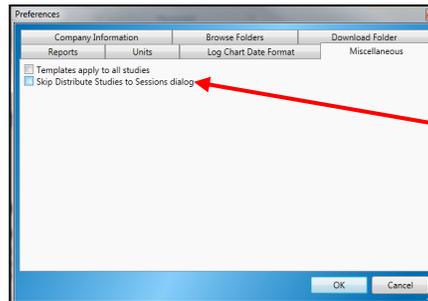
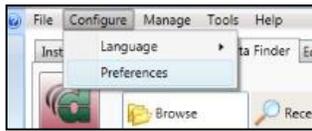
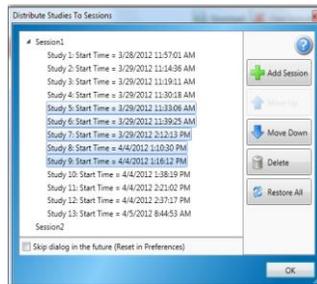


Figure 1-36: DMS menu: Configure > Preferences > Miscellaneous

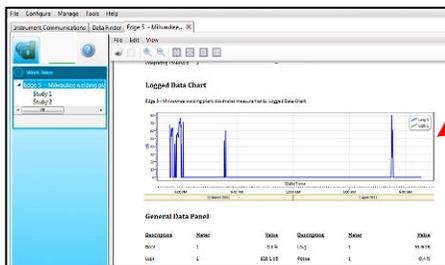
2. Download Edge files and the **Distribute Studies to Sessions** dialog box will appear (see below).



Add, Move Up, Move Down, Delete, Restore All

Figure 1-37: DMS and the Distribute Studies to Sessions dialog box

3. Click the **Add Session** button.
4. To move the studies into a new session, click and select studies while holding shift to select more than one file then click **Move Down** button.
5. Continue to add/move studies into sessions as needed using the **Add, Move up, Move Down** buttons. Click **OK** when complete.
6. In the Data Finder Page, the sessions will be organized into the newly designated sessions. Click **Quick Report** or **Analyze** to view the data.



Report/analyze data in new sessions

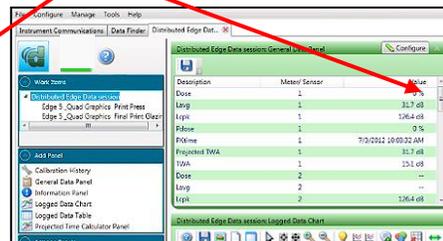
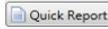


Figure 1-38: Example of Edge files distributed

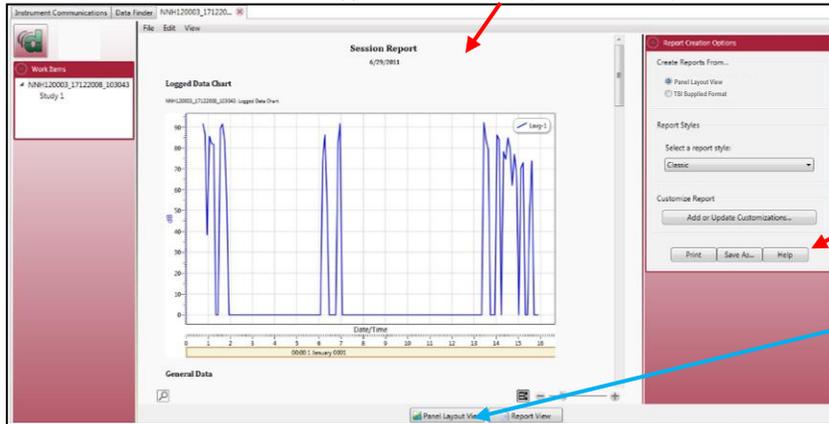


Edge: Reports and Printing

To quickly create reports, left-click the session/study and click the quick report  button. A standard template of charts and tables (or panels) will appear in the report.

NOTE: If you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen. Click **Report View**, if appropriate.

Report example with logged data chart displayed for dosimetry measurements/data



Quick reporting customization tools

Toggle/switch back to panel layout view (charts/tables)

Figure 1-39: Sample Edge report

Printing

To print a report from the report view page, do one of the following from the report view page:

- Click on the  icon from the title bar.
- Click on the  icon from the session report title bar.

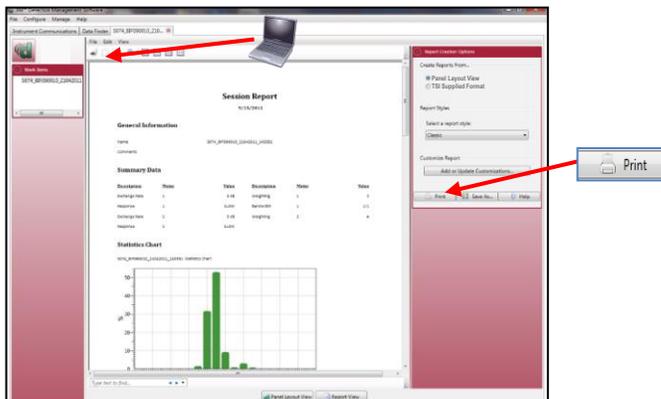


Figure 1-40: Edge and printing

Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

1. From the report creation options box (see **A**), click on **Add or Update Customizations...** button. Follow steps below as:

- There are four tabs to modify (if applicable) which include: company information, cover page, report, and headers/footers.

The example below displays customizing the header and footer.

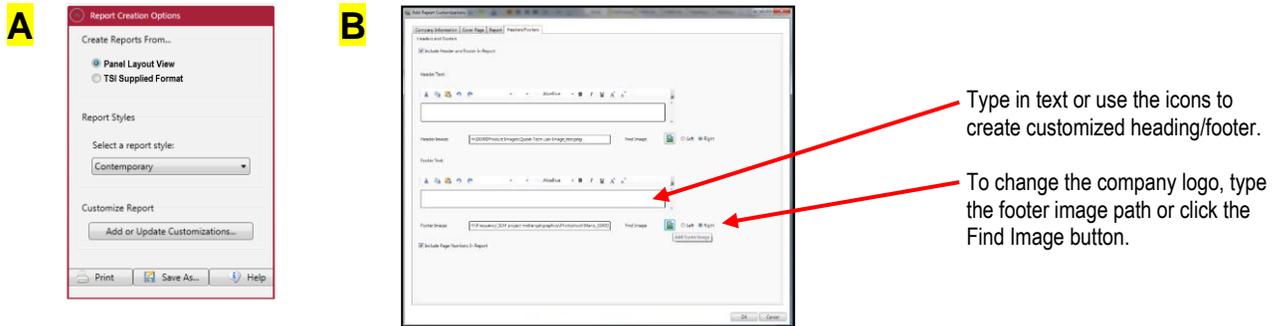


Figure 1-41: Report customization tools

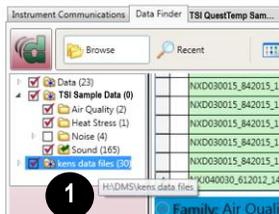


Edge: Sharing Data

Emailing Data

1. To email data, right-click on a chart/table and select **Email setting** (see **1**).
2. Once selected, the email program will automatically open and attach the chart/table as a file to the bottom of an email.
3. For the person receiving the email, save the file to a known folder location and then open DMS. In the Data finder page, right-click the folders and select refresh. The saved files will appear.

Tip: Point your mouse over the folder you want to save the data in the data finder page, and DMS will display the file location (see **1**). If the file was emailed, right-click on the attached file and save it to the location displayed from the DMS mouse over (if applicable). Once saved, right-click on the folder via the Data Finder Page and select **Refresh**. The files will be imported into DMS.



4. From the menu bar, the end-user selects: **File, Open**, and then browses to the folder (see **2**).
5. DMS would then display the data in the data panel.

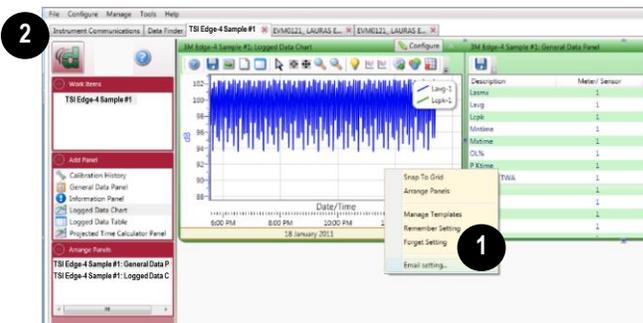


Figure 1-42: Edge and emailing data



Edge: Organizing Data

Creating a New Folder

When copying and or sharing data, you may want to organize the data with the create folder feature. Please follow the steps below.

1. In the data finder page, right-click and the context menu will appear as displayed below. Click on **New Folder** (see A).

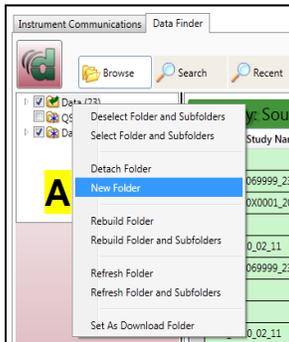


Figure 1-43: New Folder example

2. Assign a name by typing in the folder name and press **Enter**.
3. See the section below to move a file.

Moving a File

1. In the data finder page with Browse and Details view (default view) displayed, select the corresponding checkbox in the folder section where the desired moved files will reside. (See **New Folder** example below, A.)
2. To move the sessions or studies, select by clicking in the data grid. (See **B** below. Note the selected session/study will be highlighted in blue.)
 - To select more than one session/study, click and hold down the control key on your keyboard while clicking on as many sessions/studies as desired.

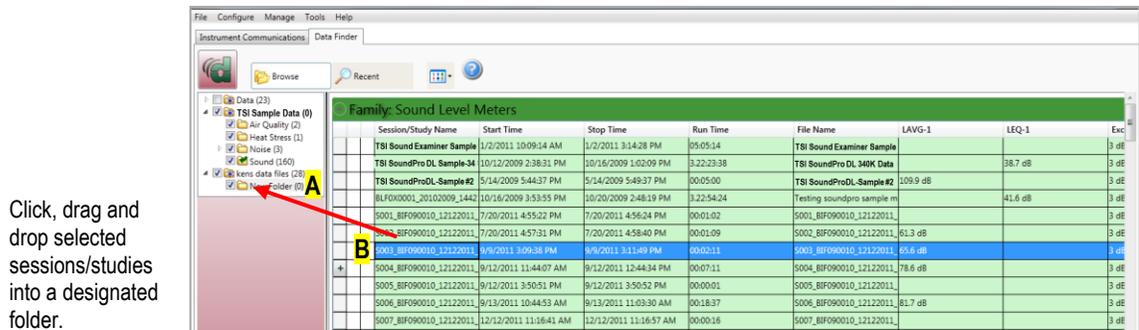


Figure 1-44: Moving folders with a selected session

3. Drag the mouse over the designated folder and release the mouse.

NOTE: A message to confirm the file move will appear.
4. Click **Yes** to move the files or **No** to cancel.

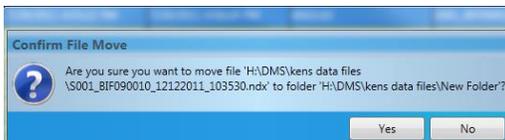


Figure 1-45: Confirm file move



Edge: Setup

There are six configurable Edge setup screens in the Edge Setup panel (see ❶). With the Edge, you have the option to save the configurations either on the instrument and/or store the configurations in DMS.

NOTE: If you save the profiles in the software, this can be used as a time management tool to organize and save all the setups for future use.

For the Edge, there are three different model groups (Edge 3–Edge 4, Edge 4P, and Edge 5) with different features and functionalities. Some of the setup parameters may not be applicable to your model. Please refer to the user manual to understand the models in more detail.

Edge: Saving and Sending Configurations

With the Edge, there are saved setup profiles used to quickly access and apply to the Edge(s). The steps below explain how to save the configuration settings in DMS and how to send to the instrument. There is also a Get Configuration feature which is used to pull the setup from the instrument into the software.

NOTE: To only send the setup or get the setup, please skip to step 3 or 4. Please refer to this section as you set up your instrument.

1. To save the Edge configuration in the software, click on a name in the **Configuration Profile Management** panel (See ❶).

NOTE: The name will be shaded a light gray when selected.

- To create a new profile name, click and type in a profile name. Click **Save**. (It will save under the configuration profile management panel).

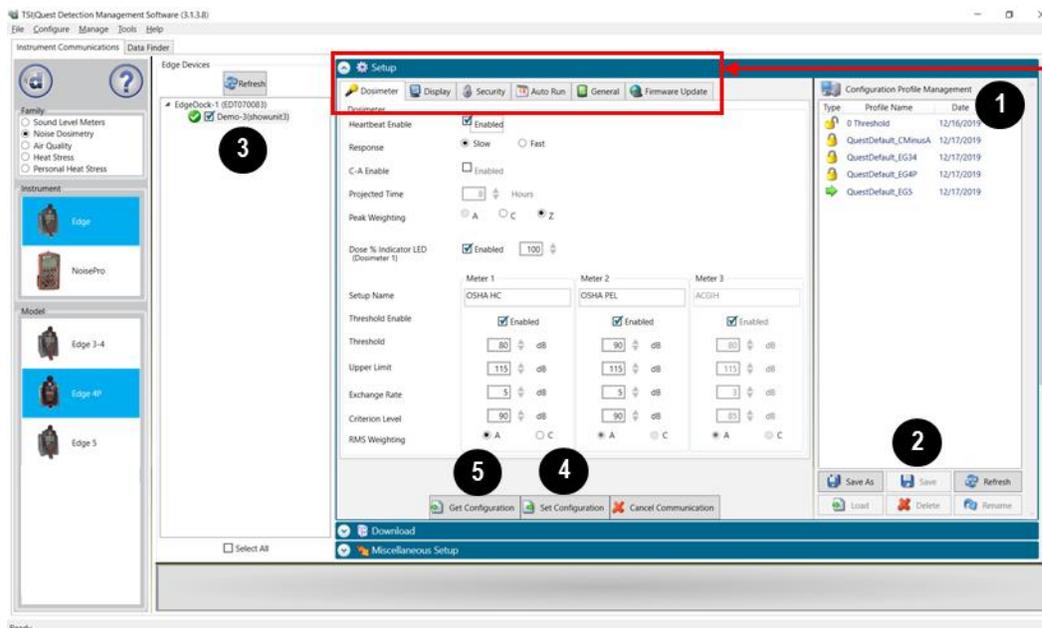
2. Click on the button (see ❷) and type in a **Name**. Click **OK**.

NOTE: This saves the configuration file in the software.

- Or click button and rename the setting by typing in a name. Click **OK**.

3. To send the setup to one or more instruments, select them in the EdgeDock section (see ❸) and click the button (see ❹).

4. To get the setup from an instrument, select it in the EdgeDock section and click on the button (see ❺). (*Optional:* To save the setup as a configuration follow steps 1–2 above.)



Setups:

Click on the tabs to set up/view:

- Dosimeter, Display, Security, Auto-Run, General, and Firmware Update.

Figure 1-46: Saving and sending Edge setups



Edge: Dosimeter Settings

The Edge dosimeter settings are used to set up the instrument with basic parameters. Please refer to the Edge Dosimeter parameters table below for details.

- Click on the Dosimeter tab from the Edge's Setup panel (see 1). To change the dosimeter settings, follow one (or all) of the selection options below.
 - Click on the arrow  and select an option.
 - Click on the  arrows and select a numeric value or type in a value.
- To set the dosimeter settings, save and send to the Edge (for more details see "[Saving and Sending Configurations](#)").

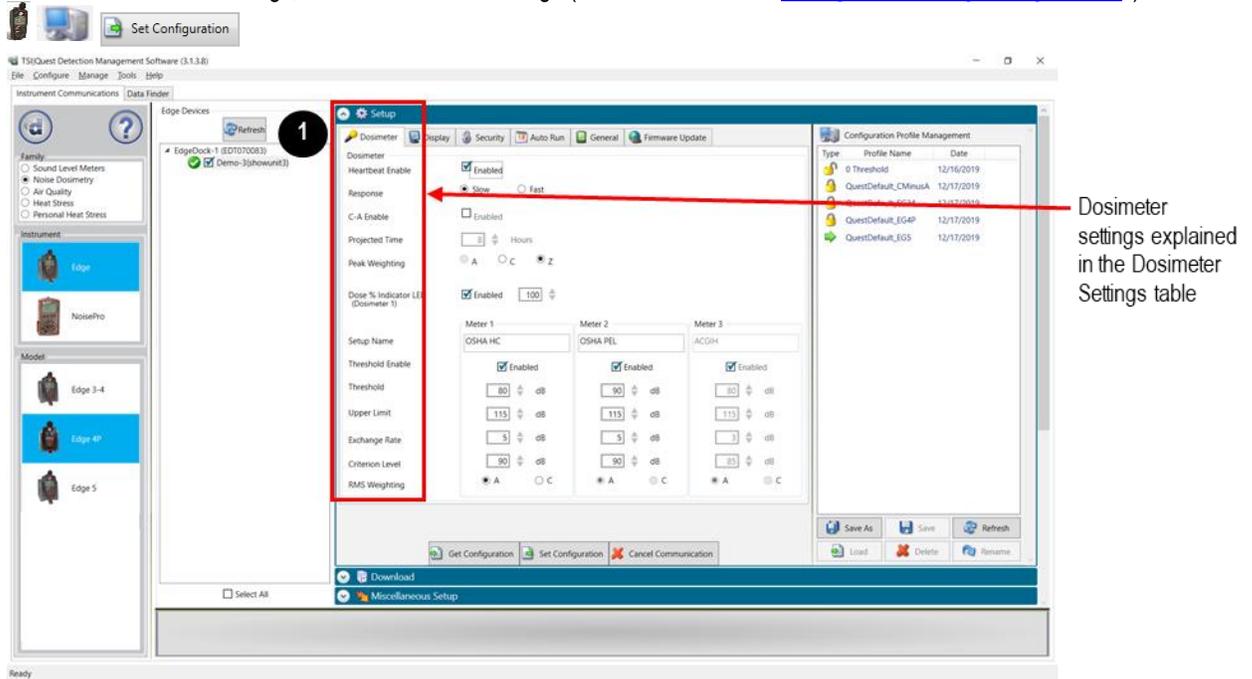


Figure 1-47: Edge dosimeter settings

Dosimeter Settings

Dosimeter Setting	Description
	*NOTE: refer to Glossary for more detailed information.
Heartbeat enable	When enabled (or checked), the LED will flash green while running and flash amber when stopped.
Response	Either Slow Time Response or Fast Time Response is applied to the measurements. (Typically, Slow time response is used in the US market while Fast is used in the EU communities.)
C-A enable	When enabled (or checked), C minus A will be calculated.
Projected Time	A selectable time parameter via the up/down arrows or type in a value. The projected time value is used to make projected dose calculation for the dose measurement.
Peak Weighting	Select either A, C or Z for the peak frequency weighting.
Dose % Indicator LED (Dosimeter 1)	When enabled (or checked), the LED will flash red when the dosimeter 1 dose value exceeds the designated entered value.
Setup name	(Optional field) A setup name may be entered into the Meter 1 and/or Meter 2 fields. When set, it appears on the top of Edge's display (example setup names: OSHA, MSHA, EU directive).
Threshold enable	When the checkbox is selected and a value is entered for meter 1 and/or meter 2 only values above the thresholds are used to calculate Lavg, TWA, and Dose measurements.
Upper Limit	Select a UL dB level by the up/down arrows or by typing in a value. NOTE: The upper limit (UL) is a measurement setting in which the user selects a specific decibel level. The UL value records the amount of time that the Sound level is at or greater than the entered level.

Dosimeter Setting	Description
	*NOTE: refer to Glossary for more detailed information.
RMS Weighting	Select either A or C RMS Weighting. NOTE: The RMS (root mean square) are the results from the Edge with the response time and weighting settings considered.
Criterion Level	Select a Criterion level via the up/down arrow or by typing in a value. NOTE: Criterion level is the average SPL that will result in 100% dose over the criterion time and is typically set by a regulatory agency such as OSHA, EU directive, etc.
Exchange Rate	Enter in (or select with up/down arrows) 3, 4, or 5 dB. ER refers to how sound energy is averaged over time. (OSHA uses a 5 dB doubling rate while most of the world uses 3 dB.)



Edge: Display Settings

The display screen is used to customize the parameters which will appear on your Edge. It is organized by two columns, the “Display position” and the “Item to Display” and includes a “Set selected Items” selection/drop-down box. The display position indicates the order of the parameter (or item) which will appear on the display, while the “Item to display” designates the measurement or parameter. The example/figure below displays the SPL, Max, Min, Lavg, TWA, Dose, UL, RT, and battery time remaining parameters to appear on the display.

NOTE: There are 18 selectable display positions on the Edge.

1. Click on the **Display** tab from the Edge’s Setup panel (see **1**). To customize the display, click on either the **Display Position** field (see **2**) or the **Item to Display** field (see **3**). The row will be shaded in blue when selected.
 2. Click on the **Set Selected Item** drop-down box (see **4**) and select a measurement/parameter to display.
 3. Repeat these steps as needed to select each position.
- NOTE:** “OFF” indicates that no measurement/parameter is selected and the row will not be shown on the Edge display.
4. To set the display settings, save and send to the Edge (for more details see [“Saving and Sending Configurations”](#)).

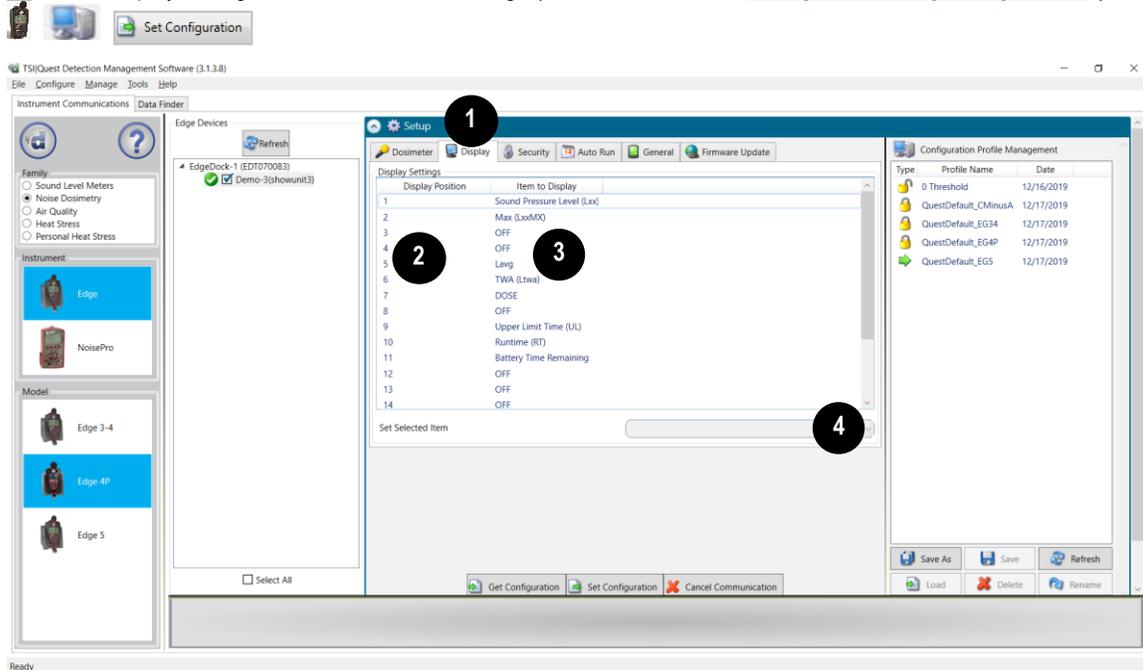


Figure 1-48: Edge display screen



Edge: Security Settings

The security setting is a type of “locking” feature (or secure run feature) that enables you to password protect the instrument to prevent users from inadvertently terminating a study. Initially, this feature is set through the software and turned on once in run mode by pressing run/stop key three consecutive times. (To unlock, press run/stop key three consecutive times and then press power key.) To set this feature, please follow the steps below.

1. Click on the **Security** tab from the Edge’s Setup panel (see **1**). To enable, click on the **Enabled** check box. (Ensure the specific Edge is selected and communicating to the software. See “[Communication Setup](#)” for more information.)
2. Next, select either **Not Displayed** (see **2**) or **Displayed** (see **3**). Press **Set Configuration** to send the changes to the selected instrument.
3. To set the security settings, save and send to the Edge (for more details see “[Saving and Sending Configurations](#)”).

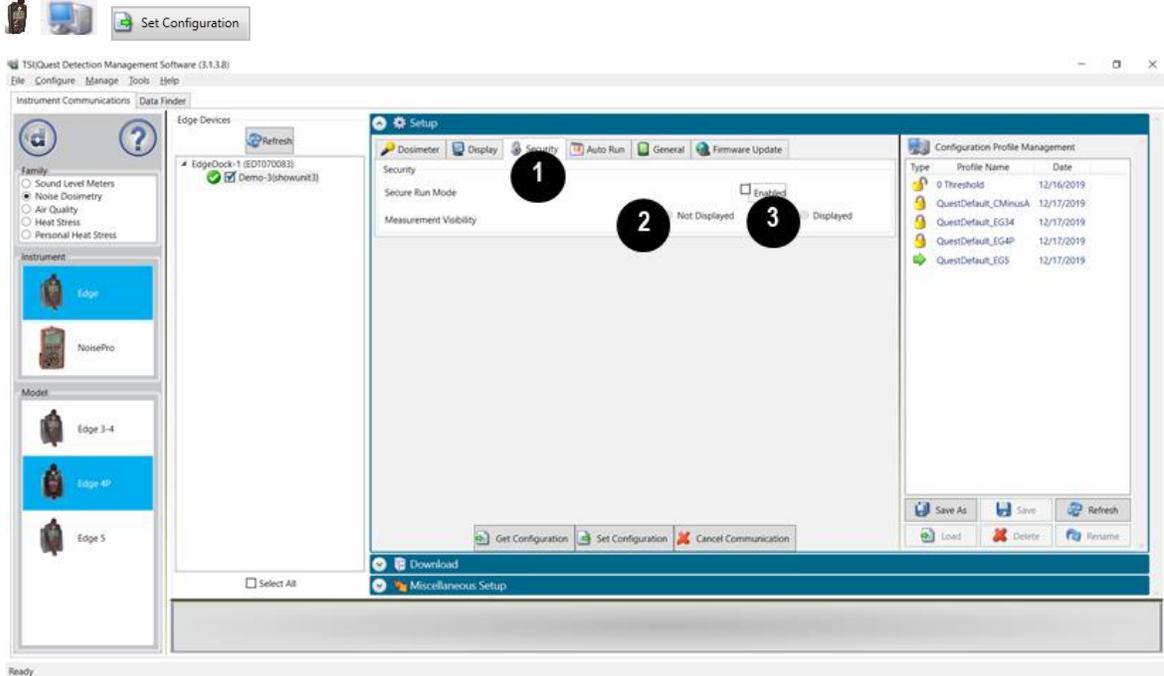


Figure 1-49: Edge security settings



Edge: Auto-Run Settings

With the Edge auto-run mode, you can program up to two (three for Edge 5) *auto start* and *auto stop* configurations when start date, start time, and duration parameters are enabled. This is useful to pre-set the instruments to run and stop for a specific time period, such as a week-long study. See steps below to enable.

1. Click on the **Auto-Run** tab from the Edge's Setup panel (see **1**) and click in the **Enable** checkbox (see **2**).
2. To program **Date 1**, click in the **Enabled** checkbox (see **3**) and select a **Start Date** (by using the calendar icon or type in a date) (see **4**). Select the **Start Time** and **Duration** by either typing in the time (designated in hours, minutes, and seconds) or using the up/down arrows (see **5**). (Repeat this step to set up the second (and third for Edge 5) Auto run mode. See **6**.)
3. To set the auto-run settings, save and send to the Edge (for more details see "[Saving and Sending Configurations](#)")

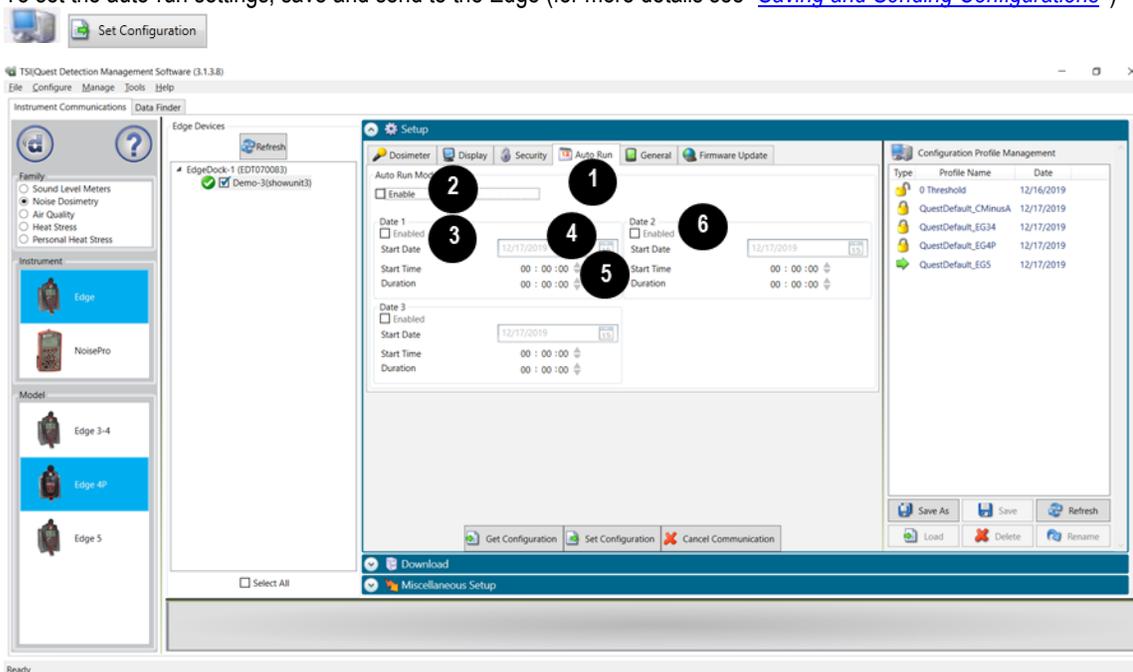


Figure 1-50: Edge auto-run screen



Edge: General Settings

The Edge general settings are used to set up the instrument with basic parameters. Please refer to the Edge dosimeter General Settings table below for details.

NOTE: Currently, these parameters only apply to the Edge 4P model. Click on the **General** tab (see ❶) from the Edge's Setup panel. To change the general settings, follow one (or all) of the selection options below.

1. Click on the arrow  and select an option.
2. Click on the  arrows and select a numeric value or type in a value.
3. To set the general settings, save and send to the Edge (for more details see "[Saving and Sending Configurations](#)").

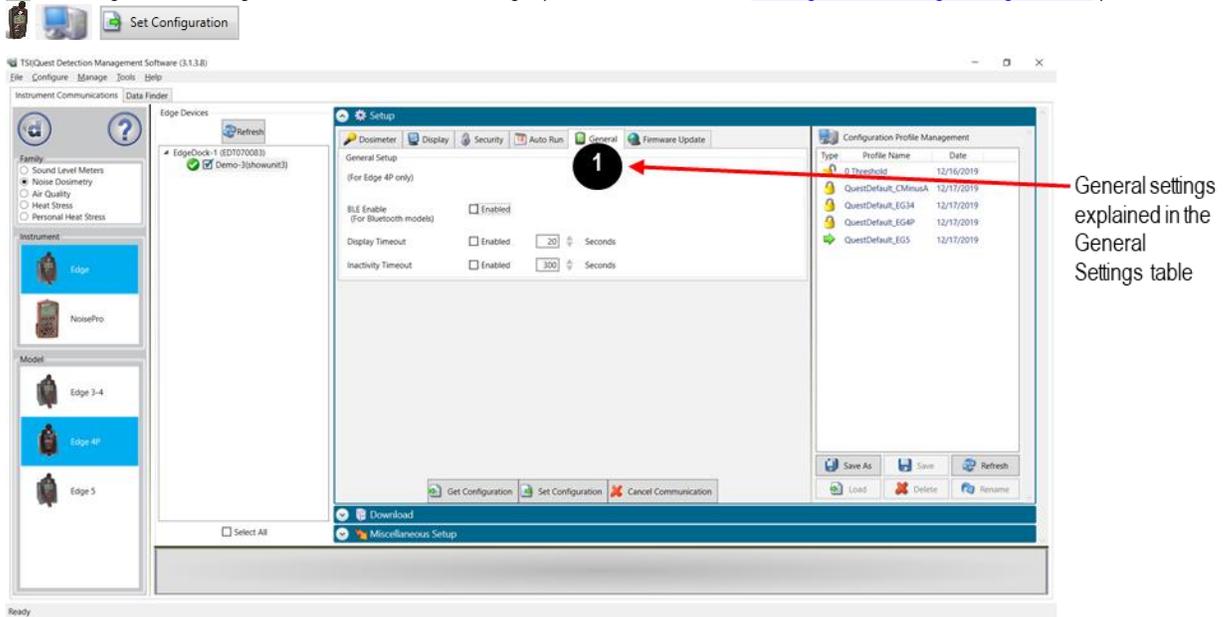


Figure 1-51: Edge general settings

General Settings

NOTE: Currently, these parameters only apply to the Edge 4P model.

General Setting	Description
BLE enable	When enabled (or checked), the Bluetooth BLE transmitter is on, thus enabling communications between the Edge 4P and the Edge dB mobile app.
Display Timeout	When enabled (or checked), enter a timeout value between 5 and 120 Seconds from the last keypad activity after which the display will be turned off. Press any keypad button momentarily to turn the display back on.
Inactivity timeout	When enabled (or checked), enter a timeout value between 5 and 32767 Seconds from the last keypad activity after which the Edge will be powered down provided it is not in run mode. Use the Edge's Power button to turn the instrument back on.



Edge: Firmware Update

Edge firmware updates are performed in DMS when the instruments are docked, communicating, and the update key is selected. Please follow the steps below prior to updating your Edge(s).

NOTE: This feature enables you to update all of your docked Edges (when powered on and not in run mode).

1. Click on the **Firmware Update** tab from the Setup panel (see **1**) and ensure to dock the Edge (or Edges). Please read steps under "Firmware Update" (see **2**) prior to updating.
 - Press  button to refresh the docked instruments (if necessary).
2. Press the  button (see **3**) and please wait until the software states that it is **Done**. (Example of the message: ).

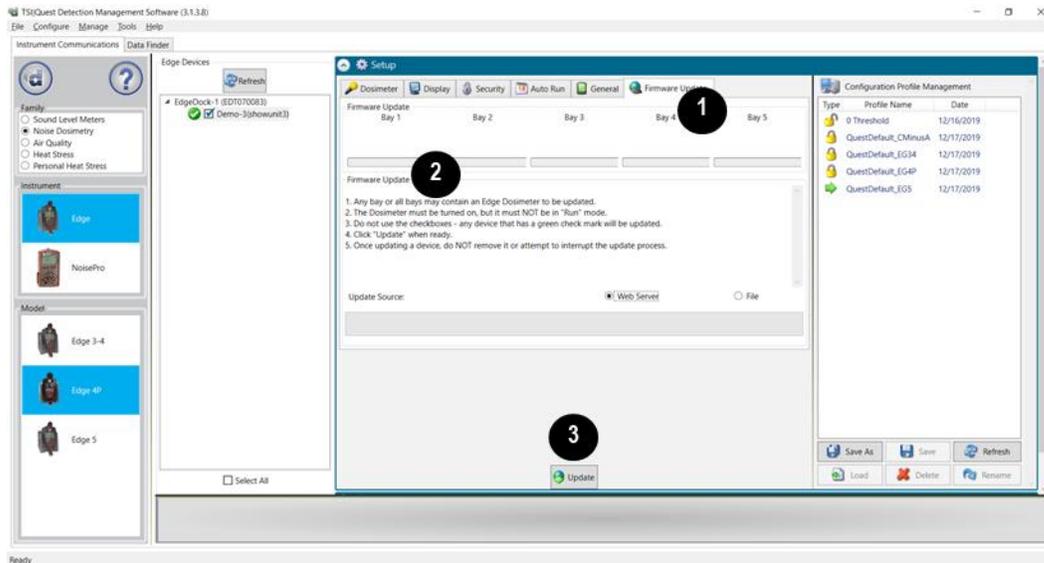


Figure 1-52: Edge firmware update screen



Edge: Miscellaneous Setup

The Edge miscellaneous setup screens can be used to set/get the Date Time of the instrument and set/get its identity string.

Setting/Getting the Date Time

Set the date time of the instrument on the **Date-Time** tab of the **Miscellaneous setup** screen. Choose either the **Current System Time** or **Specific Time** radio button. For **Specific Time**, enter the date using the calendar or manual entry. Set the time with the arrows and select a numeric value or type in a value. Send the date time to the instrument by clicking the **Set Date Time** button. You can retrieve the instrument's current time value by clicking the **Get Date Time** button.

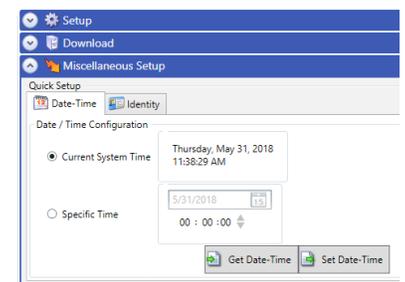


Figure 1-53: Set/Get Date-Time screen

Setting/Getting the Identity

Set the identity string of the instrument on the **Identity** tab of the **Miscellaneous setup** screen. Enter an identity value in the **Identity string** text box. Send the identity to the instrument by clicking the **Set Identity** button. You can retrieve the instrument's current identity value by clicking the **Get Identity** button.

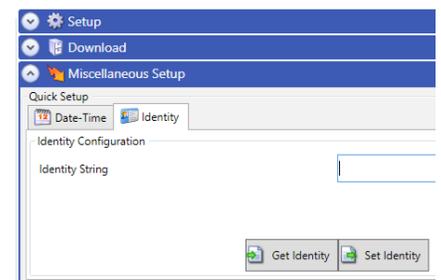


Figure 1-54: Set/Get Identity screen

NoisePro® Personal Noise Dosimeter



NoisePro Dosimeter: Communication Setup

The communication setup is an important starting point with your instrument and DMS. Once communicating, you have the option to download data, configure instrument parameters, and configure quick setup features, such as the time and date settings. The following explains the NoisePro communication setup steps.

1. While the NoisePro dosimeter is powered on, connect the infrared cable to the pc and set up the instrument to communicate to the software (see 1–3).

1

2

3

A. Example of connecting to serial port with IR USB cable.

B. From start screen of meter, press “COMM” soft key

C. Communication screen – Press id soft key to communicate between software and NoisePro dosimeter.

NOTE: RS-232 to USB cable may be used.

Figure 1-55: NoisePro and communicating

2. From the start page of DMS, select or buttons and the Instrument Communications page will appear (see Figure below).
3. Select **Noise Dosimetry** under Family, **NoisePro** under **Instrument**, and your NoisePro model under **Model**. (See 1, 2, and 3). You are now ready to set up or download your instrument.
 - See the subsequent NoisePro instrument setup sections to set up or download your instrument.

Figure 1-56: Instrument Communications/download layout

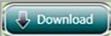
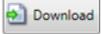


NoisePro Dosimeter: Downloading Files

The Instrument Download feature enables you to download your files from the NoisePro dosimeter into the software for review and analysis of the data. Once the files are downloaded and if "Go to Data finder after Download" is checked, DMS will open the Data finder tab/page layout.

NOTE: The data finder page layout stores all of the downloaded data by instrument, session and study. The data is stored in a bar chart layout with measurements/parameters displayed on the top navigational bar. See Data Finder for more information."

To download, please follow steps below:

1. To download the NoisePro data, ensure your instrument is communicating properly. (See Communication setup for details.)
2. From the Start page, select the  button.
3. Select **Noise Dosimetry** under Family, **NoisePro** under **Instrument**, and your NoisePro model under **Model** (see **1**).
4. Press the **Download**  button (see **2**).

NOTE: DMS will report pending (when communicating properly) and successful, once completed.

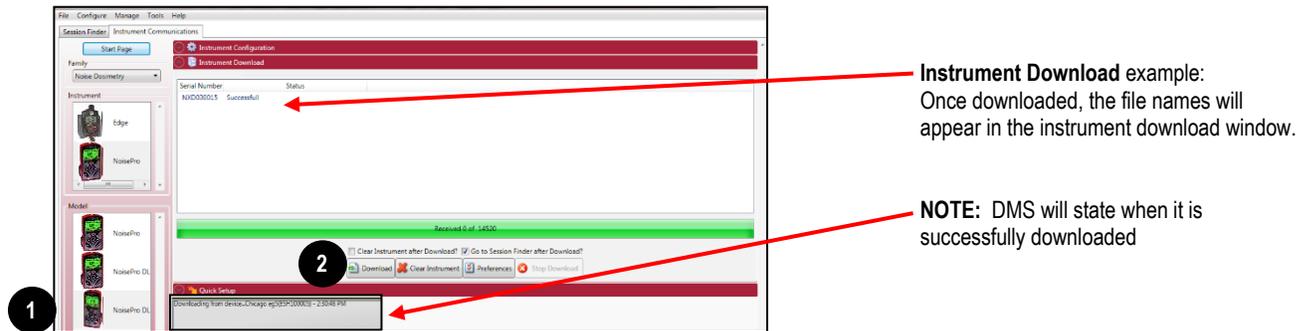


Figure 1-57: Downloading NoisePro files



NoisePro Dosimeter: Viewing Data

The following section outlines how to work with the NoisePro sessions/data in the data finder page.

Selecting a Session/Study

To view downloaded data from the welcome page, click on the  button and the data finder screen will appear.

1. Select a session by either double-clicking on data or select the  button.

NOTE: The example below illustrates a dosimetry session with logged data over an 8 hour run.

B Parameters and measurements

The table headings and columns are customizable by a single click, drag, and drop to a new column location (similar to Microsoft® Excel® spreadsheet program).

A Session/Study (NoisePro data) Double-click to open in the panel layout view.

Session/Study Name	Start Time	Stop Time	Run Time	Lavg-1	TWA-1	Dose-1	Criterion Level-1	Dose-2	TWA-2	Lavg-2
NoisePro DLX Sample #1	5/4/2011 6:23:26 AM	5/4/2011 1:46:07 PM	07:22:41	78.3 dB	77.7 dB	18.2%	90 dB	7.8 %	71.6 dB	72.2 dB
Chicago eg5(ESH100005)_2	3/21/2011 10:18:56 AM	1/1/2000 12:50:17 AM	4:01:14:54	7.3 dB	25.3 dB	0 %	90 dB			
Chicago eg5(ESH100005)_2	3/21/2011 10:18:56 AM	1/1/2000 12:50:17 AM	4:01:14:54	7.3 dB	25.3 dB	0 %	90 dB			
TSI Edge-5 Sample #1	3/31/2011 5:23:34 PM	4/1/2011 6:51:25 AM	13:27:21	47.8 dB	51.6 dB	0.4 %	90 dB	23.2 %	79.4 dB	75.7 dB
TSI Edge-4 Sample #1	1/18/2011 5:24:11 PM	1/19/2011 1:24:11 AM	08:00:00	99.8 dB	99.8 dB	390.1 %	90 dB	388.1 %	99.7 dB	99.7 dB
TSI Edge-4 Sample #1	1/18/2011 5:24:11 PM	1/19/2011 1:24:11 AM	08:00:00	99.8 dB	99.8 dB	390.1 %	90 dB	388.1 %	99.7 dB	99.7 dB

Figure 1-58: Data Finder and Noise Dosimetry sessions



NoisePro Dosimeter: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

- Panel Layout View is divided into Work Items (see **A**), Add Panel (see **B**), and Arrange Panels (see **C**) palettes, as well as data panels (see **D**).
 - Work items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
 - Add panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
 - Arrange panels (C)** – displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.
 - Data Panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: Use the Configure icon to customize parameters.
 - Toolbar icons and Configure button (E)** – the toolbar icons and configure button are used to customize or select different measurement parameters.

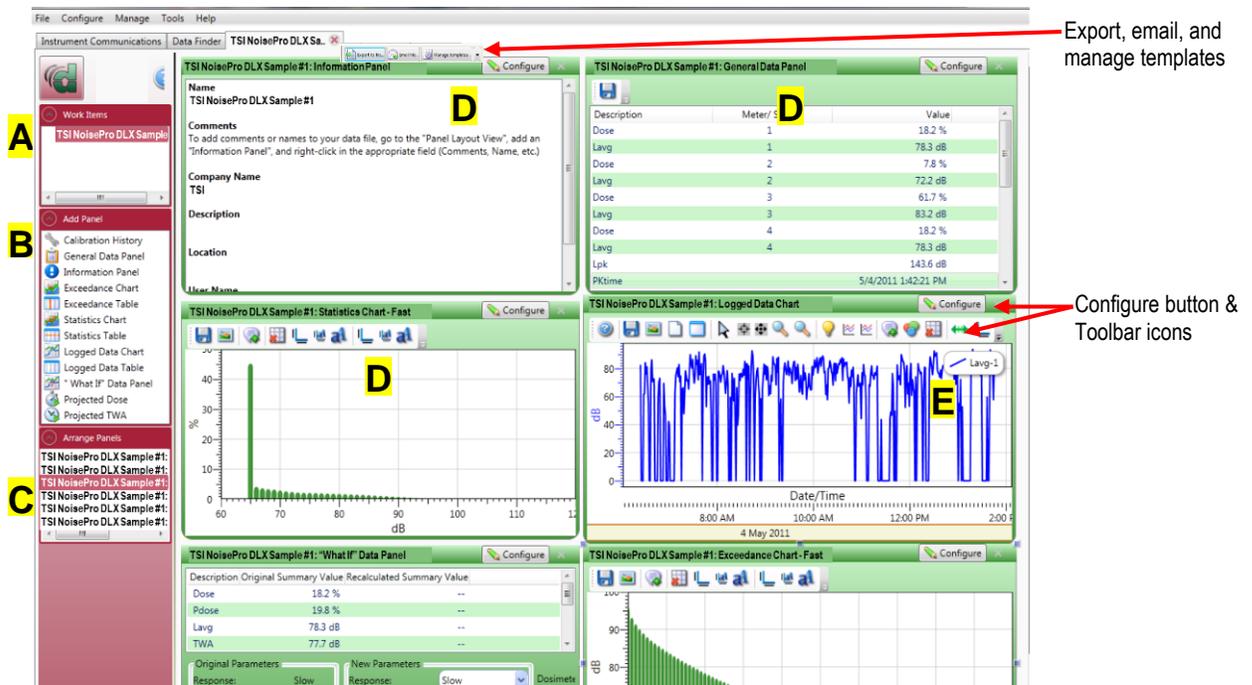


Figure 1-59: NoisePro panel layout page

- To change the chart/table data parameters, click on the  button. Depending on the chart/table you are working on there are selectable measurements that may be chosen for further data analysis.
- To view the data as a report, click the  button.

NOTE: The panels will print in the order in which they are displayed in the panel layout page.

- The quick tips below explain how to customize the panels:

- To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.
- To move the panel**, click on the panel's header and drag and drop to the appropriate position.

NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.
- To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.

NOTE: It will span the numbers up or down depending on how you drag the mouse.

- To save a layout, right-click outside the panel area as displayed below. Click **Remember Setting**.

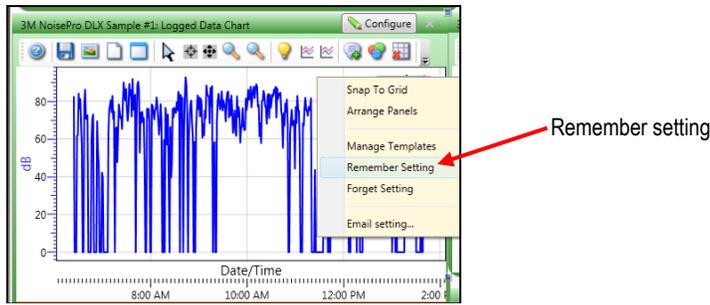
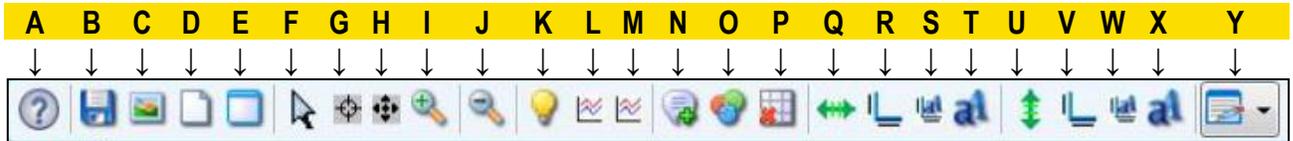
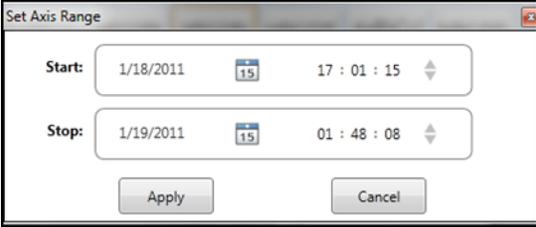


Figure 1-60: Save a layout, remember setting

5. To change the parameters on the logged data chart using the toolbar, please follow below:



	A.	Quick Help icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc.).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed). NOTE: If the  icon is yellow and the reset is clicked, the measurements on the logged data chart will appear as you cursor over the chart.
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	G.	Select Cursor icon: Click to select values for calculation for Lavg or Leq measurements. This is used for an advanced calculation referred to as data editing/recalculation. To select values, click  icon then left-click and hold the mouse pointer over the points you want to edit. To deselect values that have been selected, hold the "Shift" key down while left-clicking and dragging the mouse.
	H.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	I.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	J.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart. Repeat if applicable.
	K.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the  icon. Hint –sometimes value label is not visible, if this occurs click the  icon and make sure the Normal cursor is selected.
	L.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	M.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	N.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click delete.
	O.	Chart Properties icon: Click to change the color of the chart attributes.

	P. Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.
	Q. X Axis Range icon: Click and select range parameters for the logged data chart x axis. NOTE: When selected, a Set Axis Range dialog box will appear (see image below). For the date setting, either click on the date and type in a value or select the  icon to choose a date from a calendar box. Choose start and stop date settings. For the time, select either the hours, minutes, or seconds and click the  arrows to change the time settings. Select Apply to exit the dialog box.  Figure 1-61: NoisePro and setting axis range
	R. X Axis Title icon: Click this icon to change the title of the x axis on the logged data chart. NOTE: When selected, the cursor will appear at the end of the title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box.
	S. X Axis Title Font icon: Select the x axis title font icon to change the font style and size of the x axis title. NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.
	T. X Axis Font icon: Select this icon to change the font style and size of the numeric values of the x axis. When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.
	U. Y Axis Range icon: Click to change the range of the y axis. (For example, you may only want to view decibel levels between 95 dB and 120 dB.) NOTE: When selected, a Set Axis Range dialog box will appear. Enter range Start and Stop values for the y axis. Select Apply to exit the dialog box.
	V. Y Axis Title icon: Click this icon to change the y axis title on the logged data chart (listed as dB). NOTE: When selected, the cursor will appear at the end of the y axis title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box.
	W. Y Axis Title Font icon: Select this icon to change the font style and size of the y axis title. NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.
	X. Y Axis Font icon: Select this icon to change the font style and size of the numeric values of the y axis. NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.
	Y. Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE.

NoisePro Dosimeter and Logged Data: Chart Selecting and Recalculating

The logged data chart provides a view of the integrating measurements over the run time. There may be situations, such as a non-typical sudden burst of noise, in which you would like to analyze a specific range of data points while ignoring all other data points. On the logged data chart, this is a feature referred to as recalculating your data. When selected, the feature provides calculations of **Lavg/Leq, TWA, Dose, and Dose[8]**. Please follow the steps below.

1. On the Logged Data Chart, click on the  button in the panel header and select either Lavg or Leq.

- To select specific ranges of the chart data for calculation, click the **Use Select Cursor**  button on the toolbar.

NOTE: The tooltip  indicates the name of the icon “Use Select cursor.”

- Move the mouse pointer to the starting point for the data selection, left-click and drag the mouse to the right.
 - Shading will appear over the selected data range (see **A** below).
 - A calculation box will appear (see **B** below) above the chart showing the calculations.
 - Optional:* To deselect (exclude) specific ranges of a current data selection, hold down the **Shift** key, left-click, and drag the mouse over the data to be deselected. Alternatively, all selected ranges and the calculation box can be cleared by selecting the **Clear**  icon.
- To change which options and additional calculations are displayed in the calculation box, right-click on the box and a context menu will appear (see **C** below). Select your desired options: **Show Total Calculations** (a combined calculation of all selected ranges), **Show Individual Calculations** (an individual calculation for each selected range), and/or **Show Excluded Calculations** (a combined calculation of all non-selected ranges). Select your desired additional calculations: **Show TWA Calculation**, and/or **Show Dose Calculation Show Dose[8] Calculation**.

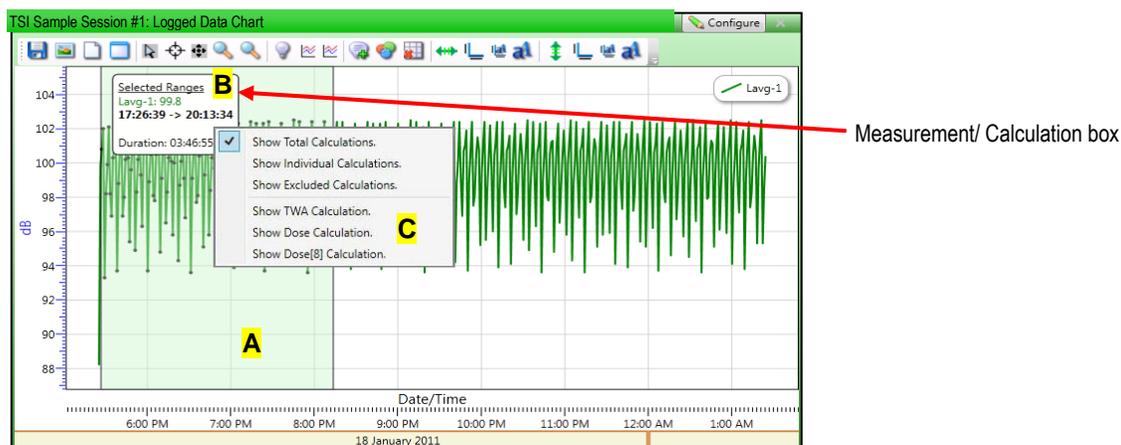
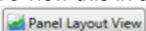


Figure 1-62: NoisePro dosimeter logged data chart and calculations

- To view this in a report, click on the  button at the bottom of the page. To get back to the panel layout view, click the  button.



NoisePro Dosimeter: Reports and Printing

To quickly create reports, open your data (in the data finder page) and click the quick report button. A standard template of charts and tables (or panels) will appear in the report.

- **Viewing reports:** if you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen.
- **Printing reports:** while in the report view page
 - Click on the icon from the title bar.
 - Click on the icon from the session report title bar.

Report example with logged data chart displayed for NoisePro data

Customize the report by inserting on-site testing images

Reports are displayed in the order in which they are displayed from the panel layout.

Customize the report by inserting on-site testing images via the button.

Quickly switch back to the panel (with data) layout view

Print

Session Report 12/9/2011

Logged Data Chart

3M NoisePro DLX Sample #1: Logged Data Chart

dB

140

120

100

80

60

40

20

0

6:00 AM 9:00 AM 12:00 PM 3:00 PM 6:00 PM 9:00 PM

May 2011 4 May 2011 4 May 2011

Exceedance Chart

3M NoisePro DLX Sample #1: Exceedance Chart - Past

dB

90

80

Type text to find...

Panel Layout View Report View

Print

Print

Save As...

Help

Report Creation Options

Create Reports From...

Panel Layout View

TSI Supplied Format

Report Styles

Select a report style:

Classic

Customize Report

Print Save As... Help

Figure 1-63: Sample NoisePro dosimeter report

Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

- From the report creation options box (see **A**), click on button.
- There are four tabs to modify (if applicable) (see **B**) which include: company information, cover page, report, and headers/footers.
- The example below displays customizing the header and footer.

A

Report Creation Options

Create Reports From...

Panel Layout View

TSI Supplied Format

Report Styles

Select a report style:

Contemporary

Customize Report

Print Save As... Help

B

Header Text

Header Image

Footer Text

Footer Image

Type in text or use the icons to create customized heading/footer.

To change the company logo, type the footer image path or click the Find Image button.

Figure 1-64: Report customization tools

Emailing Data

1. To email data, right-click on a chart/table and select **Email setting...** (see ❶).
2. Once selected, the email program will automatically open and attach the chart/table as a file to the bottom of an email.
3. For the person receiving the email, save the file to a known folder location and then open DMS. In the Data finder page, right-click the folders and select refresh. The saved files will appear. (Or select **File, Open** and browse to the folder as displayed below.)
 - **Tip:** Point your mouse over the folder you want to save the data in the data finder page, and DMS will display the file location (see ❷). If the file was emailed, right-click on the attached file and save it to the location displayed from the DMS mouse over (if applicable). Once saved, right-click on the folder via the Data Finder Page and select **Refresh**. The files will be imported into DMS.

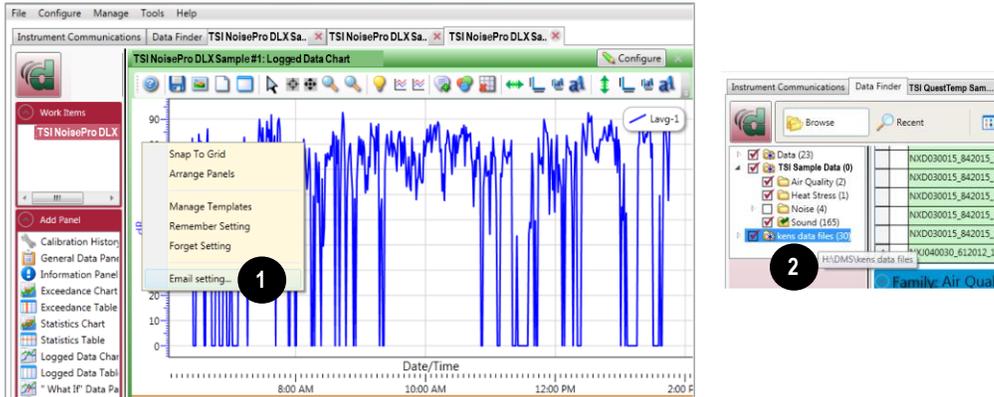


Figure 1-65: NoisePro dosimeter and emailing data



NoisePro Dosimeter: Organizing Data

Creating a New Folder

When copying and or sharing data, you may want to organize the data with the create folder feature. Please follow the steps below.

1. In the data finder page, right-click and the context menu will appear as displayed below. Click on **New Folder** (see A).

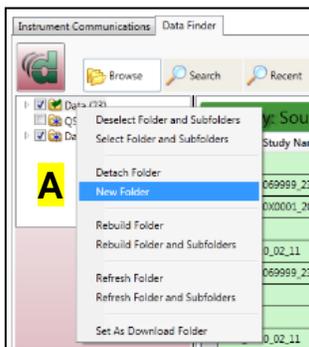


Figure 1-66: New Folder example

2. Assign a name by typing in the folder name and press **Enter**.
3. See the section below to move a file.

Moving a File

1. In the data finder page with Browse and Details view (default view) displayed, select the corresponding checkbox in the folder section where the desired moved files will reside. (See New Folder example below, **A**.)
2. To move the sessions or studies, select by clicking in the data grid. (See **B** below. Note the selected session/study will be highlighted in blue.)
 - To select more than one session/study, click and hold down the control key on your keyboard while clicking on as many sessions/studies as desired.

Click, drag and drop selected sessions/studies into a designated folder.

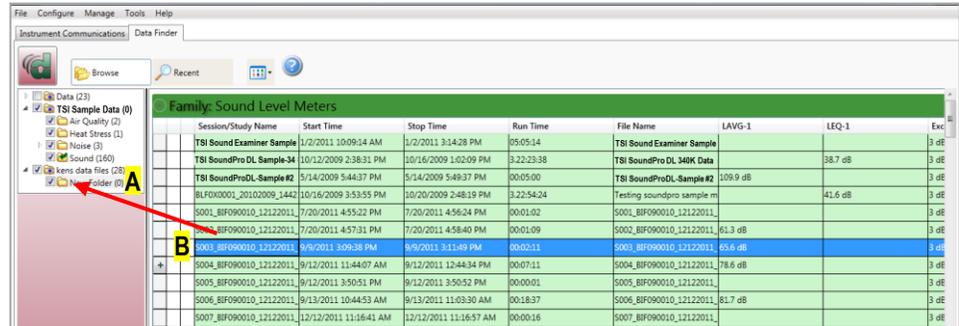


Figure 1-67: Moving folders with a selected session

3. Drag the mouse over the designated folder and release the mouse.

NOTE: A message to confirm the file move will appear.
4. Click **Yes** to move the files or **No** to cancel.



Figure 1-68: Confirm file move



NoisePro Dosimeter: Setup

There are seven configurable NoisePro setup screens in the setup panel on the **Instrument Communications** page (see **1**). With the NoisePro dosimeter, you have the option to save the configurations either on the instrument and/or store the configurations in DMS.

NOTE: If you save the profiles in the software, this can be used as a time management tool to organize and save all the setups for future use.

With the NoisePro dosimeter, there are five different models with different features and functionalities. Some of the setup parameters may not be applicable to your model. Please refer to the user manual to understand the models in more detail.

NoisePro Dosimeter: Saving and Sending Configurations



With the NoisePro dosimeter, there are saved setup profiles used to quickly access and apply to your NoisePro dosimeter. Below explains how to save configuration settings in DMS and how to send to the instrument. Also, the get configuration feature is used to copy the setup parameters into the software.

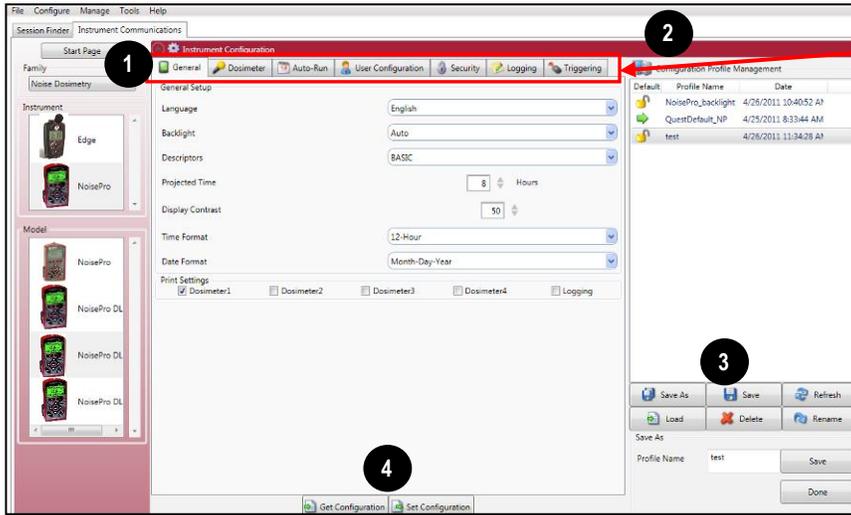
NOTE: To only send the setup, please skip to step 3. Please refer to this section as you set up your instrument.

1. To save the NoisePro dosimeter configuration in the software, click on a name in the **Configuration Profile Management** panel (See **2**).

NOTE: The name will be shaded a light gray when selected.

 - To create a new profile name, click and type in a profile name. Click **Save**. (It will save under the configuration profile management panel).
2. Click on the button (see **3**) and type in a **Name**. Click **OK**.

NOTE: This saves the configuration file to the software.
3. To send to the instrument, click on the button (see **4**).
4. To get the setup from the instrument, click on the button (see **4**). (*Optional:* To save the setup as a configuration follow steps 1-2 above.)



Setup:

Click on the tabs to set up/view:

- General, Dosimeter, Auto-Run, User Configuration, Security, Logging, and Triggering settings

Figure 1-69: Saving and sending NoisePro setups



NoisePro Dosimeter: General Settings

The NoisePro dosimeter general settings are used to set up the instrument with basic parameters. Please refer to the NoisePro dosimeter General Settings table below for details.

- Click on the **General** tab (see 1) from the NoisePro dosimeter’s Setup panel. To change the general settings, follow one (or all) of the selection options below.
 - Click on the arrow and select an option.
 - Click on the arrows and select a numeric value or type in a value.
 - Click in the print settings checkbox to activate/enable the print settings feature.
- To send to the instrument, click on or **Save and Send Configuration** (for more details see “[Saving and Sending Configurations](#)”).

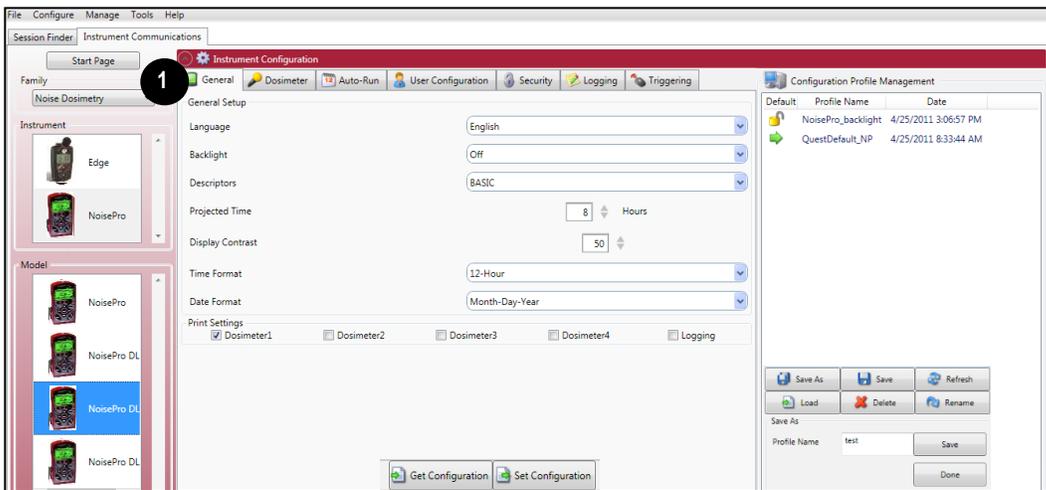


Figure 1-70: NoisePro dosimeter General Settings

NoisePro Dosimeter General Settings

General Settings	Description *NOTE: Refer to Glossary for more detailed information
Language	There are eight selectable languages including: English, French, German, Italian, Spanish, Portuguese, Simplified Chinese, and Korean. When selected, the language on the instrument will change to the specified language.
Backlight	<p>The backlight is used to illuminate the display and may be used in dark settings such as a manufacturing plant with dim lighting. The setting include:</p> <ul style="list-style-type: none"> • Off – this is the default setting with no backlight. • Auto – will turn the backlight on automatically when a dimmer setting is detected. NOTE: The “auto” feature will help preserve the battery power and will only turn on when a dim setting is detected. • Key – will turn the backlight on when a key is selected and will remain laminated for approximately three to four seconds.
Descriptors	<p>There are two types of measurement descriptors used on the instrument which is basic or IEC/ISO.</p> <ul style="list-style-type: none"> • Basic – a type of measurement descriptor which abbreviates the measurements in a US version notation. (For example, the following measurements are abbreviated as: SPL, Peak, Max, Min) • IEC/ISO – a type of measurement descriptor which abbreviates the measurements in IEC/ISO notation. (For example, the following measurements are abbreviated as: L_{AS}, L_{ZPK}, L_{ASMX}, L_{ASMN})
Projected Time	The projected time value is used to make projected dose calculation for the dose measurement.
Display Contrast	The default display setting is set at a mid-range contrast setting. To increase or decrease the contrast, set the numbers either higher/lower to adjust the display.
Time Format	The time format may be set to either 12-hour or 24-hour time format. The default setting is a 12-hour clock.
Date Format	The date format may be set to either month-day-year format or day-month-year. The default setting is month-day-year format.
Print Settings	Select the appropriate checkbox to view up to four dosimeter settings and/or logging settings.



NoisePro Dosimeter: Dosimeter Settings

There are up to four internal meters that may be set and used simultaneously during a run (see **1**) depending on the NoisePro model you are using. Please see the user manual for details.

The settings are based on the parameters listed under “Configuration Parameter” (see **2**) and explained in the User Configuration Settings table in the following section.

1. Click on the Dosimeter tab from the NoisePro dosimeter’s Setup panel. To set the dosimeter settings, select one of the following pre-defined regulations or user-defined setups by clicking on the arrow and selecting an option. (Please refer to the table below for more details.)
2. To send to the instrument, click on or **Save and Send Configuration** (for more details see “[Saving and Sending Configurations](#)”).

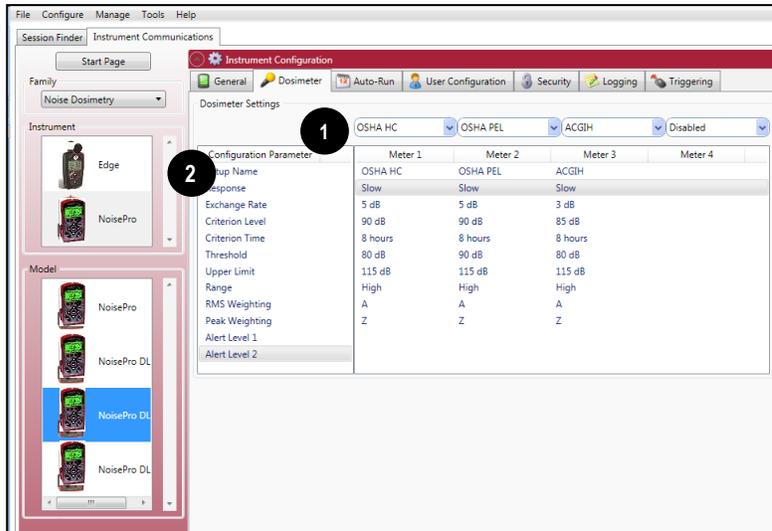


Figure 1-71: NoisePro dosimeter settings

NoisePro Dosimeter Settings (alert levels explained)

Dosimeter Setups (Alert Levels)	Description
	Refer to user manual for more detailed information
OSHA - HC	Pre-defined settings based on the OSHA- HC levels.
OSHA - PEL	Pre-defined settings based on the OSHA-PEL levels.
MSHA - HC	Pre-defined settings based on the MSHA-HC levels.
MSHA – PEL	Pre-defined settings based on the MSHA-PEL levels.
ACGIH	Pre-defined settings based on the ACGIH levels.
200310EC	Pre-defined settings based on the 200310EC levels.
User 1	User defined settings which may be entered in from the User Configuration tab
User 2	User defined settings which may be entered in from the User Configuration tab
User 3	User defined settings which may be entered in from the User Configuration tab
User 4	User defined settings which may be entered in from the User Configuration tab



NoisePro Dosimeter: User Configuration Settings

The NoisePro dosimeter user configuration screen is used to set up the parameters applied in the four user-defined setups of the Dosimeter settings screen. Please refer to the NoisePro User Configuration Settings table for an explanation of parameters.

1. Click on the **User Configuration** tab from the NoisePro dosimeter's Setup panel (see **1**). To change the user configuration settings, follow one (or all) of the selection options below.
 - Use the default name or enter a custom name for each of the four setups.
 - Click on the arrow  and select an option (see **2**).
 - Click on the  arrows and select a numeric value or type in a value (see **3**).
2. To send to the instrument, click on  (see **4**), or **Save** (see **5**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

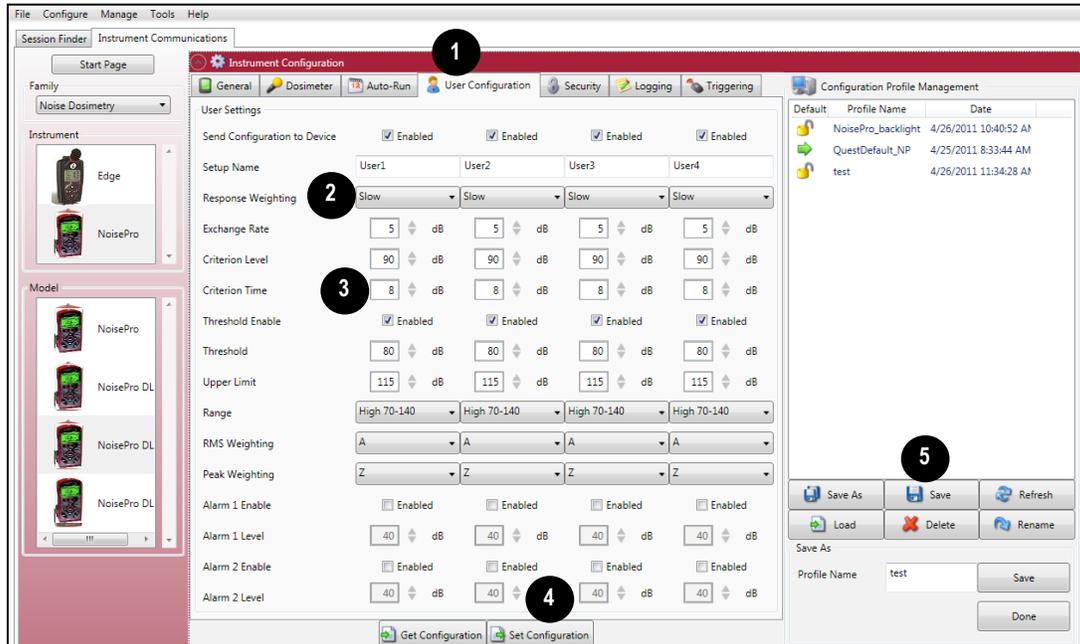


Figure 1-72: NoisePro dosimeter User Configuration settings

NoisePro Dosimeter User Configuration Settings

User Configuration Settings	Description *NOTE: Refer to Glossary for more detailed information
Send configuration to device	Check the appropriate instruments to communicate with via the Enable checkbox.
Setup Name	A setup name may be entered into the Meter 1 and/or Meter 2 fields. When set, it appears on the top of NoisePro dosimeter's display (example setup names: OSHA, MSHA, EU directive).
Response Weighting	Either Slow Time Response or Fast Time Response is applied to the measurements. (Typically, Slow time response is used in the US market while Fast is used in the EU communities.)
Exchange Rate	Enter in (or select with up/down arrows) 3, 4, or 5 dB. ER refers to how sound energy is averaged over time. (OSHA uses a 5 dB doubling rate while most of the world uses 3 dB.)
Criterion Level	Select a Criterion level from 40-140 dB via the up/down arrow or by typing in a value. NOTE: Criterion level is the average SPL that will result in 100% dose over the criterion time and is typically set by a regulatory agency such as OSHA, EU directive.
Criterion Time	Enter in a Criterion time from 1- 18 hours in 1-hour increments per dosimeter.
Threshold Enable	When the checkbox is selected and a value is entered for meter 1 and/or meter 2, the threshold is used to calculate Lavg, TWA, and Dose measurements.
Threshold	When the checkbox is selected and a value is entered for meter 1 and/or meter 2, the threshold is used to calculate Lavg, TWA, and Dose measurements. A decibel value is entered to calculate the Lavg, TWA, and Dose measurements.
Upper Limit	Select a UL dB level by the up/down arrows or by typing in a value. NOTE: The upper limit (UL) is a measurement setting in which the user selects a specific decibel level. The UL value records the amount of time that the Sound level is at or greater than the entered level.
Range	Select one of the following ranges: 40 – 110 dB and 70 – 140 dB, each of which covers a 70 dB dynamic range. NOTE: All dosimeters are set to the same range. Maximum level is for sinusoidal signals. A signal with a 10 dB crest factor will be measured accurately if its RMS level is 10 dB below the maximum level for the range.
RMS Weighting	Select either A or C RMS Weighting. NOTE: The RMS (root mean square) are the results from the Edge with the response time and weighting settings considered.
Peak Weighting	Select either A, C or Z for the peak frequency weighting.
Alarm 1 Enable	Additional alarms may be set by entering in a decibel level.
Alarm 1 Level	Additional alarms may be set by entering in a decibel level.
Alarm 2 Enable	Additional alarms may be set by entering in a decibel level.
Alarm 2 Level	Additional alarms may be set by entering in a decibel level.

SoundPro® Sound Level Meter



SoundPro Meter: Communication Setup

The communication setup is an important starting point with your instrument and DMS. Once communicating, you have the option to download data, configure instrument parameters, and configure quick setup features, such as the time and date settings. The following explains the SoundPro communication setup steps.

1. Using a USB cable, plug the cable into the SoundPro meter and then to the computer port.



Figure 1-73: Retrieving your data

2. From the start page of DMS, select  or  buttons and the Instrument Communications page will appear (see Figure below).
3. Select **SLM** Family and then select **SoundPro** under Instrument. (See **1** and **2**). You are now ready to set up or download your instrument.
 - See the subsequent SoundPro instrument setup sections to set up or download your instrument.

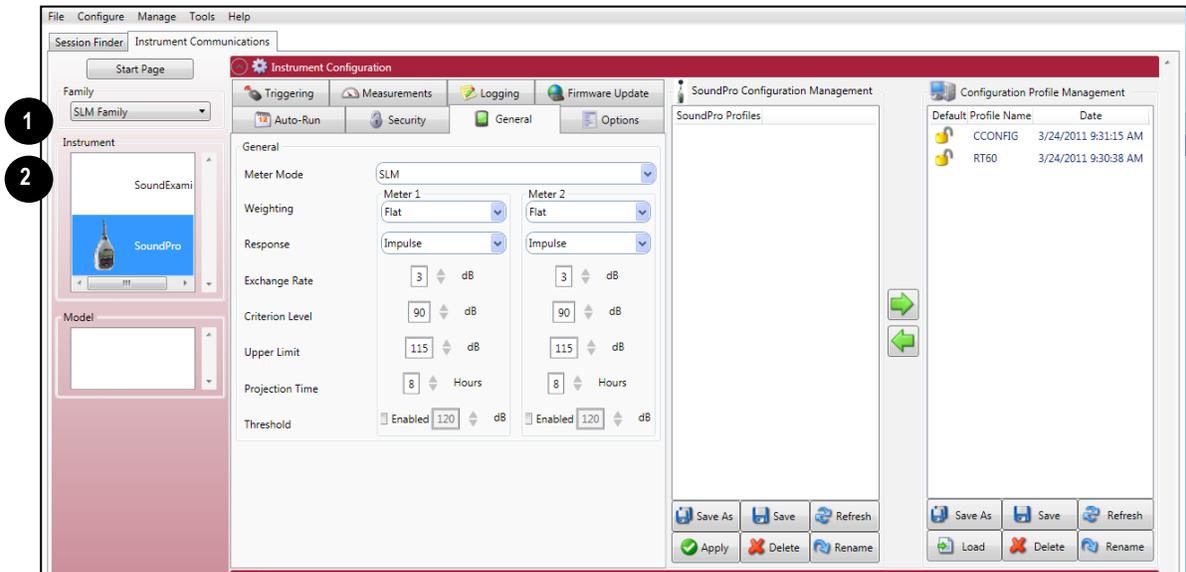


Figure 1-74: SoundPro Sound Level Meter communication setup



SoundPro Meter: Downloading Files

The Instrument Download feature enables you to download your files from the SoundPro meter into the software for review and analysis of the data. Once the files are downloaded and if “Go to Data Finder after Download” is checked, DMS will open into the Data Finder window.

NOTE: The Data Finder window stores all of the downloaded data by instrument, session and study. The information is stored in a bar chart style with measurements/parameters displayed on the top navigational bar. See Data Finder for more information.”

To download, please follow steps below:

1. To download the SoundPro data, ensure your instrument is communicating properly. (See **Communication Setup** for details.)
2. From the Start page, select the  button.
3. Select the **SLM family** and the **SoundPro** from the Instrument window (see **1**).
4. *Optional:* Click on **Select All** or check/uncheck sessions to be downloaded (see **2**).
5. Press the **Download** button (see **3**).

NOTE: DMS will report the sessions loaded and a time stamp of completion (see **4**).

Instrument Download example: Once downloaded, the file names will appear in the instrument download window.

NOTE: DMS will state when it is successfully downloaded

File	Size	Date
<input checked="" type="checkbox"/> S001.SES	8,192	7/20/2011 4:55:00 PM
<input checked="" type="checkbox"/> S002.SES	8,206	7/20/2011 4:57:00 PM
<input checked="" type="checkbox"/> S003.SES	9,728	9/9/2011 3:09:00 PM
<input checked="" type="checkbox"/> S004.SES	20,992	9/12/2011 11:44:00 AM
<input checked="" type="checkbox"/> S005.SES	8,704	9/12/2011 3:50:00 PM
<input checked="" type="checkbox"/> S006.SES	19,968	9/13/2011 10:44:00 AM

Success - Download Complete - S005.SES - 3:34:04 PM

Figure 1-75: Downloading SoundPro Sound Level Meter files



SoundPro Meter: Viewing Data

The following section outlines how to work with the SoundPro meter sessions/data in the data finder page.

Selecting a Session/Study

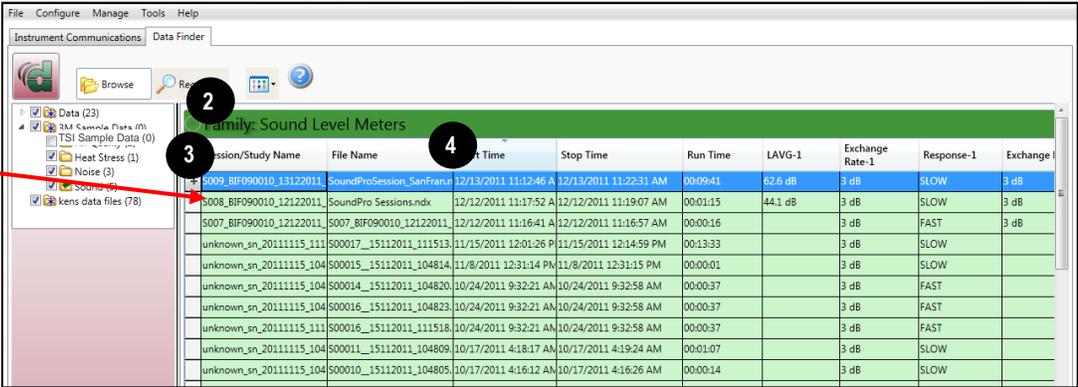
To view downloaded data from the welcome page, click on the  button and the data finder screen will appear. (Or select the Data Finder tab if already opened.)

1. Select a session by either double-clicking on data or click on the session/study and select the  button.

NOTE: The example below illustrates a SoundPro meter session with logged data over the 9:41 minute run-time. (See **1**).

- **Family: Sound Level Meters:** SoundPro data is stored in this family. (See **2**).
- **Session/Study:** The SoundPro data is organized by the table headings, such as the session/study name. . (See **3**).
- **Start Time:** To quickly locate your study by most recent start time, click on the Start Time heading and it will sort ascending/descending (See **4**).
- **Parameters and measurements:** The table headings and columns are customizable by a quick click, drag, and drop to a new column location (similar to Microsoft® Excel® spreadsheet program.)

Double-click to select/view SoundPro data in charts and tables



Session/Study Name	File Name	Start Time	Stop Time	Run Time	LAVG-1	Exchange Rate-1	Response-1	Exchange I
S009_BIF090010_13122011	SoundProSession_SanFran	12/13/2011 11:12:46 A	12/13/2011 11:22:31 AM	00:09:41	62.6 dB	3 dB	SLOW	3 dB
S008_BIF090010_12122011	SoundPro Sessions.ndx	12/12/2011 11:17:52 A	12/12/2011 11:19:07 AM	00:01:15	44.1 dB	3 dB	SLOW	3 dB
S007_BIF090010_12122011	S007_BIF090010_12122011	12/12/2011 11:16:41 A	12/12/2011 11:16:57 AM	00:00:16		3 dB	FAST	3 dB
unknown_sn_20111115_111	S00017_15112011_111513	11/15/2011 12:01:26 P	11/15/2011 12:14:59 PM	00:13:33		3 dB	SLOW	
unknown_sn_20111115_104	S00015_15112011_104814	11/8/2011 12:31:14 PM	11/8/2011 12:31:15 PM	00:00:01		3 dB	SLOW	
unknown_sn_20111115_104	S00014_15112011_104820	10/24/2011 9:32:21 AM	10/24/2011 9:32:58 AM	00:00:37		3 dB	FAST	
unknown_sn_20111115_104	S00016_15112011_104823	10/24/2011 9:32:21 AM	10/24/2011 9:32:58 AM	00:00:37		3 dB	FAST	
unknown_sn_20111115_111	S00016_15112011_111518	10/24/2011 9:32:21 AM	10/24/2011 9:32:58 AM	00:00:37		3 dB	FAST	
unknown_sn_20111115_104	S00011_15112011_104809	10/17/2011 4:18:17 AM	10/17/2011 4:19:24 AM	00:01:07		3 dB	SLOW	
unknown_sn_20111115_104	S00010_15112011_104805	10/17/2011 4:16:12 AM	10/17/2011 4:16:26 AM	00:00:14		3 dB	SLOW	

Figure 1-76: Data Finder and SLM sessions



SoundPro Meter: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

1. Panel Layout View is divided into Work Items (see **A**), Add Panel (see **B**), and Arrange Panels (see **C**) palettes, as well as data panels (see **D**).

- **Work items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
- **Add panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
- **Arrange panels (C)** – displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.

- **Data Panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: Use the Configure icon to customize parameters.

- **Toolbar icons and Configure button (E)** – the toolbar and configure button are used to customize or select different measurement parameters.



Figure 1-77: SoundPro Sound Level Meter and panel layout page

2. To change the chart/table data parameters, click on the  button. Depending on the chart/table you are working on there are selectable measurements that may be chosen for further data analysis.
3. To view the data as a report, click the  button.

NOTE: The panels will print in the order in which they are displayed in the panel layout page.

4. The quick tips below explain how to customize the panels:

- **To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.

- **To move the panel**, click on the panel's header and drag and drop to the appropriate position.

NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.

- **To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.

NOTE: It will span the numbers up or down depending on how you drag the mouse.

- To save a layout, right-click outside the panel area as displayed below. Click **Remember Setting**.

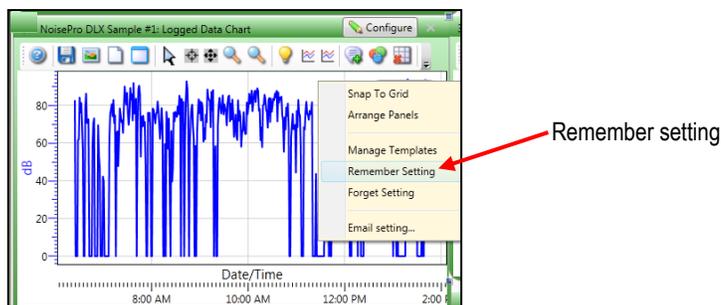
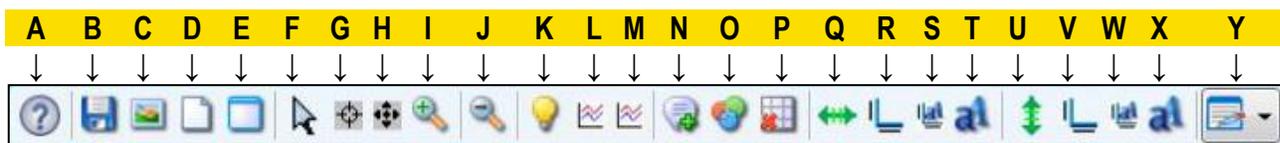


Figure 1-78: Save a layout, remember setting

NOTE: For additional logged data chart customization please see step 3.

5. To change the parameters on the logged data chart using the toolbar, please follow below:



	A.	Quick Help icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc..).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed). NOTE: If the  icon is yellow and the reset is clicked, the measurements on the logged data chart will appear as you cursor over the chart.
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	G.	Select Cursor icon: Click to select values for calculation for Lavg or Leq measurements. This is used for an advanced calculation referred to as data editing/recalculation. To select values, click  icon then left-click and hold the mouse pointer over the points you want to edit. To deselect values that have been selected, hold the "Shift" key down while left-clicking and dragging the mouse.
	H.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	I.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	J.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart. Repeat if applicable.
	K.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the  icon. Hint –sometimes value label is not visible, if this occurs click the  icon and make sure the Normal cursor is selected.
	L.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	M.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	N.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click delete.
	O.	Chart Properties icon: Click to change the color of the chart attributes.

	<p>P. Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.</p>
	<p>Q. X Axis Range icon: Click and select range parameters for the logged data chart x axis. NOTE: When selected, a Set Axis Range dialog box will appear (see image below). For the date setting, either click on the date and type in a value or select the  icon to choose a date from a calendar box. Choose start and stop date settings. For the time, select either the hours, minutes, or seconds and click the  arrows to change the time settings. Select Apply to exit the dialog box.</p> <div data-bbox="418 415 959 640" style="border: 1px solid gray; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Set Axis Range</p> <p>Start: <input type="text" value="1/18/2011"/>  17 : 01 : 15 </p> <p>Stop: <input type="text" value="1/19/2011"/>  01 : 48 : 08 </p> <p style="text-align: center;"><input type="button" value="Apply"/> <input type="button" value="Cancel"/></p> </div> <p style="text-align: center;">Figure 1-79: SoundPro meter and setting axis range</p>
	<p>R. X Axis Title icon: Click this icon to change the title of the x axis on the logged data chart. NOTE: When selected, the cursor will appear at the end of the title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box.</p>
	<p>S. X Axis Title Font icon: Select the x axis title font icon to change the font style and size of the x axis title. NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>T. X Axis Font icon: Select this icon to change the font style and size of the numeric values of the x axis. When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>U. Y Axis Range icon: Click to change the range of the y axis. (For example, you may only want to view decibel levels between 95 dB and 120 dB.) NOTE: When selected, a Set Axis Range dialog box will appear. Enter range Start and Stop values for the y axis. Select Apply to exit the dialog box.</p>
	<p>V. Y Axis Title icon: Click this icon to change the y axis title on the logged data chart (listed as dB). NOTE: When selected, the cursor will appear at the end of the y axis title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box.</p>
	<p>W. Y Axis Title Font icon: Select this icon to change the font style and size of the y axis title. NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>X. Y Axis Font icon: Select this icon to change the font style and size of the numeric values of the y axis. NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	<p>Y. Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE.</p>



SoundPro Meter and Logged Data: Chart Selecting and Recalculating

The logged data chart provides a view of the integrating measurements over the run time. There may be situations, such as a non-typical sudden burst of noise, in which you would like to analyze a specific range of data points while ignoring all other data points. On the logged data chart, this is a feature referred to as recalculating your data. When selected, the feature provides calculations of **Lavg/Leq**, **TWA**, **Dose**, and **Dose[8]**. Please follow the steps below.

1. On the Logged Data Chart, click on the  button in the panel header and select either Lavg or Leq.
2. To select specific ranges of the chart data for calculation, click the **Use Select Cursor**  button on the toolbar.

NOTE: The tooltip  indicates the name of the icon “Use Select cursor.”

3. Move the mouse pointer to the starting point for the data selection, left-click and drag the mouse to the right.
 - Shading will appear over the selected data range (see **A** below).
 - A calculation box will appear (see **B** below) above the chart showing the calculations.
 - *Optional:* To deselect (exclude) specific ranges of a current data selection, hold down the **Shift** key, left-click, and drag the mouse over the data to be deselected. Alternatively, all selected ranges and the calculation box can be cleared by selecting the **Clear**  icon.
4. To change which options and additional calculations are displayed in the calculation box, right-click on the box and a context menu will appear (see **C** below). Select your desired options: **Show Total Calculations** (a combined calculation of all selected ranges), **Show Individual Calculations** (an individual calculation for each selected range), and/or **Show Excluded Calculations** (a combined calculation of all non-selected ranges). Select your desired additional calculations: **Show TWA Calculation**, and/or **Show Dose Calculation Show Dose[8] Calculation**.



Figure 1-80: SoundPro meter and logged data chart with calculations

5. To view this in a report, click on the  button at the bottom of the page. To get back to the panel layout view, click the  button.



SoundPro Meter: Reports and Printing

To quickly create reports, open your data (in the data finder page) and click the quick report button. A standard template of charts and tables (or panels) will appear in the report.

- **Viewing reports:** if you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen.
- **Printing reports:** while in the report view page you have two options outlined below:
 - Click on the icon from the title bar.
 - Click on the icon from the session report title bar.

Report example with logged data chart displayed for SoundPro data

Customize the report by inserting on-site testing images

Reports are displayed in the order in which they are displayed from the panel layout.

Customize the report by inserting on-site testing images via the button.

Quickly switch back to the panel (with data) layout view

Figure 1-81: Sample SoundPro meter report

Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

- From the report creation options box (see **A**), click on button.
- There are four tabs to modify (if applicable) which include: company information, cover page, report, and headers/footers.
- The example below displays customizing the header and footer.

A

B

Type in text or use the icons to create customized heading/footer.

To change the company logo, type the footer image path or click the Find Image button.

Figure 1-82: Report customization tools



SoundPro Meter: Sharing Data

Emailing Data

- To email data, right-click on a chart/table and select **Email setting** (see ❶ in figure below).
- Once selected, the email program will automatically open and attach the chart/table as a file to the bottom of an email.
- For the person receiving the email, save the file to a known folder location and then open DMS. In the Data finder page, right-click the folders and select refresh. The saved files will appear.
 - Tip:** Point your mouse over the folder you want to save the data in the data finder page, and DMS will display the file location (see ❶). If the file was emailed, right-click on the attached file and save it to the location displayed from the DMS mouse over (if applicable). Once saved, right-click on the folder via the Data Finder Page and select **Refresh**. The files will be imported into DMS.

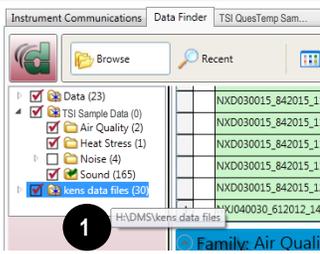


Figure 1-83: Display file location

- Another option:** From the menu bar, the end-user selects: **File, Open**, and then browses to the folder (see ❷).
 - DMS would then display the data in the data panel.

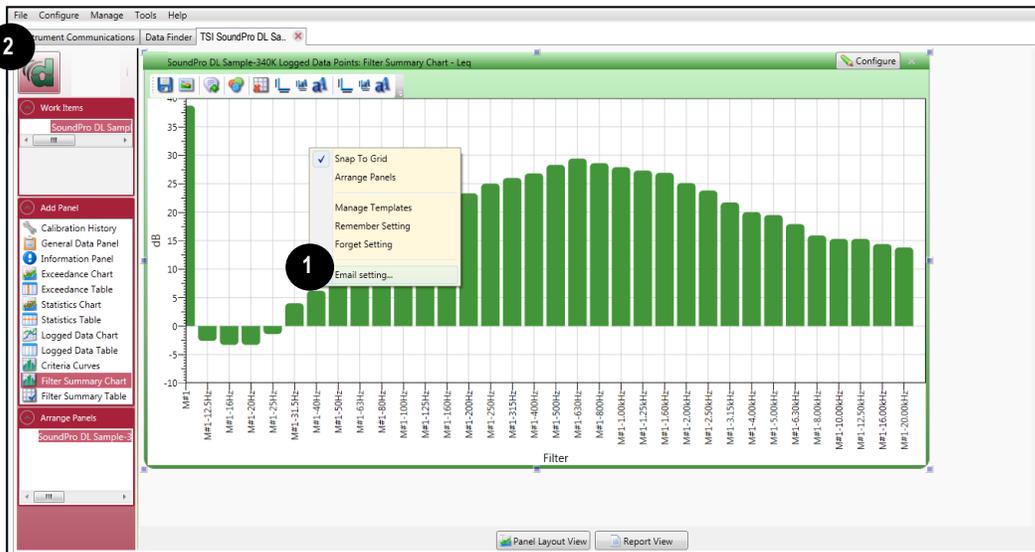


Figure 1-84: SoundPro Sound Level Meter and emailing data



SoundPro Meter: Organizing Data

Creating a New Folder

When copying and or sharing data, you may want to organize the data with the create folder feature. Please follow the steps below.

1. In the data finder page, right-click and the context menu will appear as displayed below. Click on **New Folder** (see **A**).

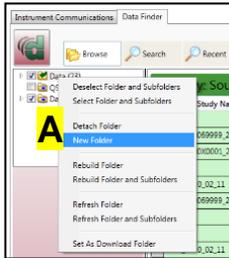


Figure 1-85: New Folder example

2. Assign a name by typing in the folder name and press **Enter**.
3. See the section below to move a file.

Moving a File

1. In the data finder page with Browse and Details view (default view) displayed, select the corresponding checkbox in the folder section where the desired moved files will reside. (See **New Folder** example below, **A**.)
2. To move the sessions or studies, select by clicking in the data grid. (See **B** below. Note the selected session/study will be highlighted in blue.)
 - To select more than one session/study, click and hold down the control key on your keyboard while clicking on as many sessions/studies as desired.

Click, drag and drop selected sessions/studies into a designated folder.

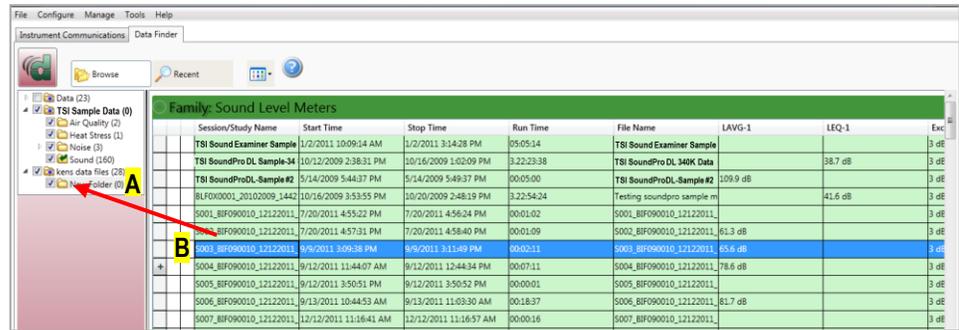


Figure 1-86: Moving folders with a selected session

3. Drag the mouse over the designated folder and release the mouse.

NOTE: A message to confirm the file move will appear.

4. Click **Yes** to move the files or **No** to cancel.



Figure 1-87: Confirm file move



SoundPro Meter: Setup

There are eight configurable SoundPro setup tabs in the instrument communications' page. When working with the SoundPro Sound Level Meter, you have the option to save the configurations either on the instrument (see **1** "SoundPro Configuration Management") and/or save in DMS (see **2** "Configuration Profile Management").

NOTE: If you save the profiles in the software, this can be used as a time management tool to organize and save all the setups for future use.

NOTE: there are several different SoundPro models, and there may be settings which do not apply to your purchased model. Please refer to user manual for more information.

SoundPro Meter: Saving and Sending Configurations

With the SoundPro Sound Level Meter, there are customized setup profiles used to quickly access and apply for future measurement studies. Below explains how to save and send the configurations in the software and on the instrument.

1. To save the SoundPro configuration in the software, click on a name in the **SoundPro Profiles name** (See **1**).

NOTE: The name will be shaded a light gray when selected.

2. Click on the  button (see **2**) and type in a **Name**. Click **OK** (see **3**).

NOTE: This saves the configuration file to the software.

3. Click on the new name and select the  **Arrow** (see **4**) to send it to the software to save (or store for a later date).

4. To update the profiles, click on the appropriate profile name and select **Save**.

NOTE: When updating from the instrument or from the software, the right arrow  (see **4**) is used to send the configuration file from the instrument to the software while the left arrow  (see **5**) is used to send the configuration file from the software to the instrument.

5. Repeat as necessary.

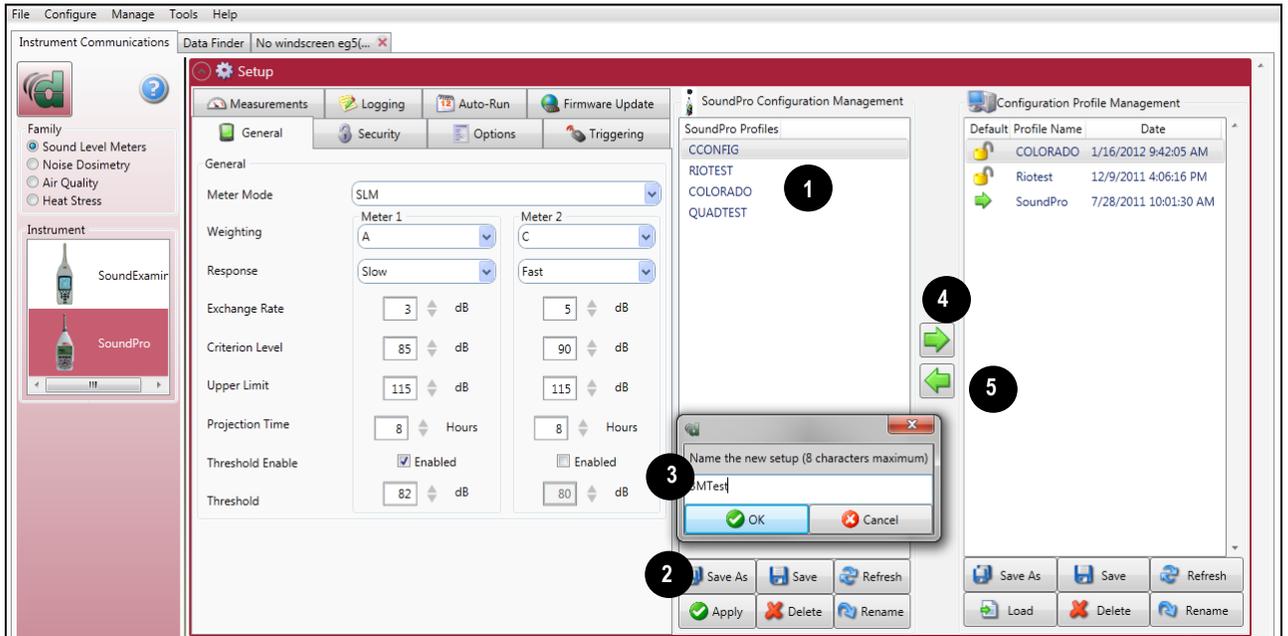


Figure 1-88: SoundPro meter configurations



SoundPro Meter: General Settings

With the SoundPro Sound Level Meter, the general measurement settings include communications for meter 1 and meter 2 (which computes two “virtual” instruments in one).

NOTE: Please see user manual for model information.

- Click on the **General** tab from the SoundPro meter’s Setup panel (see **1**). To change the General settings, there are three different options depending upon which field you are working with.
 - Select the drop arrow and select an option.
 - Click on the arrows and select a numeric value.
 - In the fields with the arrows, type in a specific value in lieu of using the arrows.
- To set the general settings, save and send to the SoundPro meter (for more details see “[Saving and Sending Configurations](#)”).

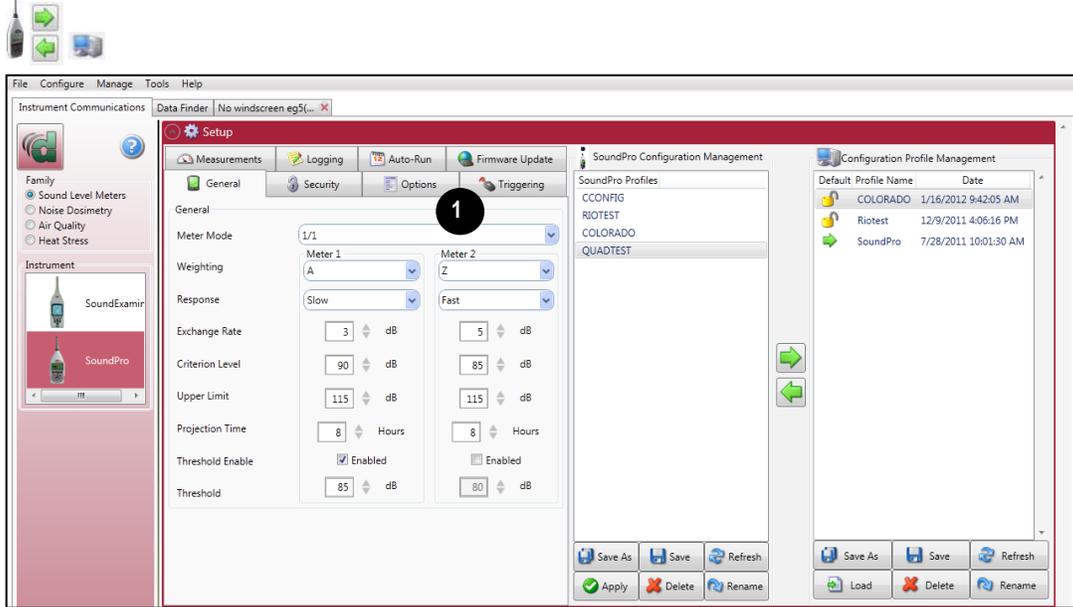


Figure 1-89: SoundPro Sound Level Meter general settings

SoundPro Meter General Settings

General Setting	Description *NOTE: refer to Glossary for more detailed information or the user manual.
Meter Mode	There are five SoundPro Sound Level Meter mode settings (which is dependent upon the model you bought). The following modes are briefly explained: <ul style="list-style-type: none"> • SLM – Sound level meter mode (for broadband measurements) • 1/1 – Full octave band analysis (16 Hz to 16 kHz) • 1/3 – One-third octave band analysis (12.5 Hz to 20 kHz)
Weighting	SPL measurements are commonly weighted (or filtered/scaled) in relation to their frequency components. Types of: <ul style="list-style-type: none"> • A weighting: A weighting filter makes the sound level meter respond closer to the way human ear responds to noise at lower levels. • C weighting: C weighting is intended to represent how the ear responds to very high levels. • Z weighting: Z weighting is a flat weighting but attenuates at a lower dB level than the F weighting. • F weighting: F weighting is a flat frequency weighting.
Response	The response time is a standardized exponential time weighting of the input signal according to the following three selectable parameters: fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 0.125 s, 1.0 s and 35 ms, respectively. Impulse time response is 35 ms rise with a constant decay of 2.9 dB/sec.

General Setting	Description
	*NOTE: refer to Glossary for more detailed information or the user manual.
Exchange Rate	Also known as the Doubling Rate, this refers to how the sound energy is averaged over time. Using the decibel scale, every time the sound energy doubles, the measured level increases by 3 dB. This is the 3 dB Exchange Rate that most of the world uses. For every increase of 3 dB in the time weighted average, the measured dose would double.
Criterion Level	The average SPL that would result in 100% dose over the Criterion Time (usually 8 hours).
Upper Limit	The total time during a study that the SPL exceeds the Upper Limit meter setting.
Projected Time	A time interval used in some calculations, usually different from the actual run time of a study or session.
Threshold	An SPL value that defines a lower level of acceptable values. Only SPL samples that exceed the threshold are used in some calculations.



SoundPro Meter: Measurement Settings

The measurement settings is used to set up noise dosimetry/community noise settings including the following: exceedance levels (up to four levels), LDN, CNEL, C-A, and Takt Time.

NOTE: these are optional setup parameters. Please refer to the SoundPro Measurement table for details.

- Click on the Measurements tab from the SoundPro meter's Setup panel (see **1**). To change the measurement settings, follow the applicable parameters below.
 - To enable an **exceedance level**, click in the **Enabled** checkbox (see **2**). Then, select a dB level. (Repeat as necessary to set up additional exceedance levels.)
 - To enable **LDN, CNEL or C-A**, click in the **Enabled** checkbox (see **3**, **4**, and **5**). (Please see C-A in the table below for information on required parameters to enable this feature.)
 - To enable **Takt Time**, select the  arrow and select one of the parameters (see **6**).
- To set the measurement settings, save and send to the SoundPro meter (for more details see "[Saving and Sending Configurations](#)").

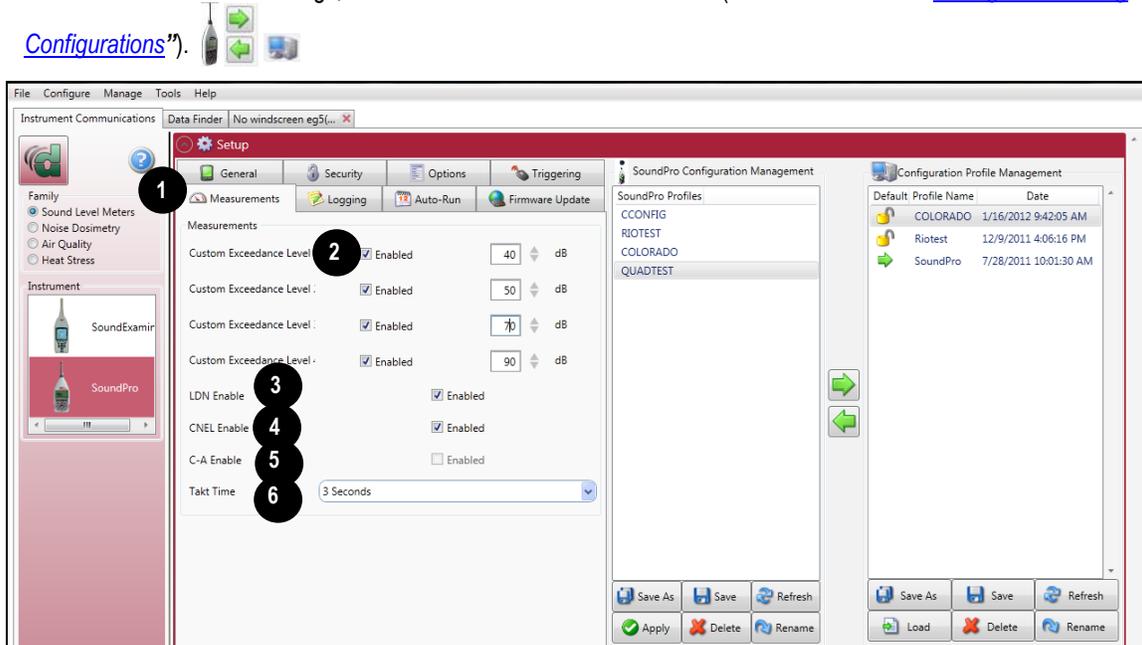


Figure 1-90: SoundPro Sound Level Meter measurement settings

SoundPro Meter Measurement Settings

Measurement Setting	Description *NOTE: Refer to Glossary for more detailed information or the user manual.
Exceedance	<p>Exceedance levels represent the percent of the run time that was spent at or above the corresponding dB level.</p> <ul style="list-style-type: none"> ● Example: An L40 equal to 73 dB would mean that for 40% of the run time, the decibel level was equal to or higher than 73 dB. ● Exceedance levels can be set from 1% to 99%.
LDN	<p>Day-Night Average is a type of community noise measurement. Representing the Day/Night sound level, this measurement is a 24-hour average sound level where 10 dB is added to all of the readings that occur between 10 pm and 7 am.</p>
CNEL	<p>Community Noise Exposure Level is a type of community noise measurement. The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours.</p>
C-A	<p>C minus A measurement is determined from concurrent measurements of the SPL by both meters. To enable C minus A calculation the following parameters will need to be activated.</p> <ul style="list-style-type: none"> ● Thresholds - Both meters set to "Off" or the same value. ● Exchange rates- Both meters set to the same value. ● Time response - Both meters set to the same value. ● Frequency weightings- Meter 1 must be set to A-weighting; Meter 2 must be set to C-weighting.
Takt Time	<p>Taktmaximal - A time average over a sampling interval that uses the highest level occurring during the preceding Taktmaximal Interval, either three or five seconds, and assumes that it was present for the whole Taktmaximal Interval.</p>



SoundPro Meter: Logging Settings

The SoundPro Sound Level Meter logging screen is used to set up your data logging options.

NOTE: The logging options are programmable on Meter 1 and Meter 2. Please refer to the Logging table below for an explanation of features.

- Click on the Logging tab from the SoundPro meter's Setup panel (see **1**). To change the logging settings, follow one (or all) of the selection options below.
 - Click in the **Enabled checkbox** to "turn on" one of the logging features.
 - Click on the arrows and select a numeric value or type in a value.
 - Select a Logging rate by clicking on the drop-down arrow and selecting an option from the logging rate list.
- To set the logging settings, save and send to the SoundPro (for more details see "[Saving and Sending Configurations.](#)")

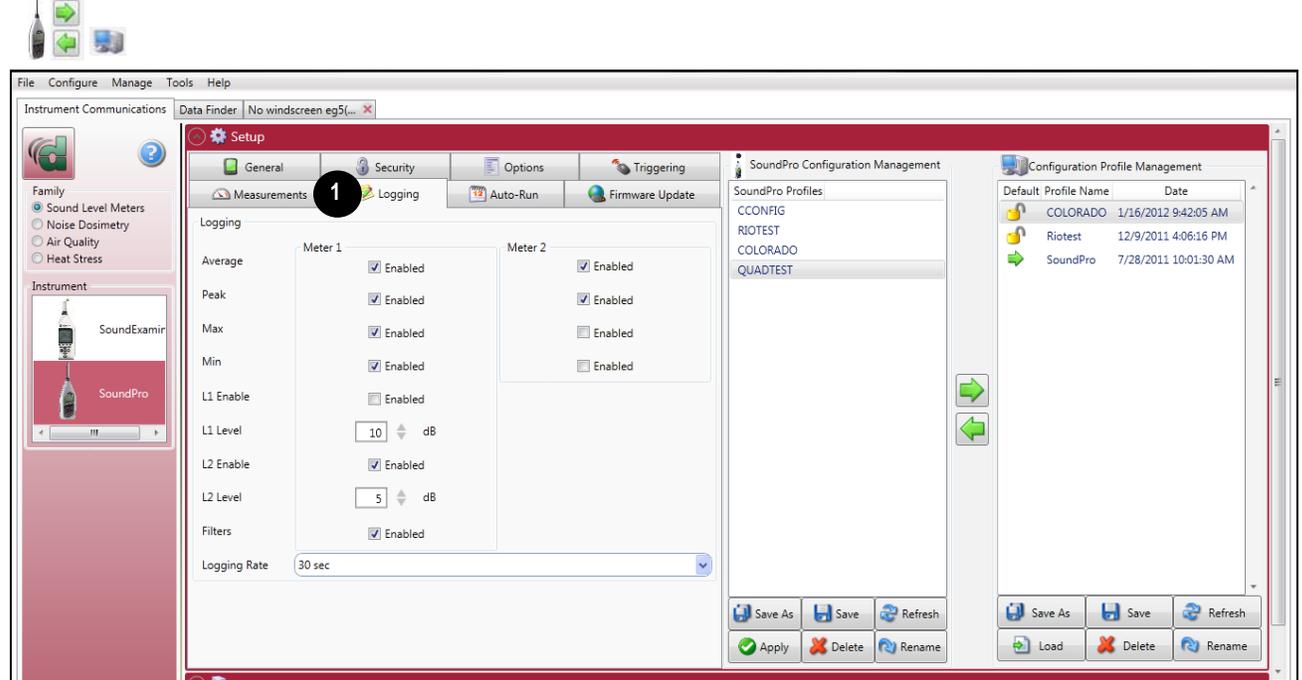


Figure 1-91: SoundPro meter and logging setup

SoundPro Meter Logging Settings

Logging Setting	Description *NOTE: Refer to Glossary for more detailed information or the user manual.
Average (see 1)	Average (Lavg) sound pressure level (SPL) is the average SPL measured over the run time/integrating period. The term Leq is used when 3 dB exchange rate is applied; the Lavg is used when 5 dB is applied.
Peak (see 2)	Peak is the highest instantaneous sound level that the microphone detects. Unlike the Max Level, the peak is detected independently of the unit's Response Time setting (Fast or Slow).
Max (see 3)	The highest sampled sound level during the instrument's run time allowing for the unit's Response Time setting (Fast or Slow).
Min (see 4)	The lowest sampled sound level during the instrument's run time allowing for the unit's Response Time setting (Fast or Slow).
L1/L2 (see 5)	L1 and L2 are types of exceedance levels used for community noise monitoring. This is defined as the level exceeded by the measured noise level for an identified fraction of time. Exceedance levels may be calculated for many time fractions (or percentages). Optional settings: Set to "Enabled" with a specific decibel level (e.g. 85 dB).
Filters (see 6)	Filters, or "Octave band filters", may be "enabled" during logging (or the run) via the checkbox. NOTE: This is only available if you purchased the 1/1 or 1/3 octave band filters option.
Logging Rate (see 7)	In sound studies, the saving of measurements at fixed intervals during a study, where each measurement is determined from data processed in the previous logging interval.



SoundPro Meter: Auto-Run Settings

The SoundPro meter has four programmable auto-run modes that allow you to automatically run and log measurements at specified times and durations. These include timed run, date, day of week, and level. (Please refer to Auto-Run table below for details.)

1. Click on the Auto-Run tab from the SoundPro meter's Setup panel (see **1**). To enable, follow one of the four options below (Timed Run, Date, Day of week, and/or Level setting).
2. To set the auto-run settings, save and send to the SoundPro meter (for more details see "[Saving and Sending Configurations](#)").



- **Timed Run setting:** click on **Enabled checkbox** (see **1**) and select the **Timed Run tab** (see **2**). Type in a **duration** [see **3** (duration is based on a 24-hour clock in hours, minutes and seconds)].

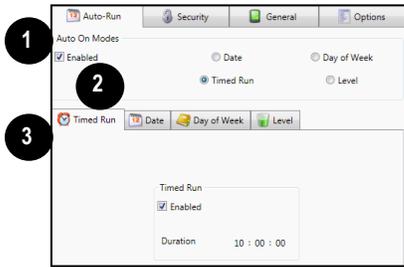


Figure 1-92: SoundPro Meter and Auto-Run with Timed Run mode

- **Date setting:** click on **Enabled** (see **1**) checkbox and select the **Date tab** (see **2**). To set up an Auto-Run Date setting, click in the **Date 1 Enabled** checkbox (see **3**) and select the Start date, start time, and duration (see **4**). Repeat this to set up additional Dates but click in Date 2, 3, and/or 4 buttons.

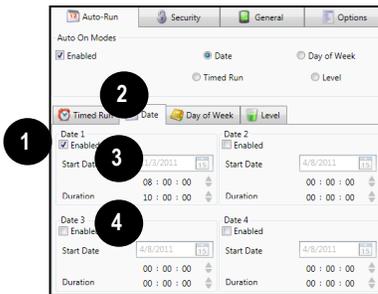


Figure 1-93: SoundPro Meter and Auto-Run with Date mode

- **Day of Week setting:** click on **Enabled** checkbox (see **1**) and select the **Day of Week** (see **2**) button and **Day of Week** tab (see **3**). Click on specific day (s) and then click in the **Enabled** day of week checkbox to set up one or two weeks of measurement sessions (see **4**). Using the up/down arrows or typing in values, select the **Start Time and Duration** (see **5**).

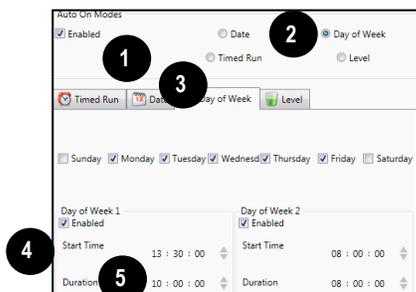


Figure 1-94: SoundPro Meter and Auto-Run with Day of Week mode

- **Level setting:** click on **Enabled** checkbox (see ❶) and select the **Level** button (see ❷) and **Level** tab (see ❸). To set up a Level setting, click on a mode (see ❹), action (see ❺) and then specify a run and stop decibel level (see ❻ & ❼). (See auto-run table below for more details.)

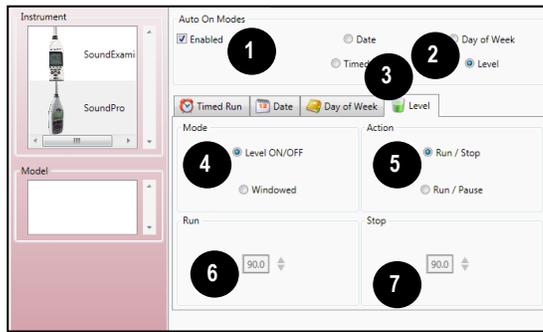


Figure 1-95: SoundPro Meter and Auto-Run with Level mode

Auto-Run Modes Explained

Auto-Run Modes and the SoundPro Meter	Description *NOTE: Refer to Glossary for more detailed information or the user manual.
Timed Run (see ❶)	With timed run mode, you program the instrument's duration (or timed run) and then manually start your study. The auto-run will end when the duration expires.
Date (see ❷)	A Date mode run wakes up the instrument from a powered down condition, runs the study, saves it then powers down again and is only executable once. The parameters are selectable by specified dates and times with up to four programmable individual setups.
Day of Week (see ❸)	The Days of the Week (DOW) mode is a pre-programmed weekly auto-run with specified days, start time, duration. You can pre-program two auto-on settings with Sunday through Saturday parameters, one specific start time, and a specified duration for each auto-on setting. NOTE: In order for the Days of the Week mode to Auto-Run, ensure the instrument is in the "off" position. The meter will then automatically switch into Auto-Run based on your setup.
Level (see ❹)	With Level mode, you program meter 1 parameters, which include a Mode, Action, and Run/Stop or Run/Pause modes. The mode, or Filtered Mode , can be set to Level On/Off and Windowed settings. <ul style="list-style-type: none"> • In Level On/Off mode, the unit starts a run when the source level exceeds the specified criteria and stops/pauses when level falls below the off criteria. The on criteria is met and either pause or stop a run when the off criteria is met. • In Windowed mode, the unit starts a run when the selected criteria falls outside the defined window. This is intended primarily for curves but can also be used with broadband or individual filter measurements. • The Action setting is used to Auto-Run the instrument either with a Run/Pause or a Run/Stop mode based on the criteria set for the run and stop decibel levels. The Run and Stop values are the criteria used to Auto-Run the instrument with corresponding mode and action fields.

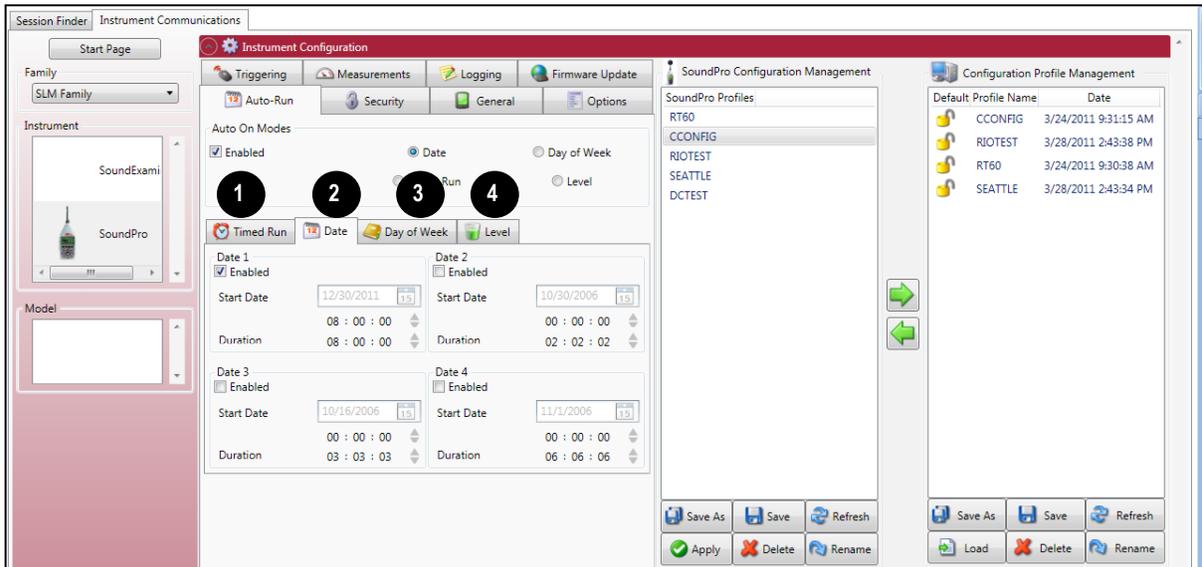


Figure 1-96: SoundPro Meter Auto-Run settings



SoundPro Meter: Triggering Settings

The triggering setting is used to control the runtimes of studies and sessions using internal and external signals (also called digital inputs and outputs). There are three settings: **Run/Pause Trigger**, **Level Trigger 2**, and **Level Trigger 3**. Please refer to the Triggering table below for an explanation of features.

- Click on the **Triggering** tab from the SoundPro meter's **Setup** panel (see **1**). To enable Triggering, follow one (or all) of the selection options below.
 - Click in the **Enabled** checkbox to “turn on” one of the triggering settings.
 - Click on the arrow or the arrow to select a logic level, threshold level, and/or trigger mode.
- To set the triggering settings, save and send to the SoundPro meter (for more details see “[Saving and Sending Configurations](#)”).

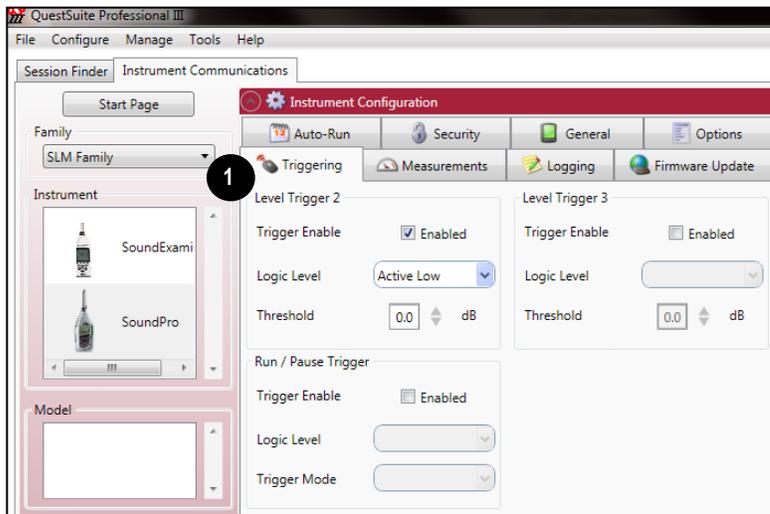


Figure 1-97: Triggering setting

Triggering Explained

Triggering Types and the SoundPro Meter	Description *NOTE: refer to Glossary for more detailed information or the user manual.
Run/Pause trigger	With Run/Pause trigger, you configure the SoundPro meter to start and pause of a run based on the Trigger Mode. To program, the Trigger Enable field is set to Enabled. When the Trigger Mode is set to Run/Pause, the instrument will run and pause based on when the external input signal is at the configured Logic Level, either Active Low or Active High. When the Trigger Mode is set to Curve, the instrument will run and pause based on when the measured sound is within the sound curve window.
Level Trigger 2 or 3	With level trigger 2 or 3, you configure the SoundPro meter to use digital output to signal if the current SPL measurements exceed a specific level (noted as “threshold”). To program, the Trigger Enable field is set to Enabled and the logic level is specified as Active Low or Active High with a specific Threshold level (e.g., 85 decibels).



SoundPro Meter: Security Settings

The security setting is a type of “locking” feature (or secure run feature) that enables you to password protect the instrument to prevent users from inadvertently terminating a study or changing the setup parameters. To set this feature, please follow the steps below.

1. Click on the Security tab from the SoundPro meter’s Setup panel (see **1**). To enable Security, click on the **Enabled** check box under setup mode or run mode (or both). Type in a numeric 4-digit code to set the security setting.
2. To set the security settings save and send to the SoundPro meter (for more details see “[Saving and Sending Configurations](#)”).

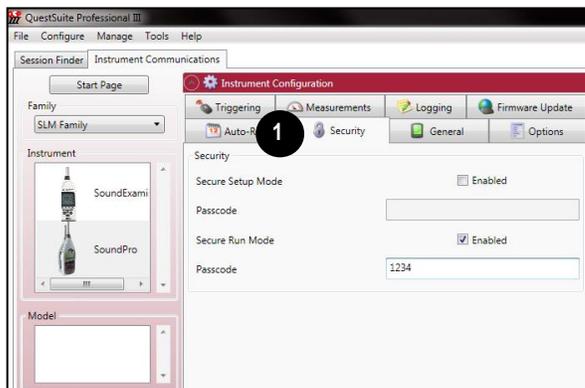


Figure 1-98: Security setting



SoundPro Meter: Options Settings

The **Options** window includes add-on features including: **curves**, **reverb time**, and/or **speech intelligibility**. (Please refer to the price listing or www.tsi.com for further information to install these options.) The Options table below explains the features and fields required to set up these features. When activating (or enabling), **Speech Intelligibility (STI-PA)**, **Reverb Time**, and/or **Curves**:

- To activate one of the options, the **meter mode** (selectable in the **General** window) must be set prior to setting up the **Options** window. The **meter modes** are identified below. Click on the **General** tab from the **Setup** panel (see **1**). Select one of the following via the  arrow:
 - Curves**: the meter mode is set to **1/1** or **1/3 octave filter** bands in the General window.
 - Speech Intelligibility**: the meter mode is set to **STI-PA** in the General window.
 - Reverberation time**: the meter mode is set to **RT60** in the General window.

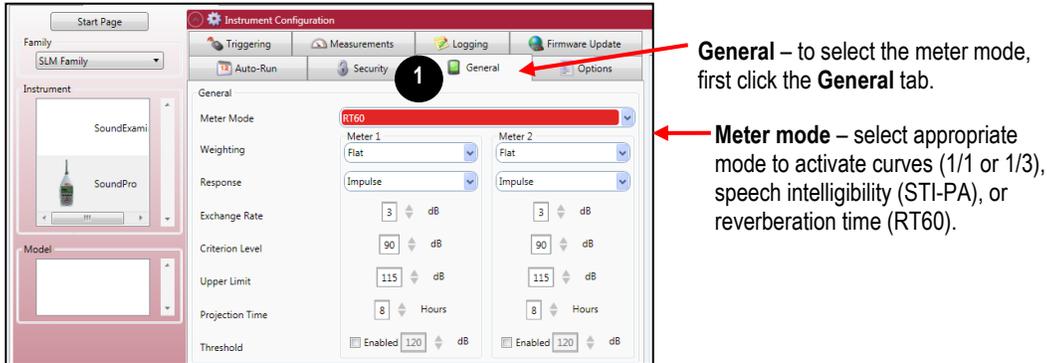


Figure 1-99: General setting

- To set the options settings, select the appropriate parameters in the **Curves**, **STI-PA**, or **Reverb Time** sections. (See Options table below for details).
 - Click on the  arrow, select a dB value via the  arrow and/or type in a value (for the reverb threshold and/or reverb measurement).

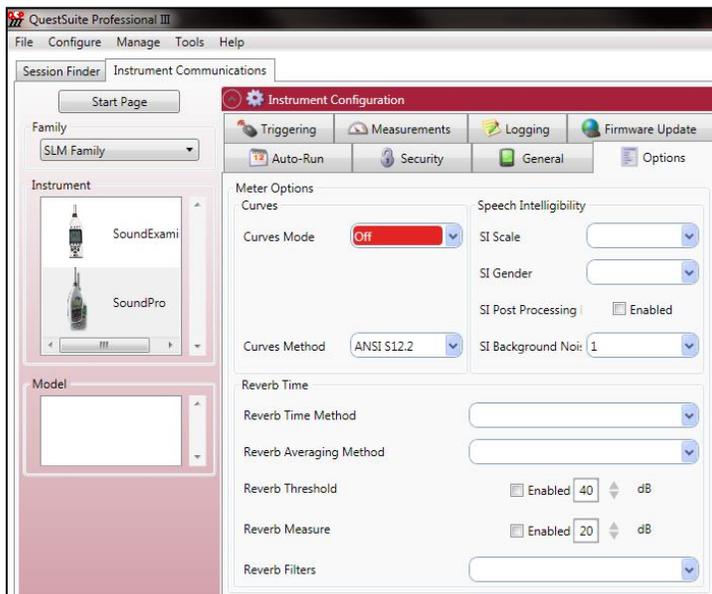


Figure 1-100: Options setting

- Save and send to the SoundPro meter (for more details see "[Saving and Sending Configurations](#)").    

Options Explained

Options and the SoundPro Meter	Description
Curves	<p>Curves, also called “acoustical spectral curves” are used to...</p> <p>Survey Mode: dynamically evaluates the noise and reports the appropriate noise curve. Typically used when taking multiple curve samples to evaluate and re-evaluate noise in a room/zone.</p> <ul style="list-style-type: none"> • Evaluation Mode: evaluates the noise levels against specific criterion. • Curve Type: NC, PNC, NCB, NR, RC, Capture, ANSI AM OSHA (please see user manual for details) <p>Curves Method:</p>
Reverb Time	<p>Reverberation time is a measurement used to evaluate and measure sound decay in a specific space, tailored to speech or music, such as: classrooms, auditoriums, gymnasiums, concert halls/theatres, (etc.). The Reverberation Time over each octave band can be analyzed using a decay curve. Each octave band shows the time of sound at the start and after the activation of the noise system using either interrupted or impulse sound methods.</p> <ul style="list-style-type: none"> • Interrupted Noise: The Interrupted noise method, applied with pink noise, is used with a portable sound system, such as a dodecahedral speaker, or with an existing sound system. • Impulse: The Impulse noise method requires a broad-spectrum impulsive noise source, such as a starter pistol, in a room to be tested. • Reverberation Averaging Method: selections are either Measurement or Ensemble which will determine how the reverb time calculates the Average. <ul style="list-style-type: none"> • With Measurement, the RT60 result times for each filter band of the 1/1 Octave or 1/3 Octave modes are averaged across the studies to arrive at a session average RT60 for that frequency band. • With Ensemble, the decay curves for each filter band of the 1/1 Octave or 1/3 Octave modes are averaged across the studies to arrive at an average session decay curve for that frequency band that is then used to calculate the session RT60 for that band. • Reverb Threshold: used to specify the dB level for triggering the start or run of the instrument. “Enabled” (also called “Auto” on the instrument) is the default setting. • Reverb Measure: this is the expected decay value. “Enabled” (also called “Auto” on the instrument) is the default setting. <p>Reverb Filters: Select either 1/1 or 1/3 octave filters. Measurements are plotted and stored in 1/1 or 1/3 octave band chart and decay chart. This field is only selectable if both 1/1 and 1/3 octave filter bands are installed features.</p>
Speech Intelligibility	<p>Speech Intelligibility testing, also called Speech Transmission Index, Public Address system (STI-PA), is a method used to evaluate and classify speech intelligibility dependent of background noise level over a mass notification system(MNS) or public address system, PA. STI is the standardized measurement in the IEC 60268-16:1998 standard.</p> <ul style="list-style-type: none"> • STI Scale – a type of MNS/PA scale which identifies if the system passes or fails (or is intelligible or non-intelligible). The scale ranges from 0.0 to 1.00 where 0.5 to 1.0 is a passing score, per the NFPA 72 and IEC 60849. • CSI Scale - Similar to the STI scale, the CIS scale uses a range from 0.0 to 1.0 to determine if the MNS is intelligible. However, with the CIS scale, a rating of 0.7 to 1.0 is an “intelligible” score, per the IEC 608489 and NFPA 72.

Sound Examiner (SE-400 Series) Sound Level Meter



SE-400 Series: Communication Setup

The communication setup is an important starting point with your instrument and DMS. Once communicating, you have the option to download data, configure instrument parameters, and configure quick setup features, such as the time and date settings. The following explains the SE-400 Series communication setup steps.

1. Using a USB cable, plug the cable into the Sound Examiner and then to the computer port.



SE-400 Series

- Turn On
- Plug in USB cable from SE-400 to PC

Figure 1-101: SE-400 Series and retrieving your data

2. From the start page of DMS, select the **Instrument communication** icon and the Instrument Communications page will appear.
3. Select **SLM Family** and then select **SE-400 Series** under **Instrument**. (See **1** and **2**). You are now ready to set up or download your instrument.
 - See the subsequent SE-400 Series instrument setup sections to set up or download your instrument.

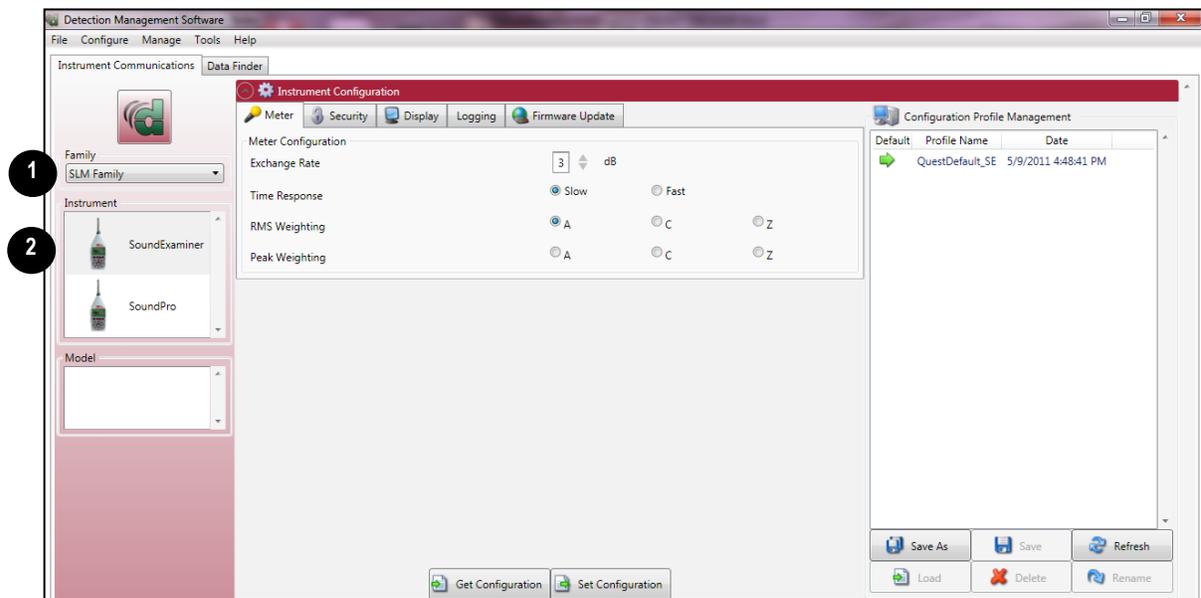


Figure 1-102: SE-400 Series communication setup



SE-400 Series: Downloading Data

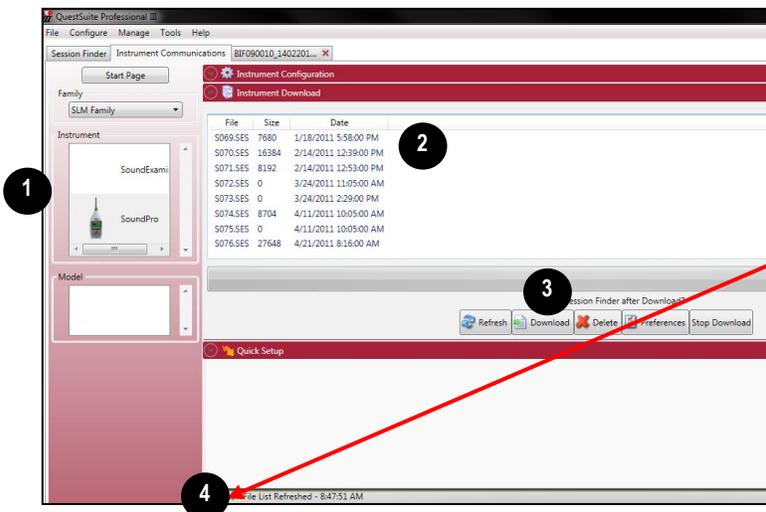
The Instrument Download feature enables you to download your files from the Sound Examiner SE-400 Series into the software for review and analysis of the data. Once the files are downloaded and if “Go to Data Finder after Download” is checked, DMS will open into the Data Finder window.

NOTE: The Data Finder window stores all of the downloaded data by instrument, session and study. The information is stored in a bar chart style with measurements/parameters displayed on the top navigational bar. See **Data Finder** for more information.”

To download, please follow steps below:

1. To download the Sound Examiner data, ensure your instrument is communicating properly. (See “SE-400 Series: Communication Setup” for details.)
2. From the Start page, select the  button.
3. Select the **SLM family** and the **Sound Examiner** from the Instrument window (see **1**).
4. Optional: click on the “Go to Data Finder after download” checkbox to view your session/study information after the download (see **2**).
5. Press the **Download** button (see **3**).

NOTE: DMS will report the sessions loaded and the date of completion (see **4**).



Instrument Download example:
Once downloaded, the file names will appear in the instrument download window.

NOTE: DMS will state when it is successfully downloaded.

Figure 1-103: Downloading SE-400 Series files



SE-400 Series: Viewing Data

The following section outlines how to work with the SE-400 Series sessions/data in the data finder page.

Selecting a Session/Study

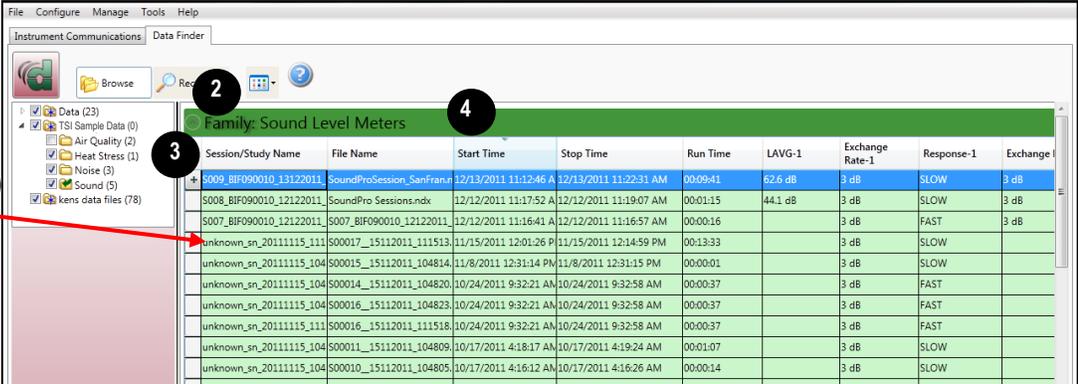
To view downloaded data from the welcome page, click on the  button and the data finder screen will appear. (Or select the Data Finder tab if already opened.)

1. Select a session by either double-clicking on data or click on the session/study and select the  button.

NOTE: The example below illustrates a SE-400 Series session with 13:33 minute run-time. (See **1**).

- **Family: Sound Level Meters:** SE-400 Series data is stored in this family. (See **2**).
- **Session/Study:** The SE-400 Series data is organized by the table headings, such as the session/study name. . (See **3**).
- **Start Time:** To quickly locate your study by most recent start time, click on the Start Time heading and it will sort ascending/descending (See **4**).
- **Parameters and measurements:** The table headings and columns are customizable by a quick click, drag, and drop to a new column location (similar to Microsoft® Excel® spreadsheet program.)

Double-click to select/view SE-400 Series data in charts and tables



Session/Study Name	File Name	Start Time	Stop Time	Run Time	LAVG-1	Exchange Rate-1	Response-1	Exchange
S009_BIF090010_13122011	SoundProSession_SanFran	12/13/2011 11:12:46 A	12/13/2011 11:22:31 AM	00:09:41	62.6 dB	3 dB	SLOW	3 dB
S008_BIF090010_12122011	SoundPro Sessions.ndx	12/12/2011 11:17:52 A	12/12/2011 11:19:07 AM	00:01:15	44.1 dB	3 dB	SLOW	3 dB
S007_BIF090010_12122011	S007_BIF090010_12122011	12/12/2011 11:16:41 A	12/12/2011 11:16:57 AM	00:00:16		3 dB	FAST	3 dB
unknown_sn_20111115_111	S00017_15112011_111513	11/15/2011 12:01:26 P	11/15/2011 12:14:59 PM	00:13:33		3 dB	SLOW	
unknown_sn_20111115_104	S00015_15112011_104814	11/8/2011 12:31:14 PM	11/8/2011 12:31:15 PM	00:00:01		3 dB	SLOW	
unknown_sn_20111115_104	S00014_15112011_104820	10/24/2011 9:32:21 AM	10/24/2011 9:32:58 AM	00:00:37		3 dB	FAST	
unknown_sn_20111115_104	S00016_15112011_104823	10/24/2011 9:32:21 AM	10/24/2011 9:32:58 AM	00:00:37		3 dB	FAST	
unknown_sn_20111115_111	S00016_15112011_111518	10/24/2011 9:32:21 AM	10/24/2011 9:32:58 AM	00:00:37		3 dB	FAST	
unknown_sn_20111115_104	S00011_15112011_104809	10/17/2011 4:18:17 AM	10/17/2011 4:19:24 AM	00:01:07		3 dB	SLOW	
unknown_sn_20111115_104	S00010_15112011_104805	10/17/2011 4:16:12 AM	10/17/2011 4:16:26 AM	00:00:14		3 dB	SLOW	

Figure 1-104: Data Finder and SLM sessions



SE-400 Series: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

1. Panel Layout View is divided into Work Items (see **A**), Add Panel (see **B**), and Arrange Panels (see **C**) palettes, as well as data panels (see **D**).

- **Work items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
- **Add panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
- **Arrange panels (C)** – displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.
- **Data Panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: Use the Configure icon to customize parameters.

- **Toolbar and Configure button (E)** – the toolbar and configure button are used to customize or select different measurement parameters.

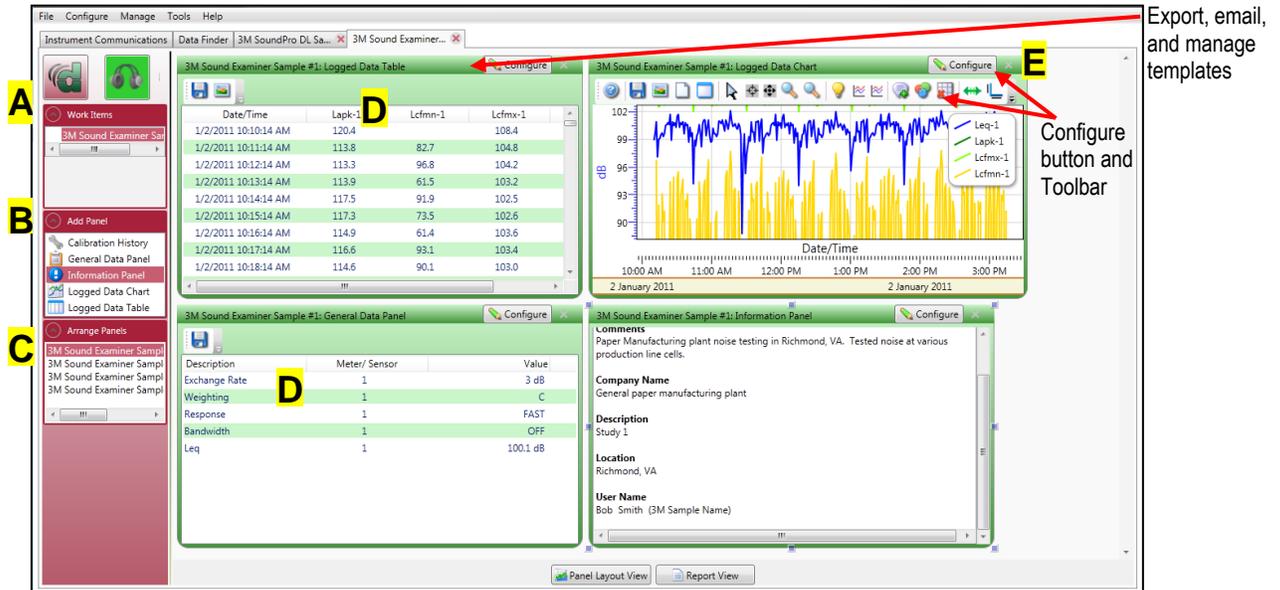


Figure 1-105: SE-400 Series and panel layout page

2. To change the chart/table data parameters, click on the **Configure** button. Depending on the chart/table you are working on there are selectable measurements that may be chosen for further data analysis.
3. To view the data as a report, click the **Report View** button.

NOTE: The panels will print in the order in which they are displayed in the panel layout page.

4. The quick tips below explain how to customize the panels:

- **To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.
- **To move the panel**, click on the panel's header and drag and drop to the appropriate position.
NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.
- **To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.
NOTE: It will span the numbers up or down depending on how you drag the mouse.
- **To save a layout**, right-click outside the panel area as displayed below. Click **Remember Setting**.

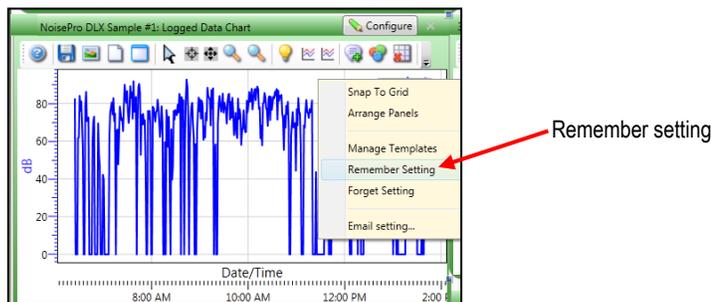
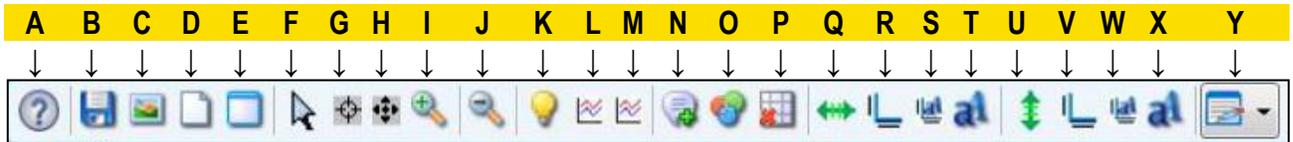


Figure 1-106: Save a layout, remember setting

NOTE: For additional logged data chart customization please see step 3.

5. To change the parameters on the logged data chart using the toolbar, please follow below:



	A.	Quick Help icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc..).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed). NOTE: If the  icon is yellow and the reset is clicked, the measurements on the logged data chart will appear as you cursor over the chart.
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	G.	Select Cursor icon: Click to select values for calculation for Lavg or Leq measurements. This is used for an advanced calculation referred to as data editing/recalculation. To select values, click  icon then left-click and hold the mouse pointer over the points you want to edit. To deselect values that have been selected, hold the "Shift" key down while left-clicking and dragging the mouse.
	H.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	I.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	J.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart. Repeat if applicable.
	K.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the  icon. Hint –sometimes value label is not visible, if this occurs click the  icon and make sure the Normal cursor is selected.
	L.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	M.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	N.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click Delete .
	O.	Chart Properties icon: Click to change the color of the chart attributes.
	P.	Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.

	<p>Q. X Axis Range icon: Click and select range parameters for the logged data chart x axis.</p> <p>NOTE: When selected, a Set Axis Range dialog box will appear (see image below). For the date setting, either click on the date and type in a value or select the  icon to choose a date from a calendar box. Choose start and stop date settings. For the time, select either the hours, minutes, or seconds and click the  arrows to change the time settings.</p> <p>Select Apply to exit the dialog box.</p> <div data-bbox="418 352 956 575" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>Set Axis Range</p> <p>Start: 1/18/2011  17 : 01 : 15 </p> <p>Stop: 1/19/2011  01 : 48 : 08 </p> <p style="text-align: center;">Apply Cancel</p> </div> <p style="text-align: center;">Figure 1-107: SE-400 Series and setting axis range</p>
	<p>R. X Axis Title icon: Click this icon to change the title of the x axis on the logged data chart.</p> <p>NOTE: When selected, the cursor will appear at the end of the title box. Press the Backspace key to delete the text and type in new text.</p> <p>Press Enter to exit the text box.</p>
	<p>S. X Axis Title Font icon: Select the x axis title font icon to change the font style and size of the x axis title.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size.</p> <p>Select OK to exit the chooser box.</p>
	<p>T. X Axis Font icon: Select this icon to change the font style and size of the numeric values of the x axis. When selected, a font chooser box will appear. Select the appropriate font type and size.</p> <p>Select OK to exit the chooser box.</p>
	<p>U. Y Axis Range icon: Click to change the range of the y axis. (For example, you may only want to view decibel levels between 95 dB and 120 dB.)</p> <p>NOTE: When selected, a Set Axis Range dialog box will appear. Enter range Start and Stop values for the y axis.</p> <p>Select Apply to exit the dialog box.</p>
	<p>V. Y Axis Title icon: Click this icon to change the y axis title on the logged data chart (listed as dB).</p> <p>NOTE: When selected, the cursor will appear at the end of the y axis title box. Press the Backspace key to delete the text and type in new text.</p> <p>Press Enter to exit the text box.</p>
	<p>W. Y Axis Title Font icon: Select this icon to change the font style and size of the y axis title.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size.</p> <p>Select OK to exit the chooser box.</p>
	<p>X. Y Axis Font icon: Select this icon to change the font style and size of the numeric values of the y axis.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size.</p> <p>Select OK to exit the chooser box.</p>
	<p>Y. Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE.</p>



SE-400 Series and Logged Data: Chart Selecting and Recalculating

The logged data chart provides a view of the integrating measurements over the run time. There may be situations, such as a non-typical sudden burst of noise, in which you would like to analyze a specific range of data points while ignoring all other data points. On the logged data chart, this is a feature referred to as recalculating your data. When selected, the feature provides calculations of **Lavg/Leq, TWA, Dose, and Dose[8]**. Please follow the steps below.

1. On the Logged Data Chart, click on the **Configure** button in the panel header and select either Lavg or Leq.
2. To select specific ranges of the chart data for calculation, click the **Use Select Cursor** button on the toolbar.

NOTE: The tooltip indicates the name of the icon “Use Select cursor.”

3. Move the mouse pointer to the starting point for the data selection, left-click and drag the mouse to the right.
 - Shading will appear over the selected data range (see **A** below).
 - A calculation box will appear (see **B** below) above the chart showing the calculations.
 - *Optional:* To deselect (exclude) specific ranges of a current data selection, hold down the **Shift** key, left-click, and drag the mouse over the data to be deselected. Alternatively, all selected ranges and the calculation box can be cleared by selecting the **Clear** icon.
4. To change which options and additional calculations are displayed in the calculation box, right-click on the box and a context menu will appear (see **C** below). Select your desired options: **Show Total Calculations** (a combined calculation of all selected ranges), **Show Individual Calculations** (an individual calculation for each selected range), and/or **Show Excluded Calculations** (a combined calculation of all non-selected ranges). Select your desired additional calculations: **Show TWA Calculation**, and/or **Show Dose Calculation Show Dose[8] Calculation**.

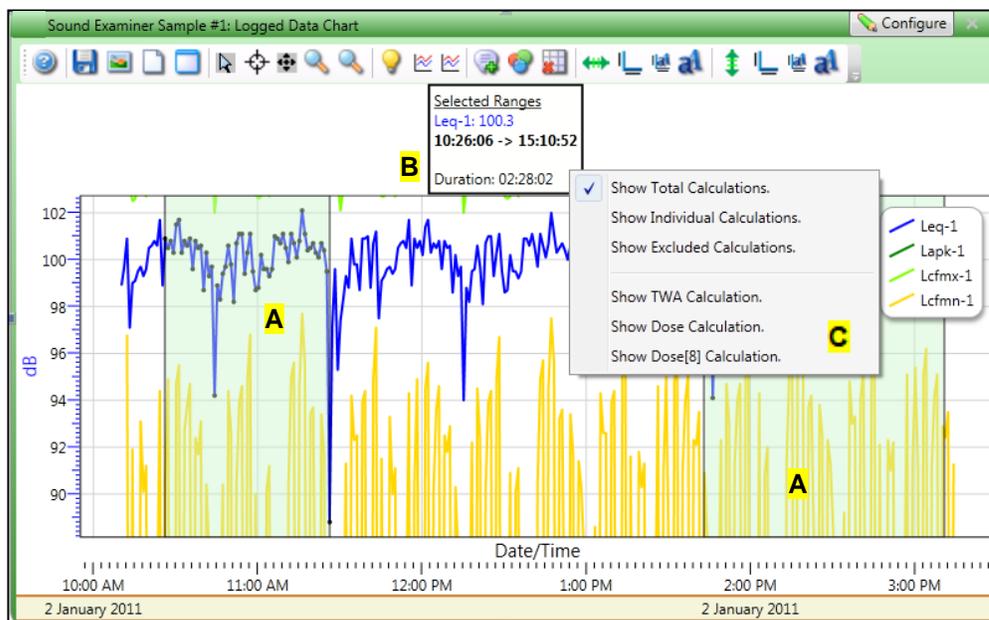


Figure 1-108: SE-400 Series and logged data chart

5. To view this in a report, click on the **Report View** button at the bottom of the page. To get back to the panel layout view, click the **Panel Layout View** button.



SE-400 Series: Setup

There are five configurable SE-400 Series setup screens (see ❶) from the instrument communications window. It is optional to save the configurations (or setups) by naming and saving the setups. Also, the get configuration feature is used copy the setup information from the instrument to the software.

NOTE: If you save the profiles in the software, this can be used as a time management tool to organize and save all the setups for future use.

SE-400 Series: Saving and Sending Configurations



The Sound Examiner features customized configurations which are applied by sending and saving to the instrument. Below explains how to save and send the configurations.

1. Once the configurations are changed, click on a name in the **Configuration Profiles Management** window (See ❷).

NOTE: The name will be shaded a light gray when selected.

- *Optional:* To create a new name, click on **Rename** or **Save As**  and type in a new name. Click **Save**.



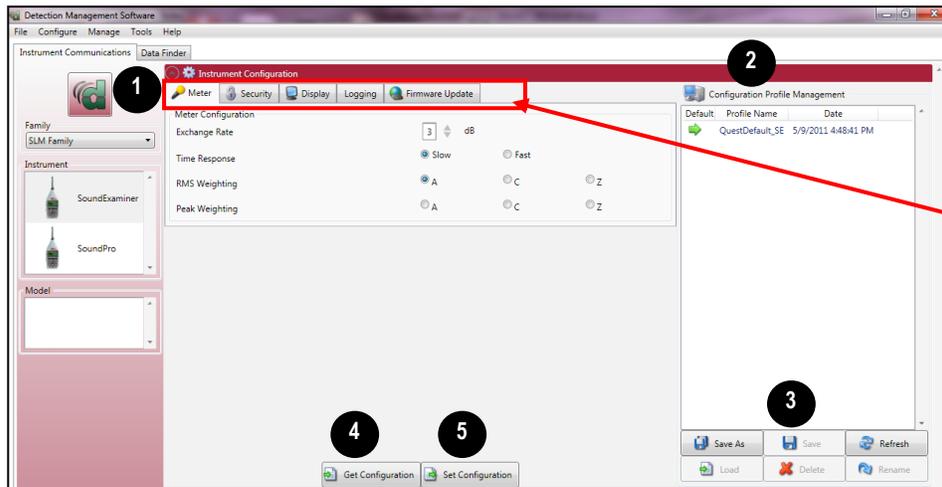
Save as box

2. Click the **Save**  button (see ❸).

3. Select the appropriate profile name and click on  **Set Configuration** button (see ❹).

NOTE: this will send the configuration to the instrument.

4. To get the setup from the instrument, click on the  **Get Configuration** button (see ❺). (Optional: to save the setup as a configuration follow steps 1-2 above.)



Setups:
Click on the tabs to set up/view:
• Meter, Security, Display, Logging, and Firmware Update

Figure 1-109: SE-400 Series configurations



SE-400 Series: Meter Settings

With the SE-400 Series, the general measurement settings are identified in the meter settings table below. To set up the parameters, please follow the steps below.

1. Click on the **Meter** tab from the SE-400 meter's Setup panel (see **1**).
2. To change the Exchange rate, click on the arrows to select or type in 3, 4, or 5.
3. To change the Time Response, RMS Weighting, and/or Peak Weighting, click in the appropriate button.
4. Select and then (for more details see "[Saving and Sending Configurations](#)".)

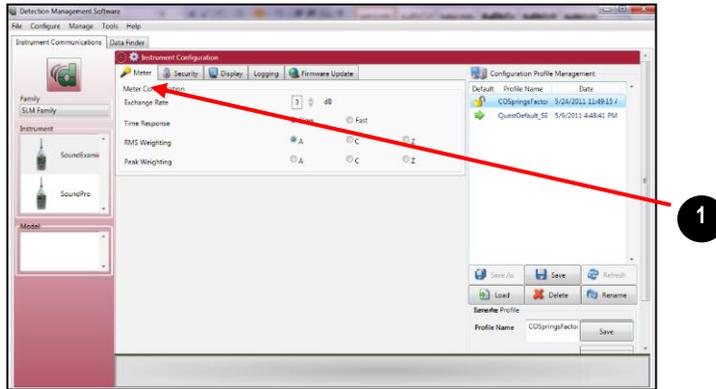


Figure 1-110: SE-400 Series Meter settings

SE-400 Series Meter Settings Explained

Meter Setting	Description *NOTE: Refer to Glossary for more detailed information or the user manual.
Exchange Rate	Also known as the Doubling Rate, this refers to how the sound energy is averaged over time. Using the decibel scale, every time the sound energy doubles, the measured level increases by 3 dB. This is the 3 dB Exchange Rate that most of the world uses. For every increase of 3 dB in the time weighted average, the measured dose would double.
Time Response	Either Slow Time Response or Fast Time Response is applied to the measurements. (Typically, Slow time response is used in the US market while Fast is used in the EU communities.)
RMS Weighting	SPL measurements are commonly weighted (or filtered/scaled) in relation to their frequency components. Types of: <ul style="list-style-type: none"> • A weighting: A weighting filter makes the sound level meter respond closer to the way human ear responds to noise at lower levels. • C weighting: C weighting is intended to represent how the ear responds to very high levels. Z weighting: Z weighting is a flat weighting but attenuates at a lower dB level than the F weighting.
Peak Weighting	Select either A, C or Z for the peak frequency weighting.



SE-400 Series: Security Settings

The security setting is a type of “locking” feature (or secure run feature) that is used to prevent a person from inadvertently stopping a run or changing the settings of the SE-400 Series.

To set the Secure Setup or Secure Run, please follow below.

1. Ensure the SE-400 Series is communicating. (See “SE-400 Series: Communication Setup” above for details.)
2. Click on the **Security** tab in order to set Secure Setup/Secure Run.
3. Click in the Enabled checkbox and type in a 4-digit passcode (see ❶). (Repeat if necessary.)
4. Click on the button to send the setup to the instrument. (Or see “Saving and Sending Configurations”.)

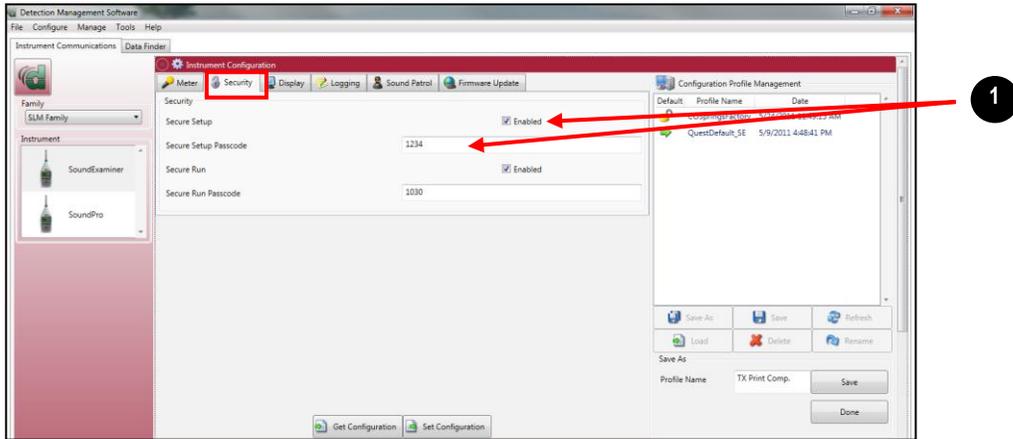


Figure 1-111: Security/Lock setup for SE-400 Series



SE-400 Series: Logging Interval

The logging setting is used to configure the logging interval with selections including: 1 second, 5 seconds, 15 seconds, 30 seconds, 1 minute, 5 minutes, 10 minutes, 15 minutes, 30 minutes, and 60 minutes. To set the logging time (or interval), please follow below:

NOTE: The 1-second and 10-minute options are valid/allowed only for instrument firmware R11E and later.

1. Ensure the SE-400 Series is communicating. (See “SE-400 Series: Communication Setup” above for details.)
2. Click on the **Logging** tab (see ❶) in the setup window.
3. In the Logging Interval drop-down box, click on the drop-down arrow and select a logging time (see ❷).
4. Click on the button to send the setup to the instrument. (Or see “Saving and Sending Configurations”.)

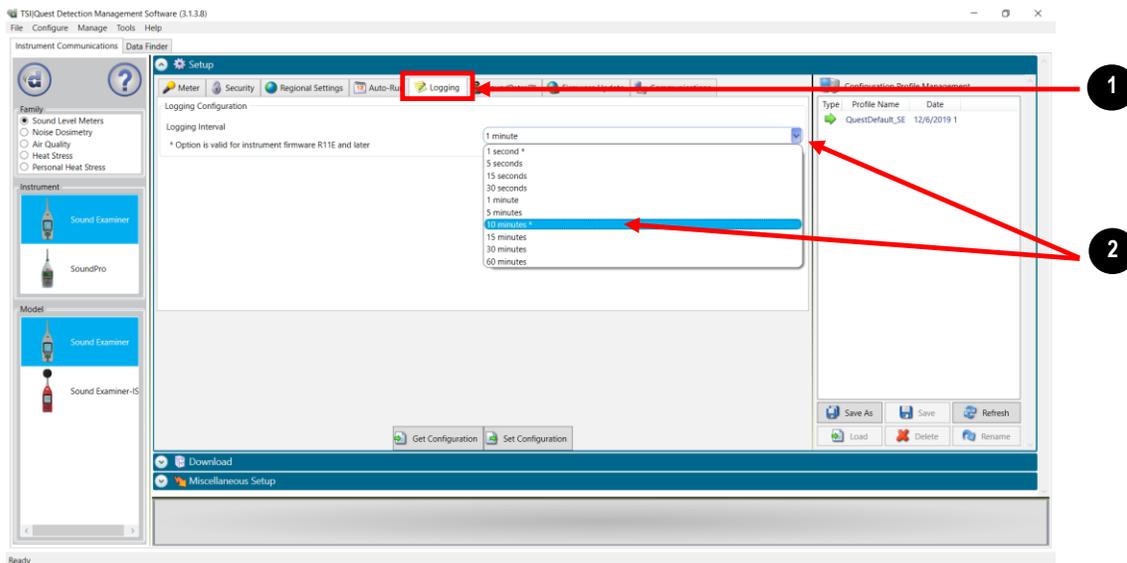


Figure 1-112: Logging interval with the SE-400 Series



SE-400 Series: SoundPatrol™ Feature

The SoundPatrol feature is used for quick printing capability, such as noise enforcement assessment, to print to a cabled, hand-held, portable printer (if purchased).

When used, the feature operates by pressing the print icon from one of the measurement or calibration screens of the instrument. DMS provides the ability to customize the report with selection of entries for printing and end-user input for the header of the report. The **Selected entries for printing** checkboxes allow you to choose which measurement and information fields are printed on the report. The **Printing notes** field enables you to provide customized text to the top of the report. To customize the report, please follow below.

1. Ensure the SE-400 Series is communicating. (See “[SE-400 Series: Communication Setup](#)” above for details.)
2. Click on the **SoundPatrol** tab (see **1**) in the setup window.
3. Click the desired **Selected entries for printing** checkboxes (see **2**) and type in **Printing notes** (see **3**).
4. Click on the  button to send the setup to the instrument. (Or see “[Saving and Sending Configurations](#)”.)

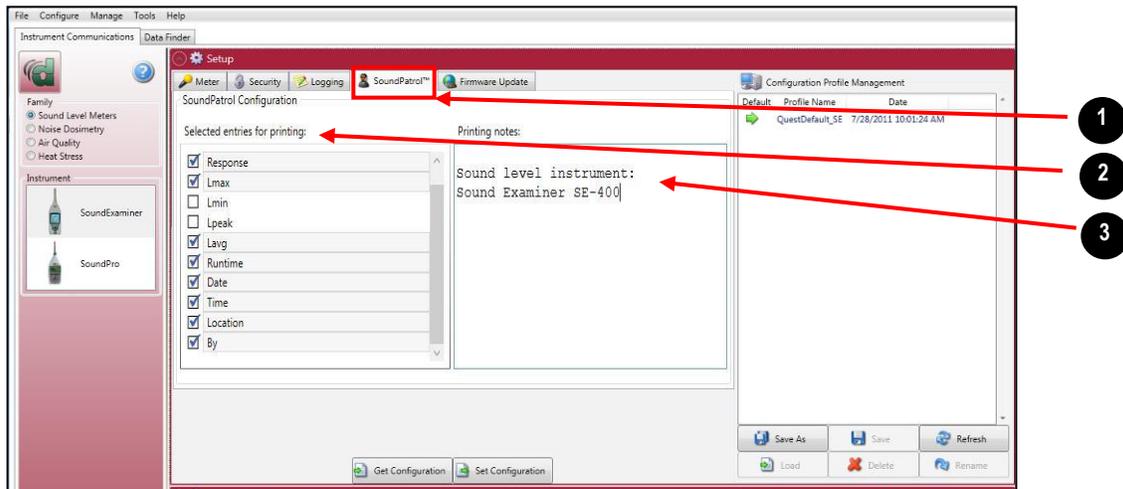


Figure 1-113: SoundPatrol screen



SE-400 Series: Firmware Update

The firmware update screen is used to update the latest software to your Sound Examiner SE-400 Series. Please follow below to update your instrument. With a firmware update, the Web Server option enables you to update through an internet connection. If you do not have internet capability, the File option is used in place of the first option.

NOTE: Contact TSI Incorporated for details on obtaining updates (www.tsi.com).

1. Ensure the SE-400 Series is communicating. (See "[SE-400 Series: Communication Setup](#)" above for details.)
2. Click on the **Firmware Update** tab and either select **Web Server** or **File**.
3. Click on the  button to send to the instrument.

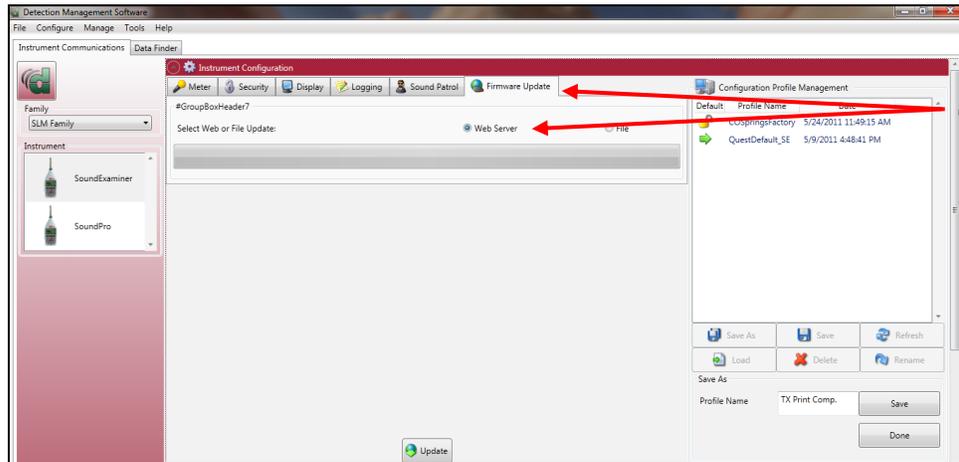


Figure 1-114: Firmware Update screen



SE-400 Series: Reports and Printing

To quickly create reports, open your data (in the data finder page) and click the quick report button. A standard template of charts and tables (or panels) will appear in the report.

- **Viewing reports:** if you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen.
- **Printing reports:** while in the report view page you have two options outlined below:
 - Click on the icon from the title bar.
 - Click on the icon from the session report title bar.

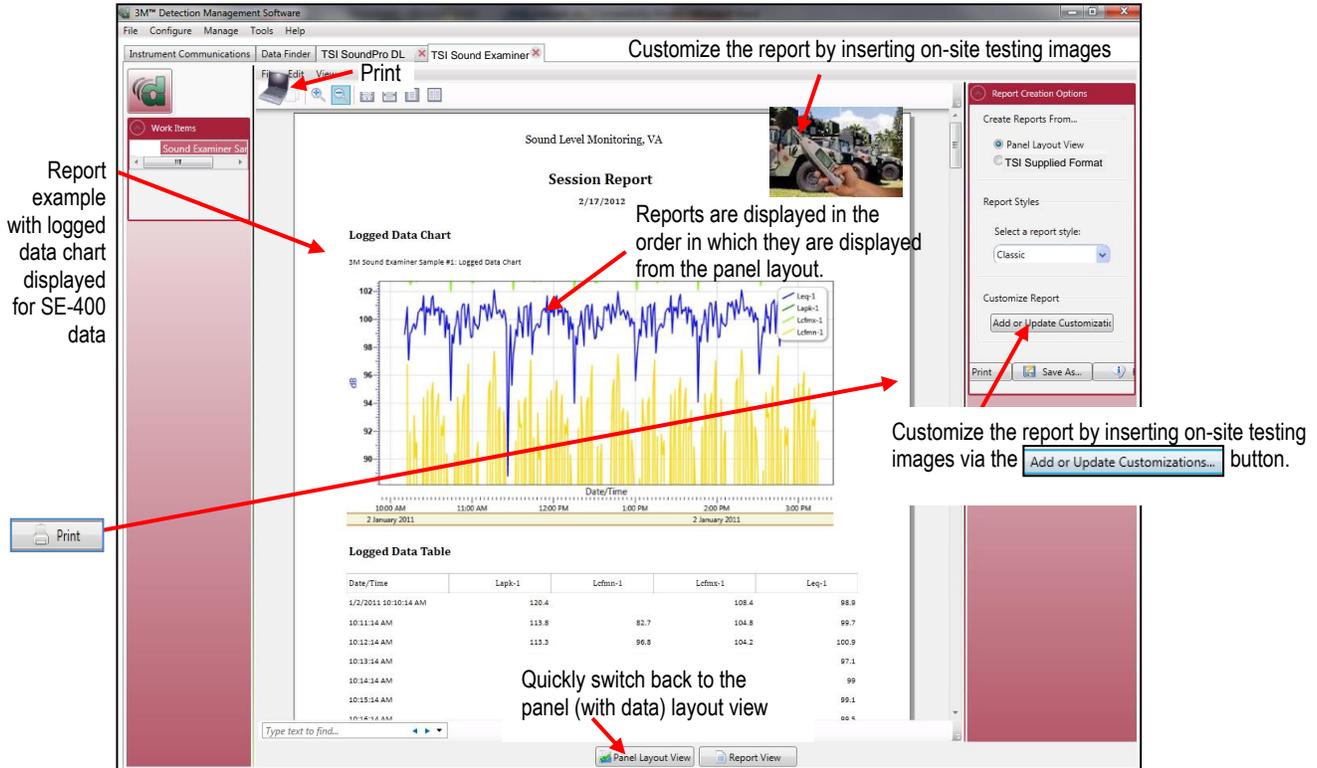
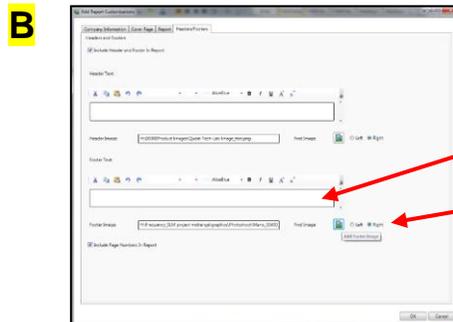
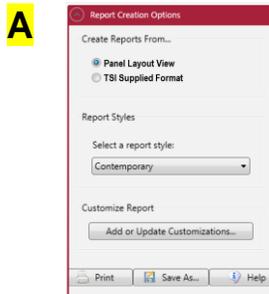


Figure 1-115: Sample SE-400 Series report

Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

- From the report creation options box (see A), click on button.
- There are four tabs to modify (if applicable) which include: company information, cover page, report, and headers/footers.
- The example below displays customizing the header and footer.



Type in text or use the icons to create customized heading/footer.

To change the company logo, type the footer image path or click the Find Image button.

Figure 1-116: Report customization tools



SE-400 Series: Sharing Data

Emailing Data

1. To email data, right-click on a chart/table and select **Email setting** (see 1 in the figure below).
2. For the person receiving the email, save the file to a known folder location and then open DMS. In the Data finder page, right-click the folders and select refresh. The saved files will appear.

Tip: Point your mouse over the folder you want to save the data in the data finder page, and DMS will display the file location (see 1). If the file was emailed, right-click on the attached file and save it to the location displayed from the DMS mouse over (if applicable). Once saved, right-click on the folder via the Data Finder Page and select **Refresh**. The files will be imported into DMS.

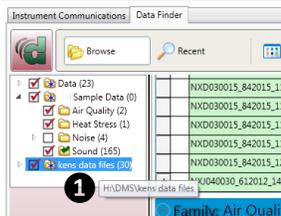


Figure 1-117: Display file location

3. *Alternative option:* From the menu bar, the end-user selects: **File, Open**, and then browses to the folder (see 2).
 - DMS would then display the data in the data panel.

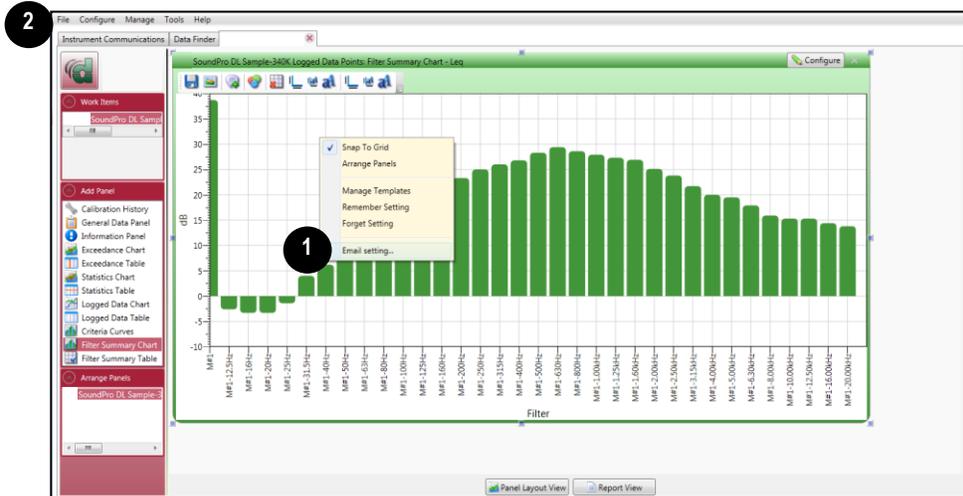


Figure 1-118: SE-400 Series and emailing data



SE-400 Series: Organizing Data

Creating a New Folder

When copying and or sharing data, you may want to organize the data with the create folder feature. Please follow the steps below.

1. In the data finder page, right-click and the context menu will appear as displayed below. Click on **New Folder** (see A).

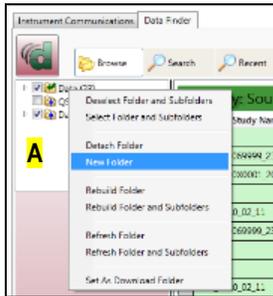


Figure 1-119: New Folder example

2. Assign a name by typing in the folder name and press enter.
3. See the section below to move a file.

Moving a File

1. In the data finder page with Browse and Details view (default view) displayed, select the corresponding checkbox in the folder section where the desired moved files will reside. (See **New Folder** example below, A.)
2. To move the sessions or studies, select by clicking in the data grid. (See B below. Note the selected session/study will be highlighted in blue.)
 - To select more than one session/study, click and hold down the control key on your keyboard while clicking on as many sessions/studies as desired.

Click, drag and drop selected sessions/studies into a designated folder.

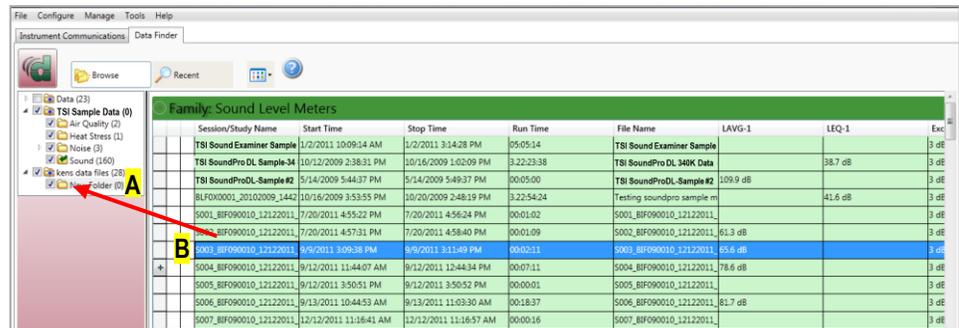


Figure 1-120: Moving folders with a selected session

3. Drag the mouse over the designated folder and release the mouse.

NOTE: A message to confirm the file move will appear.) Click **Yes** to move the files or **No** to cancel.

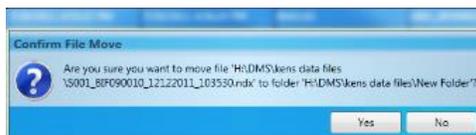


Figure 1-121: Confirm file move

EVM Series (Environmental and Air Quality Monitoring)



EVM Communication

Once communicating with the EVM and DMS, you have the option to download data, configure instrument parameters, and configure quick setup features, such as the time and date settings. The following explains the EVM communication download and/or setup steps.

1. Using a USB cable, plug the cable into the powered on EVM and then connect it to the computer port.



Figure 1-122: Communicating with the EVM and DMS

2. From the start page of DMS, select the **Instrument communication**  icon and the Instrument Communications layout will appear.
3. Select **Air Quality** and then select **EVM** under **Instrument**. (See **1** and **2**). You are now ready to set up or download your instrument.
 - See the subsequent EVM instrument setup sections to set up or download your instrument.

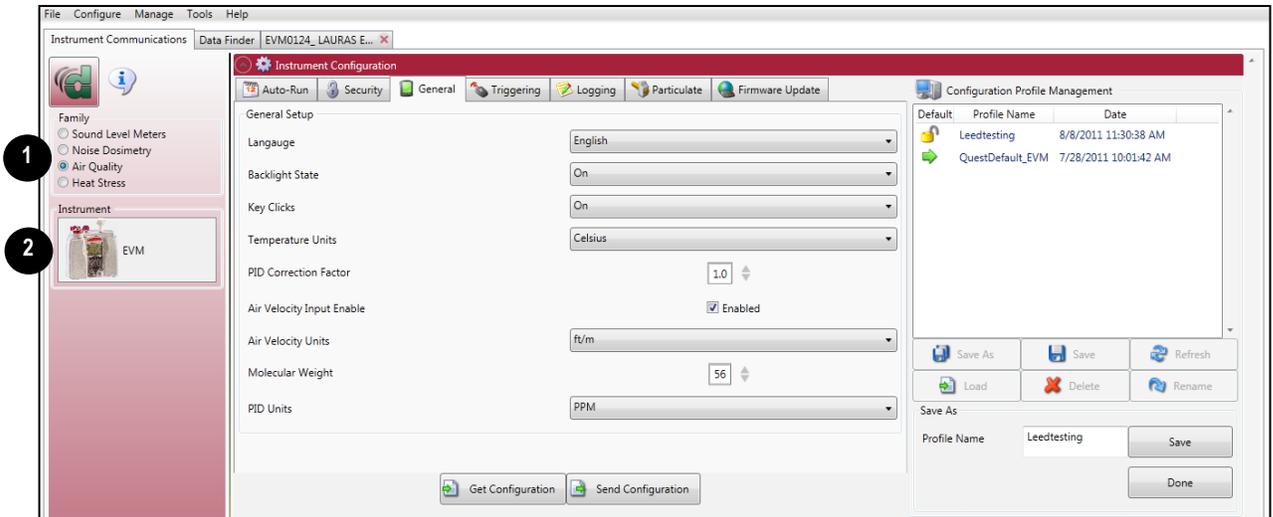


Figure 1-123: Communicating (downloading data)

NOTE: The first time you communicate with the EVM and DMS the Found New Hardware wizard will appear. Please install and follow the screen prompts.



EVM Series: Downloading Data

The Instrument Download feature enables you to download your files from the EVM Series into the software for review and analysis of the data. Once the files are downloaded and if “Go to Data Finder after Download” is checked, DMS will open into the Data Finder window.

NOTE: The Data Finder window stores all of the downloaded data by instrument, session and study. The information is stored in a bar chart style with measurements/parameters displayed on the top navigational bar. See [Data Finder](#) for more information.”

To download, please follow steps below:

1. To download the EVM data, ensure your instrument is communicating properly. (See [SE-400 Series: Communication Setup](#) for details.)
2. From the Start page, select the  button.
3. Select the **Air Quality** family and the EVM from the Instrument window (see **1**).
4. *Optional:* click on the “Go to Data Finder after download” checkbox to view your session/study information after the download (see **2**).
5. Press the **Download** button (see **3**).

NOTE: DMS will report the sessions loaded and the date of completion (see **4**).

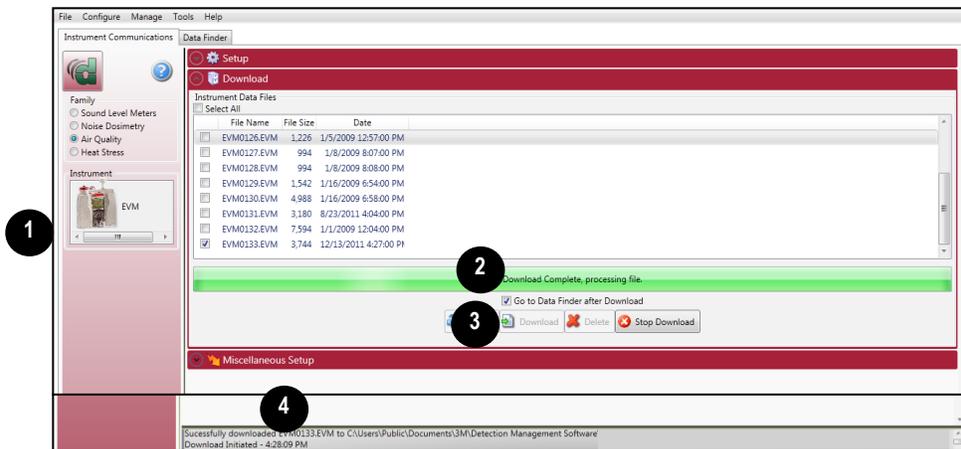


Figure 1-124: Downloading EVM files



EVM Series: Viewing Data

The following section outlines how to work with the EVM sessions/data in the data finder page.

Selecting a Session/Study

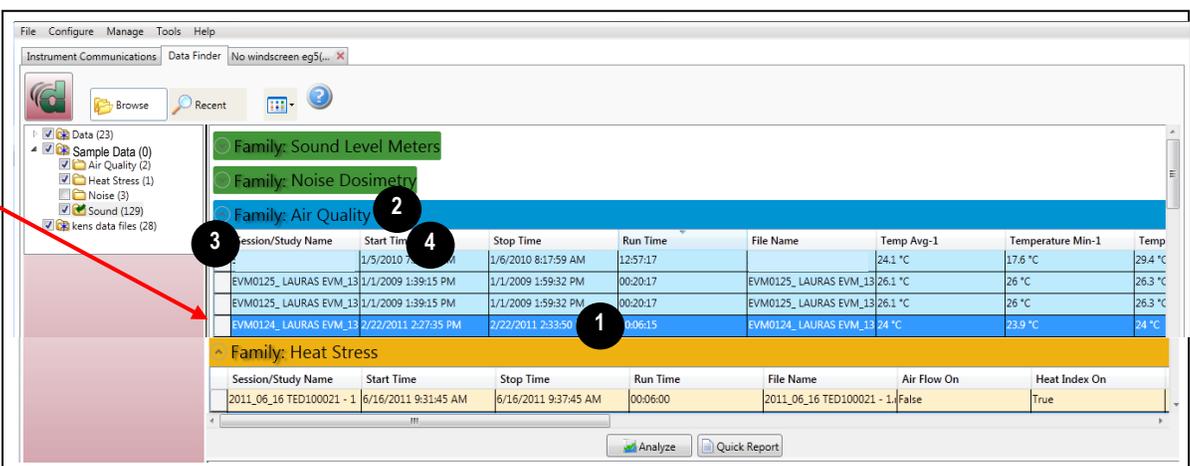
To view downloaded data from the welcome page, click on the  button and the data finder screen will appear. (Or select the Data Finder tab if already opened.)

1. Select a session by either double-clicking on data or click on the session/study and select the  button.

NOTE: The example below illustrates an EVM session with logged data over the 6:15 minute run-time.) (See **1**).

- **Family: Air Quality:** EVM data is stored in this family (See **2**).
- **Session/Study:** The EVM data is organized by the table headings, such as the session/study name (See **3**).
- **Start Time:** To quickly locate your study by most recent start time, click on the Start Time heading and it will sort ascending/descending (See **4**).
- **Parameters and measurements:** The table headings and columns are customizable by a quick click, drag, and drop to a new column location (similar to Microsoft® Excel® spreadsheet program).

Double-click to select/view EVM data in charts and tables



Session/Study Name	Start Time	Stop Time	Run Time	File Name	Temp Avg-1	Temperature Min-1	Temp
EVM0125_LAURAS EVM_13	1/5/2010 7:00:00 PM	1/6/2010 8:17:59 AM	12:57:17	EVM0125_LAURAS EVM_13	24.1 °C	17.6 °C	29.4 °C
EVM0125_LAURAS EVM_13	1/1/2009 1:39:15 PM	1/1/2009 1:59:32 PM	00:20:17	EVM0125_LAURAS EVM_13	26.1 °C	26 °C	26.3 °C
EVM0125_LAURAS EVM_13	1/1/2009 1:39:15 PM	1/1/2009 1:59:32 PM	00:20:17	EVM0125_LAURAS EVM_13	26.1 °C	26 °C	26.3 °C
EVM0124_LAURAS EVM_13	2/22/2011 2:27:35 PM	2/22/2011 2:33:50	00:06:15	EVM0124_LAURAS EVM_13	24 °C	23.9 °C	24 °C

Session/Study Name	Start Time	Stop Time	Run Time	File Name	Air Flow On	Heat Index On
2011_06_16 TED100021 - 1	6/16/2011 9:31:45 AM	6/16/2011 9:37:45 AM	00:06:00	2011_06_16 TED100021 - 1	False	True

Figure 1-125: EVM data selection



EVM Series: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

- Panel Layout View is divided into Work Items (see **A**), Add Panel (see **B**), and Arrange Panels (see **C**) palettes, as well as data panels (see **D**).
 - Work items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
 - Add panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
 - Arrange panels (C)** - displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.
 - Data Panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: Use the Configure icon to customize parameters.
 - Toolbar and Configure button (E)** – the toolbar and configure button are used to customize or select different measurement parameters.



Figure 1-126: EVM data panel layout page

- To change the chart/table data parameters, click on the  button. Each chart/table may have different configurable parameters depending on the parameters applicable to the specific panel.
- To view the data as a report, click the  button (see **F**).

NOTE: The panels will print in the order in which they are displayed in the panel layout page.
- The quick tips below explain how to customize the panels:
 - To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.
 - To move the panel**, click on the panel's header and drag and drop to the appropriate position.

NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.
 - To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.

NOTE: It will span the numbers up or down depending on how you drag the mouse.

- **To save a layout**, right-click outside the panel area as displayed below. Click **Remember Setting**.

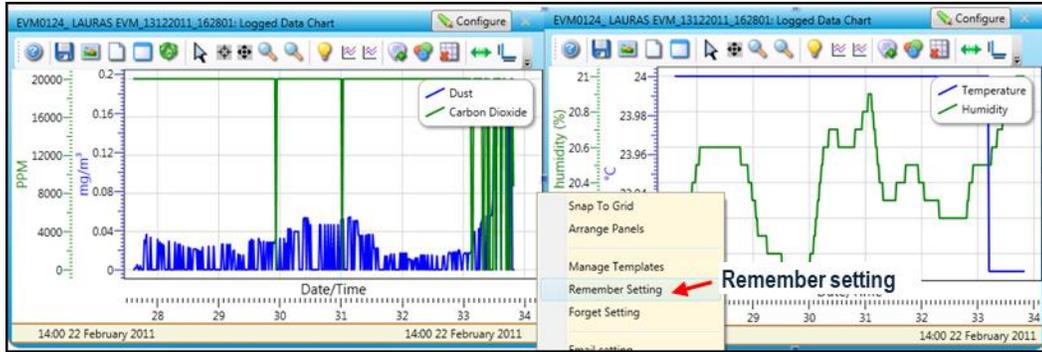
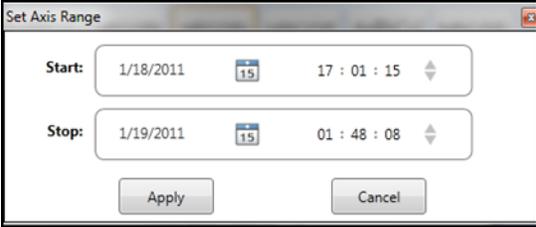


Figure 1-127: Logged data chart and saving setting

5. To change the parameters on the logged data chart using the toolbar, follow below:



	A.	Quick Help icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma-separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc..).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed).
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Set outside CO₂ Levels icon (present only when chart is configured to display Carbon Dioxide): When selected, the Outside CO ₂ Levels dialog box will appear. Enter Starting and Ending Outside CO₂ Levels in numeric format (ppm) and select Save . NOTE: These affect the chart calculations (see “Logged Data: Chart Selecting and Recalculating”).
	G.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	H.	Select Cursor icon (present only when chart is configured to display Carbon Dioxide): Click to select values for calculation for CO ₂ measurements. This is used for an advanced calculation referred to as data editing/recalculation. To select values, click icon then left-click and hold the mouse pointer over the points you want to edit. To deselect values that have been selected, hold the "Shift" key down while left-clicking and dragging the mouse.
	I.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	J.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	K.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart.
	L.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the icon. Hint –sometimes value label is not visible, if this occurs click the icon and make sure the Normal cursor is selected.

	M.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	N.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	O.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click delete.
	P.	Chart Properties icon: Click to change the color of the chart attributes.
	Q.	Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.
	R.	<p>X Axis Range icon: Click and select range parameters for the logged data chart x axis.</p> <p>NOTE: When selected, a Set Axis Range dialog box will appear (see image below). For the date setting, either click on the date and type in a value or select the  icon to choose a date from a calendar box. Choose start and stop date settings. For the time, select either the hours, minutes, or seconds and click the  arrows to change the time settings.</p> <p>Select Apply to exit the dialog box.</p>  <p style="text-align: center;">Figure 1-128: EVM and setting axis range</p>
	S.	<p>X Axis Title icon: Click this icon to change the title of the x axis on the logged data chart.</p> <p>NOTE: When selected, the cursor will appear at the end of the title box. Press the Backspace key to delete the text and type in new text.</p> <p>Press Enter to exit the text box.</p>
	T.	<p>X Axis Title Font icon: Select the x axis title font icon to change the font style and size of the x axis title.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size.</p> <p>Select OK to exit the chooser box.</p>
	U.	<p>X Axis Font icon: Select this icon to change the font style and size of the numeric values of the x axis. When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	V.	<p>Y Axis Range icon: Click to change the range of one of the y axes. (For example, you may only want to view CO₂ levels between 650 PPM and 800 PPM.)</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a Set Axis Range dialog box will appear. Enter range Start and Stop values for the selected y axis.</p> <p>Select Apply to exit the dialog box.</p>
	W.	<p>Y Axis Title icon: Click this icon to change the title of one of the y axes on the logged data chart.</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and the cursor will appear at the end of the selected y axis title box.</p> <p>Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box.</p>
	X.	<p>Y Axis Title Font icon: Select this icon to change the font style and size of the title of one of the y axes.</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis.</p> <p>Select OK to exit the chooser box.</p>

	Y.	<p>Y Axis Font icon: Select this icon to change the font style and size of the numeric values of one of the y axes.</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis.</p> <p>Select OK to exit the chooser box.</p>
	Z.	<p>Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE.</p>



EVM Series and Logged Data: Chart Selecting and Recalculating

The logged data chart provides a view of the integrating measurements over the run time. There may be situations, such as a non-typical exposure of toxics, in which you would like to analyze a specific range of data points while ignoring all other data points. On the logged data chart, this is a feature referred to as recalculating your data and for EVM it is available for **Carbon Dioxide** data only. When selected, the feature provides calculations of **Change/Hour**, **Air Half Life**, and **Mean Air Life**. Please follow the steps below.

1. On the Logged Data Chart, click on the button in the panel header and select Carbon Dioxide.

NOTE: The **Change/Hour**, **Air Half Life**, and **Mean Air Life** calculations are affected by the levels of Carbon Dioxide measured outside of the room/building that is the subject of the logged data chart. Prior to selecting specific data ranges for the calculations, you should enter the actual outside CO₂ levels. Select the **Set outside CO₂ Levels** icon to open the Outside CO₂ Levels dialog box. Enter **Starting and Ending outside CO₂ Levels** (in ppm) and select **Save**.

2. To select specific ranges of the chart data for calculation, click the **Use Select Cursor** button on the toolbar.



NOTE: The tooltip indicates the name of the icon "Use Select cursor."

3. Move the mouse pointer to the starting point for the data selection, left-click and drag the mouse to the right
 - Shading will appear over the selected data range (see **A** below).
 - A calculation box will appear (see **B** below) above the chart showing the calculations.
 - *Optional:* To deselect (exclude) specific ranges of a current data selection, hold down the **Shift** key, left-click, and drag the mouse over the data to be deselected. Alternatively, all selected ranges and the calculation box can be cleared by selecting the **Clear** icon.
4. To change which calculations are displayed in the calculation box, right-click on the box and a context menu will appear (see **C** below). Select your desired options: **Show Total Calculations** (a combined calculation of all selected ranges), **Show Individual Calculations** (an individual calculation for each selected range), and/or **Show Excluded Calculations** (a combined calculation of all non-selected ranges).

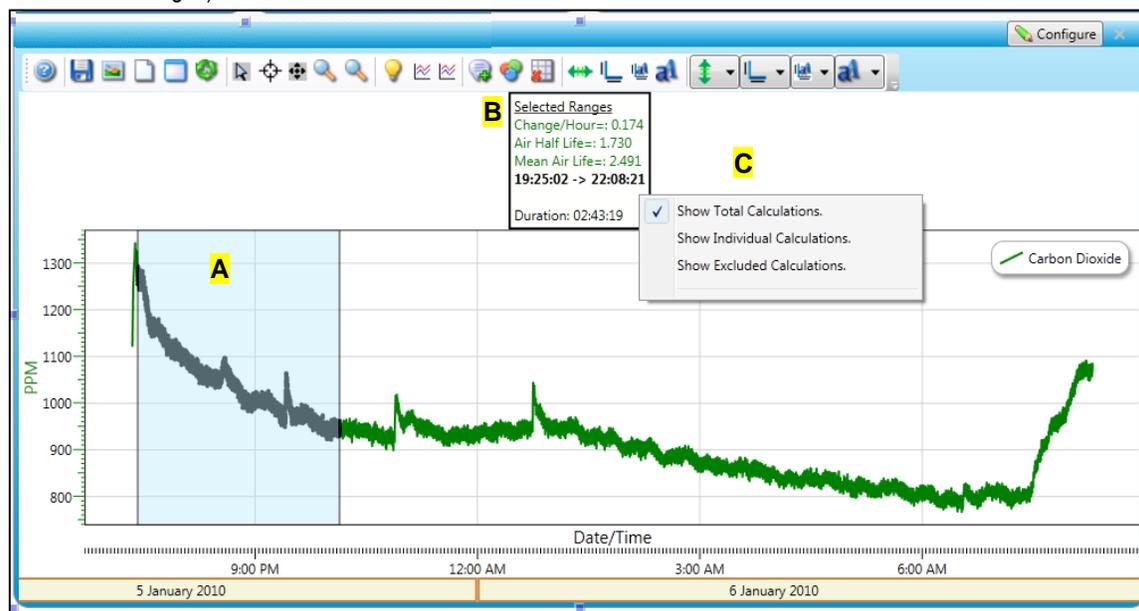


Figure 1-129: Logged data chart and selecting/recalculating

- To view this in a report, click on the  button at the bottom of the page. To get back to the panel layout view, click the  button.



EVM Series: Reports and Printing

To quickly create reports, open your data (in the data finder page) and click the quick report  button. A standard template of charts and tables (or panels) will appear in the report.

- **Viewing reports:** if you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen.
- **Printing reports:** while in the report view page you have two options outlined below:
 - Click on the  icon from the title bar.
 - Click on the  icon from the session report title bar.

Report example with logged data chart displayed with EVM data

Customize the report by inserting on-site testing images

Reports are displayed in the order in which they are displayed from the panel layout.

Customize the report by inserting on-site testing images via the  button.

Quickly switch back to the panel layout view (charts & tables)

Description	Value	Description	Value
Temp Avg	24.1 °C	Temperature Min	17.6 °C
Temperature Max	29.4 °C	Temp Min Time	1/9/2010 7:20:42 PM
Temp Max Time	1/9/2010 10:15:07 PM	Humidity Max	44.7 %
Humidity Avg	25.6 %	Humidity Min	20.0 %
Humidity Max Time	1/9/2010 7:20:42 PM	Humidity Min Time	1/9/2010 10:33:00 PM
Dust Average	0.047 mg/m ³	Dust Min	0 mg/m ³
Dust Max	2.343 mg/m ³	Dust STEL	0.134 mg/m ³
Dust TWA	0.077 mg/m ³	Dust Min Time	1/9/2010 8:06:05 PM
		Dust Max STEL Time	1/9/2010

Figure 1-130: Sample EVM report

Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

- From the report creation options box (see A), click on  button.
- There are four tabs to modify (if applicable) which include: company information, cover page, report, and headers/footers.
- The example below displays customizing the header and footer.

A

B

Type in text or use the icons to create customized heading/footer.

To change the company logo, type the footer image path or click the Find Image button.

Figure 1-131: Report customization tools



EVM Series: Setup

There are seven configurable EVM setup screens (see ❶ in figure below) in the setup page. With the EVM, you have the option to save the configurations either on the instrument and/or store the configurations in DMS.

NOTE: If you save the profiles in the software, this can be used as a time management tool to organize and save all the setups for future use.

Please note that there are five different models with different features and functionalities. Some of the setup parameters may not be applicable to your model. Please refer to the user manual to understand the models in more detail.

EVM Series: Saving and Sending Configurations

With the EVM, there are saved setup profiles used to quickly access and apply to your EVM. Below explains how to save configuration settings in DMS and how to send to the instrument.

NOTE: To only send the setup, please skip to step 3. Please refer to this section as you set up your instrument.

1. To save the EVM configuration in the software, click on a name in the **Configuration Profile Management** panel (See ❷).

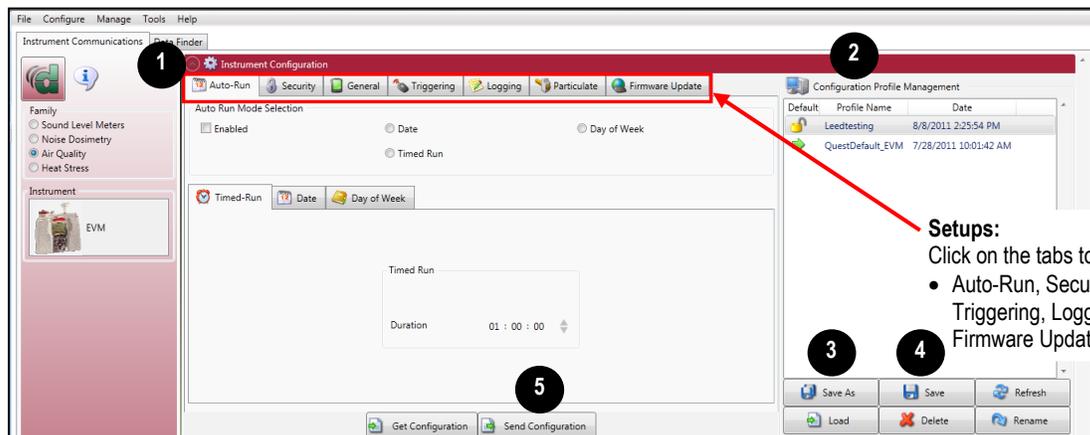
NOTE: The name will be shaded a light gray when selected.

- To create a new profile name, click  (see ❸) and type in a profile name. Click **Save**. (It will save under the configuration profile management panel).

2. Click on the  button (see ❹) and type in a **Name**. Click **OK**.

NOTE: This saves the configuration file to the software.

3. To send to the instrument, click on  (see ❺), or **Save** (see ❹) and **Send Configuration** (for more details see "[Saving and Sending Configurations](#)").



Setups:

Click on the tabs to set up/view:

- Auto-Run, Security, General, Triggering, Logging, Particulate, Firmware Update

Figure 1-132: Saving and sending EVM setups



EVM Series: General Settings

The EVM's general settings are used to set up the instrument with basic parameters. Refer to the EVM general settings table below for details.

- Click on the **General** tab (see **1**) from the EVM's Instrument Communications Setup panel. To change the general settings, follow one (or all) of the selection options below.
 - Click on the arrow  and select an option (see **2**).
 - Click on the  arrows and select a numeric value or type in a value (see **3**).
- To send to the instrument, click on  (see **4**), or **Save** (see **5**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

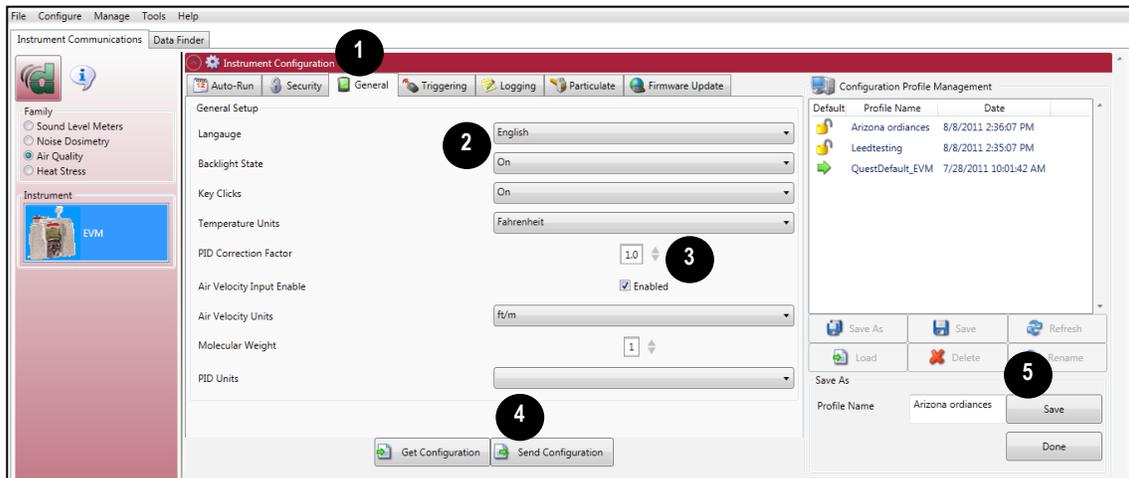


Figure 1-133: General EVM setups

EVM Series General Settings

General Setting	Description *NOTE: Refer to Glossary for more detailed information
Language	With the language setting, there are six options including: English, Spanish, German, French, Italian, and Portuguese.
Backlight State	The backlight is used to illuminate the screen from a dark gray to a light gray color.
Key Clicks	With the key click setting, you can turn the sound to "on" and each time you press a key on the keypad you will hear a soft click sound. This can be disabled by choosing the "off" setting.
Temperature Units	The temperature unit is selectable either in Celsius or Fahrenheit via a drop-down box.
PID Correction Factor	The PID correction factor is automatically set to 1.0. For best results, it is recommended to add a correction factor to the relevant VOC you intend to measure. NOTE: Appendix C of the EVM Series User Manual, provides a listing of PID correction factors.
Air Velocity Input Enable	Air Velocity measurements are conducted with an add-on air velocity probe and can be enabled/disabled in DMS. (NOTE: The instrument will automatically detect if the air velocity probe is connected.)
Air Velocity Units	Air velocity units (if enabled and an air probe is connected) is measured in either meters per second (m/s) or feet per minute (ft/m).
Molecular Weight	The default Molecular Weight is programmed to 56 with a correction factor of 1. To change this value either type in a new value or use the up/down arrows.
PID Units	The PID PPM or PPB sensor (for VOC measurements) setting is one of the four: PPM, mg/m ³ , PPB, or µg/m ³ .



EVM Series: Logging Settings

The EVM logging screen is used to set up your data logging options. The EVM provides a choice of selectable logging parameters with a specific logging rate (also called logging intervals) and an averaging time. Please refer to the EVM Logging Settings table below for an explanation of features.

- Click on the Logging tab (see **1**) from the EVM's Instrument Communications panel. To change the logging settings, follow one (or all) of the selection options below.
 - Click in the **Enabled checkbox** to log specific parameters which includes: Levels, STEL, Max, Min, and Avg. (See **2**).
 - Click on the arrows and select a numeric value or type in a value (see **4**).
 - Select a Logging rate by clicking on the drop-down arrow (see **3**) and selecting an option from the logging rate list.
- To send to the instrument, click on (see **5**), or **Save** (see **6**) and **Send Configuration** (for more details see "[Saving and Sending Configurations](#)").

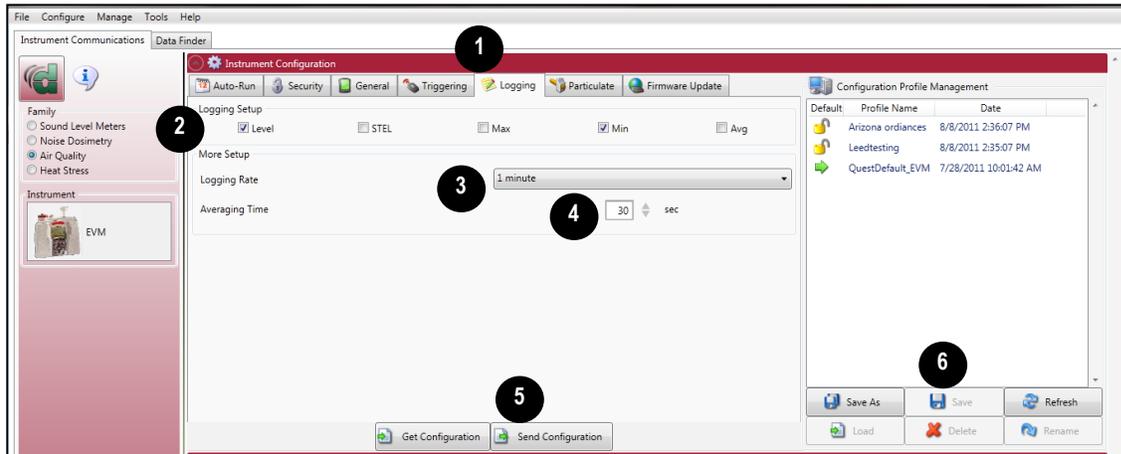


Figure 1-134: Logging EVM setups

EVM Series Logging Settings

Logging Setting	Description *NOTE: Refer to Glossary for more detailed information
Logging setup	To enable logging, click in the specific checkbox to enable one or all of the following measurements: <ul style="list-style-type: none"> Level: The instantaneous measurement at a specific point in time. STEL: The maximum concentration above the time-weighted average that employees can be exposed to over a specific time period (usually 15 minutes) no more than four (4) times per day. (See PEL for more information.) Max: The maximum measurement over the time interval (or logging interval). Min: The minimum measurement over the time interval (or logging interval). Avg: The measurement value over the time interval (or logging interval).
Logging rate	Logging rate/interval (also called time history data) sets the frequency at which data will be logged during a session. The settings include: 1, 5, 15, 30 seconds and 1, 5, 10, 15, 30, and 60 minutes.
Averaging time	A type of data filtering which is applied to the Level measurement. The selectable parameters are 1-30 seconds.



EVM Series: Auto-Run Settings

The EVM has three programmable auto-run modes that allow you to automatically run and log measurements at specified times and durations. These include timed run, date, and day of week (DOW) modes.

The three Auto-Run modes are briefly explained below:

- **Timed-Run mode:** With Timed Run mode, the instrument is powered on and run is enabled. The instrument will automatically stop based on the programmed duration.
- **Date mode:** With Date mode, the instrument wakes up from a powered down condition, runs the study, saves it then powers down again. Up to four date settings are programmable with a specified start date, start time (in hours, minutes, seconds), and duration.
- **Days of week mode:** With Days of Week (DOW) mode, up to two weekly auto-runs are programmable with specified days of week, start time, and duration.

Auto-Run with Timed-Run Setting

To enable the Timed-Run mode, please follow below.

1. Click on the **Auto-Run** tab (see **1**) from the EVM's Instrument Communications Setup panel.
2. Click in the **Auto Run Mode Selection** **Enabled** checkbox and click in the **Timed Run** radio button (see **2**).
3. On the **Timed-Run** tab, set the **Duration** by either using the arrows or type in a numeric values (see **3**).
4. To send to the instrument, click on (see **4**), or **Save** (see **5**) and **Send Configuration** (for more details see "[Saving and Sending Configurations](#)").

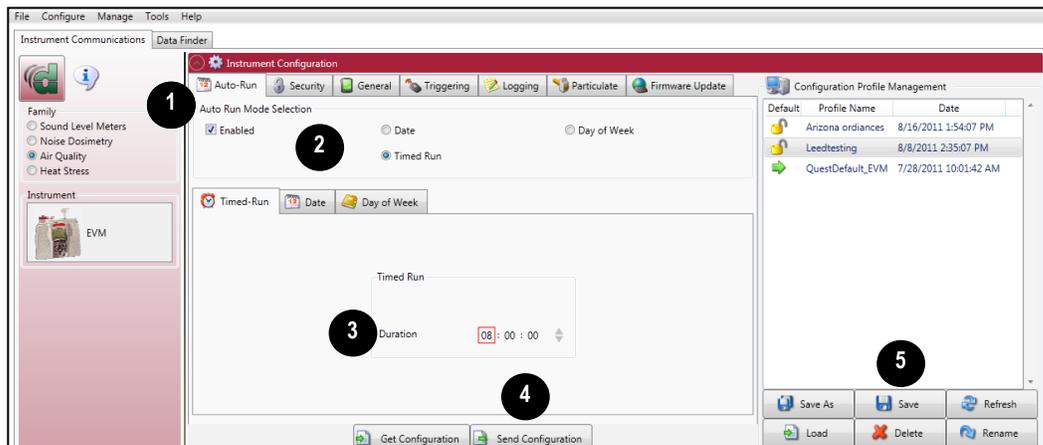


Figure 1-135: EVM auto-run with timed-run setting

Auto-Run with Date Setting

To enable Date mode, please follow below.

1. Click on the **Auto-Run** tab (see **1**) from the EVM's Instrument Communications Setup panel.
2. Click in the **Auto Run Mode Selection** **Enabled** checkbox and click in the **Date** radio button (see **2**).
3. On the **Date** tab, click in the **Enabled** checkbox for **Date 1** (see **3**) to enable (or activate) Date 1 auto-run.
 - To set the **Start Date**, either use the  icon or type in a date value.
 - To set the **Start Time** and **Duration**, either use the  arrows or type in a numeric values.
4. To enable additional date settings (**Date 2 – Date 4**), repeat step 3.
5. To send to the instrument, click on  (see **4**), or **Save** (see **5**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

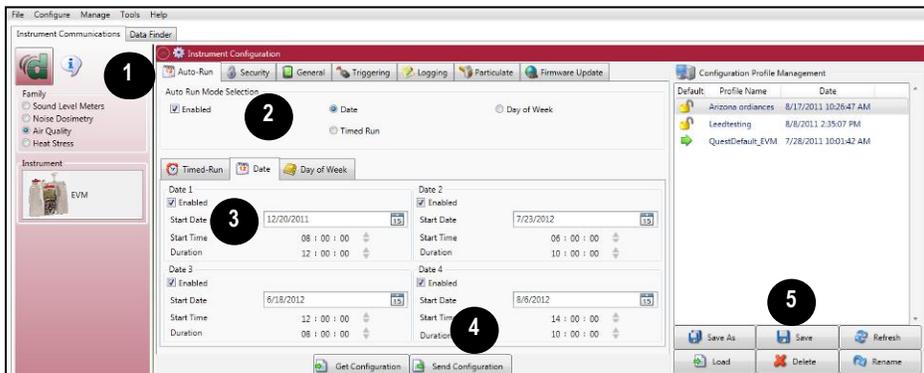


Figure 1-136: EVM auto-run with date setting

Auto-Run with Day of Week Setting

To enable Date of Week mode, please follow below.

1. Click on the **Auto-Run** tab (see **1**) from the EVM's Instrument Communications Setup panel.
2. Click in the **Auto Run Mode Selection** **Enabled** checkbox (see **2**) and click in the **Day of Week** radio button (see **3**).
3. On the **Day of Week** tab, click in the appropriate day boxes for the day or days you intend to run/log measurements (see **4**).
4. To enable auto-run for week 1, click in the **Enabled** checkbox and set the **Start Time** and **Duration** by either clicking on the  or typing in numeric values on the **Day of Week 1** group (see **5**).
5. To enable auto-run for week 2, repeat steps 3 -4 on the **Day of Week 2** group.
6. To send to the instrument, click on  (see **6**), or **Save** (see **7**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

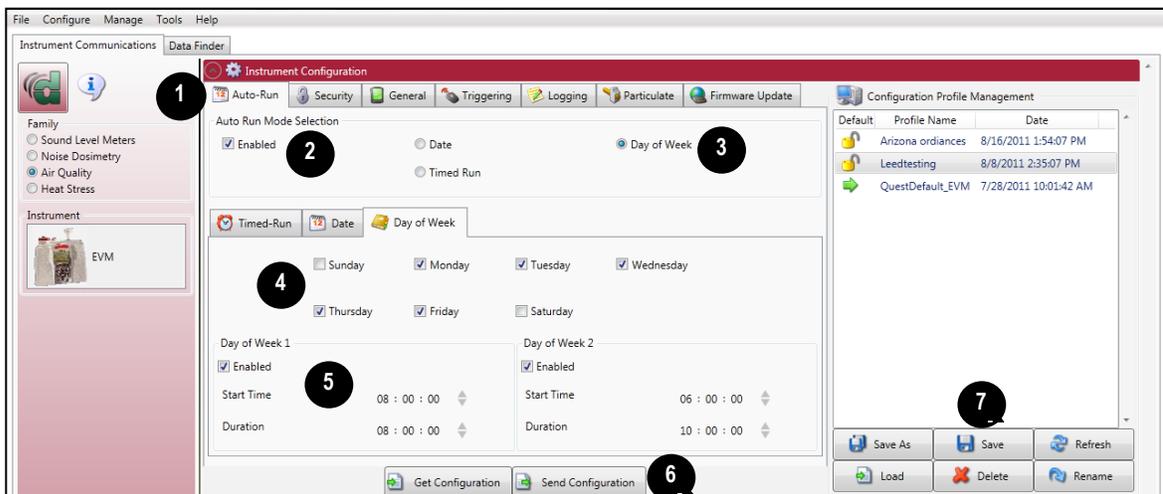


Figure 1-137: EVM auto-run with day of week setting



EVM Series: Security Settings

The security setting is a type of locking feature (or secure run feature) that is used to prevent a user from interrupting a run and/or changing a setup or saved setups on the instrument.

NOTE: A default code, “9157”, will disable secure run or secure setup if the numeric Passcode is forgotten.

1. Click on the **Security** tab (see **1**) from the EVM's Instrument Communications panel.
2. To set the Secure Setup Mode or Secure Run Mode, please follow below:
 - Click in the **Enabled** boxes (see **2** and **3**) to turn on secure run setup mode and/or secure run mode.
3. Type in a passcode (4 numeric characters).
4. To send to the instrument, click on  (see **4**), or **Save** (see **5**) and **Send Configuration** (for more details see [“Saving and Sending Configurations”](#)).

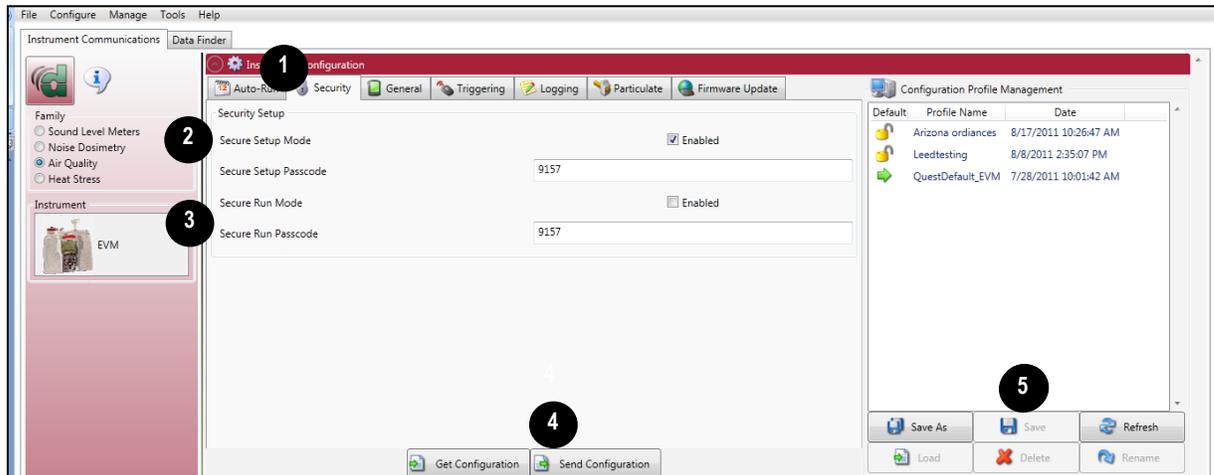


Figure 1-138: EVM with security settings



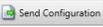
EVM Series: Triggering Settings

There are two types of triggering outputs which may be programmed to with one of the seven sensors.

NOTE: The EVM Triggering Settings table explains the components of this setup screen.

- **Digital output:** The user can connect an external device to the monitor. This can be used to signal a specific level to turn on a notification device, an LED, or a fan motor at a specific threshold (or set point). Once enabled, the following three are selectable parameters: a sensor, logic setting, and threshold setting.
 - **Analog output:** Enables the analog output on the device when checked. The analog output will vary between 0-5 volts based upon the minimum and maximum levels for the particular sensor.
1. Click on the **Triggering** tab (see **1**) from the EVM's Instrument Communications panel.
 2. To set the Triggering for Digital Output or Analog Output, please follow below:
 - Click in the **Enabled** box to turn on Trigger digital/analog output.
 - For the Logic level, click the  arrow to select a level (for digital output only).
 - For the parameter, select one of the sensors.

NOTE: For air velocity, verify the sensor is attached to the EVM and selected in the General panel of DMS.
 - For the threshold, type in a value for the selected parameter or use the  to select.

4. To set the triggering setup, click on  or save and send to the EVM (for more details see [“Saving and Sending Configurations”](#)).

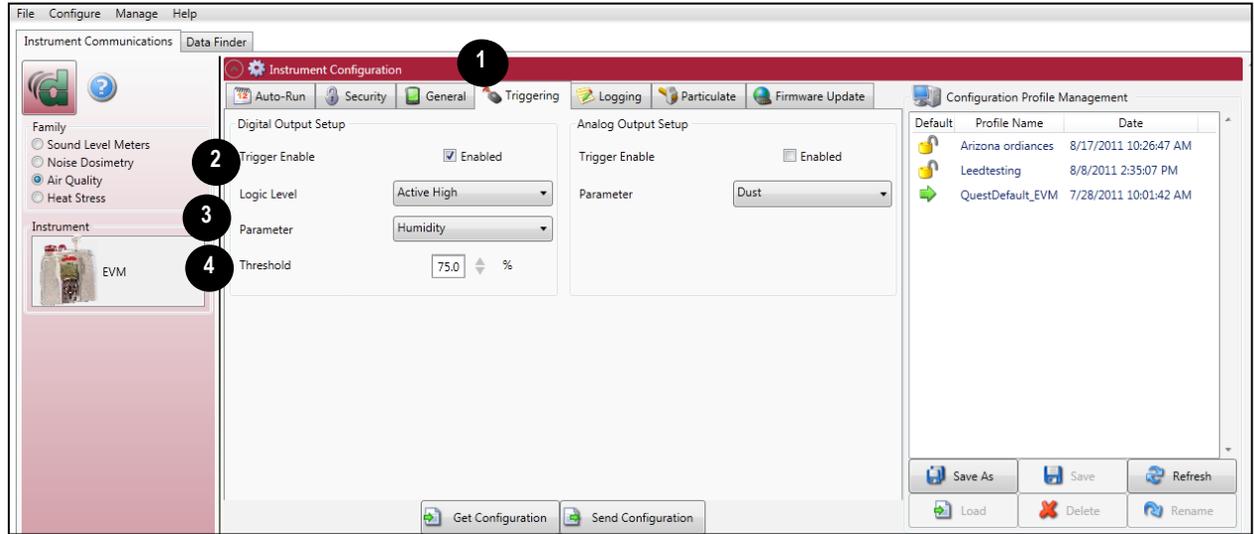


Figure 1-139: EVM and triggering settings

EVM Series Triggering Settings

Triggering Setting	Explanation
Digital Output	Enables the digital output on the device when checked per the mode, parameter, and threshold settings. NOTE: Only one of these parameters (Digital Output, Analog Output, or Air Velocity) can be enabled at one time.
Analog Output	Enables the analog output on the device when checked. The analog output will vary between 0-5 volts based upon the minimum and maximum levels for the particular sensor.
Logic level (Also called “Mode” on the EVM)	The type of signal that will be triggered when the parameter and threshold are satisfied. It may either be active high, active low, active high pulse, or active low pulse. (Reference Table 3-3 for detailed information.)
Parameters	The sensor that is to trigger the digital/analog output.
Threshold	The threshold at which the sensor will be triggered for the given parameter.
Air velocity input	Enables the Air Velocity Input when checked. NOTE: This is mutually exclusive with the digital out meaning that only one or the other can be enabled at any given time.
Units	Sets the units in which the wind speed will be measured, either meters per second or feet per minute.



EVM Series: Particulate Settings

The particulate settings tab may be programmed with up to eight correction factor profiles. It also provides the capability to view the gravimetric accumulator mass and gravimetric volume if **Get Configuration** is selected.

To configure, please follow below.

1. Click on the **Particulate** tab (see **1**) from the EVM's Instrument Communications panel.
2. To customize particulate profiles, double-click a profile in the list (see **2**).
 - The edit profile screen will appear (see **3**). Type in a name and type in the appropriate correction factor or use the key to set the numeric value. Repeat this step as necessary to customize the remaining seven profiles.
3. The active profile field (see **4**) may be set to a customized profile name with a designated correction factor (see step two for details). To set an active profile, click on the arrow and select one of the profile names. (Not applicable if step 2 was skipped.)
4. To set the Units, select the arrow and select a unit of measurement.
5. To send to the instrument, click on (see **5**), or **Save** (see **6**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

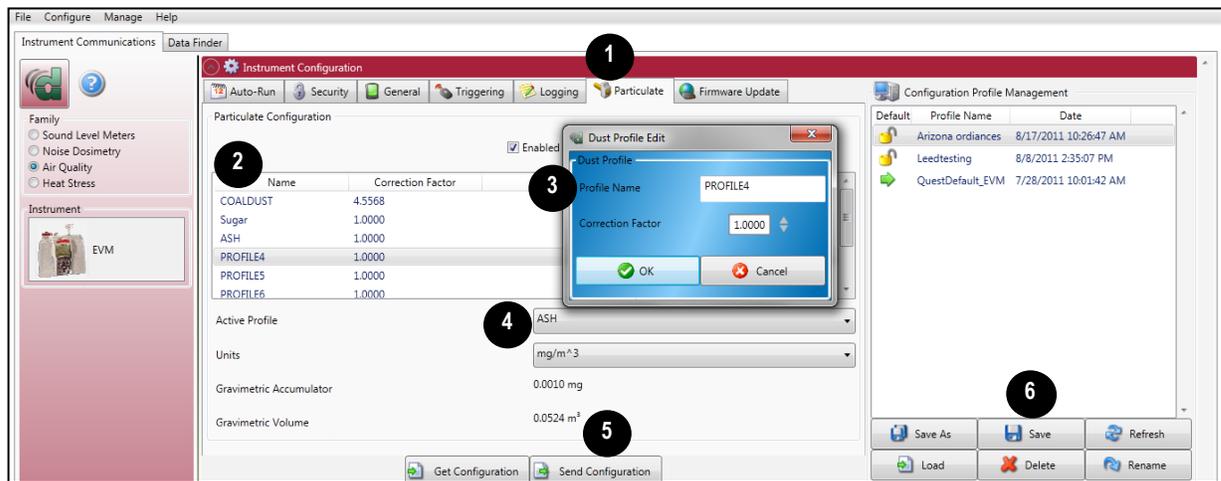


Figure 1-140: EVM and particulate settings

EVM Particulates Settings

Particulates Setting	Explanation
Particulate Enabled checkbox	Enables the particulates/dust sensor when checked.
Profiles	Eight profiles consisting of a profile name and a correction factor for use within the EVM device. To edit the name or correction factor associated with a given profile, double-click the profile in the list and use the Dust Profile Edit dialog. Correction factors are based on the type of dust being measured.
Active profile	The profile to be used for dust measurements by the device.
Units	Particulate sampling is measured with either mg/m ³ (milligrams per cubic meter) or µg/m ³ (micrograms per cubic meter). This is selectable via the drop-down menu.
Gravimetric accumulator	The amount of dust, in milligrams, that has been accumulated by the dust sensor since the last time it has been reset.
Gravimetric volume	The volume of air that has passed through the gravimetric filter since the last time it has been reset.
Get setup from instrument button	Retrieves the setup configuration from the device.
Send setup to instrument button	Sends the setup configuration to the device.
Saved setups window	From this window you can save or load a default or custom configuration profile that has been or will be archived for quick access.



EVM Series: Firmware Update

The firmware update screen is used to update the latest software to EVM Series. With a firmware update, the Web Server option enables you to update through an internet connection. If you do not have internet capability, the File option is used in place of the first option.

NOTE: Contact TSI Incorporated for updates (www.tsi.com). Follow steps below to update your instrument.

1. Ensure the EVM Series is communicating. (See "[EVM Communication setup](#)" above for details.)
2. Click on the **Firmware Update** tab and either select **Web Server** or **File**.
3. Click on the  button to send to the instrument.

QUESTemp° 34/36 (Heat Stress Monitoring)

The QUESTemp° 34/36 (QT° 34/36) instruments are used for measuring occupational heat stress. The following sections explain communicating with the QT° 34/36 and DMS, saving and sending configurations, downloading, viewing data, setup, firmware updates, and printing reports.



QUESTemp°34/36: Communication Setup

The communication setup is an important starting point with your instrument and DMS. Once communicating, you have the option to download data, configure instrument parameters and use quick setup features for time and date settings. The following explains the QT° 34/36 communication setup steps.

1. Using a TSI cable, part number 054-715, plug the cable into the computer and plug the opposite end into the side jack of the QT° 34/36 data port.



Figure 1-141: Communicating with the QUESTemp° 34/36 and DMS

2. From the start page of DMS, select the  button and the instrument communication panel will appear with the Setup tab selected.
3. Select the **Heat Stress** Family and then select the **Model Type** by clicking on **QT-34** or **QT-36**. (see **1** and **2**). (You are now ready to set up or download your instrument.)
4. Once selected, see the following sections for downloading or setup parameters to learn more about working with the QT° 34/36.
 - See the subsequent QT° 34/36 instrument setup sections to set up or download your instrument.

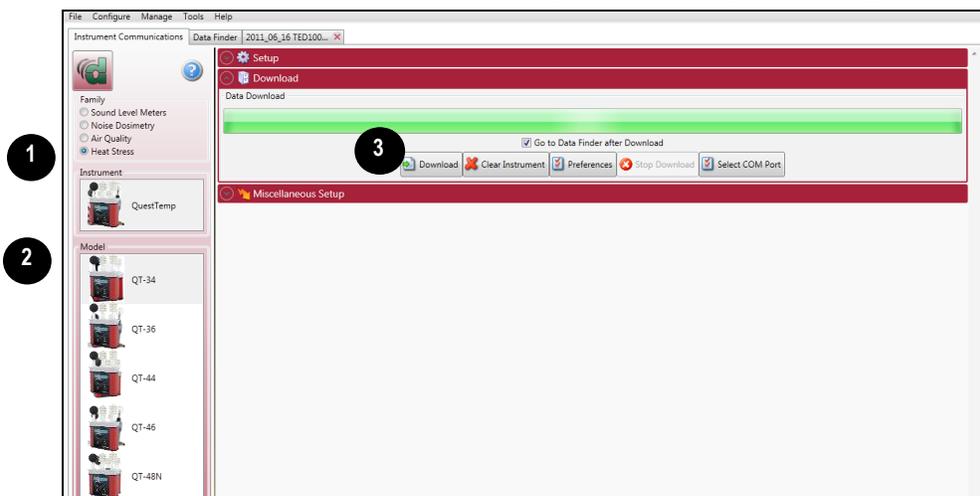


Figure 1-142: Communicating (Setting up the instrument to communicate)

NOTE: The first time you communicate with the QT° 34/36 and DMS the Found New Hardware wizard will appear. Please install and follow the screen prompts.



QUESTemp^o34/36: Downloading Data

The Instrument Download feature is used to download your files from the QT^o34/36 into the software for review and analysis of the data. Once the files are downloaded and if “Go to Data Finder after Download” is checked, DMS will open into the Data Finder window.

NOTE: The Data Finder window stores all of the downloaded data by instrument, session and study. The information is stored in a bar chart style with measurements/parameters displayed on the top navigational bar. See Data Finder for more information.”

To download, please follow steps below:

1. To download the QT^o 34/36 data, ensure your instrument is communicating properly. (See “[Communication Setup](#)” for details.)
2. From the Start page, select the  button and the instrument communication panel will appear with the Download tab selected.
3. Select the **Heat Stress** Family and then select **the Model Type** by clicking on **QT-34** or **QT-36** (see **1** and **2**).
4. *Optional:* Select the “Go to Data Finder after download” checkbox to view your session/study information after the download (see **3**).
5. Press the **Download** button (see **4**).

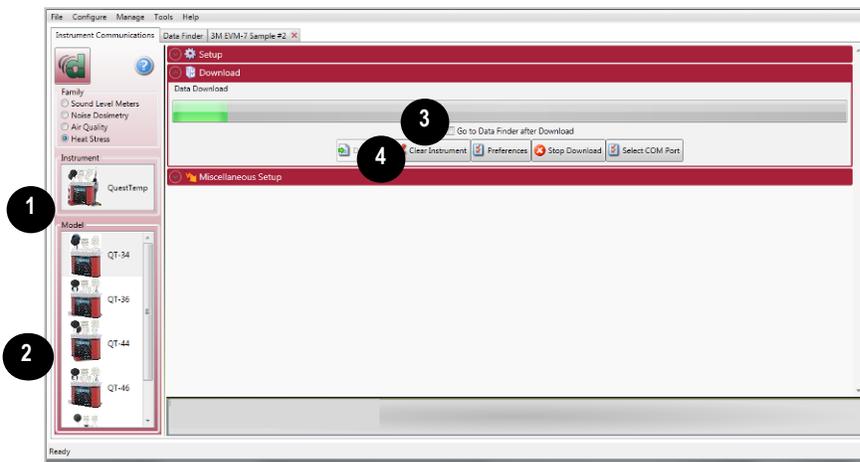


Figure 1-143: Downloading QUESTemp^o 34/36 files



QUESTemp^o34/36: Viewing Data

The following section outlines viewing your data with the QUESTemp^o 34/36 models.

Selecting a Session/Study

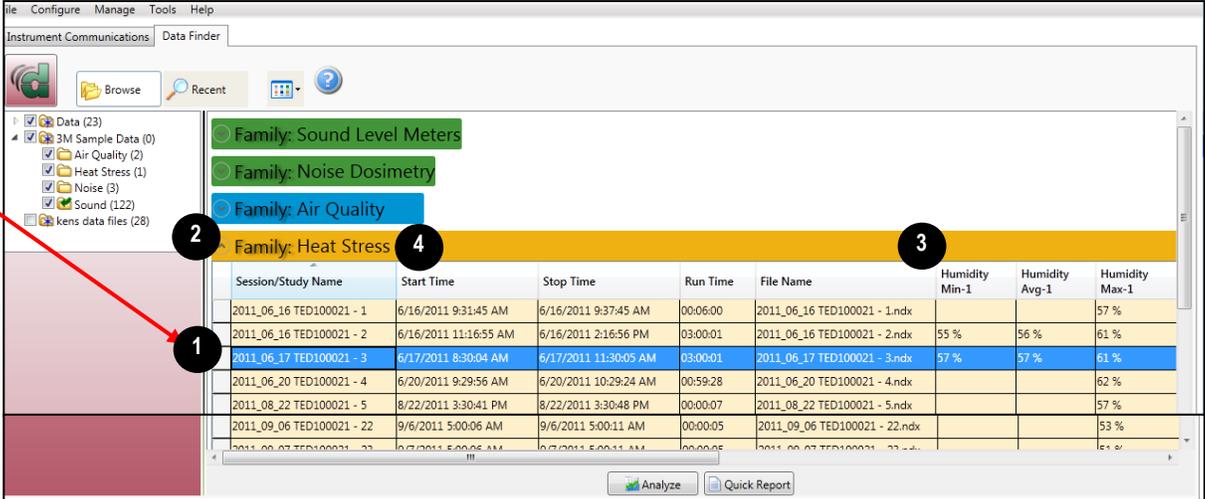
To view downloaded data from the welcome page, click on the  button and the data finder screen will appear. (Or select the Data Finder tab if already opened.)

1. Select a session by either double-clicking on data or click on the session/study and select the  button.

NOTE: The example below illustrates a session selected with a run time of 3 minutes. (See **1**).

- **Family: Heat Stress:** QT^o 34/36 data is stored in this family. (See **2**).
- **Session/Study:** The QT^o 34/36 data is organized by the table headings, such as the session/study name. (See **3**).
- **Start Time:** To quickly locate your study by most recent start time, click on the Start Time heading and it will sort ascending/descending (See **4**).
- **Parameters & measurements:** The table headings and columns are customizable by a quick click, drag, and drop to a new column location (similar to Microsoft[®] Excel[®] spreadsheet program.)

Double-click to select/view QT^o 34/36 data in charts and tables



Session/Study Name	Start Time	Stop Time	Run Time	File Name	Humidity Min-1	Humidity Avg-1	Humidity Max-1
2011_06_16 TED100021 - 1	6/16/2011 9:31:45 AM	6/16/2011 9:37:45 AM	00:06:00	2011_06_16 TED100021 - 1.ndx			57 %
2011_06_16 TED100021 - 2	6/16/2011 11:16:55 AM	6/16/2011 2:16:56 PM	03:00:01	2011_06_16 TED100021 - 2.ndx	55 %	56 %	61 %
2011_06_17 TED100021 - 3	6/17/2011 8:30:04 AM	6/17/2011 11:30:05 AM	03:00:01	2011_06_17 TED100021 - 3.ndx	57 %	57 %	61 %
2011_06_20 TED100021 - 4	6/20/2011 9:29:56 AM	6/20/2011 10:29:24 AM	00:59:28	2011_06_20 TED100021 - 4.ndx			62 %
2011_08_22 TED100021 - 5	8/22/2011 3:30:41 PM	8/22/2011 3:30:48 PM	00:00:07	2011_08_22 TED100021 - 5.ndx			57 %
2011_09_06 TED100021 - 22	9/6/2011 5:00:06 AM	9/6/2011 5:00:11 AM	00:00:05	2011_09_06 TED100021 - 22.ndx			53 %
2011_09_07 TED100021 - 23	9/7/2011 5:00:06 AM	9/7/2011 5:00:11 AM	00:00:05	2011_09_07 TED100021 - 23.ndx			54 %

Figure 1-144: Selecting a session



QUESTemp^o34/36: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

1. Panel Layout View is divided into Work Items (see **A**), Add Panel (see **B**), and Arrange Panels (see **C**) palettes, as well as data panels (see **D**).
 - **Work items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
 - **Add panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
 - **Arrange panels (C)** – displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.
 - **Data Panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: Use the Configure icon to customize parameters.

- **Toolbar and Configure button (E)** – the toolbar and configure button are used to customize or select different measurement parameters.

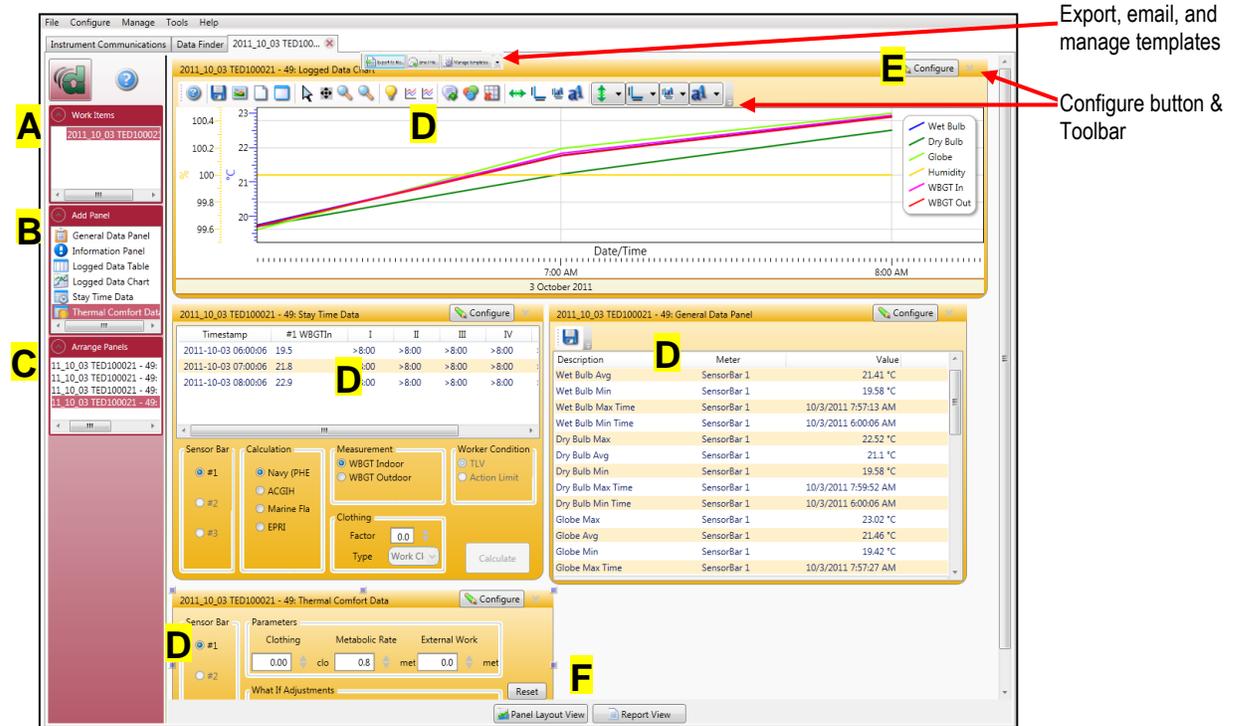


Figure 1-145: QUESTemp[®] 36 data in panel layout view

- To change the chart/table data parameters, click on the button. Each chart/table may have different configurable parameters depending on the parameters applicable to the specific panel.
 - To view the data as a report, click the button (see F).
- NOTE:** the panels will print in the order in which they are displayed in the panel layout page.
- The quick tips below explain how to customize the panels:
 - **To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.
 - **To move the panel**, click on the panel's header and drag and drop to the appropriate position.
NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.
 - **To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.
NOTE: It will span the numbers up or down depending on how you drag the mouse.)
 - **To save a layout**, right-click outside the panel area as displayed below. Click **Remember Setting**.

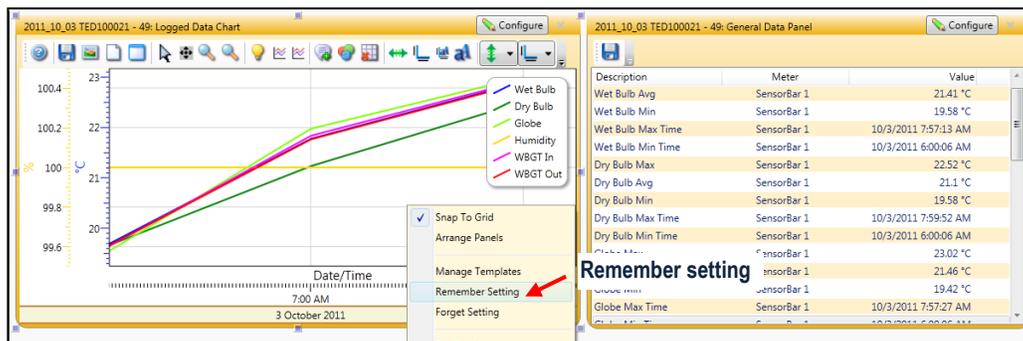
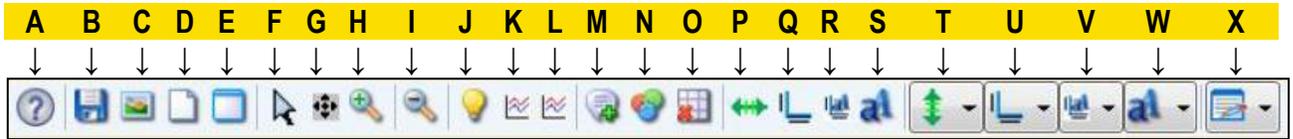


Figure 1-146: Rearranging panels and saving layout

5. To change the parameters on the logged data chart using the toolbar, please follow below:



	A.	Quick Help icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma-separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc.).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed).
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	G.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	H.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	I.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart.
	J.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the  icon. Hint –sometimes value label is not visible, if this occurs click the  icon and make sure the Normal cursor is selected.
	K.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	L.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	M.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click delete.
	N.	Chart Properties icon: Click to change the color of the chart attributes.
	O.	Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.
	P.	X Axis Range icon: Click and select range parameters for the logged data chart x axis. NOTE: When selected, a Set Axis Range dialog box will appear (see image below). For the date setting, either click on the date and type in a value or select the  icon to choose a date from a calendar box. Choose start and stop date settings. For the time, select either the hours, minutes, or seconds and click the  arrows to change the time settings. Select Apply to exit the dialog box.

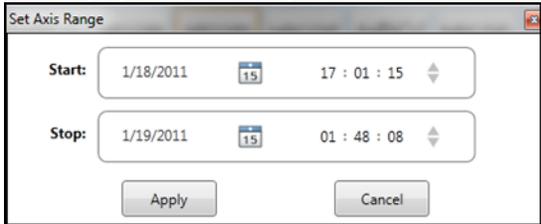
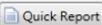


Figure 1-147: Set Axis Range screen

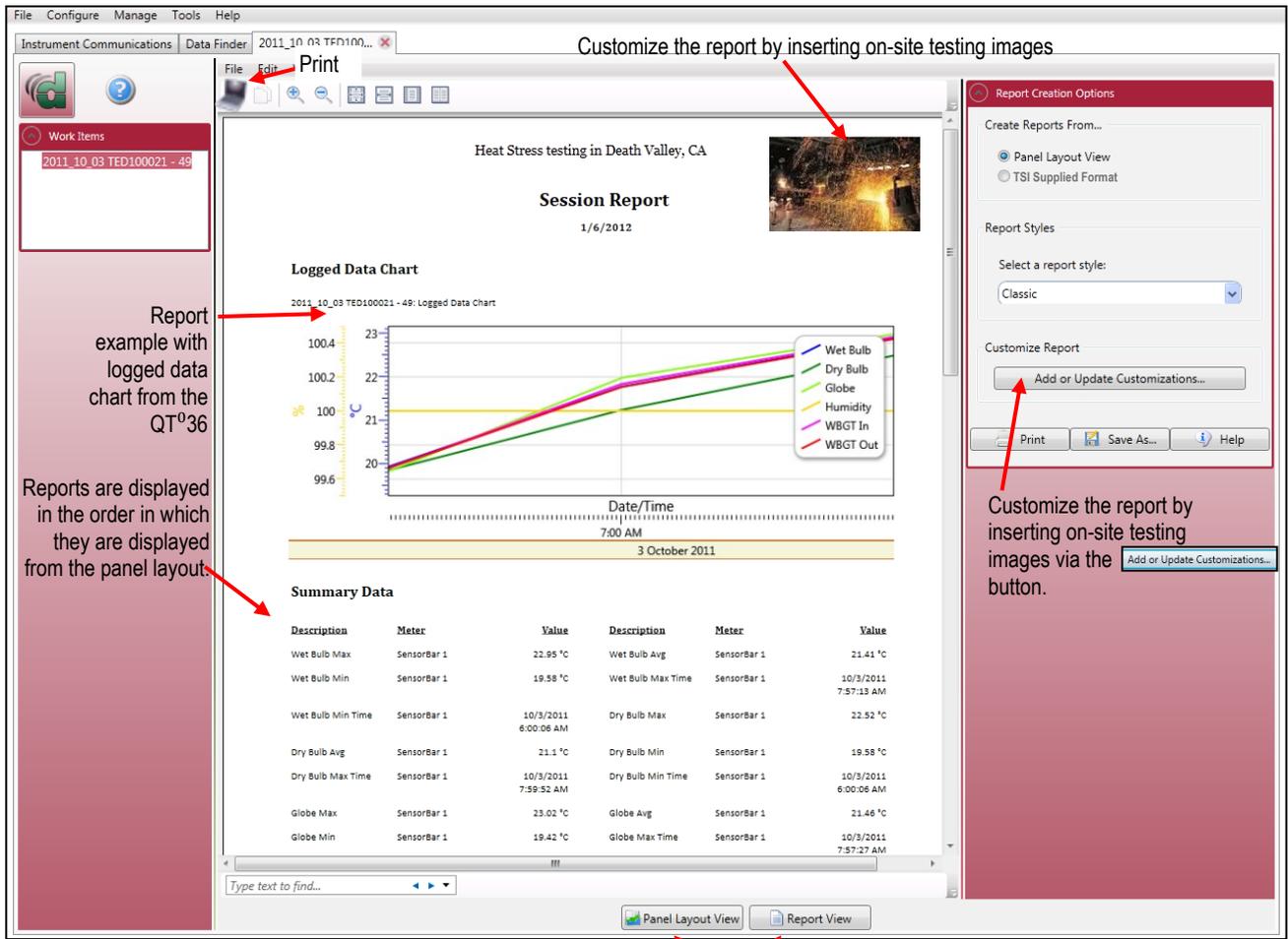
	Q.	X Axis Title icon: Click this icon to change the title of the x axis on the logged data chart. NOTE: When selected, the cursor will appear at the end of the title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box..
	R.	X Axis Title Font icon: Select the x axis title font icon to change the font style and size of the x axis title. NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.
	S.	X Axis Font icon: Select this icon to change the font style and size of the numeric values of the x axis. When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.
	T.	Y Axis Range icon: Click to change the range of one of the y axes. (For example, you may only want to view humidity levels between 10 % and 70 %.) NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a Set Axis Range dialog box will appear. Enter range Start and Stop values for the selected y axis. Select Apply to exit the dialog box.
	U.	Y Axis Title icon: Click this icon to change the title of one of the y axes on the logged data chart. NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and the cursor will appear at the end of the selected y axis title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box..
	V.	Y Axis Title Font icon: Select this icon to change the font style and size of the title of one of the y axes. NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis. Select OK to exit the chooser box.
	W.	Y Axis Font icon: Select this icon to change the font style and size of the numeric values of one of the y axes. NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis. Select OK to exit the chooser box.
	X.	Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE.



QUESTemp°34/36: Reports and Printing

To quickly create reports, open your data (in the data finder page) and click the quick report  button. A standard template of charts and tables (or panels) will appear in the report.

- **Viewing reports:** if you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen.
- **Printing reports:** while in the report view page you have two options outlined below:
 - Click on the  icon from the title bar.
 - Click on the  icon from the session report title bar.



Quickly switch back to the panel layout view (charts & tables)

Figure 1-148: Sample QUESTemp° 34/36 report

Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

- From the report creation options box (see A), click on **Add or Update Customizations...** button.
- There are four tabs to modify (if applicable) which include: company information, cover page, report, and headers/footers.
- The example below displays customizing the header and footer.

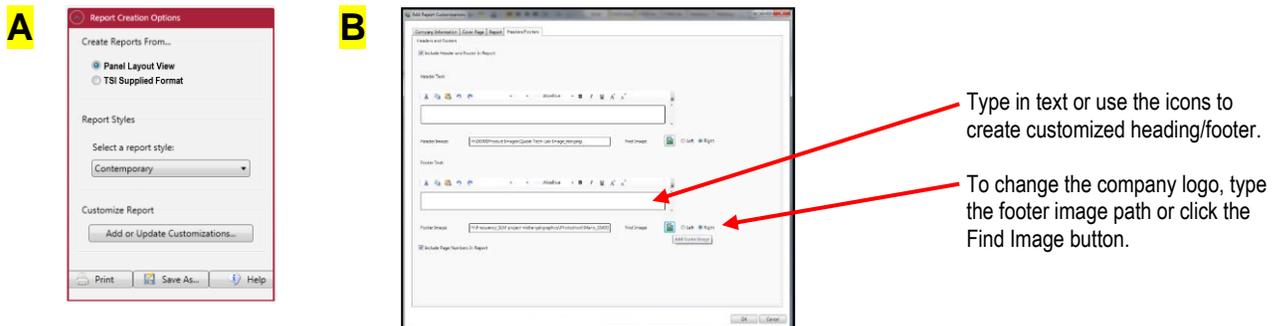


Figure 1-149: Report customization tools



QUESTemp^o34/36: Setup

There are up to four configurable tabs on the QT^o 34/36 setup page (see Figure below). With the QT^o 34/36, you have the option to save the configurations either on the instrument and/or store the configurations in DMS.

NOTE: If you save the profiles in the software, this can be used as a time management tool to organize and save all the setups for future use.

Please note that the QT^o 34 and QT^o 36 have different features and functionalities. Some of the setup parameters may not be applicable to your model. Please refer to the user manual to understand the models in more detail.

QUESTemp^o34/36: Saving and Sending Configurations

With the QT^o 34/36, there are saved setup profiles used to quickly access and apply to your instrument. Below explains how to save configuration settings in DMS and how to send to the instrument.

NOTE: To only send the setup, please skip to step 3. Please refer to this section as you set up your instrument.

1. To save the QT^o 34/36 configuration in the software, click on a name in the **Configuration Profile Management** panel (See **1**).

NOTE: The name will be shaded a light gray when selected.

- To create a new profile name, click  (see **2**) and type in a profile name. Click **Save**. (It will save under the configuration profile management panel).

2. Click on the  button (see **3**) and type in a **Name**. Click **OK**.

NOTE: This saves the configuration file to the software.

3. To send to the instrument, click on the  (see **4**).

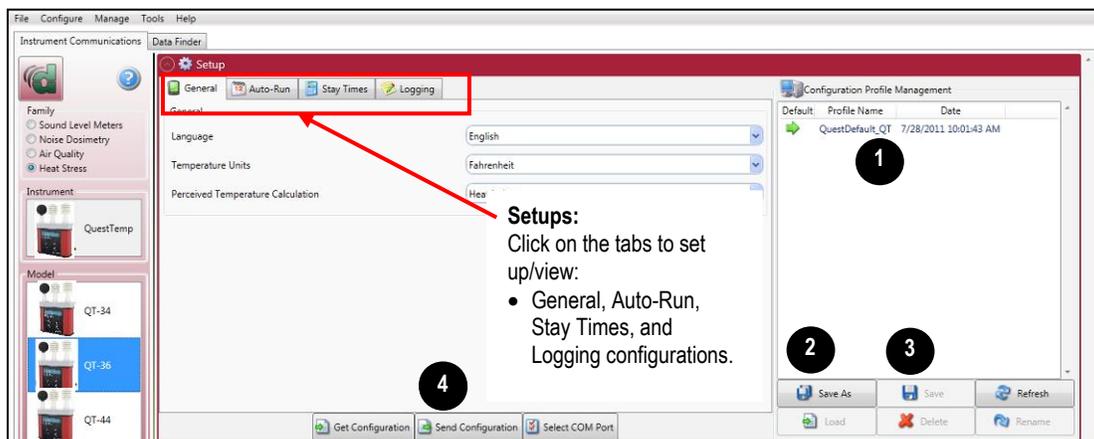


Figure 1-150: Saving and sending QUESTemp^o 34/36 setups



QUESTemp^o34/36: General Settings

The general settings are used to configure the instrument with basic parameters and is located in the instrument communications page. Please refer to the QT^o 34/36 parameters table below for details.

- Click on the **General** tab (see **1**) from the QT^o 34/36 Setup panel. To change the general settings, follow the selection option below.
 - Click on the arrow  and select an option (see **2**).
- To send to the instrument, click on  (see **3**), or **Save** (see **4**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

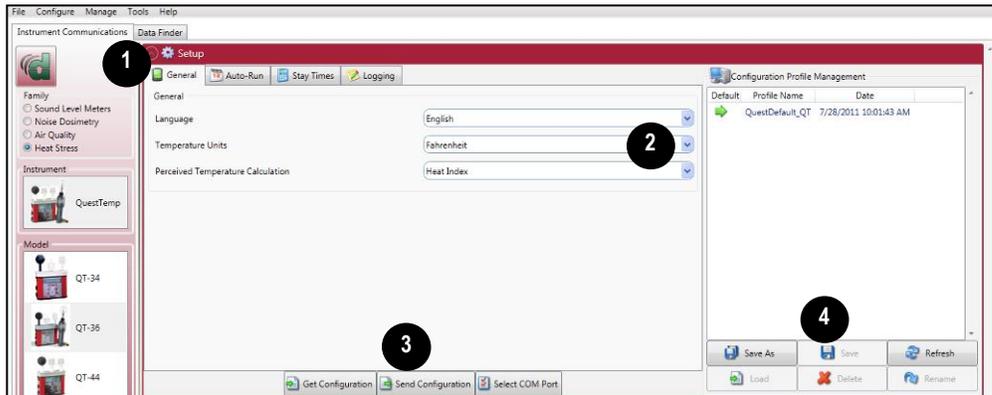


Figure 1-151: General settings for QUESTemp^o 34/36

QT^o 34/36 General Settings

General Setting	Description
Language	There are five selectable languages including: English, French, Spanish, German, and Italian.
Temperature Units	The temperature units are measured in Celsius and/or Fahrenheit.
Perceived Temperature Calculation	<p>There are two perceived temperature calculations which include: Heat Index and Humidex measurements.</p> <p>b. The Heat Index is determined using the dry bulb temperature and relative humidity. Heat Index represents how an average person feels give to the relative climate conditions (according to the U.S. National Weather service.) The Heat Index is defined over a temperature range of 70°F to 120°F (21°C to 49°C) and an RH range of 30 % to 99%. Outside of this range the instrument will display dashes.</p> <p>c. The Humidex, primarily used in Canada, functions similar to the Heat Index with different values. The Humidex is defined over a temperature range of 70°F to 109°F (21°C to 43°C) and an RH range of 20% to 99%. Outside of this range the instrument will display dashes.</p>



QUESTemp^o34/36: Auto-Run Settings

The QT^o 34/36 models have three programmable auto-run modes that will automatically start and stop sessions: timed run, date, and day of week.

Auto-Run Modes

Auto-Run Mode	Description
Timed Run	With Timed Run mode, the QT ^o 34/36 is powered on and run is enabled. The instrument will automatically stop based on the programmed duration.
Date	A Date mode run wakes up the instrument from a powered down condition, runs the study, saves it then powers down again and is only executable once. The parameters are selectable by specified start date, start time, and duration.
Day of Week	<p>The Day of the Week (DOW) setting is a pre-programmed weekly auto-run with a specified day, start time, and duration.</p> <ul style="list-style-type: none"> NOTE: In order for the Days of the Week mode to Auto-Run, ensure the instrument is in the "off" position. The instrument will then automatically switch into Auto-Run based on your setup parameters.

Auto-Run with Timed-Run Setting

To enable the Timed-Run mode, please follow below.

1. Click on the **Auto-Run** tab (see **1**) from the QT °34/36 Instrument Communications' panel.
2. Click in the **Enabled checkbox** and click in the **Timed-Run** field (see **2**).
NOTE: The Timed-Run tab will automatically select.
3. Select the **Start Time** and **Duration** by either using the arrows or type in the values (see **3**).
4. To send to the instrument, click on (see **4**), or **Save** (see **5**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

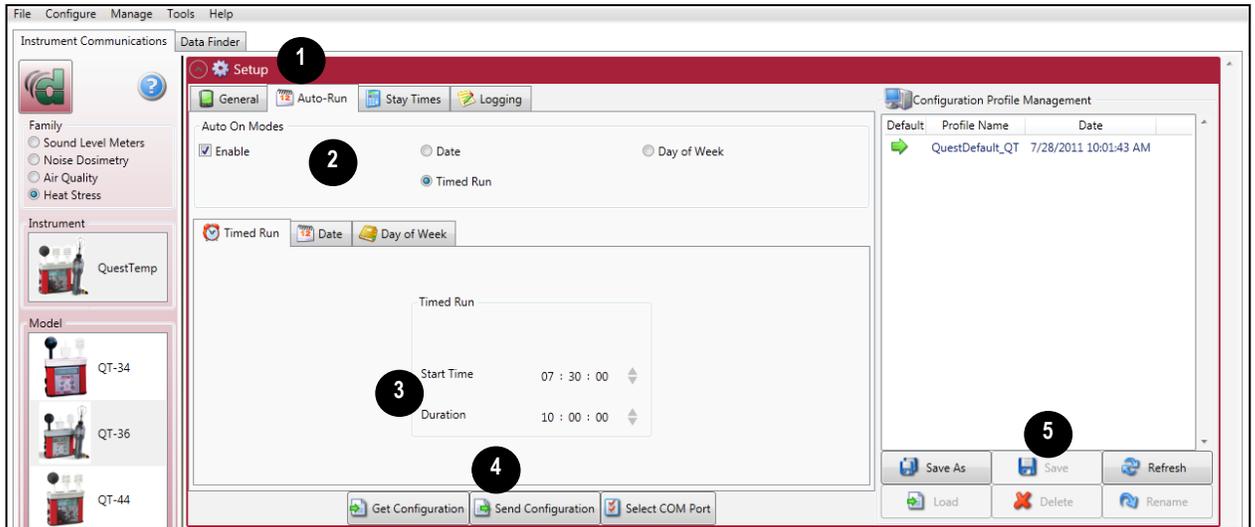


Figure 1-152: QUESTemp° 34/36 Auto-Run with Timed-Run setting

Auto-Run with Date Setting

To enable the Date mode, please follow below.

1. Click on the **Auto-Run** tab (see **1**) from the QT °34/36 Instrument Communications' panel.
2. Click in the **Enabled checkbox** and click in the **Date** field (see **2**).
NOTE: The Timed-Run tab will automatically select.
3. Select the **Start Time** and **Duration** by either using the arrows or type in the values (see **3**).
4. To send to the instrument, click on (see **4**), or **Save** (see **5**) and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

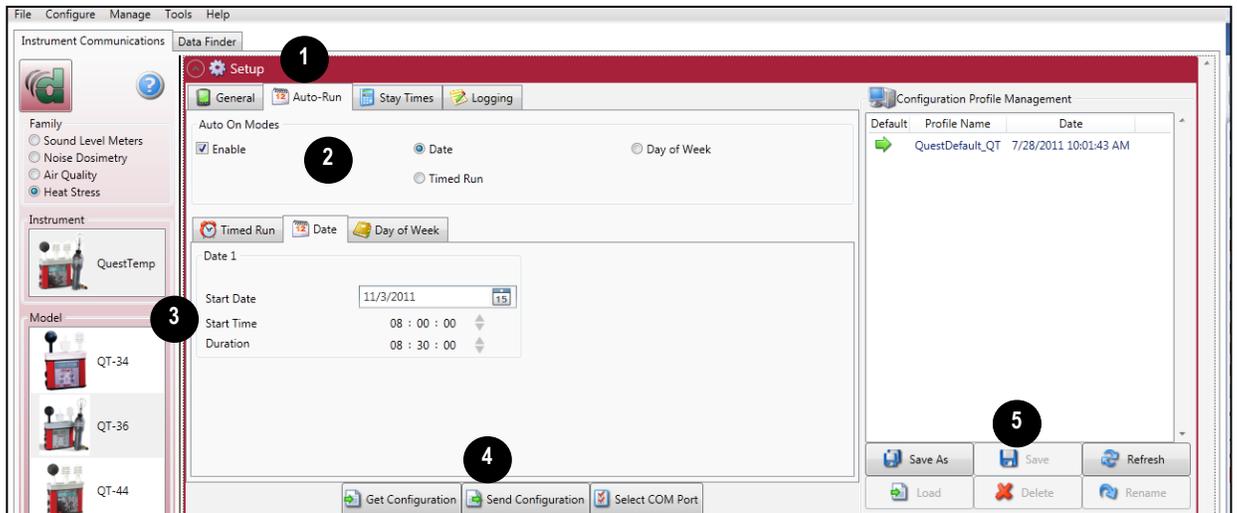


Figure 1-153: QUESTemp° 34/36 Auto-Run with Date setting

Auto-Run with Day of Week Setting

To enable Day of Week mode, please follow below.

1. Click on the **Auto-Run** tab (see ❶) from the QT° 34/36 Instrument Communications' panel.
2. Click in the **Enabled** checkbox and click in the **Day of Week** field (see ❷).
NOTE: The Timed-Run tab will automatically select.
3. Check a specific day/s of the week (or days of the week) by clicking in the box (see ❸).
4. Select the **Start Time** and **Duration** by either using the arrows or type in the values (see ❹).
5. To send to the instrument, click on (see ❺), or (see ❻) and (for more details see "[Saving and Sending Configurations](#)").

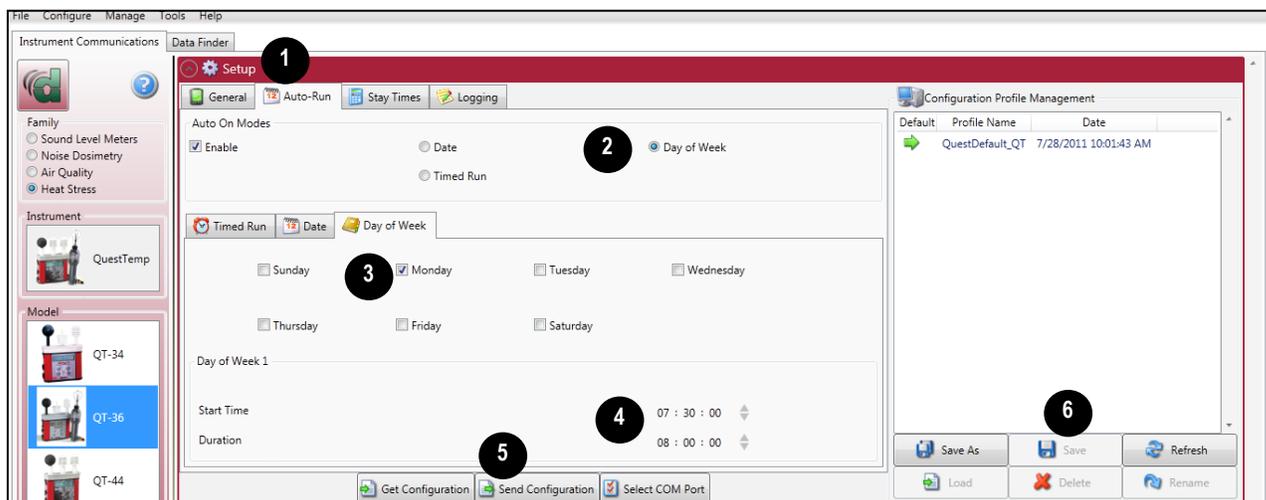


Figure 1-154: QUESTemp° 34/36 Auto-Run with Day of Week setting



QUESTemp^o34/36: Stay Time Settings

The stay time settings are configurable with the QT^o 36 model. When displayed, the stay time data may be used to manage work/rest regimens. The following steps outline how to select the stay time parameters:

1. To select one of the stay time parameters and/or the air velocity settings, select the Stay Times tab (see **1**) from the QT^o 36 instrument communications panel.
2. To select the settings, do one of the following (see **2**):
 - Click on the arrow  and select a setting.
 - d. Click on the  arrows and select a numeric value or type in a value.
3. To send to the instrument, click on  (see **3**), or **Save** (see **4**) and **Send Configuration** (for more details see [“Saving and Sending Configurations”](#)).

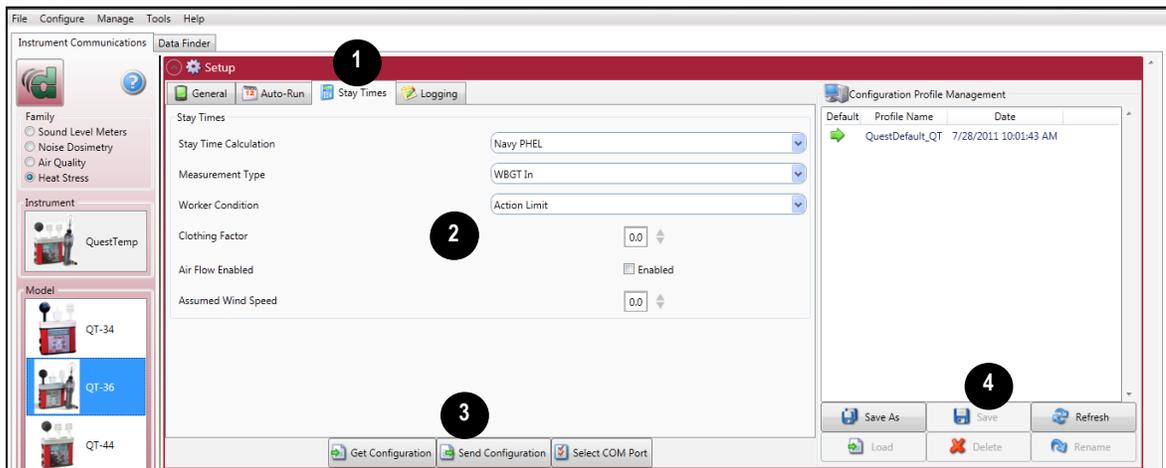


Figure 1-155: Stay time settings with the QUESTemp^o 36



QUESTemp^o34/36: Logging Settings

The QT^o 34/36 logging screen is used to set up data logging settings. The Logging rate/interval (also called time history data) sets the frequency at which data will be logged during a session. The settings include: 1, 5, 15, 30 seconds and 15, 30, and 60 minutes.

1. Click on the Logging tab (see **1**) from the QT^o34/36 Instrument Communications panel.
2. To change the logging settings, select a Logging rate by clicking on the drop-down arrow  (see **2**) and selecting an option from the logging rate list.
3. To send to the instrument, click on  (see **3**), or **Save** (see **4**) and **Send Configuration** (for more details see "[Saving and Sending Configurations](#)").

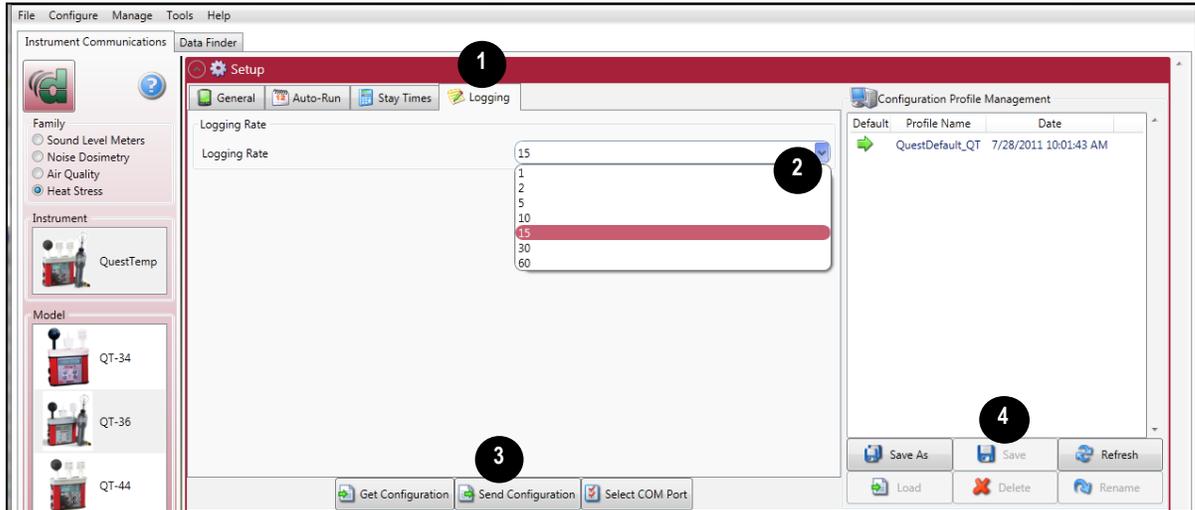


Figure 1-156: Logging settings with the QUESTemp^o 34/36

QUESTemp° 44/46/48N (Heat Stress Monitoring)

The QUESTemp° 44/46/48N (QT° 44/46/48N) instruments are used for measuring occupational heat stress. The following sections explain communicating with the QT° 44/46/48N and DMS, saving and sending configurations, downloading, viewing data, setup, firmware updates, and printing reports.



QUESTemp° 44/46/48N: Communication Setup

The communication setup is an important starting point with your instrument and DMS. Once communicating, you have the option to download data, configure instrument parameters and use quick setup features for time and date settings. The following explains the QT° 44/46/48N communication setup steps.

1. Using a TSI cable, part number 054-715, plug the cable into the computer and plug the opposite end into the side jack of the QT° 44/46/48N data port.



Figure 1-157: Communicating with the QUESTemp° 44/46/48N and DMS

2. From the start page of DMS, select the  Setup or  Download buttons and the instrument communication panel will appear.

3. Select **Heat Stress** and then select the **Model Type** by clicking on **QT°44**, **QT°46**, or **QT°48N**. (See **1** and **2**). (You are now ready to set up or download your instrument.)
4. Once selected, see the following sections for downloading or setup parameters to learn more about working with the QT° 44/46/48N.
 - See the subsequent QT° 44/46/48N instrument setup sections to set up or download your instrument.

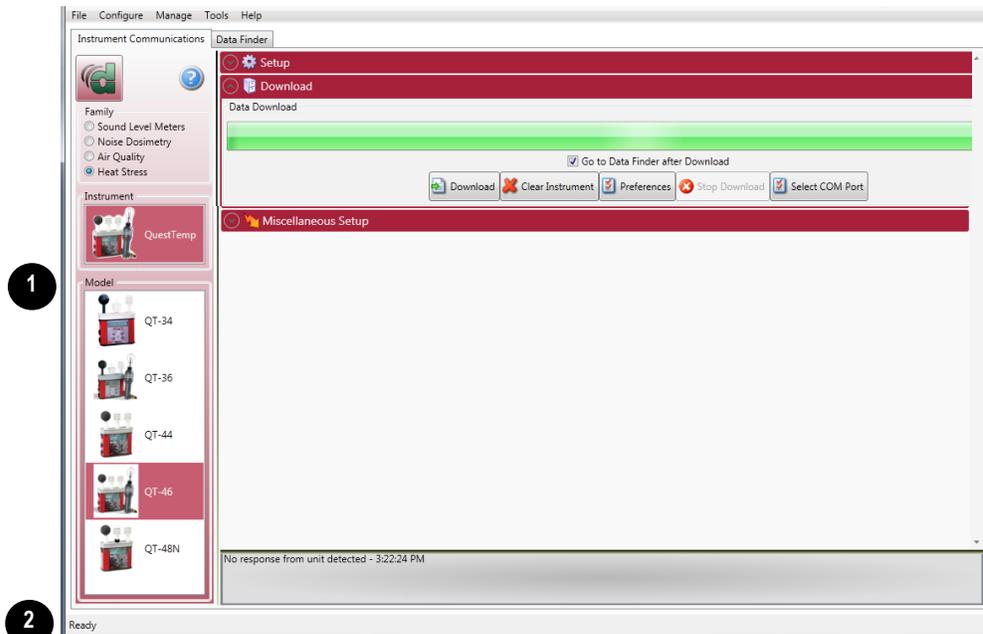


Figure 1-158: QUESTemp° 44/46/48N downloading data

NOTE: The first time you communicate with the QT° 44/46/48N and DMS the Found New Hardware wizard will appear. Please install and follow the screen prompts.



QUESTemp° 44/46/48N: Downloading Data

The Instrument Download feature is used to download your files from the QT° 44/46/48N into the software for review and analysis of the data. Once the files are downloaded and if **“Go to Data Finder after Download”** is checked, DMS will open into the Data Finder window.

NOTE: The Data Finder window stores all of the downloaded data by instrument, session and study. The information is stored in tabular style with measurements/parameters displayed on the table header. See Data Finder for more information.”

To download, please follow steps below:

1. To download the QT° 44/46/48N data, ensure your instrument is communicating properly. (See *“Communication Setup”* for details.)
2. From the Start page, select the  button and the instrument communication panel will appear with the Download tab selected.
3. Select the **Heat Stress** Family and the appropriate QT° 44/46/48N model (see **1** and **2**).
4. *Optional:* Select the *“Go to Data Finder after download”* checkbox to view your session/study information after the download (see **3**).
5. Press the **Download** button (see **4**).

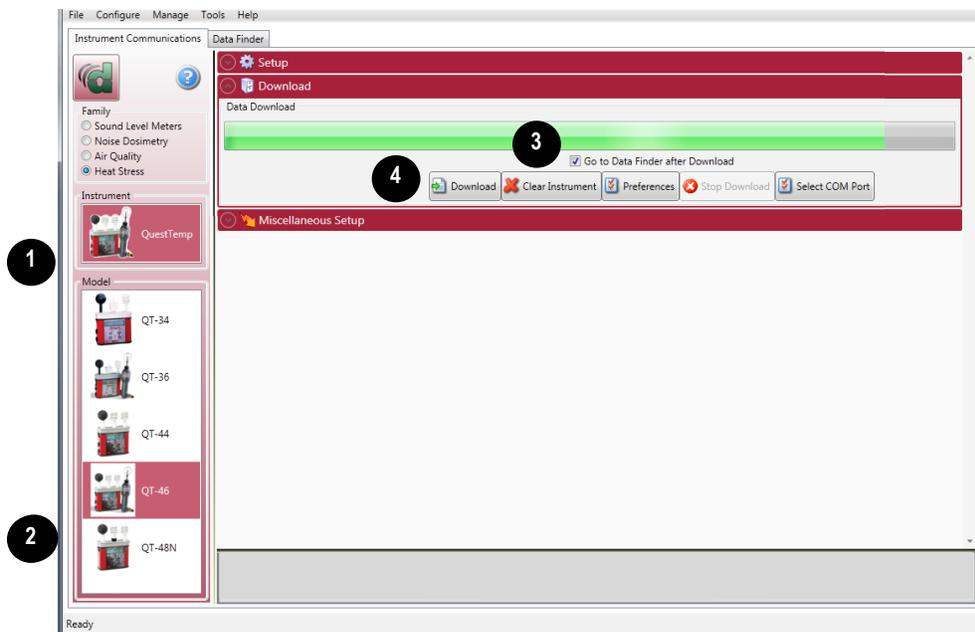


Figure 1-159: Downloading QUESTemp° 44/46/48N files



QUESTemp° 44/46/48N: Viewing Data

The following section outlines viewing your data with the QT° 44/46/48N models.

Selecting a Session/Study

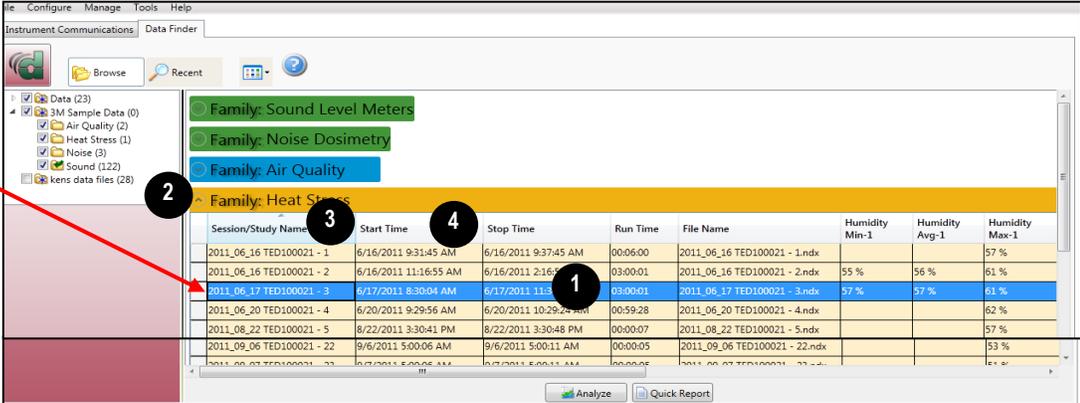
To view downloaded data from the welcome page, click on the  button and the data finder screen will appear. (Or select the **Data Finder** tab if already opened.)

1. Select a session by either double-clicking on data or click on the session/study and select the  button.

NOTE: The example below illustrates a session selected with a run time of 3 minutes. (See **1**).

- **Family: Heat Stress:** QT°44/46/48N data is stored in this family. (See **2**).
- **Session/Study:** The QT° data is organized by the table headings, such as the session/study name (See **3**).
- **Start Time:** To quickly locate your study by most recent start time, click on the **Start Time** heading and it will sort ascending/descending (See **4**).
- **Parameters & measurements:** The table headings and columns are customizable by a quick click, drag, and drop to a new column location (similar to Microsoft® Excel® spreadsheet program.)

Double-click to select/view QT° 44/46/48N data in charts and tables



Session/Study Name	Start Time	Stop Time	Run Time	File Name	Humidity Min-1	Humidity Avg-1	Humidity Max-1
2011_06_16 TED100021 - 1	6/16/2011 9:31:45 AM	6/16/2011 9:37:45 AM	00:06:00	2011_06_16 TED100021 - 1.ndx			57 %
2011_06_16 TED100021 - 2	6/16/2011 11:16:55 AM	6/16/2011 2:16:55 PM	03:00:01	2011_06_16 TED100021 - 2.ndx	55 %	56 %	61 %
2011_06_17 TED100021 - 3	6/17/2011 8:30:04 AM	6/17/2011 11:30:04 AM	03:00:01	2011_06_17 TED100021 - 3.ndx	57 %	57 %	61 %
2011_06_20 TED100021 - 4	8/20/2011 9:29:56 AM	8/20/2011 10:29:24 AM	00:59:28	2011_06_20 TED100021 - 4.ndx			62 %
2011_08_22 TED100021 - 5	8/22/2011 3:30:41 PM	8/22/2011 3:30:48 PM	00:00:07	2011_08_22 TED100021 - 5.ndx			57 %
2011_09_06 TED100021 - 22	9/6/2011 5:00:06 AM	9/6/2011 5:00:11 AM	00:00:05	2011_09_06 TED100021 - 22.ndx			53 %

Figure 1-160: Data Finder and Heat Stress sessions



QUESTemp° 44/46/48N: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

1. Panel Layout View is divided into Work Items (see **A**), Add Panel (see **B**), and Arrange Panels (see **C**) palettes, as well as data panels (see **D**).

- **Work items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
- **Add panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
- **Arrange panels (C)** – displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.
- **Data panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: use the Configure icon to customize parameters.

- **Toolbar and Configure button (E)** – the toolbar and configure button are used to customize or select different measurement parameters.

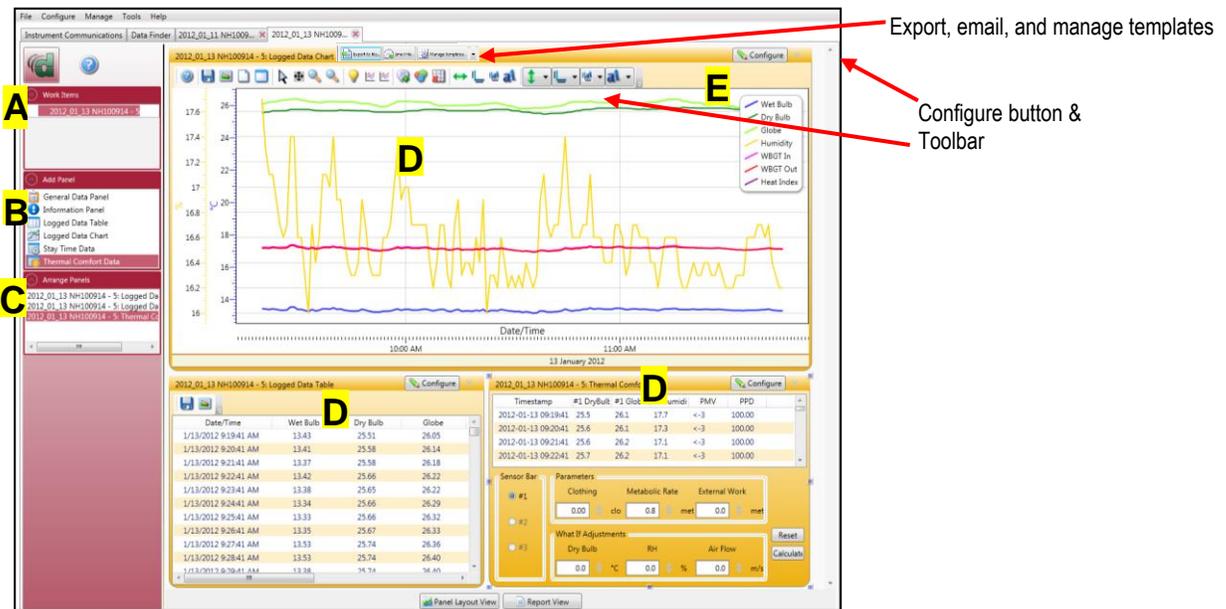


Figure 1-161: QUESTemp° 44/46/48N data in panel layout view

2. To change the chart/table data parameters, click on the  button. Each chart/table may have different configurable parameters depending on the parameters applicable to the specific panel.
3. To view the data as a report, click the  button.

NOTE: The panels will print in the order in which they are displayed in the panel layout page.

4. The quick tips below explain how to customize the panels:

- **To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.
- **To move the panel**, click on the panel's header and drag and drop to the appropriate position.
NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.
- **To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.
NOTE: It will span the numbers up or down depending on how you drag the mouse.
- **To save a layout**, right-click outside the panel area as displayed below. Click **Remember Setting**.

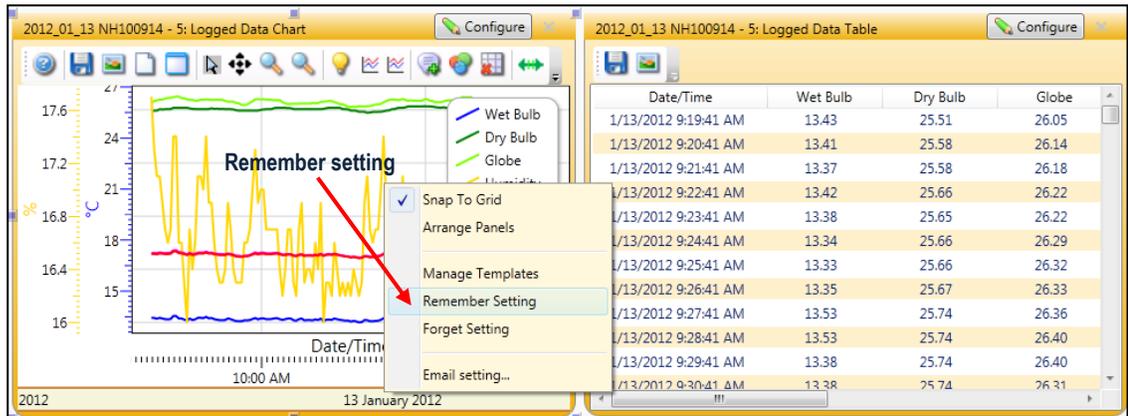
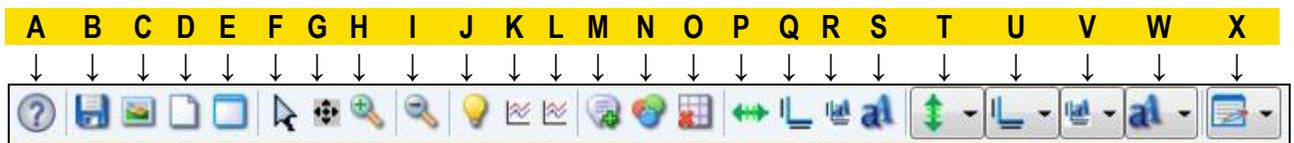
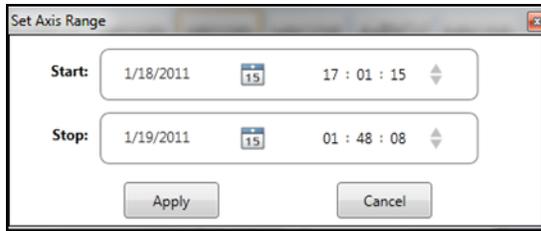


Figure 1-162: Rearranging panels and saving layout

5. To change the parameters on the logged data chart using the toolbar, please follow below:



	A.	Quick Help icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma-separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc..).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed).
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	G.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	H.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	I.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart.
	J.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the icon. Hint –sometimes value label is not visible, if this occurs click the icon and make sure the Normal cursor is selected.

	K.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	L.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	M.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click delete.
	N.	Chart Properties icon: Click to change the color of the chart attributes.
	O.	Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.
	P.	<p>X Axis Range icon: Click and select range parameters for the logged data chart x axis.</p> <p>NOTE: When selected, a Set Axis Range dialog box will appear (see image below). For the date setting, either click on the date and type in a value or select the  icon to choose a date from a calendar box. Choose start and stop date settings. For the time, select either the hours, minutes, or seconds and click the  arrows to change the time settings.</p> <p>Select Apply to exit the dialog box.</p>  <p>Figure 1-163: Set Axis Range screen</p>
	Q.	<p>X Axis Title icon: Click this icon to change the title of the x axis on the logged data chart.</p> <p>NOTE: When selected, the cursor will appear at the end of the title box. Press the Backspace key to delete the text and type in new text.</p> <p>Press Enter to exit the text box.</p>
	R.	<p>X Axis Title Font icon: Select the x axis title font icon to change the font style and size of the x axis title.</p> <p>NOTE: When selected, a font chooser box will appear. Select the appropriate font type and size.</p> <p>Select OK to exit the chooser box.</p>
	S.	<p>X Axis Font icon: Select this icon to change the font style and size of the numeric values of the x axis. When selected, a font chooser box will appear. Select the appropriate font type and size. Select OK to exit the chooser box.</p>
	T.	<p>Y Axis Range icon: Click to change the range of one of the y axes. (For example, you may only want to view humidity levels between 10 % and 70 %.)</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a Set Axis Range dialog box will appear. Enter range Start and Stop values for the selected y axis.</p> <p>Select Apply to exit the dialog box.</p>
	U.	<p>Y Axis Title icon: Click this icon to change the title of one of the y axes on the logged data chart.</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and the cursor will appear at the end of the selected y axis title box. Press the Backspace key to delete the text and type in new text.</p> <p>Press Enter to exit the text box.</p>
	V.	<p>Y Axis Title Font icon: Select this icon to change the font style and size of the title of one of the y axes.</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis.</p> <p>Select OK to exit the chooser box.</p>

	<p>W. Y Axis Font icon: Select this icon to change the font style and size of the numeric values of one of the y axes.</p> <p>NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis.</p> <p>Select OK to exit the chooser box.</p>
	<p>X. Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE.</p>



QUESTemp° 44/46/48N: Reports and Printing

To quickly create reports, open your data (in the data finder page) and click the quick report  button. A standard template of charts and tables (or panels) will appear in the report.

- **Viewing reports:** if you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen.
- **Printing reports:** while in the report view page you have two options outlined below:
 - Click on the  icon from the title bar.
 - Click on the  icon from the session report title bar.

Heat Stress Monitoring Sedona, AZ

Session Report
1/13/2012

Description	Meter	Value	Description	Meter	Value
Wet Bulb Max	SensorBar 1	13.6 °C	Wet Bulb Avg	SensorBar 1	13.34 °C
Wet Bulb Min	SensorBar 1	13.15 °C	Wet Bulb Max Time	SensorBar 1	1/13/2012 9:28:14 AM
Wet Bulb Min Time	SensorBar 1	1/13/2012 10:30:41 AM	Dry Bulb Max	SensorBar 1	25.89 °C
Dry Bulb Avg	SensorBar 1	25.60 °C	Dry Bulb Min	SensorBar 1	25.45 °C
Dry Bulb Max Time	SensorBar 1	1/13/2012 11:17:19 AM	Dry Bulb Min Time	SensorBar 1	1/13/2012 10:38:41 AM
Globe Max	SensorBar 1	26.42 °C	Globe Avg	SensorBar 1	26.08 °C
Globe Min	SensorBar 1	25.77 °C	Globe Max Time	SensorBar 1	1/13/2012 11:14:50 AM
Globe Min Time	SensorBar 1	1/13/2012 11:34:41 AM	WBGT in Max	SensorBar 1	17.44 °C
WBGT in Avg	SensorBar 1	17.17 °C	WBGT in Min	SensorBar 1	16.95 °C
WBGT in Max Time	SensorBar 1	1/13/2012 9:28:14 AM	WBGT in Min Time	SensorBar 1	1/13/2012 10:35:41 AM

2012_01_13 NH100914 - 5 Logged Data Chart

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Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

- From the report creation options box (see **A**), click on **Add or Update Customizations...** button.
- There are four tabs to modify (if applicable) which include: company information, cover page, report, and headers/footers.
- The example below displays customizing the header and footer.

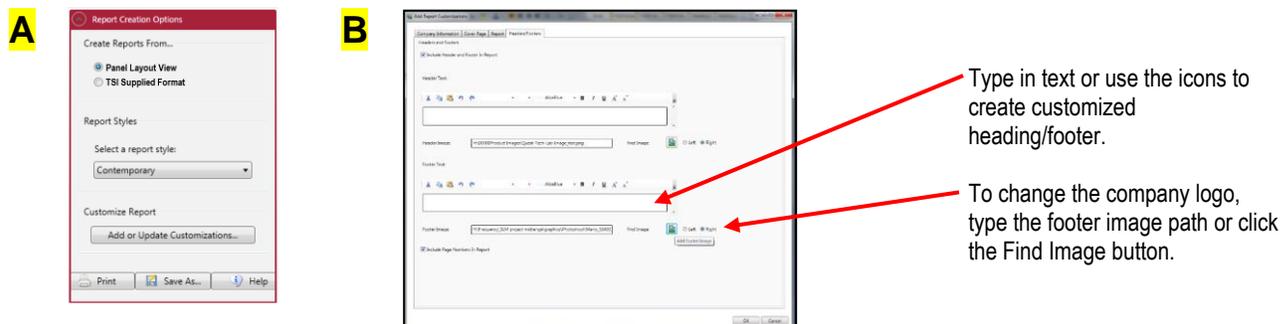


Figure 1-165: Report customization tools



QUESTemp° 44/46/48N: Setup

There are up to four configurable tabs (see Figure below) in the QT° 44/46/48N setup page. With the QT° 44/46/48N, you have the option to save the configurations either on the instrument and/or store the configurations in DMS.

NOTE: If you save the profiles in the software, this can be used as a time management tool to organize and save all the setups for future use.

Note that there are two different models in the QT° 44/46/48N models with different features and functionalities. Some of the setup parameters may not be applicable to your model. Please refer to the user manual to understand the models in more detail.

QUESTemp° 44/46/48N: Saving and Sending Configurations

With the QT° 44/46/48N, there are saved setup profiles used to quickly access and apply to your instrument. Below explains how to save configuration settings in DMS and how to send to the instrument.

NOTE: To only send the setup, skip to step 3. Refer to this section as you set up your instrument.

1. To save the QT° 44/46/48N configuration in the software, click on a name in the **Configuration Profile Management** panel (See **1**).

NOTE: The name will be shaded a light gray when selected.

- To create a new profile name, click **Save As** (see **2**) and type in a profile name. Click **Save**. (It will save under the configuration profile management panel).
2. Click on the **Save** button (see **3**) and type in a **Name**. Click **OK**.
- NOTE:** This saves the configuration to the software.

To send to the instrument, click on  (see **4**), or **Save and Send Configuration** (for more details see [“Saving and Sending Configurations”](#)).

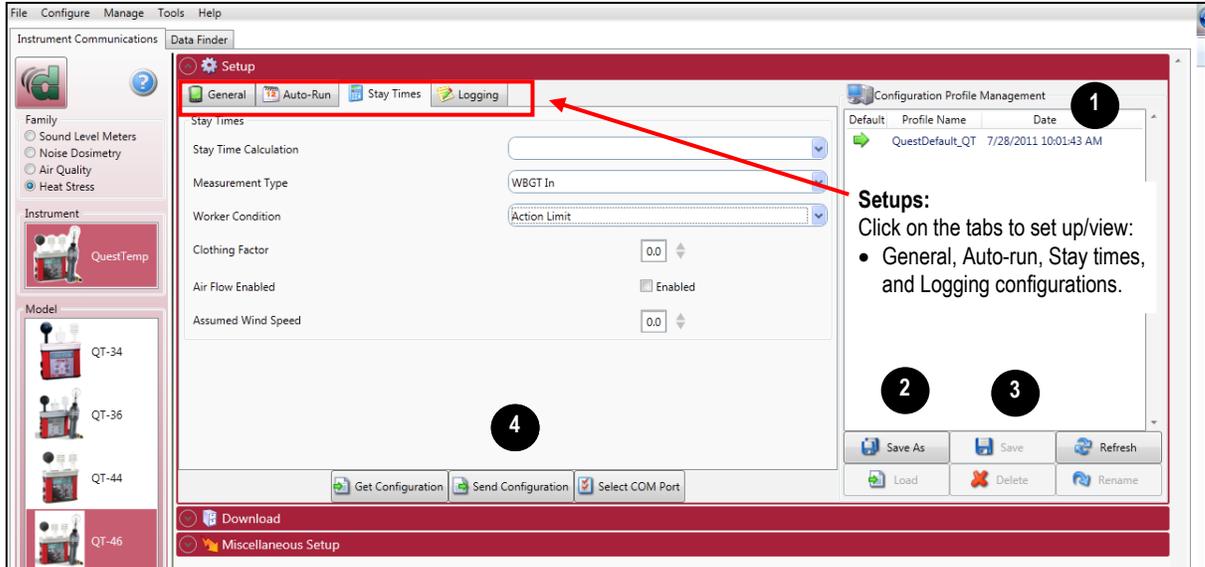
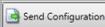


Figure 1-166: Saving and sending QUESTemp[®] 44/46/48N setups



QUESTemp[®] 44/46/48N: General Settings

The general settings are used to configure the instrument with basic parameters and is located in the instrument communications page. Please refer to the QT[®] 44/46/48N parameters table below for details.

- Click on the **General** tab (see **1**) from the QT[®] 44/46/48N Setup panel. To change the general settings, follow one (or all) of the selection options below.
 - Click on the arrow  and select an option (see **2**).
- To send to the instrument, click  (see **4**), or **Save** (see **3**) and **Send Configuration** and (for more details see [“Saving and Sending Configurations”](#)).

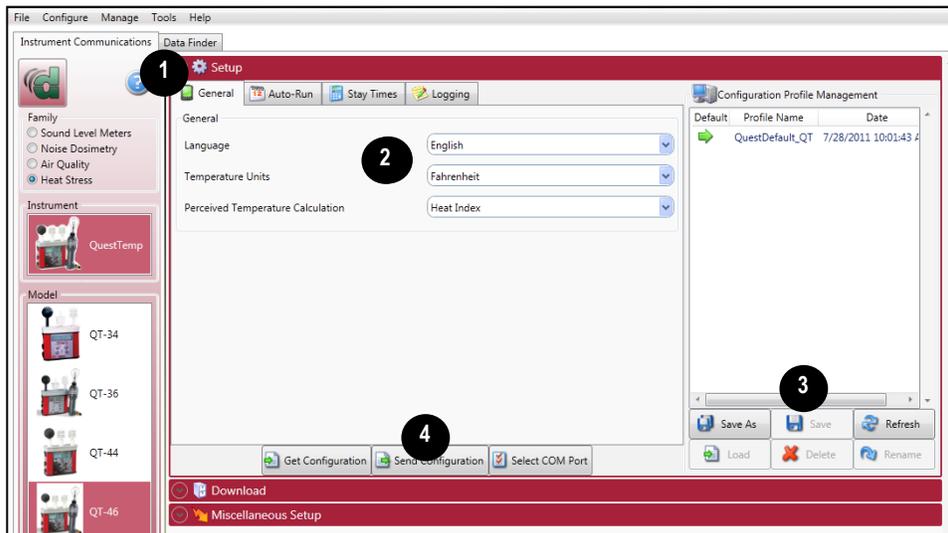


Figure 1-167: General settings for QUESTemp[®] 44/46/48N

QT° 44/46/48N General Settings

General Setting	Description
Language	There are five selectable languages including: English, French, Spanish, German, and Italian.
Temperature Units	The temperature units are measured in Celsius and/or Fahrenheit.
Perceived Temperature Calculation	There are two perceived temperature calculations which include: Heat Index and Humidex measurements. <ol style="list-style-type: none"> The Heat Index is determined using the dry bulb temperature and relative humidity. Heat Index represents how an average person feels give to the relative climate conditions (according to the U.S. National Weather service.) The Heat Index is defined over a temperature range of 70°F to 120°F (21°C to 49°C) and an RH range of 30% to 99%. Outside of this range the instrument will display dashes. The Humidex, primarily used in Canada, functions similar to the Heat Index with different values. The Humidex is defined over a temperature range of 70°F to 109°F (21°C to 43°C) and an RH range of 20% to 99%. Outside of this range the instrument will display dashes.



QUESTemp° 44/46/48N: Auto-Run Settings

The QT° 44/46/48N models have three programmable auto-run modes that will automatically start and stop sessions: timed run, date, and day of week.

Auto-Run Modes

Auto-Run Mode	Description
Timed Run	With Timed Run mode, the QT° 44/46/48N is powered on and run is enabled. The instrument will automatically stop based on the programmed duration.
Date	A Date mode run wakes up the instrument from a powered down condition, runs the study, saves it then powers down again and is only executable once. The parameters are selectable by specified start date, start time, and duration.
Day of Week	The Day of the Week (DOW) mode is a pre-programmed weekly auto-run with a specified day, start time, and duration. NOTE: In order for the Days of the Week mode to Auto-Run, ensure the instrument is in the “off” position. The instrument will then automatically switch into Auto-Run based on your setup parameters.

Auto-Run with Timed-Run Setting

To enable the Timed-Run mode, please follow below.

- Click on the **Auto-Run** tab (see **1**) from the QT° 44/46/48N Instrument Communications' panel.
- Click in the **Enabled checkbox** and click in the **Timed-Run** field (see **2**).
NOTE: The Timed-Run tab will automatically select.
- Select the **Start Time** and **Duration** by either using the arrows or type in the values (see **3**).

- To send to the instrument, click  (see **4**), or **Save** (see **5**) and **Send Configuration** and (for more details see [“Saving and Sending Configurations”](#)).

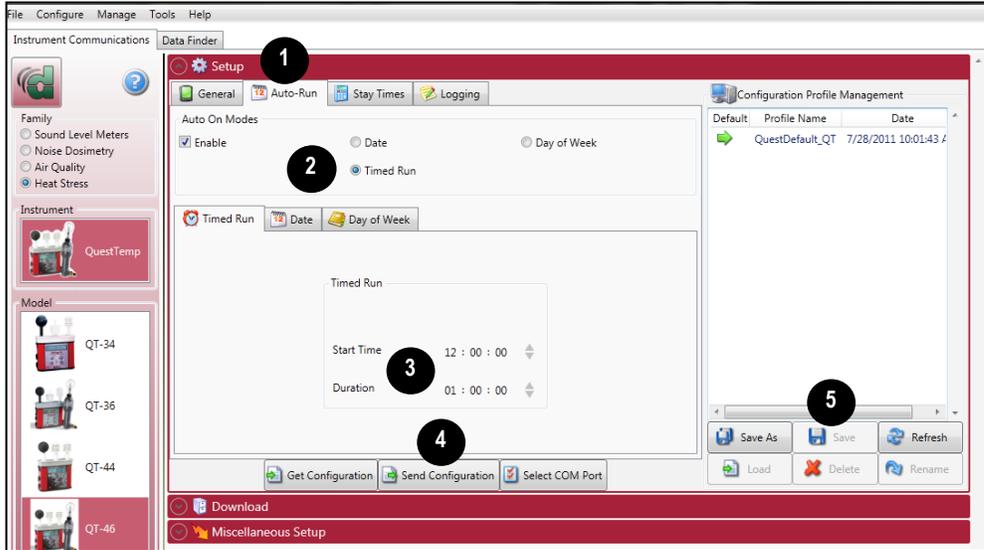


Figure 1-168: QUESTemp^o 44/46/48N Auto-Run with Timed-Run setting

Auto-Run with Date Setting

To enable the Date auto-run mode, please follow below.

- Click on the **Auto-Run** tab (see **1**) from the QT^o 44/46/48N Instrument Communications' panel.

- Click in the **Enabled** checkbox and click in the **Date** field (see **2**).

NOTE: The Timed-Run tab will automatically select.

- Select the **Start Time** and **Duration** by either using the arrows or type in the values (see **3**).

- To set auto-run, click on  (see **4**) or save and send to the QT^o44/46/48N (for more details see [“Saving and Sending Configurations”](#).)

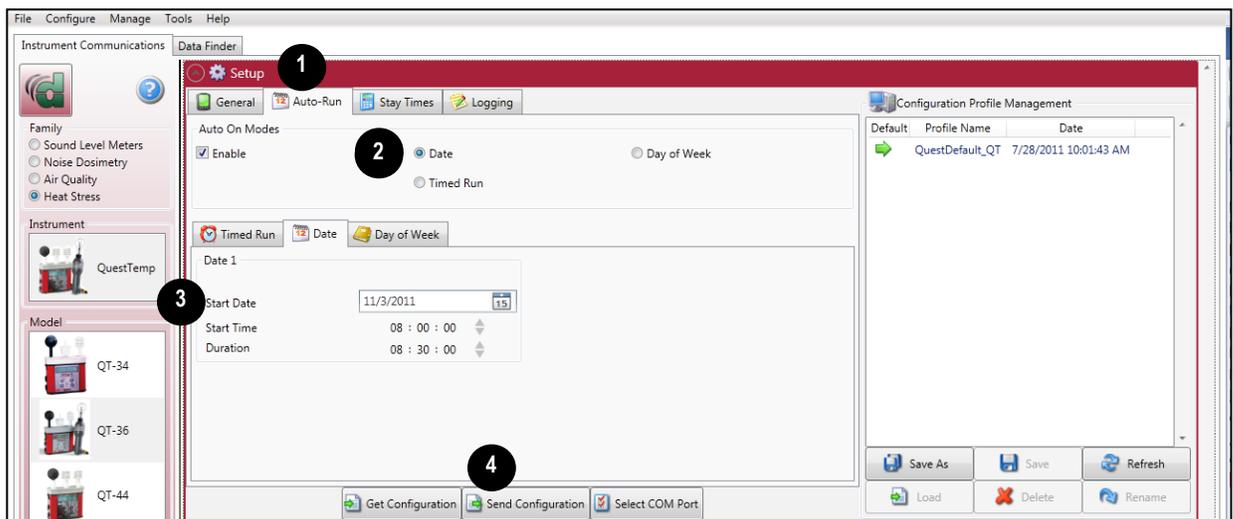


Figure 1-169: QUESTemp^o 44/46/48N Auto-Run with Date setting

Auto-Run with Day of Week Setting

To enable the Date auto-run mode, please follow below.

1. Click on the **Auto-Run** tab (see **1**) from the QT^o 44/46/48N Instrument Communications' panel.
2. Click in the **Enabled** checkbox and click in the **Day of Week** field (see **2**).
NOTE: The Timed-Run tab will automatically select.
3. Check a specific day/s of the week (or days of the week) by clicking in the box (see **3**).
4. Select the **Start Time** and **Duration** by either using the arrows or type in the values (see **4**).
5. To set auto-run, click on (see **5**) or save and send to the QT^o 34/36 (for more details see ["Saving and Sending Configurations"](#)).

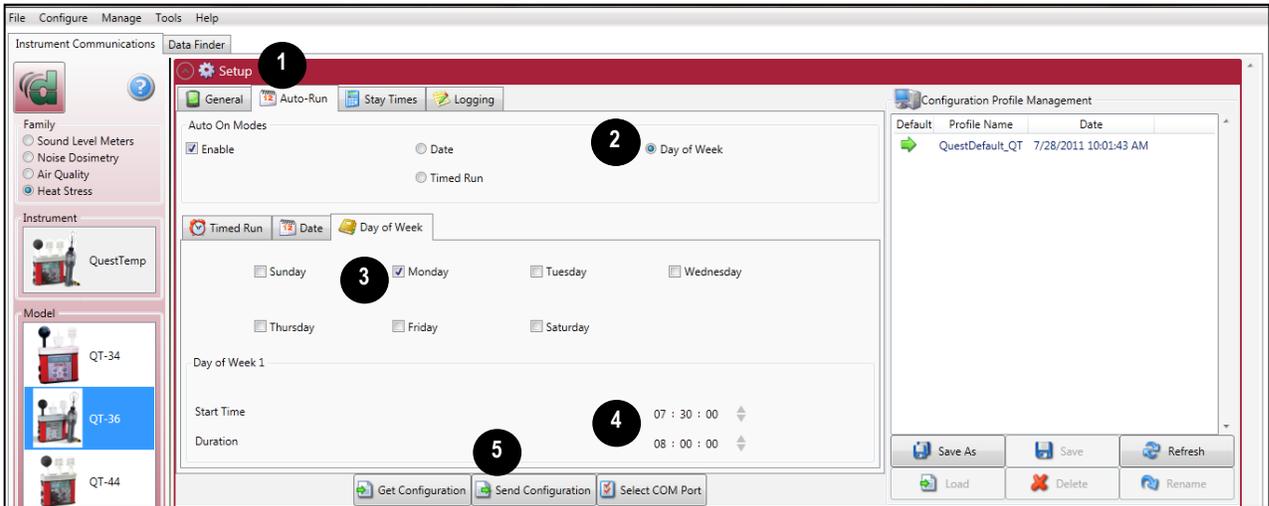


Figure 1-170: QUESTemp^o 44/46/48N Auto-Run with Day of Week setting



QUESTemp^o 44/46/48N: Stay Time Settings

The stay time settings are configurable with the QT^o 46 and 48N models. When displayed, the stay time data may be used to manage work/rest regimens. The following steps outline how to select the stay time parameters.

1. To select one of the stay time parameters and/or the air velocity settings, select the Stay Times tab (see **1**) from the QT^o 46/48N instrument communications panel.
2. To select the settings (see **2**), do one of the following:
 - Click on the arrow and select a setting.
 - Click on the arrows and select a numeric value or type in a value.
3. To set, click on (see **3**) or save and **Send Configuration** (for more details see ["Saving and Sending Configurations"](#)).

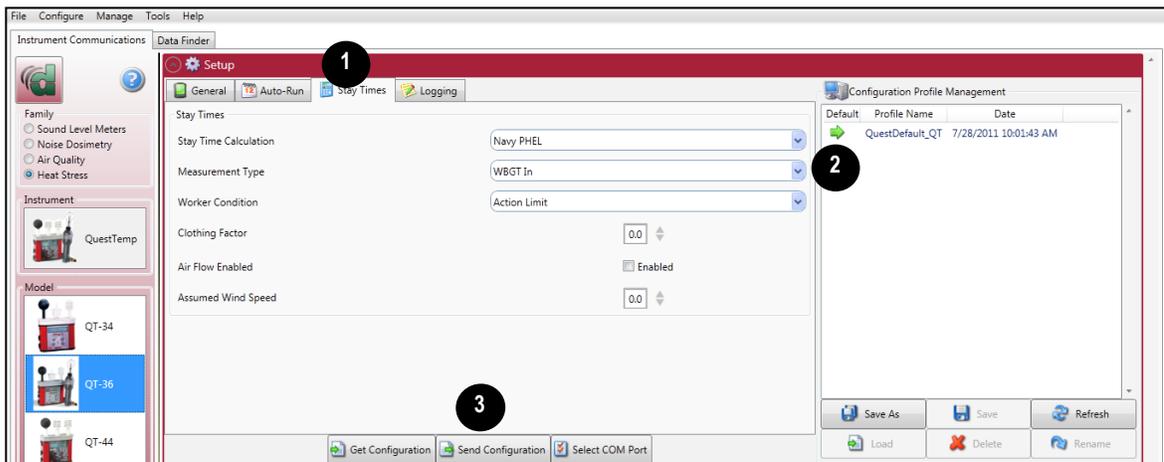


Figure 1-171: Stay Time settings with the QUESTemp^o 46/48N



QUESTemp° 44/46/48N: Logging Settings

The QT° 44/46/48N logging screen is used to set up data logging settings. The Logging rate/interval (also called time history data) sets the frequency at which data will be logged during a session. The settings include: 1, 5, 15, 30 seconds and 15, 30, and 60 minutes.

1. Click on the Logging tab (see **1**) from the QT°44/46/48N Instrument Communications panel. To change the logging settings, follow one (or all) of the selection options below.
 - Select a Logging rate by clicking on the drop-down arrow  (see **2**) and selecting an option from the logging rate list.
2. To set the logging settings, click on  (see **3**) or save and send to the QT° (for more details see [“Saving and Sending Configurations”](#)).

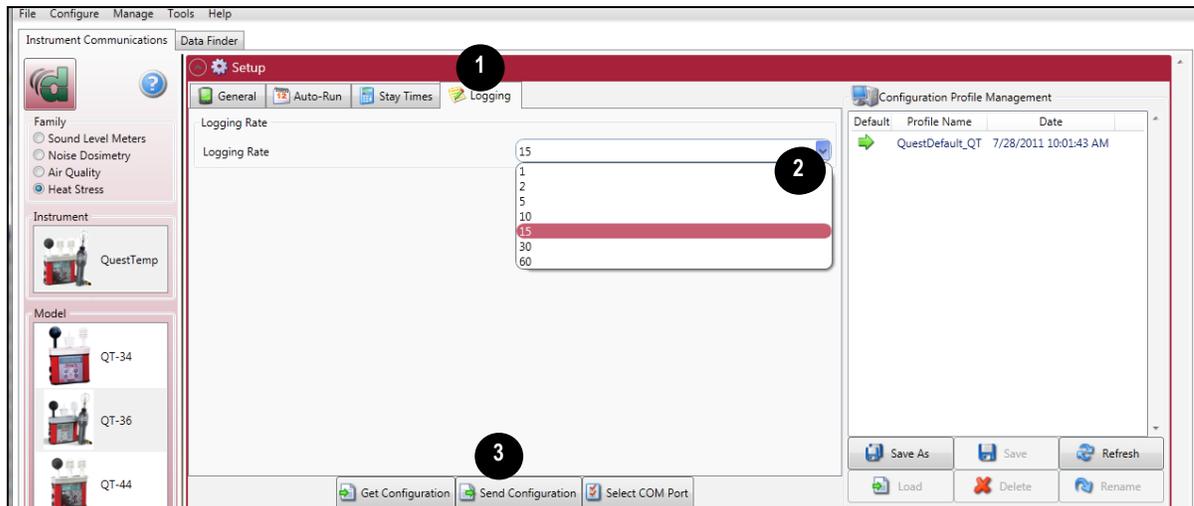


Figure 1-172: Logging settings with the QUESTemp° 44/46/48N

QUESTEMP^o II (Personal Heat Stress Monitoring)

The QUESTEMP^o II (QT^o II) personal heat stress monitor data may be downloaded into DMS for analysis, reporting, and file storage.

The following section explains communicating with the QT^o II and DMS, downloading, viewing data, and printing reports.



QUESTEMP^o II: Communication Setup

The communication setup is an important starting point with your instrument and DMS. Once communicating, you have the option to download data, configure instrument parameters and use quick setup features for time and date settings. The following explains the QT^o II communication setup steps.

1. Using a TSI cable, part number 054-715, plug the cable into the computer and plug the opposite end into the side jack of the QT^o II data port.

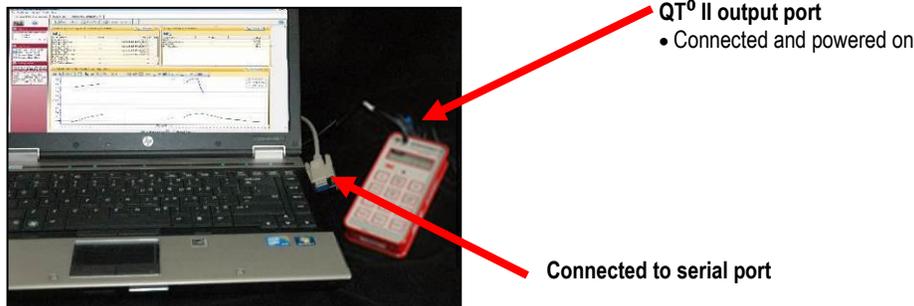


Figure 1-173: Communicating with the QUESTemp^o II and DMS

2. From the start page of DMS, select the  or  buttons and the instrument communication panel will appear.



QUESTEMP^o II: Downloading Data

The Instrument Download feature is used to download your files from the QT^o II into the software for review and analysis of the data. Once the files are downloaded and if “Go to Data Finder after Download” is checked, DMS will open into the Data Finder window.

NOTE: The Data Finder window stores all of the downloaded data by instrument, session and study. The information is stored in a bar chart style with measurements/parameters displayed on the top navigational bar. See [Data Finder](#) for more information.”

To download, please follow steps below:

1. On the QT^o II keypad, press the  button while ensuring the baud rate is set to 9600 and press the  button.

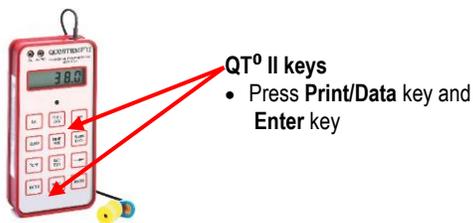


Figure 1-174: QUESTemp^o II keypads

2. Ensure your instrument is communicating properly. (See “[Communication Setup](#)” for details.)
3. From the Start page, select the  button.

4. Select the **Heat Stress** Family and click on the **QUESTemp^o II** Instrument (see **1** and **2**).
5. *Optional:* Click on the “Go to Data Finder after download” checkbox to view your session/study information after the download (see **3**).
6. Press the **Download** button (see **4**).

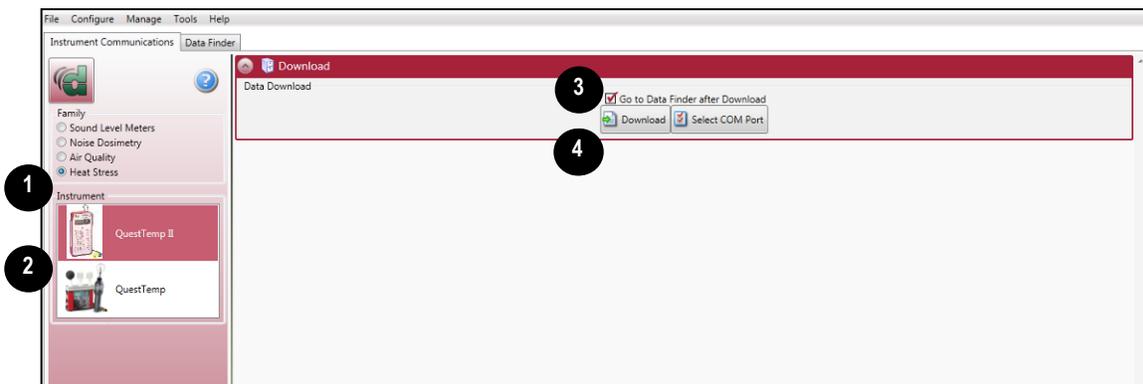


Figure 1-175: Downloading QUESTemp^o II files



QUESTEMP^o II: Viewing Data

The following section outlines viewing your data with the QUESTemp^o II models.

Selecting a Session/Study

To view downloaded data from the welcome page, click on the  button and the data finder screen will appear. (Or select the Data Finder tab if already opened.)

1. Select a session by either double-clicking on data or click on the session/study and select the  button.
 - **Family: Heat Stress:** QT^o II data is stored in this family. (See **1**).
 - **Session/Study:** The Heat Stress data is organized by the table headings, such as the session/study name (See **2**).
 - **Start Time:** To quickly locate your study by most recent start time, click on the Start Time heading and it will sort ascending/descending (See **3**).
 - **Parameters & measurements:** The table headings and columns are customizable by a quick click, drag, and drop to a new column location (similar to Microsoft[®] Excel[®] spreadsheet program.)

Double-click to select/view QT^o II data in charts and tables

Session/Study Name	Start Time	Stop Time	Run Time	File Name	Humidity Min-1	Humidity Avg-1	Humidity Max-1
2011_06_16 TED100021 - 1	6/16/2011 9:31:45 AM	6/16/2011 9:37:45 AM	00:06:00	2011_06_16 TED100021 - 1.ndx			57 %
2011_06_16 TED100021 - 2	6/16/2011 11:16:55 AM	6/16/2011 2:16:56 PM	03:00:01	2011_06_16 TED100021 - 2.ndx	55 %	56 %	61 %
2011_06_17 TED100021 - 3	6/17/2011 8:39:04 AM	6/17/2011 11:39:05 AM	03:00:01	2011_06_17 TED100021 - 3.ndx	57 %	57 %	61 %
2011_06_20 TED100021 - 4	6/20/2011 9:29:56 AM	6/20/2011 10:29:24 AM	00:59:28	2011_06_20 TED100021 - 4.ndx			62 %
2011_08_22 TED100021 - 5	8/22/2011 3:30:41 PM	8/22/2011 3:30:48 PM	00:00:07	2011_08_22 TED100021 - 5.ndx			57 %
2011_09_06 TED100021 - 22	9/6/2011 5:00:06 AM	9/6/2011 5:00:11 AM	00:00:05	2011_09_06 TED100021 - 22.ndx			53 %

Figure 1-176: Selecting a session



QUESTEMP® II: Panel Layout View Page

The measurements and parameters will be displayed in charts and tables which may be customized for analysis and/or reporting purposes.

NOTE: A  button provides a quick link to viewing the panel layout view data in a report format.

1. Panel Layout View is divided into Work Items (see **A**), Add Panel (see **B**), and Arrange Panels (see **C**) palettes, as well as data panels (see **D**).

- **Work items (A)** – select either the session or study (in order to view appropriate measurement/parameter data).
- **Add panel (B)** – double-click on a chart/table type and it will appear as a panel on your screen.
- **Arrange panels (C)** – displays the order of the charts/tables which appear in the panel layout. Also, when a chart/table is selected in the arrange panels palette, the associated data panel is selected. The resize handles are applied and the panel is brought into view. (This is very useful when several panels are displayed.) To delete a panel, right-click on a chart/table and press delete from your keyboard.
- **Data panels (D)** – used to view your measurement and/or parameters from your study.

NOTE: Use the Configure icon to customize parameters.

- **Toolbar and Configure button (E)** – the toolbar and configure button are used to customize or select different measurement parameters.

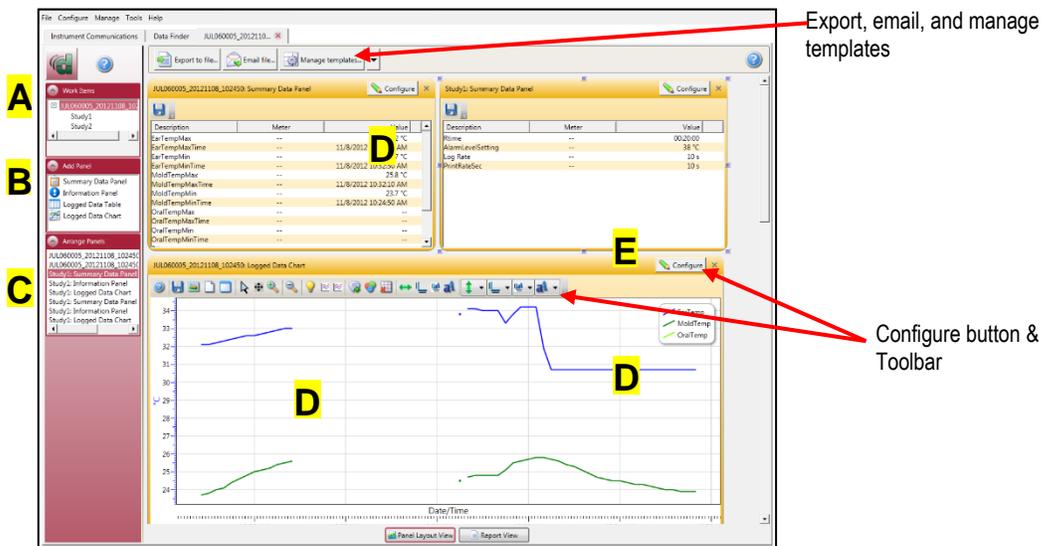


Figure 1-177: QUESTemp® II data in panel layout view

2. To change the chart/table data parameters, click on the  button. Each chart/table may have different configurable parameters depending on the parameters applicable to the specific panel.

3. To view the data as a report, click the  button.

NOTE: The panels will print in the order in which they are displayed in the panel layout page.

4. The quick tips below explain how to customize the panels:

- **To stretch the panel**, click on one of the grips along the panel's edges and drag the mouse. The panel will expand or shrink when resizing.
- **To move the panel**, click on the panel's header and drag and drop to the appropriate position.

NOTE: By default, the panels will snap into place on an invisible grid. Right-click outside the panel area and click **Snap to Grid** to clear the checkbox and allow free panel placement.

- **To change ranges**, when clicking on either the x-axis or y-axis, click and drag the mouse until the appropriate range is selected.

NOTE: It will span the numbers up or down depending on how you drag the mouse.

- To save a layout, right-click outside the panel area as displayed below. Click **Remember Setting**.

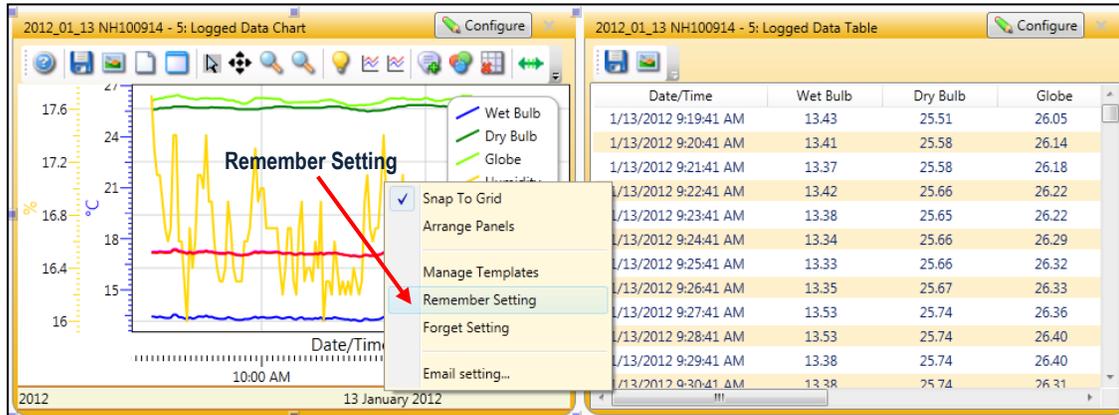
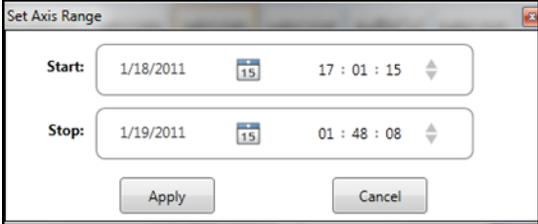


Figure 1-178: Rearranging panels and saving layout

4. To change the parameters on the logged data chart using the toolbar, please follow below:



	A.	Quick Help Icon: Click to learn more about the toolbar icons.
	B.	Save icon: Click to save the chart/table data to the logged data chart in one of the following formats: .xls (Excel®), .pdf (Adobe Acrobat Reader®), .xml (XML), .csv (comma-separated files).
	C.	Copy Chart icon: Click to copy the logged data chart (to a clipboard) and then paste it into your file (such as PowerPoint®, Microsoft® Word®, Excel®, Adobe® etc..).
	D.	Reset icon: Click to reset (or restore) the logged data chart to its original state (if changed).
	E.	Clear icon: Click to clear the edited values in the chart (advanced function used with data recalculations).
	F.	Normal Cursor icon: Click to reset the cursor function from when the mouse is used for selecting data (advanced function used with data recalculations).
	G.	Pan Cursor icon: Click to pan the logged data chart. Left-click and hold within the chart, and move the mouse.
	H.	Zoom In Cursor icon: Click to zoom in (+) icon. Then click, hold, and drag the mouse on the logged data chart. The chart will expand. Repeat if applicable.
	I.	Zoom Out Cursor icon: Click to zoom out (-) on the logged data chart.
	J.	Hide Current Values icon: Click to hide measurement values when the mouse hovers over the chart data points. How this feature works: When this icon is enabled (yellow, as shown) the values on the chart are displayed when the mouse hovers over them. To turn off this feature, click on the  icon. Hint –sometimes value label is not visible, if this occurs click the  icon and make sure the Normal cursor is selected.
	K.	Show Horizontal Calculation Line icon: When clicked, a horizontal line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	L.	Show Vertical Calculation Line icon: When clicked, a vertical line will appear. To adjust the line, click, drag, and release the mouse to move. To hide the line, click the icon again.
	M.	Add Label icon: When clicked, a label box (or text box) appears on the chart. Right-click on the label box, and select edit text. Type in text/label. To position it, click drag and drop it in appropriate position. To delete it, right-click on the label box, and click Delete .
	N.	Chart Properties icon: Click to change the color of the chart attributes.

	O. Hide Grid Lines icon: Click to hide the grid lines on the logged data chart (note the x will disappear when hiding.) Click again to show the grid lines.
	P. Range icon: Click and select range parameters for the logged data chart in the set axis range box (see image below). For the date setting, select the  setting and choose a start/stop setting. For the time, select the  arrows to change the time settings.  Figure 1-179: QUESTemp^o II and Set Axis Range screen
	Q. X Axis Title icon: Click this icon to change the title of the x axis title on the logged data chart. NOTE: When selected, the cursor will appear at the end of the title box. Press the backspace key to delete the text and type in new text. Press Enter to exit the text box.
	R. X Axis Title Font icon: Select the x axis title font icon to change the font style and size. When selected, a font box will appear in a new window. Select the appropriate font type, size, and select OK .
	S. Axis Font icon: Select the x axis title font icon to change the font style and size. When selected, a font box will appear in a new window. Select the appropriate font type, size, and select OK .
	T. Y Axis Range icon: Click to change the range of one of the y axes. (For example, you may only want to view humidity levels between 10 % and 70 %.) NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a Set Axis Range dialog box will appear. Enter range Start and Stop values for the selected y axis. Select Apply to exit the dialog box.
	U. Y Axis Title icon: Click this icon to change the title of one of the y axes on the logged data chart. NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and the cursor will appear at the end of the selected y axis title box. Press the Backspace key to delete the text and type in new text. Press Enter to exit the text box.
	V. Y Axis Title Font icon: Select this icon to change the font style and size of the title of one of the y axes. NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis. Select OK to exit the chooser box.
	W. Y Axis Font icon: Select this icon to change the font style and size of the numeric values of one of the y axes. NOTE: When selected, a drop-down list of y axis titles appears. Click on the title list item corresponding to the y axis to be changed and a font chooser box will appear. Select the appropriate font type and size for the selected y axis. Select OK to exit the chooser box.
	X. Change Legend Position icon: Click this icon to select the position of the legend. When selected, a drop-down list appears. Click on the list item corresponding to the desired compass-based position: Move legend to NW, N, NE, W, C, E, SW, S, SE .



QUESTEMP^o II: Reports and Printing

To quickly create reports, open your data (in the data finder page) and click the quick report **Quick Report** button. A standard template of charts and tables (or panels) will appear in the report.

- **Viewing reports:** if you are in the data layout page and you have rearranged the charts/tables, the report will print in the sequence in which they appear on the screen.
- **Printing reports:** while in the report view page you have two options outlined below:
 - Click on the icon from the title bar.
 - Click on the **Print** icon from the session report title bar.

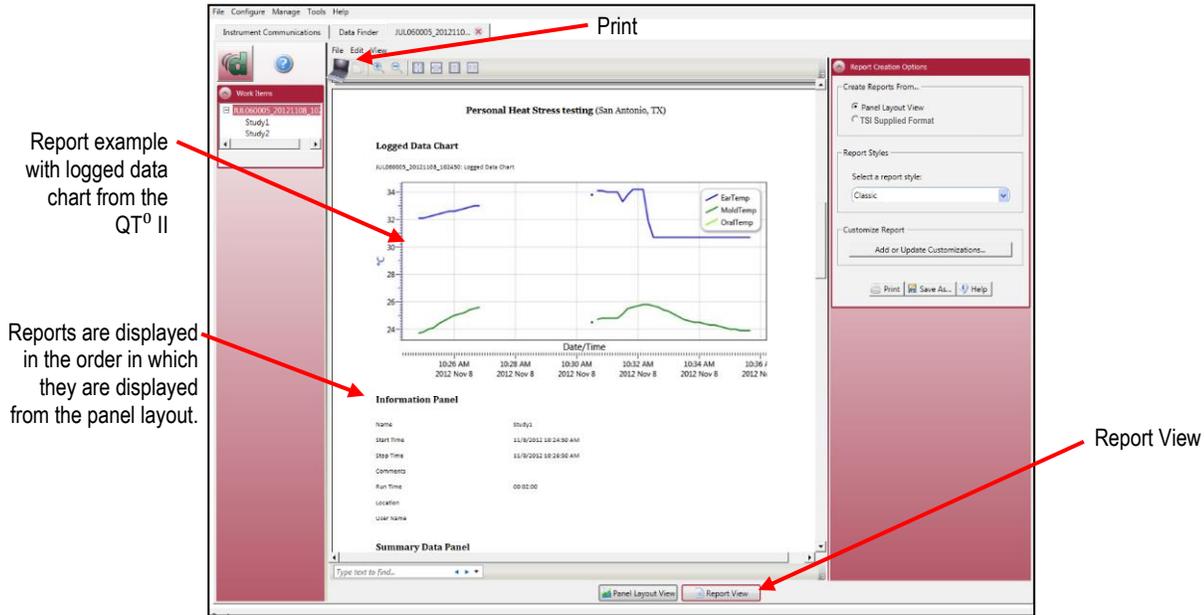


Figure 1-180: Sample QUESTemp^o II Report View tab

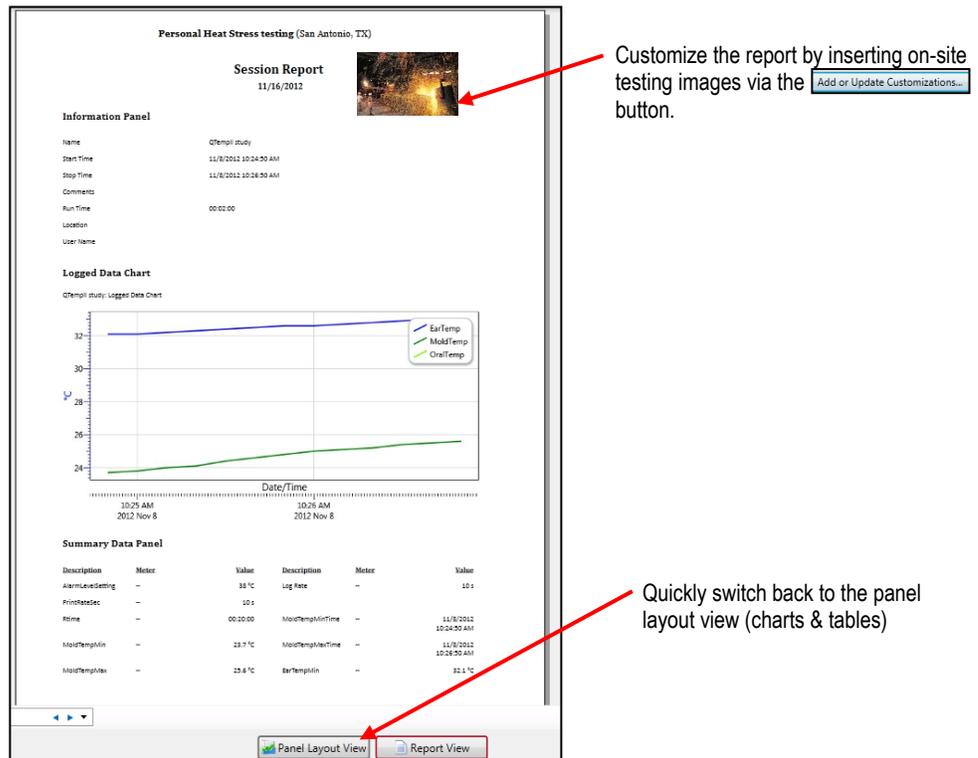


Figure 1-181: Sample QUESTemp^o II report

Customizing Reports

To modify the reports with customized headers, footers, report titles, company logos (etc.), the customize report feature may be used.

- From the report creation options box (see **A**), click on **Add or Update Customizations...** button.
- There are four tabs (see **B**) to modify (if applicable) which include: company information, cover page, report, and headers/footers.
- The example below displays customizing the header and footer.

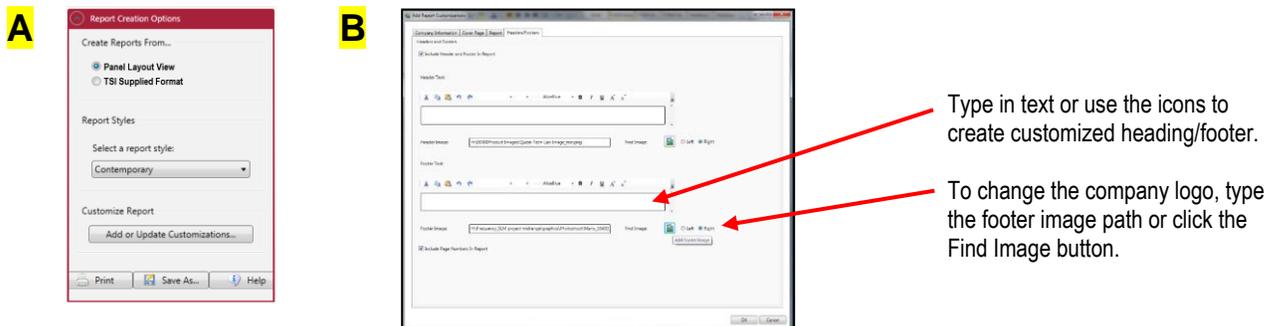


Figure 1-182: Report customization tools

Appendix A

Glossary of Terms for Noise Dosimeters (The Edge, NoisePro®)

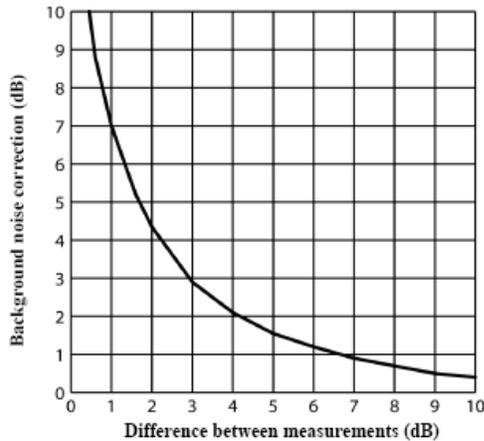
Background Noise, effects of

Background noise can cause considerable error in measurement when its level is high relative to the level of a noise source of interest. If you can make measurements both with and without the contribution of a noise source of interest, you can mathematically subtract the background noise from the combined measurement, yielding the level of the noise source of interest alone. The accuracy of this determination improves as the difference between the two measurements increases.

To remove background noise

1. Obtain a measurement that includes the contribution of the noise source of interest (the combined measurement).
2. Make a second measurement under exactly the same conditions as in Step 1 but without the presence of the noise source of interest (the background noise measurement).
3. Determine the decibel difference between these two measurements.
4. Find that difference on the x-axis of the figure below.
5. Find the point on the curve directly above this difference.
6. Read the corresponding value on the y-axis for that point (the correction value).
7. Subtract the correction value from the combined measurement.

Example: Measurements with and without the noise source of interest are 91 dB and 90 dB, respectively. For a difference of 1 dB, the background noise correction value is 7 dB. Therefore, the level for the noise source of interest without the noisy background is 84 dB.



C-A

The C-A measurement is an L_{AVG} that enhances the low-frequency components of the sound signal. It is the result of subtracting an A-weighted L_{AVG} from a simultaneously collected C-weighted L_{AVG} and is sometimes used as the NRR (noise reduction rating) factor to determine if hearing protection devices are adequate for usage in the field.

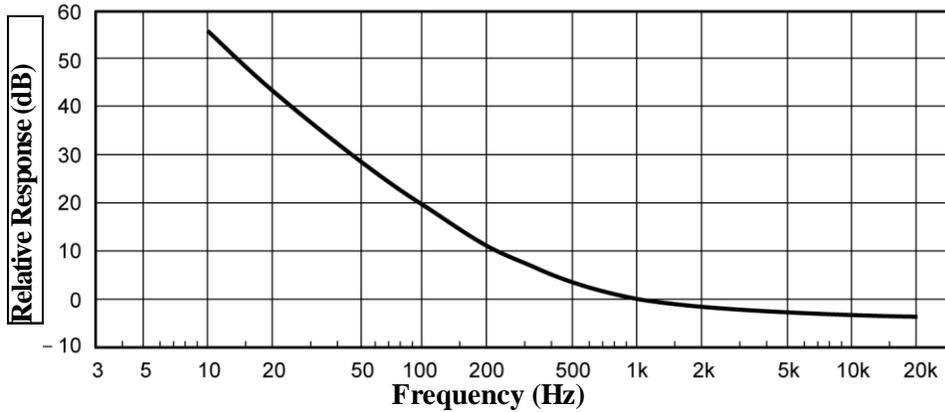


Figure A-1: C-A weighting response curve

Center frequency

The center frequency of each octave and third octave filter band.

CNEL

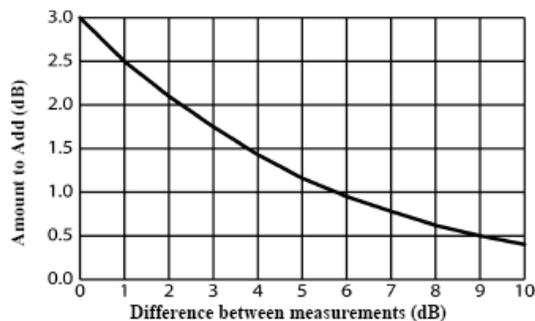
Community Noise Exposure Level. The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 p.m. and 10 p.m. are boosted by 5 dB; samples taken between 10 p.m. and 7 a.m. are boosted by 10 dB. The values reported by SoundPro SE/DL ignore the threshold and use a 3 dB Exchange Rate, regardless how those parameters are set.

Combining Noise sources

Because sound levels are measured in decibels they cannot be simply added together. A sound level of 90 dB plus 90 dB does not yield 180 dB but rather 93 dB. The procedure for mathematically determining a combined level of sound from independent measurements made for two noise sources is given below.

1. Make independent measurements for both noise sources, where each exists without the presence of the other.
2. Determine the decibel difference between these two measurements.
3. Find that difference on the x-axis of the figure below.
4. Find the point on the curve directly above this difference.
5. Read the corresponding value on the y-axis for that point (the Amount to Add).
6. Add this value to the larger of the two measurements.

Example: Independent measurements for the two noise sources yielded levels of 90 dB and 91 dB. For a difference of 1 dB, the correction factor taken from the curve below is 2.5 dB. Therefore, the combined level when these two sound sources are present in the measurement area at the same time 93.5 dB.



Crest Factor

Crest Factor is the ratio of the instantaneous peak value of a wave to its RMS value. This is a performance specification of a meter's ability to process signals that have peaks that are substantially higher than their RMS averages.

Criterion Level (CL)

Criterion level is the average SPL that will result in a 100% dose over the Criterion time, usually 8 hours. The Criterion Level is typically set by a regulating agency, such as OSHA, and is not usually applicable for community noise monitoring. Examples: OSHA mandates the Criterion Level (maximum allowable accumulated noise exposure) to be 90 dB for 8 hours. For an 8-hour sample, an average level (LAVG) of 90 dB will result in 100% dose. For the OSHA HEARING CONSERVATION AMENDMENT, the "action level" is 85 dB for 8 hours. This would result in a 50% dose reading. Note that the Criterion Level has not changed. (If the Criterion Level were changed to 85 dB then an 8-hour average of 85 dB would result in 100% dose.)

Criterion Time

The time over which the Criterion Level is established, which the resulting dose is 100%, generally 8 hours.

Decibel (dB)

Sound Level Meters use the decibel as the unit of measure known as Sound Pressure Level (SPL). SPL uses the ratio between a reference level of 20 microPascals (.00002 Pascals) and the level being measured. $SPL = 20 \log (\text{measured level}/\text{reference level})$. Example: the SPL for 1 Pascal is $20 \log (1 \text{ Pascal}/.00002 \text{ Pascal}) = 94\text{dB}$ 20 microPascals (.00002 Pascals) is considered the average threshold of hearing. A whisper is about 20 dB. A normal conversation is typically from 60 to 70 dB, and a noisy factory from 90 to 100 dB. Loud thunder is approximately 110 dB, and 120 dB borders on the threshold of pain.

$$SPL = 20 \log (\text{measured level}/\text{reference level})$$

Example: the SPL for 1 Pascal is $20 \log (1 \text{ Pascal}/.00002 \text{ Pascal}) = 94 \text{ dB}$ 20 microPascals (.00002 Pascals) is considered the average threshold of hearing.

A whisper is about 20 dB. A normal conversation is typically from 60 to 70 dB, and a noisy factory from 90 to 100 dB. Loud thunder is approximately 110 dB, and 120 dB borders on the threshold of pain.

Dose

Related to the Criterion Level, a dose reading of 100% is the maximum allowable exposure to accumulated noise. For OSHA, 100% dose occurs for an average sound level of 90 dB over an 8-hour period (or any equivalent exposure). By using a TWA reading rather than the average sound level, the time period is no longer explicitly needed. A TWA of 90 dB is the equivalent of 100% dose. The dose will double (halve) every time the TWA increases (decreases) by the Exchange Rate. Example: OSHA uses an Exchange Rate of 5 dB. Suppose the TWA is 100 dB. The dose would double for each 5 dB increase over the Criterion Level of 90 dB. The resulting dose is therefore 400%. If the TWA was instead equal to 80 dB then the dose would halve for each 5 dB below the Criterion Level. The resulting dose would be 25%. When taking noise samples less than the full workday, dose is an easy number to work with because it is linear with respect to time. Example: If a 0.5-hour sample results in 9% dose and the workday is 7.5 hours long then the dose for the full workday would be a 135% dose ($7.5 / 0.5 \times 9\%$). This is computed assuming that the sampled noise will continue at the same levels for the full 7.5-hour workday.

Exchange Rate (ER – also known as the Doubling Rate)

Exchange rate refers to how the sound energy is averaged over time. (Also, referred to as Doubling Rate.) Using the decibel scale, every time the sound energy doubles, the measured level increases by 3 dB. This is the 3 dB exchange rate that most of the world uses. For every increase of 3 dB in the time weighted average, the measured DOSE would double. Some organizations such as OSHA in the U.S. have argued that the human ear self-compensates for changing noise levels and they felt that the 3 dB exchange rate should be changed to more closely match the response of the human ear. OSHA currently uses a 5 dB exchange rate, which would mean that the reported DOSE would double with every 5 dB increase in the time weighted average. The exchange rate affects the integrated reading LAVG, DOSE, and TWA but does not affect the instantaneous sound level.

Field Calibration (vs. Factory Calibration), pre-calibration, post-calibration

To be sure the dosimeter is functioning within specified tolerance limits, it should be returned to the factory annually for a factory recalibration. To verify that the dosimeter is measuring properly during normal use, field calibrations should be performed. Pre-calibration is performed prior to any data being recorded by the dosimeter. During a pre-calibration, the dosimeter level may be adjusted to match the calibrator output level. Post-calibration is a simple verification that the instrument has remained in calibration throughout the measurement period.

Free field setting (microphone)

Measurements made in an area without sound reflections, diffractions and absorptions caused by nearby objects (including the operator). Sound waves are free to spread out continuously, like ripples on a pond, without reflection. When making free field measurements with a dosimeter set up for use as a sound level meter, the microphone is typically pointed directly at the sound source.

Hearing Conservation (HC)

The Occupational Safety and Health Administration (OSHA) and Mine Safety and Health Administration (MSHA) provide regulatory standards for hearing conservation programs. In addition, the American Conference of Governmental Industrial Hygienists (ACGIH) provides industrial standards for hearing conservation programs. <http://www.osha.gov/> , <http://www.msha.gov/> , <http://www.acgih.org/home.htm>

Hertz (Hz)

Unit of vibration frequency in cycles per second.

Lavg (Average Level)

Lavg is the average sound level measured over the run time. This becomes a bit confusing when thresholds are used. Any sound below the threshold is not included in this average. Remember that sound is measured in the logarithmic scale of decibels therefore the average cannot be computed by simply adding the levels and dividing by the number of samples. When averaging decibels, short durations of high levels can significantly contribute to the average level. Example: Assume the threshold is set to 80 dB and the Exchange Rate is 5 dB (the settings of OSHA's Hearing Conservation Amendment). Consider taking a one-hour noise measurement in an office where the A-weighted sound level was typically between 50 dB and 70 dB. If the sound level never exceeded the 80 dB threshold during the one hour period then the Lavg would not indicate any reading at all. If 80 dB was exceeded for only a few seconds due to a telephone ringing near the instrument then only those seconds will contribute to the Lavg resulting in a level perhaps around 40 dB (notably lower than the actual levels in the environment).

Lep,d

Daily personal noise exposure level.

Leq (Equivalent Level)

The true equivalent sound level measured over the run time. The term LEQ is functionally the same as LAVG except that it is only used when the Exchange Rate is set to 3 dB and the threshold is set to none.

Logging

(Also called Data Logging.) Certain measurements, such as average level (L_{AVG}) and maximum level (max), can be recorded by the dosimeter at regular intervals. For example: A dosimeter is set to log L_{AVG} and max at one-minute logging intervals. If the dosimeter runs for one hour then it would log 60 L_{AVG} results and 60 max levels. You would be able to see the average and maximum levels for each minute of the one hour run time.

Maximum Level (L_{MAX})

The highest sampled sound level during the instrument's run time allowing for the unit's Response Time setting (Fast or Slow).

Measurement Range

The decibel range within which the unit's measurements are valid.

Minimum Level (L_{MIN})

The lowest sampled sound level during the instrument's run time allowing for the unit's Response Time setting (Fast or Slow).

Noise Floor

In a "Perfectly Quiet" room, the electrical noise produced by the microphone is approximately 35 dB on A-weighting and 45 dB on C-weighting. These levels are known as the Noise Floor of the instrument. The Noise Floor can cause inaccurate measurements at low measurement levels. Measurements must always be at least 5 dB above the Noise Floor to be valid. Therefore, the lowest valid measurements of the dosimeter are approximately 40 dB on A-Weighting and 50 dB on C-Weighting.

Peak Level

Peak is the highest instantaneous sound level that the microphone detects. Unlike the Max Level, the peak is detected independently of the unit's Response Time setting (Fast or Slow). Example: The peak circuitry is very sensitive. Test this by simply blowing across the microphone. You will notice that the peak reading may be 120 dB or greater. When taking a long-term noise sample (such as a typical 8-hour workday sample for OSHA compliance), the peak level is often very high. Because brushing the microphone over a shirt collar or accidentally bumping it can cause such a high reading, the user must be careful of placing too much emphasis on the reading.

PEL (Permissible Exposure Level)

The A-weighted sound level at which exposure for a Criterion Time, typically eight hours, accumulates a 100% noise dose.

Projected Time

The variable amount of time used to make a projected dose calculation from an actual dose measurement.

Random incidence (microphone)

This only applies to Class/Type 1 microphones. Measurements made in an area where sound waves are coming from all directions, including reflections and diffractions. When the dosimeter is being used as a sound level meter in an area where reflections and diffractions from nearby objects are present, use the Random Incidence Corrector with the microphone, and angle the microphone at approximately 70 degrees. Most personal noise dosimetry applications do not require the random incidence corrector, since they are not measured with a Class/Type 1 microphone.

Response Time

The response determines how quickly the unit responds to fluctuating noise. Fast has a time constant of 125 milliseconds. Slow has a time constant of 1 second. Example: Typically, noise is not constant. If you were to try to read the sound level without a response time, the readings would fluctuate so much that determining the actual level would be extremely difficult. Using a response of slow or fast simply smooths the noise fluctuation and makes the sound level easier to work with. While the terms slow and fast have very specific meanings (time constraints), they work very much as you would expect. The fast response would result in a more fluctuating sound level reading than would the slow response. The OSHA regulations require the slow response.

RMS (Root Mean Square)

The RMS voltage of a signal is computed by squaring the instantaneous voltage, integrating over the desired time, and taking the square root. Simply put, the RMS values are the results from the dosimeter with the response time and weighting settings considered.

SEL/Lxe (Sound Exposure Level)

The sound exposure level averages the sampled sound over a one second period. Assuming the sampled run time to be greater than one second, SEL is the equivalent one-second noise that would be equal in energy to the noise that was sampled. SEL is typically measured using a 3 dB exchange rate without a threshold. SEL is not used by OSHA. Example: Suppose you wanted to measure in a location next to railroad tracks, which also happened to be in the takeoff path of an airport. A train passes by taking 10 minutes with an average sound level of 82 dB. A jet passes overhead taking 45 seconds with an average level of 96 dB. Which of these events results in more sound energy? You can answer the question by comparing their SEL readings, which compress each event into an equivalent one-second occurrence. SEL for the train = 109.7dB, SEL for the jet = 112.5 dB.

Threshold

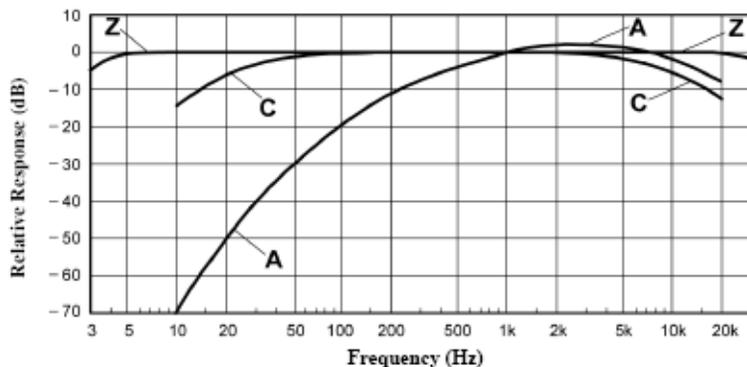
The threshold affects the L_{AVG} , TWA, and Dose measurements. All sound below the threshold is considered nonexistent noise for the averaging and integrating functions. The threshold does not affect measurements in the sound level mode. OSHA uses two different thresholds. The original Occupational Noise Exposure Standard (1971) used a 90 dB threshold and called for engineering controls to reduce the noise levels if the eight-hour TWA was greater than 90 dB. The Hearing Conservation Amendment (1983) uses an 80 dB threshold and calls for a hearing conservation program to be put in place if the eight-hour TWA exceeds 85 dB (50% dose). The Hearing Conservation Amendment is the more stringent of the two rulings and is what most US industrial users are concerned with. Example: With an 80 dB threshold, suppose you placed a 79dB calibrator on the unit for a period of time. Because all of the noise is below the threshold, there would be no average (you can think of it as an average of 0dB). If the calibrator were 80 dB instead then the average would be 80 dB. On histogram printouts, typically 1-minute (or other specified increment) averages are printed. Because real noise fluctuates, it is quite possible to have an average level below the threshold. This also applies for the overall L_{AVG} .

TWA (Time Weighted Average)

The time weighted average always averages the sampled sound over an 8-hour period. TWA starts at zero and grows. The TWA is less than the L_{AVG} for a duration of less than eight hours, exactly equal to the L_{AVG} at eight hours, and grows higher than L_{AVG} after eight hours. TWA represents a constant sound level lasting eight hours that would result in the equivalent sound energy as the noise that was sampled. Example: Think of TWA as having a large 8-hour container that stores sound energy. If you run a dosimeter for 2 hours, your L_{AVG} is the average level for those 2 hours—consider this a smaller 2-hour container filled with sound energy. For TWA, take the smaller 2-hour container and pour that energy into the larger 8-hour TWA container. The TWA level will be lower. Again, TWA is ALWAYS based on the 8-hour container. When measuring using OSHA's guidelines, TWA is the proper number to report provided that the full work shift was measured. Example: If the work shift is 6.5 hours long then measure for the entire 6.5 hours. TWA is the correct level to report to OSHA. It does not have to be modified.

Weighting (A, C, Z, etc.)

"A", "B", "C", "Z" and LINEAR are the standard weighting networks available. These are frequency filters that cover the frequency range of human hearing (20 Hz to 20 kHz). "A" weighting is the most commonly used filter in both industrial noise applications (OSHA) and community noise regulations. "A" weighted measurements are often reported as dBA. The "A" weighted filter attempts to make the dosimeter respond closer to the way the human ear hears. It attenuates the frequencies below several hundred hertz as well as the high frequencies above six thousand hertz. "B" weighting is similar to "A" weighting but with less attenuation. The "B" weighting is very seldom, if ever, used. The "C" weighting provides a fairly flat frequency response with only slight attenuation of the very high and very low frequencies. "C" weighting is intended to represent how the ear perceives sound at high decibel levels and is often used as a "flat" response when LINEAR is not available. "C" weighted measurements are often reported as dBC. "Z" is zero weighting, with no weighting across the frequency range of human hearing. LINEAR is thought of as having a flat frequency response curve over the entire measurement frequency range. LINEAR is most commonly found on upper model sound level meters and is typically used when performing octave band filter analysis.



Upper Limit (UL)

A type of measurement parameter setting in which the user selects a certain decibel level. The dosimeter will then record the amount of time that the sound level was at or greater than the preset level. This time is then recorded as "UL Time"

Windscreen

A windscreen is a covering for the microphone that reduces disturbances caused by wind and direct contact with other surfaces. The windscreen is placed over the microphone when taking measurements to help prevent false high readings due to wind blowing across the microphone or objects (hair, clothing, etc.) brushing against the microphone. The windscreen will also help protect the microphone from dust and debris.

Glossary of Terms for Sound Level Meters [SoundPro®, Sound Examiner (SE-400 Series)]

C-A

The C-A measurement is an SPL average that enhances the low-frequency components of the sound signal.

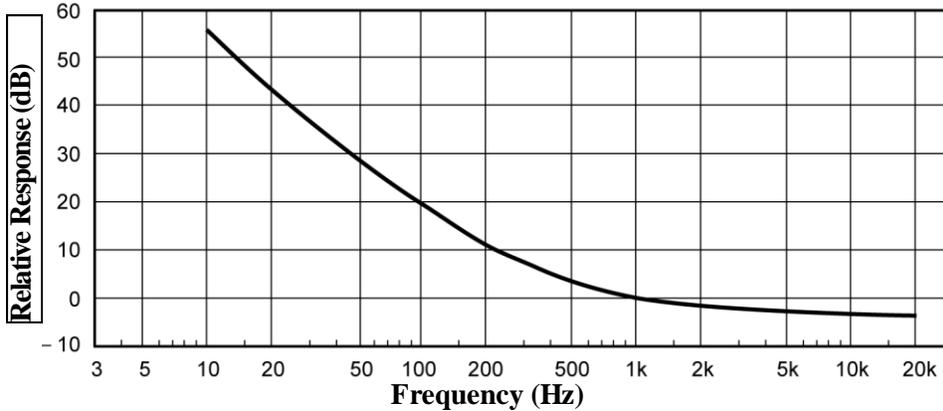


Figure A-2: C-A weighting response curve

Center frequency

The center frequency of each octave and third octave filter band.

CNEL

Community Noise Exposure Level. The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 p.m. and 10 p.m. are boosted by 5 dB; samples taken between 10 p.m. and 7 a.m. are boosted by 10 dB. The values reported by SoundPro SE/DL ignore the threshold and use a 3 dB Exchange Rate, regardless how those parameters are set.

Criterion Level

Criterion Level. The average SPL that would result in 100% dose over the Criterion Time (usually 8 hours).

CT

Criterion Time. At the Criterion Level, the time period over which the resulting dose is 100%. Usually is 8 hours.

dB

Sound Level Meters use the decibel as the unit of measure known as Sound Pressure Level (SPL). SPL uses the ratio between a reference level of 20 microPascals (.00002 Pascals) and the level being measured.

$$\text{SPL} = 20 \log (\text{measured level}/\text{reference level})$$

Example: The SPL for 1 Pascal is $20 \log (1 \text{ Pascal}/.00002 \text{ Pascal}) = 94 \text{ dB}$. 20 microPascals (.00002 Pascals) is considered the average threshold of hearing.

A whisper is about 20 dB. A normal conversation is typically from 60 to 70 dB, and a noisy factory from 90 to 100 dB. Loud thunder is approximately 110 dB, and 120 dB borders on the threshold of pain.

Dose

Related to the Criterion Level, a dose reading of 100% is the maximum allowable exposure to accumulated noise. For OSHA, 100% dose occurs for an average sound level of 90 dB over an 8-hour period (or any equivalent exposure). By using a TWA reading rather than the average sound level, the time period is no longer explicitly needed. A TWA of 90 dB is the equivalent of 100% dose. The dose will double (halve) every time the TWA increases (decreases) by the Exchange Rate.

- ☑ **Example:** OSHA uses an Exchange Rate of 5 dB. Suppose the TWA is 100 dB. The dose would double for each 5 dB increase over the Criterion Level of 90 dB. The resulting dose is therefore 400%. If the TWA was instead equal to 80 dB then the dose would halve for each 5 dB below the Criterion Level. The resulting dose would be 25%.
- ☑ When taking noise samples less than the full workday, dose is an easy number to work with because it is linear with respect to time.
- ☑ **Example:** If a 0.5-hour sample results in 9% dose and the workday is 7.5 hours long then the dose for the full workday would be a 135% dose ($7.5 / 0.5 \times 9\%$). This is computed assuming that the sampled noise will continue at the same levels for the full 7.5-hour workday.

Dynamic range

The range of input amplitudes on any given range setting over which the instrument can produce a meaningful response. The bottom of the dynamic range is the instrument's Noise Floor for that range setting, and the top of the dynamic range is the maximum input signal that will not overload the instrument on that range setting.

Exceedance Level (Ln)

Exceedance levels represent the percent of the run time that was spent at or above the corresponding dB level.

- ☑ **Example:** An L40 equal to 73 dB would mean that for 40% of the run time, the decibel level was equal to or higher than 73 dB.
- ☑ Exceedance levels can be set from 1% to 99%.

Exchange Rate (ER)

Also known as the Doubling Rate, this refers to how the sound energy is averaged over time. Using the decibel scale, every time the sound energy doubles, the measured level increases by 3 dB. This is the 3 dB Exchange Rate that most of the world uses. For every increase of 3 dB in the time weighted average, the measured dose would double.

Some organizations such as OSHA in the U.S. have argued that the human ear self-compensates for changing noise levels and they felt that the 3 dB Exchange Rate should be changed to more closely match the response of the human ear. OSHA currently uses a 5 dB Exchange Rate which would mean that the reported dose would double with every 5 dB increase in the time weighted average. The Exchange Rate affects the integrated reading L_{AVG} , Dose, and TWA but does not affect the instantaneous sound level.

ExpHrs

Hours of sound exposure. Accumulated exposure to sound measured in hours using an Exchange Rate of 3 dB. The display will switch to ExpSec if RTIME is less than one hour.

$$EXP_{Hrs} = [2^{(L_{eq} - 94)/3.01}] \frac{RTIME}{3600} \text{ Pa}^2\text{H}$$

OR

$$EXP_{Hrs} = \frac{(P_o^2 T) [10^{0.1xL_{Aeq}}]}{3600} \text{ Pa}^2\text{H}$$

where $P_o = 20 \mu\text{Pa}$

ExpSec

Seconds of sound exposure. Accumulated exposure to sound measured in seconds using an Exchange Rate of 3 dB. The display will switch to ExpHrs if RTIME is greater than 3600 seconds.

$$EXP_{Sec} = [2^{(L_{eq} - 94)/3.01}] RTIME Pa^2S$$

OR

$$EXP_{Sec} = (P_0^2 T) [10^{0.11L_{Aeq}}] Pa^2S$$

where $P_0 = 20 \mu Pa$

Level (L_{FT})

Notation used to represent sound pressure level measurements in IEC/ISO notation, where the measurements are made with particular frequency (F) and time (T) response parameters. For an actual measurement, the F and T parameters are replaced by standardized notation for those parameters.

L_{AV}

Average sound level measured over the run time. This becomes a bit confusing when thresholds are used. Any sound below the threshold is not included in this average. Remember that sound is measured in the logarithmic scale of decibels therefore the average cannot be computed by simply adding the levels and dividing by the number of samples. When averaging decibels, short durations of high levels can significantly contribute to the average level.

Example: Assume the threshold is set to 80 dB and the Exchange Rate is 5 dB (the settings of OSHA's Hearing Conservation Amendment). Consider taking a one-hour noise measurement in an office where the A-weighted sound level was typically between 50 dB and 70 dB. If the sound level never exceeded the 80 dB threshold during the one hour period then the L_{AVG} would not indicate a reading of zero. If 80 dB was exceeded for only a few seconds due to a telephone ringing near the instrument then only those seconds will contribute to the L_{AVG} resulting in a level perhaps around 40 dB (notably lower than the actual levels in the environment).

$$L_{avg} = ER \left[\log_2 \int_0^{RTIME} 2^{LS/ER} dt - \log_2 (RTIME) \right] dB$$

L_{EQ}

The true equivalent sound level measured over the run time. The term L_{EQ} is functionally the same as L_{AV} except that it is only used when the Exchange Rate is set to 3 dB and the threshold is set to none.

LDN

Representing the Day/Night sound level, this measurement is a 24-hour average sound level where 10 dB is added to all of the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "penalty" for night time noise. Typically, LDNs are measured using A weighting, a 3 dB Exchange Rate, and no Threshold.

L_{MN}

Minimum SPL. Lowest SPL measured over a time interval.

L_{MX}

Maximum SPL. Highest SPL measured over a time interval.

Logging

In sound studies, the saving of measurements at fixed intervals during a study, where each measurement is determined from data processed in the previous logging interval.

L_{PK}

Peak SPL. This is the highest SPL value obtained during a study or a session. A peak SPL measurement is affected by the frequency response setting but not by the time response setting of the meter.

Octave band

An Octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Noise

Unwanted sound.

NCB (Balanced Noise Criterion Curves)

This is the most recent incarnation of the curves based on Beranek's work (1987). This curve family goes beyond a simple tangency method to try to ensure a more neutral characteristic to the noise spectrum and also accounts for speech interference such as: rumble, rattle, and hiss. NCB was recommended for use with HVAC systems and similar applications and accounts for lower frequency sounds in comparison to NC curves.

When setting NCB as the type on the meter, you should use S12.1 unless a local ordinance or similar requirement specifies the use of a tangency technique. (This is usually specified in a standard.)

Noise Criterion Curves (NC)

With NC curve evaluation, sound is measured in octave bands in 8 octave bands ranging from 63 to 8000 Hz and is then plotted on the octave band spectrum using a set of curves.

NC curve evaluation uses a tangency method. A tangency method is a process of comparing your measurements to a fixed curve. The correct curve number is the lowest curve that meets or exceeds the measured octave values. Typically, this is used in HVAC applications.

Noise Rating Curves (NR)

This curve family is a tangency technique and is used primarily in Europe and Australia. It is used not only for HVAC and machine noise applications, but also in community noise enforcement.

Noise Floor

The signal magnitude at the bottom of the instrument's linear range. Input signals below the noise floor cannot be differentiated from the internal noise of the instrument.

Overload (OL)

An overload will occur whenever the input signal exceeds the dynamic range of the instrument.

Pascal (Pa)

Unit of pressure equal to 1 Newton per square meter.

PTWA

This is a projected TWA determined for a projected time (Prt) in relation to the Criterion Time (CT) as follows.

$$TWA = L_{avg} + ER \left[\log_2 \left(\frac{Prt}{CT} \right) \right] dB$$

Peak -C

The following chart illustrates the range of Sound Level with C-weighted Peak.

Level Range (dB)	Peak C Level Range (dB)	Level Range (dB)	Peak C Level Range (dB)
-20 to 70	42.2 to 73	20 to 110	42.7 to 113
-10 to 80	42.6 to 83	30 to 120	46.7 to 123
0 to 90	41.6 to 93	40 to 130	55.4 to 132
10 to 100	43.4 to 103	50 to 140	66.3 to 142

Preferred Noise Criterion (PNC) Curves

The Preferred Noise Criterion Curves, a type of tangency method, was an update to Beranek's original NC curves that accounted for the lower frequency side of the criterion curves (1971). The PNC curves extended the range to 32 Hz instead of 63 Hz used in NC curves.

Projected time (Prt)

A time interval used in some calculations, usually different from the actual run time of a study or session.

Reference pressure

The sound pressure at the threshold of human hearing, as measured under standard conditions. This generally accepted magnitude of this pressure is 2×10^{-5} Pascals (Pa).

Response time (F,S, I)

Selectable time response settings used in SoundPro SE/DL measurements. The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 0.125 s, 1.0 s and 35 ms, respectively. Impulse time response is 35 ms rise with a constant decay of 2.9 dB/sec.

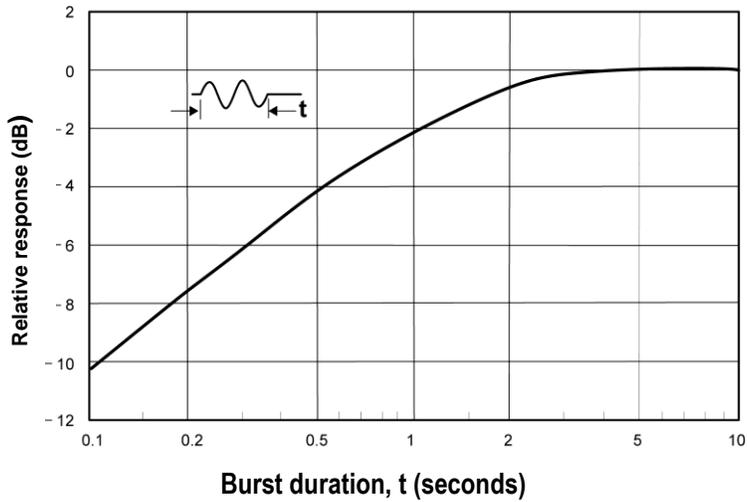


Figure A-3: Slow response to a tone burst

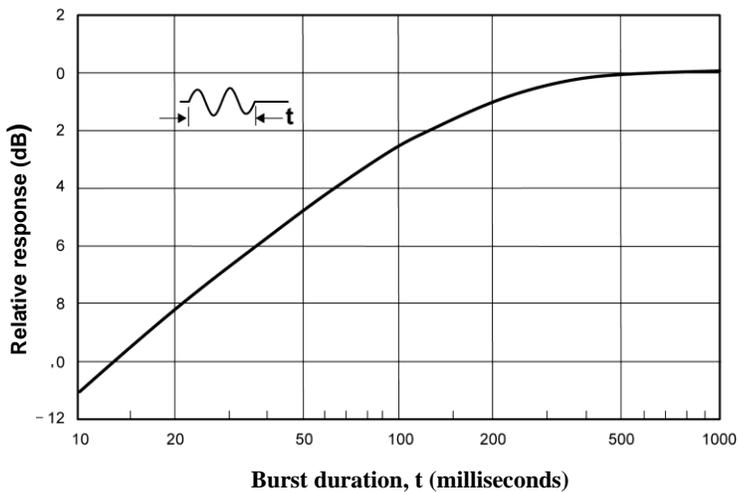


Figure A-4: Fast response to a tone burst

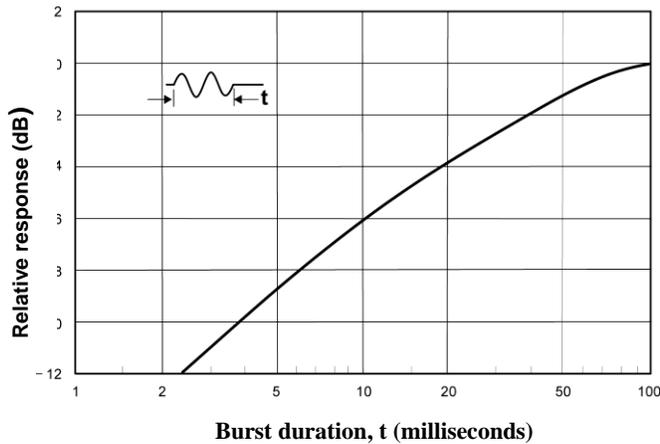


Figure A-5: Impulse response to a tone burst

Room Criterion Curves (RC)

Room Criterion curve's was introduced in 1981 by Blazier to primarily rate noise in offices/room acoustics. This methodology calculates a numerical rating based on speech interference and indicates any interference such as hissing, rumbling, or vibration.

SEL

Sound Exposure Level. The continuous SPL lasting one-second that would deliver the same sound exposure as an accumulated exposure determined over a sampling interval (RTime). SEL is typically determined with a 3 dB Exchange Rate, slow exponential time-weighting, and without regard to an Integrating Threshold.

$$SEL = ER \left[\log_2 \int_0^{R\text{TIME}} 2^{L/ER} dt \right] dB$$

SPL

Sound pressure level. A ratio of one sound pressure to a reference pressure (See Reference Pressure on page 146). Because of the enormous dynamic range of the human ear, the ratio is calculated logarithmically by the formula below, where L_r is the reference pressure.

Taktmx

A time average over a sampling interval that uses the highest level occurring during the preceding Taktmaximal Interval, either three or five seconds, and assumes that it was present for the whole Taktmaximal Interval.

$$SPL = 20 \log \left(\frac{L}{L_r} \right) dB$$

Third-octave band

A Third-octave band is defined as a frequency band whose upper band- edge frequency is 1.26 times the lower band frequency.

Threshold

An SPL value that defines a lower level of acceptable values. Only SPL samples that exceed the threshold are used in some calculations.

TWA

Time weighted average. The constant SPL over an 8-hour interval that would produce the same exposure to sound as an exposure measured over a run time sampling interval (Rtime).

$$TWA = ER \left[\log_2 \int_0^{R\text{TIME}} 2^{L/ER} dt - \log_2 (CT) \right] dB$$

Upper Limit (UL)

The total time during a study that the SPL exceeds the Upper Limit meter setting.

Weighting (A, C, Z, F)

SPL measurements are commonly weighted (scaled) in relation to their frequency components in order to provide a consistent basis for comparison to other measurements of the same type. In addition to the standardized A, C and Z weighting curves, you can select F-weighting (flat) which provides no weighting at all. The four SoundPro SE/DL weighting curves are plotted together in Figure A-5, where the F-weighting curve has been shifted up by 5 dB for graphical clarity. The tolerance limits for F frequency weighting are the same as A, C, and Z frequency weighting.

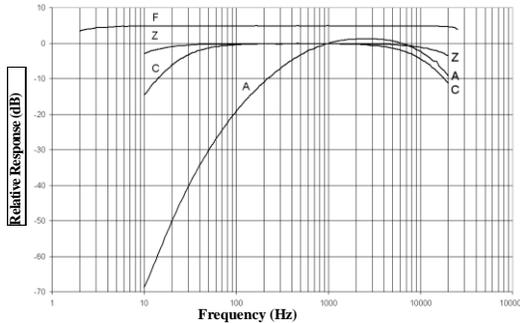


Figure A-6: All frequency weightings plotted together

Windscreen

A covering for a microphone that reduces disturbances caused by wind and direct contact with other surfaces.

Glossary of Terms for EVM (Environmental Monitoring)

ACGIH

The American Conference of Governmental Industrial Hygienists organization in the United States.

Air monitoring

Sampling for pollutants in the air using a variety of means such as sorbent tubes, bags, filters and sampling conventions.

Air pollutant

Any substance in air that could, in high enough concentration, harm man, other animals, vegetation, or material. Pollutants may include almost any natural or artificial composition of airborne matter capable of being airborne. They may be in the form of solid particles, liquid droplets, gases, or in combination.

Air pollution

Air pollution are chemicals present in the atmosphere which are normally not a part of the atmosphere. Basically, air pollution is air that is contaminated, interferes with human health or welfare, or harms the environment. Some examples include dust, smoke, and a variety of toxic gases such as carbon monoxide.

Air quality monitoring

Sampling, measurement/analysis of airborne pollutants.

Air quality standards

The level of pollutants prescribed by regulations that are not to be exceeded during a given time in a defined area.

Airborne particulates

Total suspended particulate matter found in the atmosphere as solid particles or liquid droplets. Chemical composition of particulates varies widely, depending on location and time of year. Airborne particulates include: windblown dust, emissions from industrial processes, smoke from the burning of wood and coal, and motor vehicle or non-road engine exhausts.

ASHRAE

The American Society of Heating, Refrigeration and Air-Conditioning Engineers in the United States.

Bump Test

A functional test of the sensors installed in the gas monitor. Calibration gas is used for a bump test.

Calculating particulate matter

The worker exposure assessment, on the EVM, is based on a gravimetric analysis with filter samples drawn over a period time. If acute effects exist from personal inhalable dust, the sampling analysis allows for short term analysis (STEL).

Ceiling

This is the maximum allowable concentration of a chemical that an employee may be exposed to. It must never be exceeded, even for an instant.

Confined Space (see also “Permit Required Confined Space”)

A “Confined Space” has three components:

- a. It is large enough to enter & perform work
- b. It has limited means for entry & exit
- c. It is not designed for continuous occupancy

Dew Point

The dew point measurement is the absolute measurement of the amount of water vapor in the air (indicating how much humidity is in the air). It is also defined by Wikipedia as, “the temperature to which a given parcel of air must be cooled, at constant barometric pressure, for water vapor to condense into water. The condensed water is called dew. The dew point is also referred to as the saturation point”.

Drift

Is a percentage of signal loss of a gas sensor per month.

Correction Factor

Correction factors can be applied during your run for particulate (dust) and PID (VOCs) measurements. The particulate (dust) correction factor can be configured using the profiles on the Particulate tab of the EVM Setup panel, while the PID correction factor can be configured on the General tab. (Please see EVM Series: Particulate Settings on page 100 and EVM Series: General Settings on page 94, respectively, for operational details.) When viewing EVM session data, the applied particulate (dust) correction factor can be displayed in the Summary Data panel as “Dust Override Factor.”

Dummy Sensor

This is required to cover a sensor socket when no sensor is present to maintain unit to environment sealing capability.

Engulfment

This is the surrounding of a person by finely divided solids or a liquid. A worker in a storage tank filled with sawdust, for example, could fall into an air pocket, be completely surrounded by sawdust, and suffocate to death.

Dust monitoring

Dust is typically known as a type of particulate matter or an aerosol with a miniscule diameter of 0.1upwards.

Filtered CO sensor vs. Unfiltered

There is a high cross-sensitivity between CO and H2S. A filtered CO sensor lessens the sensitivity of the sensor to H2S.

Fire Triangle

A term for the three components required to start a fire: fuel, oxygen, and ignition.

Gravimetric analysis

Describes an analytical chemistry methodology for determining the quantitative mass of a solid. The EVM collects particulates in an internal gravimetric sample holder that are filtered, collected, and weighed to determine the severity of the worker exposure.

Hazardous Atmosphere

Means an atmosphere presenting a potential for death, disablement, injury, or acute illness from one or more of the following causes:

- a. A flammable gas, vapor or mist in excess of 10% of its' lower explosive limit (LEL).
- b. An oxygen deficient atmosphere containing less than 19.5% oxygen by volume or an oxygen enriched atmosphere containing more than 23.5% oxygen by volume.
- c. Airborne combustible dust at a concentration that meets or exceeds its LEL (airborne combustible dust which obscures vision at five feet or less).
- d. An atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in subpart Z, Toxic and Hazardous Substances, which could result in an employee exposure in excess of its dose or permissible exposure limit, and that could cause death, incapacitation, impairment of ability to self-rescue, injury or acute illness.
- e. Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

IDLH (Immediately Dangerous to Life and Health)

Any condition that poses an immediate or delayed threat to life, or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a confined space.

Lockout-Tagout

Placing locks or tags on the energy-isolating device (e.g. breaker boxes, control switches, valves, etc.) to prevent the unauthorized re-energization of the device or circuit while work is being performed by personnel. Tags shall indicate that the energy-isolated device must not be operated until the tag is removed by the individual(s) that installed the tag.

Material Safety Data Sheet, published for every chemical or substance that may be hazardous; if an exposure limit has been published for a substance being discussed in an MSDS, that limit, such as TWA or PEL, is required to be included in the MSDS publication. Ref: 29 CFR 1910.1200 (g)(2)(i)(C)(2) and (g)(2)(vi). TWA's and PEL's are not available for most chemicals. There are simply too many chemicals, many of which have not gone through the rigorous scientific study and peer review required. The absence of an exposure limit for a substance should not be used to assume that a substance is not hazardous.

Measurement parameters

The following measurements are displayed on the instrument and in the Logged data table/chart in DMS.

- **Average**
The measurement value over the time interval (or logging interval)
- **Level**
The instantaneous measurement at a specific point in time.
- **Minimum**
The minimum measurement over the time interval (or logging interval).
- **Maximum**
The maximum measurement over the time interval (or logging interval).
- **STEL (Short term Exposure Limit)**
The maximum concentration above the time-weighted average that employees can be exposed to over a specific time period (usually 15 minutes) no more than four (4) times per day. (See [PEL](#) for more information.)
- **TWA**
Most permissible exposure limits are based upon an 8-hour time weighted average (TWA). The air concentration may sometimes go above the TWA value, as long as the 8-hour average stays below. (See [PEL](#) for more information.)

MSHA

The Mine Safety and Health Administration in the USA.

NIOSH

The National Institute for Occupational Safety and Hygiene in the United States. An organization dedicated to investigating the harmful effects of varied industrial hazards on the working population and promulgating regulations to control their harmful effects.

OSHA

The Occupational Safety and Health Administration in the United States. A division of the Department of Labor charged with dealing with the health and welfare of the working population that issues guidelines and legislation to control the hazards at work.

Particulate (Dust) Profile

You can set up EVM to apply a correction factor for particulate (dust) measurements based on the type of dust being measured. On the Particulate tab of the EVM Setup panel, you can configure eight particulate (dust) profiles consisting of a name and a correction factor. Then use the tab's Active Profile drop-down field to select which profile will be applied during measurement. (Please see EVM Series: Particulate Settings on page 100 for operational details.) The profiles are also transferred to the EVM where they can be managed as well.

Particulate matter (PM)

Particulate matter, [also referred to as total suspended particles (TSP)] consists of tiny inhalable dust which can be man-made or natural. A wide range of particulates include the following pollutants: road dust, the burning of fossil fuel, diesel soot, environmental fires (forest or grassland), power plants, and wood smoke. These particles are a mixture of visible and microscopic solid particles and tiny liquid droplets referred to as aerosols.

- **Thoracic dust:** PM10 is the fraction of PM containing particles that are small enough to pass the PM10 impactor (10 mm)
- **Respirable dust:** The cut-points for respirable dust are: PM4 (4 microns), PM2.5 (2.5 microns)

Peak

The highest level of toxic gas or oxygen reached while the unit is on.

PEL (Permissible Exposure Limit)

Permissible exposure limit. PELs are a regulatory limitation to exposure used to specify the allowable exposure to a substance in the workplace and assume that the exposure takes place over an 8-hour shift in a 40-hour work week. Note that there are more stringent exposure limits for higher levels of exposure that may occur over a shorter time interval.

There are three types of PELs:

- **TWA**
Most permissible exposure limits are based upon an 8-hour time weighted average (TWA). The air concentration may sometimes go above the TWA value, as long as the 8-hour average stays below. (**NOTE:** This measurement is not applicable with temperature, relative humidity, or air velocity sensors.)
- **Ceiling Limit**
The maximum allowable concentration of a chemical that an employee may be exposed to. It must never be exceeded, even for an instant.

STEL

The Short Term Exposure Limit (STEL) is the maximum concentration above the time-weighted average that employees can be exposed to over a specific time period (usually 15 minutes) no more than four (4) times per day. This stands for Short Term Exposure Limit and is the maximum average concentration of a toxic gas to which an unprotected worker may be exposed over any fifteen-minute interval during a work period. The EVM calculates the STEL by compiling fifteen one-minute averages, and updates that average each minute after the initial fifteen-minute exposure. If the STEL is reached or exceeded, the alarm activates, and the STEL enunciator turns on.

Different regulatory agencies have different acronyms for PELs: NIOSH (National Institute for Occupational Safety and Health) uses REL (Recommended Exposure Limit), and ACGIH (American Conference of Governmental Industrial Hygienists) uses TLV (Threshold Limit Value). (**NOTE:** This measurement is not applicable with temperature, relative humidity, or air velocity sensors.)

Photodiode

A type of photodetector that is able to convert light source into either current or voltage. With the EVM, it is used to measure the amount of light scattered from a particle cloud.

ppm/ppb

Parts per million (or parts per billion) of concentration of the gas of interest in air. For example, 1 ppm signifies one part of gas to 1 million parts of air.

REL (Recommended Exposure Limit)

Exposure limits set by the National Institute for Occupational Safety and Health (NIOSH).

Relative Humidity

The relative humidity of an air-water mixture is defined as the ratio of the partial pressure of water vapor in the mixture to the saturated vapor pressure of water at a prescribed temperature. This can be calculated by dividing the temperature and dew point readings and multiplying by 100%.

Relative Sensitivity

Toxic and LEL sensors are calibrated to detect a specific gas. However, there may be some cross-sensitivity of the sensor to other toxics or combustibles.

TIME

Point in time when the maximum exposure will occur from the beginning of any 8-hour period

TLV

Threshold limit value: the level of exposure that a worker can experience in the workplace without an unreasonable risk of disease or injury. These are not estimates of "level of risk" for different exposure levels nor do they address the different means by which a person may be exposed to a substance. TLV's are specified by ACGIH, the American Conference of Government Industrial Hygienists. TLV's are guidelines prepared by ACGIH and are solely concerned with health risk. They do not address economic considerations. TLV's are not regulatory but rather are advisory. (See [PEL](#) and [TWA](#) which are specified by OSHA).

VOC (Volatile Organic Compound)

A type of air pollution that is a carbon-containing chemical, which is typically vaporized at ambient temperatures. Some examples of VOCs include: biological agents (mold, dust, mites...etc.), carbon monoxide, formaldehyde, second hand tobacco smoke. On the EVM, VOCs are measured in air by using the Photoionization detection (PID) sensor.

Glossary of Terms for Heat Stress Monitors (QUESTemp^o 34/36, QUESTemp^o 44/46/48N, QUESTEMP^o II)

Heat Exposure Tables

ACGIH

Screening Criteria for Heat Stress Exposure. WBGT values in °C. **NOTE:** According to the ACGIH's guidelines, the temperature values represent a work and rest process which is explained in the standards. Please refer to the ACGIH TLVs and BEIs for specific details.

Work and recovery (TLV)	Light	Moderate	Heavy	Very Heavy	Work and recovery (Action Limit)	Light	Moderate	Heavy	Very Heavy
75% to 100%	31.0	28.0	26.0*	23.5*	75% to 100%	28.0	25.0	22.5*	20.0*
50% to 75%	31.0	29.0	27.5	25.5*	50% to 75%	28.5	26.0	24.0	22.5*
25% to 50%	32.0	30.0	29.0	28.0	25% to 50%	29.5	27.0	25.5	24.5
0% to 25%	32.5	31.5	30.5	30.0	0% to 25%	30.0	29.0	28.0	27.0

*Values not specified by ACGIH have been estimated for continuity.

ACGIH Clothing Corrections

The following clothing corrections are in degrees Celsius. When a clothing correction is entered into the setup portion of the QUESTemp^o 46, the value is added to the WBGT only for looking up the stay times. The WBGT value displayed by the unit does not reflect corrections.

Clothing type	Clothing correction [Addition to WBGT (°C)]
Work clothes (long sleeve shirt and pants)	0°
Cloth (woven material) coveralls	0°
Double-layer woven clothing	3°
SMS polypropylene coveralls	0.5°
Polyolefin coveralls	1°
Limited-use vapor-barrier coveralls	11°

Cited from "American Conference of Governmental Industrial Hygienists - Threshold Limit Values and Biological Exposure Indices for 2008"; Reprinted with permission from ACGIH

United States Navy

Physiological Heat Exposure Limits (PHEL) Time Table (Without the presence of fuel combustion gases/fuel vapors)

The recommended working hours are shown based on a maximum of eight hours. Naval personnel will follow a category, I - VI, based upon their function.

PHEL Curves (Total Exposure Time in Hours: Minutes)						
WBGT(F)	I	II	III	IV	V	VI
80.0	>8:00	>8:00	>8:00	8:00	6:35	4:30
81.0	>8:00	>8:00	>8:00	8:00	6:35	4:30
82.0	>8:00	>8:00	8:00	7:05	5:25	3:40
83.0	>8:00	8:00	7:45	6:25	4:55	3:20
84.0	>8:00	8:00	7:05	5:55	4:30	3:05
85.0	8:00	7:45	6:30	5:20	4:05	2:50
86.0	8:00	7:05	5:55	4:55	3:45	2:35
87.0	7:25	6:30	5:25	4:30	3:25	2:20
88.0	6:45	5:55	4:55	4:05	3:10	2:10
89.0	6:10	5:25	4:30	3:45	2:50	2:00
90.0	5:40	5:00	4:10	3:25	2:40	1:50
91.0	5:15	4:35	3:50	3:10	2:25	1:40
92.0	4:50	4:10	3:30	2:55	2:15	1:30
93.0	4:25	3:50	3:15	2:40	2:00	1:25
94.0	4:05	3:35	3:00	2:25	1:50	1:15
95.0	3:45	3:15	2:45	2:15	1:45	1:10
96.0	3:25	3:00	2:30	2:05	1:35	1:05
97.0	3:10	2:45	2:20	1:55	1:25	1:00
98.0	2:55	2:35	2:10	1:45	1:20	0:55
99.0	2:40	2:20	2:00	1:40	1:15	0:50
100.0	2:30	2:10	1:50	1:30	1:10	0:45
101.0	2:20	2:00	1:40	1:25	1:05	0:45
102.0	2:10	1:50	1:35	1:15	1:00	0:40
103.0	2:00	1:45	1:25	1:10	0:55	0:35
104.0	1:50	1:35	1:20	1:05	0:50	0:35
105.0	1:40	1:30	1:15	1:00	0:45	0:30
106.0	1:35	1:25	1:10	0:55	0:45	0:30
107.0	1:30	1:15	1:05	0:50	0:40	0:25
108.0	1:20	1:10	1:00	0:50	0:35	0:25
109.0	1:15	1:05	0:55	0:45	0:35	0:25
110.0	1:10	1:00	0:50	0:40	0:30	0:20
111.0	1:05	1:00	0:50	0:40	0:30	0:20
112.0	1:00	0:55	0:45	0:35	0:25	0:20
113.0	0:55	0:50	0:40	0:35	0:25	0:15
114.0	0:55	0:45	0:40	0:30	0:25	0:15
115.0	0:50	0:45	0:35	0:30	0:20	0:15
116.0	0:45	0:40	0:35	0:25	0:20	0:15
117.0	0:45	0:40	0:30	0:25	0:20	0:10
118.0	0:40	0:35	0:30	0:25	0:15	0:10

PHEL Curves (Total Exposure Time in Hours: Minutes)						
WBGT(F)	I	II	III	IV	V	VI
119.0	0:35	0:35	0:25	0:20	0:15	0:10
120.0	0:35	0:30	0:25	0:20	0:15	0:10
121.0	0:35	0:30	0:25	0:20	0:15	0:10
122.0	0:30	0:25	0:20	0:15	0:15	0:10
123.0	0:30	0:25	0:20	0:15	0:10	0:10
124.0	0:25	0:25	0:20	0:15	0:10	0:05

Flag Conditions for U.S. Navy/Marine Corp. Ashore

The following chart details the heat stress monitoring Flag Conditions for U.S. Navy/Marine Corp. Ashore in Degrees Fahrenheit and Celsius.

	No Flag	Green	Yellow	Red	Black
Flag Degrees F	<80.0	80.0-84.9	85.0-87.9	88.0-89.9	>90
Flag Degrees C	<26.7	26.7-29.4	29.4-31.1	31.1-32.2	>32.2

* Rest means minimal physical activity (sitting or standing) and should be accomplished in the shade if possible.

Electrical power research institute (EPRI)

The recommended working hours are shown based on a maximum of four hours. A time of 4:01 indicates greater than 4 hours.

WBGT°C	Light	Moderate	Heavy
28	4:01	4:01	3:00
29	4:01	4:00	2:00
30	4:01	3:00	1:30
31	4:01	2:00	1:15
32	4:00	1:30	1:00
33	3:30	1:15	0:45
34	3:00	1:00	0:40
35	2:30	0:53	0:35
36	2:00	0:45	0:30
37	1:45	0:40	0:25
38	1:30	0:35	0:20
39	1:15	0:33	0:18
40	1:00	0:30	0:15
41	0:53	0:28	0
42	0:45	0:25	0
43	0:38	0:23	0
44	0:30	0:20	0
45	0:28	0:18	0
46	0:25	0:15	0
47	0:23	0	0
48	0:20	0	0
49	0:18	0	0
50	0:15	0	0



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