onset®

HOBO® Data Loggers

HOBOware®
Alarm & Readout Tool User's Guide

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Chapter 1:
Getting started

The Alarm & Readout Tool is a plug-in tool installed with HOBOware® Pro to monitor select HOBO data loggers, read them out, and notify you when sensor and logger conditions fall outside the limits you specify.

This chapter explains:

- ✓ Connecting Loggers
- ✓ Using the Alarm & Readout Tool
- ✓ Software Updates

Connecting Loggers

The Alarm & Readout Tool can perform scheduled readouts and monitor sensor conditions, communication status, memory usage, and battery level. (It does not monitor states and events.)

> **Tip:** Loggers that require a base station to communicate will experience more rapid battery drain when left in the coupler. Refer to your logger's manual for more information.

For most reliable operation, Onset recommends using direct USB or serial port connections for your loggers and base stations. If your computer does not have a serial port, you may use a USB port with a Keyspan™ USB Serial Adapter.

In addition, remote connections to USB loggers are possible with a Keyspan or Tibbo USB Server connected to a local Ethernet port. The Alarm & Readout Tool does not support connecting serial loggers to a USB server via a serial adapter.

Using the Alarm & Readout Tool

To use the Alarm & Readout Tool:

1. Connect a logger to the computer. The logger can be logging, waiting for a delayed or button start, or stopped.

   Important: A serial logger that is waiting for a delayed or button start cannot provide an updated sensor reading until the logger begins logging. Once a serial logger begins logging, it can only provide the last logged value.

   > **Tip:** To avoid disrupting an active deployment, do not connect sensors to a serial logger if it is already logging.

2. If you want to include scheduled readouts in your configuration, launch the logger (if it is not already launched) before starting the monitor. The logger must be logging, or waiting for a delayed or trigger start, in order to perform scheduled readouts. If you plan to use partial readouts with a wrap-enabled logger, the logger must not have wrapped before you start the monitor. If the logger wraps after the monitor is started, but before the first partial readout, partial readouts will be discontinued.

3. From the Tools menu, choose **Manage Alarms & Readouts**, then choose **New Configuration**.

4. Create a configuration as described in "Creating and saving a configuration" on page 6. You must create at least one alarm condition OR readout schedule for each logger in the configuration.

5. Click **Start** on the Configure Alarms and Readouts dialog to begin monitoring the logger. Refer to "Starting the monitor" on page 21 for more information about the alarm and readout monitor.

Notes:

- Alarm sensor conditions cannot be set on state or event channels. Only logger conditions, such as communication, memory, and battery level, can be monitored for state and event loggers (U9-001 and U11-001).

- To set up a scheduled readout for a state and event loggers (U9-001 or U11-001 models) with partial readouts, the battery channel must be configured to log valid timestamps using any battery logging interval.

- The HOBO 4-Channel Pulse Input data logger (UX120-017) and UX90 series loggers are not supported with this tool.

- Data assistant and filtered series configured at launch time are not compatible with this tool. These series will cause the tool to read the data incorrectly.

- Alarm & Readout Tool email notifications do not support SSL or port configuration.

Software updates

If you have an Internet connection, HOBOware Pro can periodically ask if you would like it to check the Onset website for software updates. This includes updates to the Alarm & Readout Tool.

The default is to check once per week, but you can configure HOBOware Pro to check daily or monthly. In Preferences, go to the **General** pane. Click **Startup** and then select how often you want to **Check for HOBOware updates**.

You can also check for updates manually at any time. Choose **Check for Updates** from the Help menu.

Chapter 2:
Configuring alarms and scheduled readouts

The Alarm & Readout Tool uses configuration files to save definitions of groups of loggers, alarm conditions, and scheduled readouts. This chapter explains:

- ✓ Creating and saving a configuration
- ✓ Opening and editing a saved configuration
- ✓ Exporting a configuration

Creating and saving a configuration

To begin, open HOBOware Pro and connect the loggers and sensors you want to include in the configuration. The loggers can be logging, waiting for a delayed or button start, or stopped.

> **Tip:** You must create at least one alarm condition OR readout schedule for each logger in the configuration.

If you want to include scheduled readouts in your configuration, launch the logger now (if it is not already launched). Once you start the monitor, the logger must be launched and either logging, or waiting for a delayed or button start in order to perform scheduled readouts. If you plan to use partial readouts with a wrap-enabled logger, the logger must not have wrapped before you start the monitor. If the logger wraps after the monitor is started, but before the first partial readout, partial readouts will be discontinued.

> **Tip:** To avoid disrupting an active deployment, do not connect sensors to a serial logger if it is already logging.

Important: A serial logger that is waiting for a delayed or button start cannot provide an updated sensor reading until the logger begins logging. Once a serial logger begins logging, it can only provide the last logged value.

Then take the following steps:

Step 1: Selecting loggers

1. From HOBOware Pro's Tools menu, choose **Manage Alarms & Readouts**, then choose **New Configuration**. The Configure Alarms and Readouts dialog is displayed with the **Logger** pane selected.

2. Click **Add Logger** to select the loggers for this configuration. From the resulting Add Loggers dialog, select the loggers you want to include, then click **OK**.
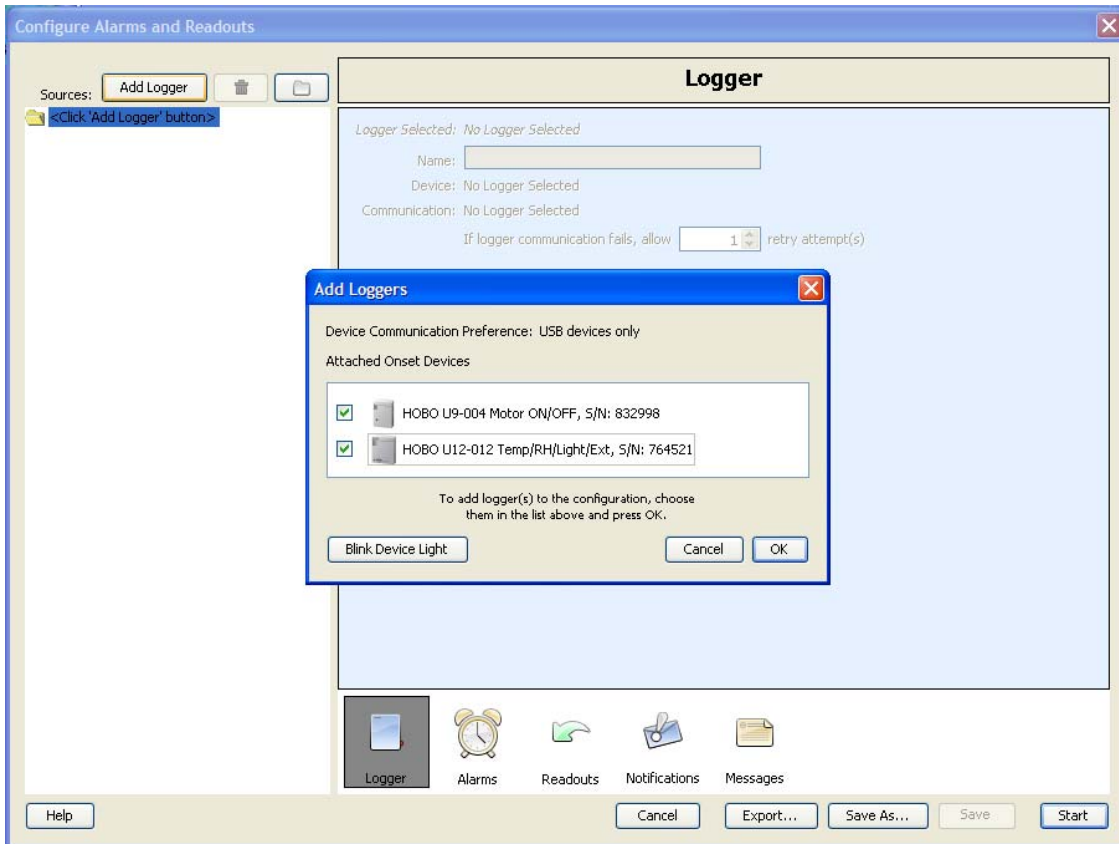
3. The loggers you chose will appear in the logger list on the left side of the Configure Alarms and Readouts dialog.

- Click the folder icon 🗀 to create "groups" to organize your loggers. Logger groups can help you set up alarms or readout schedules for similar types of loggers. To add a logger to a group, click the logger's name to select it, then drag it to the group's folder.
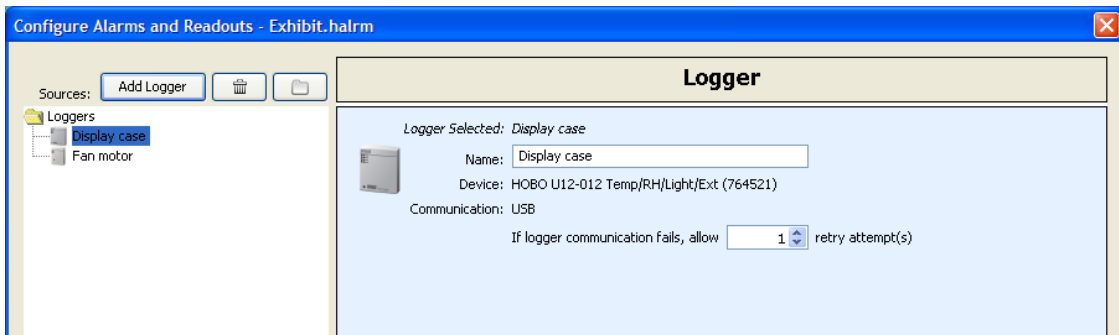
- To delete a logger from the configuration, click the logger's name, then click the trash icon 🗑 .

- To delete a group and all the loggers in it, click the group's name, then click the trash icon 🗑 . (If you do not want to delete all of the loggers that are in the group, drag them out of the group before deleting it.)

4. In the **Logger** pane, enter a **Name** (up to 25 characters) that will be used to identify the currently selected logger in the monitor, scheduled readouts, and notifications. The first 25 characters of the logger's most recent **Launch Description** will be used as the default; if you change the text here, the logger's **Launch Description** will not be affected.

5. Enter the number of **retry attempt(s)** (if any) the Alarm & Readout Tool should make if the selected logger fails to respond for an alarm check or readout attempt. For most applications, one retry should be enough; there is a 60-second delay between retries. If the Alarm & Readout Tool encounters frequent logger communication failures during a deployment, you may wish to increase the number of retries.

> **Tip:** If the **Interval** for alarm conditions or readouts is too short to accommodate all retries, the remaining retries will be skipped so as not to delay the start of the next interval.

Step 2: Defining alarm conditions

1. To define alarm conditions, click the Alarms icon near the bottom of the Configure Alarms and Readouts dialog.

2. Click a logger's name in the logger list to set the interval at which alarm conditions will be checked, and define alarm conditions for that logger.

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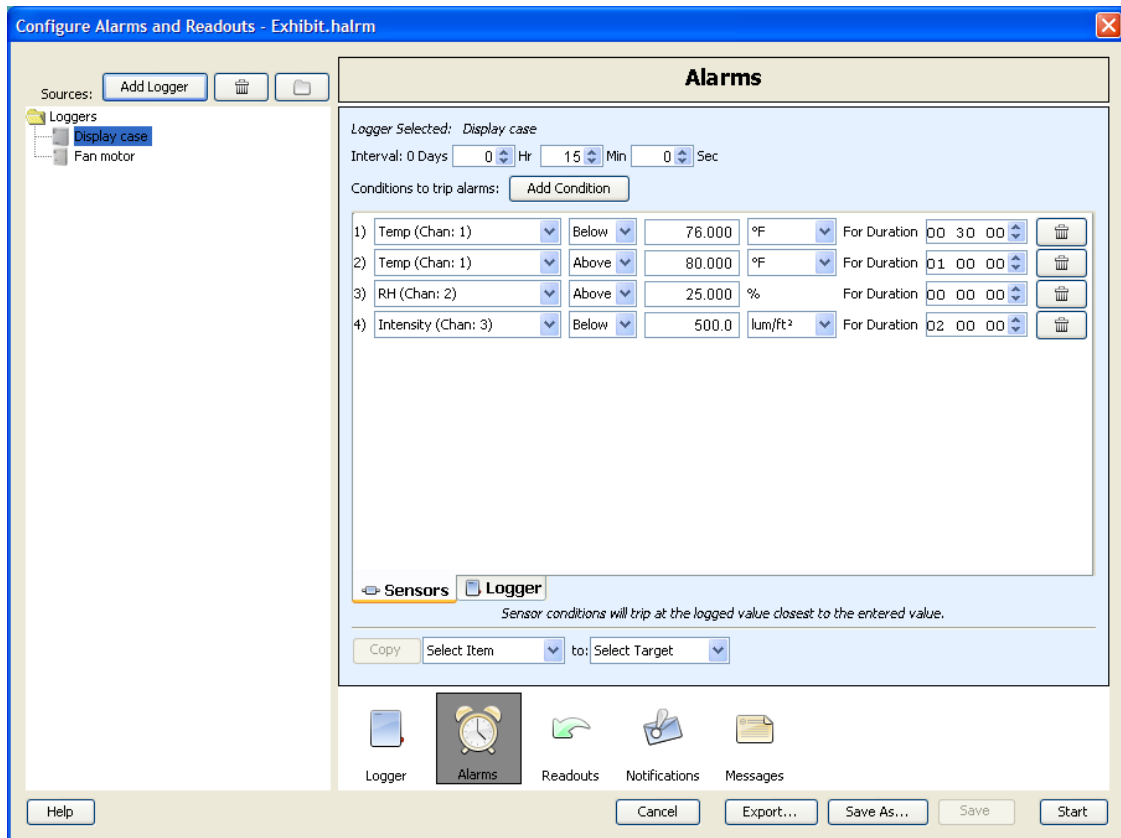
The following table explains the elements in the **Alarms** pane:

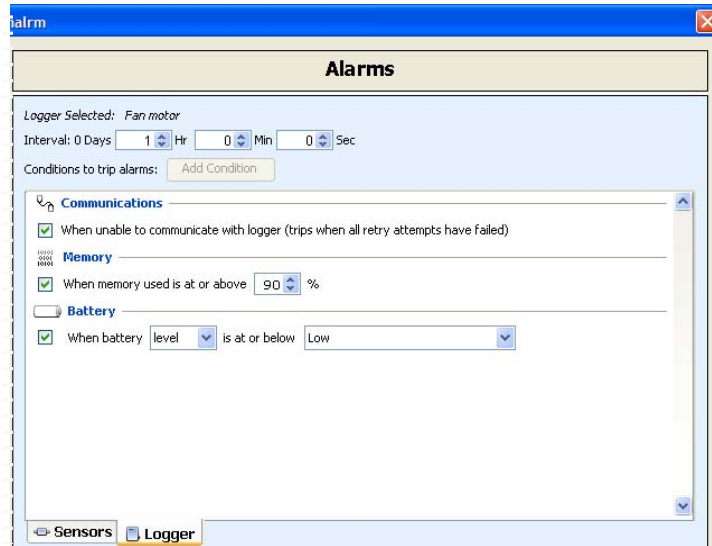| "Alarms" fields	Description
Logger Selected	Logger whose alarm settings are displayed. To work with alarm conditions for a different logger, select the logger from the logger list to the left.
Interval	How often the Alarm & Readout Tool should check this logger for alarm conditions. The minimum alarm interval is one second for USB loggers and five seconds for serial loggers. The maximum is 23 hours, 59 minutes, and 59 seconds.
	This interval is directly related to the sensor condition durations. If you change the interval after you have set up sensor conditions, be sure to adjust the sensor condition durations accordingly.
	Tip: If the logger requires a base station/coupler to communicate, refer to your logger's manual to determine whether it will go to "sleep" if the computer does not communicate with it more often than every 30 minutes.
	When loggers are added to a configuration and set to similar alarm intervals, the amount of time needed for the monitor to complete a polling cycle increases. (Adding sensor alarm conditions also slightly increases the amount of time needed.) This is particularly true of serial loggers. If a polling cycle takes longer than the interval, you will see unpredictable behavior in the monitor window and a delay in notifications.
	You may need to experiment to determine the best interval for your needs. If you encounter problems, a longer interval is recommended. Longer intervals also put less demand on the logger's battery.
Refresh (not shown in example)	If you have added sensors to a serial logger (or removed them), click this button to update the sensor list.
	*Important: If you have removed a sensor for which a sensor condition has already been defined, the sensor condition will be deleted when you click **Refresh**. Also, if the logger is logging, clicking **Refresh** will cause the list to revert to the sensors that were connected at launch.*
Conditions to trip alarms (**Sensors** tab)	Sensor conditions that have been added to this configuration. When *any* of these conditions are met, the monitor sends a notification. Note that a sensor can have more than one condition.
	Important: State and event channel activity cannot trigger alarms.
	To add a condition to this list, click **Add Condition** and use the dropdown lists to describe the condition. Choose a sensor, comparison type, value, units (if applicable), and duration needed to generate an alarm.
	Tip: The units you choose for a sensor condition will always be the units displayed for that condition in the monitor window and details, even if you switch units (US/SI) in HOBOware Pro preferences.
	The **For Duration** is directly related to the **Interval**. For example, if your **Interval** is 15 minutes, you can choose a **Duration** of 0, 15 minutes, 30 minutes, etc. With a **Duration** of 0, the alarm will trip on the first reading that meets the sensor condition. If the **Duration** is equal to the **Interval** (in this example, 15 minutes), the alarm will trip only if the condition is met for two consecutive readings; if the **Duration** is equal to two intervals (in this example, 30 minutes), the alarm will trip only if the condition is met for three consecutive readings; and so forth. To remove a sensor condition from this list, click the trash icon 🗑 next to the condition.

"Alarms" fields	Description
Conditions to trip alarms (**Loggers** tab)	Click the **Logger** tab to select logger conditions (communication, memory, or battery) that can trip the alarm. These conditions are also subject to the **Interval** for alarms. When *any* of these conditions are met during an alarm interval, the monitor sends a notification.

Alarms

Logger Selected: Fan motor

Interval: 0 Days   1   Hr   0   Min   0   Sec

Conditions to trip alarms: Add Condition

Communications
☑ When unable to communicate with logger (trips when all retry attempts have failed)

Memory
☑ When memory used is at or above   90   %

Battery
☑ When battery   level   is at or below   Low

Sensors   Logger

When unable to communicate with logger: This condition occurs only after all logger communication attempts, including retries, for a given alarm interval have failed. (It does not apply to communication failures that occur during scheduled readouts; this condition can be enabled on the **Readouts** pane.)

When memory used is at or above *n*%: This condition occurs when logger memory reaches a threshold you specify. (Note that a serial logger that has been launched with wrapping enabled will always be at 100% once it has wrapped.)

> **Tip:** If you choose the memory and/or battery conditions, be sure to specify limits for these conditions.

When battery level/voltage is at or below *n*: This condition occurs when battery power reaches a threshold you specify.

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3. To copy this logger's alarm settings to other loggers in this configuration, select the setting you want to copy (**interval**, **sensor condition(s)**, **logger condition(s)**, or **all Alarm settings**) from the first drop-down next to the **Copy** button. Then select the destination loggers from the second drop-down. You may choose a logger group, an individual logger, or **Group: Loggers** for all loggers. Click **Copy** to complete this step.

- Copied intervals and logger conditions *replace* the destination loggers' alarm settings with those of the current logger.

- Copied sensor conditions are *added to* the destination loggers' existing conditions, if any. They do not replace any sensor conditions that have already been defined for those loggers.

  When copying a sensor condition to a destination logger that is a different model than the source logger, the software tries to identify a similar sensor on the destination logger. If it does not find one, or if the sensor on the destination logger has a different measurement range than the sensor on the source logger, you will receive a warning message. You should then review the alarm conditions for each logger to make sure that they are what you expect.

Step 3: Scheduling readouts

Important: In order to perform a scheduled readout, the logger must be logging, or waiting for a delayed or trigger start when you start the monitor.

Tip:	Refer to "Readouts" on p. 30 for preferences related to the formatting of text files and datafiles.

1. To schedule readouts, click the Readouts icon 🖙 near the bottom of the Configure Alarms and Readouts dialog.

2. Click a logger's name in the logger list to schedule readouts for that logger.
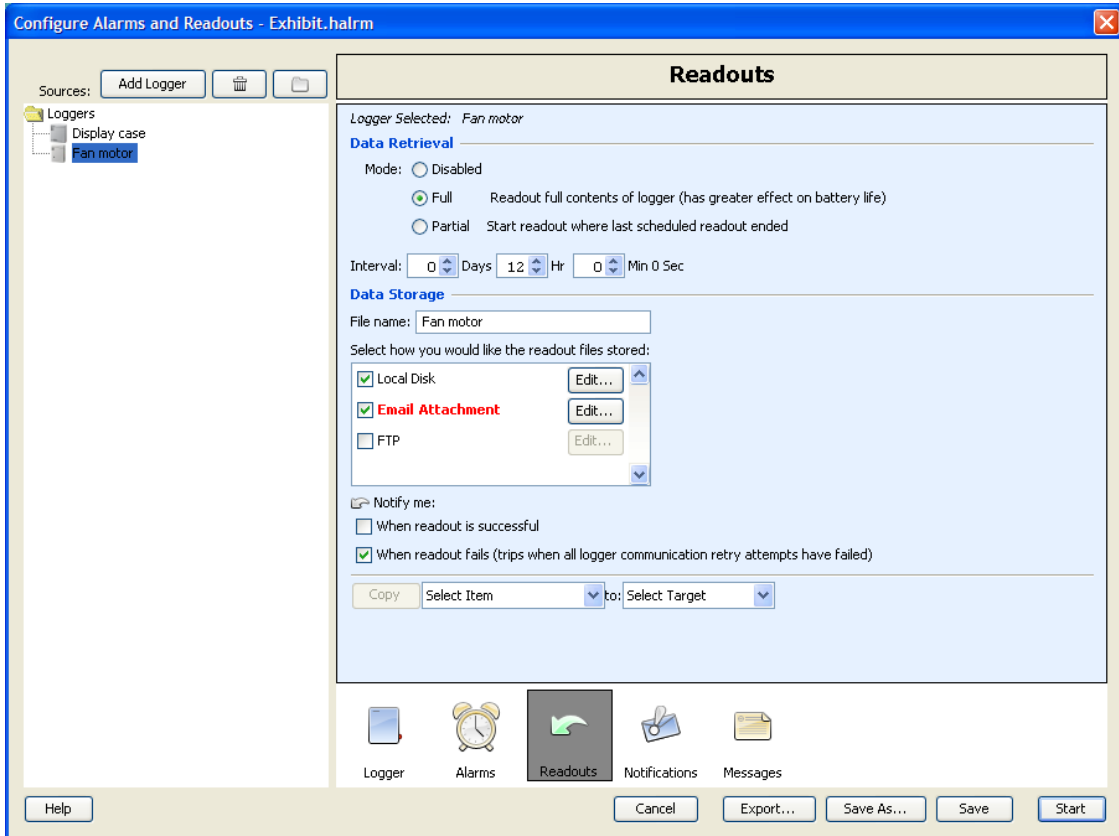
The following table explains the elements in the **Readouts** pane.

| "Readouts" fields	Description
Logger Selected	Logger whose readout schedule is displayed. To work with the readout schedule for a different logger, select the logger from the logger list to the left.
Mode	Select **Disabled** if you do not want to schedule readouts for this logger.
	Full reads out the full contents of the logger. Performing a full readout each time puts more strain on the logger's battery.
	Partial starts reading out where the last scheduled readout ended. The initial partial readout reads out the full contents of the logger.
	Tips for partial readouts: Partial readouts cannot be performed on loggers that have multiple logging intervals defined. If the logger was launched with wrap enabled, you will not be able to create data (.dtf) files with partial readouts. However, you will still be able to create text (.txt) files. The logger must have the same deployment number at readout time as it did when you started the monitor. If you relaunch the logger while the monitor is running, the deployment number will increase, and partial readouts will fail. If you plan to use partial readouts with a wrap-enabled logger, the logger must not have wrapped before you start the monitor. If the logger wraps after the monitor is started, but before the first partial readout, partial readouts will be discontinued.
	Refer to "Readouts" on p. 30 for preferences related to the creation of text files and datafiles.
Interval	How often the Alarm & Readout Tool should read out the logger. Select a readout frequency from one minute to 364 days, 23 hours, and 59 minutes.
	Tip: If the logger requires a base station/coupler to communicate, refer to your logger's manual to determine whether it will go to "sleep" if the computer does not communicate with it more often than every 30 minutes.
	When loggers are added to a configuration and set to similar readout intervals, the amount of time needed for the monitor to complete a readout cycle increases. This is particularly true of serial loggers. If a readout cycle takes longer than the interval, you will see unpredictable behavior in the monitor window, and a delay in readouts and notifications.
	You may need to experiment to determine the best interval for your needs. If you encounter problems, a longer interval is recommended. Longer intervals also put less demand on the logger's battery.
	Tip: If you launch a serial logger with wrapping enabled, make a note of the logging duration on the Launch window in HOBOware Pro to determine how often you need to read out the logger to avoid missing data. For example, if the logger will fill and wrap within six days with the connected sensors and you configure the Alarm & Readout Tool to read it out every seven days, you will miss a day's worth of data each week. If data loss is detected, scheduled readouts will fail, and no further readout attempts will be made.

"Readouts" fields	Description
File name	Keep the default **File name** (the logger name), or enter a new one.
	Tip: Be sure to use a unique file name for each of the loggers in a configuration.
Local Disk	Enable **Local Disk** to store the files on the machine that is running the Alarm & Readout Tool. It is a good idea to save files locally, even if you also plan to send them via email or upload them to an FTP site. This will provide you with a backup of the data if your network connection is lost. When you enable **Local Disk**, the words "Local Disk" will turn red to remind you to configure local disk settings. Click the **Edit** button and complete the Manage Data Storage dialog.
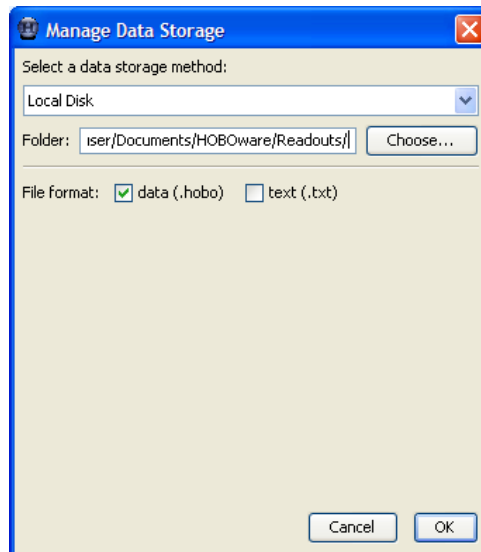
Click **Choose** to select a file location. The default location for saved files is the My Documents\HOBOware\Readouts folder.

Specify a **File format** (**data** or **text**) for the resulting file. (You may select both **data** and **text**; this will result in the creation of two files.) Datafiles (.hobo and .dtf) can be opened directly in HOBOware Pro. Text files can easily be imported into HOBOware Pro, or used in spreadsheets and many other programs.

Tip: If you selected partial readouts and the logger has wrap enabled, **data** (.dtf) will not be available.

"Readouts" fields	Description
Email Attachment	Enable **Email Attachment** to have the files sent as an email attachment. When you enable **Email Attachment**, the words "Email Attachment" will turn red to remind you to configure email attachment settings. Click the **Edit** button and complete the Manage Data Storage dialog.

In the **To** field, enter the full email addresses (up to 120 characters), separated by semicolons, where you want the email to be delivered.

In the **From** field, enter the full email address where you want the email to originate.

In the **Subj** field, enter up to 30 characters for the subject line of the message.

In the remaining fields, enter the information required by your SMTP server. You may be able to find this information in your email software. If you do not know which settings to use, contact your system administrator or Internet service provider.

Click **Test** to verify that the settings are correct. The Alarm & Readout Tool should confirm that the test message was sent, and you should receive a message at the **To** address.

Finally, specify a **File format** (**data** or **text**) for the resulting file. (You may select both **data** and **text**; this will result in the creation of two files.) Datafiles (.hobo and .dtf) can be opened directly in HOBOware Pro. Text files can easily be imported into HOBOware Pro, or used in spreadsheets and many other programs.

> **Tip:** If you selected partial readouts and the logger has wrap enabled, **data** (.dtf) will not be available.
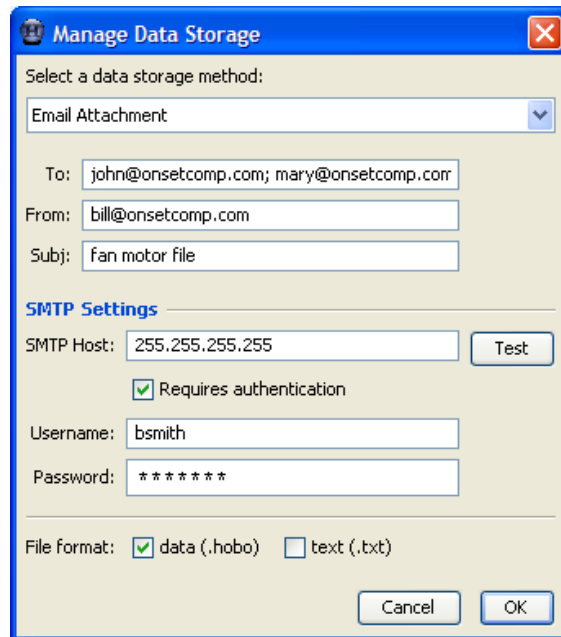
"Readouts" fields	Description
FTP	Enable **FTP** to upload the file to an FTP site. When you enable **FTP**, the word "FTP" will turn red to remind you to configure FTP settings. Click the **Edit** button and complete the Manage Data Storage dialog.
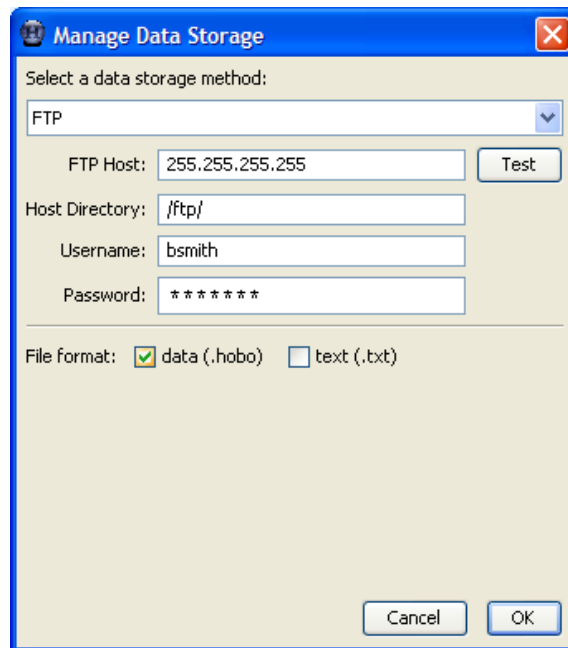
Enter the information required by the FTP host. (Do not include "ftp://" in the **FTP host** field.) If you do not know which settings to use, contact your system administrator or Internet service provider.

Click **Test** to verify that the settings are correct. The Alarm & Readout Tool should confirm that a test file was uploaded, and you should find a test file named "test.txt" at the FTP site.

Specify a **File format** (**data** or **text**) for the resulting file. (You may select both **data** and **text**; this will result in the creation of two files.) Datafiles (.hobo and .dtf) can be opened directly in HOBOware Pro. Text files can easily be imported into HOBOware Pro, or used in spreadsheets and many other programs.

> **Tip:** If you selected partial readouts and the logger has wrap enabled, **data** (.dtf) will not be available.

Notify me	Select the conditions for which you want to be notified. When any selected condition is met, the monitor sends a notification immediately.

When readout is successful: This condition occurs when a scheduled readout has completed, and the resulting file has been saved, emailed, or uploaded to an FTP site.

> **Tip:** It is possible to be notified of a successful readout, but not receive the expected email with the attached datafile or text file. The Alarm & Readout Tool cannot tell if something goes wrong after the email was sent.

When readout fails: This condition occurs when a scheduled readout (and all retry attempts) failed due to a communication error; or if there was an error saving the file, emailing it, or uploading it to an FTP server. |

"Readouts" fields	Description
Copy	To copy this logger's readout settings to other loggers in this configuration, select the setting you want to copy (**mode, interval, Local Disk settings, Email Attachment settings, FTP settings,** or **notifications**) from the first drop-down next to the **Copy** button. Then select the name of a logger group, the name of an individual logger, or **Group: Loggers** (to select all loggers) from the second drop-down. Click **Copy** to complete this step.

Step 4: Setting up notifications

Tip: Refer to "Notifications" on p. 31 for preferences related to notifications.

1. To define notifications, click the Notifications icon near the bottom of the Configure Alarms and Readouts dialog. Notification settings apply to all loggers.
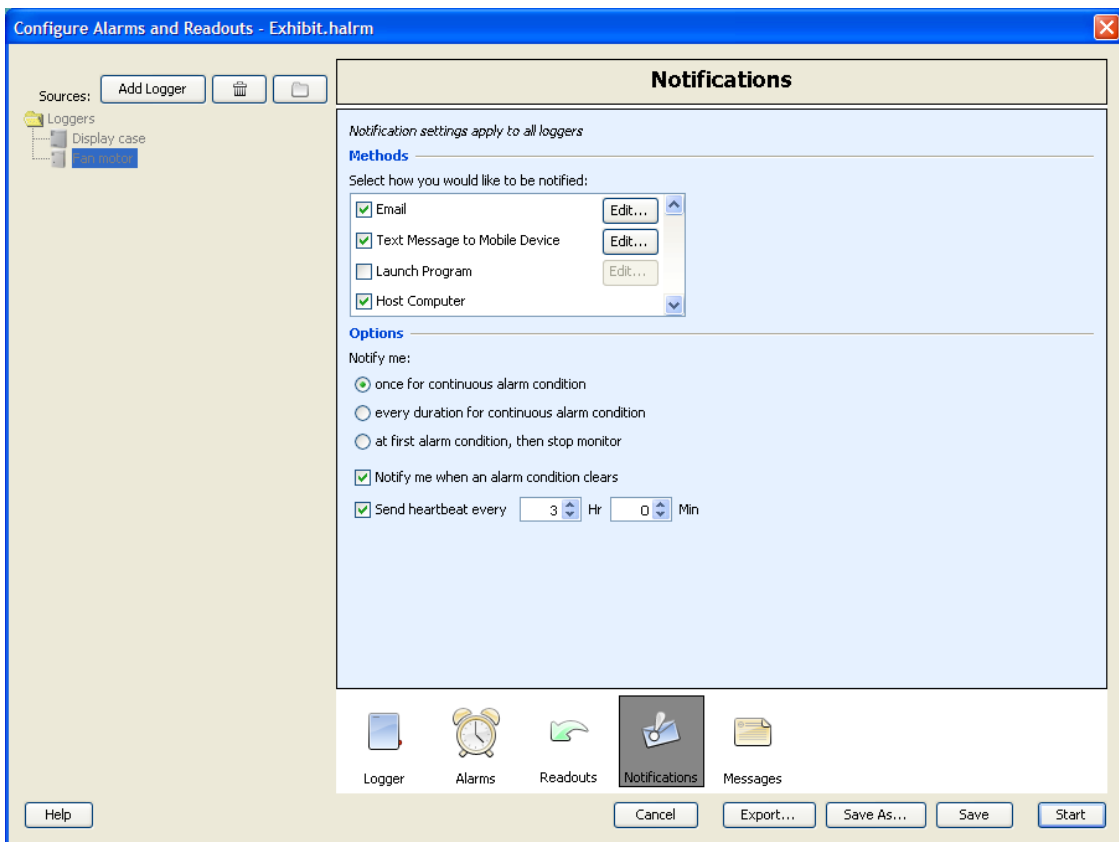
2. Choose one or more notification methods and options.

Tip: In general, the reliability of email and mobile text messaging depends on many factors, including but not limited to SMTP servers, wireless service provider, routers, receiving devices, and even environmental forces such as solar flares. This variability means that messages may not be delivered in a timely manner, and could even be delivered out of order. If you often get messages late or out of order, you may be able to improve your odds by using multiple notification methods, and/or multiple addresses (in different domains) in the **To:** field, separated by semicolons. For example:

john@onsetcomp.com; mary@onsetcomp.com

The following table explains the different notification methods and options.

"Notifications" fields	Description
Email	Enable **Email** to send email notifications. When you enable **Email**, the word "Email" will turn red to remind you to configure email settings. Click the **Edit** button and complete the Manage Notification Methods dialog.
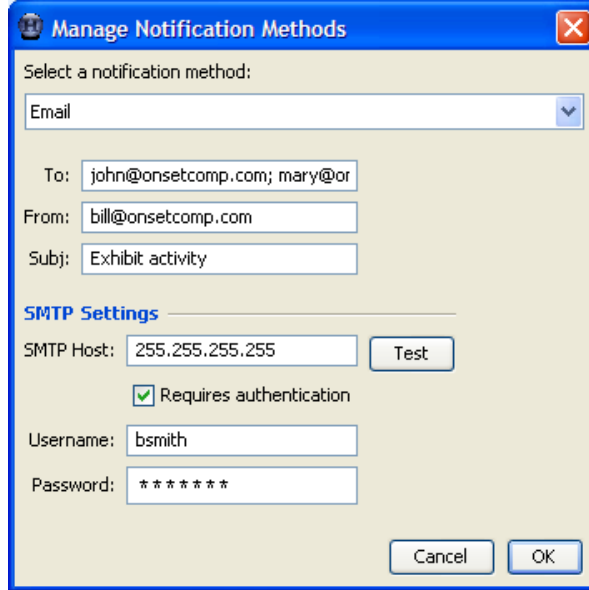
In the **To** field, enter the full email addresses (up to 120 characters), separated by semicolons, where you want the email message to be delivered.

In the **From** field, enter the full email address where you want the email message to originate.

In the **Subj** field, enter up to 30 characters for the subject line of the email message.

In the remaining fields, enter the information required by your SMTP server. You may be able to find this information in your email software. If you do not know which settings to use, contact your system administrator or Internet service provider.

Click **Test** to verify that the settings are correct. The Alarm & Readout Tool should confirm that the test message was sent, and you should receive a message at the **To** address.

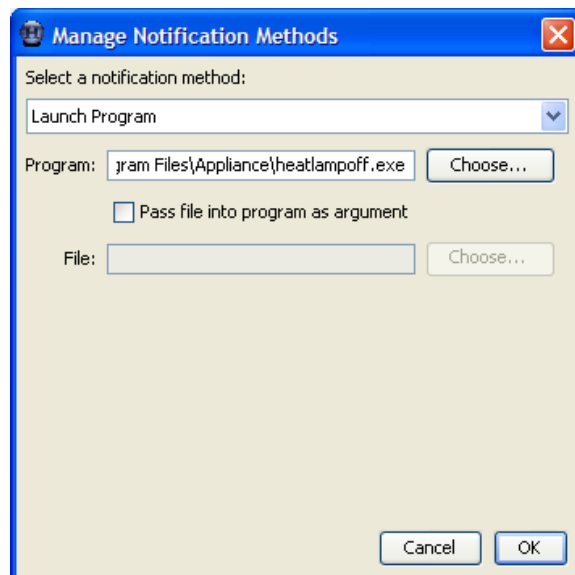| "Notifications" fields	Description
Text Message to Mobile Device	Enable **Text Message to Mobile Device** to send a text message to an SMS-enabled mobile device, such as a cellular telephone or a pager. When you enable this notification method, the words "Text Message to Mobile Device" will turn red to remind you to configure text message settings. Click the **Edit** button and complete the Manage Notification Methods dialog.
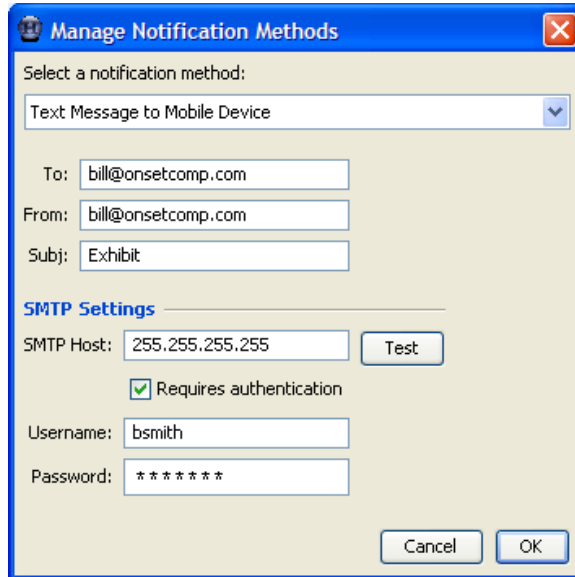
This setup dialog is similar to the dialog for Email, but there is a 15-character limit for the **Subj** field. Refer to "Notifications" on p. 31 for information about a preference to set a maximum length for mobile text messages.

Launch Program	Enable **Launch Program** to have the Alarm & Readout Tool launch a program on the host computer. When you enable this notification method, the words "Launch Program" will turn red to remind you to configure program settings. Click the **Edit** button and complete the Manage Notification Methods dialog.

Click **Choose** and browse to the program you would like to run. If you want the program to use a file as input, enable **Pass file into program as argument** and enter the file location and name in the **File** field.

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| "Notifications" fields	Description
Host Computer	Enable this option if you want to the monitor to play a sound and attempt to grab the focus on the host computer. Refer to "Notifications" on p. 31 for information about how to select a different sound.
Notify me	Specify how often you want to be notified of alarm conditions. You can be notified at the start of each alarm condition (**once for continuous alarm condition**); you can be notified at every duration of a continuous alarm condition (**every duration for continuous alarm condition**); or you can have the monitor notify you just once, at the start of the first alarm, and then stop the monitor (**at first alarm condition, then stop monitor**). **Tip:** These options apply to alarm condition notifications only. Notifications of readout success or readout failure are sent once per readout.
Notify me when an alarm condition clears	Enable this option if you want to receive a notification when the alarm condition has returned to a non-alarm state.
Send heartbeat every ___	You can have the host machine send you regularly scheduled notifications to let you know that the monitor is still running and able to communicate while you are away. Enable this option and specify how often you want to be notified.

Step 5: Constructing messages

1. To construct the message that will be sent by certain notification methods, click the Messages icon near the bottom of the Configure Alarms and Readouts dialog. Message settings apply to all loggers.
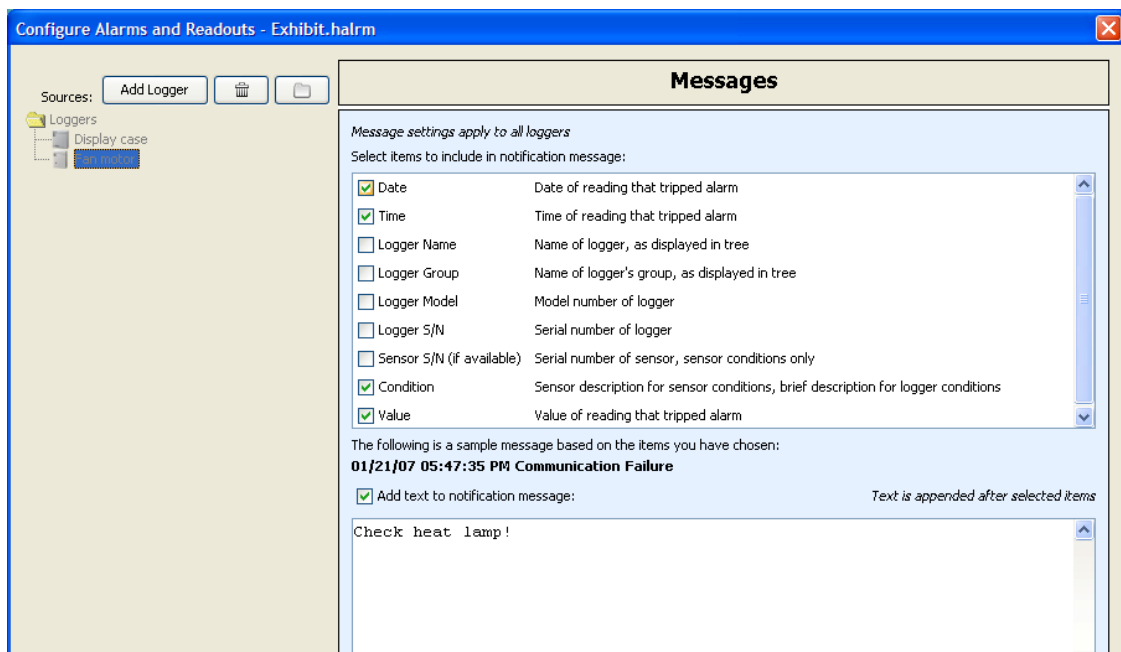
2. The top portion of this dialog lists the items you can include in a notification message. Select all of the items you would like to include. A sample message, based on your choices, appears below this area.

3. To include additional, customized text in the message, enable **Add text to notification message** and type the text in the area below this option.

Step 6: Saving the configuration

Click **Save** to save the configuration. By default, configurations are saved in the My Documents\HOBOware\Alarms folder with an extension of .halrm.

Step 7: Finishing up

To start the monitor now, click **Start**. If the monitor is already running, you will be warned that the monitor will stop the previous configuration before running the new one.

To close the Configure Alarms and Readouts dialog without saving changes or starting the monitor, click **Cancel**.

Opening and editing a saved configuration

Once you have created and saved a configuration, you can open it to review settings, change the settings, and start the monitor.

> **Tip:** When the monitor is running, you can access the Configure Alarms and Readouts dialog for the current configuration by clicking **Configure** on the Alarm and Readout Monitor dialog. Changes that you make to the configuration will not take effect until the next time you start the monitor.

1. From the Tools menu, choose **Manage Alarms & Readouts**, then choose **Open Configuration**. Select the configuration and click **Open**. The Configure Alarms and Readouts dialog is displayed.

2. Review the settings and make changes, if desired.

3. To save changes to the existing configuration file, click **Save**. To save the changes to a new configuration file with a different name, click **Save As**.

4. To start the monitor now, connect the loggers and sensors (if applicable) that are defined in the configuration. If any loggers in the configuration have scheduled readouts enabled, be sure those loggers are launched, and either actively logging, or awaiting a delayed or triggered start. Click **Start**. If the monitor is already running, you will be warned that the monitor will stop the previous configuration before running the new one.

   Important: A serial logger that is waiting for a delayed or button start cannot provide an updated sensor reading until the logger begins logging. Once a serial logger begins logging, it can only provide the last logged value.

   > **Tip:** To avoid disrupting an active deployment, do not connect sensors to a serial logger if it is already logging.

5. To close the Configure Alarms and Readouts dialog without starting the monitor, click **Cancel**.

Exporting a configuration

To export a configuration to a text file, view the configuration and click **Export**. By default, exported configurations are saved in the My Documents\HOBOware\Alarms folder with an extension of .txt.

Chapter 3: Monitoring

The alarm and readout monitor polls the loggers and sensors at the intervals specified by the configuration, compares the values to the alarm conditions, and notifies you if an alarm is triggered. It also performs scheduled readouts and stores and/or sends the resulting files, as applicable. This chapter explains:

- ✓ Starting the monitor
- ✓ Viewing the monitor details
- ✓ Hiding the monitor
- ✓ Stopping the monitor

Starting the monitor

> **Tip:** The alarm and readout monitor uses your computer's system clock to determine when to poll loggers and read them out. If you (or an automated program) adjust the time backwards while the monitor is running, the next polling and/or readout time will be delayed until the clock reaches that time.
>
> Automatic time changes caused by the start and end of Daylight Saving Time, and manual changes to your time zone setting, do not cause a delay in the monitor.

1. From the Tools menu, choose **Manage Alarms & Readouts**, then choose **Open Configuration**. Select the configuration you want and click **Open**. The Configure Alarms and Readouts dialog is displayed.

2. Connect the loggers and sensors (if applicable) that are defined in the configuration. The loggers can be logging, waiting for a delayed or button start, or stopped. Any loggers that have scheduled readouts must be either logging, or awaiting a delayed or triggered start when you start the monitor. The loggers should be logging by the time of the first scheduled readout. Serial loggers that are scheduled for partial readouts and have wrap enabled must not wrap before the first scheduled readout; if they are wrapped, the readout will fail.

   Important: A serial logger that is waiting for a delayed or button start cannot provide an updated sensor reading until the logger begins logging. Once a serial logger begins logging, it can only provide the last logged value.

   > **Tip:** To avoid disrupting an active deployment, do not connect sensors to a serial logger if it is already logging.

3. Click **Start**. If the monitor is already running, you will be warned that the monitor will stop the previous configuration before running the new one. The Alarm and Readout Monitor dialog is displayed, and an alarm icon appears in the lower right corner of the main HOBOware Pro window.

Once the monitor is running, if there is a communication failure, any sensor readings will be italicized and in purple text to indicate that they are not current.
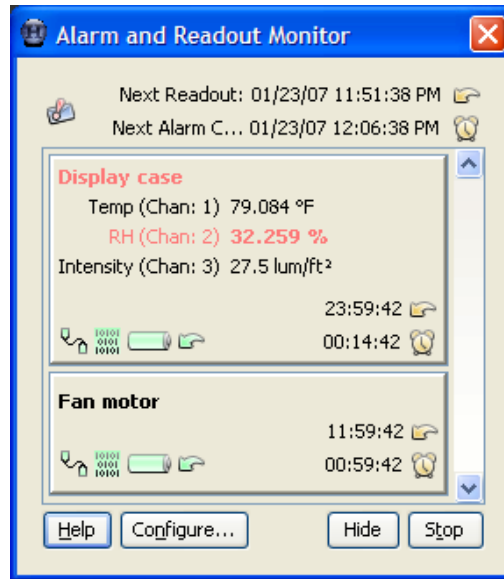
In this example, two loggers are being monitored. Because different loggers may be read at different intervals, the **Next Readout** and **Next Alarm Check** at the top of the monitor window lets you know when the next readout and alarm check will be taken for the configuration. The icon indicates that there has been a notification failure.

The first logger, Display case, is being monitored for temperature, RH, intensity, communication status (icon), memory usage (icon), battery (icon), and readouts (icon). The icons are displayed in green to indicate that they are "okay" (not in an alarm condition). The logger name (Display case) and alarm condition (RH) are displayed in red to indicate that the RH value is in an "above" alarm condition. (For a "below" alarm, sensor text is displayed in blue.) There are 23 hours, 59 minutes, and 42 seconds until the next readout, and 14 minutes and 42 seconds until the next alarm check.

The second logger, Fan motor, is being monitored for communication status, memory usage, battery, and readouts. The next readout will be made in 11 hours, 59 minutes, and 42 seconds, and the next alarm check will be in 59 minutes and 42 seconds.

4. Note that each logger has its own panel in the monitor window, which includes the logger name, monitored conditions, and countdowns to the next alarm check and readout.

   • To view details about the logger's status, click the logger's panel.

   • To access the Configure Alarms and Readouts dialog for the current configuration, click **Configure**. Changes that you make to the configuration will not take effect until the next time you start the monitor.

5. You can continue to use HOBOware Pro to work with other loggers and datafiles. In addition, you can work with the monitored loggers in HOBOware Pro when the monitor is not taking a reading.

> **Tip:** A logger cannot communicate with HOBOware Pro and the monitor at the same time. If both applications attempt to access the logger at the same time, you will receive communication errors.

Viewing the monitor details

To view the details of a logger's condition while the monitor is running, click the logger's panel in the Alarm and Readout Monitor dialog. In this example, the RH condition is displayed in red text to indicate an "above" alarm condition.
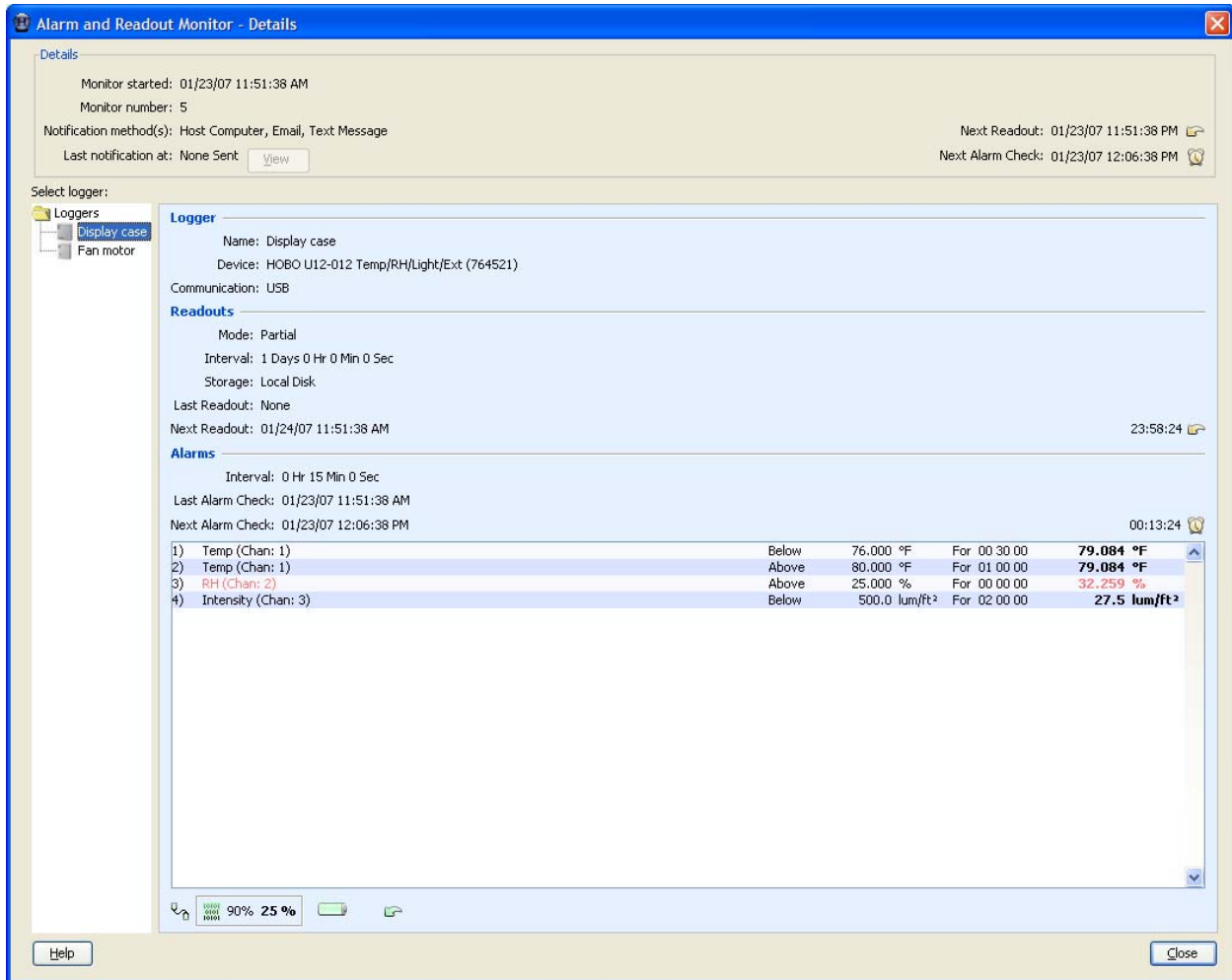
The following table explains the elements in the Alarm and Readout Monitor - Details dialog.

Monitor detail	Description
Monitor started	Time when the monitor was started.
Monitor number	Number of times the monitor has been started. Each time you start the monitor, the Alarm & Readout Tool's internal counter (the monitor number) increases by one. If the monitor performs readouts, the monitor number is added after the file name, before the sequence number (if any).
Notification method(s)	Notification methods in use. This can be any combination of email, mobile text message, launch program, or host computer.
Last notification at	Time when the most recent notification was sent. If this is "None Sent," no notifications have been sent yet. Click **View** to see the text of the last notification that was sent.

Monitor detail	Description
Select logger	This box lists the loggers that are being monitored. The information in this dialog refers to the logger that is currently highlighted in the logger list. To view details for a different logger, click that logger's name.
Name	Description that was entered for the logger on the Configure Alarms and Readouts dialog.
Device	Model and serial number of the logger.
Communication	Communication protocol for this logger (USB or serial).
Readout Mode	Readout mode selected for this logger (full, partial, or disabled).
Interval (readouts)	Frequency with which the monitor is reading out the logger.
Readout Storage	Storage method(s) for the resulting datafile or text file (local disk, email attachment, or FTP).
Last Readout	Time when the last readout was performed. If a scheduled readout has not been performed yet, this is "None."
Next Readout	Time of the next scheduled readout attempt, if applicable, and a countdown timer.

If readouts can no longer be performed on the logger (because the logger was relaunched, or has stopped, filled up, wrapped more than once between readouts so that data was lost, or wrapped before the first partial readout), the countdown timer will read 00:00:00. If you are not sure why readouts were cancelled, pause the mouse pointer over the countdown timer for an explanation. |
Interval (alarms)	The frequency with which the monitor is polling the logger for alarm conditions.
Last Alarm Check	Time when the last alarm check was performed.
Next Alarm Check	Time of the next scheduled alarm check, if applicable, and a countdown timer.
Monitored sensor conditions (not labeled)	This box lists the sensor conditions, if any, that were defined for this logger, along with their current values as of the last reading.

If a sensor is in an "above" alarm condition, its text is red. If it is in a "below" alarm condition, its text is blue. If it is "okay," its text is black. If there is a communication failure, the current reading is italicized and in purple text to indicate that it is outdated. |
| Monitored logger conditions (not labeled) | The area at the bottom of the window lists the logger conditions (communication 📶, memory ▤, battery status ▱, and readout 🖼), if any, that were defined for this logger. The memory icon also displays the amount of memory that has been used. In the example, the alarm will be tripped when memory is 90% full; currently, it is 25% full.

If one of these items is in an alarm condition, its icon is red. Otherwise, it is green. |
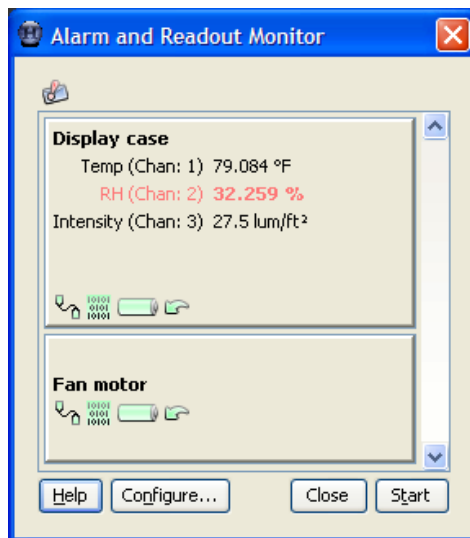
Hiding the monitor

To hide the monitor without stopping it, click the **Hide** button on the Alarm and Readout Monitor dialog, or choose **Hide Monitor** from the **Manage Alarms & Readouts** submenu on HOBOware Pro's Tools menu. The alarm clock icon 🕰 will remain in the lower right corner of the main HOBOware Pro window to remind you that the monitor is active, and the icon will turn red and "jump" when an alarm is triggered. In addition, if the configuration is set to notify on the host machine when an alarm is triggered, the monitor window will open automatically at that time.

To restore the monitor window at any time, click the alarm clock icon 🕰, or choose **Show Monitor** from the **Manage Alarms & Readouts** submenu on HOBOware Pro's Tools menu.

Stopping the monitor

To stop the monitor, click the **Stop** button on the Alarm and Readout Monitor dialog, or choose **Stop Monitor** from the **Manage Alarms & Readouts** submenu on HOBOware Pro's Tools menu. This ends all readouts and notifications until you start the monitor again.

After all alarm checks and readouts in progress have finished, the **Stop** button becomes a **Start** button, and the **Hide** button becomes a **Close** button. You can restart the monitor by clicking the **Start** button, or close it by clicking the **Close** button.

You can define a configuration to stop the monitor immediately after sending the first alarm notification. Enable the **at first alarm condition, then stop monitor** option on the **Notifications** pane.

There are also preference settings that cause the monitor to stop automatically. In Preferences, in the Notification category on the **Alarms** pane, enable "Stop monitor after *N* notifications sent" if you want the monitor to stop after sending a specific number of notifications. Enable "Stop the monitor if sending a notification fails" if you want the monitor to stop when it is unable to send a notification. Refer to "Notifications" on page 29.

Chapter 4:
Readout files

When you use the Alarm & Readout Tool to perform scheduled readouts, you have a choice of creating datafiles (.hobo and .dtf) and/or text (.txt) files. Only HOBOware can open datafiles, but text files can be imported easily into HOBOware Pro, and be viewed in text editors, spreadsheets, and other kinds of software. This chapter explains: format of text files created by scheduled readouts.

    ✓   The numbering scheme for readout file names

    ✓   The format of text files created by scheduled readouts

Readout file numbering scheme

The Alarm & Readout Tool employs a simple numbering scheme to avoid overwriting files that have been created as a result of scheduled readouts. Each time you start the monitor, the Alarm & Readout Tool's internal counter (the monitor number) increases by one. If the monitor performs readouts, the monitor number is added after the file name, before the sequence number (if any).

For example, consider a configuration with two loggers – LoggerA and LoggerB. Each logger will be read out once per day, over a period of seven days. LoggerA is configured for partial readouts, which (with default Preference settings) results in one file. LoggerB is configured for full readouts, which (again, with default Preference settings) results in seven files.

The first time you start the monitor, the monitor number is 1. When you stop the monitor, you should have eight files: LoggerA_1.hobo, and LoggerB_1_0000.hobo, LoggerB_1_0001.hobo, LoggerB_1_0002.hobo, etc.

The next time you start the monitor, the monitor number is 2. When you stop the monitor, you should again have eight files: LoggerA_2.hobo, and LoggerB_2_0000.hobo, LoggerB_2_0001.hobo, LoggerB_2_0002.hobo, etc.

The monitor number advances every time you start the monitor, even if no readouts are performed. If the monitor number reaches 99,999, it will roll over to 1.

> **Tip:** Be careful when renaming files while they are still in their original location. If, for some reason, you rename "MyLogger_1.txt" to "MyLogger_2.txt," the file could be overwritten the second time you run the monitor.

Text file format

The first section of the text file contains the header. This header conforms to YAML standards (http://www.yaml.org), allowing maximum compatibility with other software. The remainder of the file contains the data.

Header information

There are three sections in the text file header: data format, logger information, and series information.

Data Format

This section includes detailed information about the way your text file is formatted.

- **dateTimeDelimiter**, **dataDelimiter**, and **decimalSeparator** identify (between double-quotes) the character used to separate date and time; the character used to separate data values from one another; and the character that is used as a decimal.

- **dateFormat** and **timeFormat** describe the way dates and times are formatted within the file. These formats are determined by the preference settings in HOBOware Pro and the regional format settings of your operating system. For example, 07/31/06 would be represented as MM/dd/yy. (Single-digit values have leading zeros.)

> **Tip:** Uppercase HH refers to 24-hour time (e.g., 15:00:00).
>
> Lowercase hh refers to 12-hour time (e.g., 3:00:00 PM). This time format should be followed with "a" to denote an AM/PM indicator (hh:mm:ss a).
>
> Lowercase ss refers to whole seconds. Uppercase SSS refers to milliseconds.
>
> Lowercase mm refers to minutes. Uppercase MM refers to months.

- **gmtOffset** and **daylightSavings** indicate the offset, in hours, from GMT on the computer that launched the logger, and whether the computer was in Daylight Saving Time when the logger was launched (true or false).

Logger Info

This section contains information about each logger that has data in this file. There is one subsection for each logger. *(For scheduled readouts, there is only one logger per file.)*

- The first line of each subsection is:

        - &#

  where "#" is an integer that counts the loggers in this file, beginning with 1. (For scheduled readouts, &1 is the only subsection.)

- The remaining fields in each subsection list the logger's launch description, model, vendor, etc., similar to the fields on the Status window in HOBOware Pro. Refer to the *HOBOware Pro User's Guide* for detailed descriptions of these items.

Series Info

This section lists each column in the file, excluding the first column ("#") and date/time column. There is one subsection for each series. Series are listed in the same order as their columns within the data.

- The first field of each subsection is **name**, followed by the series name.

- The next field is **type**, which can be value, state, event, or internalEvent.

- For value, external event, and state series, **type** is followed by **unitName**. Values and external events have only one **unitName**. For state series, the two states are listed on two separate lines, with the high state listed first.

- For value series only, **OMClassName, OMPartNumber, OMUnitIndex, OMChannelType,** and **OMValuePattern** provide additional series information to Onset's software.

- The **location**, if any, is the location string for a serial logger sensor.

- The last field of each subsection is **logger**. This identifies the logger that logged this series or provided the data from which this series was derived (such as dew point). The logger is identified as *# where "#" corresponds to the logger number in the Logger Info section. *(For scheduled readouts, *1 is the only logger.)*

Data

- Data is separated from the file header by a row of hyphens.

- The first row of data consists of the column headings. Each column heading is enclosed in double quotation marks ("") and separated by the **dataDelimiter** character. The first column header is "#"; the second column header is "Time, GMT-04.00" (or whatever offset is appropriate).

- The remaining columns identify each series name and unit type, if applicable, in the format "Series Name, Unit" (enclosed in double quotation marks). Each series, including states, external events, and internal logger events, has its own column. (Refer to "Readouts" on p. 30 for preferences that allow you to include more information in the series column headers.)

- The first column is the point number, as shown in a HOBOware datafile.

- The date and time are separated by the **dateTimeDelimiter** character. (There is a preference that allows you to split date and time into two columns. Refer to "Readouts" on p. 30 for details.)

- For internal logger events, the field value is Logged; otherwise, there is no field value.

- No zeros or spaces are used for fields that do not contain values.

- Rows of data are separated with a paragraph return.

- Thousands separators are not used. Two thousand (2,000) is expressed as 2000.

Chapter 5:
Preferences

When you install the Alarm & Readout Tool, an **Alarms** pane is added to the HOBOware Pro preferences dialog. This chapter explains:

✓ Setting preferences for the Alarm & Readout Tool

✓ Alarm condition, readout, notification, message, and warning preferences

## Setting alarm preferences

To change preferences for the Alarm & Readout Tool:

1. From the File menu, choose **Preferences**.

2. Click the Alarms icon to open the **Alarms** pane.

3. Make the changes and click **OK**.

Clicking the **Restore Defaults** button on the Preferences dialog will restore all preferences, including HOBOware Pro and Alarm & Readout Tool preferences.

The following preferences are available on the **Alarms** pane:

Alarm Conditions
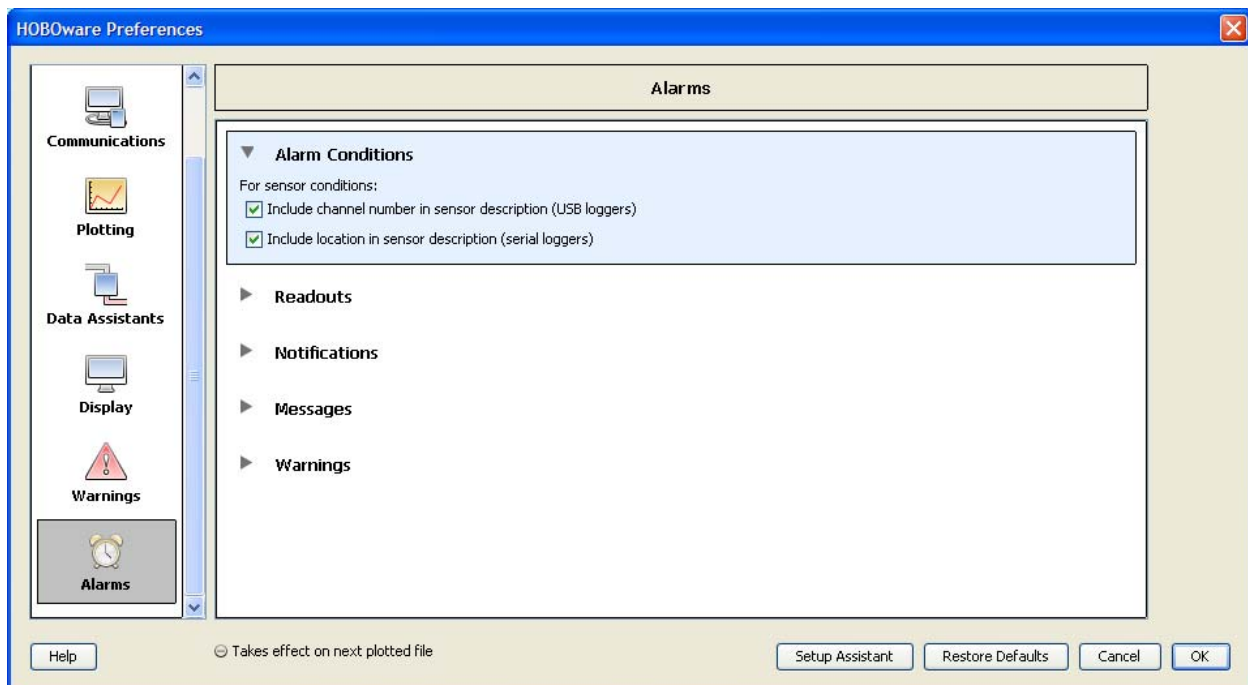
- **Include channel number in sensor description.** For USB loggers, you may include the channel number in the sensor description. This is especially helpful if you are using external sensors.

- **Include location in sensor description.** For serial loggers, you may include the location that was defined for the sensor the last time the logger was launched.

Readouts
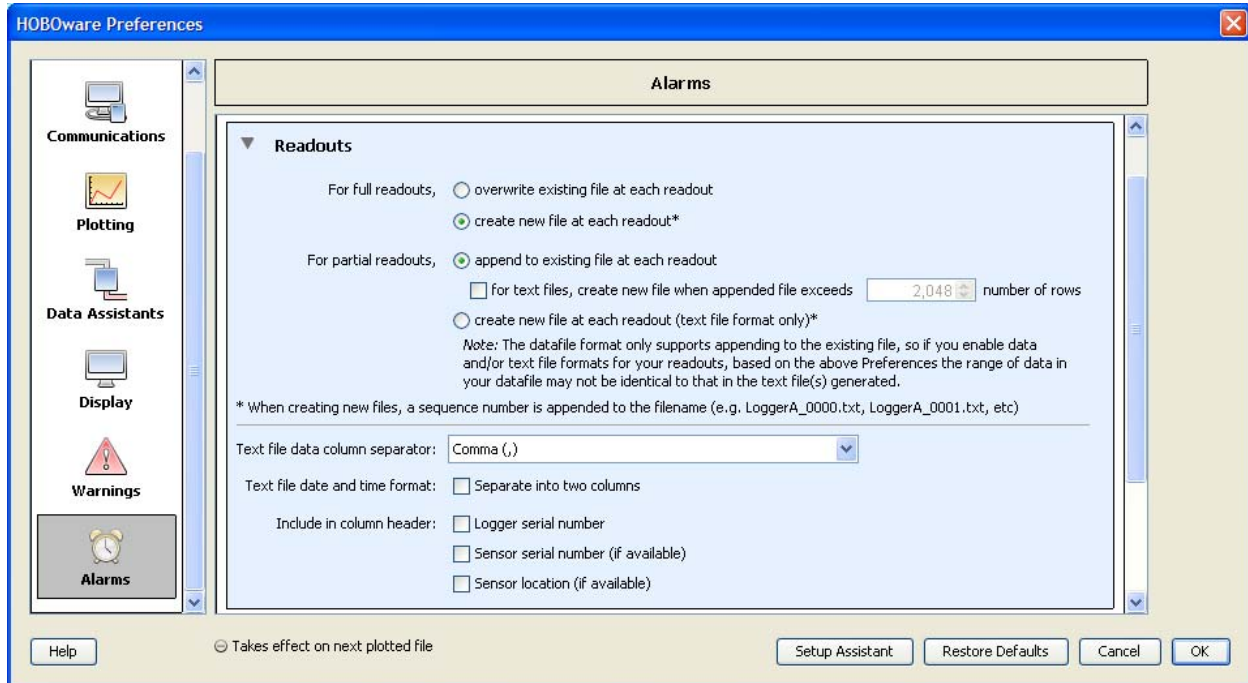
- **For full readouts.** If you have configured loggers for full readouts, a new file is normally created at every readout, with the file name you entered in the configuration, followed by the monitor number, followed by a numeric suffix to identify the sequence (the sequence number). For example, LoggerA_*X*_0000.hobo, LoggerA_*X*_0001.hobo, etc. where *X* is the monitor number.

  If you prefer to keep only one file, select **overwrite existing file at each readout**. This setting is not recommended when performing full readouts to text files for serial loggers that have wrapping enabled; once the logger has wrapped, the data from the beginning of the deployment will be lost when the original file is overwritten.

- **For partial readouts.** If you have configured loggers for partial readouts, a new text file or datafile is created with the first readout, and subsequent partial readouts are normally appended to this file.

  To control the size of text files only, enable **for text files, create new file when appended file exceeds** and enter the number of rows. This will not split a readout into multiple files; rather, it will create a new file only when the existing file has already exceeded this limit. Each file name will have a monitor number, followed by a numeric suffix to identify the sequence (the sequence number). For example, LoggerB_*X*_0000.txt, LoggerB_*X*_0001.txt, etc. where *X* is the monitor number.

  You can also have the Alarm & Readout Tool create a new text file for every partial readout. Select **create new file at each readout**. Each file name will have a monitor number, followed by a numeric suffix to identify the sequence (the sequence number). For example, LoggerA_*X*_0000.txt, LoggerA_*X*_0001.txt, etc. where *X* is the monitor number.

> **Tip:** When performing scheduled readouts, the Alarm & Readout Tool will use the preference settings that were in effect when you started the monitor. If you change any of the *following* Readouts preferences while the monitor is running, the new settings will not take effect until the next time you start the monitor.

- **Text file data column separator.** This setting controls how the columns are separated in the text file. Choose comma, semicolon, or tab.

- **Text file date and time format: Separate into two columns.** By default, date and time are kept in a single column in the text file to facilitate graphing in spreadsheet programs. If enabled, this setting splits the date and time into two columns.

- **Include logger serial number in column header.** This setting adds the logger's serial number to each column header when a text file is saved. This is especially useful if you plan to analyze data from different loggers.

- **Include sensor serial number (if available) in column header.** This setting adds the sensor's serial number, if it has a serial number, to each column header when a text file is saved. This is especially useful if your data includes similar series that were recorded on different sensors; for example, three different temperature series.

- **Include sensor location (if available) in column header.** This setting adds the sensor's location string, if it had a location defined at the last launch, to each column header when a text file is saved. This is especially useful if your data includes similar series that were recorded on different sensors; for example, three different voltage sensors.

Notifications
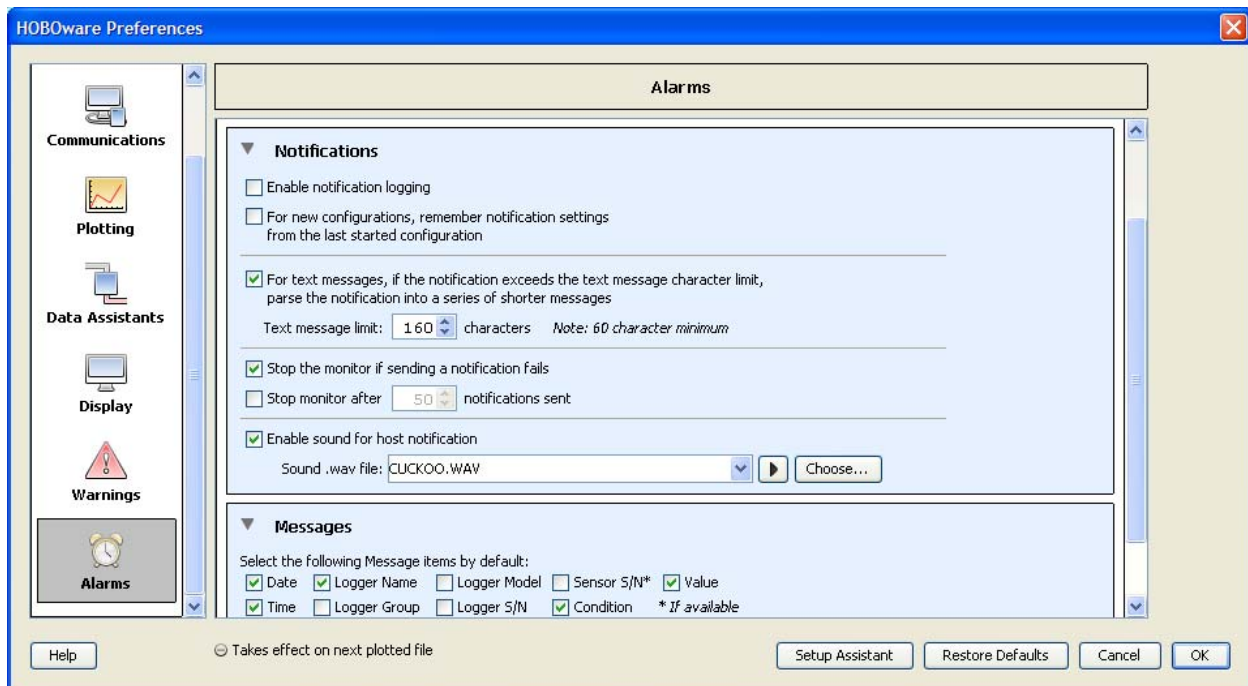
- **Enable notification logging.** Enable this option if you would like the Alarm & Readout Tool to keep a log of all notifications that have been created. You may find this helpful if you suspect that you are not receiving all of your notifications due to problems with your email or text messaging service. The log file will be named NotificationLog.txt and kept in C:\Documents and Settings*username*, and it will be overwritten each time you start the monitor.

- **For new configurations, remember notification settings from the last started configuration.** If you generally use the same notification settings for each configuration, enabling this option will save you some time when creating new configurations.

- **For text messages....** Some mobile text messaging services have maximum message length limits. To ensure that you do not miss any text notifications, enable this option and enter the limit in the **Text message limit** box. If a notification exceeds this number of characters, it will be sent in a series of shorter messages.

- **Stop the monitor if sending a notification fails.** Enable this option if you want the monitor to stop if it is not able to send a notification.

- **Stop monitor after *N* notifications sent.** To stop the monitor after a certain number of notifications are sent, enable this option and specify the number of notifications. This helps you limit unnecessary battery drain on the logger and the expense of frequent text messaging if you will not be able to stop the monitor directly at the host system.

- **Enable sound for host notification.** By default, notifications on the host machine are accompanied by a sound. You can select a different sound file, or disable the sound by unchecking the box.

  To change the sound played with the notification, select a sound from the dropdown list, or click **Choose** to browse to the .wav file you want to use. To preview the sound, click the Play icon ▶.

Messages

- **Select the following Message items by default.** If you want to include or exclude certain items from most notification messages, select the items you want to include here. These will become the default message items when you create a new configuration.

Warnings
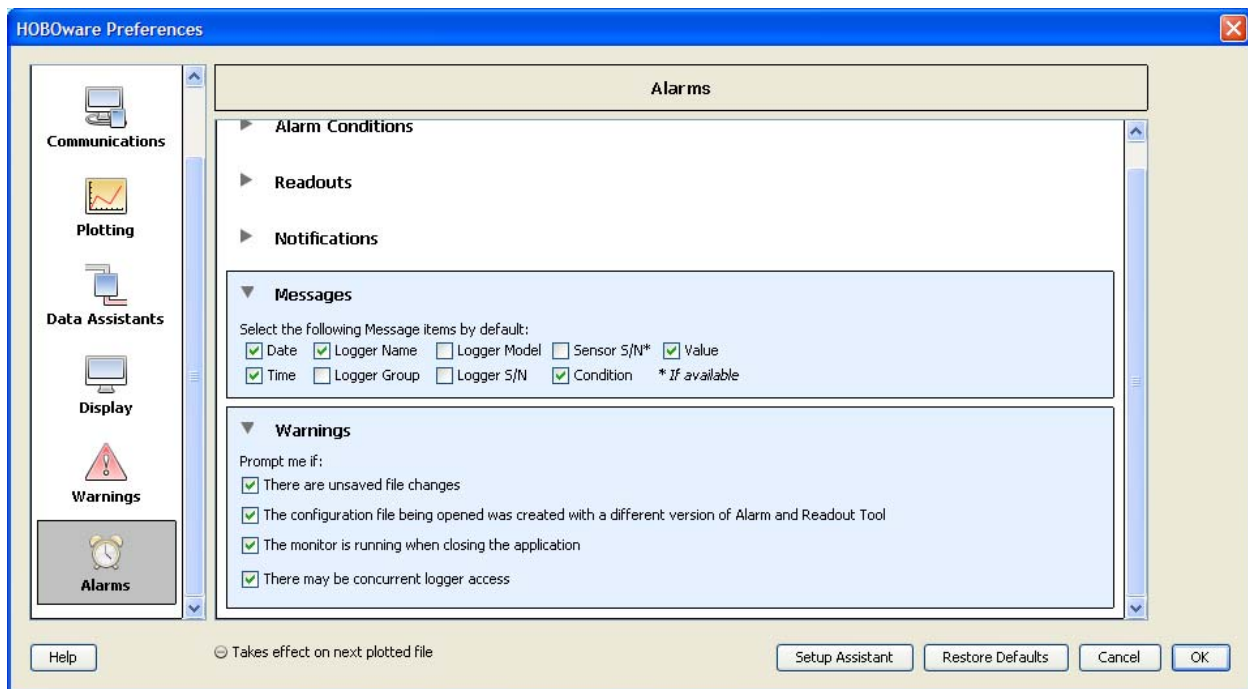
Some warning dialogs offer you a checkbox to disable the warning so that you do not see it again. You can also disable (and re-enable) these warnings here.

- **There are unsaved file changes.** If you try to start the monitor or cancel the configuration dialog when the displayed configuration contains settings that have not been saved, this warning gives you a chance to save the changes before the configuration dialog closes.

- **The configuration file being opened was created with a different version of the Alarm & Readout Tool.** Configuration files from the previous version of this software (the Real-Time Alarm Software) are fully compatible with the current version. If you save the configuration file after you open it, it will be updated to the current version. If the configuration includes references to serial loggers, you should click **Refresh** 🔃 on the **Sensors** tab of the **Alarms** pane before saving the file. This will add more information about the sensors to the configuration file.

- **The monitor is running when closing the application.** If you try to quit HOBOware Pro while the monitor is running, this warning reminds you that quitting HOBOware Pro will stop the monitor, and gives you a chance to cancel.

- **There may be concurrent logger access.** This warning appears if you try to communicate with (add or refresh) a logger in the Configure Alarms and Readouts dialog while the logger is included in the currently running alarm and readout monitor.