OneWireViewer User's Guide, Version 1.6

UG3358; Rev 3; 6/19

Abstract

This user's guide explains the OneWireViewer software program and how it can be used to evaluate the unique features of 1-Wire® and iButton® devices.

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Introduction

The OneWireViewer is a Java®-based software package for exploring Maxim's 1-Wire and iButton devices with a personal computer. The 1-Wire® and iButton® devices communicate over a single data line plus ground reference using the 1-Wire protocol. Several 1-Wire adapters are available for USB and serial ports. The OneWireViewer provides a user interface to evaluate the unique features of 1-Wire and iButton products, including Thermochron® (temperature logging), Hygrochron™ (real-time temperature and humidity), clock, memory, and file operations.

Installation

OneWireViewer requires Java JRE (version 5, update 8 or higher) installed in the target computer. We suggest obtaining the JRE from AdoptOpenJDK, Oracle®, or another preferred vendor. To check whether you have Java installed in your computer or which version is installed, open a command prompt and type "java -version" and press **Enter**, as shown in **Figure 1**.

Figure 1. Check the installed Java version.

If Java is not installed in the target computer, download and install Java and proceed to the next step.

Download Bundled OneWireViewer and 1-Wire Drivers

NOTE: Do not insert the DS9490R# USB adapter into the PC USB slot until directed later in the installation process.

Download the bundled OneWireViewer and 1-Wire **drivers** on the Maxim website. These pages have pulldown menus to help select the correct file for the target operating system. Select the appropriate version of Microsoft Windows®, and then choose whether it is 32-bit or 64-bit system.

If you are not certain which version you have, go to the **Start** menu and type "Control Panel", then open **System and Security** -> **System** to display your system properties. This version is shown in **Figure 2** under **System type** in the **System** section. In this case, it is a 64-bit system, thus you will have to choose the 64-bit version of the 1-Wire driver software.
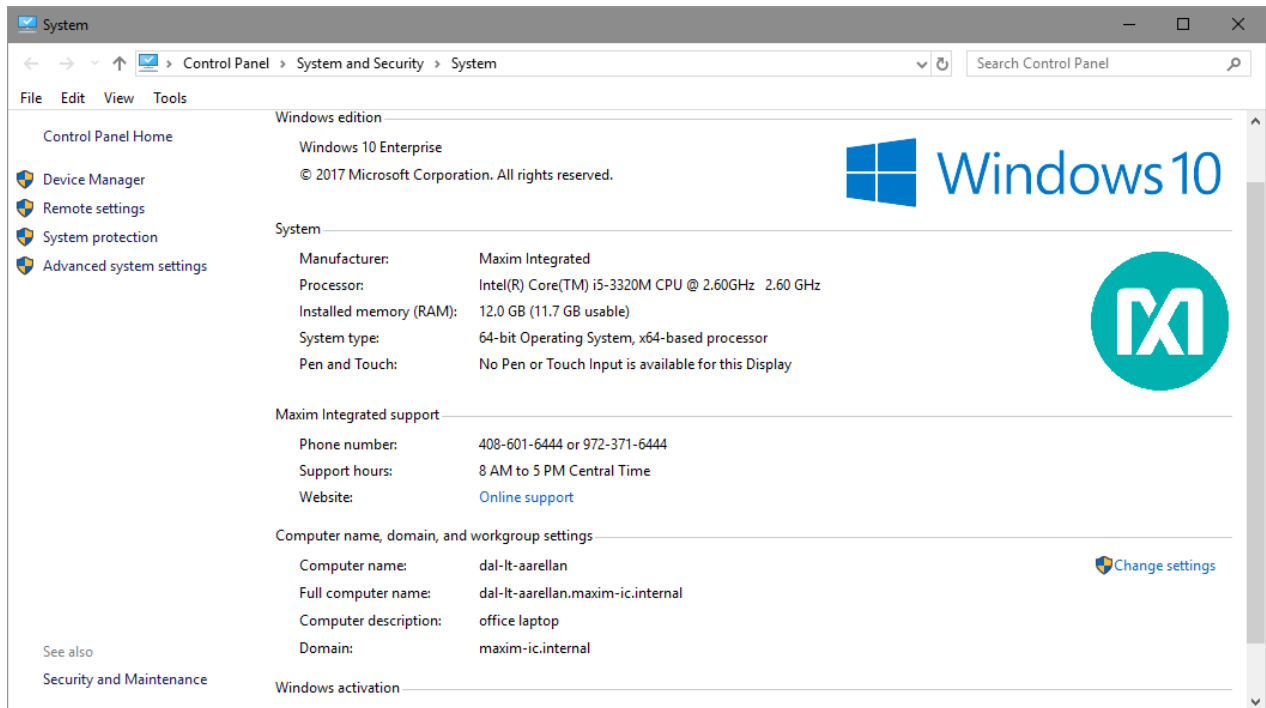
Figure 2. Check the operating system version.

Install Bundled OneWireViewer and 1-Wire Drivers

After downloading the installer (.msi file), run the file to start the installation. The setup window shown in **Figure 3** will appear. Click **Next** to start the installation.
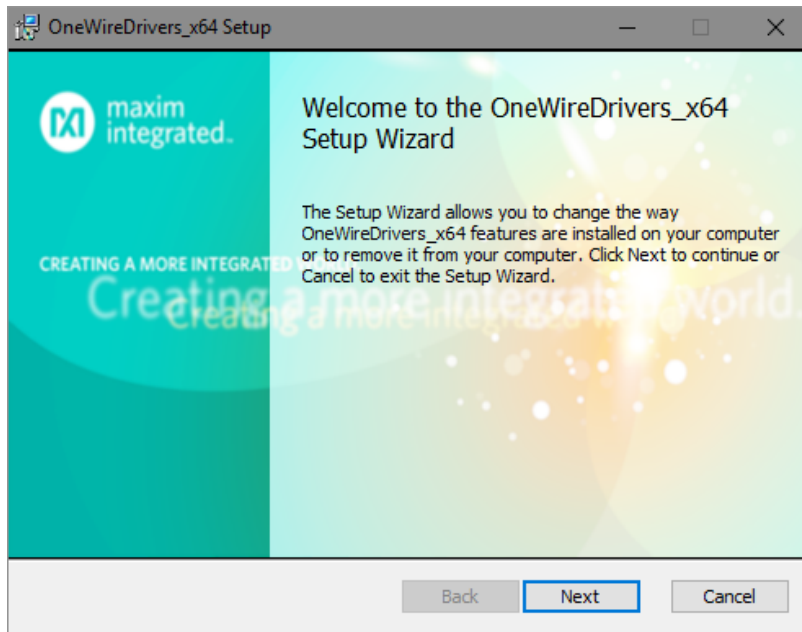
Figure 3. Initial installation window.

Next, you will be prompted to affirm the license agreement to use the 1-Wire drivers and the OneWireViewer software, as shown in **Figure 4**. Accept the terms by checking the box next to the "I accept" text and click **Next** to complete the process.
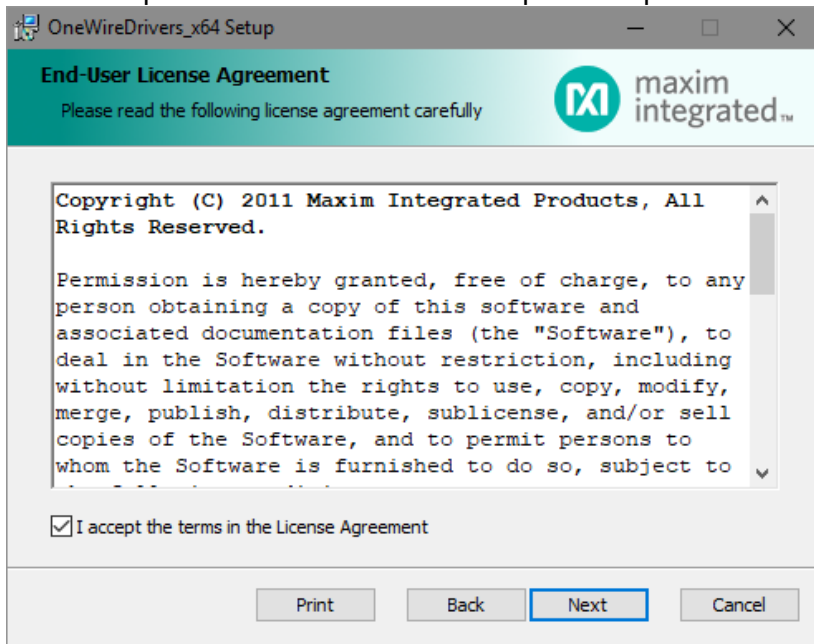
Figure 4. Window for end-user license agreement.

You will be required to choose a destination folder, then the final window appears, as shown in **Figure 5.** Click the **Finish** button to complete the installation.
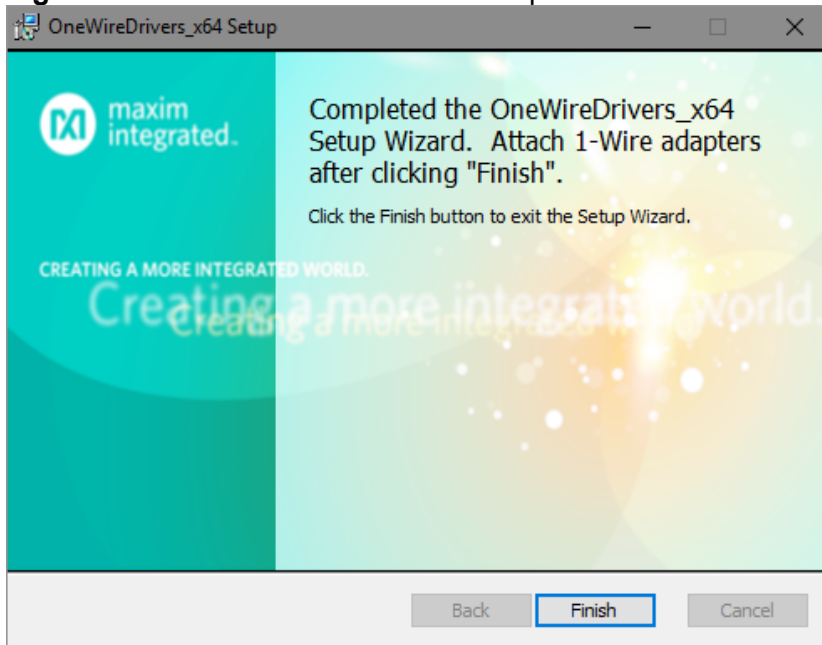
Figure 5. Final installation window.

At this point, if you are using a USB adapter, insert it now and proceed to the next phase. If you are using a parallel-port adapter, you must reboot before continuing.

Starting the OneWireViewer Program

Follow these steps to launch the OneWireViewer from Windows 10, Windows 7, Windows Vista®, or Windows XP®:

- Click the Windows **Start** button (usually in the lower left corner of the screen).
- Select **All Programs**.
- Click on the **1-Wire Drivers x64, 1-Wire Drivers x86** folder.
- Click **OneWireViewer.jar**.

Uninstalling the OneWireViewer Program

Type "Control Panel" in the search bar and press **Enter**, as seen in **Figure 6**. On Windows 7 and older operating systems, click **Start**, and then click **Control Panel**, which opens as a new window containing a list of computer settings.
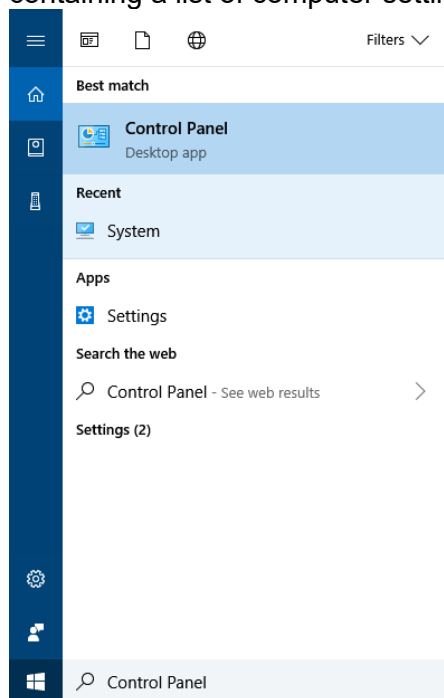
Figure 6. Access the control panel.

Select **Programs and Features** and then search for OneWireDrivers, as seen in **Figure 7**. Typically, the installed programs are sorted by name. The driver version is part of the program name. An x64 at the end of the program name indicates that the 64-bit version is installed. With the 32-bit version, an x86 is appended to the OneWireDrivers text. Select the appropriate OneWireDrivers software, click **Uninstall**, and follow the uninstall instructions.
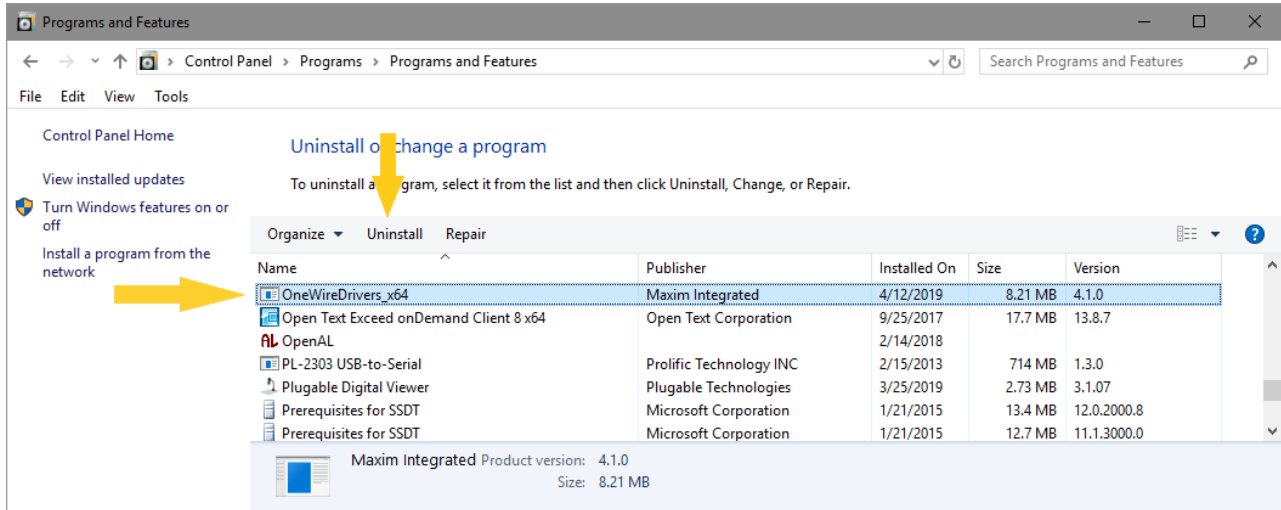
Figure 7. Uninstall the OneWireViewer and drivers.

OneWireViewer Features

Program Main Window

The main window of the OneWireViewer consists of four areas: **Device List** (top left), **1-Wire Search Mode** (bottom left), **Tab area** (to the right), and menus (top row). The width of the device list/search mode area can be adjusted by horizontally moving the vertical scroll bar that separates these areas from the **Tab area**. The **Device List** and **1-Wire Search Mode** areas can be removed or restored by clicking on one of the triangles to the right of the **Device List**, as seen in **Figure 8**.
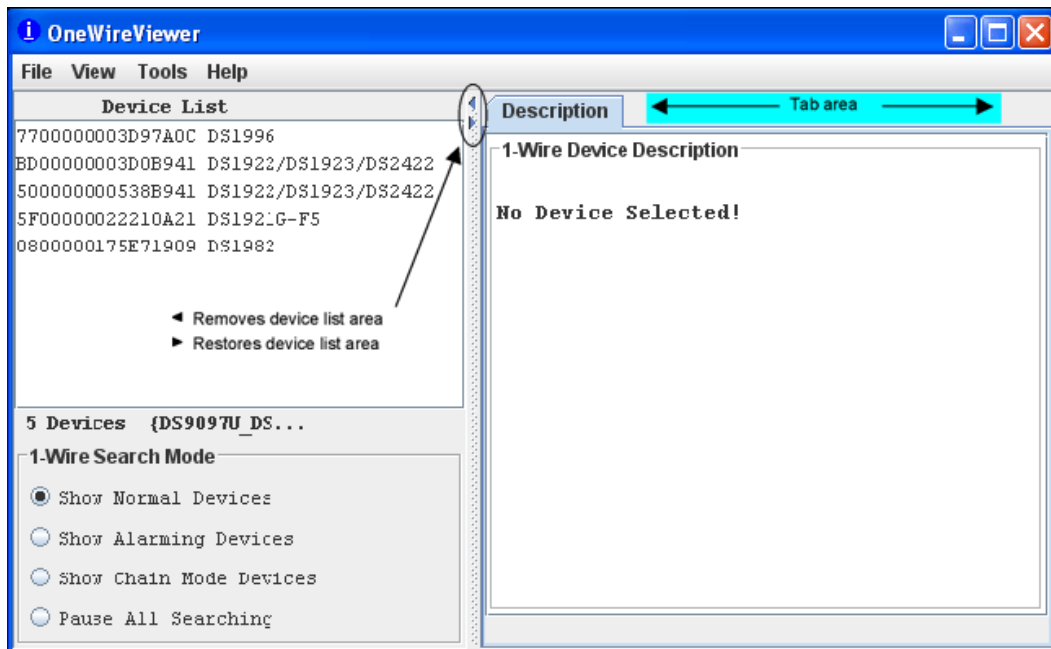
Figure 8. OneWireViewer main window.

Viewer Menus

File

Close (to exit program)

This function has the keyboard shortcut **Alt+1**, instead of **Alt+F4**, though the program will end with **Alt+1**, **Alt-1**, and **Alt+4**. However, the **1** must be pressed on the normal keypad, not the numeric keypad, to be accepted.

View

Show Message Log (to read error messages)

This function opens a new window that displays the device access log and error messages.

Show Tab in New Window (to view multiple functions or devices simultaneously)

To use this function, first select a device, then select one of the available tabs. Next, select **Show Tab in New Window**, which moves the selected tab into a window of its own. The main window will then revert back to the **Description** tab.

Show Device Alternate Names (to see alternate names in the device list)

Example: Thermochron appears to the right of the ROM ID instead of DS1921G-F5.

Tools

Pick Adapter (to change the communication port and 1-Wire port adapter)

This function opens a new window for selecting one of several 1-Wire port adapters, port type, and port number. For more information, see the *How to Change 1-Wire Adapters and Ports* section of Maxim application note 5057: "**OneWireViewer Tips and Tricks**."

XML Tagging (to load device tags that can be displayed in the device list)

This opens a new window to select the file that holds the XML tags of the devices in use. See Maxim application note 158: "**1-Wire® Tagging with XML**" for tag specification and how to create tag files that are compatible with the OneWireViewer.

1-Wire Speed (to select the preferred 1-Wire speed)

This function allows selection of standard speed or overdrive speed. Most 1-Wire devices support both speed modes. To use overdrive speed, the port adapter must also support overdrive. If overdrive is selected and the port adapter does not support overdrive, an error message will appear when trying to access an overdrive-supporting 1-Wire device.

Device Poll Rate (to set the frequency at which the 1-Wire net is searched for devices)

The rates are 1s, 5s, 10s, 30s, 1min, 5min, and immediate poll. The typical value is 1s, which yields the fastest response.

Help

About (displays the version numbers of the software components that comprise the OneWireViewer)

This function opens a window that displays the:

- Site from which the source code of the 1-Wire API and OneWireViewer can be downloaded

- API version

- Version numbers of the various viewers

- Location of the onewireviewer.properties file on the local hard drive

The OneWireViewer is provided as a source code example in the **1-Wire API for Java Kit**.

Viewer Window Areas

Device List

This is the area that displays the ROM IDs of devices on the network and the device part numbers/names. The **1-Wire Search Mode** controls whether a device is included in the list. Devices that arrive on the network are appended at the bottom of the list. If XML tags have been defined (see *XML Tagging* in the ***Viewer Menus>Tools*** section), the device list shows the tags instead of the part numbers or names. In addition, only the functionality associated with their tags is exercisable.

Below the **Device List**, the total number of devices on the network and the type of port adapter are displayed. In this example, the adapter is a DS9097U. The { } brackets around the adapter name indicate that it uses a native TMEX driver.

1-Wire Search Mode (affects the contents of the device list)

Show Normal Devices

When checked, the list shows all devices on the network.

Show Alarming Devices

When checked, the list shows only devices that respond to the Conditional Search ROM command (e.g., because of an alarming condition).

Show Chain Mode Devices

When checked, the list shows only devices that support the Chain Mode. This feature allows detecting the physical sequence of all the devices in a linear network that are wired for Chain Mode. An example device is the DS28EA00 1-Wire digital thermometer.

Pause All Searching (to stop/restart searching the network for arriving/departing devices)

When checked, the 1-Wire network is no longer searched. This minimizes the communication traffic on the network (e.g., to facilitate catching events with an oscilloscope), and freezes the content of the device list. An error message will be generated if one selects a device that has departed from the network. With the searching paused, one cannot access devices that have arrived because they are not included in the device list. To end the pause, check **Show Normal Devices**.

Tab Area

Once a device is selected, the **Description** tab appears with a short description of the device. Depending on the device, additional tabs may appear that provide access to the applicable device function viewers. See **Table 1** for a list of devices and applicable device viewers.
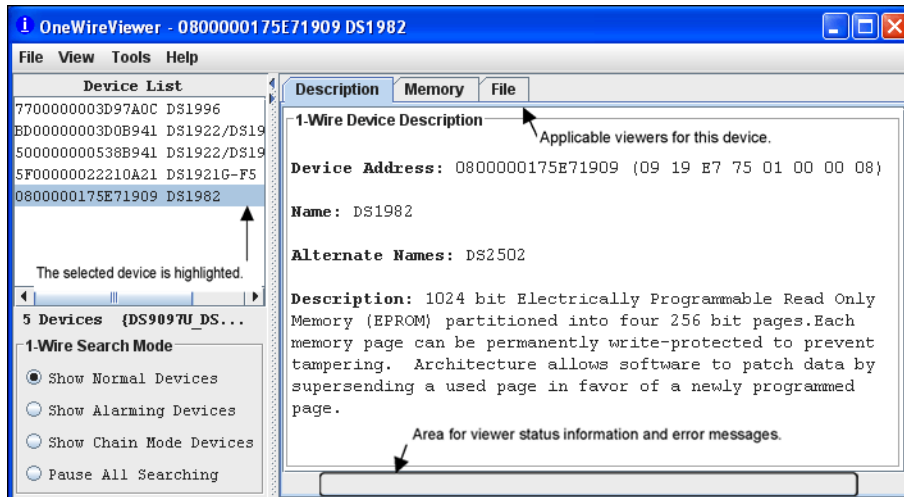
Figure 9. OneWireViewer tab area.

The 1-Wire and iButton products support a broad set of features. **Table 1**, sorted by family code, shows the applicable device function viewers.

Table 1. Supported Devices

Supported Devices	Family Code	Thermochron	Mission	Temperature	Humidity	Switch	A to D	Clock	Memory	File	Password
DS1990A DS1990R	01										
DS1993L	06								√	√	
DS1992L	08								√	√	
DS1982 DS2502	09								√	√	
DS1995L	0A								√	√	
DS1985 DS2505	0B								√	√	
DS1996L	0C								√	√	
DS1920	10			√							
DS2406	12					√			√	√	
DS1971[1] DS2430A[1]	14								√	(√)	
DS28E04	1C					√			√	√	
DS1921	21	√		√				√	√	√	
DS1822	22			√							
DS1973	23								√	√	
DS1904 DS2415	24							√			
DS2438	26			√	√		√	√			
DS2417	27							√			
DS18B20	28			√							
DS2408	29					√					
DS2431	2D								√	√	
DS2760 DS2762	30			√			√				
DS1977	37								√	√	√
DS2413	3A					√					
DS1922	41		√	√			(√)	√	√	√	√
DS1923	41		√	√	√			√	√	√	√
DS1925	53		√	√			(√)	√	√	√	√
DS28EA002	42			√							
DS28EC20	43								√	√	

[1]It is possible to format this device; however, there is no memory left to store a file.

[2]This device supports Chain Mode; see the data sheet for more information.

Device Function Viewers

Thermochron (Temperature Logging)

The Thermochron viewer gives real-time information on the mission parameters and status of the selected Thermochron iButton connected to the OneWireViewer. The user can start a new mission, end (disable) a running mission, view and download the mission's temperature log, and see (but not download) the mission's temperature histogram and alarm log. Similar to the Mission viewer, the Thermochron viewer is used only for the DS1921 series of temperature loggers and their features. See also **Table 1** for details.

The tab structure of the Thermochron viewer consists of two areas: **Command** (top), and device data tabs (bottom). The **Command** tab includes three buttons to operate the device's logging function and to select the temperature scale (°C or °F). Depending on the size of the **Thermochron** tab, there can be scroll bars for both.

Figure 10. Sample Thermochron viewer tab.

Thermochron Viewer Commands

Refresh Mission Results (to read device status, temperature, histogram, and alarm log)

This allows a mission to be monitored in progress without changing device viewers.

Start New Mission (to allow the user to enter all data necessary to start a new mission)

This command opens a new window in which the user enters the parameters for the next mission.

Disable Mission (to stop a running mission)

This command stops a mission. The collected data remains stored in the device.

When the **Thermochron** tab is active, the Thermochron viewer:

- Automatically reads the device status, temperature, histogram, and alarm log.

- Automatically displays the device status on the **Status** tab.

- Displays the temperature log as a graphic if you open the **Temperatures** tab.

- Displays the temperature histogram in text form if you open the **Histogram** tab.

- Displays the alarm log in text form if you open the **Alarm Log** tab.

- Allows the temperature scale to be changed between °C (default) and °F; the selected scale is stored in memory.

- Allows activation of automatic rescaling of the temperature log graph.

- Allows the graph data to be exported by using the clipboard or saving as a CSV (Excel®) file.
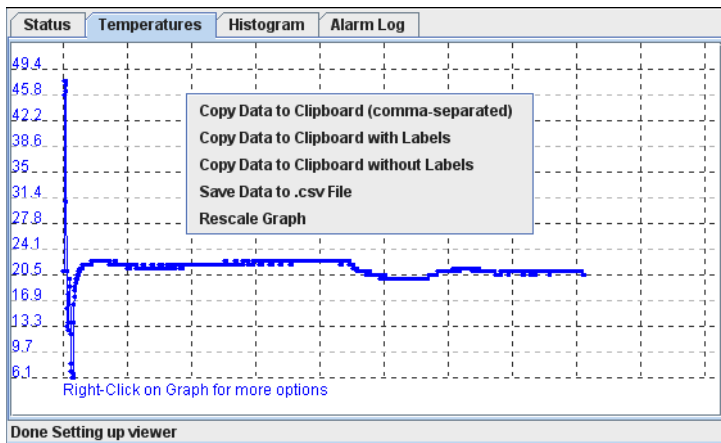
Figure 11. Sample temperature log graphic.
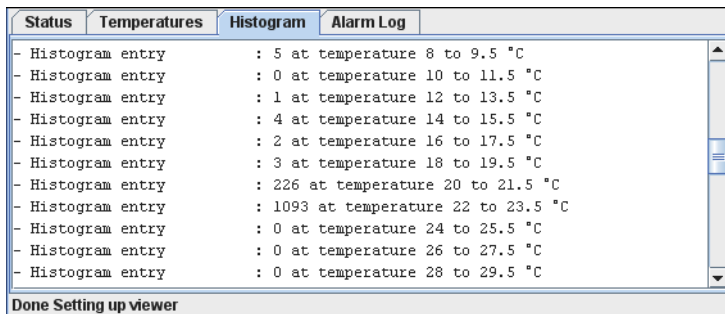
Figure 12. Sample histogram.
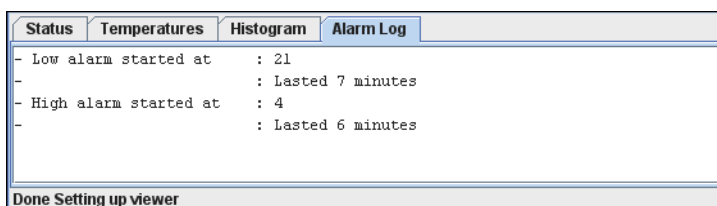
Figure 13. Sample alarm log.
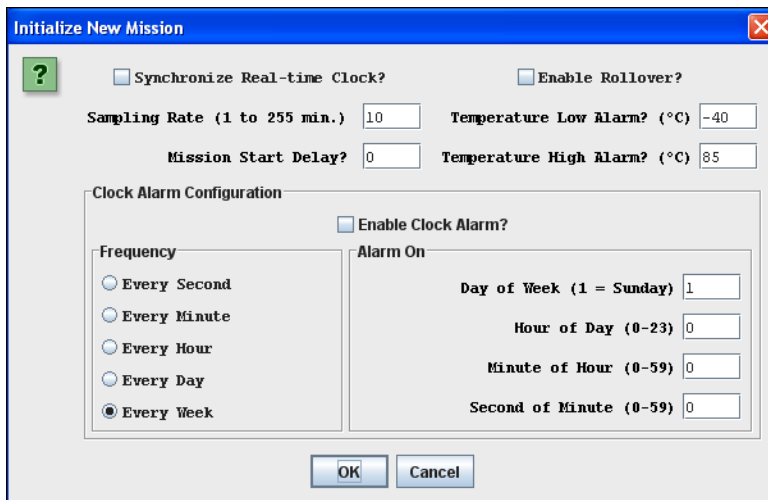
Figure 14. Start New Mission window (default).

It is recommended that you synchronize the device's real-time clock (RTC) to the PC. Enter the mission start delay in minutes. Sampling rate, mission start delay, temperature alarms, and rollover depend on the technical requirements of the mission. See the respective DS1921-series data sheets for guidelines. The clock alarm functions are not relevant for a device on a mission. The default settings, therefore, can be accepted.

Notes:

- The Thermochron viewer does not enable the temperature-high and temperature-low alarm search. As a result, if a temperature alarm occurs during the mission, the device will not be identified as an alarming device unless there is also a timer alarm.

- For the alarm-frequency and alarm-time values to be updated in the device, **Enable Clock Alarm?** must be checked. Otherwise, the current (i.e., previous mission's) settings remain in effect for the new mission.

- When a mission extends across time zones, the time shown in the exported data (clipboard or CSV file) refers to the time at the location where the mission was started.

Mission (Temperature and Humidity Logging)

The Mission viewer gives real-time information on the mission parameters and status of the selected temperature logger iButton connected to the OneWireViewer. The user can start a new mission, end (disable) a running mission, and view and download the mission's temperature and humidity. The Mission viewer is similar to the Thermochron viewer, but it is used for the DS1922 series of iButton products, the DS1923 Hygrochron and its features, and the DS2422 1-Wire temperature/data logger. See also **Table 1** for details.

The tab structure of the Mission viewer consists of two areas: **Command** (top), and device data tabs (bottom). The **Command** tab includes three buttons to operate the logging function of the device, and two checkboxes to select the temperature scale (°C or °F). Depending on the size of the **Mission** tab, there may be scroll bars for both areas.
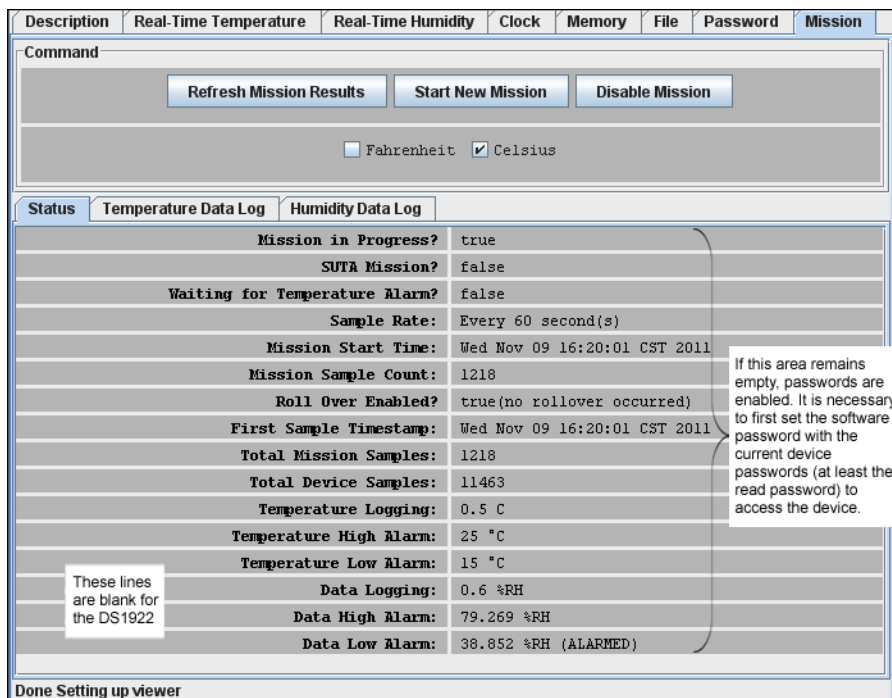
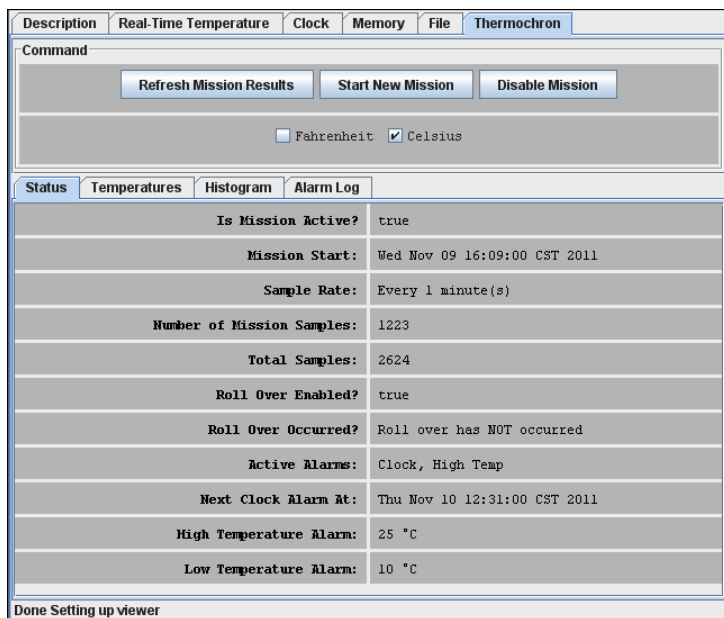*Figure 15. Simple Mission viewer tab.*

Mission Viewer Commands

Refresh Mission Results (to read device status, temperature log, and data log)

This allows a mission in progress to be watched without changing device viewers. If passwords are enabled for the device, the user must first use the Password viewer command **Set Software Passwords** before access is granted to device data.

Start New Mission (to allow the user to enter all data necessary to start a new mission)

This command opens a new window in which the user enters the parameters for the next mission. If passwords are enabled for the device, the user must first use the Password viewer command **Set Software Passwords** before access is granted to device data.

Disable Mission (to stop a running mission)

This command stops a mission. The data collected remains stored in the device. If passwords are enabled for the device, the user must first use the Password viewer command **Set Software Passwords** before access is granted to device data.

When the **Mission** tab is active, the Mission viewer:

- Automatically reads the device status, temperature log, and data log.

- Automatically displays the device status on the **Status** tab.

- Displays the temperature log as a graphic if you open the **Temperature Data Log** tab.

- Displays the humidity or data log as a graphic if you open the **Humidity Data Log** tab).

- Allows the temperature scale to be changed between °C (default) and °F; the selected scale is stored in memory.

- Allows activation of automatic rescaling of the log graphs.

- Allows log data to be exported by using the clipboard or saving as a CSV (Excel) file.
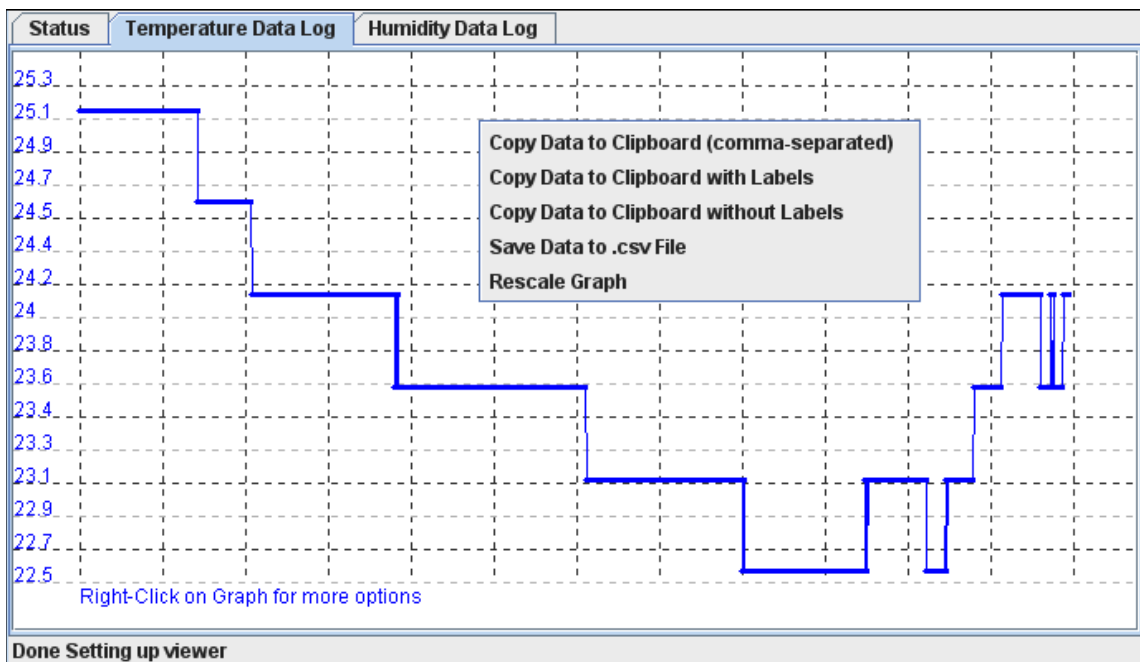
Figure 16. Sample Temperature Data Log graphic. (Humidity Data Log looks similar.)
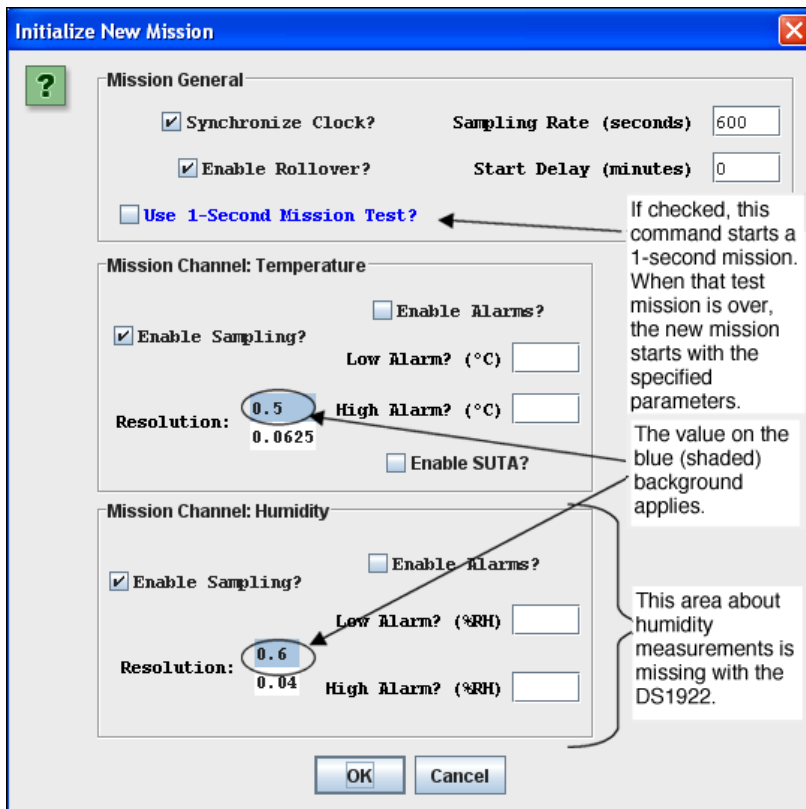
Figure 17. Start New Mission window (default).

It is recommended that you synchronize the device's RTC to the PC. Enter the **Sampling Rate** in seconds (between samples). Enter the mission's **Start Delay** in minutes. Sampling rate, mission start delay, resolution, alarms, and rollover depend on the technical requirements of the mission. See the respective device data sheets for details and guidelines.
Notes:

- **SUTA** means Start mission Upon Temperature Alarm.

- **Mission Samples Count** on the **Status** tab indicates the number of valid samples in the data-log memory. This number stops incrementing when the memory is full.

- **Total Mission Samples** indicates the number of samples taken during a mission. This number continues incrementing when a rollover occurs.

- **Use 1-Second Mission Test?** is not needed for B1 revision parts (date code 2007 and newer; serial numbers 005A900h to 005C09Fh, 0064200h and higher).

- Although the part is found as an alarming device, a **Temperature High Alarm** is not flagged on the **Status** tab. If there is a **Temperature Low Alarm**, both the high and low alarm are flagged on the **Status** tab.

- When a mission extends across time zones, the time shown in the exported data (clipboard or CSV file) refers to the time at the location where the mission was started.

Password

The Password viewer allows the user to set, enable, and disable passwords on a 1-Wire device, and to input the device-specific read and write passwords into the viewer.

As seen in **Figure 18**, the tab structure of the Password viewer consists of two areas: **Info** (top) and **Config** (bottom). The **Config** tab has three buttons to set the software passwords, set the device passwords, and enable/disable the password protection on the 1-Wire device. Depending on the size of the **Password** tab, there may be scroll bars for the **Info** area.
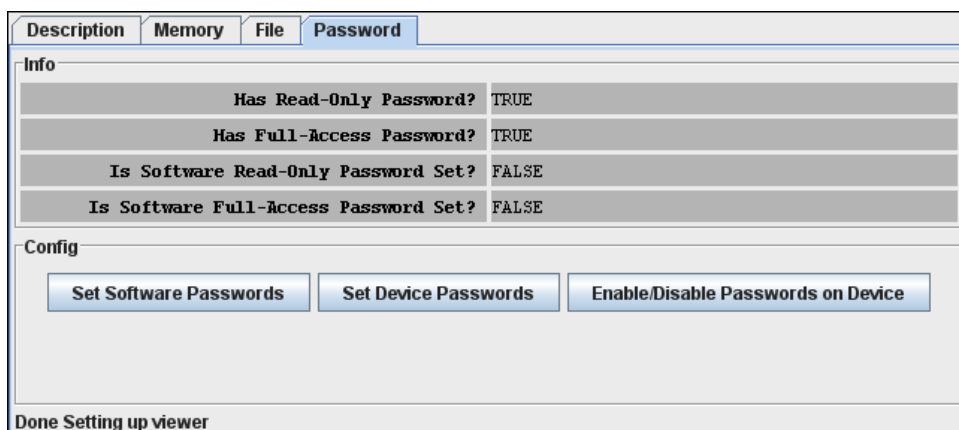
Figure 18. Password viewer tab.

Password Viewer Commands

Set Software Passwords (to input the read and write password of the device into the software)

If the device has passwords enabled, the viewer needs to know the passwords to access the device. This command prompts the user to enter a read password in a separate small window. Once the read password is entered, the user is asked to enter the full-access password. The viewer does not store the passwords in memory after the session with a particular device is closed. Passwords are 8-byte hexadecimal strings.

Set Device Passwords (to write a read password and a full-access password to the device)

If the user wants to activate passwords with the device, the passwords must first be written to the device and then enabled to take effect. This command prompts the user to specify/enter a read password in a separate small window. Once the read password is entered, the user is asked to enter the full-access password. Next, the passwords are written to the respective device registers. The viewer does not store the passwords in memory after the session with a particular device is closed. Passwords entered with this command are automatically taken as software passwords; there is no need to reenter these passwords as software passwords. Passwords must be entered as 8-byte hexadecimal strings.

Enable/Disable Passwords on Device (to enable or disable the use of passwords with the device)

This command allows the user to activate (enable) passwords that were written to the device previously. If passwords are enabled, this command allows the user to disable them. This command does not erase passwords in the device.

Real-Time Temperature

The Real-Time Temperature viewer gives a real-time temperature reading of the selected 1-Wire temperature device connected to the OneWireViewer. The real-time temperature log on the screen is created from temperature data stored in the PC's memory. This is different from Thermochron and Mission viewers, where the temperature logging is performed inside an iButton, whether or not the device is connected to the OneWireViewer.

The tab structure of the Real-Time Temperature viewer (shown in **Figure 19**) consists of three areas: **Info** (top), **Graph** (bottom left), and **Thermometer** (bottom right). Depending on the size of the **Real-Time Temperature** tab, there may be scroll bars for the **Thermometer**, **Graph**, and **Info** areas. The Real-Time Temperature viewer applies to devices that contain a digital thermometer. See **Table 1** for the list of devices.
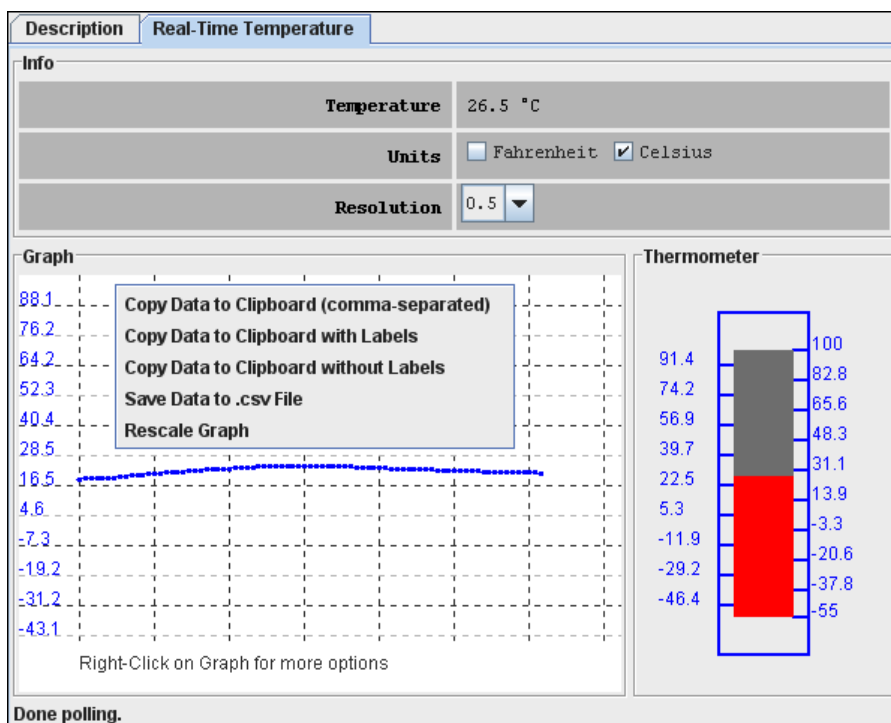
Figure 19. Sample Real-Time Temperature tab.

When the **Real-Time Temperature** tab is active, the Real-Time Temperature viewer:

- Continuously issues the device-specific command to perform a temperature conversion.

- After each conversion, reads the temperature registers of the selected device.

- Converts the reading from the device-specific format into a conventional format.

- Displays the result as a number, graph, and thermometer scale.

- Compresses the horizontal scale of the graph, as needed, to display additional readings.

- Allows the temperature scale to be changed between °C (default) and °F. The selected scale is stored in memory.

- Allows the resolution of the temperature display (some devices only) to be changed.

- Allows activation of automatic rescaling of the graph.

- Allows graph data to be exported by using the clipboard or saving as a CSV (Excel) file.

Notes:

- The Real-Time Temperature viewer closes whenever the selected device is found to be missing from the network or when another device is selected.

- To keep the Real-Time Temperature viewer running while evaluating other devices, first activate the Real-Time Temperature viewer. Then, on the **View** menu (see the OneWireViewer main window), select **Show Tab in New Window** to restart the Real-Time Temperature viewer in a new window. This separate window will remain open, even if the device disappears from the network.

- With the DS1922L, DS1922T, and DS1923, the temperature readings displayed are software corrected. For the DS1922E, software correction does not apply.

- The Real-Time Temperature viewer cannot read the temperature of a Thermochron (DS1921, DS1922, or DS1923) that is currently running a mission.

Real-Time Humidity

The Real-Time Humidity viewer gives a real-time humidity reading of the selected 1-Wire humidity device connected to the OneWireViewer. The real-time humidity log on the screen is created from humidity data stored in the PC's memory. This is different from Mission viewer, where the humidity logging is performed inside an iButton whether or not it is connected to the OneWireViewer.

The tab of the Real-Time Humidity viewer consists of three areas: **Info** (top), **Graph** (bottom left), and **Humidity** (bottom right). Depending on the size of the **Humidity** tab, there may be scroll bars for the graph and/or humidity area. The Real-Time Humidity viewer applies primarily to the DS1923. The viewer may also support other devices that can be set up to measure humidity. See **Table 1** for the list of devices.
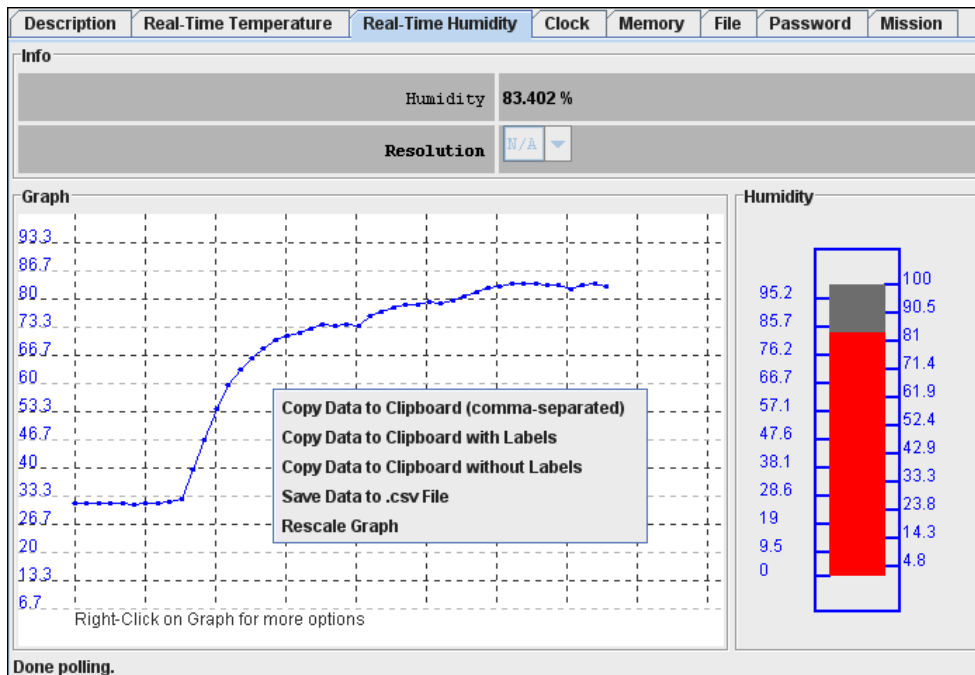
Figure 20. Sample Real-Time Humidity tab.

When the **Real-Time Humidity** tab is active, the Real-Time Humidity viewer:

- Continuously issues the device-specific command to perform a humidity conversion.

- After each conversion, reads the humidity registers of the selected device.

- Converts the reading from device-specific format into a conventional format.

- Displays the result as a number, graph, and humidity scale.

- Compresses the horizontal scale of the graph, as needed, to display additional readings. Allows activation of automatic rescaling of the graph.

- Allows graph data to be exported by using the clipboard or saving as a CSV (Excel) file.

Notes:

- The Real-Time Humidity viewer closes whenever the selected device is found to be missing from the network or when another device is selected.

- To keep the Real-Time Humidity viewer running while evaluating other devices, first activate the Real-Time Humidity viewer. Then, on the **View** menu (see OneWireViewer main window), select **Show Tab in New Window** to restart the Real-Time Humidity viewer in a new window. This separate window will remain open, even if the device disappears from the network.

- To watch humidity and temperature simultaneously, open the Real-Time Humidity and Real-Time Temperature viewers in separate windows.

- With the DS1923, the humidity readings displayed are software corrected; they are not compensated for temperature or saturation drift.

- The Real-Time Humidity viewer cannot read the humidity of a DS1923 that is currently running a mission.

Switch

The Switch viewer gives real-time information on the input/output (I/O) channels of the selected 1-Wire addressable switch device connected to the OneWireViewer. This information includes the channel's state, the logic level at its output, and the state of the associated activity latch. The user can change (toggle) the state of the I/O channel and clear its activity latch. Each I/O channel of a multichannel addressable switch device can be operated individually.

The tab of the Switch viewer consists of two areas: **Features** (top), and **Channels** (bottom). The **Features** area lists device-specific characteristics. The number of switches (i.e., number of channels) for the selected device is indicated by the number of channel boxes in the channels area. A digital switch can be closed (**State** = true) or open (**State** = false). **Level** shows the logic equivalent of the voltage at the switch output. Each channel has two command buttons associated with it. Depending on the size of the **Switch** tab and/or the device, there may be scroll bars for both areas. The Switch viewer applies to all devices that contain one or more electronic switches. See **Table 1** for the list of devices.
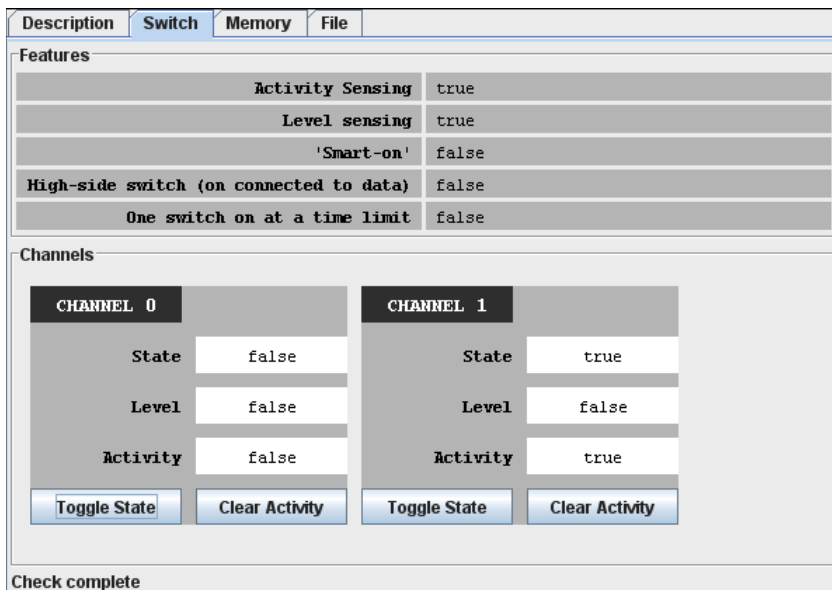
Figure 21. Sample Switch tab.

Switch Viewer Channel Commands

Toggle State (to toggle the state of the switch between on and off)

This command allows the switch's state to be changed through the 1-Wire network.

Clear Activity (to clear the channel's activity latch)

This command allows the switch's activity latch to be cleared through the 1-Wire network.

When the **Switch** tab is active, the Switch viewer:

- Continuously reads the state of all channels of the selected device.

- Automatically updates the state, level, and activity information in the **Channels** area.

Notes:

- To use a switch channel as a remote digital sensor, the switch must be off (**State** = false).

- See the respective device data sheets for more details on how the individual channels operate.

Clock

The Clock viewer gives a real-time reading of the RTC in the selected 1-Wire device connected to the OneWireViewer. This viewer also tells the time difference between the RTC in the 1-Wire device and in the PC. The user can synchronize the RTC in the 1-Wire device to the one in the PC or halt the RTC oscillator in the 1-Wire device.

The tab of the Clock viewer consists of two areas: **Info** (top), and **Config** (bottom). Depending on the size of the tab area, there may be scroll bars (horizontal or vertical) for the **Info** area. The current time is always displayed in the 24-hour format with time zone. The Clock viewer applies to all devices that contain an RTC. See **Table 1** for the list of devices.

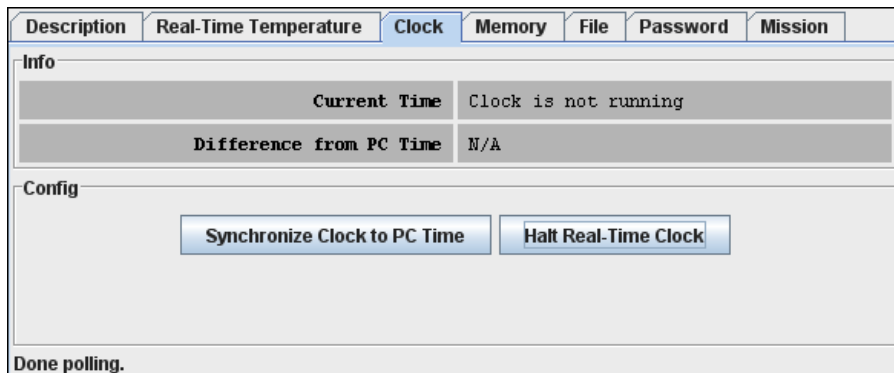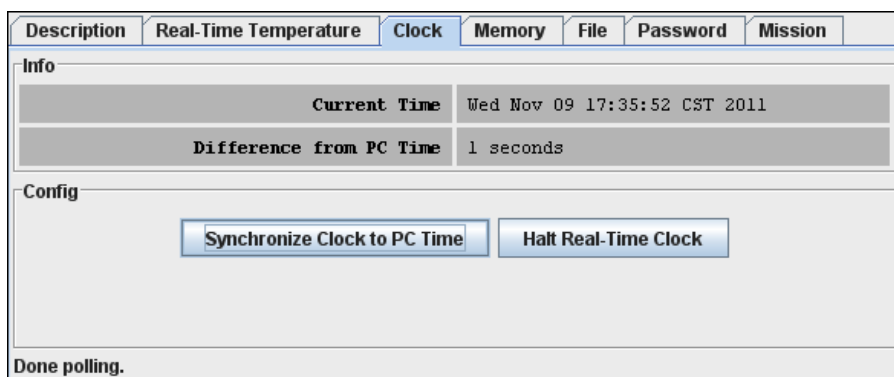*Figure 22. Sample Clock tab – initial view.*

Figure 23. Sample Clock tab – after clock synchronization.

When the **Clock** tab is active, the Clock viewer:

- Continuously reads the time registers of the selected device.

- Converts the reading from the device-specific format into a conventional format.

- Displays the time read from the device (automatically updated with every reading).

- Allows the RTC oscillator to be stopped and restarted.

- Allows the time/date of the computer (PC or workstation) to be copied to the time registers in the device (i.e., click on **Synchronize Clock to PC Time**); this function also restarts a halted RTC oscillator.

Notes
- If the 1-Wire device uses a binary counter such as an RTC (e.g., the DS1904, DS2415, or DS2417), the Clock viewer sets the device clock to UTC (also known as Greenwich Mean Time, GMT). If the RTC of the 1-Wire device counts seconds, hours, days, months, and years in separate registers (e.g., the DS1921, DS1922), the Clock viewer sets the device clock to the local time.

Memory

The Memory viewer displays in hexadecimal format the data of the selected memory bank of the selected 1-Wire memory device connected to the OneWireViewer. The user can change the data (see *Hex Editor* in the **Auxiliary Functions** section) and write it back to the 1-Wire device.

The tab of the Memory viewer consists of three areas: **Banks** (top), **Info** (bottom left), and **Contents** (center right). Two buttons below the **Contents** area allow: the data of a selected memory bank to be reread (**Refresh** button), and data that was manually entered in the contents area to be written to the 1-Wire device (**Commit Changes** button). Depending on the size of the tab area, there may be scroll bars for the **Info** and **Contents** area. The Memory viewer applies to all devices that contain general-purpose user memory and/or special function/register pages. See **Table 1** for the list of applicable devices.

A memory bank must first be selected before its data (**Contents** area) and characteristics (**Info** area) will be displayed. The **Contents** area is automatically refreshed whenever the bank selection changes.
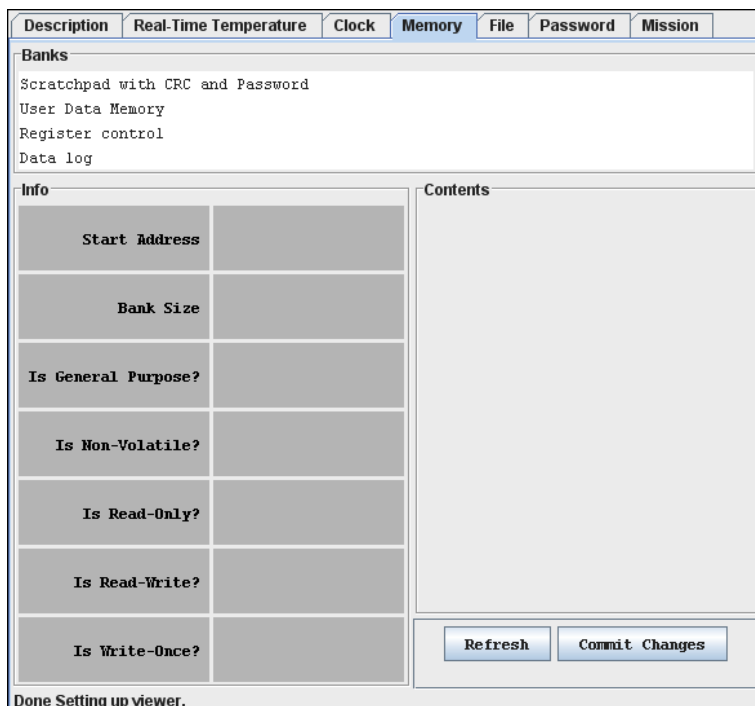

Figure 24. Sample Memory tab (DS1922L).

When the **Memory** tab is active, the Memory viewer:

- Lists the names of the available banks.

- Displays the characteristics and contents of the selected bank.

- Allows the contents of the selected bank to be changed.

- Allows the new data to be copied to the selected bank.
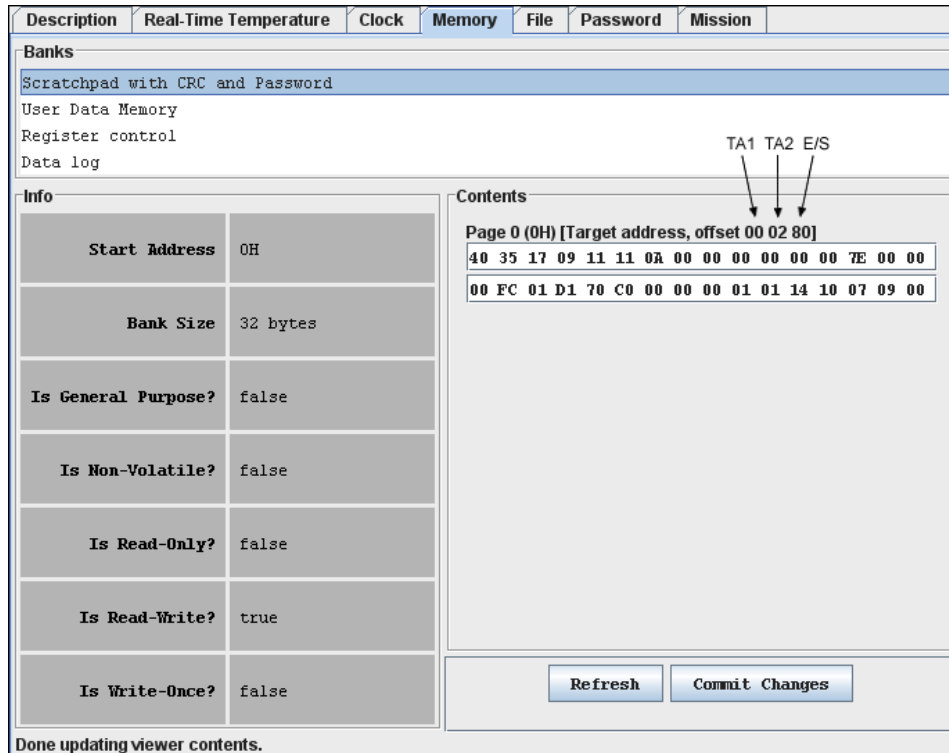
Figure 25. Sample Memory tab with scratchpad selected.

Notes:

- The number of the memory banks and their respective names depend on the type of the device viewed.

- The display format in the content field varies with the device and memory bank selected. For most devices there are 2 x 16 bytes per page. With EPROM devices, there are n x 8 bytes (special function registers only). With the DS1977, the format is 2 x 32 bytes per page.

- If the selected memory bank is a scratchpad, the target address TA1, TA2, and the E/S byte (offset) are displayed above the scratchpad contents. With other memory banks and depending on the device, one will see device-specific information associated with a memory page.

- To write to the device, select the bytes to be changed in the **Contents** field, type "new data", and click on **Commit Changes**. This method applies to all memory blocks shown in the **Memory** tab. The viewer will perform the necessary steps (e.g., write scratchpad, copy scratchpad) to update the device memory or register. See *Hex Editor* in the *Auxiliary Functions* section for more details.

- Writing to an EPROM device requires a port adapter that supports 12V programming pulses.

File

The File viewer displays the file names and directory structure of the selected 1-Wire memory device connected to the OneWireViewer. The user can format the device, create/delete directories and files, edit files (see *Hex Editor* and *ASCII Editor* in the **Auxiliary Functions** section), resize files, and write them back to the 1-Wire device.

The File viewer supports the 1-Wire File Structure. (See Maxim application note 114: "**1-Wire File Structure**.") The tab of the File viewer consists of two areas: directory (center left), and file contents (center right). In addition, there are eight command buttons. The vertical bar between the directory and file contents can be moved horizontally to change the size of the areas. Depending on the size of the **File** tab, there may be scroll bars for the directory and file contents area. The File viewer applies to all devices that contain general-purpose user memory. See **Table 1** for the list of devices.
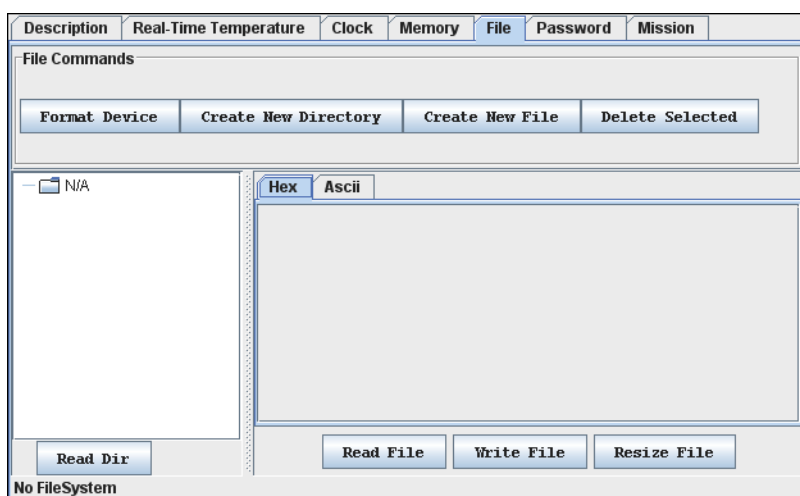
Figure 26. Sample File tab (DS1922L).

File Viewer Commands

Format Device (to create a root directory in the device)

The device must be formatted before files can be created. See Maxim application note 114: "**1-Wire File Structure**" for additional information. Formatting does not erase the memory. Data from previous sessions will eventually be overwritten.

Create New Directory (to create a file directory or subdirectory)

Directory names are up to four ASCII characters long.

Create New File (to create a file in the device)

File names are up to four ASCII characters plus a numeric extension in the range from 0 to 99. Certain extensions are reserved for special purposes, e.g., 100 for Append Files (EPROM devices only). For more information, see Table 1 in application note 114: "**1-Wire File Structure**."

Delete Selected (to delete a file or directory)

This function deletes the entry of the file in the directory or removes a subdirectory. It does not erase the file contents. However, with the file entry or subdirectory removed, the file is no longer accessible through the File viewer. The file data can be recovered on the byte level through the Memory viewer (see above).

Read Dir (to read the device directory)

Displays file and directory names.

Read File (to read and display the contents of the selected file)

The file contents can be viewed as data bytes or as text. Click on the **Hex** or **Ascii** tab to change the view.

Write File (to write changes to the device)

This function assumes that the size of the file has not changed. If the file size has changed, first use **Resize File** to specify the new file length. **Write File** includes an automatic readback for verification.

Resize File (to change the size of a file)

This function allows specification of the number of bytes that will be used for the file. If the new size is lower than the number of characters (bytes) in the content area, the data will be truncated at the end. If the new size is too large, 00h bytes will be appended at the end of the file. A file first needs to be read before it can be resized.

When the **File** tab is active, the File viewer:

- Provides access to various file and directory functions.

- Allows a file to be selected or a directory to be opened.

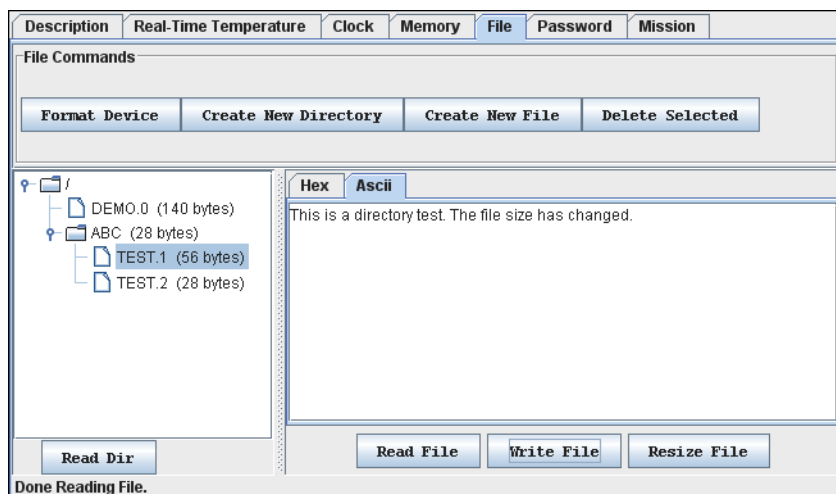- Allows the file's contents and size to be changed. Allows the new contents to be written to the device.

Figure 27. Sample File tab with directory and file data displayed.

Notes:

- The 1-Wire File Structure allows multiple devices to be formatted as one cluster. For this reason, when formatting a device, the device needs to be selected again, even if the File viewer already accesses it.

- Before data can be written to a file, the file must first be created as a new file.

- The file size is a multiple of 28 bytes (59 bytes with the DS1977). Changing the file size through **Resize File** automatically updates the file size in the display's directory area. Changing the file size to 0 bytes is equivalent to first deleting and then creating the same file again.

- A new file is filled with 00h bytes and has a size of 28 bytes (59 bytes with the DS1977).

- To create a file inside a directory, first click on the directory and then use the **Create New File** function.

To change the contents of a file (hex, as well as ASCII format), select the section (bytes/characters) to be changed, type the new content, and click on **Write File**. If the file is edited on the **ASCII** tab, there will be an automatic resize when the file is written back to the device. See *Hex Editor with File Viewer* and *ASCII Editor* in the ***Auxiliary Functions*** section for more details.

- Writing to an EPROM device requires a port adapter that supports 12V programming pulses.

- When accessing another device, the file contents area still shows data from the most recently accessed file.

- To copy data from a disk file to the File viewer and vice versa, use the editing, copy, and paste functions of the operating system.

Auxiliary Functions

Hex Editor

The Memory viewer allows the user to enter data in hex format. The File viewer expects hex input when the **Hex** tab is selected. There are three ways to use the hex editor:

- Change: Select one or more bytes and replace them with the same number of new bytes.

- Delete : Select one or more bytes and delete them.

- Insert: Position the cursor between bytes in the contents field and enter one or more bytes.

With special function registers or EPROM devices, one should only change (overwrite) bytes, but not insert or delete bytes.

Hex Editor with Memory Viewer

Editing Area

All fields with white background that are displayed in the **Contents** area of the viewer. Each field is treated as an independent entity. More than one field can be updated before committing the changes.

Changing Data

Using the cursor, select a range of adjacent bytes in the editing area and type as many new bytes as are selected. Entering data overwrites the selected range and changes the background color of the field to yellow. When finished, click **Commit Changes**.

Deleting Data

Using the cursor, select one or more adjacent bytes in the editing area and press the **Delete** key. This removes as many bytes as are selected in the editing area and changes the background color of the affected field to yellow. When finished, click **Commit Changes**. The viewer will ask for permission to pad the affected field(s) in the editing area with 00h bytes. This padding, however, does not happen and data at the end of the affected field(s) remains unchanged. All other data in the field(s) is shifted to the left (lower address) according to the number of bytes deleted.

Inserting Data

Position the cursor in a field of the editing area and type the data to be inserted. This changes the background color of the field to yellow and shifts existing data to the right of the cursor out of the field, where it is lost. When finished, click **Commit Changes**.

Verifying Data

Click **Refresh** and scroll to the updated field in the editing area.

Error Handling

Numbers from 0 to 9 and characters (upper/lower case) from A to F are accepted. Other characters can be entered in the editing area, but they are not written to the device. Spaces are optional between bytes; they are taken as delimiters.

Hex Editor with File Viewer

Editing Area

Multiple rows of 16 bytes each in the **Hex** tab of the viewer; the last row can be shorter (partially editable). Each row is treated as an independent entity. More than one row can be updated before committing the changes. Use the **Resize** button to set the size of the editing area, as needed. The description below assumes that the editing area contains data, which was obtained by selecting a file in the directory area and then clicking **Read File**.

Changing Data

Using the cursor, select a range of adjacent bytes in the editing area and type as many new bytes as are selected. Entering data overwrites the selected range and changes the background color of the row to yellow. When finished, click **Write File**.

Deleting Data

Using the cursor, select one or more adjacent bytes in the editing area and press the **Delete** key. This removes as many bytes as are selected in the editing area and changes the background color of the affected field to yellow. When finished, click **Write File**. There is no padding at the end, and data deleted at the end remains unchanged. All other data in the row(s) is shifted to the left (lower address) according to the number of bytes deleted.

Inserting Data

Position the cursor in a row of the editing area and type the data to be inserted. This changes the background color of the field to yellow and shifts existing data to the right of the cursor out of the row, where it is lost. When finished, click **Write File**.

Verifying Data

After writing, the file is automatically read back and its data is displayed.

Error Handling

Numbers from 0 to 9 and characters (upper/lower case) from A to F are accepted. Other characters can be entered in the editing area, but an error message appears if there is an attempt to write the file to the device. Spaces are optional between bytes; they are taken as delimiters.

ASCII Editor (File Viewer Only)

Editing Area

This is a large blank field in the **ASCII** tab of the viewer. The size of the file can be changed using the **Resize** button. The description below assumes that the editing area is filled with "blanks" or contains data, which was obtained by selecting a file in the directory area and then clicking **Read File**.

Changing Data

Using the cursor, select a range of adjacent characters in the editing area and type as many new characters as are selected. Entering data overwrites the selected range. When finished, click **Write File**.

Deleting Data

Using the cursor, select one or more adjacent characters in the editing area and press the **Delete** key. This removes as many characters as are selected in the editing area. When finished, click **Write File**. Instead of padding at the end, the file is automatically resized.

Inserting Data

Position the cursor in the editing area and type the text to be inserted. No text is deleted. When finished, click **Write File**. The file is automatically resized.

Verifying Data

After writing, the file is automatically read back and its data is displayed.

Error Handling

All characters are accepted, including those that are not found on the English keyboard.

DS1925/DS1922L Comparison

- Family code is 53h instead of 41h.

- 3920 log pages instead of 256.

- RTC is in seconds instead of BCD. (The Java code converts it into seconds anyway so there is no impact for OWAPI users.)

- User memory is write once, but the whole 16 pages can be cleared.

- All functions now require strong pullup (handled by the container and memory banks for OWAPI users).

- No rollover on missions.

- The log can be read in a failing battery condition. This is done by reading a backup copy of the mission registers on pages 19 to 20.

- New function to read the battery voltage.

OneWireViewer DS1925/DS1922L Mission Viewer Comparison

- New button **Clear Mission Log** (**Figure 28**). This can be called to do an **XPC Clear Memory (log)** on a new device. This could be done to a device that you don't want to start a mission but want to get it out of the starting state.

- New mission status field **Battery Fail Condition:** with a field of either true or false to indicate battery status.

- The OneWireContainer implements **ADContainer** so the **A to D** viewer tab appears with one channel. The channel indicates the battery voltage. This will only work if the new device has had the **clearMission(log)** method run and if a mission is not running.

- The mission will be downloaded even if the battery has expired or is failing. No other operations will work.

- Uses the new **loadMissionResultsPartial** function. It will display a percentage remaining on the download.
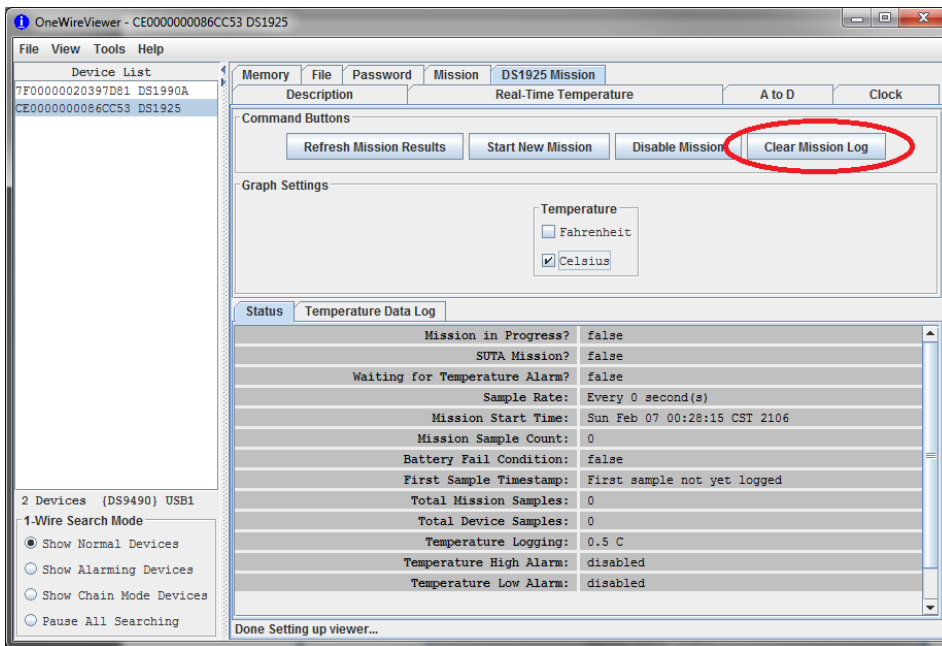
Figure 28. Sample DS1925 Mission tab.

Appendix A

1-Wire Port Adapters

Table 2 lists the 1-Wire adapters that the OneWireViewer supports. The name shown in the Short Reference column is used to identify a category of adapter during the program setup. The DS9097E is a legacy adapter that relies on the bit timing of the UART that is controlling the COM port. This method is described in Maxim application note 214: "**Using a UART to Implement a 1-Wire Bus Master**."

Table 2. 1-Wire Port Adapters

Port Type	Short Reference	Ordering Part Number	Extended Features
COM	DS9097U	DS9097U-009#	Overdrive, power delivery, built-in serial number (009 -suffix only)
		DS9097U-S09#	
		DS1411-009#	
		DS1411-S09#	
COM	DS9097U	DS9097U-E25#	Overdrive, power delivery, EPROM programming (12V)
COM	DS9097E*	DS9097E#	EPROM programming (12V)
COM	DS9097E*	DS9097#	None
		DS1413#	
USB	DS9490	DS9490B#	Overdrive, power delivery, built-in serial number
		DS9490R#	
USB	DS9481R	DS9481R-3C7+	Overdrive, power delivery, EPROM programming (12V, 7V)

*Not recommended for new designs.

Extended Features

Overdrive

The standard 1-Wire data rate is 15.3kbps. All iButtons and 1-Wire devices support this communication speed. Most 1-Wire devices also support overdrive speed, which is typically 125kbps.

Power Delivery

Most iButtons and 1-Wire devices are parasite powered. This means that they derive their operating energy from the 1-Wire net during communication. Some devices, however, require more energy than can be accumulated in this fashion. For these devices, choose an adapter with the power-delivery feature.

EPROM Programming

iButton and 1-Wire devices that are one-time-programmable (OTP) incorporate technology called electrically programmable read-only memory (EPROM). EPROM programming requires 12V programming or writing. Although all adapters can read an EPROM iButton, only adapters with EPROM programming capability can write to them.

NetAdapter

The NetAdapter is a virtualized 1-Wire adapter. Using TCP/IP protocol, it is possible for the OneWireViewer to communicate through a 1-Wire adapter attached to another PC, as long as both PCs are connected through a TCP/IP network. Another requirement is that the other PC must be running a small host program, such as the StartNetAdapterHost demo program found in the **1-Wire API for Java Software Development Kit (SDK)**. It is recommended that suitable software drivers for the 1-Wire adapter be installed on the host PC, such as the 1-Wire Drivers. For a more in-depth NetAdapter discussion, see Maxim application note 193: "**Extending 1-Wire Range with Network Proxies**."

On the host PC where the 1-Wire adapter of interest resides, the StartNetAdapterHost Java program should be run from a command line. This is done by simply copying the program and the OneWireAPI.jar file to a directory and typing the following example command-line parameters:

```
java -cp .;OneWireAPI.jar StartNetAdapterHost -adapterName {DS9490} -adapterPort USB1 -listenPort 6161 -secret secret
```

This sets up the host program to communicate to a DS9490 on USB1 and allows NetAdapter connections to it through the TCP/IP port of 6161 with the secret set to "secret". Then, on the client OneWireViewer, simply set up the NetAdapter as shown in **Figure 29**. In the **Adapter Name** field, type "NetAdapter". In the **Adapter Port** field, type in the IP address of the host computer, TCP/IP socket port number, and secret separated by colons.
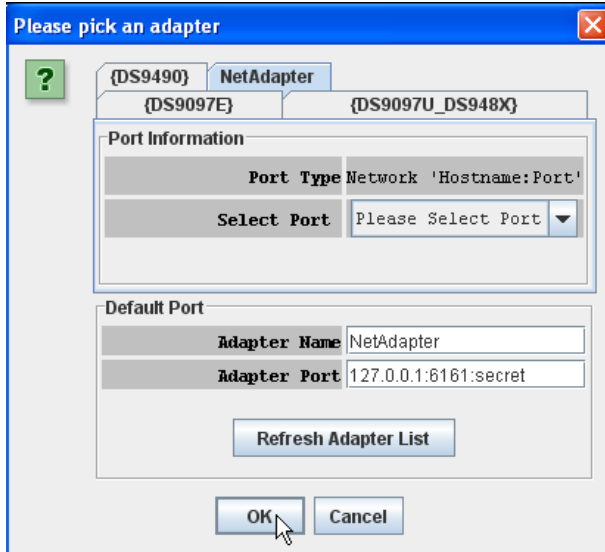
Figure 29. Example pick adapter window.

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