

USER GUIDE 3358

OneWireViewer User's Guide, Version 1.5

By: Bernhard Linke, Principal Member Technical Staff
Sep 25, 2009

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.

Introduction

The OneWireViewer is a Java™-based software package to explore 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), A to D (analog to digital), clock, memory, and file operations.

Installation

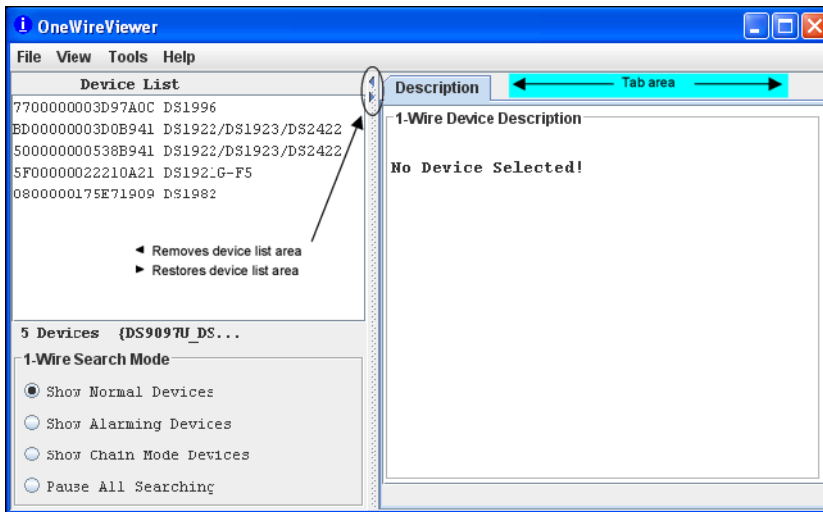
Refer to application note 4373, "OneWireViewer and iButton® Quick Start Guide" for the installation instructions for the 1-Wire Drivers, which also install the OneWireViewer. For additional/expanded help, see application note 5057, "OneWireViewer Tips and Tricks," starting with the section *Identifying the System*.

Uninstalling

Refer to the application note 5057, "OneWireViewer Tips and Tricks," section *How to Install a Newer OneWireViewer Version*.

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/1-Wire Search Mode areas can be removed/restored by clicking on one of the tiny triangles to the right of the device list.



Viewer Menus

File

Close (to exit program)

Has a subtitle Alt-1 (instead of Alt+F4). The Program will end with Alt+F4 as well as Alt+1. The '1' must be pressed on the normal keypad, not the numeric keypad, to be accepted.

View

Show Message Log (to read error messages)

Opens a new window that displays a 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. Then use 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 instead of DS1921G-F5 to the right of the ROM ID

Tools

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

Opens a new window for selecting one of several 1-Wire port adapters, port type, and port number. For more information see application note 5057, "[OneWireViewer Tips and Tricks](#)," section *How to Change 1-Wire Adapters and Ports*.

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

Opens a new window to select the file that holds the XML tags of the devices in use. See 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)

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)

Opens a window that displays: the site from which the source code of the 1-Wire API and OneWireViewer can be downloaded; the API version; the version numbers of the various viewers; and the 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 the section *Viewer Menus, Tools, XML Tagging* above), the device list shows the tags instead of the part numbers/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

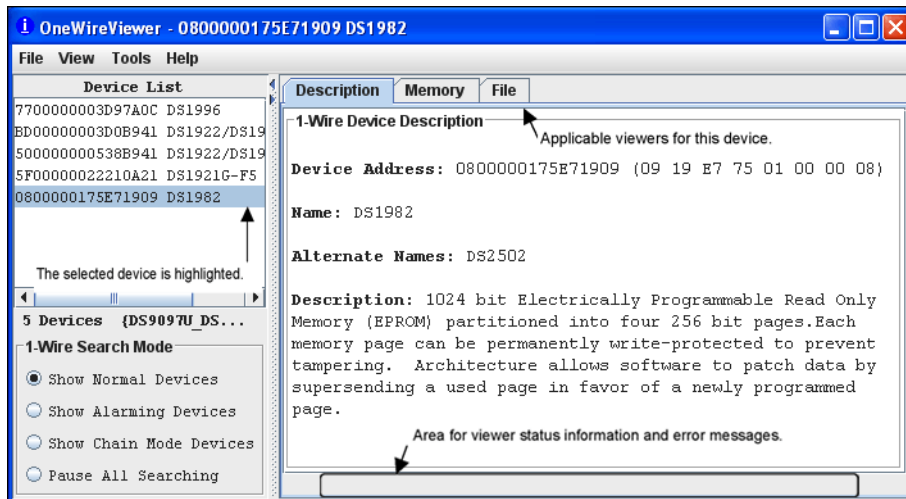
When checked, the list shows only devices that support the Chain Mode. This feature allows detecting the physical sequence of all the devices in a linear network that are wired for Chain Mode. An example device is the DS28EA00 1-Wire digital thermometer.

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 the Supported Devices table below for a list of devices and applicable device viewers.



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

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, DS1820	10			✓							
DS2406	12					✓			✓	✓	
DS1971, ¹ DS2430A ¹	14								✓	(✓)	
DS28E04	1C					✓			✓	✓	
DS2450	20						✓				
DS1921	21	✓		✓				✓	✓	✓	
DS1822	22			✓							
DS1973, DS2433	23								✓	✓	
DS1904, DS2415	24							✓			
DS2438	26			✓	✓		✓	✓			
DS2417	27							✓			
DS18B20	28			✓							
DS2408	29					✓					
DS2431	2D								✓	✓	
DS2760, DS2762	30			✓			✓				
DS1977	37								✓	✓	✓
DS2413	3A					✓					
DS1922, ² DS2422 ²	41		✓	✓			(✓)	✓	✓	✓	✓
DS1923	41		✓	✓	✓			✓	✓	✓	✓
DS1925	53		✓	✓			(✓)	✓	✓	✓	✓
DS28EA00, ³	42			✓							
DS28EC20	43								✓	✓	

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

²A-to-D support applies to the DS2422 only.

³This device supports Chain Mode; see 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 jButton 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 the *Supported Devices* table above.

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 areas.

Sample Thermochron Viewer Tab

Description	Real-Time Temperature	Clock	Memory	File	Thermochron
Command					
<input type="button" value="Refresh Mission Results"/> <input type="button" value="Start New Mission"/> <input type="button" value="Disable Mission"/>					
<input type="checkbox"/> Fahrenheit <input checked="" type="checkbox"/> Celsius					
Status Temperatures Histogram Alarm Log					
Is Mission Active?		true			
Mission Start:		Wed Nov 09 16:09:00 CST 2011			
Sample Rate:		Every 1 minute(s)			
Number of Mission Samples:		1223			
Total Samples:		2624			
Roll Over Enabled?		true			
Roll Over Occurred?		Roll over has NOT occurred			
Active Alarms:		Clock, High Temp			
Next Clock Alarm At:		Thu Nov 10 12:31:00 CST 2011			
High Temperature Alarm:		25 °C			
Low Temperature Alarm:		10 °C			
Done Setting up viewer					

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.

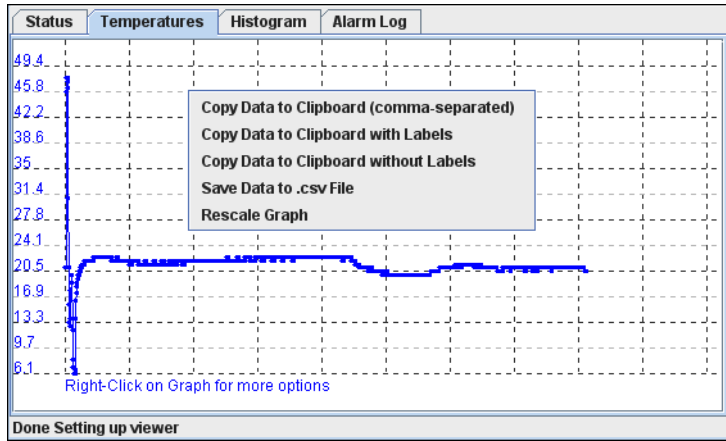
Start New Mission (to allow the user to enter all data necessary to start a new mission)
This command opens a new window in which the user enters the parameters for the next mission.

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 memorized.
- 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.

Sample Temperature Log Graphic



Sample Histogram

Status	Temperatures	Histogram	Alarm Log
- Histogram entry	:	5 at temperature 8 to 9.5 °C	
- Histogram entry	:	0 at temperature 10 to 11.5 °C	
- Histogram entry	:	1 at temperature 12 to 13.5 °C	
- Histogram entry	:	4 at temperature 14 to 15.5 °C	
- Histogram entry	:	2 at temperature 16 to 17.5 °C	
- Histogram entry	:	3 at temperature 18 to 19.5 °C	
- Histogram entry	:	226 at temperature 20 to 21.5 °C	
- Histogram entry	:	1093 at temperature 22 to 23.5 °C	
- Histogram entry	:	0 at temperature 24 to 25.5 °C	
- Histogram entry	:	0 at temperature 26 to 27.5 °C	
- Histogram entry	:	0 at temperature 28 to 29.5 °C	

Done Setting up viewer

Sample Alarm Log

Status	Temperatures	Histogram	Alarm Log
- Low alarm started at	:	21	
-	:	Lasted 7 minutes	
- High alarm started at	:	4	
-	:	Lasted 6 minutes	

Done Setting up viewer

Start New Mission Window (default)

Initialize New Mission

Synchronize Real-time Clock? Enable Rollover?

Sampling Rate (1 to 255 min.) Temperature Low Alarm? (°C)

Mission Start Delay? Temperature High Alarm? (°C)

Clock Alarm Configuration

Enable Clock Alarm?

Frequency

Every Second

Every Minute

Every Hour

Every Day

Every Week

Alarm On

Day of Week (1 = Sunday)

Hour of Day (0-23)

Minute of Hour (0-59)

Second of Minute (0-59)

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 time reference in the alarm log (e.g., "Low alarm started at: 21") indicates minutes after the start of the mission. To find the day and time when the alarm occurred, manually add the indicated time to the mission start date and time.
- 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 jButton connected to the OneWireViewer. The user can start a new mission, end (disable) a running mission, view and download the mission's temperature and humidity. The Mission viewer is similar to the ThermoChron viewer, but is used for the DS1922 series of jButton products, the DS1923 HygroChron and its features, and the DS2422 1-Wire temperature/data logger. See also the Supported Devices table above.

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 to select the temperature scale (°C or °F). Depending on the size of the **Mission** tab, there may be scroll bars for both areas.

Sample Mission Viewer Tab

Description	Real-Time Temperature	Real-Time Humidity	Clock	Memory	File	Password	Mission																																		
Command																																									
<input type="button" value="Refresh Mission Results"/> <input type="button" value="Start New Mission"/> <input type="button" value="Disable Mission"/>																																									
<input type="checkbox"/> Fahrenheit <input checked="" type="checkbox"/> Celsius																																									
Status																																									
<table border="1"> <thead> <tr> <th>Temperature Data Log</th> <th>Humidity Data Log</th> </tr> </thead> <tbody> <tr> <td>Mission in Progress?</td> <td>true</td> </tr> <tr> <td>SUTA Mission?</td> <td>false</td> </tr> <tr> <td>Waiting for Temperature Alarm?</td> <td>false</td> </tr> <tr> <td>Sample Rate:</td> <td>Every 60 second(s)</td> </tr> <tr> <td>Mission Start Time:</td> <td>Wed Nov 09 16:20:01 CST 2011</td> </tr> <tr> <td>Mission Sample Count:</td> <td>1218</td> </tr> <tr> <td>Roll Over Enabled?</td> <td>true(no rollover occurred)</td> </tr> <tr> <td>First Sample Timestamp:</td> <td>Wed Nov 09 16:20:01 CST 2011</td> </tr> <tr> <td>Total Mission Samples:</td> <td>1218</td> </tr> <tr> <td>Total Device Samples:</td> <td>11463</td> </tr> <tr> <td>Temperature Logging:</td> <td>0.5 C</td> </tr> <tr> <td>Temperature High Alarm:</td> <td>25 °C</td> </tr> <tr> <td>Temperature Low Alarm:</td> <td>15 °C</td> </tr> <tr> <td>Data Logging:</td> <td>0.6 %RH</td> </tr> <tr> <td>Data High Alarm:</td> <td>79.269 %RH</td> </tr> <tr> <td>Data Low Alarm:</td> <td>38.852 %RH (ALARMED)</td> </tr> </tbody> </table>								Temperature Data Log	Humidity Data Log	Mission in Progress?	true	SUTA Mission?	false	Waiting for Temperature Alarm?	false	Sample Rate:	Every 60 second(s)	Mission Start Time:	Wed Nov 09 16:20:01 CST 2011	Mission Sample Count:	1218	Roll Over Enabled?	true(no rollover occurred)	First Sample Timestamp:	Wed Nov 09 16:20:01 CST 2011	Total Mission Samples:	1218	Total Device Samples:	11463	Temperature Logging:	0.5 C	Temperature High Alarm:	25 °C	Temperature Low Alarm:	15 °C	Data Logging:	0.6 %RH	Data High Alarm:	79.269 %RH	Data Low Alarm:	38.852 %RH (ALARMED)
Temperature Data Log	Humidity Data Log																																								
Mission in Progress?	true																																								
SUTA Mission?	false																																								
Waiting for Temperature Alarm?	false																																								
Sample Rate:	Every 60 second(s)																																								
Mission Start Time:	Wed Nov 09 16:20:01 CST 2011																																								
Mission Sample Count:	1218																																								
Roll Over Enabled?	true(no rollover occurred)																																								
First Sample Timestamp:	Wed Nov 09 16:20:01 CST 2011																																								
Total Mission Samples:	1218																																								
Total Device Samples:	11463																																								
Temperature Logging:	0.5 C																																								
Temperature High Alarm:	25 °C																																								
Temperature Low Alarm:	15 °C																																								
Data Logging:	0.6 %RH																																								
Data High Alarm:	79.269 %RH																																								
Data Low Alarm:	38.852 %RH (ALARMED)																																								
These lines are blank for the DS1922		If this area remains empty, passwords are enabled. It is necessary to first set the software password with the current device passwords (at least the read password) to access the device.																																							
Done Setting up viewer																																									

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.

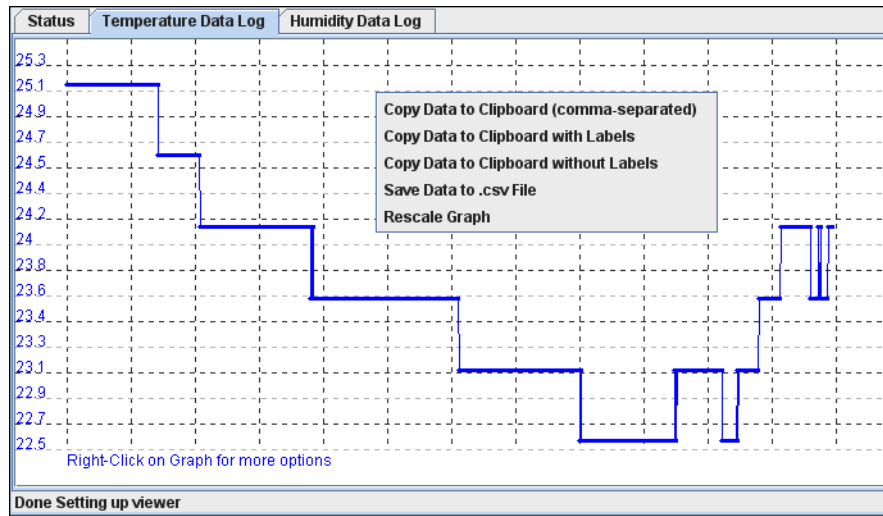
Disable Mission (to stop a running mission)

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** or **Data** tab).
- Allows the temperature scale to be changed between °C (default) and °F; the selected scale is memorized.
- 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.

Sample Temperature Data Log Graphic (Humidity Data Log looks similar)



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. SUTA means Start mission Upon Temperature Alarm. 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:

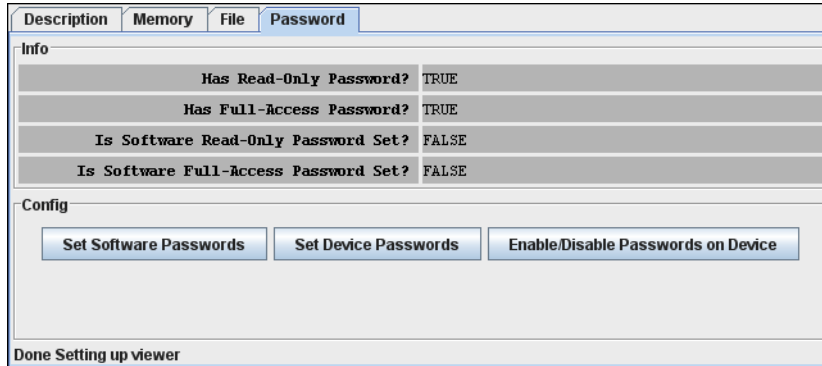
- **Mission Samples Count** on the Status tab indicates the number of valid samples in the datalog memory. This number stops incrementing when the memory is full.
- **Total Mission Samples** indicates the number of samples taken during a mission. This number continues incrementing when a rollover occurs.
- The **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.

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 to 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.

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 memorize the passwords 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 memorize the passwords 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 need to be entered as 8-byte hexadecimal strings.

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

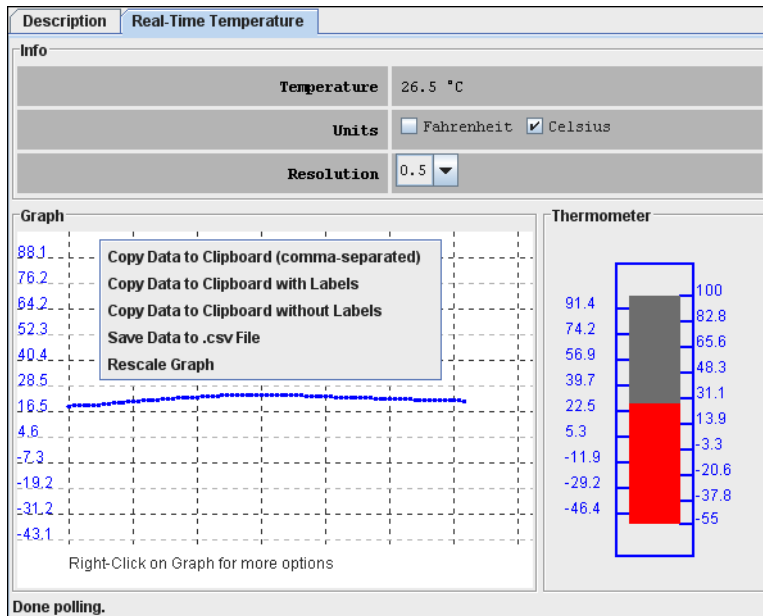
This command allows the user to activate (enable) passwords that were written to the device previously. If passwords are enabled, this command allows the user to disable them. This command does not erase passwords in the device.

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 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 area. The Real-Time Temperature viewer applies to devices that contain a digital thermometer. See the *Supported Devices* table above for the list of devices.

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 memorized.
- 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:

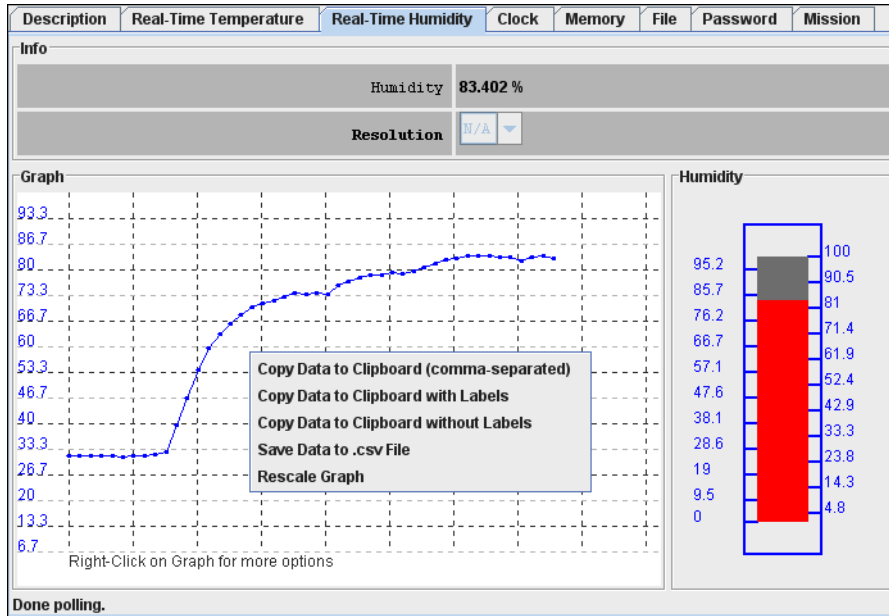
- The Real-Time Temperature viewer closes whenever the selected device is found to be missing from the network or when another device is selected.
- To keep the Real-Time Temperature viewer running while evaluating other devices, first activate the Real-Time Temperature viewer. Then on the **View** menu (see *Program Main Window*), select Show Tab in New Window which will 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 the *Supported Devices* table above for the list of devices.

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 the 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 *Program Main Window*), select Show Tab in New Window which will 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 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 the *Supported Devices* table above for the list of devices.

Sample Switch Tab

Description	Switch	Memory	File
Features			
Activity Sensing	true		
Level sensing	true		
'Smart-on'	false		
High-side switch (on connected to data)	false		
One switch on at a time limit	false		
Channels			
CHANNEL 0		CHANNEL 1	
State	false	State	true
Level	false	Level	false
Activity	false	Activity	true
<input type="button" value="Toggle State"/>	<input type="button" value="Clear Activity"/>	<input type="button" value="Toggle State"/>	<input type="button" value="Clear Activity"/>
Check complete			

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.

A to D (Analog to Digital)

The A to D viewer gives a real-time voltage reading on the analog inputs of the selected 1-Wire ADC connected to the OneWireViewer. The user can select which channels of a multichannel ADC are included in the polling.

The tab of the A to D viewer (for an analog-to-digital converter, ADC) consists of two areas: **Features** (top), and **Channels** (bottom). The Features area lists device-specific characteristics. For each channel, there is a channel box in the Channels area. **A to D Voltage** shows the voltage reading of the analog input. Depending on the size of the A to D tab and/or the number of channels, there may be scroll bars for both areas. The A to D viewer applies to devices that contain an ADC with one or more input channels. See the *Supported Devices* table above for the list of devices.

Sample A to D Tab

Description	A to D	Memory
Features		
Number of Channels	4	
Supports Multi-Channel Read?	true	
Has High/Low AD Alarms?	true	
Channels		
Channel 0	<input checked="" type="checkbox"/> Include in Poll	Channel 1 <input checked="" type="checkbox"/> Include in Poll
AtoD Voltage	0.03	AtoD Voltage 0.03

Done polling.

When the A to D tab is active, the A to D viewer:

- Continuously reads/converts the input voltage of the selected channels.
- For the selected channels, automatically updates the voltage reading in the Channels area.
- Allows the channels that are monitored (see **Include in Poll**) to be selected.

Notes:

- If a channel is not included in the poll, the display for this channel will "freeze", and not show the actual input voltage.
- The voltage range, resolution, voltage alarm thresholds, and alternate channel functions can be set on the byte level through the **Memory** tab. See the respective device data sheet for more details.

Clock

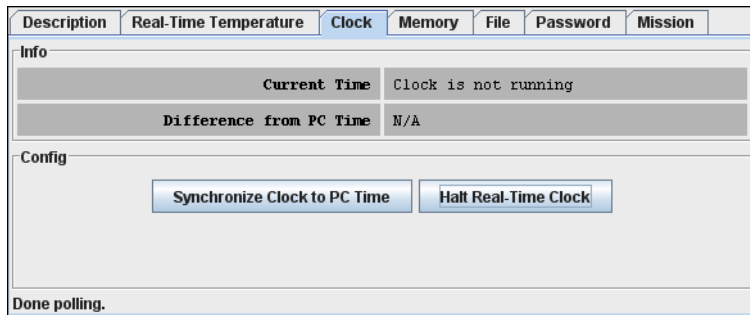
The Clock viewer gives a real-time reading of the RTC in the selected 1-Wire device connected to the OneWireViewer. This viewer also tells the time difference between the RTC in the 1-Wire device and in the PC. The user can synchronize the RTC in the 1-Wire device to the one in the PC or halt the RTC 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, 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 the Supported Devices table above for the list of devices.

Sample Clock Tabs

Description	Real-Time Temperature	Clock	Memory	File	Password	Mission
Info						
Current Time	Wed Nov 09 17:35:52 CST 2011					
Difference from PC Time	1 seconds					
Config						
Synchronize Clock to PC Time			Halt Real-Time Clock			

Done polling.



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:

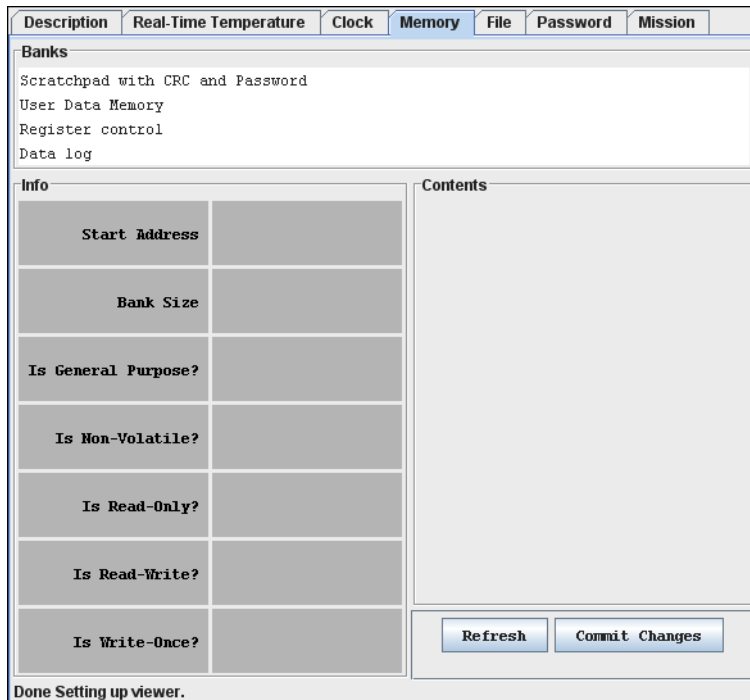
- If the 1-Wire device uses a binary counter as RTC (e. g., the DS1904, DS2415, DS2417), the **Clock** viewer sets the device clock to UTC (also known as Greenwich Mean Time, GMT). If the RTC of the 1-Wire device counts seconds, hours, days, months, and years in separate registers (e.g., the DS1921, 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 below) 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**) and data that was manually entered in the contents area to be written to the 1-Wire device (**Commit Changes**). 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 the *Supported Devices* table above for the list of devices. A memory bank must first be selected before its data (Contents) and characteristics (Info) will be displayed. The Contents area is automatically refreshed whenever the bank selection changes.

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.

Sample Memory Tab with Scratchpad Selected

Description	Real-Time Temperature	Clock	Memory	File	Password	Mission																																
Banks																																						
Scratchpad with CRC and Password																																						
User Data Memory																																						
Register control																																						
Data log																																						
Info			Contents																																			
Start Address	0H		TA1 TA2 E/S ↓ ↓ ↓ Page 0 (0H) [Target address, offset 00 02 80] <table border="1"> <tr> <td>40</td><td>35</td><td>17</td><td>09</td><td>11</td><td>11</td><td>0A</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>00</td><td>7E</td><td>00</td><td>00</td> </tr> <tr> <td>00</td><td>FC</td><td>01</td><td>D1</td><td>70</td><td>C0</td><td>00</td><td>00</td><td>00</td><td>01</td><td>01</td><td>14</td><td>10</td><td>07</td><td>09</td><td>00</td> </tr> </table>				40	35	17	09	11	11	0A	00	00	00	00	00	00	7E	00	00	00	FC	01	D1	70	C0	00	00	00	01	01	14	10	07	09	00
40	35	17	09	11	11	0A	00	00	00	00	00	00	7E	00	00																							
00	FC	01	D1	70	C0	00	00	00	01	01	14	10	07	09	00																							
Bank Size	32 bytes																																					
Is General Purpose?	false																																					
Is Non-Volatile?	false																																					
Is Read-Only?	false																																					
Is Read-Write?	true																																					
Is Write-Once?	false																																					
			<input type="button" value="Refresh"/> <input type="button" value="Commit Changes"/>																																			
Done updating viewer contents.																																						

Notes:

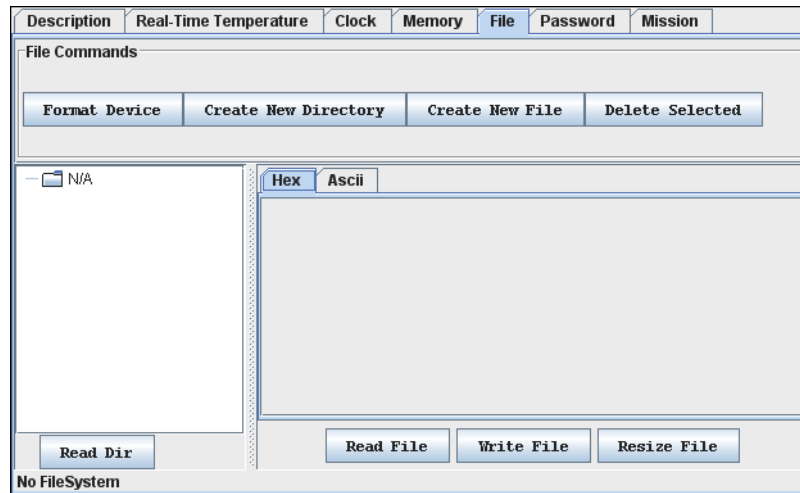
- The number of the memory banks and their respective names depend on the type of the device viewed.
- The display format in the content field varies with the device and memory bank selected. For most devices there are 2 x 16 bytes per page. With EPROM devices, there are n x 8 bytes (special function 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 the section *Auxiliary Functions* text editor (hex/ASCII editor) 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*), resize files, and write them back to the 1-Wire device.

The File viewer supports the 1-Wire File Structure. (See 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 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 the *Supported Devices* table above for the list of devices.

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 application note 114 (cited above) 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.

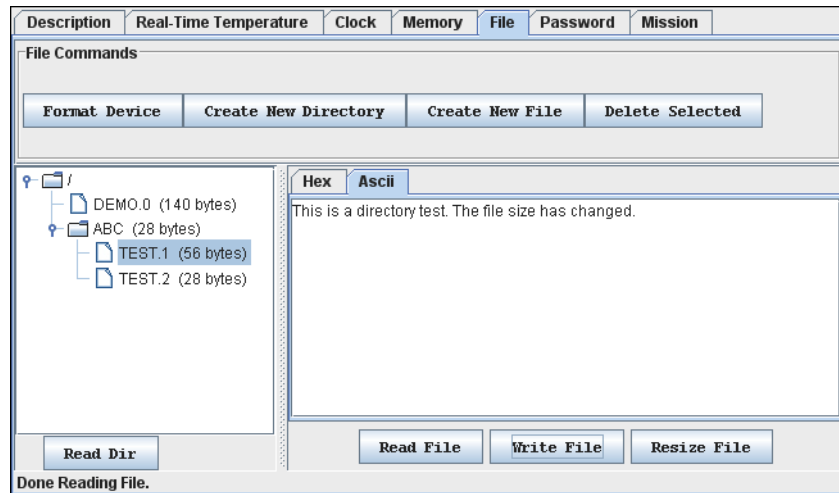
Resize File (to change the size of a file)

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.

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 contents, 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 **Auxiliary Functions**, and sections *Hex Editor with File Viewer* and *ASCII Editor* 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:

1. **Change:** select one or more bytes and replace them with the same number of new bytes.
2. **Delete:** select one or more bytes and delete them.
3. **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. <i>Each field is treated as an independent entity.</i> 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 on Commit Changes.
Deleting data	Using the cursor, select one or more adjacent bytes in the editing area and press the "delete" key on the keyboard. 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 on 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 <i>out of the field</i> , where it is lost. When finished, click on Commit Changes.
Verifying data	Click the Refresh button 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 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). <i>Each row is treated as an independent entity.</i> 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 the Read File button.
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 on Write File.
Deleting data	Using the cursor, select one or more adjacent bytes in the editing area and press the "delete" key on the keyboard. 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 on 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 on 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)

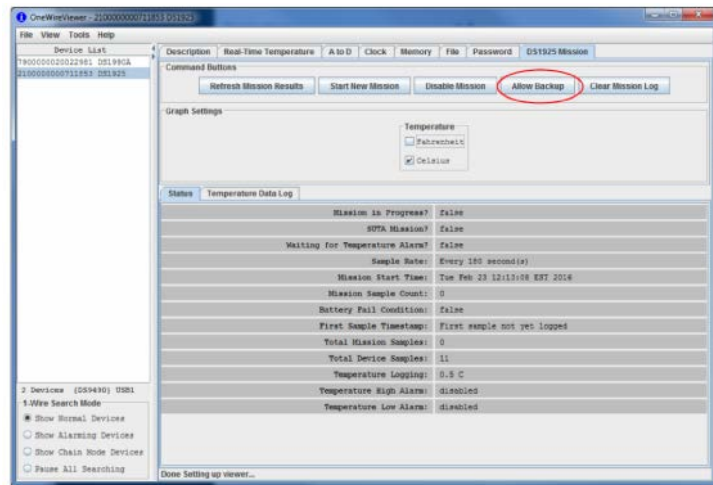
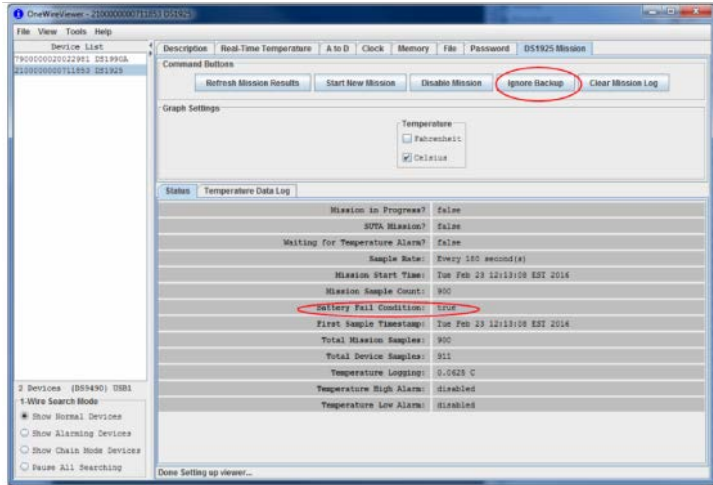
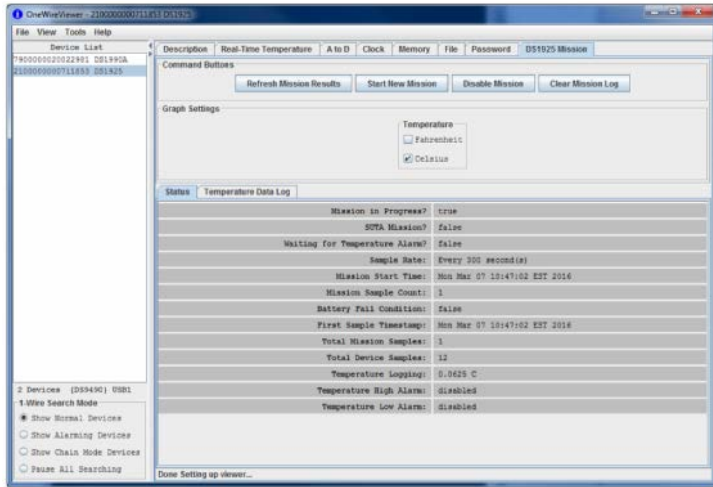
Editing area	This is a large blank field in the ASCII tab of the viewer. The size of the file can be changed using the Resize button. The description below assumes that the editing area is filled with "blanks" or contains data, which was obtained by selecting a file in the directory area and then clicking 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 on the keyboard. This removes as many characters as are selected in the editing area. When finished, click on 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 on 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 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 roll-over 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 19-20.
- New function to read the battery voltage

OneWireViewer DS1925/DS1922L Mission Viewer Compare

- New button **Clear Mission Log**. 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 **OneWireContainer53** 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 **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 % to go on the download.
- If a battery fail condition is detected the mission displayed will be the backup mission. Under this condition a new button appears at the top of the mission viewer labeled **Ignore Backup**. When you click on this button then the button label changes to **Allow backup** and the mission status displayed is the current status. This button will toggle between these two states. When the current mission status is displayed then a new mission can be started. (see screen captures below)



Appendix A. 1-Wire Port Adapters

The following table 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 application note 214, "[Using a UART to Implement a 1-Wire Bus Master.](#)"

1-Wire Port Adapter Table			
Port Type	Short Reference	Ordering Part Number	Extended Features
COM	DS9097U	DS9097U-009# DS9097U-S09# DS1411-009# DS1411-S09#	Overdrive, power delivery, built-in serial number (009-suffix only)
COM	DS9097U	DS9097U-E25#	Overdrive, power delivery, EPROM programming (12V)
COM	DS9097E*	DS9097E#	EPROM programming (12V)
COM	DS9097E*	DS9097# DS1413#	None
USB	DS9490	DS9490B# DS9490R#	Overdrive, power delivery, built-in serial number
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 for writing. Although all adapters can read an EPROM iButton, only adapters with EPROM programming capability can write to them.

NetAdapter

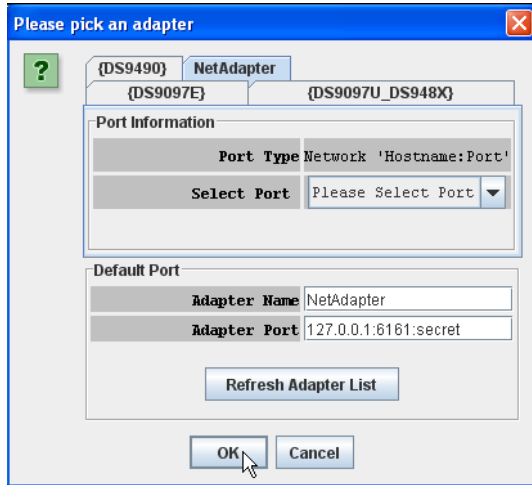
The NetAdapter is a virtualized 1-Wire adapter. Using TCP/IP protocol, it is possible for the OneWireViewer to communicate through a 1-Wire adapter attached to another PC, as long as both PCs are connected through a TCP/IP network. Another requirement is that the other PC must be running a small host program, such as the "StartNetAdapterHost" demo program found in the [1-Wire API for Java Software Development Kit](#). 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 discussion on this, please see 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 the screen shot below. In the "Adapter Name" field, type in "NetAdapter". In the "Adapter Port" field, type in the IP address of the host computer, the TCP/IP socket port number, and the secret separated by colons.

Example "Pick Adapter" Window



1-Wire is a registered trademark of Maxim Integrated Products, Inc.
 Excel is a registered trademark of Microsoft Corporation.
 Hygrochron is a trademark of Maxim Integrated Products, Inc.
 iButton is a registered trademark of Maxim Integrated Products, Inc.
 Java is a registered trademark and registered service mark of Oracle and/or its affiliates.
 Thermochron is a registered trademark of Maxim Integrated Products, Inc.

Related Parts		
DS1411	Serial Port iButton Holder	
DS1925	iButton High-Density Temperature Logger with 122KB Data-Log Memory	Free Samples
DS2480B	Serial to 1-Wire Line Driver	Free Samples
DS2490	USB to 1-Wire Bridge Chip	
DS9097U-009	Universal 1-Wire COM Port Adapter	
DS9097U-E25	Universal 1-Wire COM Port Adapter	
DS9097U-S09	Universal 1-Wire COM Port Adapter	
DS9490	USB to 1-Wire/iButton Adapter	

More Information

For Technical Support: <https://www.maximintegrated.com/en/support>
 For Samples: <https://www.maximintegrated.com/en/samples>
 Other Questions and Comments: <https://www.maximintegrated.com/en/contact>

Application Note 3358: <https://www.maximintegrated.com/en/an3358>
 USER GUIDE 3358, AN3358, AN 3358, APP3358, Appnote3358, Appnote 3358
 © 2014 Maxim Integrated Products, Inc.
 The content on this webpage is protected by copyright laws of the United States and of foreign countries. For requests to copy this content, [contact us](#).
 Additional Legal Notices: <https://www.maximintegrated.com/en/legal>