

Keywords: DS1921G, DS1921H, DS1921Z, DS1922L, DS1922T, DS1923, import, Excel, temperature, logging, thermochron, hygrochron, onewireviewer, ibutton, logger, spreadsheet, graph

APPLICATION NOTE 3809

Exporting DS192x Logger Data from the OneWireViewer into Excel

Abstract: This application note describes how to export the logged temperature/humidity data from the Thermochron line of temperature and humidity loggers, and then import that data into Microsoft Excel for graphing. The DS1921G is used to demonstrate the process.

Introduction

This application note describes the process for exporting data from all <u>iButton temperature/humidity data loggers</u> (DS1921G, DS1921H, DS1921Z, DS1922L, DS1922T, and DS1923) by using the OneWireViewer. This data is then copied into either Microsoft Notepad or Wordpad, and saved as a text file. This text file is then imported into a Microsoft Excel spreadsheet to generate printable graphs.

A working knowledge of the OneWireViewer and Microsoft Excel is required to use the information in this application note. The OneWireViewer is a free utility available on this website: <u>iButton: 1-Wire Drivers for Windows</u>

General information on the DS192x series of data loggers can be found here: iButton Products: iButtons

The software screenshots show data for the <u>DS1921G</u> iButton, but differences among the data loggers will be noted in the text. The DS1921H and DS1921Z will have windows similar to the DS1921G.

Procedure

- 1. Attach the necessary <u>iButton PC-connectivity hardware</u>. This would be a combination of a 1-Wire adapter, which plugs into a spare PC port, and a Blue Dot receptor, which plugs into the 1-Wire adapter and holds <u>i</u>Buttons for reading/writing.
- 2. Start the OneWireViewer and place the iButton in the receptor.
- 3. Select the correct ROM ID number from the device list (Figure 1).
- 4. For the DS1921G, open the Thermochron subviewer by clicking on the Thermochron tab. For the other data loggers, this screen does not have a Thermochron tab. Instead, open the Mission subviewer by clicking on the Mission tab (not shown in Figure 1).

| i OneWireViewer - F400000011 | 2E2C21 DS1921G-F5 | | | | | | | | | |
|------------------------------|---|------------------------------|--|--|--|--|--|--|--|--|
| File View Tools Help | | | | | | | | | | |
| Device List | Description Temperature Clock Mer | nory File Thermochron | | | | | | | | |
| F4000000112E2C21 DS1921G-F5 | Command | | | | | | | | | |
| | Refresh Mission Results Start New Mission Disable Mission | | | | | | | | | |
| | | | | | | | | | | |
| | 🗹 Fahrenheit 🗌 Celsius | | | | | | | | | |
| | Status Temperatures Histogram Ala | arm Log | | | | | | | | |
| | Is Mission Active? | false | | | | | | | | |
| | Mission Start: | Fri Oct 28 10:53:00 CDT 2005 | | | | | | | | |
| | Sample Rate: | Every 5 minute(s) | | | | | | | | |
| | Number of Mission Samples: | 13301 | | | | | | | | |
| | Total Samples: | 88562 | | | | | | | | |
| | Roll Over Enabled? | true | | | | | | | | |
| | Roll Over Occurred? | Roll over has occurred | | | | | | | | |
| | Active Alarms: | Clock | | | | | | | | |
| 1 Device (DS9097U) COM1 | Next Clock Alarm At: | Sun Dec 18 00:00:00 CST 2005 | | | | | | | | |
| Show Normal Devices | High Temperature Alarm: | 158 °F | | | | | | | | |
| 🗹 Show Tagged Devices | Low Temperature Alarm: | -4 °F | | | | | | | | |
| Pause All Searching | Done Setting up viewer |] | | | | | | | | |

Figure 1. Thermochron viewer screen.

- 5. Select either Fahrenheit or Celsius in the command window.
- 6. For the DS1921G, if the "Is Mission Active?" shows "true," then stop the mission by clicking the Disable Mission button. For the other loggers, the query will be, "Mission in Process?"
- 7. On the screen in Figure 1, notice that there are two rows of tabs, an upper row and a lower row. Select the lower "Temperatures" tab. This displays graphically the Thermochron log of temperature vs. time (**Figure 2**).



Figure 2. Thermochron temperature vs. time graph.

8. Place the mouse pointer on the graph and right click.

9. Select the "Copy Data to Clipboard with Labels" line, and click on it (Figure 3) to save the data to the Clipboard.



Figure 3. When you have your data graph, you can copy that data to the clipboard with a simple right click of the mouse.

- 10. Open a text file using either Notepad or Wordpad.
- 11. Paste from the clipboard, and save the file. If you are using the European numbering style (e.g., 77,0), please see Note 1 at the end of this application note.
- 12. Start the Excel program.
- 13. Select "Open" from the Excel "File" drop-down menu. Browse to the directory in which you saved the text file and change the "Files of type:" window to "All Files (*.*)."
- 14. Select your text file, and select the "Open" button. The Text Import Wizard will appear (Figure 4).
- 15. Be sure the "Delimited" button is marked before selecting the "Next" button.

| Text Import Wizard - Step 1 of 3 | | | | | | | | |
|--|-----|--|--|--|--|--|--|--|
| The Text Wizard has determined that your data is Delimited. If this is correct, choose Next, or choose the Data Type that best describes your data. Original data type Choose the file type that best describes your data: © Delimited - Characters such as commas or tabs separate each field. © Fixed width - Fields are aligned in columns with spaces between each field. | | | | | | | | |
| Start import at row: 1 🚔 File Origin: Windows (ANSI) | • | | | | | | | |
| Preview of file C:\1WV tests\Test01.txt. | | | | | | | | |
| 1 12/6/05 11:38:00 AM,F,71.6 2 12/6/05 11:43:00 AM,F,71.6 3 12/6/05 11:48:00 AM,F,71.6 4 12/6/05 11:53:00 AM,F,73.4 5 12/6/05 11:58:00 AM,F,77 6 12/6/05 12:03:00 PM.F.77.9 | × | | | | | | | |
| Cancel < Back Next > Ein | ish | | | | | | | |

Figure 4. The Text Import Wizard asks you to indicate that your text data is a delimited file before you can proceed.

16. In the Delimiters window that appears, be sure that only the "Comma" or "Semicolon" box is checked (Figure 5). Then select the "Next" button.

| Text Import Wizard - Step 2 of 3 | |
|--|-----|
| This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below. | |
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| Space Qther: Text Qualifier: | |
| Data preview | |
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| 12/6/05 11:48:00 AN F 71.6 12/6/05 11:53:00 AM F 73.4 | |
| 12/6/05 11:58:00 AM F 77 | -1 |
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| Cancel < <u>B</u> ack Next > <u>Fi</u> nish | |

Figure 5. For the data to flow into Excel smoothly, it is important that you mark the file delimiters correctly, using either a comma or a semicolon.

17. From the "Column data format" window, check the "Date:" button and select the proper format. Then select the "Finish" button (Figure 6).

| Text Import Wizard - Step 3 of 3 | ? 🛛 |
|--|--------------------|
| This screen lets you select each column and set the Data Format. Column data form 'General' converts numeric values to numbers, date C Iext | nat |
| values to dates, and all remaining values to text. | Y rt column (Skip) |
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| 12/6/05 12:03:00 PM IF 177.9 Cancel < Back | Next > Einish |

Figure 6. It is important that you select the correct date format, or your data will not import correctly.

18. Column widths will have to be changed and other general changes for personal preference will have to be made in Excel, but the raw data is now in the proper columns for graphing.

Data Format

The first column of the imported data contains date and time information that was downloaded from the logger (Figure 7).

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Figure 7. Once your data is in Excel, Column A will display the date and time when you downloaded your data.

Column B contains either C or F for either Celsius or Fahrenheit. This column can be deleted.

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Figure 8. Column B should show your temperature data.

After you delete the Celsius or Fahrenheit identifier from Column B, the second column (Column B, again) contains the temperature information (Figure 8).

Graphing

1. To create a graph, go to the first date and time entry of the graph. Select that cell. A space must be placed in front of the data in the operations line of the Excel file (**Figure 9**).

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Figure 9. You must insert a space before the data and time after you select that cell.

2. Select the log data to be graphed, highlighting both the time and temperature columns (Figure 10).

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Figure 10. Select your time and temperature data to begin graphing.

^{3.} Next select "Chart" from the menu under "Insert" (Figure 11).

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| 16 | 12/6/200 | 5 12:53 | 74.3 | | | | | | | | | | | | | | |
| 17 | 12/6/200 | 5 12:58 | 74.3 | | | | | | | | | | | | | | |
| 18 | 12/6/200 | 5 13:03 | 73.4 | | | | | | | | | | | | | | |
| 19 | 12/6/200 | 5 13:08 | 73.4 | | | | | | | | | | | | | | |
| 20 | 12/6/200 | 5 13:13 | 73.4 | | | | | | | | | | | | | | |
| 21 | 12/6/200 | 5 13:18 | 73.4 | | | | | | | | | | | | | | |
| 22 | 12/6/200 | 5 13:23 | 74.3 | | | | | | | | | | | | | | |
| 23 | 12/6/200 | 5 13:28 | 76.1 | | | | | | | | | | | | | | |
| 24 | 12/6/200 | 5 13:33 | 78.8 | | | | | | | | | | | | | | |
| 25 | 12/6/200 | 5 13:38 | 79.7 | | | | | | | | | | | | | | |
| 26 | 12/6/200 | 5 13:43 | 77.9 | | | | | | | | | | | | | | |
| 27 | 12/6/200 | 5 13:48 | 80.6 | | | | | | | | | | _ | | | | -88 |
| 28 | 12/6/200 | 5 13:53 | 79.7 | | | | | | | | | | _ | | | | |
| 29 | 12/6/200 | 15 13:58 | 81.5 | | | | | | | | | | _ | | | | -8 |
| 30 | 12/6/200 | 5 14:03 | 83.3 | | | | | | | | | | | | | | |
| 31 | 12/6/200 | 5 14:08 | 81.5 | | | | | | | | | | - | | | | - |
| 32 | 12/6/200 | 5 14:13 | 78.8 | | | | | | | | | | \rightarrow | | | | |
| 33 | 12/6/200 | 5 14:18 | 75.0 | | | | | | | | | | - | | | | |
| 34 | 12/6/200 | 5 14:23 | 75.2 | | | | | | | | | | | | | | |
| 33 | NN Test01 | / 14:20 | 75-4 | | 1 | | | | | 1 | | | _ | | | | , Č |
| Dec. | Testur, | / | | | 14 | | | - | | TELOC A | E-04 | | | | | 100000 | 1 |
| Kea | uy | | | | | | | Sur | n=4// | 100004.1 | 15:31 | | | NOM | | | |

Figure 11. After your data is highlighted, you must select the chart format.

4. From the Chart Wizard that appears, select the type of chart that is required. Typically the Line chart works well with log data (Figure 12).

| Chart Wizard - Step 1 of 4 - Ch | art Type 🛛 😤 🗙 |
|---|--|
| Standard Types Custom Types | 1 |
| Chart type: | Chart sub-type: |
| Column Bar Bar Cine Pie Cycloter) Area Coughnut Radar Surface Surface Stock V | |
| | Line with markers displayed at each data value. Press and hold to <u>vi</u> ew sample |
| Cancel | < Back Next > Einish |

Figure 12. The Chart Wizard gives you several choices for chart format. The Line chart typically works well.

5. A sample of the graph will be shown. This allows the data range to be checked and set (Figure 13).



Figure 13. A sample view of the chart lets you preview and check your data.

6. Add chart options. In this example we will add titles and labels(Figure 14).



Figure 14. Now you decide what title and labels to add to your chart.

7. The final step (Step 4) in the Chart Wizard sets the placement of the graph in the spreadsheet (Figure 15).

| Chart Wizard - Step 4 of 4 - Chart Location 🛛 🛛 🛛 🔀 | | | | | | | | |
|---|------------------------|---------------|--|--|--|--|--|--|
| Place chart: | • As new sheet: Shart1 | | | | | | | |
| | C As gbject in: Test01 | • | | | | | | |
| 2 | Cancel < <u>B</u> ack | Vext > Einish | | | | | | |

Figure 15. You finish your chart by selecting where to place the graph in a spreadsheet.

If you are satisfied and do not want to make other changes, click the Finish button to create the graph (Figure 16).



Note 1. If you are using the European numbering style (e.g., 77,0) and a Centigrade scale, open the text file. Select the "Replace" from the "Edit" menu. In the "Find what" window, place "M,C,"; then in the "Replace with" window, place "M;C;". Click on the 'Replace All' button. If you are using Fahrenheit, then "Find what" is "M,F," and "Replace with" is "M;F;". Then, select the Semicolon for the Delimiter when importing the text file.

Application Note 3809: <u>www.maxim-ic.com/an3809</u>

More Information

For technical support: <u>www.maxim-ic.com/support</u> For samples: <u>www.maxim-ic.com/samples</u> Other questions and comments: <u>www.maxim-ic.com/contact</u>

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- DS1921G: QuickView -- Full (PDF) Data Sheet
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- DS1921Z: QuickView -- Full (PDF) Data Sheet
- DS1922L: QuickView -- Full (PDF) Data Sheet
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- DS1923: QuickView -- Full (PDF) Data Sheet

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