

Read TDMS Files

Goal

Log data to a TDMS file and read the same TDMS file to access information about a specific channel.

Scenerio

You are given a TDMS Logger VI that generates measurement data for any number of units under test (UUTs). The UUT measurement data consists of a time domain waveform and the power spectrum of a waveform.

Run the TDMS Logger VI that accepts UUTs identified by serial numbers. The TDMS Logger VI retrieves the measurement data from the Generate Data VI, and logs the UUT data and additional properties to a TDMS file.

The TDMS file contains the author, timestamp, and two channel groups—Time Data and Power Spectrum Data. Each group contains a channel for each UUT. The serial number of the UUT names each channel and contains the matching signal data.

Saving data to a file serves no purpose unless you also can access the data. Create a reader VI to access data from the TDMS file you generated. The reader should return either time data or power spectrum data for a particular UUT serial number.



Note Optionally, if you have Microsoft Excel installed on your system you can use the the TDM Excel Add-In tool to load the TDMS file into Microsoft Excel.

Design

TDMS File Reference Information

- File Level Information
 - **Time Stamp**—contains the current time.
 - **Author**—contains the test operator name, acquired through a front panel control.
 - The file contains two channel groups, one for time data and one for the power spectrum data.

- Channel Group Level Information
 - **Name**—contains Time Data or Power Spectrum Data. This identifies the channel group.
 - Each channel group should contain a channel for each UUT.
- Channel Level Information
 - **Name**—contains the UUT Serial Number, which associates the numeric data with a particular unit.
 - **Signal**—contains an array of floating-point numeric data.
 - Several other properties, such as the signal minimum and maximum will automatically be calculated and added to the file.

TDMS Reader Inputs and Outputs

Table 1. TDMS Reader VI Inputs and Outputs

Type	Name	Properties
File Path Control	TDMS File Path	Default Value = <NI eLearning>\LV Core 2\ Using TDMS Files\Exercise\ Test Data.TDMS
String Control	Serial Number	—
Combo Box	Data Set	Item 1 = “Time Data” Item 2 = “Power Spectrum”
Waveform Graph Indicator	Channel Data	—
String Indicator	Test Operator	—
Time Stamp Indicator	Time of Test	—

Your VI should begin by opening the TDMS file and reading the author and time stamp file properties. Then read the time data or power spectrum data for the specified UUT and display the data on the Channel Data waveform graph.

Implementation

TDMS Logger

The files that you need to complete this exercise are here:

<NI eLearning>\LV Core 2\Using TDMS Files\Exercise.

1. Open TDMS Logger.vi in the <Exercise> directory. This VI is pre-built for you as shown in Figure 1.

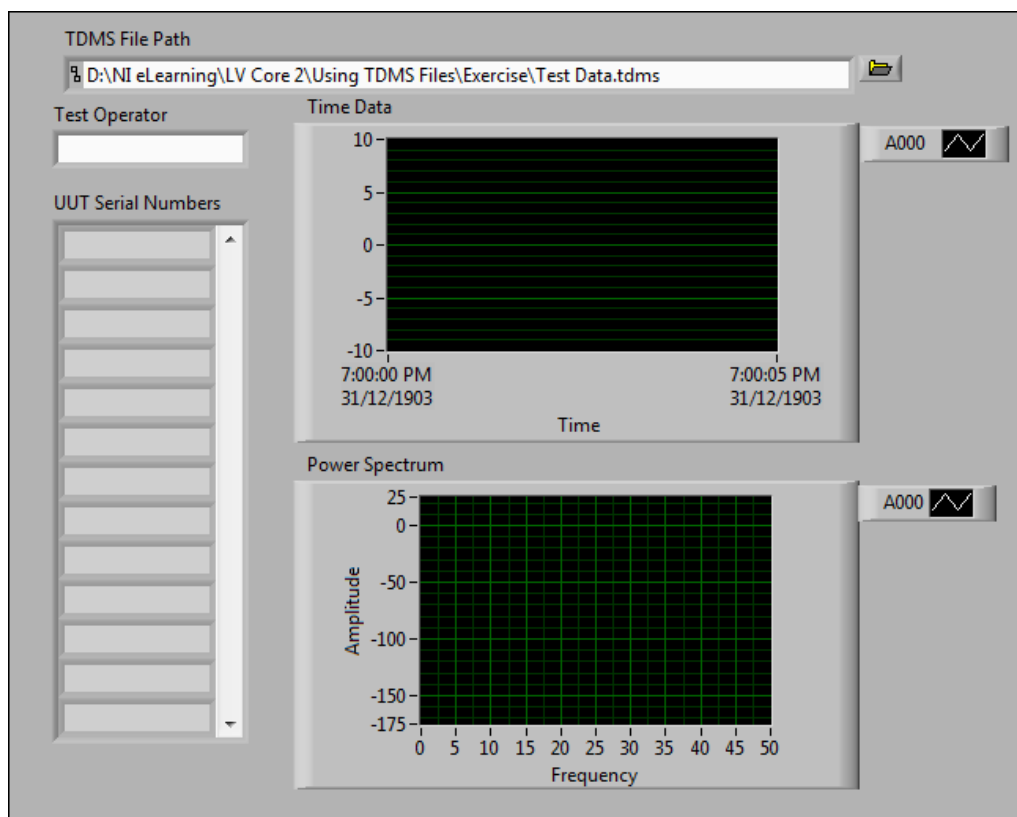


Figure 1. TDMS Logger Front Panel

2. Run the TDMS Logger VI.
 - ☐ Verify that the default value of the **TDMS File Path** control is <NI eLearning>\LV Core 2\Using TDMS Files\Exercise\Test Data.tdms.
 - ☐ Enter your name in the **Test Operator** field.
 - ☐ Enter A001, A002, and A003 in the **UUT Serial Numbers** control.
 - ☐ Run and test the TDMS Logger VI. View the logged data in the TDMS File Viewer window. The graphs on the front panel of the TDMS Logger VI should also display a plot for each serial number you enter.

- ☐ Click **Quit** to close the TDMS File Viewer window.
- ☐ Examine the block diagram.
- ☐ Close the TDMS Logger VI. Do not save any changes.

TDMS Reader VI

1. Create a blank VI.
2. Save the VI as `TDMS Reader.vi` in the <Exercise> directory.
3. Build the VI front panel.

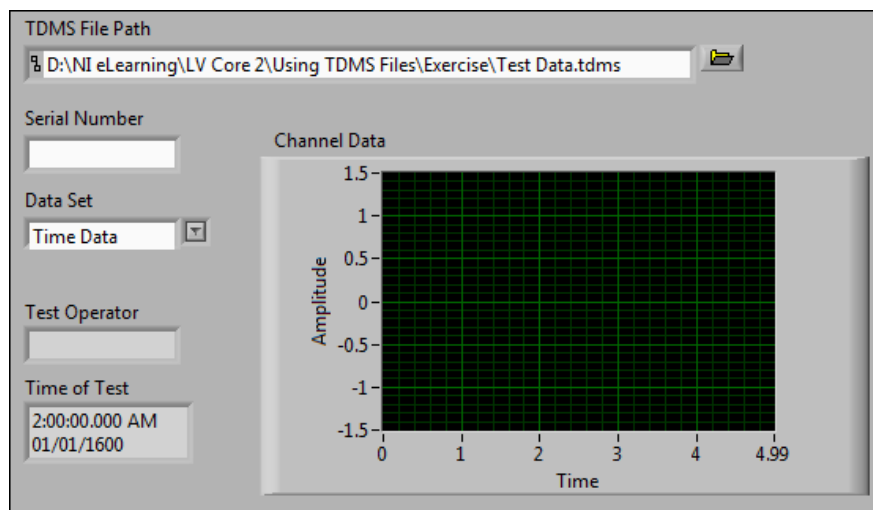


Figure 2. TDMS Reader Front Panel

- ☐ Create the **TDMS File Path** control with a default value of <NI eLearning>\LV Core 2\Using TDMS Files\Exercise\Test Data.tdms.
- ☐ Create the **Serial Number** string control.
- ☐ Create the **Time of Test** time stamp indicator.
- ☐ Create the **Test Operator** string indicator.
- ☐ Create the **Channel Data** waveform graph.
- ☐ Place a combo box control on the front panel. Label the combo box Data Set.
- ☐ Right-click the **Data Set** control and select **Edit Items** from the shortcut menu.
- ☐ Click **Insert**.

- ☐ Enter `Power Spectrum` in the **Items** list.
 - ☐ Click **Insert**.
 - ☐ Enter `Time Data` in the **Items** list.
 - ☐ Deselect the **Allow undefined values at run time** box.
 - ☐ Click OK.
 - ☐ Select **Time Data** from the drop-down menu of the **Data Set** control.
 - ☐ Right-click the **Data Set** control and select **Data Operations»Make Current Value Default** from the shortcut menu.
 - ☐ Arrange the front panel as shown in Figure 2.
4. Open the TDMS file.



- ☐ Add a **TDMS Open** function to the block diagram.
- ☐ Right-click the **operation** input of the TDMS Open function and select **Create»Constant** from the shortcut menu.
- ☐ Select **open (read-only)** as the value of the constant.



Note Opening a file with the open (read-only) option increases the speed of reads in the file. Also, it does not lock the file so that other programs can use it at the same time.

- ☐ Wire the **TDMS File Path** control to the **file path** input of the TDMS Open function.

5. Read the Author file property.



- ☐ Add a **TDMS Get Properties** function to the block diagram.
- ☐ Right-click the **property name** input of the TDMS Get Properties function and select **Create»Constant** from the shortcut menu.
- ☐ Enter `Author` in the string constant.



- ☐ Wire an empty **string constant** to the **data type** input of the TDMS Get Properties function.
- ☐ Wire the **property value** output of the TDMS Get Properties function to the **Test Operator** string indicator.

6. Read the Time Stamp file property.



- ☐ Add a **TDMS Get Properties** function to the block diagram.

- ☐ Right-click the **property name** input of the TDMS Get Properties function and select **Create»Constant** from the shortcut menu.

- ☐ Enter `Time Stamp` in the string constant.

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MM/DD/YYYY

- ☐ Wire a **time stamp constant** to the **data type** input of the TDMS Get Properties function.

- ☐ Wire the **property value** output of the TDMS Get Properties function to the **Time of Test** indicator.

7. Read the time data or power spectrum data for the specified UUT and display the data on the Channel Data waveform graph.



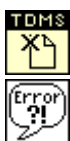
- ☐ Add a **TDMS Read** function to the block diagram.

- ☐ Wire the **Data Set** control to the **group name in** input of the TDMS Read function.

- ☐ Wire the **Serial Number** control to the **channel name(s)** in input of the TDMS Read function.

- ☐ Wire the **data** output of the TDMS Read function to the **Channel Data** indicator.

8. Close the file and handle errors.



- ☐ Add a **TDMS Close** function to the block diagram.

- ☐ Add a **Simple Error Handler VI** to the block diagram.

- ☐ Wire the block diagram as shown in Figure 3.

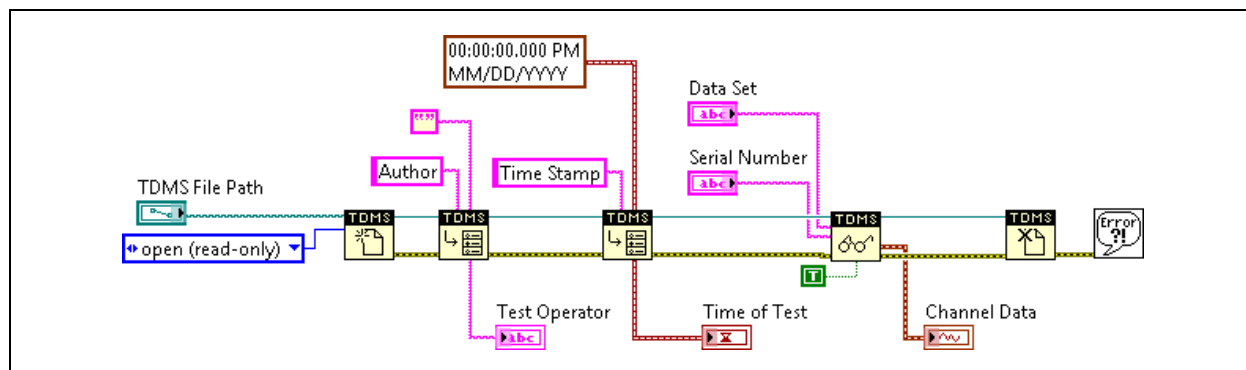


Figure 3. TDMS Reader Block Diagram

9. Save the VI.
10. Set the attributes and time stamp properties of the waveform graph.
 - ☐ On the front panel, right-click the **Channel Data** graph and select **Ignore Attributes**.



Note You must ignore the attributes of the waveform, otherwise the waveform name attribute would overwrite the labels you set. This option is available only after you wire a waveform to the graph.

Test

1. Read and display the time domain data.
 - ☐ On the VI front panel, ensure that the default TDMS File Path matches Table 1 and the Data Set is set to **Time Data**.
 - ☐ Enter A001 in the **Serial Number** control.



Note A001 was one of the serial numbers you entered when you ran the TDMS Logger VI.

- ☐ Run the VI. A sine wave should display in the Channel Data graph.
 - ☐ Change the Serial Number to A002.
 - ☐ Run the VI. A different sine wave should display.
2. Read and display the power spectrum data.
 - ☐ Change the **Data Set** control to **Power Spectrum**.
 - ☐ Run the VI. Power spectrum data should display in the Channel Data graph.
 3. Close the VI.

TDM Excel Add-In (Optional)



Note This exercise requires Microsoft Excel version 2003 or 2007 and the TDM Add-in Tool available on ni.com.

1. Launch Microsoft Excel.



2. Click the **Add-Ins** tab and select the **TDM Importer : Import a TDM(S) File** icon in the **Custom Toolbars** section.
3. Browse to find the TDMS file you created earlier in the <Exercise> directory. The property information is displayed on the first worksheet. The Time data and Power Spectrum data are displayed on separate worksheets.
4. Exit Microsoft Excel and return to LabVIEW.

End of Exercise

Notes
