Importing and Synchronizing Data and Video with ProAnalyst®

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Abstract

The ability to import and synchronize external sensor data with a video is one of the most powerful features of ProAnalyst. While the process is simple and straightforward, several steps are required to import and synchronize data successfully.

Before any external data can be imported into ProAnalyst, it must first be properly formatted. Data must be contained in a text file in which each line contains one set of data. The text file may also contain comment lines, indicated by a special character at the start of the comment line. Any blank lines in the text file are ignored. Non-comment lines should contain the same number values. These values can be separated by spaces, tabs, commas, or any other delimiter.

1. Shown below is an example of a suitable text file. In this file, comments are indicated by the # character and each line of data contains five tab delimited values (frame index, time and readings taken from three sensors).
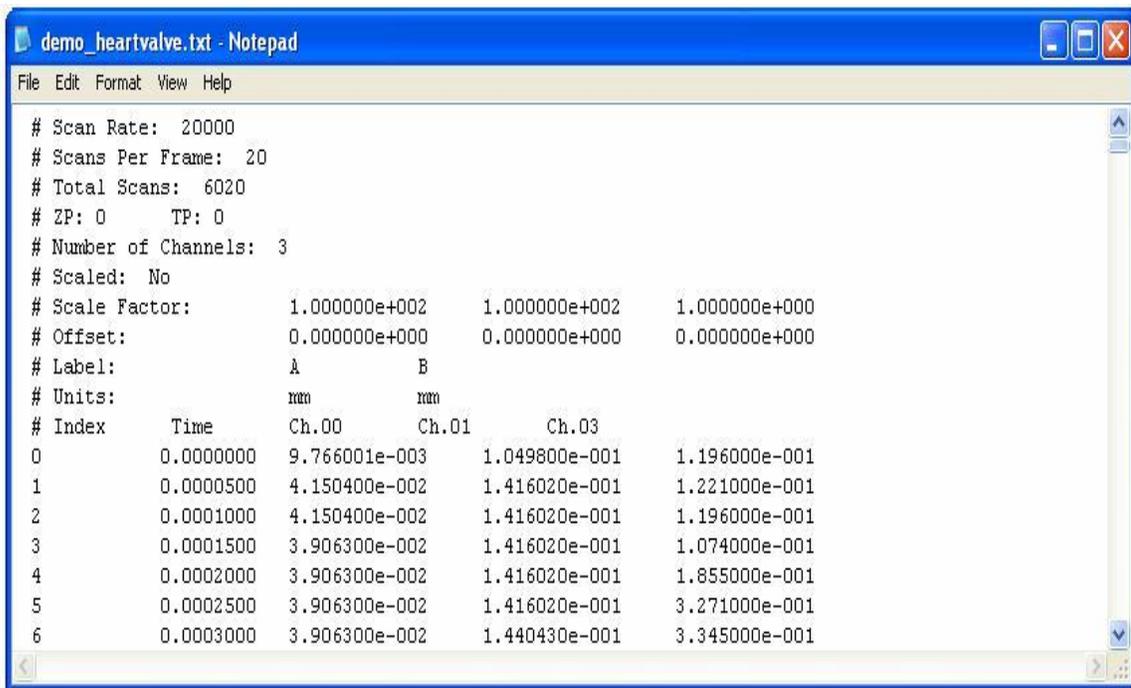

```
# Scan Rate:  20000
# Scans Per Frame:  20
# Total Scans:  6020
# ZP: 0     TP: 0
# Number of Channels:  3
# Scaled:  No
# Scale Factor:       1.000000e+002    1.000000e+002    1.000000e+000
# Offset:             0.000000e+000    0.000000e+000    0.000000e+000
# Label:              A          B
# Units:              mm         mm
# Index     Time      Ch.00      Ch.01        Ch.03
0           0.0000000 9.766001e-003  1.049800e-001    1.196000e-001
1           0.0000500 4.150400e-002  1.416020e-001    1.221000e-001
2           0.0001000 4.150400e-002  1.416020e-001    1.196000e-001
3           0.0001500 3.906300e-002  1.416020e-001    1.074000e-001
4           0.0002000 3.906300e-002  1.416020e-001    1.855000e-001
5           0.0002500 3.906300e-002  1.416020e-001    3.271000e-001
6           0.0003000 3.906300e-002  1.440430e-001    3.345000e-001
```

Figure 1:

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2. With the data file properly formatted, launch ProAnalyst and open the video that the data file is associated with. **Select File-->Import Data-->From Text...** to open the Import Data window.
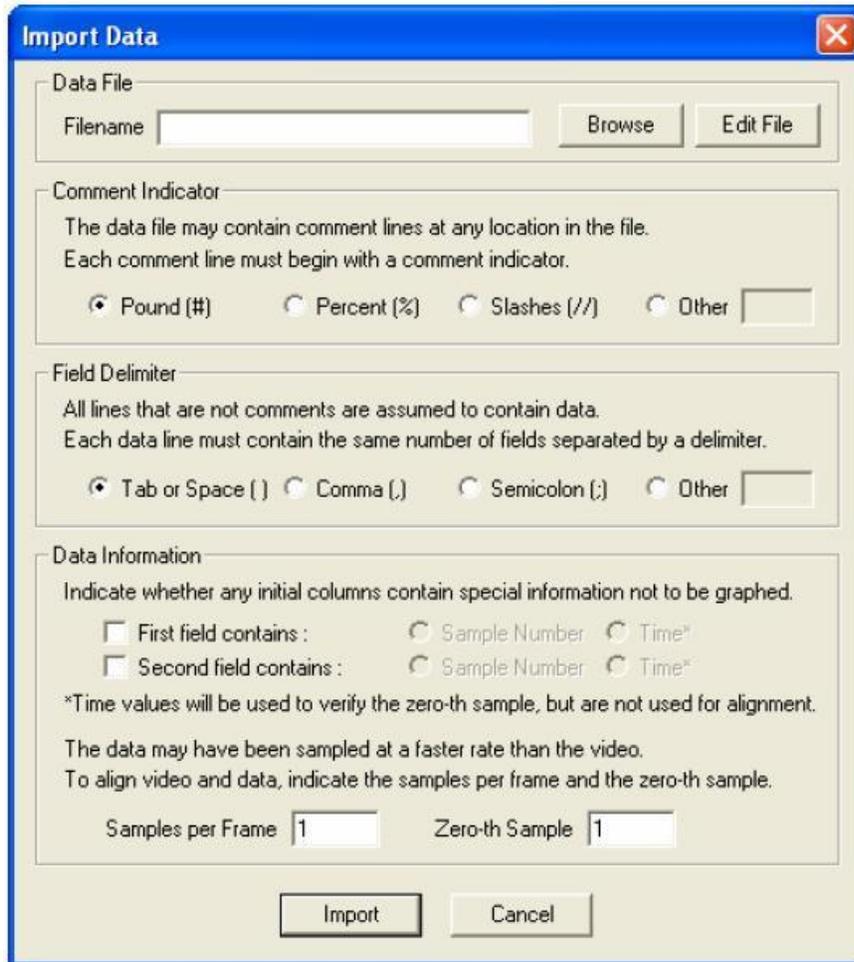

Figure 2:

3. The Import Data window contains a number of fields that allow the configuration of a data file to be specified. The first field, **Data File**, specifies the location of the text file that is to be imported. The **Browse** button opens a dialog box that allows the required data file to be selected and loaded. The **Edit File** button will open the specified data file in the system's default text editor so that any modifications can be made prior to importing the file.

4. The second field, **Comment Indicator**, allows the specification of what character is used to specify comment lines in a data file. The default selection, **Pound (#)**, is shown in the sample data file above.

   The **Other** selection allows for a custom comment character to be defined and recognized by ProAnalyst.

5. The third field, **Field Delimiter**, defines what type of delimitation is used to separate values within the data file. As with the **Comment Indicator** option, the sample data file shown above uses the default **Tab** delimiter. Likewise, the **Other** option allows for the specification of a custom delimiter if one of the default values does not correspond to the formatting of the data file.

6. The fourth field, **Data Information**, contains a series of options for the specification of data formatting within the text file. The first two values present in any line of a data file should specify the index and time stamp for the other values contained within that line. In the sample data file above, the first data field represents the sample index, while the second data field contains the time value. In this case, the two default settings specified for the **First Field Contains:** and **Second Field Contains:** option will be sufficient. These options can be set based on the configuration of the data file being imported.

7. The final two fields specify the sample rate and zero sample index for the data file. These two options allow for the synchronization of video and data, even if the two were sampled at different rates. For example, if the video in question was recorded at 100 frames per second, and the sensor data was acquired at 10,000 samples per second, the **Samples per Frame** text box would be set to 100. The value input into the **Samples Per Frame** text box must be an integer - you cannot have a video that was captured at 60 frames per second coupled with sensor data sampled at 100 samples per second. The **Zero-th Sample** text field specifies in which data sample the trigger occurred. For example, if the video is 100 frames long, the trigger is at frame 50, and there are 100 data samples per frame, then the **Zero-th Sample** could be set to 5,000. ProAnalyst will then align the video and data so that data sample 5,000 coincides with video frame 50.

8. When the properties of a data file have been specified, click the **Import** button will load the data file and align it to the video based on the preferences that have been set. If the **Samples per Frame** option was set incorrectly, the data must be reloaded through the **Import Data** window. If the **Zero-th Sample** was set incorrectly, right-click on the graph pane and select **Graph-Menus-->Adjust Video-Data Alignment** from the pop-up menu. The window that is launched will present a slider bar that can be used to re-adjust the position of the **Zero-th Sample** with respect to the video.
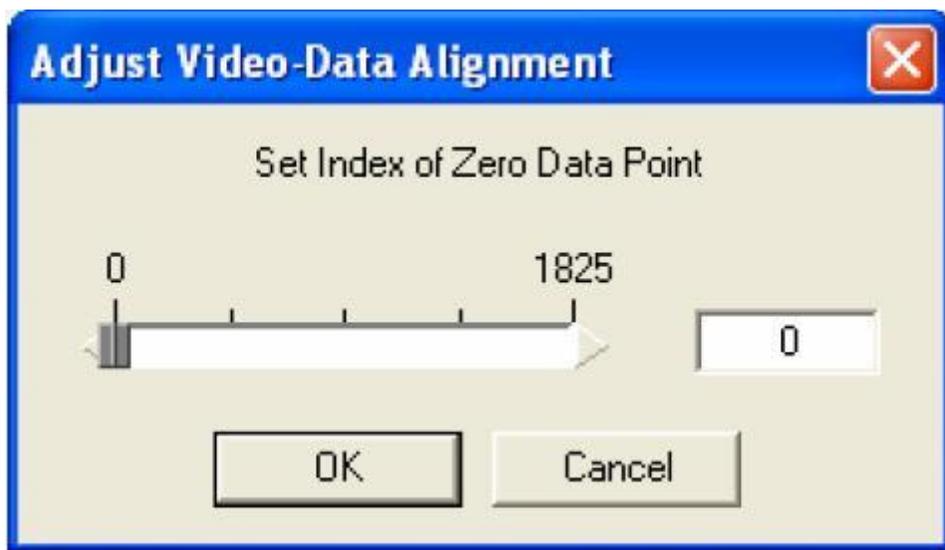

Figure 3:

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