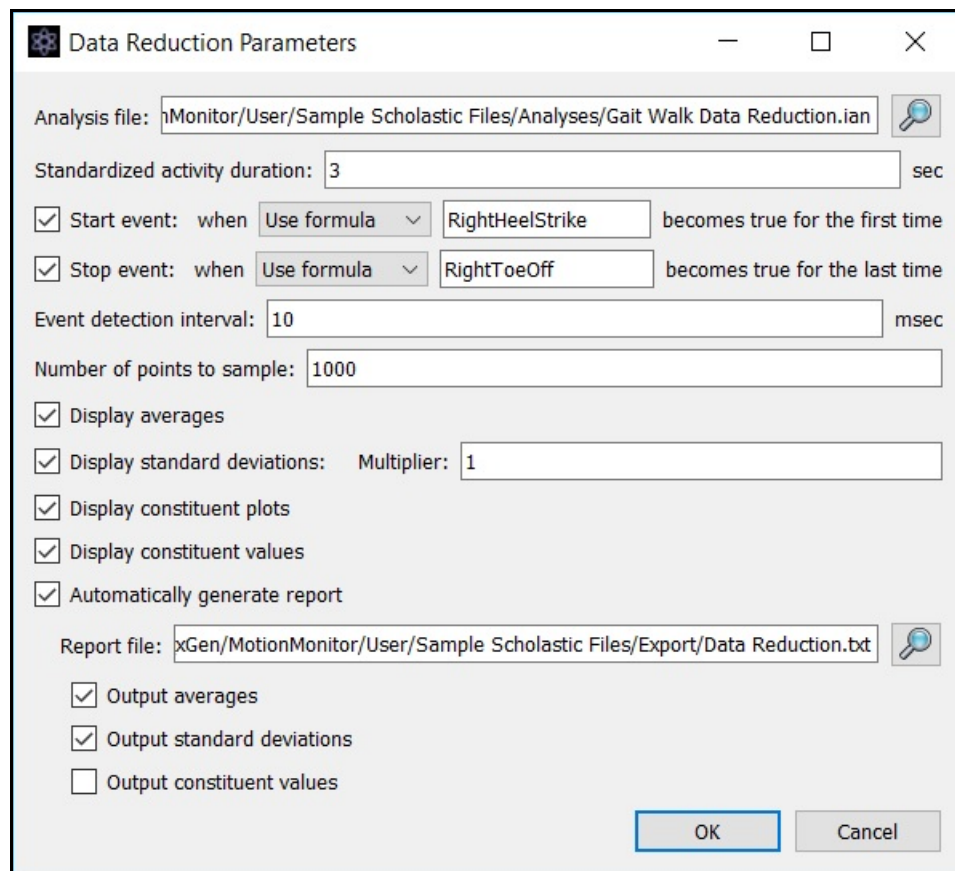


The MotionMonitor xGen Software Guide: **Data Reduction**

The following document provides instructions for configuring data reduction parameters. Data reduction provides the ability to normalize, ensemble average and compute standard deviations for data collected in repeated trials. Ensemble averaged data can then be displayed in an Activity file format or directly exported as a report (.txt file).

The Data Reduction Parameters dialog looks as follows and can be opened from the Live Workspace Analyze>Data Reduction menu or through a script that calls the DataReduction() function. The Data Reduction Parameters dialog settings are saved with the Workspace and Analysis files.



The screenshot shows the 'Data Reduction Parameters' dialog box. It contains the following fields and options:

- Analysis file: hMonitor/User/Sample Scholastic Files/Analyses/Gait Walk Data Reduction.ian
- Standardized activity duration: 3 sec
- Start event: when Use formula (dropdown) RightHeelStrike becomes true for the first time
- Stop event: when Use formula (dropdown) RightToeOff becomes true for the last time
- Event detection interval: 10 msec
- Number of points to sample: 1000
- Display averages:
- Display standard deviations: Multiplier: 1
- Display constituent plots:
- Display constituent values:
- Automatically generate report:
- Report file: xGen/MotionMonitor/User/Sample Scholastic Files/Export/Data Reduction.txt
- Output averages:
- Output standard deviations:
- Output constituent values:

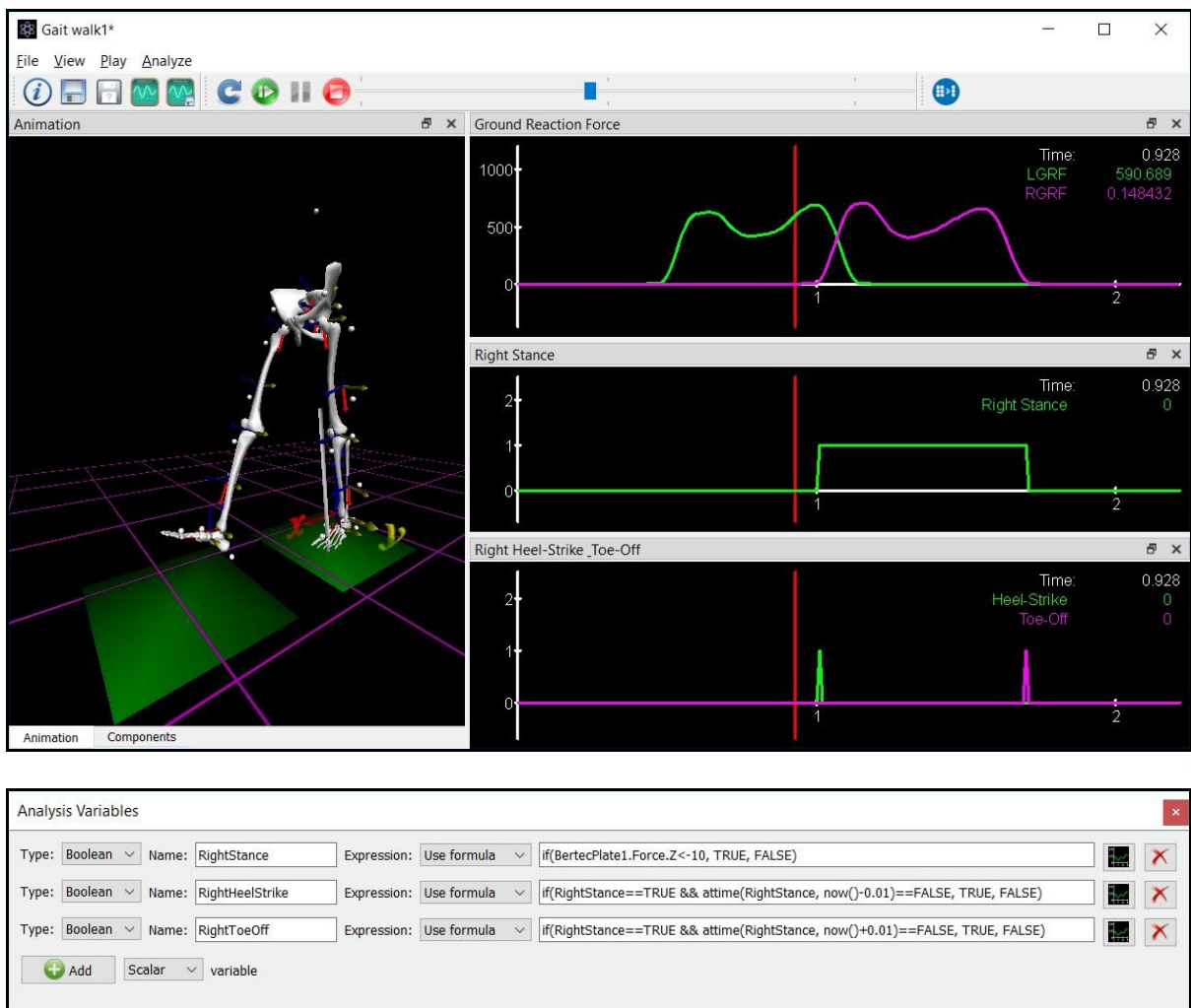
Buttons: OK, Cancel

The following example will reference the sample *Gait Walk* files available in the 'Sample Scholastic Files' User included with The MotionMonitor xGen installer.

The Analysis file to be used for Data Reduction can be selected using the Browse icon. The Analysis file includes the settings such as the defined variables, graphs and filters that will be used for performing the data reduction. It should be noted that the Live Workspace does not need to contain any of the analysis settings that you wish to be applied in your data reduction. The settings will all get loaded to each individual or constituent Activity using the selected Analysis file. The Data Reduction procedure will only be applied to variables which are included in graphs within the Analysis file. Variables which are not defined as a plot within a time series graph, such as those defined in other types of graphs or those that are only defined in the Analysis Variables list, will not be included in the data reduction.

The “Standardized activity duration” edit field specifies the duration or length of the resulting Data Reduction Activity file. In other words, if you were to playback the Data Reduction Activity, this is what determines how long would it be. Data from all files included in the data reduction will be normalized to this length.

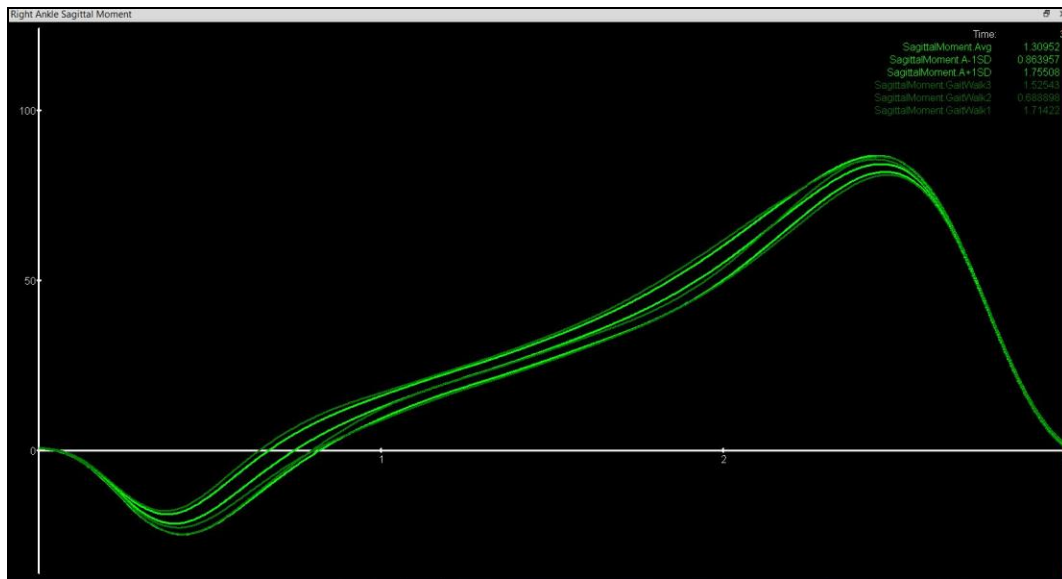
Data reduction can be performed on the whole activity, such as in the case where a common trigger across all trials was used to control the recording parameters, or on data between defined events. For the current example, data reduction is performed between heel strike and toe-off events to analyze a single stride, regardless of when the events occur in the activities included in the reduction. The software will use the first instance of these events to define the start and end of the data reduction. Unchecking the “Start event” and “Stop event” options will result in data reduction being performed from the first frame and last frame of the included activities, respectively. For examples on defining variables please see our tutorial videos [here](#) as well as the *Gait Walk* activity files included in the “Sample Scholastic” User folder or the images shown below.



The “Event detection interval” is the resolution at which the software looks for the Start and End events, when enabled. This value is in milliseconds. The user should ensure that the resolution in this field matches the measurement rate (resolution) of the data used to create the events. For example, if the events are defined using data collected at 100 Hz or with a 0.01 second interval, the event detection should be set to 10msec or lower. If using data collected at 1,000 Hz or with a 0.001 second interval, the event detection should be set to 1msec. And so on.

The “Number of Points to Sample” is the resolution of the data which is included in the data reduction. For example, a 10 second recording, or a 10 second subset of a longer activity, collected at 100Hz would result in a total of 1,000 data points. If the user desires to include all data points in the data reduction, this field should be set to 1,000. If they only want to include every 10th point, then this field would be set to 100. And so on. This value and the Standard activity duration will, in effect, determine if the underlying data from the activities are under or oversampled. The “Number of points to sample”/”Standardized activity duration” should give you an effective measurement rate for the data in the Data Reduction.

The “Display averages”, “Display standard deviations”, “Display constituent plots”, and “Display constituent values” checkboxes control what is displayed in the data reduction activity graphs, as shown below. The image below was generated with each of these options enabled. The standard deviations “Multiplier” field determines the value for the standard deviation.



A report can also be generated using the “Automatically generate report” check box. A .txt file path and file name must be specified where the report will be written to. The “Output averages”, “Output standard deviations”, and “Output constituent values” checkboxes can be enabled to include these values in the exported file.

If the `'DataReduction();'` script function is specified in a script, without the Analysis file, the script will result in opening the Data Reduction parameters dialog.

If the file path and analysis file are specified, as shown below, the data reduction parameters from the Analysis file will be used and the user will be immediately prompted to select the constituent files for performing the data reduction.

```
'DataReduction("C:/ProgramData/Innsport/TMM_xGen/MotionMonitor/User/Sample Scholastic Files/Analyses/Gait Walk Data Reduction");'
```