bioRobotics

simVITRO

Data File Structure

Quick Reference Guide

2013RB-001-002.A

Table of Contents

1. <u>Revision History</u>

Revision	Date	Name	Comment
A	8-26-14	R. Colbrunn	Created

2. <u>Using The Manual</u>

2.1. Purpose

This document outlines the file naming and storage conventions for a simVITRO project. Specific details about what data is stored in what file, how files are formatted, what portions of files are considered header, are not included in the quick reference guide. These details can be found in the 2013RB-001-003 File Organization, Contents, and Conventions Specification.

2013RB-001-002 simVITRO Data File Structure Quick Reference Guide

3. <u>Directory Definitions</u>

3.1. Drive

Path = *Drive*

This is the drive letter to which the information is to be saved or loaded from.

3.2. Test Cell Directory

Path = *Drive\Test Cell*

It is the root folder in which all experiment data resides.

Test Cell is unique to the machine or test cell in which research being performed at any given time. In the case of the simVITRO product line this is the default:

- simVITRO

3.3. Project Directory

Path = *Drive\Test Cell\Project Identifier*

It is the folder in which all experiment data for a given project done in that particular test cell resides.

Project Identifier is unique to the research being performed at any given time. Examples are:

- RB-0021-01 *(Project Number)*
- Foot
- Knee
- Shoulder

3.4. Specimen Directory

Path = *Drive\Test Cell\Project Identifier\Specimen Number*

It is the folder in which all experiment data for a given project specimen in that particular test cell resides.

Specimen Number is unique to the specimen under test at any given time. A system must be developed within each laboratory to keep track of specimens to ensure all numbers are unique and that all specimens are marked.

3.5. Experiment Run Directory

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Experiment Run Number_ Experiment Run Name*

It is the folder in which all experiment data for a given run of a given project specimen in that particular test cell resides.

Experiment Run Number is unique to the specimen under test at any given time. These numbers are automatically generated such that there will be no duplicates for a given specimen.

The *Experiment Run Name* does not need to be unique and should be a few word summary of the given run. This name will allow for easy human sorting of data files as needed. For example, the run name could be Run, Jump, Normal Gait, Pathological Gait, etc.

3.6. Subcategory Directory

Path = *Directory/SubCategory*

A subcategory is a subdirectory of any of the Test Cell, Project, Specimen, or Experiment Run directories. The following are the names of the Subcategory directories.

Configuration – Configuration data includes what ever is needed to define the configuration of the particular category.

Data – Data includes any information that is related to sensor data. This is typically used for an actual experiment run. A rule of thumb is that anything coming in the DAQ board should be stored here.

For example:

The data files for given run will be stored under the following path.

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Experiment Run Number_ Experiment Run Name\Data*

The configuration files for a given specimen will be stored under the following path.

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Configuration*

A subcategory directory is not required for the storage of all data. In some cases, the files could be located at the root. For example, a summary file for a given run will be stored under the following path.

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Experiment Run Number_ Experiment Run Name*

4. <u>File Definitions</u>

4.1. Project File

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Experiment Run Number_ Experiment Run Name\Configuration*

Extension = .sVprj

The project file stores specific simVITRO configuration parameters for a given specimen type or even for a specific project or test. Configuration parameters include sensor, state, control, actuator, channel names, trajectory, setup, gains, limits, DAQ parameters, and other settings. This file contains all the settings used for a specific experiment run and is saved for each experiment run. In this way, any changes to the system configuration are captured and known for each specific test.

4.2. Raw Data File

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Experiment Run Number_ Experiment Run Name\Data*
   *Experiment Run Number_ Experiment Run Name_*Main.tdms

Extension = .tdms

The raw data file stores all the data selected for collection in simVITRO along with a few other required system data channels. This data may contain different sample rates, and start times. The data may be analog low-pass frequency filtered based on any hardware filtering in the chain. No software filters are applied by default. However, if the analog DAQ low-pass software filter is enabled in simVITRO, then the raw data file will contain filtered analog data. All filtering has the possibility of create temporal phase shifts in the data. The amount of phase shift is a function of the filter parameters.

Note that an *Experiment Run Number_ Experiment Run Name_*Main.tdms_index file will also be created in this folder. This file is used by LabVIEW when opening the .tdms file. This file does not need to be saved, and can be deleted to save hard drive space. It will automatically be recreated the next time the .tdms file is opened.

4.3. Processed Data File

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Experiment Run Number_ Experiment Run Name\Data*
   *Experiment Run Number_ Experiment Run Name_*Main_processed.tdms

Extension = .tdms

The processed data file stores all the data selected for collection in simVITRO. This data, unlike the raw file, is all time aligned and has been resampled to produce the same sample rate for all channels and groups. The sample rate of the data is the "Digitized Data DAQ Rate" as set in the project manager. The data may be frequency filtered based on any filtering present in the raw file. In addition, the simVITRO post-processing low-pass filter is applied to all channels and groups. This low-pass filter is a zero-phase filter.

Note that an *Experiment Run Number_ Experiment Run Name_*Main_processed.tdms_index file will also be created in this folder. This file is used by LabVIEW when opening the .tdms file. This file does not need to be saved, and can be deleted to save hard drive space. It will automatically be recreated the next time the .tdms file is opened.

4.4. Summary Data File

Path = *Drive\Test Cell\Project Identifier\Specimen Number\Experiment Run Number_ Experiment Run Name\Data*
   *Project_Specimen_Experiment Run Number_ Experiment Run Name_*summary.txt

Extension = .txt

A summary file editor window will reflect what notes the user enters at the end of each experiment run. The header of the file will contain some key test parameters such as experiment run number and name, project name, specimen name, list and paths of all the files generated during the run. It also provides a place to add any comments or notes unique to a particular experiment run.

2013RB-001-002 simVITRO Data File Structure Quick Reference Guide