



DirectFeed Sample

Overview

The DirectFeed sample enables to process arbitrarily big move profiles for one ore several axes.

There are many buttons to demonstrate what's happening under the covers. However, the `Auto Loop` button as well as a command line switch allow for automating repeated profile moves.

Additionally, when dragging a move profile file over the application icon, it will automatically be executed.

Please read and follow the recommendations in this document before first starting the application.

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1 Configuration

This document presumes Visual Studio as IDE to use with the sample projects. When starting Visual Studio, one or more security warnings will be shown. In order to work properly, choose “Load project normally” and acknowledge the dialog.

When first opening the solution, set the `DirectFeedApplication` project as startup project.

1.1 Hardware Environment

Several configurations within the `DirectFeed.sln` must be adjusted to the actual hardware environment to execute the application for.

The starting point is a working TAM configuration for your system. Refer to the Drive Setup User Guide on how to set up a configuration.

If you didn't make the configuration persistent on the drive, you'll need to set up the path to the configuration by starting this application, then going to preferences using menu **File | Preferences...**, and setting the *TAM configuration file* preference in the *Startup* category appropriately.

Note This application works with the default Triamec workspace on the system. That is, changing preferences as described above may affect other applications as well.

As next step, configure the preferences shown in the *DirectFeed* category.

At least, the *Axes* preference needs your attention. Initially, there are no axes configured. Clicking on the ellipsis on the right will show a collection editor which allows you to add, reorder and modify individual axis configurations. The application identifies each axis by the name of the station and the index of the axis within the drive. *Encoder Type* has to be left as *Analog* for digital and analog encoders, and set to *Endat* for EnDat digital encoders.

The order of the axes is significant in several aspects:

- The order must be according to the data columns.
- If there are mechanical constraints, the order defines the sequence the axes move to their start and park positions. The application moves the axes to the start positions one by one in the order they are defined, and in reverse order back to park position.

The `PositionDimensionality` preference affects the amount of data sent to one axis. The application supports the following values:

- 1 – send position.
- 2 – send position and velocity.
- 3 – send position, velocity, and acceleration.

The imported data must have an according layout.

2 Motion Profiles

A simple motion profile, `data.txt`, is shipped as example, look in the `DirectFeedApplication` project.

The motion profile needs to correspond with the `Axis` and `PositionDimensionality` preferences as introduced in chapter 1.1 above. For each specified axis, `PositionDimensionality` number of columns need to be specified, in correct order. Columns exceeding that requirement will be ignored.

Beneath the provided sample `data.txt` profile, simple profiles may be created using the scope of the TAM System Explorer as follows:

- Of the path planner signals, plot position, velocity, and acceleration of each axis with 10kHz while moving.
- Save plots as comma separated value file.
- Modify the first two data rows such that the first data row contains the park position and the second data row the start position. The start position is the first actual row of the motion profile.

3 Application Modes

When simply starting the application, a window with plenty of buttons is presented. The left button column sets up DirectFeed top down while the right column is used for tear down bottom up. A history is shown at the bottom of the window. Text printed out in red indicates some warning or error, mostly due to some unlucky configuration.

The *Auto Loop* button will automatically start the process of repeatedly feeding the motion profile, using the buttons from the *Feeder Loop* group. If you omit the *Auto Loop* button, you may step through the process manually.

There is another mode, comparable to an autopilot, which is activated by passing the name of a motion profile file to the DirectFeed application. Dragging the motion profile file over the application icon in Windows Explorer does just this. In this case, the `DirectFeed.Execute` method will be called. This method demonstrates the use of the different business functionality in correct sequence. The buttons and history will reflect progress. When you intercept the script by pressing a button, this will tear down the system.

4 Shortcomings

The application imports all positions as single precision floating point numbers.

As a developer, you may customize the rate the packet feeder feeds packets to the drives using the `PacketFeeder.DownsamplingControl` peripheral register. This application uses the maximal feasible rate as indicated by the `IsochronousBasePeriod` of the first configured station. However, move profiles might include information about the rate, too (as is the case with the example `data.txt`). The application currently ignores this information.

Triamec didn't design this application for use in a production environment.

Revision History

Version	Date	Editor	Comment
1.0	2011-12-09	chm	Upgrade from old <code>readme.txt</code>
1.1	2013-06-10	chm	Changes in chapter 1 due to introduction of the Triamec workspace.
003	2014-04-03	chm	Added explanation on axis configuration in 1.1.
004	2015-03-25	chm	Start and park positions are now approached sequentially, see section 1.1. Motion profiles now contain park positions. Updated section 2 accordingly.
005	2016-01-15	chm	Section 4: Mention position floating point format
006	2017-07-19	chm	Removed Software Environment section, since setup is now trivial using NuGet
007	2023-01-31	chm	Axis identification changed from device name to station name

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Triamec Motion AG
Lindenstrasse 16
6340 Baar / Switzerland

Phone +41 41 747 4040
Email info@triamec.com
Web www.triamec.com

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