

FLEXMOTION™ VI LIBRARY VERSION 4.5

The FlexMotion VI Library 4.5 is the motion control VI library for interfacing with all National Instruments FlexMotion series motion controllers in the LabVIEW and BridgeVIEW—LabVIEW for Industrial Automation—programming environments. The FlexMotion VI Library is compatible with LabVIEW version 5.0.1 or later and BridgeVIEW version 2.0 or later.

These release notes discuss compatibility issues, describe how to install your FlexMotion VI Library, and summarize changes and improvements associated with this version.

Compatibility Issues

If you have previously developed VIs using the FlexMotion VI Library 4.0, you should read this section. If you are a first-time user of the FlexMotion VI Library, skip this section and select **No** when the FlexMotion VI Library 4.5 installer asks if you wish to install the automatic conversion files.



Note In order for the FlexMotion VI Library 4.5 to work, you must have version 4.5 firmware or later on your motion controller. See the *Updating Firmware* section of the *FlexMotion Software Version 4.5 Release Notes* on how to update your FlexMotion controller firmware.

Your existing VIs, developed with the FlexMotion VI Library 4.0, will continue to work with the FlexMotion VI Library 4.5, but we strongly recommend that you convert them to the new 4.5 format to take advantage of the improved error handling in version 4.5.

The major change between version 4.0 and 4.5 is the addition of error handling in the style of other National Instruments VI libraries. All of the FlexMotion VIs have been updated in this release to include error in and error out terminals, and the names have all been changed to be more readable. All of the previous 4.0 VIs have been moved to a *Compatibility* directory so that existing applications developed with

version 4.0 VIs will continue to work. However, due to the significant improvement in error handling, we strongly recommended that you update your 4.0 VIs to the new 4.5 VIs.

In order to make the process of updating your VIs easier, we have developed conversion files that will automatically map your 4.0 VIs to the new 4.5 VIs. If you are upgrading from the FlexMotion VI Library 4.0 to version 4.5, we recommend that you install the conversion files when presented with that choice in the installer. If you install the conversion files, your VIs developed with the FlexMotion VI Library 4.0 will be automatically converted when you open them for the first time. Then, for each of your old VIs developed with the FlexMotion VI Library 4.0, remove the old error handling calls from your application, wire up the error in and error out terminals between the VIs, and use the Motion Error Handler VI for error handling. Refer to the example VIs for guidance on using the Motion Error Handler. All of your existing wiring will remain intact.

If you choose not to install the conversion files, your old VIs will still function via the compatibility VIs, and only your new applications will make use of the new 4.5 VIs.



Note When installing the conversion files under LabVIEW, LabVIEW will be updated from 5.0.x to 5.0.1f4, or 5.1.x to 5.1f1. The next time you launch LabVIEW, you will need to provide your LabVIEW serial number again. If you do not know your LabVIEW serial number, launch LabVIEW before installing the FlexMotion VI Library 4.5 and choose **About LabVIEW** from the Help menu to view your LabVIEW serial number.

The FlexMotion VI Library is compiled in version 5.0.1f1 of LabVIEW and will work with versions 5.0.1 and later. If you have an older version of LabVIEW, contact National Instruments for an upgrade.

VI Library Installation

Before you can use the FlexMotion 4.5 VIs, you need to install FlexMotion software version 4.5 or later. Refer to the *FlexMotion Software Version 4.5 Release Notes* for software installation instructions. Complete the FlexMotion software installation before installing the FlexMotion VI Library.



Note If you are going to install the conversion files, discussed in the *Compatibility Issues* section of this document, be sure you know your LabVIEW serial number before beginning the VI library installation.

Complete the following steps to install your FlexMotion VI library:

1. If you have an earlier version of the FlexMotion VIs installed on your computer, remove it using the Add/Remove Programs feature in Windows. Only FlexMotion VI Library components will be removed; VIs that you have created will not be uninstalled.
2. Insert the FlexMotion VI Library CD into your CD-ROM drive.
3. Select **Install FlexMotion VIs 4.5**.
4. Follow the installer prompts through the rest of the installation.
5. Refer to the `ReadMe.txt` file after the installation is complete for last-minute information not contained in this document for the FlexMotion VI online help.

The FlexMotion VI Library 4.5 is installed.

Windows 3.1 Support

The previous release of FlexMotion VIs (version 4.0) supports Windows 3.1 with the PC-FlexMotion-6C controller. Version 4.0 of the FlexMotion VIs are located in the `Other\FlexVI40` directory on the FlexMotion VI Library 4.5 CD.

Summary of Changes and Improvements

There are several changes and improvements to the FlexMotion VI Library that make it easier to use and expand its functionality. However, code that you have created and validated in the past will still operate with the new VI library. A broad description of changes made in version 4.5 follows.

Error In, Error Out

All of the FlexMotion VIs have been updated to include error in and error out terminals. In addition, a special Motion Error Handler VI has been added to process any errors generated by previously executed VIs in the VI chain, as well as errors generated on the FlexMotion controller.

Also, an additional Resource Out terminal was added to the VIs to make wiring easier when multiple VIs are acting on the same resource (axis, vector space, ADC, and so on). Finally, the existing terminals were rearranged to make wiring from the top and bottom easier.

Expanded Encoder Counts per Revolution and Steps per Revolution Support

The FlexMotion family of motion controllers now supports Encoder Counts per Revolution and Steps per Revolution values up to 268,435,455 counts or steps. The new Load Counts/Steps per Revolution VI replaces the old Load Counts per Revolution and Load Steps per Revolution VIs.

However, the Init VI, as well as its sub-VIs, only supports counts per revolution and steps per revolution initialization values up to 65,536. If you wish to use values larger than 65,536, you need to call the Load Counts/Steps per Revolution VI after executing the Init VI.

Expanded Example Set

Six onboard programming examples have been added to the 13 examples in the previous release of the FlexMotion VI Library.

Re-Entrant VIs

The VIs have been recompiled using LabVIEW 5.0 and made re-entrant to use the multi-threading capabilities of LabVIEW 5.0 and later.

New VIs

The VIs in Table 1 have been added to the FlexMotion VI Library.

Table 1. New FlexMotion VIs

New VI	Description
Configure PWM Output	Enables and disables PWM outputs and sets the PWM clock frequency.
Load PWM Duty Cycle	Sets the duty cycle for a PWM output.
Set ADC Range	Sets the voltage range for the analog to digital converters on a per-channel basis. This VI is only supported by 7344 motion controllers.
Load Counts/Steps per Revolution	Loads the quadrature counts or steps per revolution for an axis. This VI can accept values up to 268,435,455 counts or steps per revolution.
Select Signal	Specifies the source and destination of various motion signals, including high-speed capture inputs, breakpoint outputs, RTSI lines, and RTSI software ports. This VI is only supported by 7344 motion controllers.
Set Encoder Frequency	Selects the maximum count frequency for an encoder channel by configuring its digital filter. This VI is only supported by 7344 motion controllers.
Read Program Status	Reads the status of an onboard program.
Enable Gearing Single Axis	Enables a slave axis for master-slave gearing.
Check Move Complete Status	Checks the move complete status for an axis, vector space, group of axes, or group of vector spaces.
Check Blend Complete Status	Checks the blend complete status for an axis, vector space, group of axes, or group of vector spaces,
Wait for Move Complete	Waits up to the specified period of time for a move to be completed on an axis, vector space, group of axes, or group of vector spaces.
Wait for Blend Complete	Waits up to the specified period of time for a blend to be completed on an axis, vector space, group of axes, or group of vector spaces
Reset Default Parameters	Resets the power-up defaults to the factory default settings.
Enable Auto Start	Allows you to automatically run a program when the controller powers up.

Table 1. New FlexMotion VIs (Continued)

New VI	Description
Enable Shutdown	Enables the shutdown functionality of the controller.
Load Base Velocity	Sets the base velocity used by the trajectory control circuitry for the axis specified.
Enable 1394 Watchdog	Enables or disables the watchdog timer on the 1394 motherboard. This VI is only supported by FW-7344 motion controllers.