FLEXMOTION™ SOFTWARE VERSION 4.0

FlexMotion software 4.0 is the motion control software for interfacing with all National Instruments FlexMotion series motion control boards. The FlexMotion software is compatible with Windows NT/98/95/3.*x* and DOS.

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

Instructions are also provided for upgrading firmware on your FlexMotion board with the FlexCommander utility and for using the new online documentation.

Compatibility Issues

The FlexMotion Software 4.0 is backward compatible with Release 3 of FlexMotion software. Existing programs should continue to work.

Note ***In order for the FlexMotion Software 4.0 to work, you must update the firmware.***

See the *Updating Firmware* section below for information on how to update the FlexMotion boards firmware.

With your firmware updated there are two changes that could affect your existing programs.

- If your existing program enabled stepper axes, the PID update rate set in the Enable Axes function may need to change. See the Enable Axes function in the *FlexMotion Software Reference Manual* for more information.
- It is no longer legal to change the PID update rate on the fly. Axes must be disabled and re-enabled to change the PID update rate using the Enable Axes function.

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Software Installation

You must install the FlexMotion software before installing a FlexMotion series motion control board for the first time. If you are upgrading from a previous version of the FlexMotion software, you do not need to remove your FlexMotion board before installing the upgrade. Your existing configuration settings shown in the Board Configuration Utility are not affected by the upgrade.

Complete the following steps to install your software:

For Windows NT/98/95

1. Insert the FlexMotion Software 4.0 CD into your CD-ROM drive.
2. Follow the installer prompts through the rest of the installation.
3. Refer to the *ReadMe.txt* file after the installation is complete for version numbers of individual motion control software components.

For Windows 3.1

1. Insert the FlexMotion Software 4.0 CD into your CD-ROM drive.
2. Choose **File»Run**.
3. Type `d:\setup16.exe` (if your CD-ROM is not drive D, type the appropriate letter).
4. Choose **OK**
5. Follow the installer prompts through the rest of the installation.
6. Refer to the *ReadMe.txt* file after the installation is complete for version numbers of individual motion control software components.

It is recommend you use the **Typical Installation**, if possible, with all of the default settings for the destination directory name and path, and so on.

DOS users can install DOS support files by running the installation batch file located on your CD's `other\Dossetup` directory.

☞ **Note** ***To obtain 3.5 in. diskettes for FlexMotion Software 4.0, contact National Instruments and request part number 777911-01. (Refer to the*** *Customer Communication* ***section of either the*** *FlexMotion Hardware User Manual* ***or the*** *FlexMotion Software Reference Manual* ***for contact information.)***

Hardware Installation

If this is the first time that you have installed the FlexMotion software on the computer, then complete the following steps to install your FlexMotion series motion control board.

☞ **Note** ***Refer to Chapter 2,*** *Configuration and Installation****, of the*** *FlexMotion Hardware User Manual* ***for additional hardware installation and handling notes.***

ISA Installation in Windows 98/95

1. Click on the **Start** button on your Windows 98/95 taskbar and select **Settings»Control Panel**.
2. Double-click on the **Add New Hardware** icon.
3. Click on the **Next** button and select **No** when prompted to search for new hardware. Then click on the **Next** button.
4. Select the **National Instruments Motion Controllers** hardware type. Then click on the **Next** button.
5. Select the **PC-FlexMotion-6C** board type. Then click on the **Next** button again.
6. After Windows assigns resources to the board, make a note of the Input/Output range. Then click on the **Next** button.
7. Click the **Finish** button to complete the **Add New Hardware Wizard**.
8. Refer to Chapter 3, *Hardware Overview*, of the *FlexMotion Hardware User Manual* for the proper DIP switch settings for the FlexMotion board to match the address assigned by Windows.

☞ **Note** ***There is no jumper to set for the interrupt number.***

9. Shut down the computer, install the FlexMotion board in an available ISA slot, and then restart the computer.
10. Click on the **Start** button on your Windows 98/95 taskbar and select **Programs»National Instruments Motion Control»Board Configuration Utility**. The FlexMotion board should automatically be assigned to the first available Board ID.
11. Click on the **VERIFY** button in the Motion Board Configuration Utility. You should receive a return message that the FlexMotion board has been verified.

ISA Installation in Windows NT/3.*x*

1. In Windows NT, click on the **Start** button on your Windows NT taskbar and select **Programs»National Instruments Motion Control»Board Configuration Utility**. In Windows 3.*x*, you can

access the Motion Board Configuration Utility from your National Instruments FlexMotion program group.

2. In the Motion Board Configuration Utility window, select the Board ID that you want to use for your FlexMotion board.
3. From the **Board Type** pull-down menu, select the **PC-FlexMotion-6C** motion control board.
4. Using Windows NT Diagnostics (or Microsoft Diagnostics in Windows 3.*x*), select a free I/O address range and interrupt setting.
5. Enter the settings you selected into the Motion Board Configuration Utility.
6. Refer to Chapter 3, *Hardware Overview*, of the *FlexMotion Hardware User Manual* for the proper DIP switch settings for the FlexMotion board to match the address you selected in Windows NT.

☞ **Note** ***There is no jumper to set for the interrupt number.***

7. Shut down the computer, install the FlexMotion board in an available ISA slot, and then restart the computer.
8. Click on the **Start** button on your Windows 98/95 taskbar and select **Programs»National Instruments Motion Control»Board Configuration Utility**. Select the Board ID for the motion control board that you just installed.
9. Click on the **VERIFY** button in the Motion Board Configuration Utility. You should receive a return message that the FlexMotion board has been verified.

PCI Installation in Windows NT/98/95

1. Shut down the computer, install the PCI-FlexMotion-6C board in an available PCI slot, and the restart your computer.
2. Click on the **Start** button on your Windows NT/98/95 taskbar and select **Programs»National Instruments Motion Control»Board Configuration Utility**. The PCI-FlexMotion-6C board should automatically be assigned to the first available Board ID.
3. Click on the **VERIFY** button in the Motion Board Configuration Utility. You should receive a return message that the FlexMotion board has been verified.

☞ **Note** ***The PCI-FlexMotion-6C board is not supported under Windows 3.x.***

Updating Firmware

Before using your FlexMotion series motion control board, you need to verify that it has the latest revision of each of its firmware components loaded. You can check these revisions and perform required updates using the FlexCommander utility as follows.

1. Click on the **Start** button on your Windows NT/98/95 taskbar and select **Programs»National Instruments Motion Control»FlexMotion»FlexCommander**. (Or run FlexCommander from your FlexMotn program group in Win 3.*x*.)
2. In FlexCommander, select **Download Firmware…** from the **Options** pull-down menu.
3. Select the **New BOOT Code** component from the pull-down menu and press the **Download Firmware** button. A prompt shows you the current BOOT Code version and the BOOT Code version that you are about to download. If the version numbers are different, click **Yes** to continue downloading this firmware component. If they are the same, click **No**.
4. Repeat step 3 to update the Firmware Code, DSP Code, and FPGA Code firmware components.

Caution ***Downloading new FPGA code resets any parameters that you have saved with the*** Save Defaults ***function to their factory default values.***

Summary of Changes and Improvements

There are several changes and improvements to the FlexMotion software that makes it easier to use and expands its functionality. However, code that you have created and validated in the past still operates with the new software. What follows is a broad description of changes in version 4.0.

Documentation Improved

The *FlexMotion Hardware User Manual* now includes insightful discussions of board-level operation including trajectory generation in different movement modes, error reporting, and onboard program capabilities, as well as thorough documentation of all motion control command and I/O circuits. The *FlexMotion Software Reference Manual* now includes information on building applications with the FlexMotion Software Library, programming language considerations, axis and resource configuration and initialization, and other advanced topics. Each command description now includes one or more pages dedicated to explaining what the command does, what each parameter does, how the command interacts with other motion control commands or processes, and examples of

operation. The *FlexMotion Software Reference Online Help* includes a hierarchical linked structure, and a searchable format for quickly finding the information related to particular functions.

Application Programming Interface

Unnecessary and unused functions in the FlexMotion API have been removed, and several commands have also been added to simplify operations on multiple axes. Refer to Appendix B, *FlexMotion Functions*, of the *FlexMotion Software Reference Manual*. Also, the parameter lists for certain functions have been simplified and standard constants have been defined to minimize the amount of required code documentation. Finally, error descriptions have been created to shorten the debugging process. Refer to Appendix A, *Error Codes*, of the *FlexMotion Software Reference Manual*.

Expanded Example Set

Several new examples have been created using LabWindows/CVI, C (Microsoft and Borland), and Visual Basic for the Windows NT/98/95, Windows 3.*x*, and DOS platforms.

Closed-Loop Stepper Functionality

Any stepper axis can now be used in closed-loop mode when configured to use a feedback resource.

Using the Online Manuals

The FlexMotion documentation is shipped with your software as two Adobe Acrobat portable document format (PDF) files, `FlexHW.pdf` and `FlexSW.pdf`. These files are electronic copies of the *FlexMotion Hardware User Manual* and the *FlexMotion Software User Manual.*

☞ **Note** ***If you do not already have Acrobat Reader version 3.0 or later installed on your system, you can install it from the FlexMotion Software CD. Run the*** `setup.exe` ***file found in the CD's*** **Support Software\Adobe Acrobat** ***directory. To view the installed PDF documents, click on the*** **Start** ***button on the Windows taskbar and select*** **Programs»National Instruments Motion Control»FlexMotion** ***and then the document that you wish to view. This automatically launches the Acrobat Reader and open the selected PDF file. You can assemble your own printed manuals, printing either the entire documentation set or only the sections relevant to your application.***

Click on any entry in the table of contents to jump directly to the corresponding manual page. You can jump to major sections within each document quickly and easily by clicking on the bookmarks.

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