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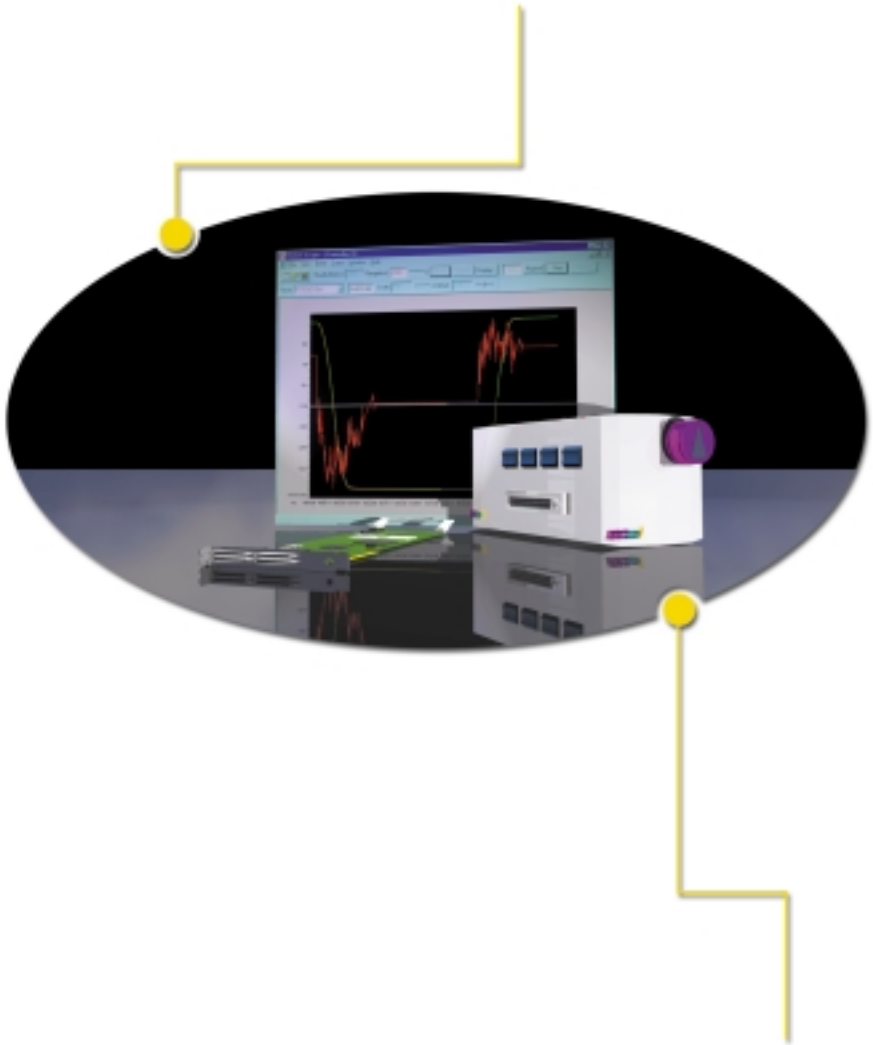
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M001-0070 1/01

Quick Start Guide



XMP Series Controller

with Motion Console & Motion Scope

Motion Engineering, Inc.

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XMP Series
Quick Start Guide

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Qstart V. 1.0

Safety Precautions

Mechanical Hazards

The following mechanical precautions should *always* be observed, especially when operating large, powerful components:

Crush-Collision Danger to Personnel— Even small mechanical components can exert sufficient force to crush or injure you! Before powering your motion control system, verify that personnel, including their hands, fingers and feet are clear of the movement zone. If you have not already done so, define the movement zone, then employ barriers and/or clearly marked boundary lines so that personnel are excluded from the zone. *Before* powering motion control components, verify that all personnel remain outside the movement zone.

Crush-Collision Hazard to Equipment— The same precautions applied to personnel should be observed for equipment. Components can be damaged or destroyed due to collision with other components or fixed hardware.

Component Hazards— Motion control may be applied to components which themselves present hazards. These include welders, saws, lasers, presses, cutters, etc. Be aware that the introduction of movement to a component extends the reach and range of that component's hazards. In addition, any object can be made dangerous if suddenly jarred loose or pitched due to sudden, wild movements. When testing new applications, it is recommended that you begin at very low speeds, then slowly increase to the design speed.

Electrical Hazards

Electrocution Hazard— Some motion control systems utilize high voltages and currents which present hazards to personnel. During installation and servicing of components:

Power off *all* electrical components and accessories connected to your motion control system.

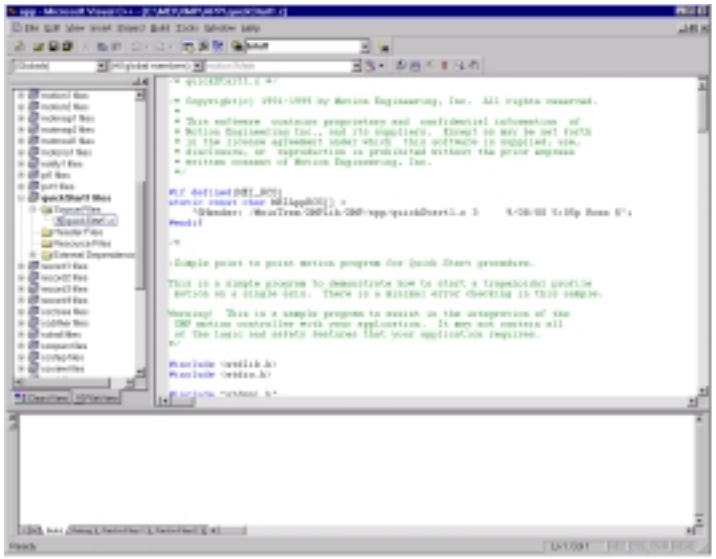
Unplug electrical devices from their source of power. Safe-lock all power plugs to prevent them from being plugged in during servicing.

Allow sufficient time for components using capacitors to discharge fully before making connections.

Do not repower *any* components until installation is complete and personnel are clear of component spaces.

ESD— Due to the use of sensitive microelectronics, all XMP boards are subject to damage due to electrostatic discharge (ESD). When handling XMP components, users are advised to observe basic ESD precautions, including the use of grounding straps and grounding mats. Removed XMP components should always be stored in protective ESD bags and/or cases.

10 Click the execute button  and the program will now be carried out. You can stop the motion anytime by hitting any key.



11 Open Motion Scope and here again you can view certain parameters by selecting the Trace button and adding those parameters you want to graph.

This guide is intended to be an introductory manual covering MEI's robust software and tuning utilites. For full documentation on all of MEI's products and capabilites please visit us on the web at www.motioneng.com or email info@motioneng.com.

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5 Change to File View and select **quickStart1** files.

6 Right click on the **quickStart1** files and ‘Set as Active Project”: this should set the **quickStart1** files in bold.

7 Click on **quickStart1.c** in the ‘Source Files’ sub directory.

8 Go to the Build menu and select Build **quickStart1.exe**.

9 Make sure that there are no errors or warnings in the dialog box.

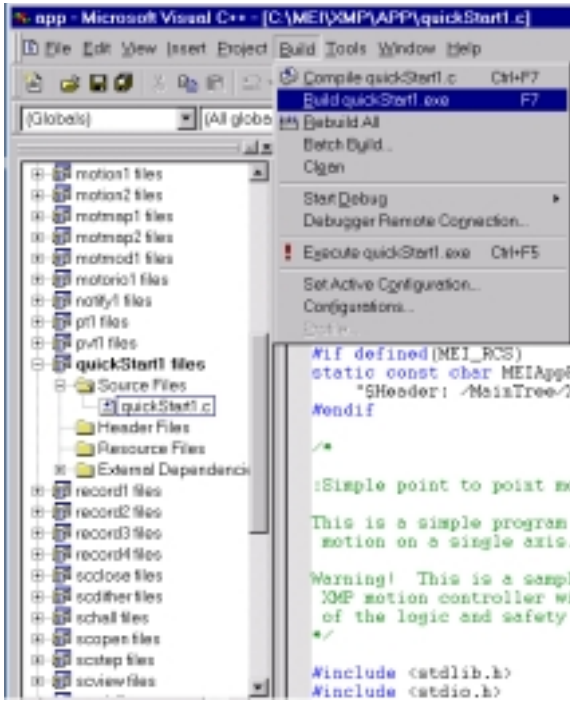


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Overview

XMP PCI and the Motion Developer Kit (MDK)

This guide will take you through installing the Motion Developer Kit (MDK) software and the XMP motion controller. You will use Motion Console to run a simple trapezoidal move with the test stand motor and Motion Scope to gather information about the associated motion. This guide lets you sample some of the powerful tuning tools MEI offers to get you up and running fast.

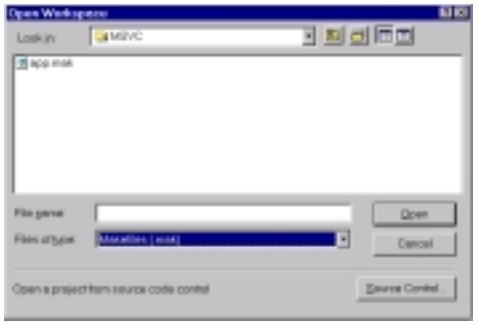
This guide also shows how to execute a C-program using Microsoft Visual C/C++ to introduce users to executing files developed from C-code. If you are not running MSVC v.4 or higher, this portion of the guide will not apply. However the MDK supports C-code written on many platforms to perform motion tasks.

Microsoft Visual C/C++

This section is an overview of running an executable C-program via Microsoft Visual C/C++. If you are not currently running MS Visual C/C++, this section will not apply. However, the XMP can be controlled by a C-program written on many different platforms; this section covers MS Visual C/C++ only.

1. Open Visual C/C++ Version 4 or higher.

2. Go to **File** -> **Open Workspace**. Browse for **app.mak**. Usually in **C**-> **MEI** -> **XMP** -> **APP** -> **(OSDirectory)** -> **MSVC**.



3. The file type should be set to display Makefile [.mak] and upon doing so the app.mak file appears. Open **app.mak** and click Yes to convert to the version of visual C/C++ you are running.

4. At this screen click OK, or press Enter if the button is off the screen.



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When selecting a trace, by default it will turn white indicating selection. The selected trace will remain white until you deselect or click anywhere on the scope background. You should notice the trace selected for command position is now the color you chose. To return to the normal view click the 'Zoom Out' button.

11 Go back to Motion Console and stop the motion by clicking on the Stop button in the MS Summary window under the Actions tab.

12 Zero the register by clicking the  button and clear any faults by clicking the clear fault button  . This will ready the controller for carrying out the quickstart1.c program covered in the next section.

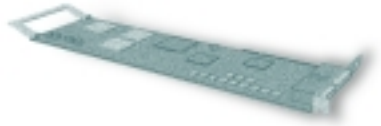
Parts List

MEI supplied components to get you started.

1 ***Motion Developers Kit CD****



2 ***XMP Series Controller***



3 ***Connector Cable****



4 ***Single Axis MEI Test Stand**** ***(power cable included)***



****Available with the Motion Developer's Kit. Please contact Motion Engineering for more information.***

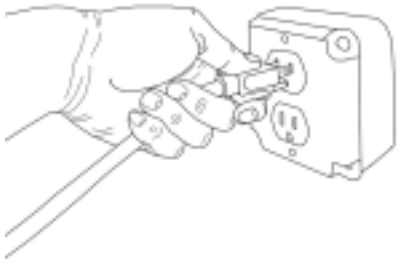
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Installing the XMP Controller

The XMP/PCI controller fits into a full-sized PCI slot in your computer. Because PC configurations vary, we recommend you refer to the expansion card installation instructions that came with your computer. If you do not feel comfortable performing the hardware installation, consult a qualified technician. Please refer to the Safety Precautions located at the beginning of this manual.

- *MEI assumes no liability for any damage caused either directly or indirectly by improper installation of components.*

- *Make sure power is OFF during the installation.*

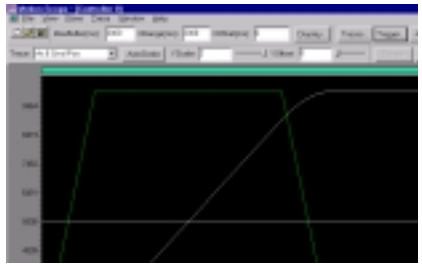


1 Shut down your computer and follow the manufacturers instruction for opening the computer and installing hardware. You should be properly grounded and avoid touching the gold contacts on the XMP/PCI controller.

2 Using the handles in a full PCI slot bay is recommended. You may need to remove the controller handles depending on the size of you computer. Make sure the XMP controller is fully inserted and should fit securely in the PCI slot.
Do not force the controller.

After you install the XMP controller, close up the computer. You are now ready to connect the cable from the XMP PCI controller to the test stand.

8 Click and drag a selection of the display like the one shown.



9 Click the 'Zoom In' button [Zoom In]. This will give a finer resolution of the data.

To better distinguish between separate traces, select **Ax 0 Cmd Pos** *from the trace field (you can also select the trace by right clicking on the trace directly) and select* **Trace -> Color** *from the menu. You are now presented with a color palette to choose a variety of preset colors along with the option to customize colors to assign to any trace.*



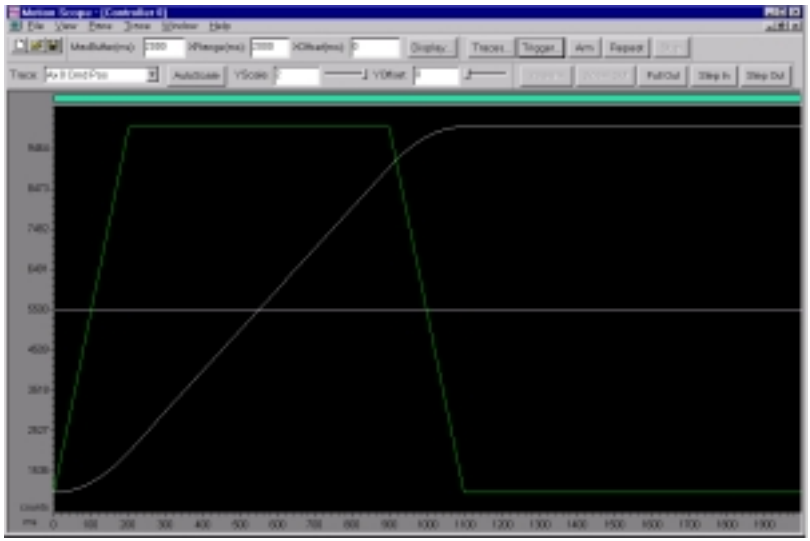
10 Choose a color and click OK.



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4 Now click the **Trigger** button and check that the **Go button** is selected as the **Start Condition** and the **Stop button** is set as the **End Condition**. Click **OK**.

5 Click the **Go** button. You will now see the selected traces being graphed in the window. This data will continue on as the motor spins.



6 At this point it may be hard to distinguish between the actual position and command position traces. Motion Scope allows you to change the color (described below) of the traces and 'Zoom In' on an area of interest.

7 Click the **Stop** button.

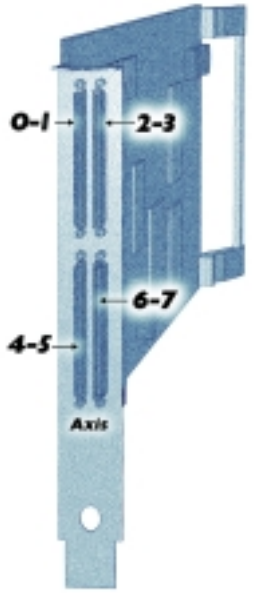
Connecting the Test Stand to the XMP Controller

1 First, connect the cable to the Axis 0-1 port on the XMP via the smaller VHDCI head on the cable supplied.

2 Make sure the power switch is in the OFF position and plug in the test stand power cord.

3 Next connect the SCSI head to the test stand, (the test stand is 12 volt single axis, sheet metal enclosed with a brush DC servo motor with a 1000 count per revolution encoder) and make sure the connector is firmly inserted.

4 Switch the test stand power ON. The green Power On LED should brighten on the MEI test stand.





MEI Test Stand

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Adding New Hardware



Use this section if your system is Windows 2000, 98, or 95 ONLY. If you are using Windows NT, proceed to the next section, "Installing the MDK Software", as this section only applies to Plug and Play operating systems.

- *All screen shots for this section were taken in Windows 2000. If you are running Windows 95 or 98, your view may look slightly different.*

Windows 95, 98, and 2000 only:

1 After the controller card has been inserted into the PCI slot, start up your system.

2 Plug and Play will recognize the new hardware, and launch the Found New Hardware Wizard.



3 Select "Display a list of the known drivers for this device so that I can choose a specific driver".



Motion Scope

This section will illustrate some basic Motion Scope features while executing a move via Motion Console.

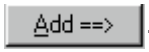
1 With Motion Console open, launch Motion Scope from the **Start Menu** -> **Program Files** -> **Motion Engineering** -> **Motion Scope** or from the Desktop.

2 After opening Motion Scope, click **File** -> **New** and you will see a new pane appear. Select Device (MPI) Controller 0. This will allow data acquisition of Controller 0 in Motion Console. Click **OK**.

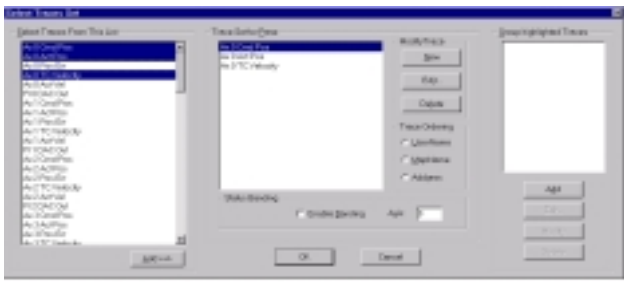


If the motor is not currently spinning as described in the last section, following the instructions to generate a trapezoidal move repetitively before going any further.

3 The scope window will appear. Click the **Traces** button on the top toolbar 

. Select **Ax 0 Cmd Pos** from the left column and click the **Add** button 

. Then add the **Ax 0 Act Pos** and **Ax 0 TC.Velocity** and Click **OK**. This will effectively trace the Actual and Command position of the move as well as the velocity calculated by the trajectory generator.



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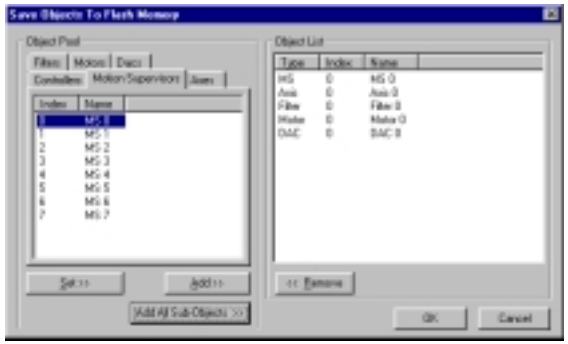
Minimizing the Motion Console window while motion is in progress will disrupt the motion.

5 Preserve your changes by clicking the Save to Flash button 

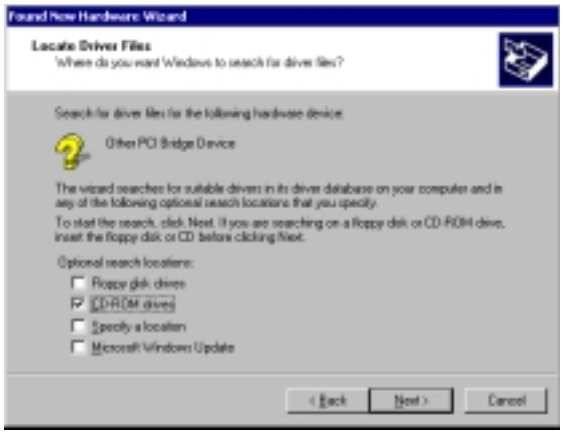
in the Motor Summary window.

If you power down your system, upon restarting Motion Console certain preferences are lost if they are not saved. If you want to save all the parameters and associations you just entered, go to the MS Summary window, and click on the Save to Flash button 

. The Object Pool contains categories by tab. From here you can add the Motion Summary, Filter, Axis and Motor summary parameters by selecting items in the Object Pool, then clicking the* Add *button. Items will be added to the Object List and are saved to flash when the* OK *button is clicked.



4 The hardware device drivers are included on the CD that MEI provides, so be sure that the 'CD-ROM drive' checkbox is selected.



5 When a driver is located, verify that the **meixmp.inf** file inside the **/drivers/<OS Directory>** was selected, then continue.



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6 Complete the Found New Hardware Wizard by clicking Finish.



Spinning the Motor

The next steps will execute a move and spin the test stand motor.

1 Go to the MS Summary Window and under the Actions tab, click the **Zero Position** button .

2 Then click the green Clear Fault button . Be sure the State under the General Status tab shows . Clicking on the **Move Pos. 2** button  will now run the commands you just entered. Clicking on the **Move Pos. 1** button  will move the axis back to position 1.

You will notice the motor spinning on the test stand slowly for several seconds. If it is not moving, check to verify that the power has been turned on, the amplifier has been enabled and that the Axis Summary window is displaying CMD and ACT position changes. Also, check for any error messages by clicking the error button,  ***or by going to the*** **View-> Library Errors** ***menu option.***

3 To repeat, click on the **Enabled** check box for the repeat mode parameter in the Action Tab.

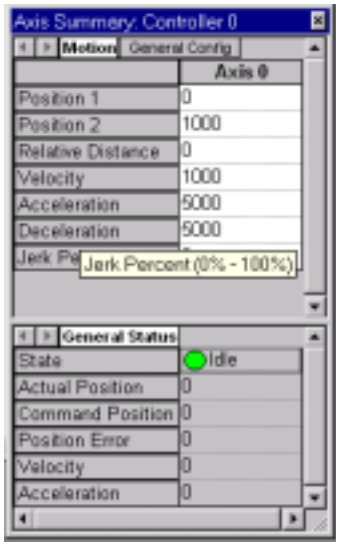
4 Now enter the following values in the Axis Summary window: for Position 2, enter **1000**: Velocity, enter **10000**: Acceleration, enter **50000** and for Deceleration enter **50000**. Click the  button and then click **Move Pos. 2** button (MS Summary Window).

The motor will now spin quickly back and forth. Leave the motor spinning.

The next section will demonstrate data acquisition via Motion Scope about the currently executing move. You can stop motion by clicking the Stop button, but resume the repeat motion before moving on.

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4 With MS 0 still highlighted in the Object Explorer window, click on the **Axis** objects button to open the **Axis Summary Window**. Under the **Motion** tab, enter **1000** for Position 2, **1000** for Velocity, **5000** for Acceleration, and **5000** for Deceleration. The Relative Distance input field should be left at 0.



You are now configured to run a simple trapezoidal move. First, we recommend arranging the windows on your desktop. This is a personal preference, but you want to try to see all the windows, in particular, the MS Summary and Axis Summary windows.

Installing the MDK Software

This section guides you through the software installation process. You must log on with administrative privileges, since the setup process writes to the registry.

WARNING!

If you are upgrading from a previous MPI/XMP software release, you must remove or archive all previous releases. To remove the previous MPI/XMP software release, click Start -> Control Panel-> Add/Remove Programs. Select the MPI/XMP Development Toolkit entry and click the Add/Remove button. Files that have been altered or added from previous installations will not be removed.
The MPI/XMP software release can also be removed by running the MDK Install Shield and choosing the Remove option.



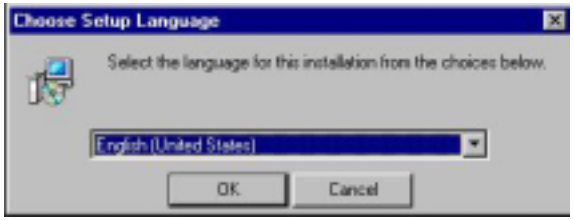


Windows NT, 98, and 95 users:

The MDK installation process uses the Windows 2000 installer. If this is not currently on your system, the MDK CD will automatically install it on your system when launching the MDK setup. The Install Wizard will reboot your system after these files are installed. Please shut down all programs before running the Install Wizard for the first time. If the Install Wizard does not re-launch automatically, browse to the CD and click Setup.exe.

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1 Insert the MDK CD. Launch the Setup.exe Install Shield Wizard from the MDK CD in your CD-ROM drive. You will then be prompted to select a setup language.



2 After a language is selected, a welcome screen will appear, click Next to continue.



Controller Associations

During the following associations, leave the summary windows open to keep them active.

1 In the Object Explorer window, make sure that MS 0 is still highlighted. Click the **Motion Supervisor** object button from the Motion Control toolbar to open the **MS Summary Window**. In this window, verify that the **Motion Type** is set to **Trapezoidal** under the General Config tab. Go to the Actions tab and click on the **Clear Fault** button.

2 With MS 0 still highlighted in the Object Explorer window, click on the **Filter** object button to open the Filter Summary Window. In this window under the General Config tab, make sure the **Algorithm** is set to **PID**. Click on the **Coefficients** tab and select **PID** from the **Algorithm** drop-down menu. Now enter:

800 for Proportional Gain (Kp)
8 for Integral Gain (Ki)
1,200 for Derivative Gain (Kd)
10,000 for Integrator Maximum at Rest (IMaxRest)

3 Go back to the Object Explorer window with MS 0 still highlighted and click the Motor object button to open the **Motor Summary Window**. Under the General Config tab in this window, make sure the motor **Type** is set to **Servo**. Verify that the **Amp Polarity** is set to **Inverted,** and check the **Amp Enable** checkbox to **Enabled**. Ensure that the amplifier is enabled by verifying that the Amp Enable LED on the test stand is lit.

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Motion Console

This section will show you how to configure Motion console for a single axis move, in order to spin the test stand motor. You will need to follow the next set of steps to associate Motion Summary, Axis Summary, Filter Summary and Motor Summary to the Controller.

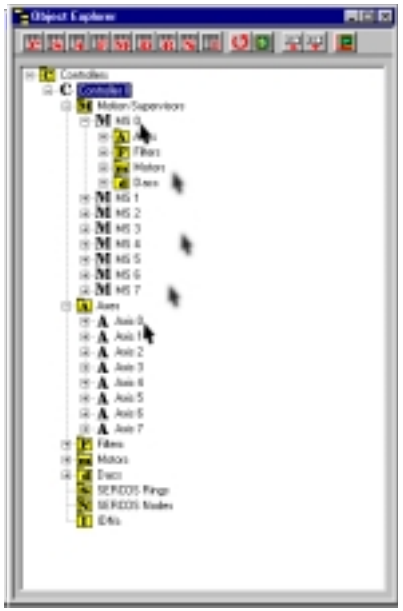
1. Launch Motion Console from the **Start Menu** -> **Programs** -> **Motion Engineering** directory, or from the Desktop.

2. When the application starts up you may see **Controller 0** with a + sign next to it under the Controllers submenu, in the Object Explorer window.

3. If you do not see the **Controller 0**, click the **Add Controller** button. Click OK at the next prompt and you should see Controller 0 with a + sign now appear in the main window.

Note

This indicates the controller is seen. If you do not see Controller 0 with a '+', check the controller's error message by clicking or by going to the View-> Library Errors menu option. You may also need to perform the device driver activation again, re-load the new firmware, and/or reinstall the MEI software. Also be sure the XMP card was properly installed.



4. Open Controller 0 by clicking on the +.

5. Open the **Motion Supervisors** by clicking on the +.

6. Next, open the **Axes** Folder again by clicking the +.

7. Left Click on Axis 0 and drag it onto MS 0. This associates Axis 0 with Motion Supervisor 0. Click Yes at the prompt to map Axis 0 to MS 0.

3. At the install prompt, you may choose either Custom or Complete as the installation type. The Install Wizard will choose **C:\mei** as the default destination directory. You can choose another directory by using the Custom installation, but MEI recommends using the MEI default.



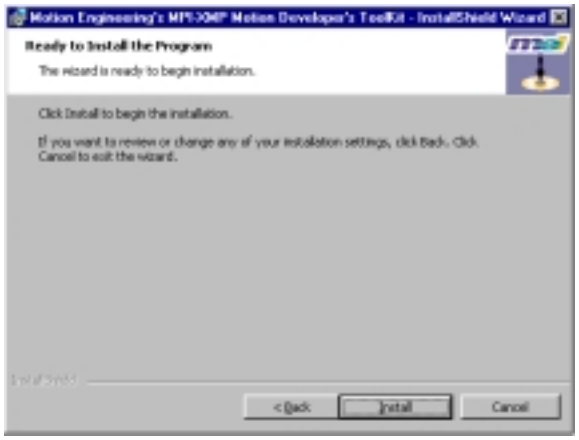
4. Custom lets you select the program features you want installed.

Setup will determine which files are needed and create a Program Group on the Start Menu called 'Motion Engineering'. Setup will also install release notes and late breaking documentation not covered in this manual.



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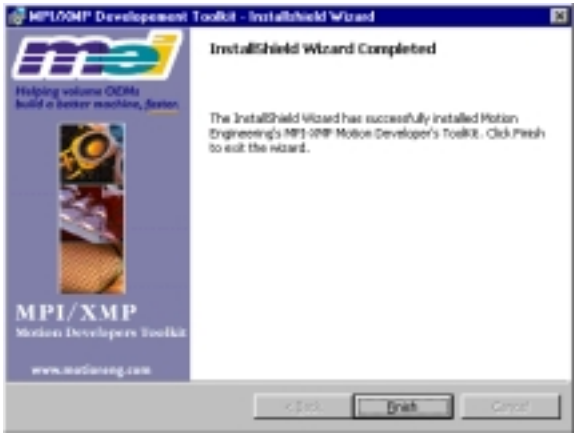
5 The setup wizard prompts you that it is ready to install the product.



6 Continue through the remainder of the installation windows by clicking 'Next' when prompted.

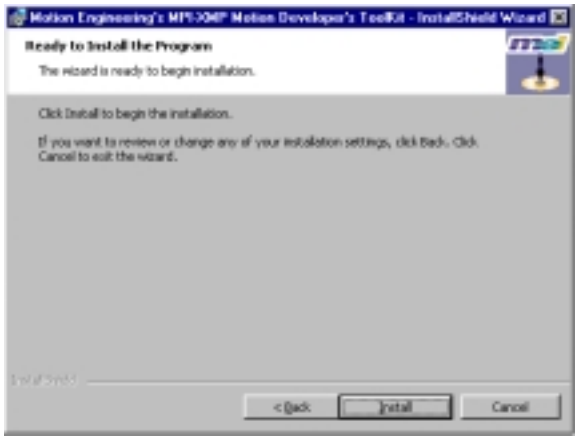


7 When you reach the Setup Complete screen, click 'Finish' to complete the installation.



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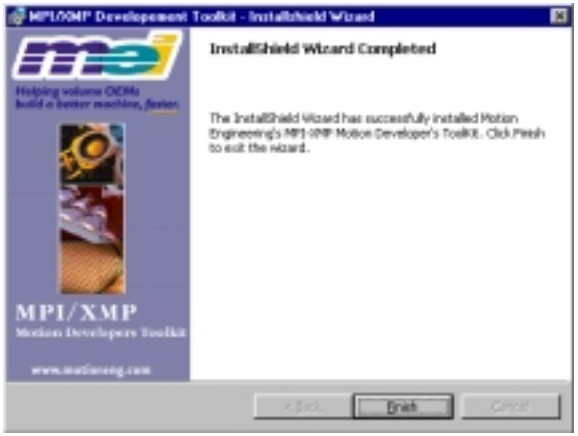
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Motion Console

This section will show you how to configure Motion console for a single axis move, in order to spin the test stand motor. You will need to follow the next set of steps to associate Motion Summary, Axis Summary, Filter Summary and Motor Summary to the Controller.

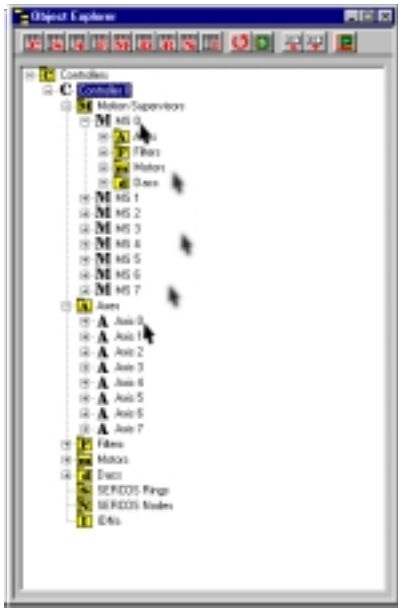
1. Launch Motion Console from the **Start Menu** -> **Programs** -> **Motion Engineering** directory, or from the Desktop.

2. When the application starts up you may see **Controller 0** with a + sign next to it under the Controllers submenu, in the Object Explorer window.

3. If you do not see the **Controller 0**, click the **Add Controller** button. Click OK at the next prompt and you should see Controller 0 with a + sign now appear in the main window.

Note

This indicates the controller is seen. If you do not see Controller 0 with a '+', check the controller's error message by clicking or by going to the View-> Library Errors menu option. You may also need to perform the device driver activation again, re-load the new firmware, and/or reinstall the MEI software. Also be sure the XMP card was properly installed.



4. Open Controller 0 by clicking on the +.

5. Open the **Motion Supervisors** by clicking on the +.

6. Next, open the **Axes** Folder again by clicking the +.

7. Left Click on Axis 0 and drag it onto MS 0. This associates Axis 0 with Motion Supervisor 0. Click Yes at the prompt to map Axis 0 to MS 0.

3. At the install prompt, you may choose either Custom or Complete as the installation type. The Install Wizard will choose **C:\mei** as the default destination directory. You can choose another directory by using the Custom installation, but MEI recommends using the MEI default.



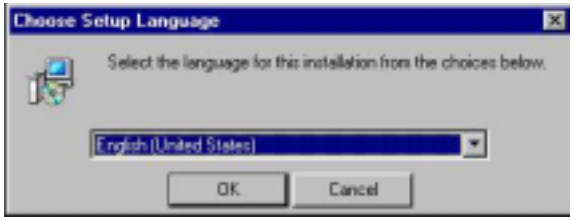
4. Custom lets you select the program features you want installed.

Setup will determine which files are needed and create a Program Group on the Start Menu called 'Motion Engineering'. Setup will also install release notes and late breaking documentation not covered in this manual.



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1 Insert the MDK CD. Launch the Setup.exe Install Shield Wizard from the MDK CD in your CD-ROM drive. You will then be prompted to select a setup language.



2 After a language is selected, a welcome screen will appear, click Next to continue.



Controller Associations

During the following associations, leave the summary windows open to keep them active.

1 In the Object Explorer window, make sure that MS 0 is still highlighted. Click the **Motion Supervisor** object button from the Motion Control toolbar to open the **MS Summary Window**. In this window, verify that the **Motion Type** is set to **Trapezoidal** under the General Config tab. Go to the Actions tab and click on the **Clear Fault** button.

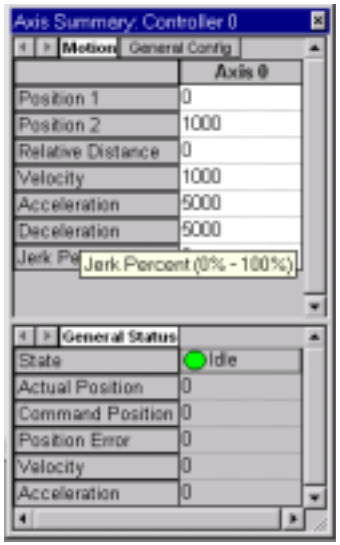
2 With MS 0 still highlighted in the Object Explorer window, click on the **Filter** object button to open the Filter Summary Window. In this window under the General Config tab, make sure the **Algorithm** is set to **PID**. Click on the **Coefficients** tab and select **PID** from the **Algorithm** drop-down menu. Now enter:

800 for Proportional Gain (Kp)
8 for Integral Gain (Ki)
1,200 for Derivative Gain (Kd)
10,000 for Integrator Maximum at Rest (IMaxRest)

3 Go back to the Object Explorer window with MS 0 still highlighted and click the Motor object button to open the **Motor Summary Window**. Under the General Config tab in this window, make sure the motor **Type** is set to **Servo**. Verify that the **Amp Polarity** is set to **Inverted,** and check the **Amp Enable** checkbox to **Enabled**. Ensure that the amplifier is enabled by verifying that the Amp Enable LED on the test stand is lit.

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4 With MS 0 still highlighted in the Object Explorer window, click on the **Axis** objects button to open the **Axis Summary Window**. Under the **Motion** tab, enter **1000** for Position 2, **1000** for Velocity, **5000** for Acceleration, and **5000** for Deceleration. The Relative Distance input field should be left at 0.



You are now configured to run a simple trapezoidal move. First, we recommend arranging the windows on your desktop. This is a personal preference, but you want to try to see all the windows, in particular, the MS Summary and Axis Summary windows.

Installing the MDK Software

This section guides you through the software installation process. You must log on with administrative privileges, since the setup process writes to the registry.

WARNING!

If you are upgrading from a previous MPI/XMP software release, you must remove or archive all previous releases. To remove the previous MPI/XMP software release, click Start -> Control Panel-> Add/Remove Programs. Select the MPI/XMP Development Toolkit entry and click the Add/Remove button. Files that have been altered or added from previous installations will not be removed.
The MPI/XMP software release can also be removed by running the MDK Install Shield and choosing the Remove option.





Windows NT, 98, and 95 users:

The MDK installation process uses the Windows 2000 installer. If this is not currently on your system, the MDK CD will automatically install it on your system when launching the MDK setup. The Install Wizard will reboot your system after these files are installed. Please shut down all programs before running the Install Wizard for the first time. If the Install Wizard does not re-launch automatically, browse to the CD and click Setup.exe.

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6 Complete the Found New Hardware Wizard by clicking Finish.



Spinning the Motor

The next steps will execute a move and spin the test stand motor.

1 Go to the MS Summary Window and under the Actions tab, click the **Zero Position** button .

2 Then click the green Clear Fault button . Be sure the State under the General Status tab shows . Clicking on the **Move Pos. 2** button  will now run the commands you just entered. Clicking on the **Move Pos. 1** button  will move the axis back to position 1.

You will notice the motor spinning on the test stand slowly for several seconds. If it is not moving, check to verify that the power has been turned on, the amplifier has been enabled and that the Axis Summary window is displaying CMD and ACT position changes. Also, check for any error messages by clicking the error button,  ***or by going to the*** **View-> Library Errors** ***menu option.***

3 To repeat, click on the **Enabled** check box for the repeat mode parameter in the Action Tab.

4 Now enter the following values in the Axis Summary window: for Position 2, enter **1000**: Velocity, enter **10000**: Acceleration, enter **50000** and for Deceleration enter **50000**. Click the  button and then click **Move Pos. 2** button (MS Summary Window).

The motor will now spin quickly back and forth. Leave the motor spinning.

The next section will demonstrate data acquisition via Motion Scope about the currently executing move. You can stop motion by clicking the Stop button, but resume the repeat motion before moving on.

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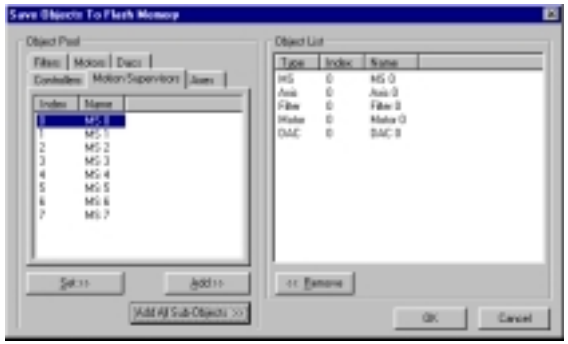
Minimizing the Motion Console window while motion is in progress will disrupt the motion.

5 Preserve your changes by clicking the Save to Flash button 

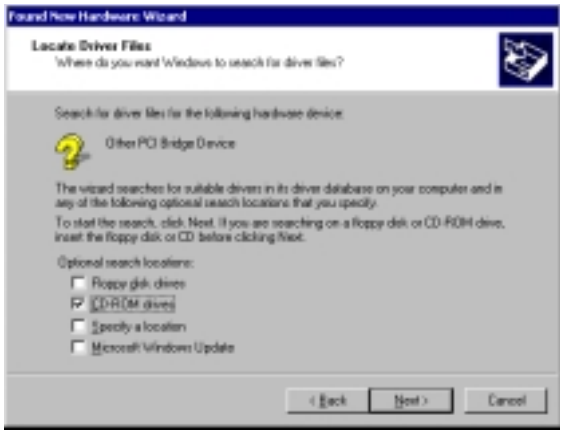
in the Motor Summary window.

If you power down your system, upon restarting Motion Console certain preferences are lost if they are not saved. If you want to save all the parameters and associations you just entered, go to the MS Summary window, and click on the Save to Flash button 

. The Object Pool contains categories by tab. From here you can add the Motion Summary, Filter, Axis and Motor summary parameters by selecting items in the Object Pool, then clicking the* Add *button. Items will be added to the Object List and are saved to flash when the* OK *button is clicked.



4 The hardware device drivers are included on the CD that MEI provides, so be sure that the 'CD-ROM drive' checkbox is selected.



5 When a driver is located, verify that the **meixmp.inf** file inside the **/drivers/<OS Directory>** was selected, then continue.



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Adding New Hardware



Use this section if your system is Windows 2000, 98, or 95 ONLY. If you are using Windows NT, proceed to the next section, "Installing the MDK Software", as this section only applies to Plug and Play operating systems.

- *All screen shots for this section were taken in Windows 2000. If you are running Windows 95 or 98, your view may look slightly different.*

Windows 95, 98, and 2000 only:

1 After the controller card has been inserted into the PCI slot, start up your system.

2 Plug and Play will recognize the new hardware, and launch the Found New Hardware Wizard.



3 Select "Display a list of the known drivers for this device so that I can choose a specific driver".



Motion Scope

This section will illustrate some basic Motion Scope features while executing a move via Motion Console.

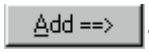
1 With Motion Console open, launch Motion Scope from the **Start Menu** -> **Program Files** -> **Motion Engineering** -> **Motion Scope** or from the Desktop.

2 After opening Motion Scope, click **File** -> **New** and you will see a new pane appear. Select Device (MPI) Controller 0. This will allow data acquisition of Controller 0 in Motion Console. Click **OK**.

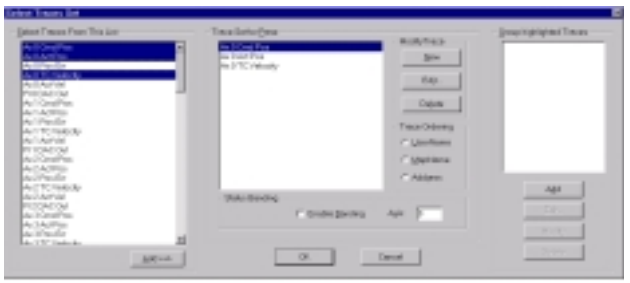


If the motor is not currently spinning as described in the last section, following the instructions to generate a trapezoidal move repetitively before going any further.

3 The scope window will appear. Click the **Traces** button on the top toolbar 

. Select **Ax 0 Cmd Pos** from the left column and click the **Add** button 

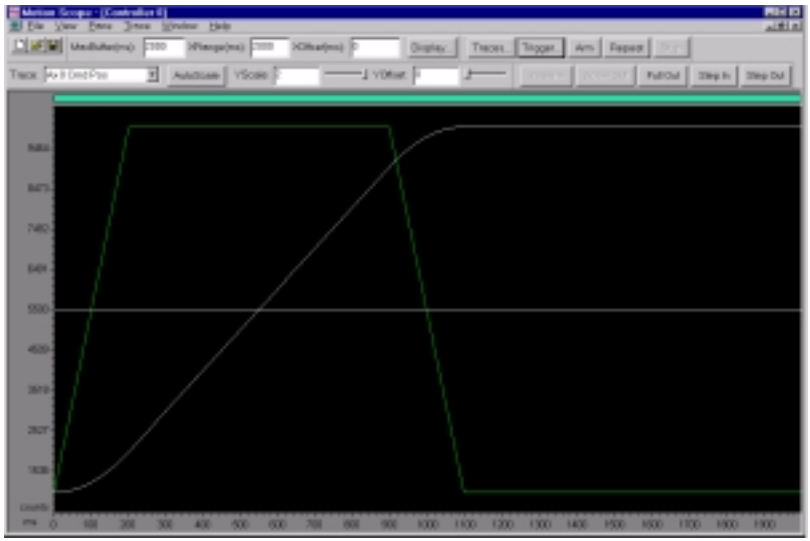
. Then add the **Ax 0 Act Pos** and **Ax 0 TC.Velocity** and Click **OK**. This will effectively trace the Actual and Command position of the move as well as the velocity calculated by the trajectory generator.



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4 Now click the **Trigger** button and check that the **Go button** is selected as the **Start Condition** and the **Stop button** is set as the **End Condition**. Click **OK**.

5 Click the **Go** button. You will now see the selected traces being graphed in the window. This data will continue on as the motor spins.



6 At this point it may be hard to distinguish between the actual position and command position traces. Motion Scope allows you to change the color (described below) of the traces and 'Zoom In' on an area of interest.

7 Click the **Stop** button.

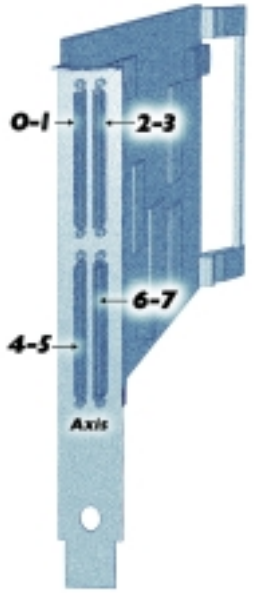
Connecting the Test Stand to the XMP Controller

1 First, connect the cable to the Axis 0-1 port on the XMP via the smaller VHDCI head on the cable supplied.

2 Make sure the power switch is in the OFF position and plug in the test stand power cord.

3 Next connect the SCSI head to the test stand, (the test stand is 12 volt single axis, sheet metal enclosed with a brush DC servo motor with a 1000 count per revolution encoder) and make sure the connector is firmly inserted.

4 Switch the test stand power ON. The green Power On LED should brighten on the MEI test stand.





MEI Test Stand

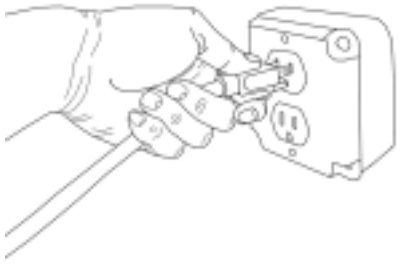
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Installing the XMP Controller

The XMP/PCI controller fits into a full-sized PCI slot in your computer. Because PC configurations vary, we recommend you refer to the expansion card installation instructions that came with your computer. If you do not feel comfortable performing the hardware installation, consult a qualified technician. Please refer to the Safety Precautions located at the beginning of this manual.

- *MEI assumes no liability for any damage caused either directly or indirectly by improper installation of components.*

- *Make sure power is OFF during the installation.*

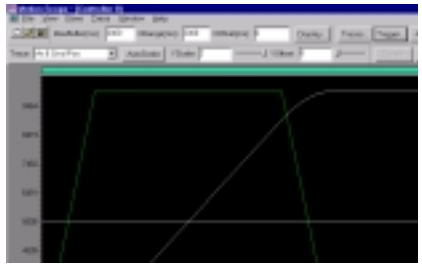


1 Shut down your computer and follow the manufacturers instruction for opening the computer and installing hardware. You should be properly grounded and avoid touching the gold contacts on the XMP/PCI controller.

2 Using the handles in a full PCI slot bay is recommended. You may need to remove the controller handles depending on the size of you computer. Make sure the XMP controller is fully inserted and should fit securely in the PCI slot.
Do not force the controller.

After you install the XMP controller, close up the computer. You are now ready to connect the cable from the XMP PCI controller to the test stand.

8 Click and drag a selection of the display like the one shown.



9 Click the 'Zoom In' button [Zoom In]. This will give a finer resolution of the data.

To better distinguish between separate traces, select **Ax 0 Cmd Pos** *from the trace field (you can also select the trace by right clicking on the trace directly) and select* **Trace -> Color** *from the menu. You are now presented with a color palette to choose a variety of preset colors along with the option to customize colors to assign to any trace.*



10 Choose a color and click OK.



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When selecting a trace, by default it will turn white indicating selection. The selected trace will remain white until you deselect or click anywhere on the scope background. You should notice the trace selected for command position is now the color you chose. To return to the normal view click the 'Zoom Out' button.

11 Go back to Motion Console and stop the motion by clicking on the Stop button in the MS Summary window under the Actions tab.

12 Zero the register by clicking the  button and clear any faults by clicking the clear fault button  . This will ready the controller for carrying out the quickstart1.c program covered in the next section.

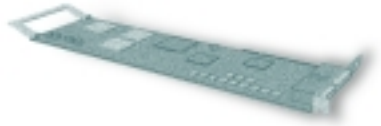
Parts List

MEI supplied components to get you started.

1 ***Motion Developers Kit CD****



2 ***XMP Series Controller***



3 ***Connector Cable****



4 ***Single Axis MEI Test Stand**** ***(power cable included)***



****Available with the Motion Developer's Kit. Please contact Motion Engineering for more information.***

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Overview

XMP PCI and the Motion Developer Kit (MDK)

This guide will take you through installing the Motion Developer Kit (MDK) software and the XMP motion controller. You will use Motion Console to run a simple trapezoidal move with the test stand motor and Motion Scope to gather information about the associated motion. This guide lets you sample some of the powerful tuning tools MEI offers to get you up and running fast.

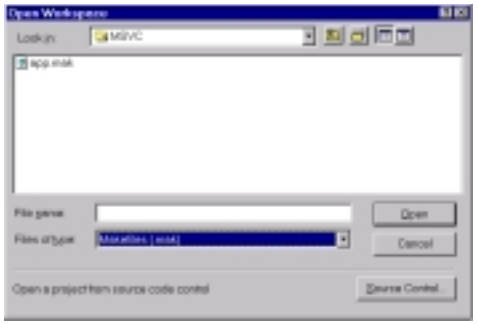
This guide also shows how to execute a C-program using Microsoft Visual C/C++ to introduce users to executing files developed from C-code. If you are not running MSVC v.4 or higher, this portion of the guide will not apply. However the MDK supports C-code written on many platforms to perform motion tasks.

Microsoft Visual C/C++

This section is an overview of running an executable C-program via Microsoft Visual C/C++. If you are not currently running MS Visual C/C++, this section will not apply. However, the XMP can be controlled by a C-program written on many different platforms; this section covers MS Visual C/C++ only.

1. Open Visual C/C++ Version 4 or higher.

2. Go to **File** -> **Open Workspace**. Browse for **app.mak**. Usually in **C**-> **MEI** -> **XMP** -> **APP** -> **(OSDirectory)** -> **MSVC**.



3. The file type should be set to display Makefile [.mak] and upon doing so the app.mak file appears. Open **app.mak** and click Yes to convert to the version of visual C/C++ you are running.

4. At this screen click OK, or press Enter if the button is off the screen.



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5 Change to File View and select **quickStart1** files.

6 Right click on the **quickStart1** files and ‘Set as Active Project”: this should set the **quickStart1** files in bold.

7 Click on **quickStart1.c** in the ‘Source Files’ sub directory.

8 Go to the Build menu and select Build **quickStart1.exe**.

9 Make sure that there are no errors or warnings in the dialog box.

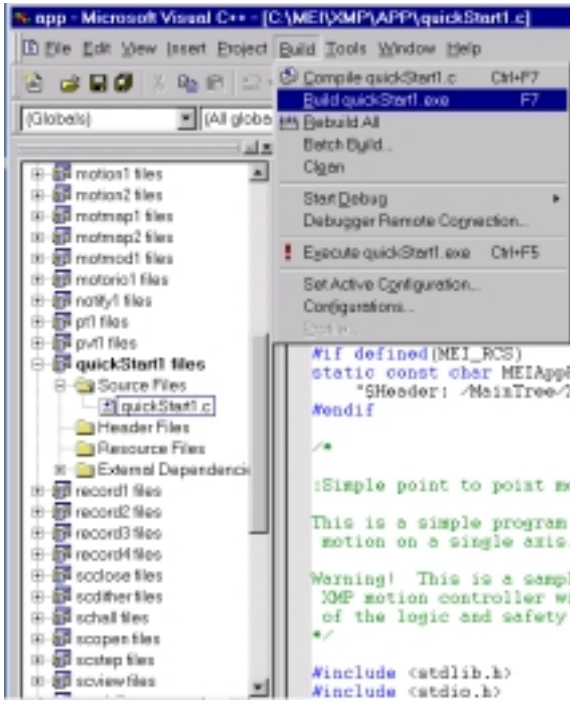


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XMP Series
Quick Start Guide

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Qstart V. 1.0

Safety Precautions

Mechanical Hazards

The following mechanical precautions should *always* be observed, especially when operating large, powerful components:

Crush-Collision Danger to Personnel— Even small mechanical components can exert sufficient force to crush or injure you! Before powering your motion control system, verify that personnel, including their hands, fingers and feet are clear of the movement zone. If you have not already done so, define the movement zone, then employ barriers and/or clearly marked boundary lines so that personnel are excluded from the zone. *Before* powering motion control components, verify that all personnel remain outside the movement zone.

Crush-Collision Hazard to Equipment— The same precautions applied to personnel should be observed for equipment. Components can be damaged or destroyed due to collision with other components or fixed hardware.

Component Hazards— Motion control may be applied to components which themselves present hazards. These include welders, saws, lasers, presses, cutters, etc. Be aware that the introduction of movement to a component extends the reach and range of that component's hazards. In addition, any object can be made dangerous if suddenly jarred loose or pitched due to sudden, wild movements. When testing new applications, it is recommended that you begin at very low speeds, then slowly increase to the design speed.

Electrical Hazards

Electrocution Hazard— Some motion control systems utilize high voltages and currents which present hazards to personnel. During installation and servicing of components:

Power off *all* electrical components and accessories connected to your motion control system.

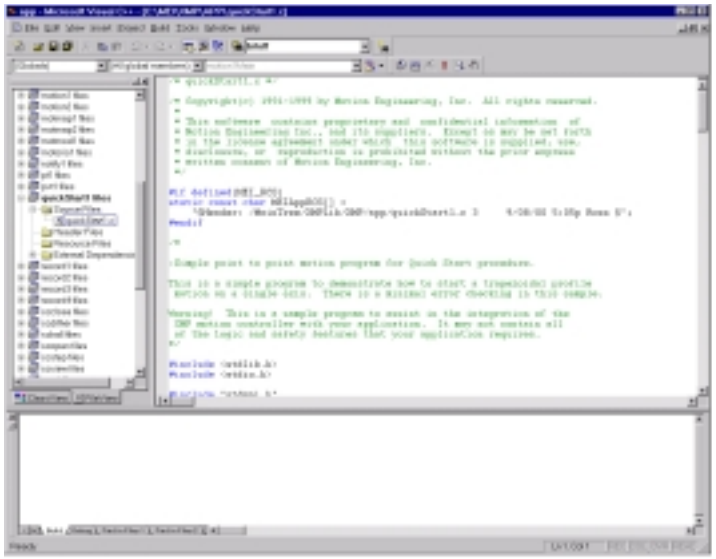
Unplug electrical devices from their source of power. Safe-lock all power plugs to prevent them from being plugged in during servicing.

Allow sufficient time for components using capacitors to discharge fully before making connections.

Do not repower *any* components until installation is complete and personnel are clear of component spaces.

ESD— Due to the use of sensitive microelectronics, all XMP boards are subject to damage due to electrostatic discharge (ESD). When handling XMP components, users are advised to observe basic ESD precautions, including the use of grounding straps and grounding mats. Removed XMP components should always be stored in protective ESD bags and/or cases.

10 Click the execute button  and the program will now be carried out. You can stop the motion anytime by hitting any key.



11 Open Motion Scope and here again you can view certain parameters by selecting the Trace button and adding those parameters you want to graph.

This guide is intended to be an introductory manual covering MEI's robust software and tuning utilites. For full documentation on all of MEI's products and capabilites please visit us on the web at www.motioneng.com or email info@motioneng.com.

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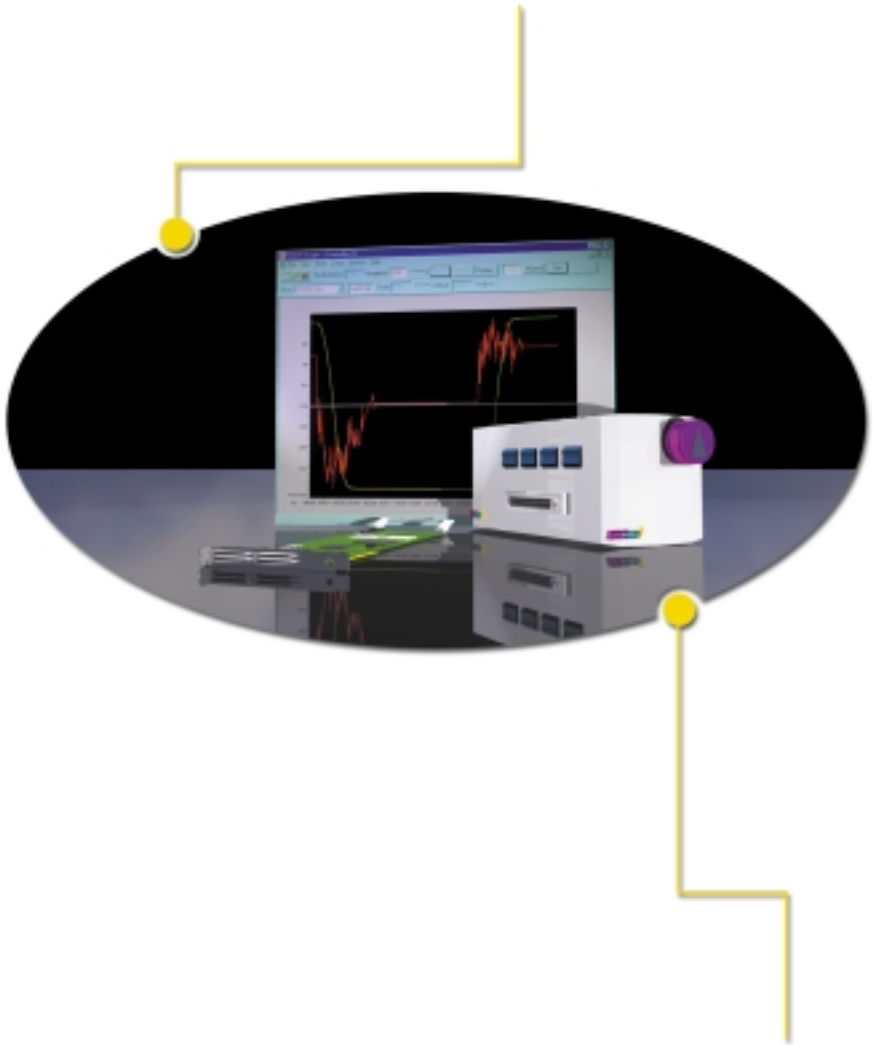
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Quick Start Guide



XMP Series Controller

with Motion Console & Motion Scope

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