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Release Note

MPI/XMP
Firmware and Library

XMP Firmware Version: 495A7
MPI Library Version: 20030620.1.11

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DCR 741

1 Introduction

Welcome to the latest release of Motion Engineering's MPI/XMP Firmware and Motion Programming Interface Library. This distribution has been prepared for Windows® NT/2000/XP. The distribution was built using Visual C++ v6.0 and tested using Visual C++ v6.0. This document provides an overview of the release, and describes the new features, changes, and bug fixes between the following versions:

	New Version	Previous Version
Firmware	495A7	493A2
MPI Library	20030620.1.11	20030620.1.10
Motion Console	03.39.12	03.39.11
Motion Scope	01.21.06	01.21.06

1.1 System Requirements

1.1.1 Operating System

The MPI release is built to operate on Windows® NT 4.0 / 2000 / XP.

1.1.2 Visual C++ DLLs

The MPI is built using Microsoft Visual C++ 6.0.

1.2 Installing the Distribution

WARNING! You must reboot your system!
If you have not used a InstallShield for Windows Installer program before, the MEI Install Shield will need to install InstallShield installer files before actually installing the MDK. You will have to **reboot** your system after these files are installed. Please shut down all programs before running the InstallShield for the first time.

WARNING! If you are upgrading from a previous MPI/XMP software release, **you will need to remove or archive all previous releases**. This will prevent any conflicts between old and new files. To remove the previous MPI/XMP software release, select **Start -> Control Panel -> Add/Remove Programs**. Select the **MPI/XMP Development Toolkit** entry and click on the **Add/Remove** button.
NOTE: The MPI/XMP software release can also be removed by running the MDK InstallShield and choosing the remove option.

The MPI/XMP distribution comes in two parts. The first part is an InstallShield distribution. Key components of the distribution are:

- device driver (meixmp.sys for WinNT / Win2000 / WinXP)
- firmware
- MPI dynamic link library
- utilities
- sample applications

To install the MPI/XMP software release, insert the MDK CD-ROM. To start the set-up process, click on WinNTSetup.exe. Follow the InstallShield instructions. The InstallShield will take care of installing the DLL and will also set the PATH environment variable to XMP\bin\WinNT for WinNT, XMP\bin\Win2000 for Win2000, and XMP\bin\WinXP for XP under the default installation directory.

The second component of this distribution contains customer-specific applications and files. This is provided to you in a separate InstallShield. To install this custom component, click on the InstallShield and follow the instructions.

2 General Changes / New Features

This section lists the changes since the 20030620.1.1 production release, beginning with the most recent.

⚠ - Denotes modifications that may require changes in code.

Version 20030620.1.11

	New Version	Previous Version
Firmware	495A7	493A2
MPI Library	20030620.1.11	20030620.1.10

2.1 PTF and PVTF Motion Type Improvements MPI 1286

The motion types MPIMotionTypePTF and MPIMotionTypePVTF support user-specified feed forward values for each point. The following improvements have been made to the PTF and PVTF motion types.

1) The feedforward values are interpolated linearly over the PT or PVT time intervals. The feedfoward values correspond to the P or PV values, i.e. when the motion reaches a specified position (PTF) or position and velocity (PVTF), the interpolated feedforward value will be equal to what is specified in the motion parameters.

2) The feedforward values are not set to zero at the beginning of the move; they retain the last value specified in the PTF or PVTF motion parameters.

3) The feedforward values are not changed by non-PTF or PVTF moves. Previous versions of the firmware would set the feedforward value to zero for any move that was not a PTF or PVTF move (i. e. PT, PVT, Spline, S-Curve, etc.).

2.2 Cable Length Check Improvements MPI 1262

In previous versions of the MPI, the network cable length mismatch check was not enabled after calling meiSynqNetFlashTopolgySave(...). If enabled, the cable length check is performed during network initialization. The cable length check is now enabled/disabled using meiSynqNetConfigSet/Get(...) methods. The suggested minimum and maximum values, based on discovered cable lengths can be obtained using meiSynqNetInfo(...). Use these values, or your own values to enable the cable length check. To disable the cable length check, set all min, max, and nominal cable length values to zero.

The network topology must first be saved to flash before saving cable lengths to flash memory. Use meiSynqNetFlashTopologySave(...) to save the topology to the controller's flash memory. meiSynqNetFlashTopolgyClear(...) will clear any cable length values saved to flash memory, causing the cable length checking to be disabled.

Version 20030620.1.10

	New Version	Previous Version
Firmware	493A2	493A1
MPI Library	20030620.1.10	20030620.1.9

2.3 Support for Multi-Vendor Flash Downloads MPI 1256

The MPI now supports the SynqNet node flash download for a number of different flash component vendors. This is where the sqNode FPGA image data is stored in flash memory on the node. These changes are transparent to the user. Flash components that are currently supported are:

Vendor	PN	Size	Circuit
Atmel	AT45DB021B	2M	Bowsprit
Atmel	AT25F2048N-10SI-2.7	2M	Bowsprit
SST*	SST25VF020-20-4C-SA	2M	Bowsprit
STM	M25P20-VMN6T	2M	Bowsprit
Xilinx	XC18V02	2M	Outrigger

Version 20030620.1.9

	New Version	Previous Version
Firmware	493A1	459B3
MPI Library	20030620.1.9	20030620.1.8

2.4 Increased Maximum Captures to 32 MPI 1261

In previous versions, the maximum number of controller captures was 16. The maxium number has been increased to 32.

Version 20030620.1.8

	New Version	Previous Version
Firmware	459B3	459B3
MPI Library	20030620.1.8	20030620.1.7

- There were no general changes or new features in the 20030620.1.8 release.

Version 20030620.1.7

	New Version	Previous Version
Firmware	459B3	459B3
MPI Library	20030620.1.7	20030620.1.6

2.5 Save/Clear Topology to Flash MPI 1192

Support has been added to the MPI so that the topology of a SynqNet network can be saved to flash memory. The following rules apply when saving/clearing the topology to flash:

- Topology cannot be cleared unless it has previously been saved.
- Configurations cannot be saved to flash unless the topology has previously been saved.
- A Topology Save does not clear working memory configurations.
- Topology cannot be saved if it has previously been saved. The topology must first be cleared before it can be resaved.
- A Topology Clear will erase/lose user configurations.

NOTE: The term "configurations" means the configurations of topology-dependent objects that are currently defined as motors, nodes, and synqnet objects.

In version 20030620.1.7, the following changes were made in *synqnet.h*:

OLD:

```
long meiSynqNetTopologyClear(MEISynqNet    synqNet);
```

NEW:

```
long meiSynqNetFlashTopologyClear(MEISynqNet    synqNet,
                                  MEIFlash      flash);
```

synqNet - a handle to an MEISynqNet object whose network topology is to be cleared.

flash - is either a vaild MEIFlash handle or MPIHandleVOID. If flash is MPIHandleVOID, an MEIFlash object will be created and deleted internally.

OLD:

```
long meiSynqNetTopologySave(MEISynqNet    synqNet);
```

NEW:

```
long meiSynqNetFlashTopologySave(MEISynqNet    synqNet,
                                 MEIFlash      flash);
```

synqNet - a handle to an MEISynqNet object whose network topology is to be saved.

flash - is either a valid MEIFlash handle or MPIHandleVOID. If flash is MPIHandleVOID,

an MEIFlash object will be created and deleted internally.

For more information about what was specifically changed or added, please see MEI's Technical Support website (http://support.motioneng.com).

- **meiSynqNetFlashTopologySave(...)** *New*
  (http://support.motioneng.com/Software-MPI/docs/Synqnet/Method/flatoposav2.htm)

- **meiSynqNetFlashTopologyClear(...)** *New*
  (http://support.motioneng.com/Software-MPI/docs/Synqnet/Method/flatopoclr2.htm)

- **mpiMotorFlashConfigSet(...)** *Revised*
  (http://support.motioneng.com/Software-MPI/docs/Motor/Method/flacfset1.htm)

- **meiSqNodeConfigSet(...)** *Revised*
  (http://support.motioneng.com/Software-MPI/docs/sqNode/Method/cfset2.htm)

- **MPI Object Configurations that use Service Commands** *New*
  (http://support.motioneng.com/Software-MPI/concepts/topics/mpi_srv_cmds.htm)

- **Saving Current SynqNet Topology to Flash** *Revised*
  (http://support.motioneng.com/Software-MPI/concepts/topics/sav_sq_topology.htm)

Version 20030620.1.6

	New Version	Previous Version
Firmware	459B3	459B3
MPI Library	20030620.1.6	20030620.1.5

2.6 Support for AMC DQ Series Drive MPI 1221

Support has been added for the new AMC DQ Series Drives.

Amc_Digiflex DQ111EE
DQ111SE-H
DQ111SS
DQ111SE

The DQ-Series replaces the DRQ-Series. The DRQ-Series is obsolete and is no longer supported by the MPI library. Additional Error Messages have been added and the Amp Fault Mask has been changed to Amp Fault Codes. The I/O defines in amc_digiflex.h have been changed to support the DQ-Series I/O.

2.7 Client/Server OptimizationMPI 837

In earlier version, saving settings to flash memory and downloading new flash images to the XMP over

a client-server connection used to take a very long time. Changes have been made to optimize this process. Now, these processes take the same amount of time as if they had occurred on a local XMP.

Version 20030620.1.5

	New Version	Previous Version
Firmware	459B3	459B2
MPI Library	20030620.1.5	20030620.1.4

- There were no general changes or new features in the 20030620.1.5 release.

Version 20030620.1.4

	New Version	Previous Version
Firmware	459B2	459B2
MPI Library	20030620.1.4	20030620.1.3

2.8 mpiMotionAction(...) Optimization MPI 1191

In this version of the MPI, the method mpiMotionAction(...) was optimized for the MPIActionRESET action type. To make the execution as fast as possible, service commands to clear node status, CRCs, and the packet error counters were removed. Service commands to clear amp and encoder faults are only sent to the node when an amp fault or encoder fault is active.

A new method, meiSqNodeStatusClear(...) was added to clear node faults. It sends service commands to the node in order to clear the node status, CRCs, packet error counters, and hardware latches for the nodeDisable and powerFault.

Version 20030620.1.3

	New Version	Previous Version
Firmware	459B2	459B1
MPI Library	20030620.1.3	20030620.1.1

2.9 Support for Trust SynqNet I/O Nodes MPI 1177

Support has been added for the following Trust SynqNet I/O nodes: TA805-D, TA805-E, TA805-F, TA806-D, TA806-E, TA806-F, TA807-D, and TA807-E.

2.10 MPI DLL/Application Compatibility Checking MPI 1152

The MPI has version compatibility protection between the DLL and an application. This was added to protect customers who do NOT recompile their applications when upgrading to newer MPI software releases. If an application is NOT compiled with the same version as the MPI DLL, mpiControlInit(...) will return a "Control: Application not compatible with MPI DLL" message.

Although this protection is valuable, it also makes patch upgrades difficult. Whenever the MPI code is changed, the version is changed, and then ALL of the tools and applications must be recompiled. In reality, the tools and applications only need to be recompiled if and only if the MPI header files have been modified.

The compatibility protection feature was changed so that it only returns an error if there has been an interface change (header files do not match DLL).

The new algorithm uses an internal version number that gets incremented only when a critical change is made that breaks compatibility. For the MPI, a critical change is defined as an interface change. An internal version number has been added which defines the version of the last interface change.

For example:

```
#define MPI_VERSION           "20030620.1.1" // actual MPI version (exists in MPI today)
#define MPI_INTERFACE_VERSION "20030620.1"   // new version that defines interface compatibility
```

The new internal version number (MPI_INTERFACE_VERSION) is now used in the existing compatibility check instead of MPI_VERSION. This will allow the MPI_VERSION to change as many times as needed, without affecting a compiled customer application.

3 Incremental Changes

Since the last Production Release of the MPI, version 20030620.1.1, API changes have been made to the header files that add features and fix various software and firmware bugs. Please see the **\XMP\doc\header_diff.doc** file to see a compiled list of the incremental changes that have taken place between the following two versions of the MPI library.

New Version	Previous Version
20030620.1.11	20030620.1.10

4 Fixed Bugs of MPI/MEI Libraries:

Version 20030620.1.11

	New Version	Previous Version
Firmware	495A7	493A2
MPI Library	20030620.1.11	20030620.1.10

"Node Busy" Timeout during Initialization of AMC *MPI 1295*

During network initialization, AMC DQ111EE drives with firmware version 8.2 intermittently failed with a "node busy" timeout error message (MEISqNodeMessageREADY_TIMEOUT).

Modification of meiSynqNetTopologyStatus(...) *MPI 1293*

A bug has been fixed in the meiSynqNetTopologyStatus(...) routine so that a saved topology will be reported in Motion Console without refreshing. This also fixes an error while saving motorConfig to flash when "OK" is selected from Motion Console's "Save network topology to flash memory now?" popup window.

Brake toggles during Controller Reset after Topology is Saved *MPI 1291*

In previous versions, the default value for Motor I/O had the brake RELEASE bit set. Since it takes a few samples before the background changes it and turns OFF the brake RELEASE bit, there would be a few samples just after SynqNet initialization where the brake RELEASE bit was set in the packet that was sent to the node. This results in the brake turning off for a few samples just after the SynqNet initialization. This problem was fixed by changing the default Motor I/O word to have the brake RELEASE bit cleared.

Downloading Firmware causes an ASSERT Error *MPI 1281*

Downloading firmware when no SynqNet nodes were attached to the controller generated an ASSERT at line 776 in SynqNet.c. This was caused by a missing case in the MPI library. MEISynqNet ConfigGet(...) was not allowing for the topology: MEIXmpSynqNetTopologyNONE. This problem has been corrected.

Filter and Axis objects Deadlock in Firmware *MPI 1280*

If an axis was prevented from completing a motion by a Stop, E-Stop, or Abort action, and then the network was shutdown and re-initialized, the controller's axis and filter objects would have corrupt calculation values. For example, the TC.Velocity and TC.Accel values would be: -1.QNAN. This problem was caused by an improper frame load due to the initial frameLoad and frameIndex value differences. This problem was corrected in the MPI by disabling axes during the network shutdown and enabling the axes during network initialization.

Version 20030620.1.10

	New Version	Previous Version
Firmware	493A2	493A1
MPI Library	20030620.1.10	20030620.1.9

SynqNet Node User Fault cannot be cleared *MPI 1272*

In MPI releases 20030620.1.9 and ealier, meiSqNodeEventReset(...) is unable to clear the node event type MEIEventTypeSQNODE_USER_FAULT. The defininition for meiEventMaskSQNODE(mask) macro (stdmei.h) has been updated to fix the problem.

Amp Enable Inversion *MPI 1271*

In MPI releases prior to 20031216, a bug existed where the Amp Enable bit on a node was inverted. This bug occurred after performing an mpiMotorFlashConfigSet(...) or when using Motion Console to save the Control Summary to flash (with the "include all sub-objects" option selected). This issue has been corrected.

TxTime = 95% Causes Network Initialization Failure *MPI 1252*

In previous releases, specific network topologies failed to initialize if the sample rate was 4000 and the TxTime was 95%. This problem was caused by bug in the SynqNet timing calculations. In some cases, the PLL would also fail to lock. This problem was corrected by updating timing calculations and a slightly modified PLL in the Node FPGAs. See the FPGA release notes for more details about the PLL change. If an older FPGA (versions 301 and earlier) is used on a node, the MPI will return an MEISynqNetMessageSCHEDULING_ERROR if the timing values are in the range that would cause a PLL failure.

CANOpen 20k Bit Rate Problem *MPI 1220*

In previous CAN firmware versions, the CANOpen interface did not work correctly at a bit rate of 20k. All other bit rates worked correctly. This problem was corrected with CAN firmware version CAN002A6.out.

CANOpen Heartbeat Problem *MPI 1218*

In previous CAN firmware versions, the XMP did not generate its heartbeat message and did not correctly monitor the health of a node that used the heartbeat. This problem did not affect nodes that use node guarding to maintain their health. This problem was corrected in CAN firmware version CAN002A6.out.

Version 20030620.1.9

	New Version	Previous Version
Firmware	493A1	459B3
MPI Library	20030620.1.9	20030620.1.8

Missing Home Event with Capture *MPI 1264*

In certain configurations, sometimes the home event was not triggered by a capture. The problem was caused by race condition between the firmware's foreground and background tasks. The capture state machine and status is updated in the foreground, the home limit and event status are updated in the background. If the foreground/background delta was large, the home limit would intermittently miss the capture. This problem was corrected by extending the capture status for one full background cycle, if the home limit is configured to trigger from the capture status and the home limit action is not "None."

Motor Configurations Lost After SynqNet Shutdown/Init *MPI 1258*

Some user-specified motor configurations were lost when the SynqNet network was shutdown and initialized. This problem has been corrected.

MPI Assert Errors in sqBuffers *MPI 1257*

There are specific conditions in MPI versions 20030620.1.7 and 20030620.1.8 where the MPI causes an assertion in xmp\mpi\sqbuffers.c at line 2700. This problem has been corrected.

Path Motion with Short Elements *MPI 1255*

In previous versions, if the path elements were closely spaced together compared to the (velocity * time) slice, the maximum velocities and accelerations would be exceeded. This was caused by a problem in the path points calculations in mpiPathMotionParamsGenerate(...). This problem was corrected by changing the point generation calculation algorithm.

Multi-threaded Performance Problems *MPI 1251*

In previous versions, a problem occurred when making MPI calls that take locks in a CRITICAL priority thread. For example, mpiMotionStart(...) or mpiMotionModify(...). The CRITICAL priority thread could be blocked for a very short time by lower priority threads that also make MPI calls that take locks. This problem has been corrected.

Version 20030620.1.8

	New Version	Previous Version
Firmware	459B3	459B3
MPI Library	20030620.1.8	20030620.1.7

Service Channel Failures — MPI 1244

In previous versions, service channel transactions would sometimes fail when two or more tasks tried to use the service channel simultaneously. The problem occurred when reading/writing to the monitor while configuring a motor with Motion Console. The problem was caused by a bug in the mpiMotorConfigSet(...) routine. Motor configurations that needed to send down service commands to the FPGA would do so without first acquiring the appropriate semaphores. If another application was using the service channel for the node that the motor was located on, there was a good possibility that the service commands would get corrupted. To fix the problem, node locks were added to the mpimotorConfigSet(...) routine. This problem has been corrected.

Random TIMEOUT Errors — MPI 1240

In previous releases, occasionally there are random, MPIMessageTIMEOUT errors being returned from the MPI on specific PCs. Mostly, the errors occur from mpiControlReset(...), which internally calls meiControlSampleWait(...). The failure was caused by a bug in certain chipsets that cause the Win32 QueryPerformanceCounter(...) to randomly jump ahead by 4 to 5 seconds. The MPI uses this counter to check how much time has elapsed when waiting for a specific number of controller samples. For more details, see the report from Microsoft at http://support.microsoft.com/default.aspx?scid=kb;en-us;274323.
This problem was corrected by using a lower resolution millisecond "tick" timer from the host.

meiEventMaskALL(...) Missing Event Types — MPI 1238

In previous versions, meiEventMaskALL(...) did not set the SynqNet, SqNode, or Can event masks. This problem has been corrected.

Version 20030620.1.7

	New Version	Previous Version
Firmware	459B3	459B3
MPI Library	20030620.1.7	20030620.1.6

Encoder Reversal Configuration Problem — MPI 1236

In previous versions, saving the network topology to flash caused the encoder reversal configuration to be disabled. This problem has been corrected.

Application DLL Compatibility Check — MPI 1229

In previous releases, if a return value of MPIControlMessageLIBRARY_VERSION was returned from mpiControlInit(...) the SynqNet network would not be inititalized. This has been changed so the network will still be initialized even when this warning is returned.

Capture Configuration Get — MPI 1228

In previous releases, if mpiCaptureConfigGet(...) was called on a capture object that had been previously

configured, the configuration information would be incorrect. This would allow mpiCaptureConfigGet(...) to read the configuration information from the wrong node. This problem has been corrected.

Multi-Point Motion Problem *MPI 1223*

In previous releases, if a PVT (or other multi-point motion) move was stopped and then an SCurve (or other point-to-point) move was executed, the Motion Supervisor could enter into an ERROR state. The problem was caused by the point buffer's low and empty limits not being disabled by the mpiMotionStart/Modify(...) for the second move, which triggered an E-Stop. This problem has been corrected.

Version 20030620.1.6

	New Version	Previous Version
Firmware	459B3	459B3
MPI Library	20030620.1.6	20030620.1.5

- There were no bug fixes in the 20030620.1.6 release.

Version 20030620.1.5

	New Version	Previous Version
Firmware	459B3	459B2
MPI Library	20030620.1.5	20030620.1.4

- There were no bug fixes in the 20030620.1.5 release.

Version 20030620.1.4

	New Version	Previous Version
Firmware	459B2	459B2
MPI Library	20030620.1.4	20030620.1.3

Network Initialization Lockup *MPI 1198*

In previous versions, meiSynqNetInit(...) would not return if the network was shutdown and all the nodes were powered off or disconnected from the controller. This problem was caused by an optimization routine that was used to detect if any nodes were found during network initialization. The optimization logic was corrected in version 20030620.1.4.

Service Command Busy Loop *MPI 1185*

A tight, busy loop in the MPI service command routine was causing process starvation in real-time systems. Although this bug is hard to reproduce, it can be experienced in a multi-threaded application when CPU bandwidth is critical (such as in an application that streams points from the host to the controller). To correct this problem, the busy loop was opened to allow threads of the same priority to take control of the CPU.

Version 20030620.1.3

	New Version	Previous Version
Firmware	459B2	459B1
MPI Library	20030620.1.3	20030620.1.1

PVT Stairstep velocity profile bug *MPI 1170*

In previous versions, a bug existed when running PVT or PVTF motion profiles. This bug caused the acceleration values for the moves to be zero, which created a "stair-step" velocity motion profile. This problem was corrected in version 20030620.1.3.

Default Configuration for Encoder Faults *MPI 1169*

The default configuration for Encoder Faults used to be Primary and Secondary when a secondary encoder was available. The default configuration for Encoder Faults is now Primary only.

Unable to Invert Aux Encoders *MPI 1165*

A bug existed where the MEIXmpMotorConfig structure in the firmware contained an incorrect address for Aux Encoders on all nodes except the first node. As a result, these nodes were unable to change the default configuration for secondary encoders. This bug was corrected in 20030620.1.3.

mpiCaptureConfigGet(...) method returns MPIMessageUNSUPPORTED *MPI 1164*

A bug existed in the mpiCaptureConfigGet(...) method where capture objects that were configured for any captureMotorNumber that did not have a secondary encoder mapped to it would return MPIMessageUNSUPPORTED. This problem was corrected in version 20030620.1.3.

Incomplete error messages in message.exe utility *MPI 1156*

In previous versions, some of the return codes returned by the MPI did not have any strings associated with them. The message.exe utility gave no indication as to the nature of the error. This problem was corrected in version 20030620.1.3.

Setting MPIControlConfig.axisCount to Zero Causes an MPI Library Assertion *MPI 1150*

In previous versions, setting a value of zero for the control config axisCount would cause an MPI library assertion error. This problem was corrected in version 20030620.1.3.

5 Existing Bugs of MPI/MEI Libraries:

Unexpected Error returned when using meiSynqNetPacketConfigSet(...) *MPI 1180*

If all members of the MEISynqNetPacketCfgMotor{} structure are set to NONE or Zero (0x0), the MPI should effectively disable the motor on the network and cause the controller to renumber the subsequent motors on the network. Instead, the following error will be returned: "ERROR 0x191d: SynqNet: invalid encoder count." This is a bug and will be corrected in future releases.

mpiControlConfigSet(...) overwrites Custom Packet Configuration *MPI 1179*

A bug exists in the mpiControlConfigSet(...) method when it is called after the meiSynqNetPacketConfigSet(...) method. Because there are conditions that require the mpiControlConfigSet routine to reinitialize the SynqNet network, this bug can reset any previously set custom packet configurations back to the default packet configuration. This bug can be avoided by performing mpiControlConfigSet(...) method calls before using any meiSynqNetPacketConfigSet(...) method calls. This is a bug and will be corrected in future releases.

Error with the SynqNet Packet ioInput Configuration *MPI 1178*

A bug exists in the meiSynqNetPacketConfigSet(...) routine that causes an internal packet data misalignment when the packet payload for an MEI_RMB node is configured with an ioInput value of MEISynqNetResourceIoBitsNONE. The effects of this data misalignment are currently unknown and could potentially cause a return value of "0x1904: SynqNet: network communication is down." However, this bug is not considered to be a safety concern.

Paired with the ioInput and ioOutput packet data fields, there are 16bits of dedicated I/O packet data for each motor. Since the dedicated I/O are fixed fields, removing the general purpose ioInput and ioOuput will not gain any network bandwidth.

It is recommended that the ioInput and ioOutput packet configuration fields remain unchanged when performing a meiSynqNetPacketConfigSet(...).

Vague Error Code returned when accessing drive parameters *MPI 1159*

When performing a drive parameter read/write to a particular parameter that is unsupported by a drive, the following incorrect error message is returned: “ERROR 0x1c05: sqDispatch: Node specific command dispatch error.” The correct return value should be a “not supported” error.

Win2000 Device Driver System Stand by Error *MPI 741*

The XMP Windows 2000 device driver will not allow a host system go into "Standby" or "Hibernation" mode. This bug will be corrected in a subsequent release.

6 Motion Console and Motion Scope

6.1 Closed Issues: Motion Console

	New Version	Previous Version
Motion Console	03.39.12	03.39.11

Modified in Version: **03.39.12**

Modification Type: ***MI (Minor Improvement)***

Number **Name**

1025 Add SynqNet Cable Lengths to Clear Topo Warning

When the network topology is cleared, a warning is displayed. The following text has been added:

"SynqNet Configuration:
Cable Lengths (min, nom, and max)"

Modification Type: ***DR (Discrepancy Report)***

Number **Name**

1007 Position Error is Sometimes Incorrect

Motion Console calculates the position error based on (command position - actual position). Sometimes these positions are collected on separate samples (normal CPU loading stuff). In this case, if the velocity is non-zero, incorrect position errors can result. The position error is calculated in MpiObjAxis.cpp with the line

"m_nStatusPosError = m_nStatusPosCommand - m_nStatusPosActual;"

The position error should be determined with mpiAxisPositionError(...).

1008 Topology Warning is Misleading

When trying to save to flash without saving topology, an error window pops up. It erroneously refers the Save Topology button in the controller summary. The button is actually in the SynqNet Summary window.

1019 Motion Console may not show CAN node live status correctly

Follow the following sequence to reproduce this bug:

1. Have one CAN node working correctly on the network. The node live status is shown correctly as live.
2. Turn power OFF to the node. The node live status is shown correctly as dead.
3. Turn power ON to the node. The node live status is shown correctly as dead.
4. Press a controller reset. The node is actually live and we can control the outputs, but the node live status is shown incorrectly as dead. It should show live.

1021 A Change from String to Ring Topology after a Controller Reset is NOT shown in the SynqNet Summery

If Motion Console shows a network type as string, and you connect the last cable to form a ring and press the controller reset button, the network type will still display "String" after the controller reset. Closing the SynqNet Summary window and reopening it shows the correct network type.

1029 [Dup. of 997] Refresh data before saving to flash

Customers can get confused when external programs modify registers and then they use Motion Console to save to flash without resetting. If Motion Console refreshed data just before saving things to flash, then this confusion would go away.

1031 CAN Node Name In Summary Is Wrong If ID Changes

If a CAN node ID is changed and the controller is reset, the name of the object as it appears in the CAN Node Summary and the I/O Summary will NOT be updated to reflect the change.

Modification Type: ***CR (Change Request)***

Number **Name**

1034 **[Dup. of 978] Separate I/O Into Groups**

In the I/O Summary, draw a line that separates the I/O associated with different motors.

Modified in Version: 03.39.11

Modification Type: ***DR (Discrepancy Report)***

Number **Name**

1012 **[Dup. of 1011] General Purpose Motor I/O Is Broken For Any Node Other Than The First One**

In the SqNodeLib, a node has a table of I/O descriptions for each motor on the node. Motion Console accesses this table using the motor number. It should be subtracting the nodes motor offset from the motor number.

Modified in Version: 03.39.10

Modification Type: ***NF (New Feature)***

Number **Name**

1001 **New Save Topology to Flash Features**

The following changes have been made to the MPI regarding saving and clearing topology have prompted the following changes to Motion Console:

1) Save Topology button is disabled if topology is already saved.
2) Clear Topology button is disabled if topology has not been saved.
3) The user is prompted to save topology to flash if they try to save an object to flash that requires the topology to be changed.

Modification Type: ***DR (Discrepancy Report)***

Number **Name**

993 **[Dup. of 992] Warning of Topology Mismatch After Network is Reinitialized**

The user normally sees a warning if an attempt is made to save topology to flash when the topology does not match either volatile or non-volatile memory. This warning is not being displayed when the network is shutdown, the topology is altered, or the network is brought up again.

999 **[Dup. of 998] Motor I/O labels are not updated when changing topologies**

Under certain situations, the Motor I/O lables are incorrect. This happens when,

1) Motion Console is minimized.
2) a SynqNet node at a particular position is swapped out with a node that has different I/O lables.
3) Motion Console is restored.

Modified in Version: 03.39.09

Modification Type: ***NF (New Feature)***

Number **Name**

980 **Add Clear Status Button to SqNode Summary**

A button has been added to the SqNode Summary that, when clicked, will call meiSqNodeStatusClear() for the selected node.

Modification Type: ***MI (Minor Improvement)***

Number **Name**

982 **Error from mpiAxisCommandPositionGet() when downloading firmware**

When firmware is downloaded to a controller, all motion supervisors that are mapped to an axis will report the following MPI error:

mpiAxisCommandPositionGet: Argument invalid.

Modification Type: ***DR (Discrepancy Report)***

Number **Name**

976 **Toolbar in Motion Console can be lost**

If the toolbar on the main frame is dragged off so that it is floating, and then closed, there is no way to get it to reappear without restarting the application. Furthermore, the state and position of the floating toolbar is not saved, so it cannot be restored properly when the application starts up.

979 **Binary download button should be disabled on a failed node**

The "Binary Download" button should be disabled if the node has failed.

983 **Download Firmware Confirmation Dialog Box Shows Up On Taskbar**

The dialog box that pops up for user confirmation before downloading firmware shows up on the Windows taskbar.

Modified in Version: 03.39.08

Modification Type: ***FE (Future Enhancement)***

Number **Name**

962 **Panic button should default to ABORT**

The Motion Supervisor panic action, the action taken when the panic button is clicked, now defaults to ABORT as opposed to NONE.

Modification Type: ***DR (Discrepancy Report)***

Number **Name**

964 **Ctrl + click on object icon doesn't open a minimized window**

Clicking on the object icon in the main toolbar while holding Ctrl + click will now show the summary window in a normal state if it was previously iconized.

Modified in Version: 03.39.07

Modification Type: ***CR (Change Request)***

Number **Name**

959 **MPIMotionTypeP and MPIMotionTypePF removed from MPI**

The MPIMotionTypeP and MPIMotionTypePF motion types were removed from the MPI and so were also removed from MotionConsole.

6.2 Closed Issues: Motion Scope

	New Version	Previous Version
Motion Scope	01.21.06	01.21.06

Modified in Version: **01.21.06**

Modification Type: ***CR (Change Request)***

Number **Name**

951 **Build Motion Scope Release configuration with MPI Release configuration**

Prior to this change, the Release configuration of Motion Scope was linked to the Debug configuration of the MPI. The Release configuration of Motion Scope is now linked to the Release configuration of the MPI.

6.3 Open Issues: Motion Console

Issue Type: ***CR (Change Request)***

Number	Name
991	**Add an Info Tab to the Motor Summary**

A tab needs to be added to the Motor Summary to display data in the MEIMotorInfo structure.

Issue Type: ***DR (Discrepancy Report)***

Number	Name
393	**CellTips don't work for checkboxes**

If the text of a cell does not fit within the cell of an Object Attribute Grid, then the CellTip should display the complete text of the cell. This feature doesnot work for cells containing checkboxes.

427 **Grid Not Always Drawn Correctly When Selection Changes**

Sometimes, selected cells are not being drawn as selected (i.e. with the colors inverted) until some window event occurs. One way to reproduce this bug is to select the entire table by clicking on the top, leftmost cell of the grid. When this is done, some cells in the grid are sometimes not drawn as inverted, but then drawn correctly when the user clicks on the grid or hovers over a control, causing a tooltip to be displayed.

561 **Last column cannot be sized to the edge of the grid**

The width of the last grid column cannot be moved to the edge of the grid. If the vertical scroll bar is present, then attempting to resize the last column will cause the width to snap to a distance of 4 pixels to the left of the right edge of the grid.

569 **Gray button drawn in origin cell when 1st column is minimized**

A faulty button is drawn in the origin cell when the following procedure is followed:

1) select the entire first column of the Motion Supervisor Actions tab grid;
2) slide the column width to the narrowest possible width. This results in the gray button appearing to be a combination of all the buttons in the column.

628 **Horizontal Scroll Bar Behaves Strangely When Large Numbers of Objects are Displayed**

When some summary windows are programmed to display a large number of objects (more than 20), the scroll bar will behave strangely.

637 **Creative position zero behavior**

If the controller is in open loop sine comm mode, the command position doesn't zero when the "Zero Position" button in the Motion Supervisor summary is clicked unless the "Clear Fault" button is clicked first.

657 **"(Not Available)" listed as an option in the pulldown menu**

In the Motor Summary window, under the I/O configuration tab, all XCVR Config pulldown menus list "(Not Available)" as an option.

741 **User In bit not reported**

The User In bit is not reported when bit is toggled.

761 **Pulldown boxes only work on primary monitor with a multiple monitor setup on win2k**

When using Motion Console on a win2k system with multiple monitors, the pull down boxes don't function on the secondary monitor, but function on the primary monitor.

847 **Flickering could appear on several status windows**

Some flickering could appear on the Axis, Motion, and Motor Status pages because of a bug in how event status flags are compared.

887 **Object settings not saved prior to opening a new .INI file**

Changes to object attributes that are stored in the .INI file are not saved when another .INI file is opened or created.

913 **Column width is forgotten after Motion Console restarts**

When a column width has been modified by the user, the new width should be associated with the object and saved in the .INI file. This will allow the column width to be restored to the users preference when the summary window is reopened.

914 Motion Console crashes on phase 2 to phase 1 conversion

Motion Console for the SynqNet Phase 1 branch (MPI 20011220) is not forward compatible with the .INI file created by Motion Console for the SynqNet Phase 2 branch (MPI 20021212 and on). The .INI file should be removed when reverting from the newer version back to the older version.

949 Motion Console hogs CPU when finding errors.

In some situations, Motion Console will use 100% of the CPU. This occurs when the MPI is waiting for a command to timeout. Usually a particular type of object is causing the problem, so closing the summary for that window will greatly improve response time by the computer.

954 Scaling in Summary Windows Partially Implemented

The size of the grids in a Summary window can be scaled using Ctrl+MouseWheel. The following needs to happen for the feature to be fully implemented:

1) Scale all grids in the summary window, not just the one with the focus
2) Adjust max size of Summary window after scaling
3) Adjust max splitter position after scaling
4) Provide some more obvious method of setting the scale

960 [Dup. of 913] Column width is forgotten after Motion Console restarts

When a column width has been modified by the user, the new width should be associated with the object and saved in the .INI file. This allows the column width to be restored to the user's preference when the summary window is re-opened.

963 Tab does not change focus cell when editing number

970 Motion Console incorrectly labels Ka2

Motion Console incorrectly labels PIV filter parameter Ka2 (the one after Ka1) as N/A and will not let the user enter in a value. It is the mixing the control for noise and sine excitation. It should be accesable by the user.

1006 [Dup. of 992] No Warning of Topology Mismatch After Network is Reinitialized

The user normally sees a warning if an attempt is made to save topology to flash when the topology does not match either volatile or non-volatile memory. This warning is not being displayed when the network is shutdown, the topology altered, or the network is brought up again.

1035 Errors with Sample Rate Change

Motion Console returns several errors when the following scenario is followed. Follow the steps to reproduce the error.

1) Run Motion Console and load fresh 493a2 firmware (for example).
2) Make sure at least the controller summary and motor summary are up and showing motor 0 (tested with RMBV2)
3) Set sample rate to 8000 hertz.
4) Error messages result.

Issue Type: ***MI (Minor Improvement)***

Number Name

739 Add more detail to tooltips for disabled controller buttons

When a button on the Controller Summary is disabled because the controller is not initialized, some clues can be added to help the user rectify the situation.

740 Add greater detail to toolbar button tooltips concerning various modes of operation

The action that is executed when a toolbar button is clicked can sometimes be modified by holding down the Ctrl or Shift keys. The nature of this modified behavior should be described in detail in the tooltip for each button.

975 Library function errors in Motion Console at newtork shutdown

6.4 Open Issues: Motion Scope

Issue Type: ***DR (Change Request)***

Number	Name
1018	No Recorders Available

Issue Type: ***DR (Discrepancy Report)***

Number	Name

542 Motion Scope fails to draw data on Windows 98

With triggering set to "Go Button" and "Stop Button," data will accumulate (as seen by the XOffset value changing), but no traces will be drawn. Changing the status of "View/Status Bar" will cause the pane to draw the traces. This problem occurs frequently, but irregularly. We have not found a way to reliably reproduce the problem. We have also not seen this problem on Windows NT.

643 Odd behavior when opening a .pan file

Here are the steps to reproduce the bug:

1) Open up a .pan file (previously created with File Save from Motion Scope).
2) Immediately hit the go button.
3) While the plots are being generated, right-click somewhere on the pane and the graphing will mysteriously disappear.

Now, if you use the Stop button to halt data acquisition, click "Traces" to bring up the Traces list dialog and then hit the “OK” button, the problem will be solved and any graphing you do after this will not have this behavior.

679 Ctrl-LMB value display hides Y-units label.

Pane Export not supporting "hex" display format.

713 Motion Scope Data not aligned with scale lines

When collecting/displaying data, sometimes the data points don't align properly with the scale markers on the X axis. This is easiest to see by turning on the "sample band" in the Pane Display configuration and Displaying in Units of Samples. The problem can be corrected by forcing a re-draw of the data: sliding the data on/off the screen, minimizing/maximizing, or zooming in/out.

769 Motion Scope hangs when opening file multiple times

Motion Scope will sometimes hang when opening a .PAN file. This can be recreated by opening a .PAN file and then closing the pane. Repeat until the hang occurs: usually after the 4th or 5th time.

776 AutoScale occasionally fails to utilize last portion of data in Range for selected Trace.

AutoScale occasionally fails to utilize last portion of data in Range for selected Trace.

781 Motion Scope displayes graph as if it missed a sample when it really didn't

While using Motion Scope to record the sample counter while I was testing motion modify code. Motion Scope displayed some data as if it missed a sample, but while investigating the sample counter I see that Motion Scope really didn't. Perhaps there is some rounding error in the calculation of elapsed time during the motion?

806 Motion Scope looses all traces after a SynqNet node dissapears

When a SynqNet node disappears when using Motion Scope, Motion Scope displays some error messages and then the pane being used vanishes. This can be reproduced by plotting some information with Motion Scope and then pulling the SynqNet cable on the first node. This can be particularly troublesome if special traces have been set up and not saved. It is easy to remove a pane but it takes a lot of work to recover settings if they were needed.

852 Time scale on Motion Scope does not refresh upon sample rate change

When the sample rate on the XMP is changed, Motion Scope is not aware of it.

877 Shift key inhibits dragging of YRangeBar slider edge

When the cursor is placed on the YRangeBar slider edge and a shift-drag is attempted, and the tooltip window is open, then the tooltip window is dragged instead of the slider edge. Without the shift key down, the tooltip window closes automatically and the drag works fine.

896 [From MPI Libraries and Firmware :] moScope "Save Pane" Corrupts timebase.

The following problem was reported using MPI 20021219:

1. Open Motion Scope and configure it to record a measured position, then capture some data.
2. Save the Motion Scope pane using File -> Save As.
3. Close the view using File -> Close.
4. Load the previously saved pane using File -> Open.

1016 Motion Scope hangs when zooming in on read-only pane files

Issue Type: ***MI (Minor Improvement)***

Number **Name**

473 Dialog boxes missing ToolTips

None of the dialog boxes display ToolTips.

662 Parameter precision (number of digits to right of decimal point) for X and Y axis labels.

Add parameters that provide the ability to modify the precision (number of digits to right of decimal point) for X and Y-axis data labels. Add a separate parameter for the X-axis and parameters per Trace on the Y-axis.

663 Groups to be supported in File Import input FFT files.

Groups to be supported in File Import input FFT files.