	Kollmorgen Controls 33 S. La Patera Lane Santa Barbara, CA 93117, USA	Document No: 9D00-0519 Rev A	1 of 3

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Application Note:
Upgrading from XMP-Series motion controllers to ZMP-Series motion controllers.

Summary

Due to an end-of-life situation for a critical component used on all XMP-series motion controllers, Kollmorgen Controls recommends an upgrade path to the ZMP-series controllers.

This application note defines the differences between an XMP-series motion controller and ZMP-series motion controller and provides information on how to upgrade existing designs.

The ZMP-SynqNet-PCI-RJ-LT (PN: T115-0005) is the most similar ZMP-Series motion controller to the widely-used XMP-SynqNet-PCI-RJ (PN: T114-0002) motion controller in terms of performance and form-factor. For complete information on the T115-0005 ZMP-series motion controller, please see our support site at: http://support.motioneng.com/Hardware/SynqNet-ZMP/default.htm

For the majority of users, this will be a seamless upgrade requiring very little, if any, changes to their current XMP-based motion system. The MPI and all of it's utilities support either type of controller.

I/O Differences

	XMP-SynqNet-PCI-RJ	ZMP-SynqNet-PCI-RJ-LT
User I/O	6 Bidirectional I/O, 1 Estop Input	3 Inputs, 3 Outputs, 1 Estop Input

The only interface difference between the ZMP and XMP series motion controller families is the Controller I/O.

XMP-Series motion controllers have six bits of bi-directional (inputs or outputs) I/O. Specifications for XMP-Series controller I/O can be found here: http://support.motioneng.com/Hardware/SynqNet-XMP/hd15.htm

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Document No:
9D00-0519

Rev A

2 of 3

ZMP-Series motion controllers have 3 dedicated inputs and 3 dedicated outputs. Specification for ZMP-Series controller I/O can be found here: http://support.motioneng.com/Hardware/SynqNet-ZMP/hd15_zmp_pci.htm

Processor Differences

	XMP-SynqNet-PCI-RJ	ZMP-SynqNet-PCI-RJ-LT
Processor	Analog Devices SHARC 32-bit floating point DSP	Motorola MPC8245 PowerPC 64-bit floating point

The ZMP processor uses Big-endian byte ordering as opposed to Little-endian on the XMP. The MPI will automatically byte-swap data for the user unless the application is making direct calls to the memory registers, bypassing the MPI. This happen most often when using the recorder object and grabbing data directly.

Software Differences

Support for the ZMP-series family of controllers is available in the MPI 3.02.00 and later software releases. If using MPI software prior to 3.02.00, an upgrade will be necessary to use the ZMP.

ZMP-series motion controllers use the same MPI library (DLL), utilities (Bode Tool, Motion Console, Motion Scope, etc) and Windows Device Driver as XMP-series motion controllers. The user application will run identically for both XMP and ZMP controllers.

ZMP-Series motion controllers do use a different firmware file than XMP-series motion controllers. While still code-compatible, the user will need to upload a ZMP firmware file having a 'ZMPxxxNx.bin' naming convention instead of 'XMPxxxNx.bin'. This ZMP firmware file is found in the same installation directory as the XMP firmware file. Any batch files or configuration scripts calling XMP firmware in the user's application will need to be updated.

The FPGA loaded into the controller by the firmware is also different for the ZMP-series motion controller. However, unless a custom FPGA is being used or the FPGA is manually loaded by the application or configuration script, the firmware will automatically load the appropriate FPGA for the controller. The following table provides the FPGA names for the ZMP-series motion controller where 'XXX' is the FPGA version.

Board Type	XMP-series FPGA	ZMP-series FPGA
PCI	XXX_9201.fpg	XXX_A301.fpg
PMC	XXX_9601.fpg (Obsolete)	NA
Embedded	XXX_9201.fpg	XXX_A501.fpg (eZMP only)

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9D00-0519

Rev A

3 of 3

Transferring Configuration Data

For systems which save configuration data in the firmware (gains, limits, etc) vs. setting dynamically with the application software, configuration data will need to be transferred from the existing XMP firmware to the ZMP firmware. The meiConfig utility can be used to make this transition. Please see http://support.motioneng.com/Utilities/meiConfig/default.htm for more information on using meiConfig.

Performance Differences

The ZMP-LT has similar to slightly better performance as the XMP. If changes to the controller sample rate or SynqNet timing (TxTime) are made, it may be necessary to re-tune the system to achieve the same level of motor stability and performance.

A rough estimate on maximum sample rates are provided in the table below based on standard firmware:

MS, Axes, Filters, Motors, Captures, UserLimitsx2		XMP	ZMP-LT
4	Typical Max Sample Rates (KHz)	10	23
8		7	9
16		3	3
32		1	1

Upgrade Checklist

The following checklist is provided to insure the necessary steps have been taken for a successful upgrade from the XMP-series motion controller to the ZMP-series motion controller:

1. MPI software supports ZMP-series controllers
2. Controller I/O has been changed as necessary to match ZMP-series controller I/O specficiations.
3. ZMP firmware has been configured and loaded to match system configuration

Contact Information

For questions regarding this upgrade or further information on the product differences described in this application note, please contact:

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