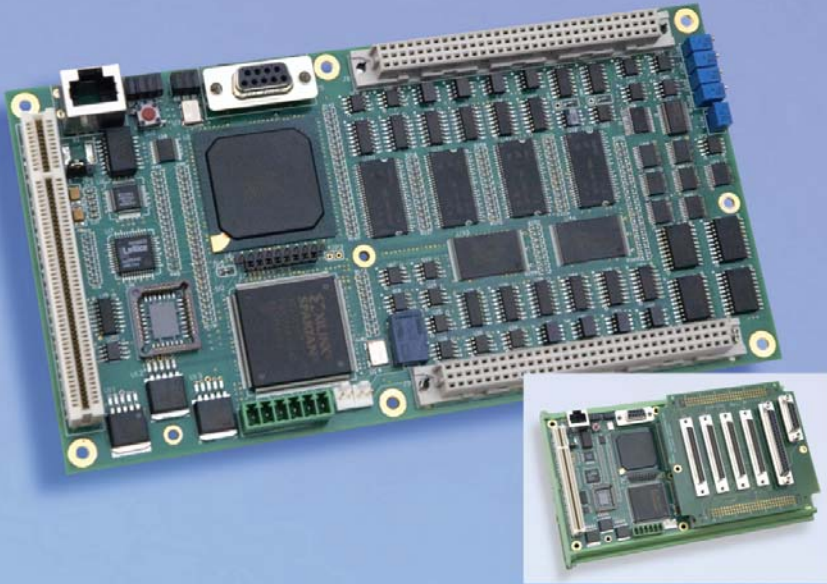


MultiFlex ETH 1440 Motion Controller

An Introduction to the MultiFlex ETH 1440 Motion Control Card...



The MultiFlex ETH 1040 is a multi-axis servo and stepper Ethernet motion controller designed to provide OEM machine builders with unmatched quality and value in a compact and economical stand-alone control card. Comprehensive feature set includes:

- **A powerful and economical 1-8 axis stand-alone servo and stepper motion controller**
 - **Advanced 64-bit RISC processor for robust real-time motion and I/O control**
 - **Extensive on-board digital and analog I/O**
 - **10/100 Mbit Ethernet or RS-232 communication**
 - **Comprehensive support for C/C++/C#, .NET, Delphi, LabVIEW and Visual Basic programmers**
 - **Powerful suite of software utilities and sample programs included**
 - **High-performance, value priced**
- Fast 10/100 Mbit Ethernet communication and RS-232 serial communication
 - Up to 8 axes of combined servo and stepper control
 - 1-4 axes of analog or PWM servo, plus 1-4 axes of step/dir. (stepper or servo) command outputs
 - Up to 8 axes of closed-loop control
 - Multi-axis point-to-point & coordinated motion
 - Trapezoidal, S-curve and parabolic profiles
 - 4 KHz servo loop update rate each axis
 - Four 16-bit analog servo command outputs
 - 5 MHz pulse outputs for precise micro-stepping
 - 20 million encoder counts/sec
 - Open and closed-loop stepper control
 - On-the-fly trajectory changes
 - On-board multi-tasking
 - Consistent real-time operation: Peak performance is maintained no matter which features are enabled
 - Eight 14-bit analog inputs (optional)
 - Dedicated high-speed I/O (encoder capture and compare)
 - Compatible with MultiFlex family of controllers
 - Includes Motion Integrator™ suite of graphical installation, tuning and diagnostic programs
 - 32 and 64-bit Windows and Linux support



MultiFlex ETH 1440 Specifications

Architecture

- Stand-alone Ethernet motion control card
- 10/100 base-T Ethernet and RS/232 ports
- 64-bit RISC processor with high-capacity customizable FPGA

Communication

- 10/100 Mbit/sec communication via 10/100 base-T Ethernet ports
- Up to 2000 command/response cycles per second

Programming

- Software API is compatible with all MultiFlex controller models
- Programmable in C/C++/C#/NET, Delphi, LabVIEW or VB
- Full support for 32 and 64 bit Windows & Linux
- Includes Motion Integrator™ graphical and intuitive Windows® software suite for easy installation, tuning and diagnostics
- Native LabVIEW/BridgeVIEW™ support via the Motion VI Library
- For Real-Time OS support, contact PMC
- Also programmable in easy-to-use motion command language
- Programmable in user units (mm, microns, ft./sec...etc.)

Motion Capabilities

- Up to 8 control axes per card
- 1-4 axes of analog or PWM servo control plus 1-4 axes of pulse (stepper or servo) control (standard)
- Up to 8 axes of PWM or step/direction control with custom firmware (contact PMC)
- 4-axes (standard) or 8-axes (optional) closed-loop control
- Point-to-point positioning
- Multi-axis synchronized & coordinated motion
- Trapezoidal, parabolic and S-curve velocity profiles
- Independent acceleration & deceleration
- Linear & circular interpolation
- High-resolution electronic gearing
- Position, velocity and gain control modes
- Backlash compensation
- Motion trajectory & PID parameters can be changed on-the-fly

Memory

- 32 Mbytes Dynamic RAM
- 512 Kbytes Flash ROM

Kinematic Ranges

- Velocity: 64 bit floating point ($\pm 10^{208}$ encoder counts/sec)
- Acceleration: 64 bit floating point ($\pm 10^{208}$ encoder counts/sec²)

Servo Control Signals

- 1-4 axes of $\pm 10V$ analog or PWM servo command signals with 16-bit resolution (up to 8 axes PWM with custom firmware), plus 1-4 axes of Step/Direction signals for pulse-controlled servo drives: 5MHz maximum pulse rate each axis (up to 8 axes Step/Direction with custom firmware)

Servo Filter

- Proportional/Integral/Derivative with acceleration, deceleration & velocity feed forward (PID-VAFF)
- 4 KHz servo loop rate each axis

Stepper Control Signals

- 4 axes of Step/Direction or CW/CCW stepper control
- (up to 8 axes Step/Direction or CW/CCW with custom firmware)
- 5 MHz maximum step (pulse) rate each axis (up to 4 axes)
- Full step, half-step and microstepping control. Full & half current
- Open or closed-loop stepper control

Position Feedback

- Standard: 4 quadrature incremental encoders with index
- Optional: 8 quadrature incremental encoders with index
- 20 MHz encoder count rate for each axis (up to 8 axes)
- Single-ended or differential inputs (A+, A-, B+, B-, I+, I-)
- High-speed encoder failure detection circuitry
- Digital noise filtering
- 32-bit position resolution ($\pm 2,147,483,647$ encoder counts)

I/O Signals

- 16 uncommitted bi-directional opto-isolated inputs with individually configurable supply & return: 5 to 24 Volts. (For home, \pm limits, amp fault, etc.)
- 12 uncommitted high-current open-collector outputs (sinking up to 100 mA): 5 to 24 Volts. (For functions such as drive enable/disable, full/half current, step/microstep, etc.)
- 32 uncommitted digital TTL I/O channels, 16 in and 16 out
- TTL outputs can sink 24 mA and source 15 mA
- All uncommitted I/O signals have default functional assignments which can be re-assigned by user as needed
- 8 channels of 14-bit analog inputs (optional) for analog joystick or other general purpose use
- 4 channels of 16-bit analog outputs (individually configurable as either a servo command signal or a general purpose analog output)
- 4 high-speed position capture (latch) inputs and 2 high-speed encoder compare (breakpoint) outputs (less than 1 uSec latency)

Other Features

- Consistent, predictable execution: Peak performance is maintained no matter which features are enabled
- All features are software-configurable: no jumpers required
- Windows Flash Wizard for quick, power-on firmware updates
- On-board watchdog timer for failsafe operation
- All software is supplied at no extra charge
- Custom features and performance enhancements available upon request - source code is available to qualified OEM's

Connections

- Standard or custom I/O interconnection boards can be mated directly onto the MultiFlex control card to reduce wiring
- Low cost I/O interconnection boards available with D-sub connectors or high-density SCSI connectors which are pin-compatible with PMC's MultiFlex PCI card family
- Low cost cables available from PMC or 3rd party cable suppliers

Environmental & Mechanical

- Operating temperature: 0-55 °C (32-131 °F) R.H. non-condensing
- Size: 203 mm x 108 mm (8" x 4.25")



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