

Universal Motion Interfaces

NI UMI-7764, NI UMI-7774, NI UMI-7772

- 2 and 4-axis Universal motion wiring interfaces with single cable connection from motion controller
- Per-axis motion signal breakout
- Screw terminal connectors for encoder, limit, motion I/O, and motor driver signals
- Host bus +5 VDC monitor with built-in driver inhibit control
- Connectivity for third-party drive and motion components
- Encoder rates of 20 MHz

NI UMI-7774, NI UMI-7772

- Tailored for industrial applications
- Per-axis D-Sub connectivity
- Isolated signals
- 2 and 4-axis versions
- 24 V I/O



Overview and Applications

For connectivity to third-party power drives, use a National Instruments UMI interface. These products provide a comprehensive wiring and connection point for motion control and feedback signals. A single cable from the motion controller to the UMI carries input and output signals for all axes. By dividing these signals into per-axis and function-specific connections, the UMI interface simplifies integration of third-party drivers, amplifiers, encoders, limits, and I/O with NI controllers. Each UMI works with up to 20 MHz quadrature encoder rates.

Each UMI incorporates a host PC power monitor that inhibits the motion driver if the host PC loses power during motion control. The UMI monitors the +5 VDC from the PC and activates the inhibit signals if the voltage falls out of tolerance.

Features

Enhanced motion-specific features set the UMI apart from simple connector-only screw terminal blocks. Compatibility with both TTL and differential encoders, input filtering, host-PC power monitoring, onboard inhibit functionality, and compact size make the UMI the ideal motion interface solution. The result is simplified wiring to third-party amplifier/driver and motor components. Refer to the motor drive section on page 642 for integrated amplifier, power supply, and connectivity solutions.

Some signals have compatibility defined as signal pass-through. This means the UMI may have passive filtering on these signals but will not affect the voltage range or current handling capability. Consult your motion controller specifications to determine the allowable voltage range and logic level compatibility of the signal.

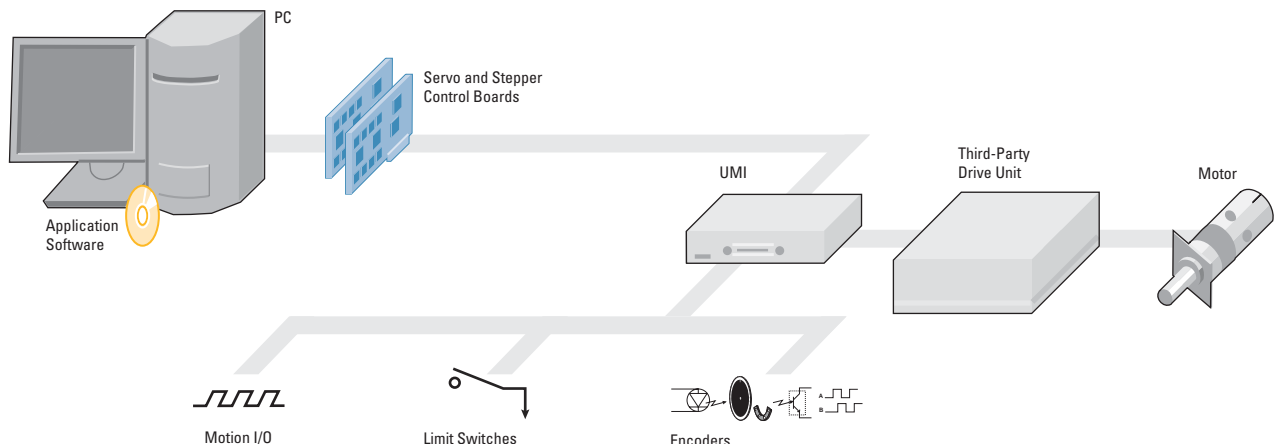


Figure 1. Typical Motion System Components

Universal Motion Interfaces

Connecting to Motor Drives

When interfacing to a third-party power drive and motor, it is important to consider the amount of current to drive the motor and the connectivity to a motor drive. National Instruments provides a wide selection of options for interfacing to motors. You can interface to 2-phase stepper motors with 4 A peak current using National Instruments power drives. In addition, you can interface to 5-phase stepper motors and other stepper motors outside the range of NI MID Series drives using National Instruments UMI interfaces. For DC-brush servo motors that need up to 10 A peak current, you can use National Instruments power drives and controllers. For DC brushless, AC, and other types of servo motors outside the range of

NI MID Series drives, an NI UMI interface simplifies connections to the motor and controller.

Ordering Information

NI UMI-7764 (4-axis)	777978-02
NI UMI-7774 (4-axis)	778558-01
NI UMI-7772 (2-axis)	778556-01
Cable	
SH 68-C68-S cable	186381-02

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Visit ni.com/info and enter `umi7764`.

Specifications

UMI-7764

Encoder Interface (each axis)

Axes	4
Inputs	Quadrature, incremental
Differential input threshold	±0.3 V (typical)
Single-ended input threshold	TTL/CMOS
Range	0 to 5 VDC
Noise filter (RC time constant)	100 ns
Maximum quadrature frequency	20 MHz
Compatibility	Signal pass-through

Trigger Inputs

Noise filter (RC time constant)	100 ns
Compatibility	Signal pass-through

Inhibit and Inhibit All Inputs

Voltage range	0 to 12 VDC
Input voltage threshold	TTL/CMOS
Input pull-up resistor	3.3 kΩ

Analog Inputs

Noise filter (RC time constant)	10 μs
Compatibility	Signal pass-through

Axis Inhibit Out

Range	0 to 5 VDC
Output low voltage	0.5 V at 16 mA
Output high voltage	2.4 V at 3.2 mA

Power Requirements

+5 VDC	200 mA + user-defined encoder and limit power
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Host Bus Voltage Interlock

Voltage	4.5 VDC
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Physical

Dimensions	19.5 by 15.2 by 4.5 cm (7.7 by 6.0 by 1.8 in.)
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Environment

Operating temperature	0 to 55 °C
Storage temperature	-20 to 70 °C
Relative humidity	10 to 90% (noncondensing)

UMI-7774, 7772

Encoder Interface

Axes	
UMI-7774	4
UMI-7772	2
Inputs	Quadrature, Incremental
Differential input threshold	± 0.3 V (typical)
Input Voltage Range	0 to 5 VDC
Single-ended input threshold	Differential only
Maximum quadrature frequency	20 MHz
Encoder Power	+5 V

Trigger Inputs

Type	Optically isolated, sinking inputs
Input Voltage Range	0 to 30 VDC
Protection	Overcurrent and reverse polarity

Inhibit and Inhibit All Inputs

Type	Optically isolated, sinking inputs
Voltage range	0 to 30 VDC
Input voltage threshold	Off: <2 VDC; On: >3.5 VDC
Protection	Overcurrent and reverse polarity
Analog Inputs	Pass through
Protection	none

Axis Inhibit Out

Type	Optically isolated, sourcing outputs
Range	5 to 30 VDC
Host Bus Voltage Interlock	Inhibits all axes if controller power not present
Protection	Short circuit and overcurrent

General Purpose I/O

Inputs	8, optically isolated, current sinking
Outputs	8, optically isolated, current sourcing
Protection	Yes

Step/Direction/Breakpoints Outputs

Type	Signal Pass Through
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Power Requirements

24VDC (±10%)	200 mA plus optional 5-30 VDC power for isolated user defined field I/O
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Physical

Dimensions	26 by 12.7 by 2.2 cm (10.2 by 5 by 0.87 in.)
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Environment

Operating temperature	0 to 55 °C
Storage temperature	-30 to 70 °C
Relative humidity	10 to 90%, noncondensing
Operating Shock*	30 g, 11 ms half sine, 3 shocks
Operating Vibration (random)*	5 _{g_{rms}} , 10-500 Hz at 0.01 g ² /Hz
Operating Vibration (sinusoidal)*	5 g, 10-500 Hz

*panel-mounted