

# Universal Motion Interfaces

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

- 4 and 2-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
- 4 and 2-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 [ni.com/motion](http://ni.com/motion) for integrated amplifier, power supply, and connectivity solutions.

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

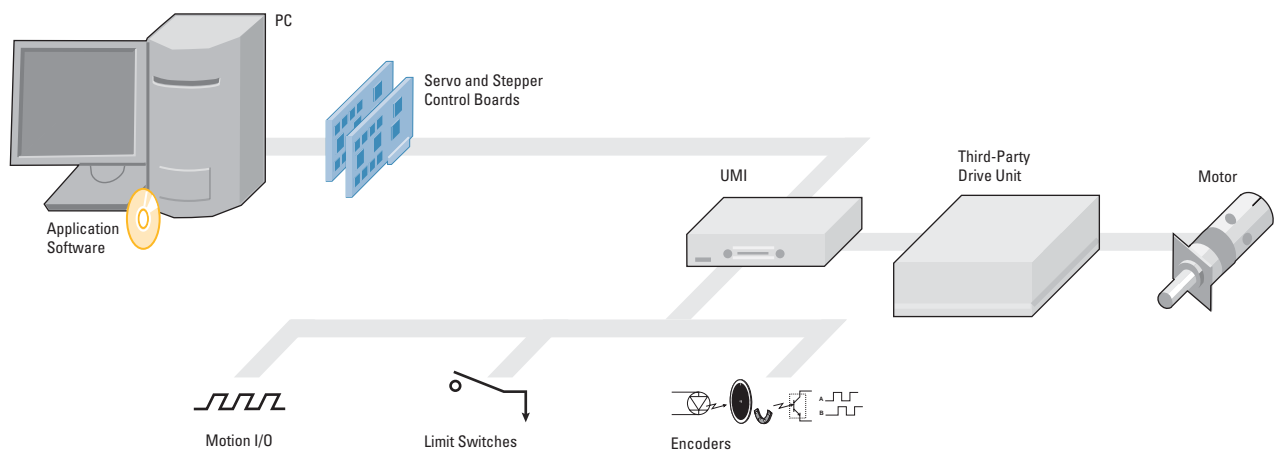


Figure 1. Typical Motion System Components

# 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

## BUY ONLINE!

Visit [ni.com/info](http://ni.com/info) and enter `umi7764`.

## Specifications

### UMI-7764

#### Encoder Interface (each axis)

Axes .....	4
Inputs .....	Quadrature, incremental
Differential input threshold .....	$\pm 0.3$ 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 k $\Omega$

#### Analog Inputs

Noise filter (RC time constant) .....	10 $\mu$ s
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
--------------	---

#### Host Bus Voltage Interlock

Voltage .....	4.5 VDC
---------------	---------

#### Physical

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

#### Environment

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

### UMI-7774, UMI-7772

#### Encoder Interface

Axes .....	4
UMI-7774 .....	4
UMI-7772 .....	2
Inputs .....	Quadrature, Incremental
Differential input threshold .....	$\pm 0.3$ 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 .....

Analog Inputs .....

Protection .....

#### 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
------------	---------------------

#### Power Requirements

24 VDC ( $\pm 10\%$ ) .....	200 mA plus optional 5 to 30 VDC power for isolated user defined field I/O
-----------------------------	--

#### Physical

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

#### Environment

Operating temperature .....	0 to 55 °C
Storage temperature .....	-30 to 70 °C
Relative humidity .....	10 to 90%, noncondensing

#### Shock and Vibration

Operating Shock* .....	30 g, 11 ms half sine, 3 shocks
Operating Vibration (random)* .....	5 <sub>rms</sub> , 10 to 500 Hz at 0.01 g/Hz
Operating Vibration (sinusoidal)* .....	5 g, 10 to 500 Hz

\*panel-mounted

# Global Services and Support

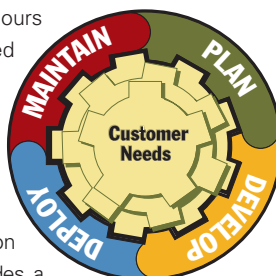
NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance – and tailored for customer requirements in research, design, validation, and manufacturing. We have direct operations in more than 37 countries and distributors in another 12 locations. Our local sales and support representatives are degreed engineers, ready to partner with you to find solutions that best fit your needs.

## Local Sales and Technical Support

In offices around the globe, our staff is local to the country so that you have access to field engineers who speak your language and are available to consult on your unique needs. We also have a worldwide support organization staffed with Applications Engineers trained to quickly provide superior technical assistance. Use our online Request Support interface ([ni.com/support](http://ni.com/support)) to define your question, then speak to or e-mail an Applications Engineer, or access more than 14,000 worldwide measurement and automation professionals within NI Developer Exchange Discussion Forums. [ni.com/support](http://ni.com/support) also provides immediate answers to your questions through self-help troubleshooting, product reference, and application development resources. For advanced technical support and software maintenance services, sign up for Premier Support, a program that provides expanded hours of support availability and expedited phone/e-mail response time (typically four business hours).

## Training and Certification

NI recognizes that both initial instruction and ongoing education contribute to your success. NI provides a variety of training alternatives, from self-paced tutorials and interactive CDs, to worldwide hands-on courses taught by experienced instructors – all designed so that you can choose how to learn about our products. Further, NI offers certifications acknowledging individual expertise in working with NI products and technologies. Visit [ni.com/training](http://ni.com/training) for more information.



## Professional Services

Our Professional Services team consists of National Instruments Applications Engineers, NI Consulting Services, and a worldwide Alliance Program (a network of 600 independent consultants and integrators). Our Professional Services team can offer services ranging from basic start-up assistance and collaborative development with your engineers, to turnkey system integration and maintenance of your system.



In addition to our NI Alliance Partners, we have developed global relationships with many industry partners that range from computer software and hardware companies, such as Microsoft, Dell, Siemens, and Tektronix. By collaborating with these companies, you receive a complete spectrum of solutions – from components to turnkey systems. Find the Alliance Partner directory at [ni.com/alliance](http://ni.com/alliance)

## Product Services

NI GPIB products are warranted against defects in workmanship and material for one year from the date of shipment. To help you meet project lifecycle requirements, NI offers extended warranties for an additional charge. NI provides complete repair services for our products. Express repair and advanced replacement services are also available. Or, order your software and hardware installed in PXI and PXI/SCXI™ systems with NI Factory Installation Services.

## Ordering Made Easy

Visit [ni.com/products](http://ni.com/products) to browse product specifications, make comparisons, or access technical representatives via online chat or telephone. Worldwide customers can use a purchase order or credit card to buy in local currency and receive direct shipments from local NI offices. Our North American Customer Service Representatives are available Monday through Friday between 7 a.m. and 7 p.m. Central Time. Outside North America, please contact the NI office in your country.

## Order Status and Service Requests

National Instruments brings you real-time status on current orders at [ni.com/status](http://ni.com/status). Similarly, find out the status of open technical support incidents or hardware repair requests at [ni.com/support/servicereq](http://ni.com/support/servicereq)



[ni.com](http://ni.com)

(800) 433-3488

National Instruments • Tel: (512) 683-0100 • Fax: (512) 683-9300 • [info@ni.com](mailto:info@ni.com)

♻️ This document represents a commitment from National Instruments to the environment.

© 2003 National Instruments Corporation. All rights reserved. Product and company names listed are trademarks or trade names of their respective companies.