USB-IIRO-16
32-Channel Isolated Input Relay Output Module

USB 2.0

FEATURES
- **High-speed USB 2.0 device, USB 1.1 compatible**
- **Small, portable 32-channel digital I/O module**
- **16 optically isolated inputs**
- **16 Form C electro-mechanical relays switch up to 1A each**
- **Internal, removable screw terminal board for easy wiring**
- **Custom high-speed function driver**
- **PC/104 module size and mounting compatibility**
- **Small (4" x 4"x 1.4") rugged industrial enclosure**

FACTORY OPTIONS
- **Eight input/output version**
- **Input only and relay only versions**
- **External power for high current capabilities**
- **DIN rail mounting provision**
- **Economy "E" version also available without the screw terminal board**
- **OEM (board only) version with PC/104 mounting holes and PCB footprint for added flexibility in embedded applications**

FUNCTIONAL DESCRIPTION
The USB-IIRO-16 is an ideal solution for adding portable, easy-to-install isolated input and relay output digital I/O capabilities to any computer with a USB port. The USB-IIRO-16 is a USB 2.0 high-speed device, offering the highest speed available with the USB bus. It is fully compatible with both USB 1.1 and USB 2.0 ports. The unit is plug-and-play allowing quick connect or disconnect whenever you need additional I/O on your USB port.

Featuring 16 Form C (SPDT) electromechanical relays and 16 optically isolated digital inputs, the unit is the smallest of its kind for digital monitoring and control using USB. The isolated, non-polarized inputs may be driven by either DC sources of 3-31 V (or higher by special order) or AC sources at frequencies of 40 Hz to 10KHZ. Optically isolating the digital inputs from each other, and from the computer, assures smooth, error-free data transmission in noisy, real-world environments. The input channels are available via a 34-pin IDC type vertical header. The relay outputs are de-energized at power-up to prevent an unintended control output signal. Data to the relays is latched. The relay contacts are available via a 50-pin IDC type vertical header.

The USB-IIRO-16 contains an internal, removable screw termination board (USB-STB-84) with onboard removable screw terminals to simplify wiring connections. The USB-STB-84 mounts directly into the vertical IDC connectors of the USB-IIRO-16 PCB. The USB-IIRO-16, like the PC/104 and PCI versions, is excellent in applications where on-board relays are required and inputs must be isolated such as in test equipment, instrumentation, and process control.

The USB-IIRO-16 is designed to be used in rugged industrial environments but is small enough to fit nicely onto any desk or testing station. The board is PC/104 sized (3.550 by 3.775 inches) and ships inside a steel powder-coated enclosure with an anti-skid bottom.

OEM USB/104 FORM FACTOR
The OEM (board only) version is perfect for a variety of embedded applications. What makes the OEM option unique is that its PCB size and mounting holes match the PC/104 form factor (without the bus connections). This allows our rugged digital board to be added to any PCI-104 or PC/104 stack by connecting it to a simple USB port usually included on-board with embedded CPU form factors such as EBX, EPIC, and PC/104. This is especially important since many newer CPU chipsets do not support ISA and have plenty of USB ports. The USB-IIRO-16 OEM board can also be installed using standoffs inside other enclosures or systems.
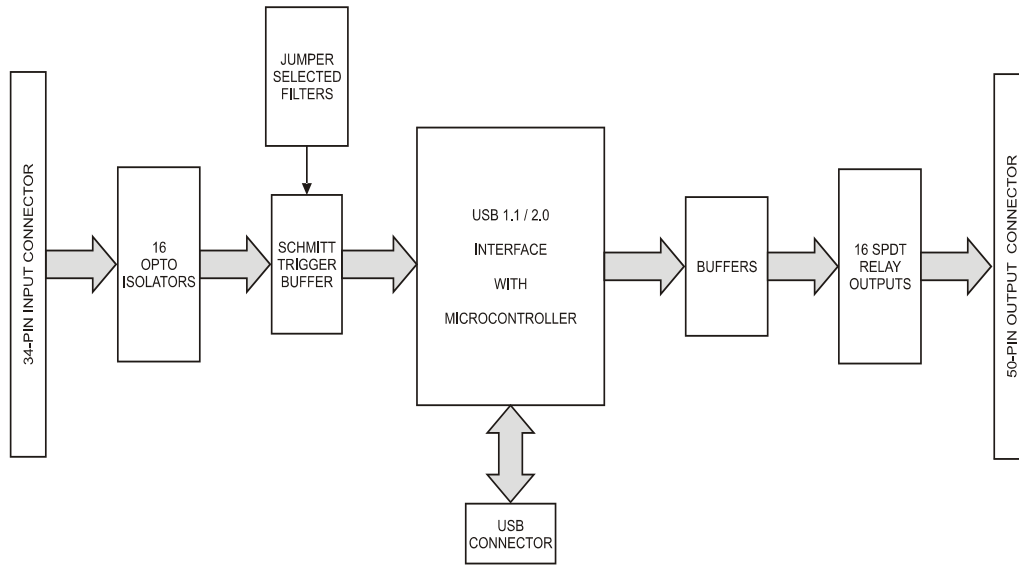
ACCESSORIES
The USB-IIRO-16 is available with optional cable assemblies and screw terminal board.

SOFTWARE
The USB-IIRO-16 is plug-and-play which allows quick connect or disconnect whenever you need additional I/O on your USB port. The module utilizes a high-speed custom function driver optimized for a maximum data throughput that is 50-100 times faster than the USB human interface device (HID) driver used by many competing products. This approach maximizes the full functionality of the hardware along with capitalizing the advantage of high-speed USB 2.0. The USB-IIRO-16 is supported for use in most USB supported operating systems and includes a free Linux and Windows 98se/Me/2000/XP/2003 compatible software package. This package contains sample programs and source code in Visual Basic, Delphi, C++ Builder, and Visual C++ for Windows. Also incorporated is a graphical setup program in Windows. Third party support includes a Windows standard DLL interface usable from the most popular application programs. Embedded OS support include Windows Xpe.

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BLOCK DIAGRAM

SPECIFICATIONS

Isolated Inputs

Number:	Sixteen
Type:	Non-polarized, optically isolated from each other and from the computer (CMOS compatible)
Voltage:	3 to 31 DC or AC RMS (40 to 1000 Hz)
Isolation:	500V* (see manual) channel-to-ground and channel-to-channel
Resistence:	1.8K ohms in series with opto-coupler
Filter Response:	Rise Time = 4.7 mS / Fall Time = 4.7 mS
Non-Filter Response:	Rise Time = 10 uS / Fall Time = 30 uS

Relay Outputs

Number:	Sixteen SPDT form C
Contact Type:	Single crossbar; Ag with Au clad
AC Load:	0.5 A at 125 VAC (62.5 VA max.)
DC Load:	1A at 24 VDC (30 W max.)
Switching Voltage:	125 VAC, 60 VDC max.
Switching Current:	1A max.
Contact Resistance:	100 mOHM max
Contact Life: mech'l:	5 million operations min.
Operating Time:	5 msec max.
Release Time:	5 msec max.

Bus Type

USB 2.0 high-speed, USB 1.1 full-speed compatible

Environmental

Operating Temperature Range:	0˚ to 70˚ C
Storage Temperature Range:	-40˚ to +85˚ C
Humidity:	Maximum 90% RH, without condensation.
Board Dimension:	3.550 x 3.775 inches.
Box Dimension:	4.00 x 4.00 x 1.4 inches.

Power

+5VDC provided via USB bus up to 500mA**
5V@ 30mA, typical (all relays off, add 30mA per relay)
5V@ 510mA, typical (all relays ON)

** Optional on-board external power circuitry and AC/DC adapter can be ordered ("-P" option) if current use is expected to be greater than what can be supplied by the USB bus. Please check to see how much current your USB port can supply and how much current you anticipate using.

Ordering Guide

USB-IIRO-16	Enclosure, module and screw terminal board
USB-II-16	16 isolated digital inputs only version
USB-RO-16	16 relay outputs only version
USB-IIRO-8	8 isolated digital inputs and 8 relay outputs version

Options

-OEM	Board only version (no enclosure and screw terminal board)
-E	Economy model (no screw terminal board)
-DIN	DIN rail mounting provision
-P	External power and AC/DC adapter

Accessories

USB-STB-84	Internal plug in screw termination board

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