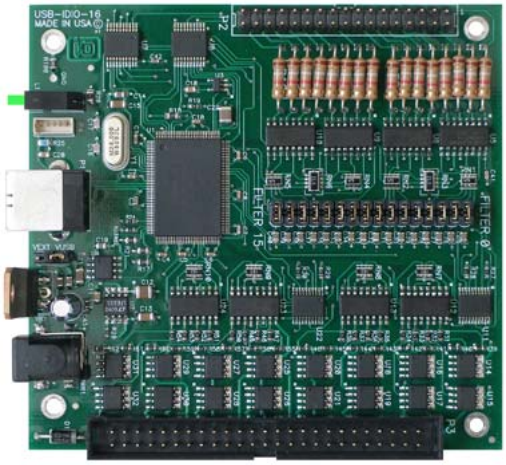
USB-IDIO-16 - Isolated Input and Solid State Relay Output Digital I/O Modules

FEATURES

- High-speed USB 2.0 device, USB 1.1 compatible
- 16 individually optically isolated inputs (channel to channel and channel to ground)
- Polarity insensitive AC/DC inputs accept up to 31 VDC or AC RMS
- Jumper selectable filtering per input channel for AC or voltage transients
- 16 optically isolated fully protected high-side FETs capable of switching up to 2A
- Internal removable screw terminal board for easy wiring
- All power drawn from USB port, no external power adapter required
- USB/104 form-factor for OEM embedded applications
- Small, (4" x 4" x 1.4") rugged industrial enclosure
- Custom high-speed function driver
- PC/104 module size and mounting compatibility
- Type B USB connector features industrial strength and high-retention design



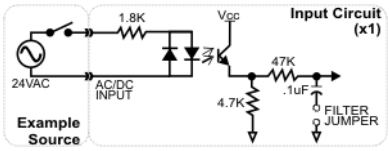
FACTORY OPTIONS

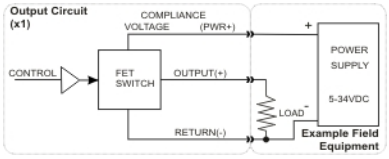
- Input only and solid state output only versions
- Eight input/output version
- External power for high current capabilities
- Extended temperature and DIN rail mounting provisions
- OEM version (board only) features PC/104 module size and mounting compatibility
- RoHS available. Please contact us for ordering information

FUNCTIONAL DESCRIPTION

The USB-IDIO-16 is an ideal solution for adding portable, easy-to-install isolated input and solid state output capabilities to any computer with a USB port. The USB-IDIO-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 features hotplug functionality allowing for quick connect/disconnect whenever you need additional I/O on your USB port.

Featuring 16 high side power MOSFET switch outputs 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 3-31V (or higher by special order) or AC sources at frequencies of 40Hz to 10kHz. Individual channel-to-channel isolation allows every channel to be physically and electrically separated from the others. 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 accessed via a 34-pin IDC type vertical header. The fully protected isolated outputs are de-energized at power-up to prevent an unintended control output signal. Data to the solid state outputs are latched and are available via a 50-pin IDC type vertical header. The unit contains an internal, removable screw termination board with onboard removable screw terminals to simplify wiring connections.





These boards are especially useful in applications where high common-mode external voltages are present. Isolation is required to guard electronics from transient voltage spikes and offers greater common-mode noise rejection in electronically noisy surroundings containing industrial machinery and inductive loads. These applications include factory automation, energy management, industrial ON/OFF control, security systems, manufacturing test, and process monitoring. In addition to protecting industrial applications from accidental contact with high external voltages, the isolation provided eliminates troublesome ground loops.

The USB-IDIO-16 was 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 with or without a steel powder-coated enclosure with an anti-skid bottom. A DIN rail mounting provision is available for installation in industrial environments.

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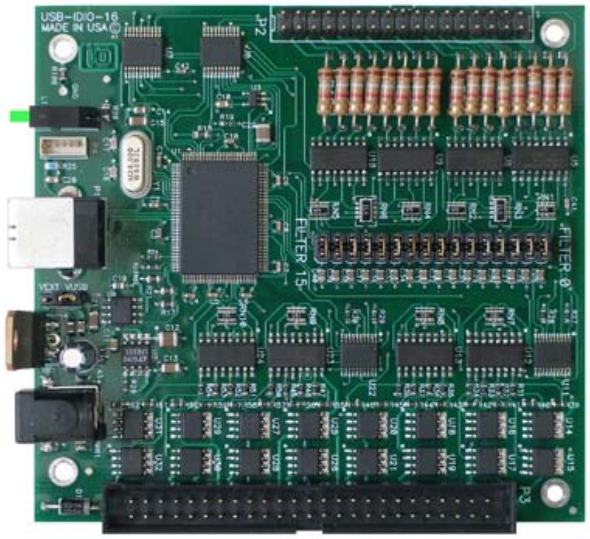
OEM USB/104 FORM FACTOR

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 pre-drilled mounting holes match the PC/104 form factor (without the bus connections). This ensures easy installation using standard standoffs inside most enclosures or systems. The board can be added to any PC/104, PCI-104, or PCI/104-Express stack by connecting it to a USB 2.0 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-IDIO-16 OEM board can also be installed using standoffs inside other enclosures or systems. For embedded OEM type applications, an additional miniature USB input header is provided in parallel with the type B connector.



High Retention USB Connector

The ever-growing presence of USB in the industrial/military marketplace has driven the need for USB connections to be reliable, dependable, and unfailing. Gone are the days of loose USB connections. A type B USB connector is used on all USB/104 products which features a high retention design that complies with the class 1, Div II minimum withdrawal requirement of over 3 pounds of force (15 Newtons). This connector has an orange color-coded insulator to quickly differentiate it from standard USB connectors. Using these USB connectors increases reliability in your system and ensures a tight connection. For embedded OEM type applications, an additional miniature USB input header is provided in parallel with the type B connector.

ACCESSORIES

Available accessories include a wide variety of cables and screw terminal boards for quick and easy connectivity.

SOFTWARE

The module utilizes a high-speed custom function driver 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-IDIO-16 is supported for use in most USB supported operating systems and includes a free Linux (including Mac OS X) and Windows 95/98/Me/NT/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 most popular application programs, and includes example LabVIEW VIs. Embedded OS support includes Windows XPe.

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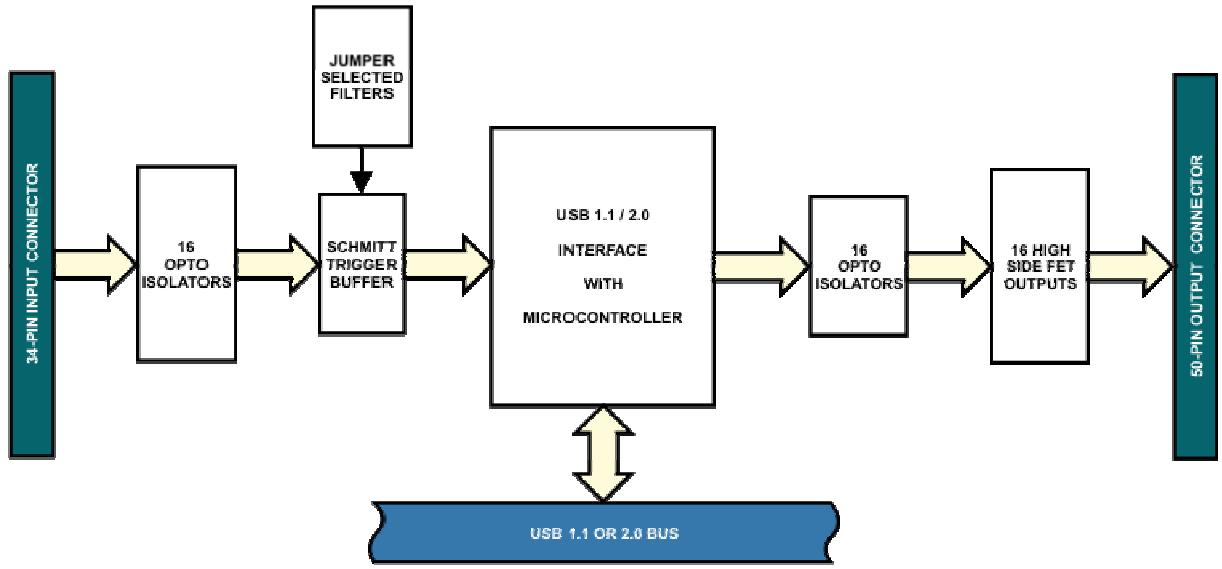
Block Diagram



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 10000 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

Isolated FET Outputs
- Number: Sixteen Solid State FETs
- Output Type: High Side Power MOSFET Switch. Protected against short circuit, over-temperature, ESD, and can drive inductive loads.
- Voltage Range: (customer supplied) 5-34VDC recommended for continuous use, 40VDC absolute max.
- Current Rating: 2A maximum
- Turn-on time: 90uS (typical)
- Turn-off time:110uS (typical)

Bus Type
- Universal Serial Bus: 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 cable up to 500mA**
- +5V @ 35mA typical (all FETs off, add 5mA per FET)
- +5V @ 115mA typical (all FETs 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.

Regulatory Compliance
- This product is designed to be in full compliance with CE requirements.

Ordering Information

USB-IDIO-16	Enclosure, module and screw terminal board
USB-IDO-16	16 isolated FET solid state outputs only version
USB-IDIO-8	8 isolated digital inputs and 8 isolated FET solid state outputs version

Accessories

USB-STB-84	Internal plug in screw termination board
MP104-DIN	DIN rail mounting provision

Options

-OEM	Board Only version (no enclosure or screw terminal board)
-E	Economy model (no screw terminal board)
-P	External power and AC/DC adapter

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