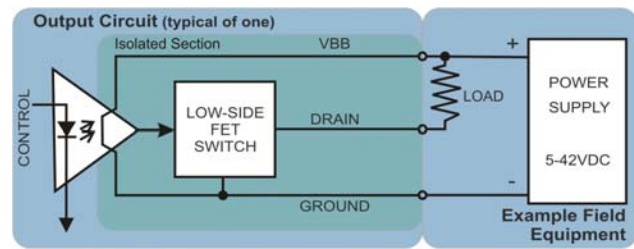




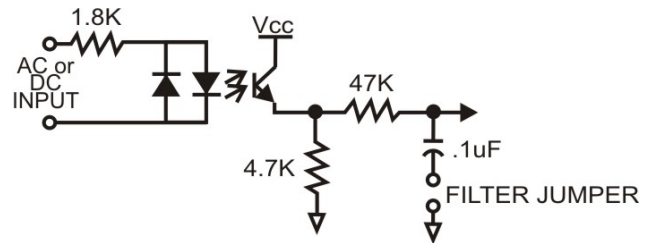
## FEATURES

- High-speed USB 2.0 device, USB 1.1 compatible
- Small, portable 32-channel digital I/O module
- 16 optically isolated inputs
- 16 fully protected and isolated FET 0.5A outputs
- 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 solid state outputs 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



Input Circuit

## FUNCTIONAL DESCRIPTION

The USB-IDIO-16L is an ideal solution for adding portable, easy-to-install isolated input and solid state output digital I/O capabilities to any computer with a USB port. The USB-IDIO-16L 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 smart low side power FET 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 3-31 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 fully protected isolated outputs are de-energized at power-up to prevent an unintended control output signal. Data to the outputs are latched and the solid state outputs are available via a 50-pin IDC type vertical header.

The USB-IDIO-16L 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-IDIO-16L PCB. The USB-IDIO-16L, like the PC/104 and PCI versions, is excellent in applications where on-board isolated solid state outputs are required and inputs must be isolated such as in test equipment, instrumentation, and process control.

The USB-IDIO-16L 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-IDIO-16L OEM board can also be installed using standoffs inside other enclosures or systems.

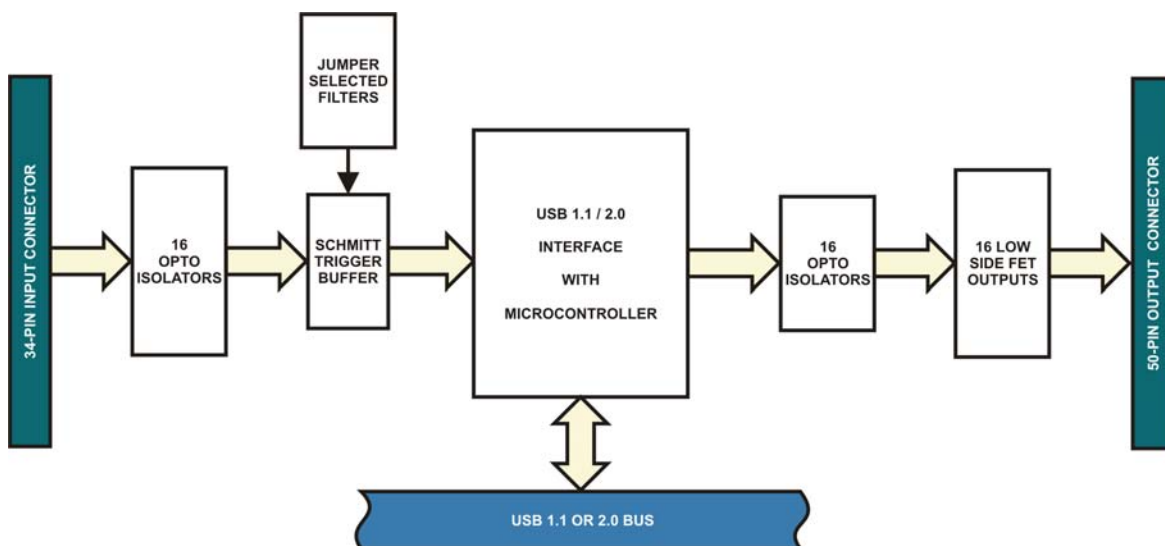
## ACCESSORIES

The USB-IDIO-16L is available with optional cable assemblies and screw terminal board.

## SOFTWARE

The USB-IDIO-16L 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-IDIO-16L 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.

## 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
Resistance:	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 FET's (off @ power up)
Output Type:	Smart Low Side Power HITFET Switch. Protected against short circuit, over-temperature, ESD, and can drive all types of resistive, inductive and capacitive loads.
Voltage Range:	5-42VDC recommended (customer supplied) for continuous use.
Current Rating:	0.5A maximum.
Turn-on time:	16 uS (typ.)
Turn-off time:	15 us (typ.)

### 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 @ 35mA, typical (all FETs off, add 10mA perFET)  
 5V @ 195mA, 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.

### Ordering Guide

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