



FEATURES

- 16 high-speed digital I/O lines featuring continuous throughput up to 16MB/s
- Capable of 80MB/s bursts
- Flexible internal or external synchronous clock and handshaking capabilities
- 18 additional digital I/O lines
- On-board FIFO memory up to 128 kByte
- All outputs buffered with 24mA sink/source capabilities
- Type B USB connector features high-retention design
- Standard 68-pin HD latching connector
- Alternate embedded USB connector
- High-Speed USB 2.0 device
- Custom high-speed function driver
- PC/104 module size and mounting compatibility
- Small (4"x 4"x 1.25") rugged industrial enclosure



FACTORY OPTIONS

- LVTTTL for 3.3V applications
- Input only, output only, and input/output versions
- OEM version (board only) features PC/104 module size and mounting compatibility
- External power for high current capabilities
- Extended temperature and DIN rail mounting provisions

FUNCTIONAL DESCRIPTION

The USB-DIO-16H is an ideal solution for adding portable, easy-to-install high-speed digital input or output capabilities to any computer with a USB 2.0 port. The USB-DIO-16H is a USB 2.0 High-Speed device, offering the highest speed currently available with the USB bus. The unit is plug-and-play allowing quick connect or disconnect whenever you need additional I/O on your USB port.

The USB-DIO-16H features 16 bits of TTL-compatible high-speed digital inputs or outputs capable of up to 8MHz (16MB/s) continuous scanning and up to 40MHz (80MB/s) bursts. The board includes a programmable clock capable of 1K - 40MHz transfers or you may choose to use your own external clock. In addition to the 16 high-speed I/O's there are 18 standard TTL-compatible digital I/O channels configurable as 4 separate ports for input or output (see block diagram). All required power is normally supplied to the board via the USB cable, however for higher current sourcing capabilities, optional external power may be used. The I/O wiring connections for the USB-DIO-16H are via an industry standard high-density pin-in-socket SCSI connector. For external circuits, a jumper selection connects fused +5VDC power to the connector. This resettable fuse is rated at 0.5A.

The USB-DIO-16H is designed to be used in rugged industrial environments but is small enough to fit nicely onto any desk or testing station. The board itself 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

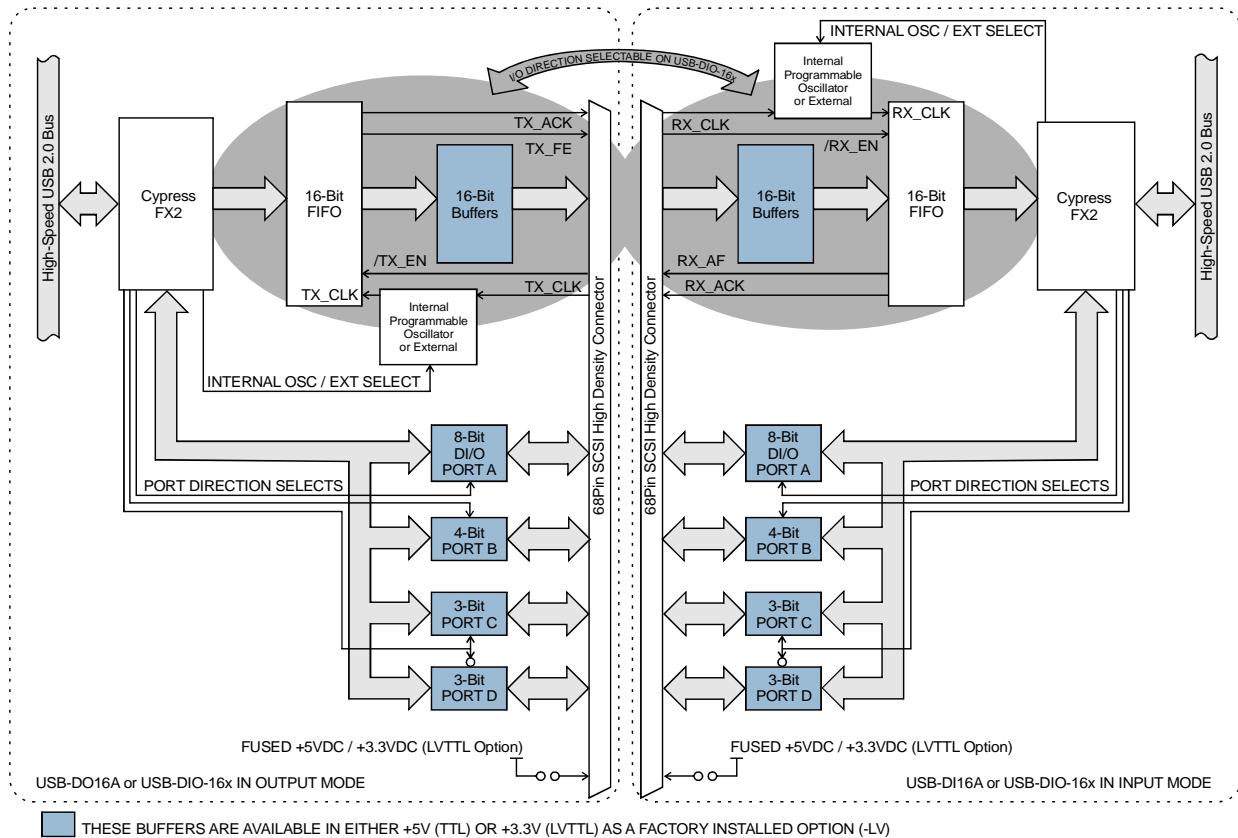
The OEM (board only) version is perfect for a variety of embedded applications. What makes the OEM option unique is that its PCB size and pre-drilled mounting holes match the PC/104 form factor (without the bus connections). This ensures easy installation using standard standoffs inside most enclosures 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-DIO-16H 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.

ACCESSORIES

Available accessories include a shielded, round-wire molded cable with latching connectors and a 68-pin screw terminal board for quick and easy connectivity.

SOFTWARE

The USB-DIO-16H utilizes a high-speed custom function driver optimized for maximum continuous data throughput of 16 MB/s that is hundreds to thousands of 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 on the advantage of high-speed USB 2.0. The boards are supported for use in most USB supported operating systems and includes a free Windows 98se/Me/2000/XP/2003/Vista compatible software package. This package contains sample programs and source code in Visual Basic, Delphi, C++ Builder, and Visual C++ for Windows. Third party support includes a Windows standard DLL interface usable from the most popular application programs and includes example LabView VIs. Embedded OS support includes Windows XPe.



BLOCK DIAGRAM

SPECIFICATIONS

TTL High-Speed Digital I/O's (LVTTTL Optional)

| | |
|------------------------|-------------------------------|
| Channels / Groups: | 16 / 1 |
| Configured as Inputs: | |
| Logic High: | 2.0 to 5.0 VDC |
| Logic Low: | -0.5 to +0.8 VDC |
| Configured as Outputs: | |
| Logic High: | 4.4 VDC minimum, source 24 mA |
| Logic Low: | 0.44 VDC maximum, sink 24 mA |

TTL Standard Digital I/O's (LVTTTL Optional)

| | |
|------------------------|-------------------------------|
| Channels / Groups: | 18 / 4 (see block diagram) |
| Configured as Inputs: | |
| Logic High: | 2.0 to 5.0 VDC |
| Logic Low: | -0.5 to +0.8 VDC |
| Configured as Outputs: | |
| Logic High: | 4.4 VDC minimum, source 24 mA |
| Logic Low: | 0.44 VDC maximum, sink 24 mA |

Internal Clock

Frequency Range: 1KHz-40MHz

External Clock

Frequency: 40MHz maximum

Data FIFO's

| | |
|--------|--|
| Width: | 16-bit |
| Depth: | USB-DIO-16H: 128 kByte USB-DIO-16A, USB-DI16A, USB-DO16A: 8 kByte |

Environmental

| | |
|------------------------------|--|
| Operating Temperature Range: | Commercial: 0° to 70°C Industrial: -40° to +85°C -40° to +85°C |
| Storage Temperature Range: | 5% -95%, non-condensing |
| Humidity: | 3.550 x 3.775 inches |
| Board Dimension: | 4.00 x 4.00 x 1.25 inches |
| Box Dimension: | |

Power

| | |
|---------------------|--|
| Basic Unit: | 100mA typical (no load) |
| Auxiliary Output: | +5VDC via 0.5A resettable fuse +3.3VDC via 0.5A resettable fuse |
| Bus Powered: | +5VDC provided via USB bus up to 500mA |
| Externally Powered: | ** Optional on-board external power circuitry with voltage regulator and 9V 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. |

ORDERING GUIDE

| | |
|-------------|---|
| USB-DIO-16H | 16 High-Speed Digital I/O's, 18 standard I/O's, |
| USB-DIO-16A | 16 High-Speed Digital I/O's & 18 standard I/O's |
| USB-DI16A | 16 High-Speed Digital Inputs & 18 standard I/O's |
| USB-DO16A | 16 High-Speed Digital Outputs & 18 standard I/O's |

Model Options

- -P External AC/DC adapter (power jack/regulator installed)
- -OEM Board only (no enclosure)
- -T Extended Temperature Operation (-40° to +85°C)
- -LV LVTTTL buffers

Accessories

| | |
|------------|--|
| STB-68 | Screw terminal board |
| C68PS18L | 68-Pin SCSI 18" shielded cable |
| MP104-DIN | DIN rail mounting provision |
| CUSB-EMB-6 | 6' USB Cable with Type A to mini connector |

