

FEATURES

- ! High-Speed USB 2.0 device, USB 1.1 compatible
- ! Small (3.5 by 3.7 in.), portable, 32-channel USB digital I/O module
- ! Four 8-bit ports independently selectable for inputs or outputs
- ! All 32 I/O lines buffered with Sink 64mA / Source 32mA current capabilities
- ! Custom high-speed function driver
- ! Removable screw terminal adaptor for easy wiring
- ! Standard 50-pin IDC connector with key
- ! Rugged industrial enclosure

FACTORY OPTIONS

- ! Three 82C54 counter/timers
- ! External power for high current capabilities
- ! Economy "E" version also available without the screw terminal adaptor
- ! OEM (board only) version with pre-drilled mounting holes for added flexibility in embedded applications



FUNCTIONAL DESCRIPTION

The USB-DIO-32 is an ideal solution for adding portable, easy-to-install digital I/O and counter capabilities to any computer with a USB port. The USB-DIO-32 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.

The USB-DIO-32 features 32 bits of TTL-compatible digital I/O with high-current capabilities and three optional 82C54 counters. Each digital port can be programmed to accept inputs or to drive outputs on four 8-bit ports, designated as port A, B, C, and D. Power is supplied to the card via the USB cable or for higher current capabilities, external power may be used. The I/O wiring connections for USB-DIO-32 are via an industry standard 50-pin connector. For external circuits, fused +5VDC power is available at the connector. This resettable fuse is rated at 0.5A.

All I/O lines are buffered by a type 74ABT245 tristate buffer transceiver capable of sinking 64 mA or sourcing 32 mA. The buffers are configured under program control for input or output. Jumper selectable pull-ups (to +5 VDC) or pull-downs (to ground) on the card allow for contact monitoring and assure that there are no erroneous outputs at power-up until the card is initialized by system software.

Unlike most USB digital I/O products which primarily use a human interface device (HID) driver, ACCES offers an easy to use, Windows-based, custom function driver optimized for maximum data throughput. This approach exposes the full functionality of the hardware along with maximizing the advantage of using the high-speed USB 2.0 bus.

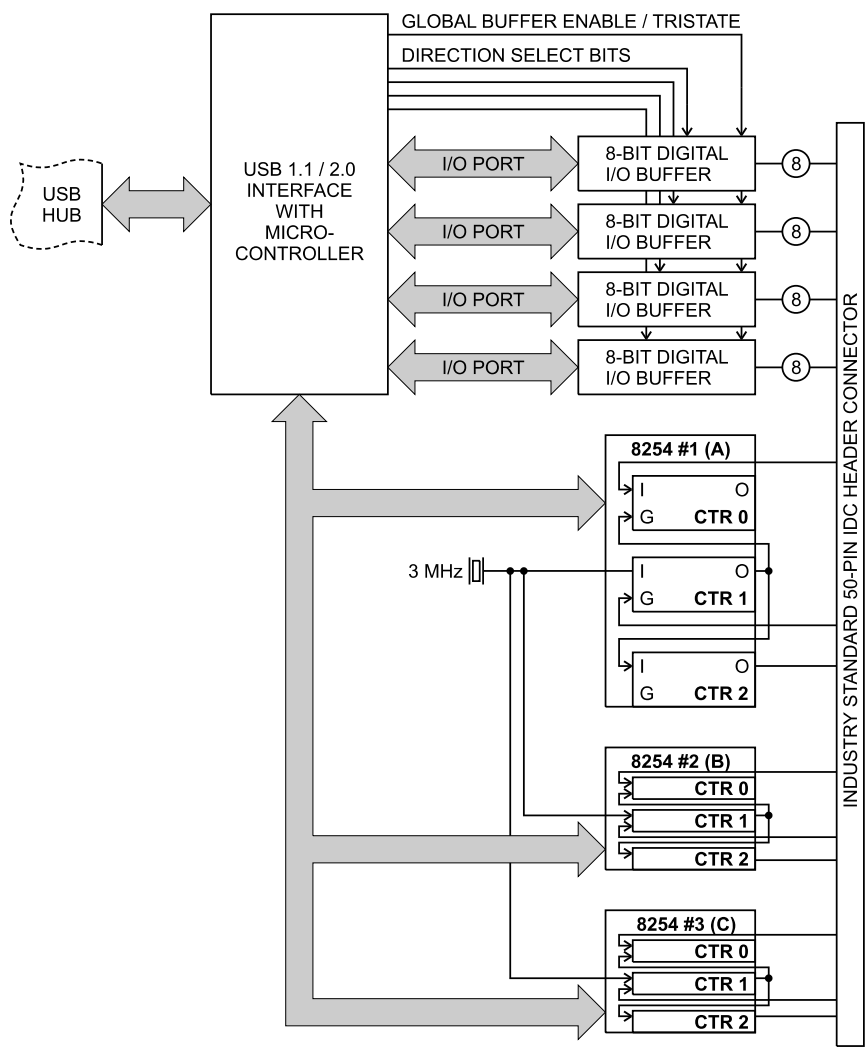
The USB-DIO-32 is designed to be used in rugged industrial environments but is small enough to fit nicely onto any desk or testing station. The card is PC/104 sized (3.550 by 3.775 inches) and ships inside a steel

powder-coated enclosure with an anti-skid bottom. The OEM (board only) version is perfect for a variety of embedded applications. The board features pre-drilled mounting holes and can be installed using standoffs inside most enclosures or systems. PC/104 systems can easily add this module to an existing stack using the conveniently sized PC/104 mounting holes.

COUNTER/TIMERS

Three 82C54 chips each include three 16-bit counter/timers factory configured in an optimal module for use as event counters, frequency output, pulse width, and frequency measurement (see the Block Diagram).

BLOCK DIAGRAM



CONNECTOR PIN ASSIGNMENTS

USB-DIO-32 has a 50-pin connector provided for I/O connections.

PIN FUNCTION		PIN FUNCTION	
1	DIO C7	2	A0 IN
3	DIO C6	4	A1 GATE
5	DIO C5	6	A2 OUT
7	DIO C4	8	B0 IN
9	DIO C3	10	B1 GATE
11	DIO C2	12	B2 OUT
13	DIO C1	14	C0 IN
15	DIO C0	16	C1 GATE
17	DIO B7	18	C2 OUT
19	DIO B6	20	DIO D7
21	DIO B5	22	DIO D6
23	DIO B4	24	GND
25	DIO B3	26	DIO D5
27	DIO B2	28	GND
29	DIO B1	30	DIO D4
31	DIO B0	32	GND
33	DIO A7	34	DIO D3
35	DIO A6	36	GND
37	DIO A5	38	DIO D2
39	DIO A4	40	GND
41	DIO A3	42	DIO D1
43	DIO A2	44	GND
45	DIO A1	46	DIO D0
47	DIO A0	48	GND
49	+5V	50	GND

Table 1: Block Diagram and 50-Pin Connector Pin Assignments

SPECIFICATIONS

Digital Inputs (TTL Compatible)

Logic High: 2.0 to 5.0 VDC

Logic Low: -0.5 to +0.8 VDC

Digital Outputs

Logic High: 2.0 VDC minimum, source 32 mA

Logic Low: 0.55 VDC maximum, sink 64 mA

Optional Counter/Timers

Type: 82C54-10 programmable interval counters

Output Drive:

2.0 VDC minimum, source 32 mA

0.55 VDC maximum, sink 64 mA

Input Gate: TTL/CMOS compatible

Clock: On-board, 3 MHz crystal-controlled clock

Active Count Edge: Negative Edge

Minimum Clock Pulse Width: 30 nS high, 40 nS low

Timer Range: 16 bits

Maximum Input Frequency: 10MHz

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 1.25 inches

Power

+5VDC provided via USB cable up to 500mA**

Basic Unit with Three Counters: 180mA typical (no load)

**optional external power supply can be ordered if the SOURCE current from the USB-DIO-32 is expected to be greater than 320mA (180mA + 320mA = ~500mA)

SOFTWARE

The USB-DIO-32 is supported for use in most operating systems and includes a free Linux and Windows 98se/Me/NT/2000/XP/2003 compatible software package. This 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. Linux support consists of installation files and basic samples for programming from user level via an open source kernel driver.

ACCESSORIES

The USB-DIO-32 is available with optional cable assemblies, screw termination boards, and an optional external AC/DC power supply. The pin connections are also compatible with industry standard I/O racks such as ACCES A24A, OPTO22, Gordos, Potter & Brumfield, etc. with optional cable.

ORDERING GUIDE

USB-DIO-32 Standard card with screw terminal board

USB-DIO-32E Economy card, no screw terminal board

Options:

-Cx counters (where x = 1, 2, or 3)

-P external power and AC/DC adapter

-OEM board only version (no enclosure)

