

FEATURES

- High-speed USB 2.0 device, USB 1.1 compatible
- 48 lines of digital I/O
- 24 fully protected FET 2A outputs
- High retention type B USB connector and a mini USB header in parallel for stacking and embedded applications
- Six (6) 8-bit ports independently selectable as inputs or outputs
- Each I/O line capable of sourcing 32mA, or sinking 64mA
- Each I/O Buffer can be enabled or tri-stated via program control
- Jumper selectable I/O pulled up to 5V for contact monitoring, pulled down to ground or floating in 8-bit groups
- Resettable fused +5VDC output per 50-pin connector
- Standard 50-pin IDC-type shrouded connectors with key
- Removable internal terminal board for ease of wiring
- Rugged steel industrial enclosure
- PC/104 module size (3.550 by 3.775 in.)

FACTORY OPTIONS

- 24 I/O, 12 FET output version
- 24 FET output only version
- External power for higher source current capabilities
- DIN rail mounting provision
- Economy "E" version without the terminal board
- OEM (board only) version for embedded applications
- Extended operating temperature -40 to +85°C
- This product is available in a RoHS compliant version

FUNCTIONAL DESCRIPTION

This USB board was designed to be used in today's new Kiosk designs as a highly functional and compact I/O module. It is also an ideal solution for adding portable, easy-to-install digital I/O capabilities and solid state FET outputs to any computer with a USB port. The board is a USB 2.0 high speed device, offering the fastest speed available with the USB 2.0 bus. The unit is plug-and-play allowing quick connect/disconnect whenever you need additional I/O on your USB port.

The board features 48 or 24 bits of TTL-compatible digital I/O with high output current capabilities. Each digital port can be programmed to accept inputs or to drive outputs. Power is supplied to the card via the USB cable, or, for higher source current capabilities, an external power option may be ordered. All I/O lines are buffered by a type 74ABT543A tristate buffer transceiver capable of sourcing 32mA or sinking 64mA. Jumper selected resistors permit configuration of each 8-bit I/O group for pull-up (to +5 VDC), pull-down (to ground) or floating depending on the application requirement. Pull-ups are useful for contact monitoring, while pull-downs assure that there are no erroneous outputs at power-up until the card is initialized by system software.

The board also features 24 or 12 high side power MOSFET switch outputs. The fully protected outputs are de-energized at power-up to prevent an unintended control signal until turned on via software command. Each output shares a common switched voltage of 5-34VDC at up to 2A. Data to the solid state outputs are latched.

The I/O wiring connections are via two or three industry standard 50-pin connectors. For external circuits, fused +5VDC power is available at pin 49 of each I/O connector. The resettable fuse is rated to hold at 50mA continuous, and to trip at 150mA.

The USB-DIO48DO24 includes an internal, removable spring cage termination board (STB) to simplify wiring connections. The STB-DIO48DO24 plugs directly into the vertical IDC connectors of the USB-DIO48DO24 circuit board, inside the included enclosure. The USB-DIO48DO24 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 (3.55 x 3.775 inches) and ships inside a rugged powder-coated steel enclosure with 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. The USB-DIO48DO24 and USB-DIO24DO12 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.

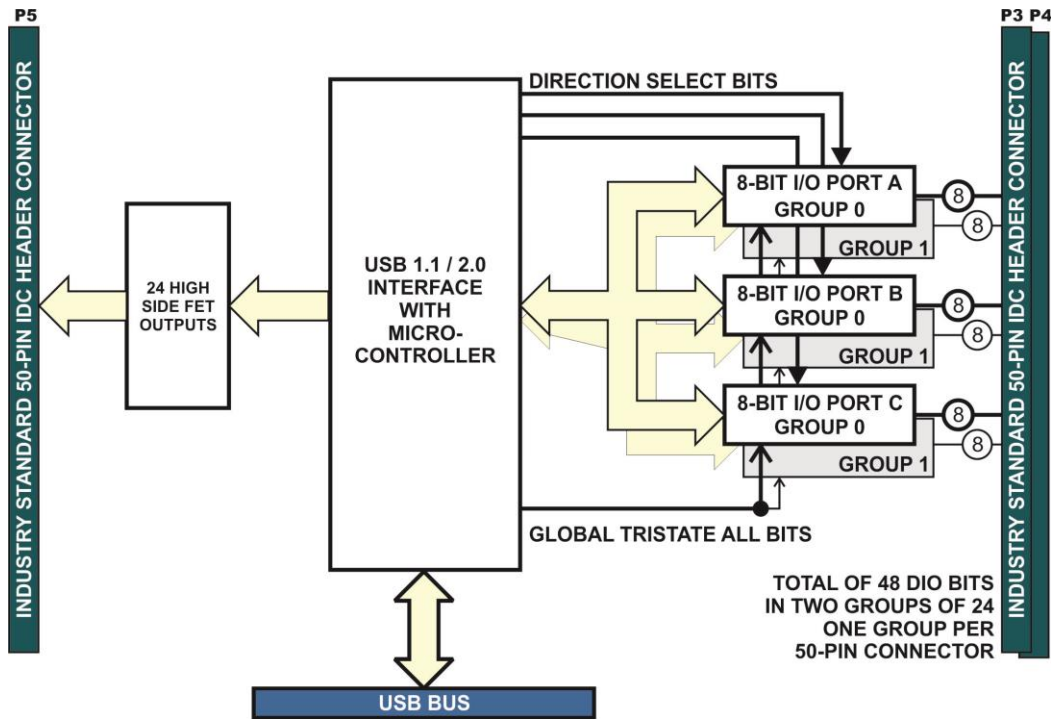
ACCESSORIES

Available accessories include a DIN-Rail mounting adaptor model MP104-DIN. Also available is our low cost IIB-24 which will add optical isolation to any standard 24-channel digital input port on a 50 pin connector. To make use of the miniature embedded USB header connector, we offer a type A to mini cable.

SOFTWARE

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 at 4000 transactions per second. This approach maximizes the full functionality of the hardware along with capitalizing the advantage of high-speed USB 2.0. The USB-DIO48DO24 is supported for use in most operating systems and includes a free Linux and Windows compatible software package. This package contains sample programs and source code in Visual Basic, Delphi 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 includes Windows XPe, and Windows Embedded Standard.





BLOCK DIAGRAM

SPECIFICATIONS

TTL Digital Input / Output Lines

Channels / Groups: 48 or 24 in 8-bit groups
 Inputs:
 Logic High: 2.0 VDC minimum, 5.5 VDC max.
 Logic Low: -0.5 VDC min., +0.8 VDC max.
 Outputs:
 Logic High: 2.0 VDC minimum, source 32 mA
 Logic Low: 0.55 VDC maximum, sink 64 mA

FET Outputs

Number: 24 or 12 Solid State FET's
 Output Type: High Side Power MOSFET switch. Protected against short circuit, over-temperature, ESD, and can drive inductive loads.
 Voltage Range: 5-34VDC for continuous use, 40VDC absolute max (customer supplied)
 Current Rating: 2A maximum
 Turn-on time: 90µS (typ)
 Turn-off time: 110µS (typ)

Bus Type

USB 2.0 high-speed
 USB 1.1 full-speed compatible

Environmental

Operating Temp.: 0°C to 70°C
 (-40 to +85°C available as a factory option)
 Storage Temp.: -40°C to +85°C
 Humidity: 5%-90% RH, non-condensing
 Board Dimension: 3.550 x 3.775 inches
 Box Dimension: 4.00 x 4.00 x 1.7 inches

Power

Basic Unit: 110mA typical (no load)
 Auxiliary Outputs: +5VDC via resettable fuses
 50mA hold current, 150mA trip current
 Bus Powered: +5VDC provided via USB bus up to 500mA
 Externally Powered: ** Optional on-board external power circuitry and 5V AC/DC adapter can be ordered ("-PR" option) if current use is expected to be greater than what can be supplied by the USB bus.

ORDERING GUIDE

USB-DIO48DO24 48 Digital I/O's and 24 FET outputs w/internal STB in rugged steel enclosure
 USB-DIO24DO12 24 Digital I/O's and 12 FET outputs w/internal STB in rugged steel enclosure
 USB-DO24 24 FET outputs w/internal spring cage terminal board in rugged steel enclosure

Model Options

- -PR Ext. regulated 5V power and AC/DC adapter
- -OEM Board only (no enclosure or STB)
- -RoHS Compliant board
- -T Extended operating temp. -40°C to +85°C
- -E Economy (with enclosure but no terminal board)

Included Accessory

STB-DIO48DO24 Internal plug in screw termination board

Optional Accessories

IIB-24 24-input optical isolator board (stackable)
 STB-50U 50-pin spring cage terminal board (stackable)
 CAB50F-x Female ribbon cable w/50 pin connectors
 x = length in feet
 CAB50-6 6' flat ribbon cable female to edge connector
 MP104-DIN DIN rail mounting provision
 CUSB-EMB-6 6' USB Cable with Type A to mini connector
 CUSB-LOCK USB Locking Cable

