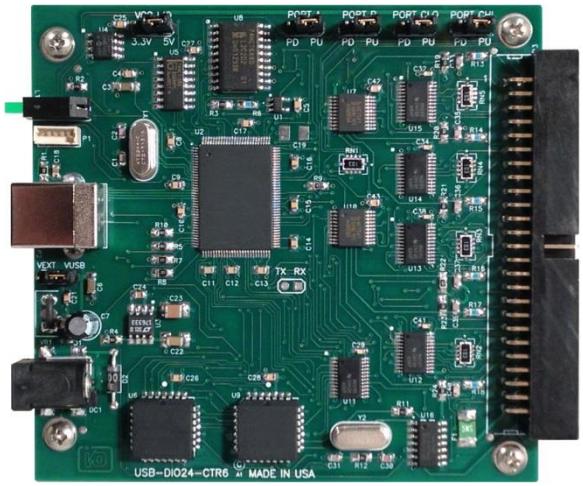
USB-DIO24-CTR6

24 Digital I/O Lines
with Six 16-bit Counter/Timers

FEATURES

- 24 lines of digital I/O
- High-speed USB 2.0 device, USB 3.0 and 1.1 compatible
- Two 8-bit & two 4-bit ports each software configurable for input or output
- Field selectable CMOS (+5V) or LVTTL (3.3V) Vccio signal levels
- CMOS: All 24 I/O lines buffered with 32 mA sink and source
- LVTTL: All 24 I/O lines buffered with 24 mA sink and source
- Two 82C54 counters with all pins available at I/O connector
- Each port field configurable with pull-up, pull-down, or no-bias
- Powered via USB cable; optional external power supply for sourcing higher total current
- Vccio at connector for general purpose use, protected by polyfuse
- Standard 50 pin male IDC header compatible with Industry-Standard I/O Racks such as Gordos, OPTO22, Potter & Brumfield
- PC/104 size (3.550 by 3.775 inches)
- Rugged, steel, industrial enclosure (4 by 4 by 1.25 inches)



FACTORY OPTIONS

- External power for higher source current capabilities
- Screw Terminal for external power connection
- 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

The board features 24 bits of CMOS/LVTTL-compatible digital I/O with high-current capabilities and two 82C54 counter/timers. Each digital port can be programmed to accept inputs or to drive outputs. Groups of two 8-bit ports and two 4-bit ports are designated as port A, B, CHi and CLo. Power is supplied to the card via the USB cable. For higher current sourcing capabilities, external power may be used. The I/O wiring connections are via an industry standard 50-pin male connector any of our optional terminal block cards. For external circuits, fused +5V (or 3.3V) DC power is available on pin 49 of the connector. The resettable fuse is rated at 0.5A.

All 24 I/O lines are buffered by a type 74LVC8T245 tristate buffer transceiver capable of operating in CMOS (+5V) or LVTTL (+3.3V) modes. The mode is set for all pins simultaneously via an onboard jumper. When using CMOS mode the outputs can sink or source 32 mA. In LVTTL mode the outputs can sink or source 24mA. The 24 bits are divided into four ports: two 8-bit ports (Port A, Port B), and two 4-bit ports (Port CLo, Port CHi). Each port can be configured independently via onboard jumpers for pull-up, pull-down, or no bias. Each port can also be configured independently, via software command, for use as inputs or outputs.

The board is available in two models, one with two 8254 counter/timer chips, and one without. The unit without counters is optimally suited for use with industry standard solid state module mounting racks. Because this version does not place any counter signals on pins normally reserved for Ground, it provides a perfectly compatible 50-pin IDC connection.

OEM USB/104 FORM FACTOR

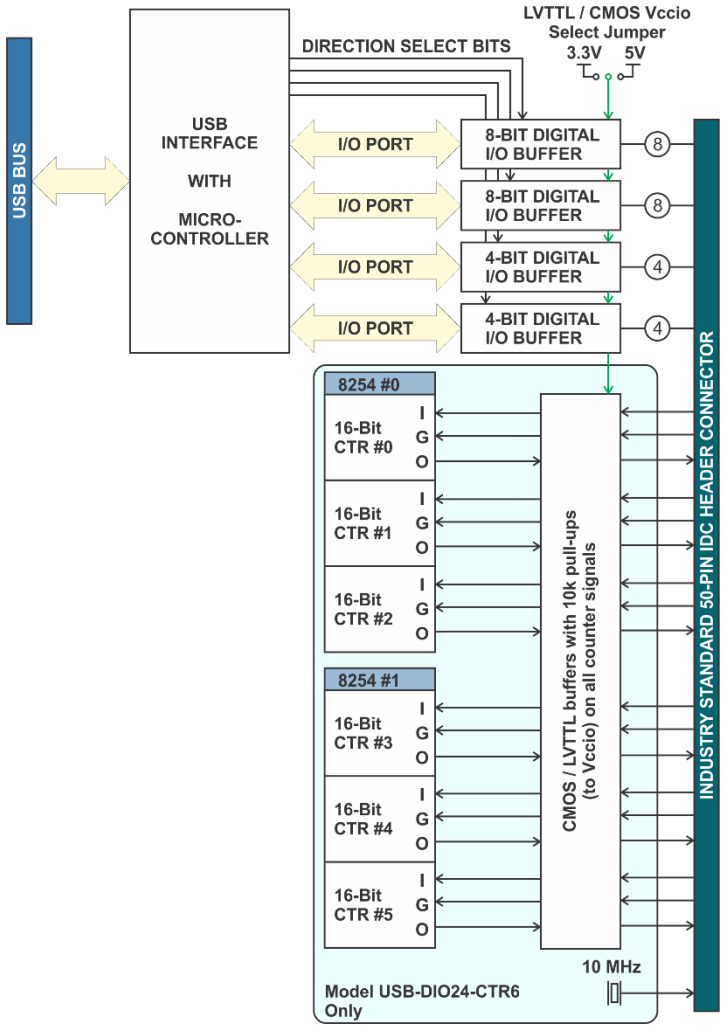
The OEM (board only) version is perfect for a variety of embedded applications. What makes the OEM option unique is that its PCB size and pre-drilled mounting holes match the PC/104 form factor (without the bus connections). The board can be added to any PC/104, PCI-104, or PCI/104-Express stack by connecting 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-DIO24-CTR6 and USB-DIO-24 OEM board can also be installed using standoffs inside other enclosures or systems. For embedded OEM type applications, an additional miniature USB header is provided in parallel with the type B connector.

ACCESSORIES

Optionally available accessories include a variety of screw terminal adapter cards and 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 for –OEM versions, 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-DIO24-CTR6 is supported for use in most operating systems and includes a free Linux and Windows compatible software package, including OSX. 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

Digital I/O

Channels / Groups:	24 in two 8-bit and two 4-bit groups
Type	8255 Mode 0 compatible
Logic Level	Vccio
Pull-up/down	10kΩ, jumper selectable

Vccio

Logic Levels	5V		3.3V	
Low Inputs	≤ 1.5V	≤ 2uA	≤ 0.8V	≤ 2uA
High Inputs	≥ 3.5V	≤ 2uA	≥ 2.0V	≤ 2uA
Low Outputs	≤ 0.55V	32mA	≤ 0.55V	24mA
High Outputs	≥ 3.8V	32mA	≥ 2.4V	24mA

Counter / Timers

Number / Type	Two 82C54 programmable interval counters
Counter size	16-bit
Logic level	Vccio
On-board clock	10MHz
Clock Pulse Width	High - 30ns (min) Low - 40ns (min)

Bus Type

USB 2.0 high-speed
USB 3.0 and 1.1 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 1.25 inches

Power

Basic Unit:	140mA typical (no load)
Auxiliary Output:	+5VDC via resettable fuse (500mA 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-DIO24-CTR6	USB 24-channel digital input/output module with two 82C54’s, installed in rugged enclosure
USB-DIO-24	USB 24-channel digital input/output module

Model Options

• -PR	Ext. regulated 5V power and AC/DC adapter
• -ST	External power connection via screw terminals
• -OEM	Board only (no enclosure or terminal board)
• -RoHS	Compliant board
• -T	Extended operating temp. -40˚C to +85˚C

Optional Accessories

UTBK-50	Removable screw terminal board
STB-50	Screw terminal board, requires ribbon cable
STB-50U	Spring cage term bd. accepts 24 to 16 AWG wire
STB-50U Kit	Terminal bd. kit mounts on I/O module enclosure
IIB-24	24-input channel optical isolator board
CAB50-6	6’ flat ribbon cable female to edge connector
CAB50F-6	6’ flat ribbon cable female to female connectors
MP104-DIN	DIN rail mounting provision
CUSB-EMB-6	6' USB Cable with Type A to mini connector
CUSB-LOCK	USB Locking Cable

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