

DT340

Low-Cost Counter/Timer and Digital I/O Board for the PCI Bus

Key Features

- Combines digital I/O and counter/timer functions in one PCI slot
- New custom counter/timer design for speed and flexibility
- Four internal interval timers enable periodic interrupt
- 32 digital I/O channels for high channel-count requirements
- Eight user accessible counter/timers for event counting, square wave generation, and interval measurement
- Interrupt on bit change detection for monitoring critical signals
- Extensive Windows software support



The DT340 features eight 16-bit counter/timers, 4 internal interval timers, and 32 digital I/O lines.

Overview

Ideal for applications that require automated counter/timer and control capabilities, the DT340 is the first board to combine digital I/O and counter/timer functions in a single PCI slot.

New Counter/Timer Design Enhances Speed and Flexibility

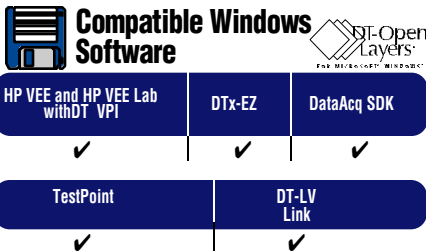
Traditional counter/timer circuits with standard 9513 and 8254 chips are hampered by limitations in speed and flexibility. Data Translation's new custom counter/timer design overcomes these limitations, enabling frequencies up to 20 MHz and providing superior flexibility.

Each of the eight counter/timers accepts a clock input and gate input signal, and outputs a clock output signal. Each counter can use a time base generated from an internal clock or from an external

clock. The internal clock uses a 25 ns time base with output frequencies ranging from 610 Hz to 20 MHz. An external clock is useful when you want to pace counter/timer operations at rates not available with the internal clock or if you want to pace at uneven intervals.

You can also internally route the clock output signal from one counter/timer to the clock input signal of the next counter/timer to internally cascade the counter/timers. In this way, you can create a 32-bit counter/timer. If you want to cascade more than two counter/timers, you can connect the counter/timers externally using the screw terminal panel accessory.

Additionally, you can set each counter to interrupt the CPU when it reaches a count of 0.



Features Summary

Port	Lines per port	Digital I/O		
		Type	Interrupt on Bit Change Detection	SSR Drive
A,B,C	8 bidirectional	Level-sensitive	No	Yes
D	8 bidirectional	Level-sensitive	Yes	Yes

Counter/Timer	Counter/Timers			
	Channels	Resolution	Maximum Clock Frequency	External Clock
Counter/Timer	8	16-bit	20 MHz	Yes
Interval Timers	4	24-bit	20 MHz	No

You can control the gate of each counter through software or by connecting an external gate signal. The external gate can trigger a one-shot output or can enable event counting, frequency measurement, or rate generation when the gate signal is active.

The DT340 supports pulse output types on the clock output signal with either high-to-low transitions or low-to-high transitions. You can program the duty cycle (or pulse width) of the pulse.

Four Internal Interval Timers for Periodic Interrupt

The DT340 provides four 24-bit interval timers. Interrupts are individually enabled for each interval timer. You can use these timers to generate a periodic interrupt to the host CPU to time an event, such as reading the digital inputs or updating the digital outputs.

Interval timers use an internal clock input signal; no external connections are used. The frequency of the clock output signal can range from 2.38 Hz to 20 MHz.

32 Digital I/O Channels for High Channel-Count Requirements

The DT340 provides 32 digital I/O lines, grouped into four 8-bit ports. You can program each port for either input or output. Digital outputs are capable of driving external solid-state relays (sink 24 mA and source 15 mA).

The DT340 board can generate an interrupt when any of the eight digital I/O lines corresponding to one of the 8-bit digital ports changes state. This feature is useful when you want to monitor critical signals or when you want to signal the host computer to transfer data to or from the board. You can enable the interrupts on a bit-by-bit basis on this port.

Easy User Connections

All signals are brought out to a dedicated 68-pin connector on the backplate of the DT340 board. The STP68 and STP340 screw terminal panels are available to simplify connections. The EP305 cable connects the DT340 board to the screw terminal panel.

Accessories

STP68 Screw Terminal Panel and EP305 Cable



The STP68 screw terminal panel together with the EP305 cable simplifies the connection of digital I/O and

counter/timer signals to the DT340 board. Accommodating all user connections on convenient screw clamp connectors, the STP68 mounts on a panel and includes nylon standoffs for table-top applications. The panel measures 3.9375 in. (100 mm) wide by 3.9375 in. (100 mm) long.

For applications requiring more extensive shielding, the STP340 screw terminal panel is also available.

The EP305 is a 68-pin, 79 in., twisted pair, shielded cable that connects the DT340 board to the screw terminal panel.

Software Support



Easy to Use: Extensive Windows Software Support

Several software options can help you get your application running quickly and easily.

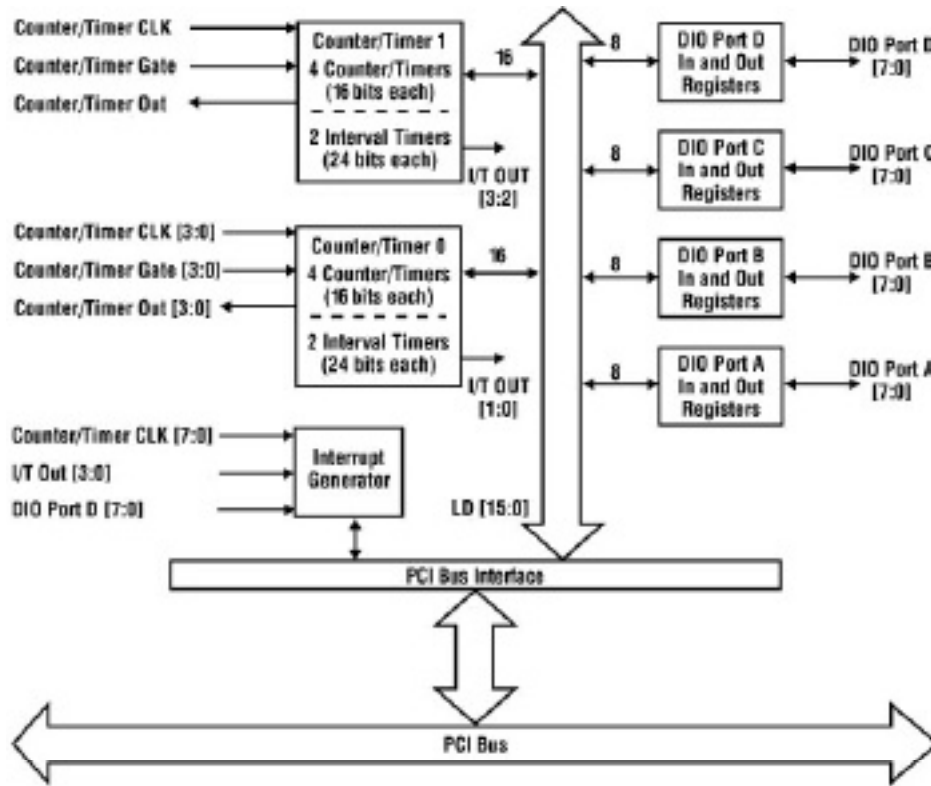
Free Software Bundle

With any USB or PCI data acquisition board from Data Translation, you will receive a free software bundle on CD-ROM, including a run-time version of **TestPoint™**, drag-and-drop software for application development; the **DataAcq SDK®** (Software Developers Kit for C) for Windows 3.1/95/98/NT; and **Quick DataAcq™**, a menu-driven, ready to run application that lets you verify the operation of your Data Translation board, collect A/D data, display data to the screen, and save data to disk.

HP VEE™ with DT VPI is a visual programming language for creating test and measurement applications that supports all functionality of Data Translation boards. HP VEE Lab is a low-cost streamlined version of HP VEE.

TestPoint Professional Development System uses object-oriented, drag-and-drop technology to bring both power and simplicity to data acquisition and test and measurement. TestPoint Internet, SPC (Statistical Process Control), and Database Toolkits are also available, as well as an Enterprise Suite which includes the TestPoint software and all three toolkits. DT-LV Link™ allows LabView® users to take advantage of the full functionality of Data Translation boards.

In addition, you can choose DTx-EZ™ Active X® controls for data acquisition.



DT340 Block Diagram

M-0461

Digital I/O

	Ports A, B, C	Port D
Number of lines	8 bidirectional per port	8 bidirectional
Inputs		
Input type:	Level-sensitive	Level-sensitive
High-level input voltage:	2.0 V minimum	2.0 V minimum
Low-level input voltage:	0.8 V maximum	0.8 V maximum
Minimum pulse width:	Not applicable	66 ns high and low*
Outputs		
Output driver high voltage:	2.4 V minimum (IOH = -15 mA)	2.4 V minimum (IOH = -15 mA)
Output driver low voltage:	0.5 V minimum (IOL = 12 mA)	0.5 V minimum (IOL = 12 mA)

*The minimum pulse width applies only to interrupt-on-change detection. Pulses less than the minimum may not be detected as a change.

Cross-Series Compatibility Saves Programming Time, Protects Your Investment

Virtually all Data Translation data acquisition boards, including the DT340, are compatible with the DT-Open Layers

software standard. This means that if your application was developed with one of Data Translation's software products, you can easily upgrade to a new Data Translation board, now or in the future. Little or no reprogramming

is needed. For example, if you are currently using a Data Translation DT2819 counter/timer board, upgrading to a DT340 is simple—just load the new drivers and you're done.

BUS: PCI

Type: Low Cost, Counter/Timer, DIO

Counter/Timer

Number of counter/timer channels	8
Clock Inputs	
Threshold voltage:	0.98 V
Input sensitivity:	±200 mV
Input hysteresis:	60 mV
Input current: (Vin = 0)	0
Input current: (Vin = 5 V)	0.5 mA
Minimum pulse width:	25 ns (high); 25 ns (low) sampled by 40 MHz
Maximum frequency:	19.9 MHz typical
Gate Inputs	
High-level input voltage:	2.0 V minimum
Low-level input voltage:	0.8 V maximum
Minimum pulse width:	25 ns (high); 25 ns (low) sampled by 40 MHz
Counter Outputs	
Output driver high voltage:	2.0 V minimum (IOH = -15 mA); 2.4 V minimum (IOH = -3 mA)
Output driver low voltage:	0.5 V maximum (IOL = 24 mA); 0.4 V maximum (IOL = 12 mA)

Power, Physical, and Environmental Specifications



Power	
+5 V	405 mA + output current nominal
Physical	
Dimensions:	6.875 inches (length) by 4.2 inches (width) (PCI short card)
I/O Connector:	68-pin AMP (#749621-7)
Certification and Compliance	FCC Class A verified; will not compromise FCC compliance of host computer CE
Environmental	
Operating temperature range:	0°C to 70°C
Storage temperature range:	-25°C to 85°C
Relative humidity:	To 95%, noncondensing

Ordering Summary

All Data Translation products are covered by a 1-year warranty. For pricing information, see a current price list, visit our web site or contact your local reseller.

DT340

The DT340 board is shipped with a CD-ROM containing Windows 95/98/NT and DT-Open Layers-compliant drivers, an executable startup utility to check board operation, and comprehensive getting started and product user's manuals in PDF format. Manuals are available in hard-copy form for an additional charge.

- DT340 PCI Counter/Timer and Digital I/O Board

Accessories

- STP340—Shielded screw terminal panel
- STP68—Low-cost screw terminal panel
- STP68-DIN—STP68 screw terminal panel equipped for DIN-rail mounting
- EP305—68-pin, 79 in., shielded cable for connecting STP68
- DT340 Manual set in hard-copy form

Software

The following products include a copy of the software, a single-user license, and a user manual. All software is supplied on CD-ROM, except as noted.

- HP VEE with DT VPI visual programming software
Version 5.0 for Windows 95/98/NT
SP1950-CD
- HP VEE Lab with DT VPI visual programming software
Version 5.0 for Windows 95/98/NT
SP1950-LAB
- TestPoint software for designing test, measurement and D/A applications for Windows 95/98/2000
SPTPXX-CD (see page 32 for details)
- DTx-EZ visual programming tools for Visual Basic and Visual C++ for Windows 95/98/NT
SP0970-CD
- DataAcq SDK Software Development Kit for Windows 95/98/NT
SP0945-CD
- DT-LV Link data acquisition connection to LabVIEW for Windows 95/98/NT on 3.5 in. 1.4 MB disk
SP0810-CL