DIGITAL I/O

Robust Digital I/O Modules for USB

DT9817-R:

— *8 isolated digital input lines with an input voltage range of +/- 3V to +/- 32V and 8 isolated digital output lines capable of switching up to +/-30V at 400mA. Includes one 32-bit counter/timer.*

DT9817-H:

— *28 programmable digital I/O lines with high drive capability to drive solid state relays and one 32-bit counter/timer.*

DT9817:

— *28 programmable digital I/O lines with one 32-bit counter/timer.*

■ **Click here for specifications.**

■ **Click here for pin assignments.**

Figure 1. The ECONseries of low-cost digital I/O modules provide a variety of options for the user in a shielded, rugged enclosure.

Simultaneous USB Series

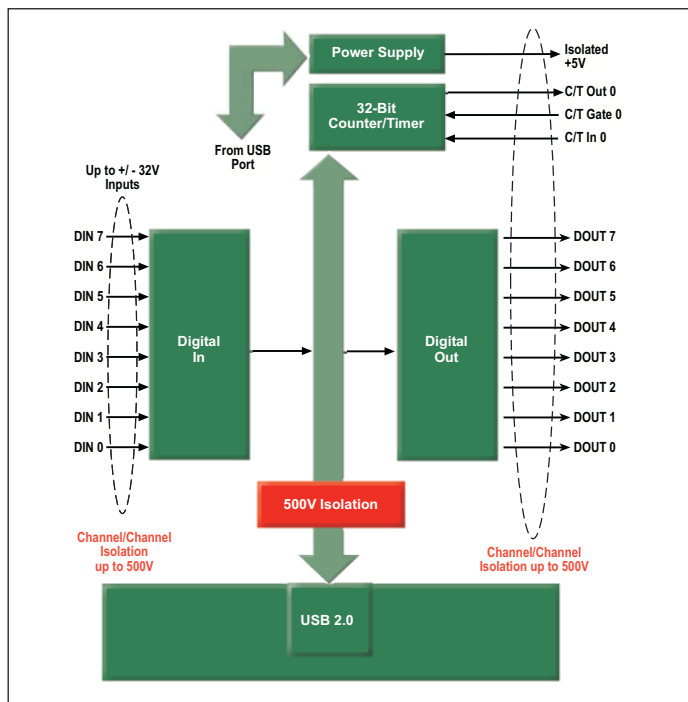| Model Number	Applications	Digital I/O Lines	Counter/ Timer	Isolation to 500V	Source	Sink	Output	Power Fully Loaded
DT9817-R	Mechanical Relay	16 (8 in/8 out)	1, 32-bit	Yes	—	—	+/-30V @ 400 mA	<100mA
DT9817-H	Solid State Relay	28 programmable	1, 32-bit	No	15mA	64mA		<150mA
DT9817	Logic	28 programmable	1, 32-bit	No	4.5mA	10mA		<150mA

Figure 2. The DT9817-R offers 8 digital input lines, 8 digital output lines, and one counter/timer channel. The 8 outputs are capable of switching up to +/-30V @ 400mA.
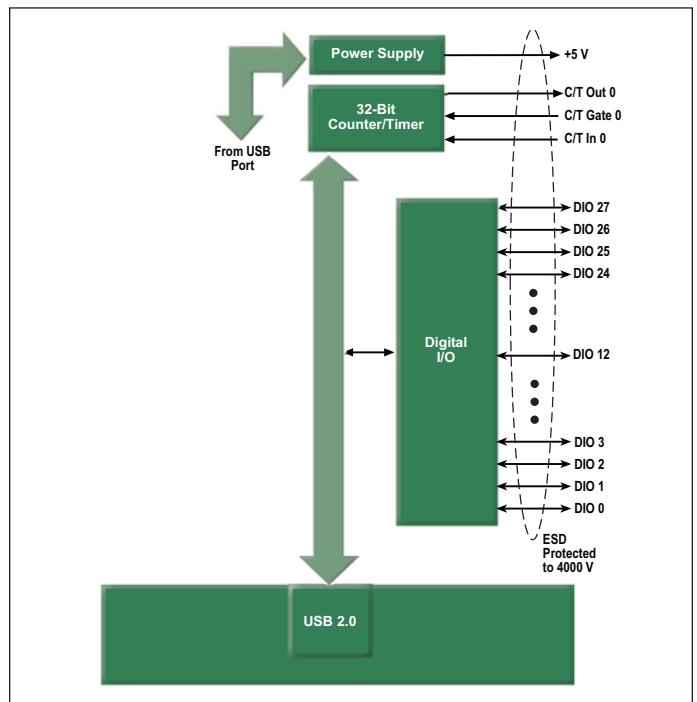

Figure 3. The DT9817and DT9817-H offer 28 programmable digital I/O lines and one counter/timer channel. The DT9817-H is perfect for driving solid state relays.

Overview

The DT9817-R, DT9817-H, and DT9817 are part of the ECONseries of mini-instruments that offer digital inputs, digital outputs, and 32-bit counter/timer functions.

DT9817-R

The DT9817-R is a low-cost, isolated digital I/O module with 8 inputs and 8 outputs and channel to channel isolation up to 500V. The 8 digital inputs have an input voltage range of +/- 3V to +/- 32V and the 8 digital outputs are capable of switching up to **+/-**30V at 400mA. It has one 32-bit counter/timer.

DT9817-H

The DT9817-H is a low-cost, non-isolated digital I/O module with 28 programmable lines. These 28 lines are organized as three 8-bit ports and one 4-bit port. These ports can be configured as input, output, or any combination required. This module offers high-drive capability that sinks 64mA and sources 15mA for driving sold-state relays. It has one, 32-bit counter/timer.

DT9817

The DT9817 is a low-cost, non-isolated digital I/O module with 28 programmable lines. These 28 lines are organized as three 8-bit ports and one 4-bit port. These ports can be configured as input, output, or any combination required. This module also offers one, 32-bit counter/timer.

Counter/Timer Subsystem

The counter/timer subsystem on these modules can be run by an internal or external clock source.

- Internal clock - Through software the user can specify the frequency at which to pace the counter/timer operation. This frequency can range from 4 Hz to 12 MHz (4 Hz to 2.5 kHz for the DT9817-R).

- External clock - The user connects an external clock source with a maximum frequency of 6 MHz and then uses a clock divider to specify the actual frequency to pace the counter/timer operation. This is useful when the user wants to pace counter/timer operations at rates not available with the internal clock or if uneven intervals are required.

The subsystem supports four separate operating modes:

- Event counting - This mode is used to count the number of falling edges that occur. The user can count up to 4,294,967,296 events before the counter rolls over to 0 and starts counting again.

- Frequency measurement - This mode allows the user to determine the frequency of the clock input.

- Edge-to-edge measurement - This mode allows the user to measure the time interval between a specified start edge and a specified stop edge. The user can measure the pulse width, the period, and the frequency of the signal.

- Rate generation - This mode allows users to generate square waves with an output frequency from 4 Hz to 12 MHz. (4 Hz to 2.5 kHz for the DT9817-R).

Easy User Connections

All signals are brought out to on-board screw terminals for easy connections. High quality industrial Phoenix connectors are used to maintain signal integrity in harsh industrial environments.

USB 2.0 Compatibility

The Digital I/O series is fully compatible with USB 2.0 and USB 1.1. USB 2.0 is both forward and backward compatible with USB 1.1, resulting in a seamless transition process for the user. In fact, USB 2.0 uses the same cables and connectors as USB 1.1. No separate power supply is required, as the module derives its power directly from the USB bus connection.
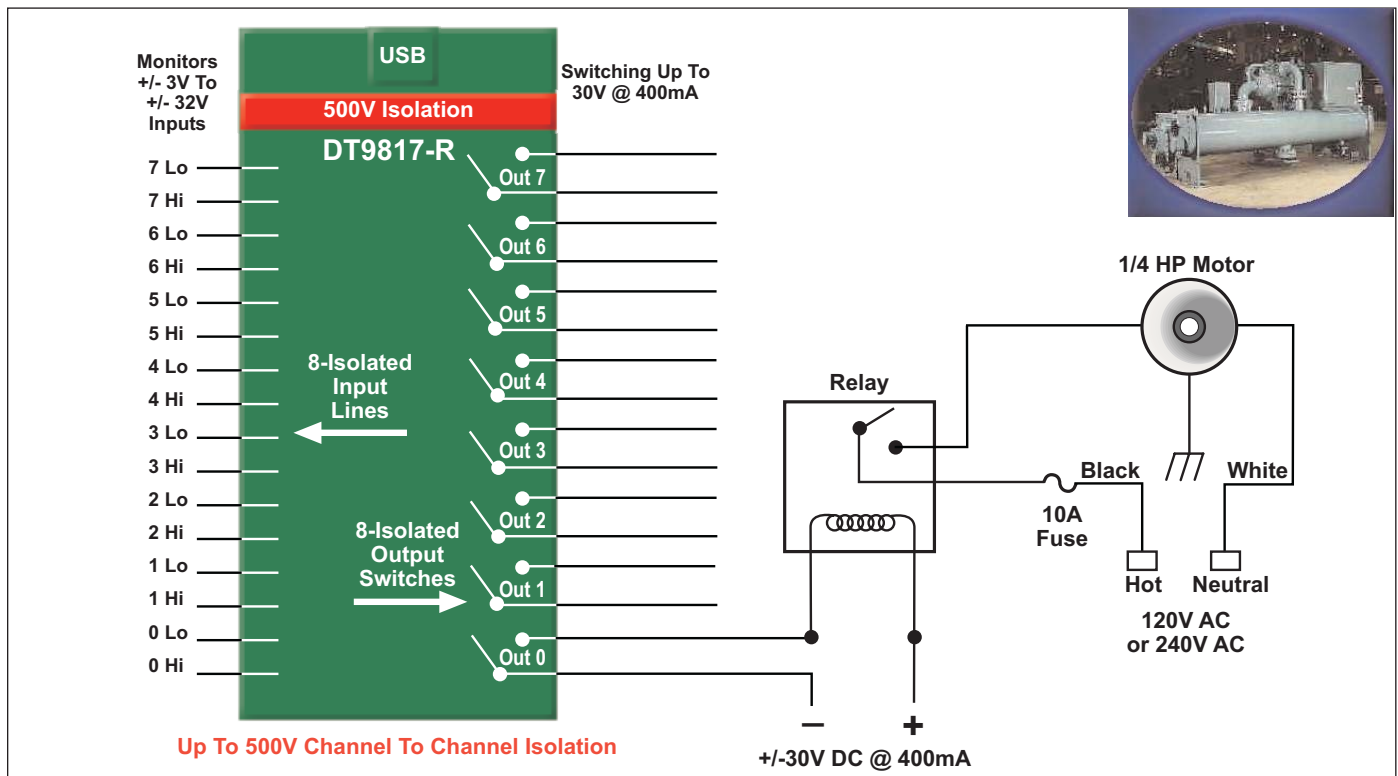

Figure 4. These modules are ideal for control and monitoring applications. Both the DT9817-H and the DT9817-R can be used to control solid-state relays and the DT9817-R can be used to control mechanical relays or high-current electric motors.

Creating Custom Applications

The **GO! application** provides an easy-to-use solution for measuring signals right out of the box! If, you'd rather create your own application, the ECONseries is fully DT-Open Layers for .NET-compliant, allowing users of all levels - from programmers to application users - the ability to create a program for the ECONseries. The following software choices are available:

Options for Solution Development

DT-Open Layers Class Library now with "native" .NET support

GO!
8 mini-instruments, no programming

DTx-EZ or DT-Display
Visual Studio Development Tools for displaying signals

DAQ Adapter for MATLAB®
Access the visualization and analysis capabilities of MATLAB with our hardware

LV-Link
Access the power of our boards through LabVIEW

quickDAQ
Aquire, plot, analyze, and save data to disk at up to 2 MHz per channel ... without writing any code

Measure Foundry
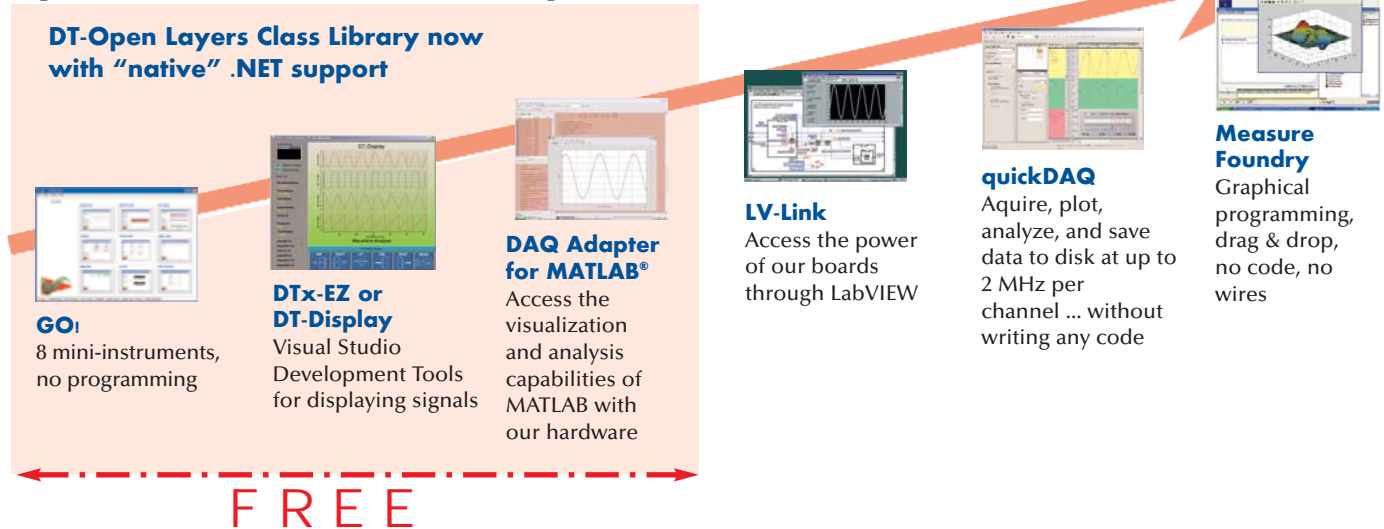Graphical programming, drag & drop, no code, no wires

FREE

Figure 5. There are many software choices available for application development. Each option offers development capability at different levels. Choose from ready-to-measure applications to full graphical programming with Measure Foundry.

These boards ship with the Omni CD that includes the following software:

■ **GO! Application** allows you to measure signals right out of the box.

■ **DT-Open Layers for .NET with DT-Display:**
The DT-Open Layers for .NET Class Library is a collection of classes, methods, properties, and events that provides a programming interface for DT-Open Layers-compatible hardware devices. It can be used from any language that conforms to the Common Language Specification (CLS), including Visual Basic.NET, Visual C#, Visual C++.NET with managed extensions, and Visual J#.NET.

— **DT-Display for .NET** is a control for plotting data to a Windows form. It provides a powerful and user-friendly interface for rendering data.

■ **DT-Open Layers for Win32:**
DT-Open Layers for Win32 consists of the DataAcq SDK and DTx-EZ.

— The **DataAcq SDK** consists of

the necessary header files, libraries, example programs, and documentation to develop your own DT-Open Layers data acquisition and control applications. It is intended for use with non .NET languages, such as ANSI C, Visual C++ 6.0, and Visual Basic 6.0.

— **DTx-EZ** provides visual programming tools for Microsoft Visual Basic and Visual C++ that enable quick and easy development of test and measurement applications.

Note: If you have an existing application that was written using the DataAcq SDK, we recommend that you migrate your application to use the DT-Open Layers for .NET Class Library. This will guarantee compatibility with future Data Translation hardware and software.

■ **Drivers:**
The 32-bit WDM device drivers make your application cross-platform compatible. These drivers support Data Translation ECONseries boards using Windows 2000/XP.

You can choose to install demo versions of the following software from the CD:

■ **Measure Foundry** is a powerful visual software environment for creating test and measurement, control, and analysis applications. No programming or wiring is required!

■ **LV-Link** contains all necessary VIs, examples, and documentation to use Data Translation hardware in LabVIEW 8.0 or greater.

■ **quickDAQ** is a high-performance, ready-to-run application that lets you acquire, plot, analyze, and save data to disk at up to 2 MHz per channel without writing any code. quickDAQ supports applications from temperature measurement to high-speed testing and analysis.

■ **Acrobat Reader 7** is necessary to view the board PDF documentation.

The following software is available as a free download from our web site.

■ **DAQ Adaptor for MATLAB** to access the visualization and analysis capabilties of MATLAB from The MathWorks™.

Technical Support

As you develop your application, application engineers are available during normal business hours to discuss your requirements. Extensive information, including drivers, example code, pinouts, a searchable Knowledgebase, and much more, is available 24 hours a day on our web site at www.datatranslation.com. You can also request complimentary support via email or fax at anytime.

Cross-Series Compatibility Saves Programming Time, Protects Your Investment

Virtually all Data Translation data acquisition boards, including the ECONseries of digital I/O modules, are compatible with the DT Open-Layers for .NET Class Library. 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.

User's Manual

This manual is provided in electronic (PDF) format on the ECONseries CD-ROM provided with the module. You can also purchase a hard copy of this manual.

DIN-RAIL Mounting Kit for USB

This kit provides a simple, standard method for mounting equipment to walls, cabinets, or machinery. The kit contains everything you need to fit it directly on the back of the USB function module housing.