

Host application loads the analog output values of the DT9854 modules. When an external trigger is detected, all the analog outputs are updated and the digital input line changes state to notify the host that the update process is complete.

Host application updates the digital output values of each DT9817-R module to control relays.

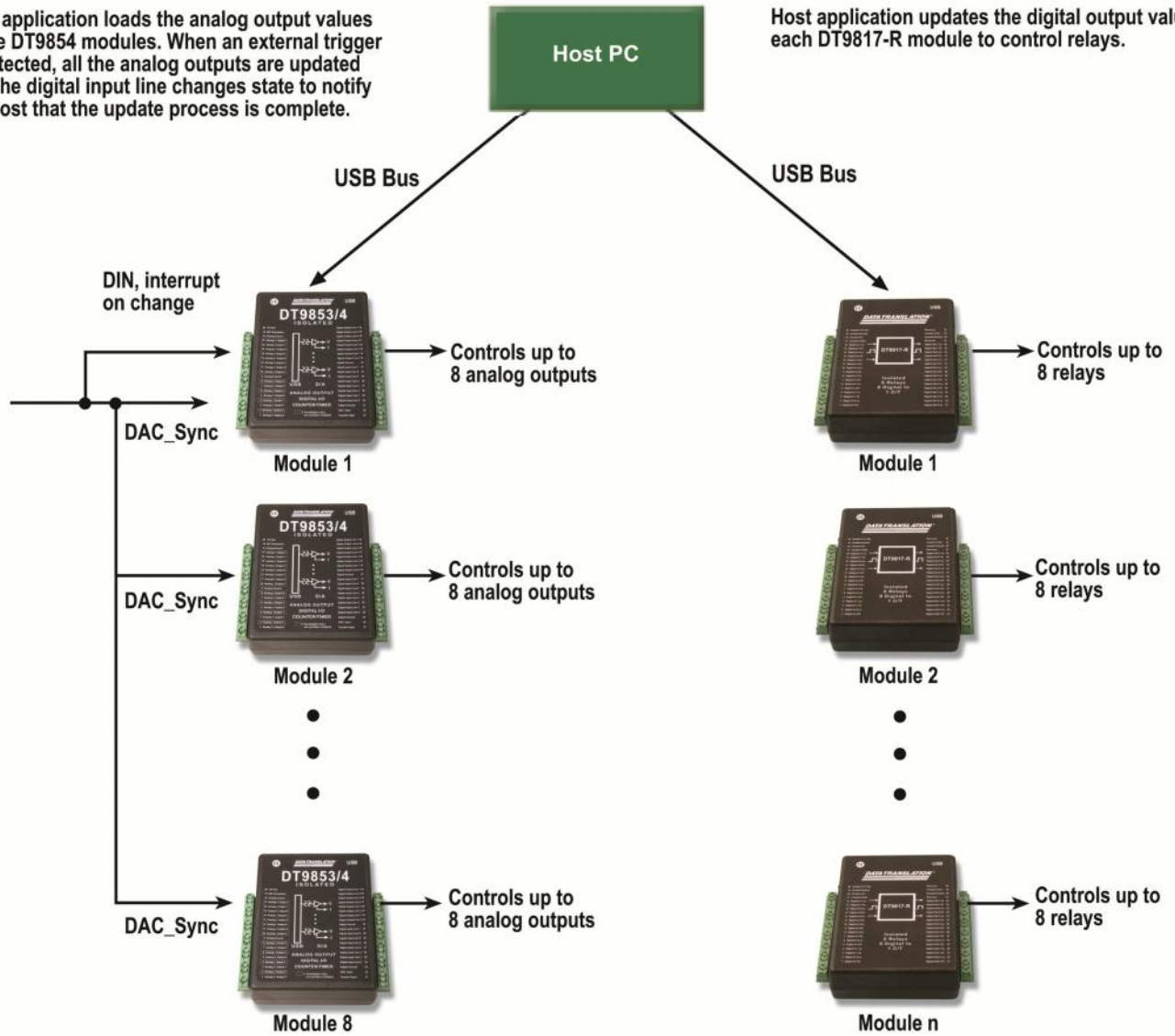


Figure 3. For high-channel count, industrial control applications, use multiple DT9853/54 modules to control analog output signals and multiple DT9817-R modules to control relays.

Overview

The DT9853 and DT9854 modules are low-cost, isolated analog output and digital I/O modules for the USB bus. They provide 4 or 8 glitchless analog outputs at 16-bit resolution in a compact enclosure. These low cost modules are ideal for applications requiring stable and accurate output signals. Both modules provide an output range of $\pm 10V$ or 0 to 10V.

Streaming Analog Outputs

Both the DT9853 and DT9854 produce waveform streaming outputs. Depending on the number of channels used, the throughput varies according to the following table:

# of Enabled Channels	Max Sampling Frequency
1	8000 Hz
2	4000 Hz
3	2666.6 Hz
4	2000 Hz
5	1600 Hz
6	1333.3 Hz
7	1142.9Hz
8	1000 Hz

A unique feature of this series provides double-buffering of the digital data on each analog output channel to prevent spurious outputs.

Analog Output Operation Modes

DT9853 and DT9854 modules provide multiple operation modes to match different application needs. The user can perform the following analog output operations with any of the modules:

- Continuous output on one or multiple channels
- Single-value on one analog output channel
- Simultaneous single-value operations on multiple analog output channels of a single module
- Simultaneous single-value operations on multiple modules

Updating All Analog Output Channels of One Module Simultaneously

All the analog output channels of one module can be updated simultaneously with a single value by performing a single value operation and using either a software or external trigger. The user specifies the value to write to the analog output channels. When software or external trigger occurs, the module simultaneously updates all the analog output channels with the specified values.

Updating All Analog Output Channels of Multiple Modules Simultaneously

The user can simultaneously update all the analog output channels of multiple modules by connecting them together through their DAC_Sync pins, performing a single values operation, and configuring their trigger sources appropriately. Figure 4 illustrates how this works.

Software Options

The following software is available for use with the DT9853/54 modules and is provided on the Data Acquisition Omni CD:

- **DT9853/54 Device Driver** –The device driver allows you to use the DT9853/54 modules with any of the supported software packages or utilities.
- **DT9853/54 Calibration Utility** – This utility allows you to calibrate features of the DT9853/54 modules.
- **DT-Open Layers® for .NET Class Library** – Use this class library if you want to use Visual C#® or Visual Basic® for .NET to develop application software using Visual Studio® 2003-2012; the class library complies with the DT-Open Layers standard.
- **Quick DataAcq** application – The Quick DataAcq application provides a quick way to get up and running. Using this application, verify key features of the module, display data on the screen, and save data to disk.
- **DataAcq SDK** – Use the Data Acq SDK to use Visual Studio 6.0 and Microsoft® C or C++ to develop application software using Windows® XP/Vista/7/8; the DataAcq SDK complies with the DT-Open Layers standard.
- **DAQ Adaptor for MATLAB** – Data Translation’s DAQ Adaptor provides an interface between the MATLAB® Data Acquisition (DAQ) toolbox from The MathWorks™ and Data Translation’s DT-Open Layers architecture.
- **LV-Link** – Data Translation’s LV-Link is a library of VIs that enable LabVIEW™ programmers to access the data acquisition features of DT-Open Layers compliant USB and PCI devices.

Trigger Sources

The DT9853 and DT9854 provide a bi-directional DAC_Sync signal that allows simultaneous update of single values on the analog output channels.

Digital I/O Lines

The DT9853 and DT9854 modules support 16 digital I/O lines. These lines are divided into two ports of eight. The user can specify the digital I/O line to read or write. Two operating modes are supported for the digital I/O lines:

- Single-value digital I/O operation
- Continuous digital input operation

Interrupts

The DT9853 and DT9854 modules can generate an interrupt when a digital input line changes state. This feature is useful for monitoring critical signals or when the user wants to signal the host computer to transfer data to or from the module.

Counter/Timer Features

The DT9853 and DT9854 modules provide one 32-bit counter/timer that accepts a counter input signal with a frequency of 1MHz. The module counts the number of rising edges that occur on the counter input signal. A maximum of 4,294,967,296 events can be counted before the counter rolls over to 0 and starts counting again.

Cross-Series Compatibility

Virtually all Data Translation's modules are compatible with the DT-Open Layers® 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 module. Little or no programming is needed.

Ordering Summary

DT9853 & DT99854

- **DT9853** – 4-channel USB analog output module
- **DT9854** – 8-channel USB analog output module

FREE SOFTWARE

- **Quick DataAcq**
- **DAQ Adaptor for MATLAB** — Access the analyzation and visualization tools of MATLAB®.
- **LV-Link** — Access the power of Data Translation boards through LabVIEW™.

All Data Translation hardware products are covered by a 1-year warranty. For pricing information, please visit our website or contact your local reseller.