

# Instrument Communication with VISA and USB

Application Notes  
Comparison Guides  
FAQs

## How-To Guides

Programming Manuals  
Quick Start Guides  
Support Information  
User's Guides



## Remote Communication With Rigol Devices: VISA and Rigol TMC Drivers

### Note:

- Rigol test and measurement products are designed for compatibility with National Instruments™ VISA runtime environment or with Rigol's USB TMC driver
- Compatibility with VISA or Rigol TMC is determined by examining the product's model and its firmware revision. (please consult the included compatibility sheet)

### VISA (Virtual Instrument Software Architecture)

Two common forms of VISA are available for use with Rigol devices:

### NI-VISA™:

The Virtual Instrument Software Architecture (VISA) is a standard for configuring, programming, and troubleshooting instrumentation systems comprising GPIB, VXI, PXI, Serial, Ethernet, and/or USB interfaces. VISA provides the programming interface between the hardware and development environments such as LabVIEW™, LabWindows™/CVI, and Measurement Studio for Microsoft Visual Studio™. NI-VISA™ is the National Instruments implementation of the VISA I/O standard. NI-VISA™ includes software libraries, interactive utilities such as [NI Spy](#) and the [VISA Interactive Control](#), and configuration programs through Measurement and Automation Explorer for all your development needs. NI-VISA™ is standard across the National Instruments product line. With NI-VISA™, you can feel confident that your software development will not become obsolete as your instrumentation interface hardware needs evolve into the future. **Source:** (<http://www.ni.com/visa/>)

**Obtain NI-VISA™:** NI-VISA™ runtime can be obtained from the download section at <http://www.ni.com/visa/>. Currently NI-VISA™ is available for 64/32-bit Windows, 32-bit Linux and Mac OS-X platforms.

### Agilent IO VISA:

#### Major Features:

- Connection Expert - automatically scans and configures your instrument IO
- IO Monitor - trace IO traffic on your instruments
- Interactive IO - send commands to instruments and read responses
- Interactive LXI - interactively send and receive LXI events and managing instrument clocks



- VISA Open Report - helps troubleshoot instrument connections for systems with multiple VISA installations
- IO Libraries now supports some 64 bit OS environments as well as Windows 7® OS. See datasheet for full technical requirements

**Benefits:**

- Works with the most popular IO Libraries including; Agilent or NI VISA, SICL, VISA COM or NI-488.2
- Auto discovery of instruments from any vendor
- Works with the most popular T&M software applications including Agilent VEE Pro, MATLAB®, NI LabVIEW, Microsoft® Visual Studio®
- Automatic detection of other vendors IO Libraries and configuration to use both of them regardless of install order. **Source( <http://www.agilent.com>)**

**Rigol Drivers**

Newer Rigol products support VISA control for all interfaces. Some older models support VISA for all interfaces except USB. These other interfaces include RS-232, GPIB, and/or LAN. Users can communicate over these interfaces using VISA or a number of other solutions. Often these interfaces are provided for automatically in your programming language of choice. When possible use the VISA interface for USB to make connection and communication most convenient. You can download a copy of VISA as described above and use the CD that came with your instrument or visit the product page on [rigolna.com](http://www.rigolna.com) to find the latest driver version. Some older models require the Rigol USB TMC driver to communicate over USB.

**Rigol USB TMC Driver:** The Rigol Test Measurement and Control (TMC) is a deprecated device driver. It provides support for a limited set of Rigol devices with older firmware revisions (please see compatibility list below). Rigol USB TMC supports only 32-bit Windows operating systems up to Windows XP. If you need the legacy Rigol USB TMC driver you can find the latest release [here](#).

To program to this driver you will need to download the “.h” file and the “.dll”s [here](#).

**In most cases using VISA should be more convenient for integrating test systems and for programming individual instruments. Use the updated VISA interface whenever it is available. View the model breakdown below or contact us directly with questions.**



**Rigol TMC Demo:** To support programming with the legacy USB TMC driver a communication test application for sending commands to Rigol devices utilizing the Rigol USB TMC interface is available. To learn more about sending commands to your Rigol device please consult your device's programming manual.

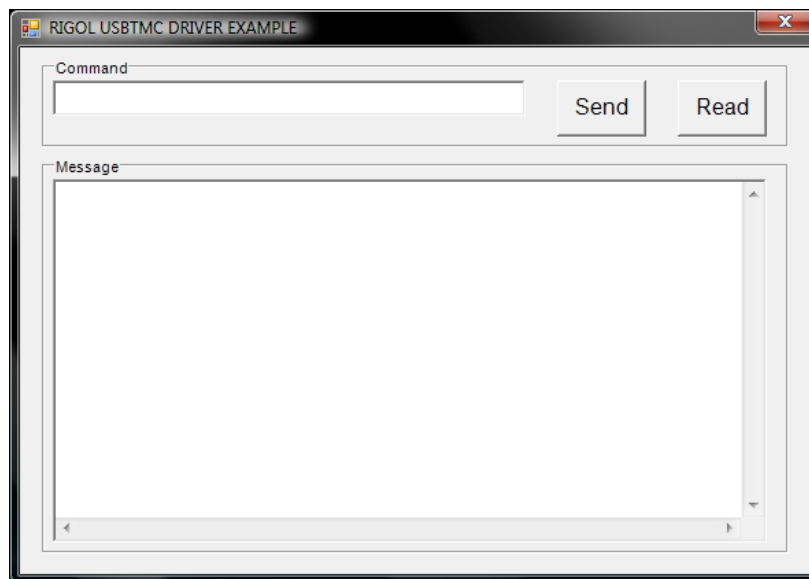


Figure 1: This demo application and others can be downloaded from [rigolna.com](http://rigolna.com) programming examples

For more help with programming in Rigol USB TMC Driver try the following programming examples available on [rigolna.com](http://rigolna.com) in programming examples:

Rigol USB example for Visual C

Rigol USB example for Visual C #2

Rigol USB example for Visual Basic 2005

Rigol USB example for Visual Basic

Rigol USB example for LabVIEW

### VISA programming examples

There are also a few general examples for programming instruments using VISA to connect to the instruments. Try the following programming examples available on [rigolna.com](http://rigolna.com) in programming examples:

VISA example for LabVIEW 8.6

VISA example for LabVIEW 8.2

VISA example for Visual C

VISA example for Visual Basic



## Interfaces

When using VISA, the commands used with an instrument are the same regardless of the interface used, so any programming example or the programming manual can get you started controlling an instrument.

**RS-232 Serial Communication:** A serial connection can be used to communicate with Rigol devices equipped with a serial port. Some instruments have RS-232 programming examples available on line. Check your product web page for more information.

**GPIB Communication:** GPIB is an industry standard communication bus used on many test systems still in use today. Many Rigol units are equipped with a GPIB port, while many of our scopes can have a GPIB option added by purchasing the USB-GPIB model.

**TCP/IP Communication:** Communication over Ethernet, LAN, or TCP/IP is gaining popularity among test equipment system builders as well as lab users. LXI (LAN eXtensions for Instruments) is a standard method of defining communication for instruments over Ethernet that makes communication more convenient, but one of the advantages of Ethernet is that you can use it to program an instrument natively from any modern programming language without requiring any drivers. View a LAN example to see how to send and receive commands with instruments directly over TCP/IP or view the LAN with VISA examples to see how to use a VISA layer to communicate over LAN. More and more Rigol products are becoming available with LXI communication standard. Rigol currently has products in every category that can be controlled in this way.



## Compatibility table for Rigol Products:

Series	Model	Firmware Version	Software Package (version)	Software Driver
Function/ Arbitrary Waveform Generators	DG1012*	All versions	<a href="#">Ulrawave (Rigol DG)</a>	<a href="#">Rigol DG</a>
	DG1022	<00.02.00.06.00.02.05	<a href="#">Ulrawave (Rigol DG)</a>	<a href="#">Rigol DG</a>
		≥00.02.00.06.00.02.05	<a href="#">Ulrawave (VISA)</a>	Use a VISA Layer
	DG2000A Series	All versions	<a href="#">Ulrawave (Rigol DG)</a>	<a href="#">Rigol DG</a>
	DG3000A Series	All versions	<a href="#">Ulrawave (Rigol DG)</a>	<a href="#">Rigol DG</a>
DG5000 Series	All versions	Contact Rigol USA for available software versions	Use a VISA Layer	
Digital Oscilloscopes	DS1000CA Series	≥03.08.01	<a href="#">Ultrascope (VISA)</a>	Use a VISA Layer
		<03.08.01	<a href="#">Ultrascope (RigolUSB)</a>	<a href="#">RigolUSB</a>
	DS1000B Series	All versions	<a href="#">Ultrascope (VISA)</a>	Use a VISA Layer
	DS1000D Series	≥00.02.02 SP2	<a href="#">Ultrascope (VISA)</a>	Use a VISA Layer
		<00.02.02 SP2	<a href="#">Ultrascope (RigolUSB)</a>	<a href="#">RigolUSB</a>
	DS1000E Series	≥00.02.02 SP2	<a href="#">Ultrascope (VISA)</a>	Use a VISA Layer
<00.02.02 SP2		<a href="#">Ultrascope (RigolUSB)</a>	<a href="#">RigolUSB</a>	
DS6000 Series	All versions	Contact Rigol USA for available software versions	Use a VISA Layer	
Digital Multimeters	DM3000 Series Legacy Instruments*	Varies by version	Contact Rigol USA for available software versions	May use <a href="#">RigolUSB</a> or VISA depending on version. Contact Rigol USA for assistance controlling legacy DM3000 Series models
	DM3058	All versions	<a href="#">UltraSensor (VISA)</a>  <a href="#">UltraVIEW 30 day trial (VISA)</a>	Use a VISA Layer
	DM3068	All versions	Contact Rigol USA for available software versions	Use a VISA Layer
Power Supplies	DP1000A Series	All versions	Contact Rigol USA for available software versions	Use a VISA Layer
Spectrum Analyzers	DSA1000 Series	All versions	Contact Rigol USA for available software versions	Use a VISA Layer
	DSA1000A Series	All versions	Contact Rigol USA for available software versions	Use a VISA Layer
Virtual Oscilloscopes	VS5000 Series	All versions	<a href="#">VS5000 App (Rigol VS)</a>	<a href="#">Rigol VS</a>

\* indicates instruments no longer sold in North America

Agilent IO Connect and Agilent IO VISA are products and/or copyright of Agilent Technologies

NI-VISA™, LabVIEW™, LabWindows™/CVI, and Measurement Studio are trademarks and/or copyright of National Instruments

Visual Studio®, Visual Basic®, and Visual C® are registered trademarks of Microsoft Corp.

RIGOL TECHNOLOGIES USA INC

**877-4-RIGOL-1**

[info@rigol.com](mailto:info@rigol.com)

[www.rigolna.com](http://www.rigolna.com)

## How-To Guide



June 30, 2010



For more information or questions contact us directly at:

Rigol Technologies USA  
7401 First Place  
Suite N  
Oakwood Village, OH 44146

You can reach us directly at:

(440) 232-4488

877-4-RIGOL-1

[info@rigol.com](mailto:info@rigol.com)

[www.rigolna.com](http://www.rigolna.com) (Rigol North America website)