# Agilent W1140A Software and Connectivity

**Data Sheet**

*Focus on your tasks, not on your connections*

- **Easy connection, communication and control of test instruments from your computer**
- **Save money with value packaged bundles**
- **Choose the combination of software, hardware and support that meets your need**

### Connectivity simplified

If you use your test instruments for anything more than simple bench top measurements, the Agilent W1140A can save you time and improve your productivity. The W1140A offers a selection of software and hardware that enables you to choose the products that solve your connectivity challenges the best way possible. This data sheet will give you the information you need decide which of Agilent's software and connectivity hardware products are right for you.

Designed for engineers who use PCs to talk to instruments, the bundles includes your choice of either the easy-to-use T&M Programmers Toolkit for Visual Studio .NET or the award winning graphical programming solution – Agilent VEE, or a bundle of both and your preference of I/O solutions (USB/GPIB interface, LAN/GPIB Gateway or a high-performance GPIB interface). With these tools, you can concentrate on your measurement tasks, instead of wasting time dealing with instrument connection, programming, and control issues.

### Open and standard

Agilent Technologies is THE T&M Company embracing open, computer standards. Other companies claim openness, while their actions drive you to proprietary solutions.

Agilent Technologies is leveraging PC standards such as LAN and USB to give you cost-effective connectivity with your instrumentation. We are integrating our software to work seamlessly with Microsoft's Visual Studio environment because it is the most frequently used software development environment in the world.

This means that you can reduce the amount of effort put into development of your automation software and be more productive at your job tasks.

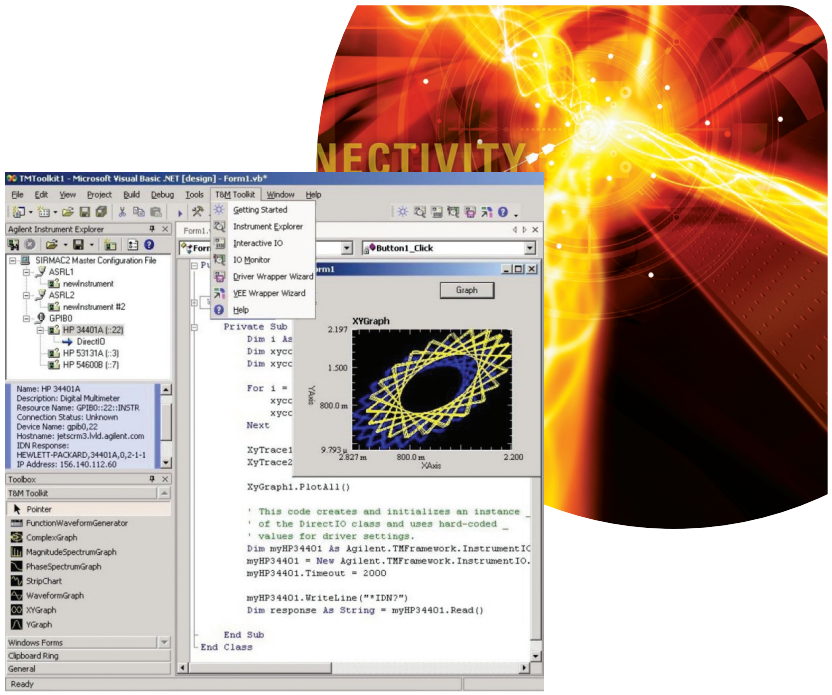
# Software

## T&M Programmers Toolkit

### Slash your programming time

Cut your instrument programming time nearly in half, speed up your product development process and improve your productivity with the Agilent T&M Programmers Toolkit. The T&M Programmers Toolkit extends Microsoft's® Visual Studio .NET platform with integrated, easy-to-use software tools and components — project wizards, APIs, class libraries, widgets, drivers and more — to make Visual Studio .NET the easiest place for you to write code for automating measurement tasks and displaying data.

With the Toolkit, Agilent's extensive measurement expertise is integrated into the Visual Studio .NET Framework, to eliminate the headaches traditionally associated with connecting to and controlling instruments. The software automatically generates code for you, and Windows® functionality like drag and drop makes many tasks faster and easier. Robust debug, analysis and tuning tools further streamline the development process.




## Visual Studio .NET advantages

As an extension of the powerful built-in functionality available in the .NET Framework (provided through Visual Studio .NET), the T&M Programmers Toolkit greatly simplifies programmatic access to your instruments and speeds your programming job. Visual Studio .NET offers:

- **Language independence** — Visual Studio .NET lets you write in virtually any programming language, without worrying about integration issues.
- **Freedom from mundane programming tasks** — Visual Studio .NET has a huge support library (.NET Framework), which means you write less "support" code, giving you more time to spend on test-and-measurement-specific code.
- **Easy code reuse** — Visual Studio .NET gives you the ability to easily reuse code across projects and across programming languages.

Best of all, since Visual Studio .NET is an industry-standard development environment, your T&M Programmers Toolkit programming expertise will be valuable in any work environment. Eliminate your worries about getting stuck in an obsolete proprietary environment.

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### *What is Visual Studio .NET?*

*Visual Studio .NET 2003 builds on top of Visual Studio .NET, Microsoft's latest introduction of its popular Visual Studio development toolset. Visual Studio .NET enables multiple development languages to be used together in a single integrated development environment (IDE). All first-class languages in Visual Studio .NET can be compiled together. That means you can mix and match languages based on your legacy environment, your expertise and the requirements of your particular task.*

*The .NET Framework is an object-oriented API with a significantly improved organizational structure for programming in a Windows environment. The .NET Framework not only provides functionality to make traditional Windows desktop application development faster, it also provides functionality to make distributed programming easier.*

*Visual Studio .NET 2003 and the .NET Framework 1.1 builds on the success of the original Visual Studio .NET release and the .NET Framework 1.0. With increased performance, scalability and security. Visual Studio .NET 2003 also adds full support for C++ as a RAD (Rapid Application Development) environment and provides enhanced upgrade technology and availability for Visual Basic.*

## Features

T&M Programmers Toolkit has a variety of features designed to make it easy for you to communicate with and configure your test instruments and test systems, and to acquire, analyze and display data. And a fully integrated, online help system lowers your programming learning curve. The Toolkit makes it easy for you to:

- **Get started**

  ***Project Wizards*** — Provides instrument and system control program building blocks, so you don't have to start from scratch when you write instrument control applications.

- ***Take any measurement and control any instrument from any vendor*** — With the ability to use almost a thousand drivers representing the most popular instruments from 70 different vendors. Toolkit can control any standard instrument and many vendor's PC plug-in cards.

- **Configure the interface, communicate with instruments and acquire data**

  ***Instrument Explorer*** — helps you quickly configure your test system by finding instruments on your PC or network and helps you easily manage instruments and drivers. Choose either DirectIO, VXIplug&play, IVI-COM or an IVI-C driver and then drag and drop the instrument icon into your work window to generate code to connect with the instrument. See Figure 1.

- **Analyze and display data**

  ***Simple access to math and analysis APIs*** — provides basic math routines such as Digital Signal Processing functions (FFT, Bartlett, Hanning, Hamming windowing), Bessel functions, Statistical function (RMS, Stand Deviation, Binomial), regression functions (Lin, Log, Exp and curve fitting routines) as well as a complex number class and an engineering formatter.

  ***Graph Displays*** — enabling visualizing, scaling and tracking data from measurement and data stores. Display results with XY, Y, Waveform, Complex, Magnitude, Spectrum, Phase Spectrum graphs or a Strip Chart.

- **Debug instrument control applications**

  ***IOMonitor*** — helps you debug instrument control applications by capturing and displaying instrument communication details from several I/O layers. Or save the file for later analysis.

- **Integrate with other environments**

  ***VEE Connect Wizard*** — provides an easy way for you to call your Agilent VEE Pro user functions from a Visual Studio .NET project.

- **Get help when you need it**

  ***Integrated help system*** — provides easily accessible assistance, fully integrated with the Microsoft help system, including sample code you can cut and paste directly into your work environment.

- **Create runtime executables**

  ***free runtime distribution with purchase*** – Unlike many proprietary environments, you can create runtime executables for use on other computers. These can be distributed without paying any additional fees. These executables can be run on Windows 98, 2000, NT 4.0, XP Pro and XP Home.

- **Worldwide service and support**

  With The T&M Toolkit, you have access to Agilent's worldwide resources for start-up assistance, training classes, and update services. As part of the purchase of any Toolkit product you will receive 6 months of support and updates included, free of charge. If you would like additional consulting services Agilent offers those too.

**To see a demo or download an evaluation version* of T&M Programmers Toolkit for Visual Studio .NET, go to www.agilent.com/find/connectivity.**

** You must have Visual Studio .NET installed to use the evaluation version of the Agilent T&M Programmers Toolkit.*

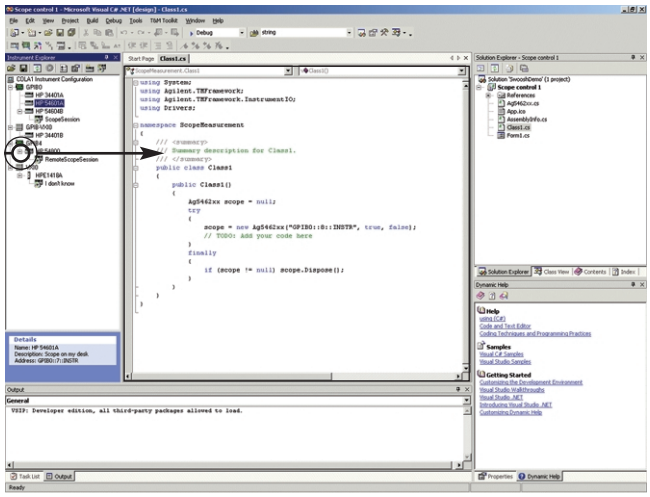


Figure 1. Drag and drop capability saves you programming time and effort. Just drop an instrument icon into your work window to generate code to talk to the instrument.

## Agilent VEE

As an alternative to The T&M Toolkit, Agilent VEE is a two-dimensional programming environment. To create a program, you choose high level graphical objects from the menu and connect them with wires. The wire connections help specify functionality and sequence in intuitive block diagrams. You program at a higher, task-oriented level using built-in scientific and engineering routines.

Using fewer programming icons, you'll create powerful test programs that take advantage of embedded MATLAB Script with world-class numerical analysis, graphics and signal processing. Full support of ActiveX means you can customize programs within VEE and automate reporting or spreadsheets with Microsoft Word or Excel. Multimedia tutorials and example programs help you get up to speed quickly.

VEE jumpstarts your programming effort, and maximizes the 2-D programming space for faster measurement analysis results with embedded MATLAB Script.

### Work with standards

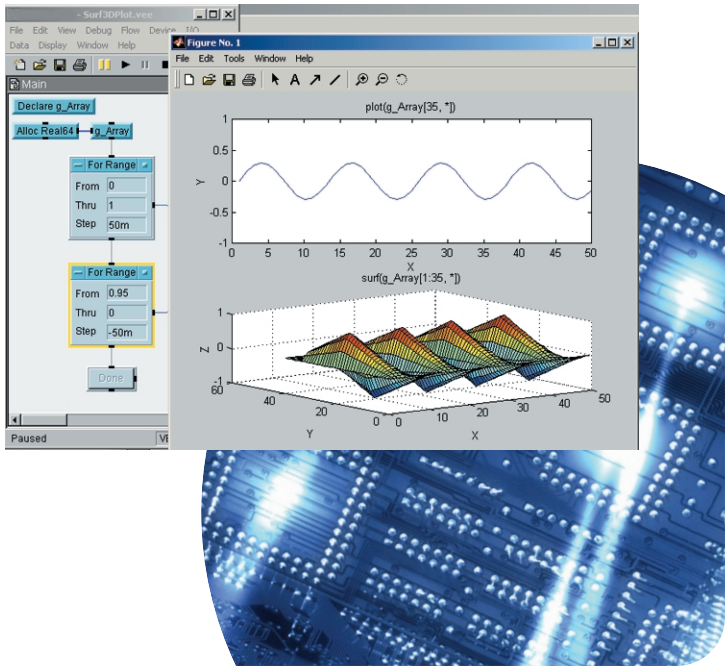
As an open graphical environment, VEE works with leading products across all market segments. It supports leading applications such as Microsoft Excel and Word, The MathWorks MATLAB, Microsoft Internet Explorer, and Netscape Navigator. It supports popular programming languages including Visual Basic, C, and Visual C++. It works with manufacturing equipment via ActiveX, including surface mount machines and robots. Agilent VEE can be used as a standalone solution or it can deliver measurement analysis results from custom inhouse solutions. It becomes part of your environment without changing the way you do business. VEE works with standard instrument interfaces including; GPIB, RS-232, LAN and many PC plug-in interfaces.

### Features

Agilent VEE has a variety of features designed to simplify your connection, control and collection of instrument data so that you can spend more time focusing on your tasks — creating better tests, faster — instead of worrying about instrument control issues.

### Get started

- ***Multimedia tutorials*** —to give you an overview and help get you up to speed quickly
- ***Welcome window*** — upon startup automatically loads the VEE example directory and MATLAB demos so you can immediately see how you can use the power of MATLAB to your application programs
- ***Context-sensitive tips and help*** — easy and accessible help along the way



### Connect to and control instruments

- ***Program the properties of instruments*** — quickly, easily, graphically through the powerful DirectIO capability or one of the almost thousand VXI plug&play drivers available
- ***Take any measurement and control any instrument from any vendor.*** — With the ability to use almost a thousand drivers representing the most popular instruments from 70 different vendors. Agilent VEE can control any standard instrument and many vendor's PC plug-in cards
- ***Automatically converts 16 different data types*** — without extra programming so you get the relevant data in the format you expect
- ***Create runtime executables*** — easily with embedded I/O configuration, and distribute the programs, at no extra charge
- ***Verify instrument addresses*** — and other parameters automatically at runtime
- ***Troubleshoot*** — instrument timeouts and other errors automatically

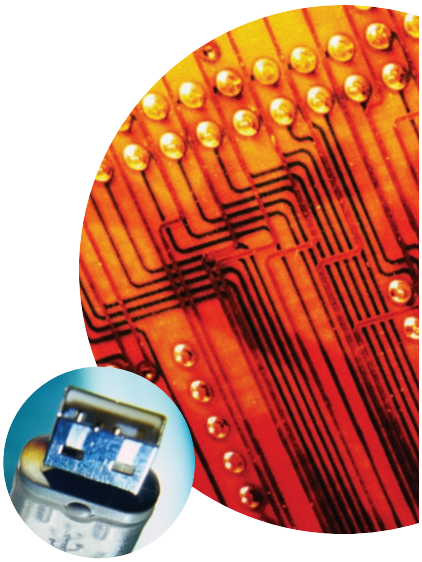
### Program instruments

- ***Create a user interface for programs*** — You don't have to create a front panel for your VEE program, but if you want to create a user interface without access to your code, you simply add the objects and UserFunctions to your front panel. automatically create a runtime executable directly from the menu.
- ***Quickly analyze code sections*** — to save development time when fine-tuning your programs.
- ***Runtime executable creation*** — automatically directly from the menu.
- **Unlimited runtime** — with VEE, you can distribute your runtime programs at no extra charge.

### Analyze and visualize data

The power of MATLAB Script and the Signal Processing Toolkit embedded within VEE, (from The Mathworks) delivers analysis and visualization capabilities in a single graphical environment.

- ***Numeric and symbolic computation*** — including linear algebra and matrix computation, Fourier and statistical analysis, differential equation solving, matrix manipulation, trigonometric and other math operations.
- ***Engineering and scientific graphics*** — 2-D and 3-D displays; triangular and grided data; waterfall diagrams; quiver, ribbon, scatter, bar, pie, and stem plots.
- ***Signal processing functions*** — including signal and linear system models, analog filter design, FIR and IIR digital filter design, spectrum estimation, and time-series modeling



### Worldwide service and support

With Agilent VEE, you have access to Agilent's worldwide resources for start-up assistance, training classes, and update services. As part of the purchase of any VEE product you will receive 6 months of support and updates included, free of charge. If you would like additional consulting services Agilent offers those too. There are currently over 30 companies available in North America, Europe, Middle East and Asia to help you develop your Agilent VEE solution. Please refer to the Agilent VEE website for a complete list. Join the Agilent VEE electronic users group. Sign up through the Agilent VEE web site and get assistance on using the Agilent VEE from experts around the world: www.agilent.com/find/vee

**To see a demo or download an evaluation version of Agilent VEE Pro, go to www.agilent.com/find/connectivity.**

## Hardware

### Direct connections to your computer

With the Agilent W1140A, you can physically connect your test and measurement instruments to your PC or network in several different ways. For the fastest, easiest connections, choose Agilent converters that let you take advantage of USB (Universal Serial Bus) and LAN (Local Area Network) – the standard I/O already available in your computer. Or if you prefer, you can order your software with a GPIB card that installs into the backplane of your desktop computer.

### 82357A USB/GPIB Interface for Windows 98 (SE)/Me/2000/XP

The Agilent 82357A USB/GPIB Interface provides a direct connection from the USB port on your laptop or desktop PC to GPIB instruments from any vendor. There are no switches to set and no PC cards to install. You can interface with up to 14 GPIB instruments, with transfer rates over 750 KB/s with large block transfers.

Because the 82357A is a standard Plug and Play device, your computer automatically detects it and configures the interface. The included standard VISA (Virtual Instrument Software Architecture) software provides GPIB emulation so your existing GPIB programs work immediately, without modification.

### E5810A LAN/GPIB Gateway for Windows

For benchtop and systems applications, the Agilent E5810A LAN/GPIB Gateway provides remote access and control of GPIB instruments via your 10BASE-T or 100BASE-TX LAN. With the LAN/GPIB gateway, you can leverage your existing network to share test equipment and data easily. The gateway lets you situate your computer remotely – at a safer or more convenient location – and control your test instruments over the LAN, instead of using a local computer with a GPIB interface card.

The LAN/GPIB gateway comes with a built-in Web server, so you can use your browser to set up, configure and use the gateway to control test instruments easily from anywhere in the world. Multiple users can access the instruments from multiple locations, giving you the ability to collaborate with worldwide teams. Consult with colleagues in different locations, collect data, perform measurements, share instruments or just monitor the progress of your tests.

And with the built-in digital display, configuration and troubleshooting is easier than ever.

The gateway – a combination of hardware and VISA/SICL software – uses client/server technology to extend the standard VISA/SICL functions to give you remote and distributed control of GPIB instruments. The gateway allows you to use VISA- or SICL- based applications designed for GPIB over the LAN without modifying the applications beyond a simple address change.

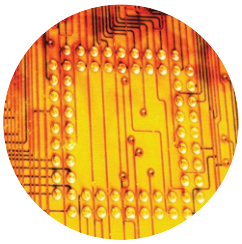
### Agilent 82350B High-Performance PCI GPIB Interface for Windows

For applications where you need to maximize throughput for all block sizes, use the Agilent 82350B high performance IEEE-488 interface. This PCI card has built-in buffering that provides superior I/O and system performance – up to 900 KB/s.

The 82350B comes with VISA and SICL software for Windows 98/Me/NT/2000/XP. The GPIB interface card plugs into a PCI slot in the back plane of your PC.

# Minimum System Requirements

## SOFTWARE



### T&M Toolkit

#### Software requirements

- Windows NT 4.0*, 2000, XP for design time
- Windows 98, ME, NT 4.0, 2000, XP for run time deployment
- Visual Basic .NET, C# or C++ Standard Edition 2003 or Visual Studio .NET 2002 or 2003 Development Environment.

**NT 4.0 supported by Visual Studio .NET 2002 only*

#### PC hardware requirements

The hardware requirements listed below include the combined resource needs for Microsoft Visual Studio .NET and the Agilent T&M Toolkit.

- Pentium II-class processor, 450MHz
- 96MB for Windows 2000 Professional, 160MB RAM for Windows XP
- .NET requires 2.5 GB of Free Disk Space with 500 MB minimum on the system drive Agilent T&M Toolkit requires 80 MB on the installation drive

### Agilent VEE Pro

#### Software requirements

- Microsoft Windows 98, Windows NT 4.0 , Windows 2000 or Windows XP operating system

#### PC hardware requirements

- Pentium 120 MHz processor; 266 MHz Pentium II or higher recommended
- 32 MB RAM with Windows 98, 64 MB RAM with Windows NT 4.0/ 2000/XP
- Hard disk free space: Windows 98/NT 4.0/2000/XP – FAT 32 550MB; NTFS 250MB

### Additional System Requirements for Software *(applies both to T&M Toolkit and Agilent VEE Pro)*

* CD-ROM or DVD ROM drive
* Super VGA (800 x 600) display or higher-resolution monitor with 256 colors or more
* PC keyboard and 2-button mouse (3rd button if present, is not used)
* One of the following physical connectivity options is required for the PC-to-instrument connection:
  - Agilent 82357A USB/GPIB Interface
  - Agilent E5810A or E2050A/B LAN/GPIB gateway
  - Agilent 82350A/B or 82341C GPIB interfaces
  - Standard RS-232
  - LAN *T&M Toolkit only*
  - USB *T&M Toolkit only*
  - National Instruments I/O hardware using NI 488 version 1.5 (or higher)

## CONNECTIVITY HARDWARE

#### 82357A USB/GPIB Interface

- Requires Windows 98(SE)/Me/2000/XP
- USB port on PC

- Includes Agilent VISA 2.2 and SICL I/O Libraries
- 750Kbytes/sec for large block transfers

**E5810A LAN/GPIB Gateway for Windows**

- Requires Windows 98/Me/NT/2000/XP
- 10BASE-T or 100BASE-TX
- LAN connection on PC
- Includes Agilent VISA 2.2 and SICL I/O Libraries

**82350B High-Performance PCI GPIB Interface for Windows**

- Requires Windows 98/Me/NT/2000/XP
- PCI slot in PC
- Max. I/O speed: 900Kbytes/sec

## WARRANTY INFORMATION

**Software:**

Agilent software comes with an exclusive money-back guarantee. If you're not completely satisfied with either the Agilent T&M Programmers Toolkit or Agilent VEE, you can return it within 90 days for a full refund, no questions asked.

**Hardware:**

The USB/GPIB Interface, the LAN/GPIB Gateway and the PCI GPIB Interface all come with a standard three-year warranty.

**Related Agilent literature**

Data sheet – Agilent 82357A USB/GPIB Interface for Windows, pub. no. 5988-5028EN

Data sheet – Agilent E5810A LAN/GPIB Gateway, pub. no. 5988-5810EN

Data sheet - Agilent 82350B PCI GPIB Interface, pub. no. 5966-7705EN

Data sheet – Agilent VEE Pro, pub no. 5988-6302EN

Brochure – Agilent Connectivity, pub no. 5988-6527EN

Application note – Simplified PC Connections for GPIB instruments, pub. no. 5988-5897EN

Application note – Agilent T&M Programmers Toolkit, Simplified Instrument Communication and Programming Using Textual Programming Languages, pub. no. 5988-6617EN

**See Toolkit or VEE, RISK-FREE**

We believe that between these two programming solutions you will simplify your instrument connection and control tasks. But there's no reason to take our word for it. Download your FREE copy of the T&M Toolkit OR Agilent VEE today at **www.agilent.com/find/connectivity**. And if you purchase after the evaluation period, you have our exclusive money-back guarantee. If you are not fully satisfied for any reason, you can return it within 90 days for a full refund, no questions asked.

## Ordering information - Refer to product W1140A

| Product description | Notes |
|---|---|
| T&M Toolkit Software | Includes Toolkit Product and 6 months of support and product updates |
| VEE Pro Software | Includes VEE Pro Product and 6 months of support and product updates |
| Test Developers Bundle with VEE, Toolkit | A cost effective way to get all of Agilent's test development software. Includes VEE, T&M Toolkit for Visual Studio .NET and 6 months of support and product updates |
| *For additional information on these and other SW products – please visit http://www.agilent.com/find/connectivity* | |
| Faculty version Toolkit – qty. 50<br>Faculty version VEE – qty. 50 licenses<br>*For approved faculty members only* | Includes 3 sets of media and manuals with the license to copy up to 50 licenses |

| Available options description | Notes |
|---|---|
| Support | Additional support purchased at any time (12 month min) |
| Hardware<br>• 82357A USB/GPIB Interface with software purchase<br>• 82350B GPIB Interface with software purchase<br>• E5810A LAN/GPIB Gateway with software purchase | Purchase I/O hardware with your test development software and receive a valuable money-saving discount |
| *For additional information on these and other connectivity products – please visit http://www.agilent.com/find/gpib* | |

| Available upgrade products description | Notes |
|---|---|
| Upgrade from VEE 5 and earlier | Includes media, manuals, support and product updates for 6 months |
| Upgrade from VEE 6 and later | Includes media, manuals, support and product updates for 6 months |
| Upgrade from VEE OneLab to VEE Pro | Includes media, manuals, support and product updates for 6 months |

*For the additional ordering and for pricing assistance please refer to http://www.agilent.com/find/connectivity*

www.agilent.com

**Agilent Technologies' Test and Measurement Support, Services, and Assistance**
Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every software instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

**Our Promise**
Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. When you use Agilent software, we can help you get started with installation, licensing, and documentation/terminology clarification as part of your purchase of the product. Many self-help tools are available for your convenience. We offer products that have built in support, updates and upgrades, so you don't have to worry about ordering a separate product number.

**Your Advantage**
Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

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**Agilent T&M Software and Connectivity**
Agilent's Test and Measurement software and connectivity products, solutions and developer network allows you to take time out of connecting your instruments to your computer with tools based on PC standards, so you can focus on your tasks, not on your connections.
Visit www.agilent.com/find/connectivity for more information.

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