

HP VEE Visual Programming Language

**Need Better Tests
Faster? HP VEE is
the Answer.**



HP VEE 5.0 Provides ActiveX® Technology
and Web-enabled Functions.

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We Have Answers. (Q&A)

You probably have a lot of questions when it comes to visual programming languages.

Are they as productive as everyone says? Are they powerful enough for real-world programming? Can they match the performance of textual languages? Can they get the job done, day in and day out?

Today there is a succinct answer. HP VEE.

HP VEE is a powerful visual programming language that handles day-to-day programming tasks in instrument control, measurement processing and test reporting.

It simplifies test development with enhancements for system integration, debugging, structured program design, and documentation. It automates instrument configuration, accelerates the creation of operator interfaces, streamlines test sequencing, and simplifies application development and management across the World Wide Web. It supports ActiveX® Controls that add application-specific functionality, and provides ActiveX Automation links for seamless integration between HP VEE and other applications such as databases, spreadsheets, and word processors.

HP VEE puts all of this power and functionality on your desktop without sacrificing simplicity. It's the simple answer to your test, measurement and data acquisition challenges.



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In a word, productivity. HP VEE will change the way you work, helping you accomplish every programming task, from the most common to the most complex, with speed, simplicity and precision. Everything goes faster with HP VEE.

Quick Visual Programming

HP VEE delivers dramatic reductions in test development time by allowing you to connect functional icons, or objects. The resulting HP VEE program, which resembles a block diagram, runs just like any program written in a textual language such as C/C++ or Visual Basic. While the number of objects provided in HP VEE is comprehensive, its real power lies in its unique balance of ease-of-use, functionality and performance.

Current users of HP VEE cite ease-of-programming as its #1 attribute.

Over 80 percent of HP VEE users get on-the-job results in the first two weeks.

Two-thirds of HP VEE users incorporate non-HP instrumentation into their test systems.

Ninety-three percent of HP VEE users recommend HP VEE to their colleagues.

Source: HP VEE Customer Satisfaction Survey, 1997

"Programming using HP VEE will continue to improve the test and evaluation process at the BAF [Benefield Anechoic Facility] and is recommended for all measurements with automation needs."

(HP VEE)

Robert M. Taylor and Jay Pasimio of Computer Sciences Corp., Automated Data Acquisition and Analysis at the Benefield Anechoic Facility, 1997 IEEE Aerospace Conference



Can HP VEE handle everyday test tasks?



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Taking measurements. Controlling instruments. Acquiring and processing data. Displaying results. Generating reports. That's the fundamental power of HP VEE, and no programming language—visual or textual—does it better. HP VEE gives you a broad feature-set to handle everyday test tasks. You'll work not just faster but smarter, with distinct bottom-line results including shorter development cycles, lower engineering costs, faster delivery of quality products, and better access to usable information.

(Q & A)

Complete Measurement Capabilities

With HP VEE you can control any instrument from any vendor. Regardless of the measurements you need to make, HP VEE allows you to interface with instruments and PC plug-in cards in a way that works for you. Use any of HP VEE's 450+ drivers, VXIplug&play drivers, or ActiveX Controls. Or, control any instrument directly—even those you build yourself—with fast, efficient Direct I/O capabilities.

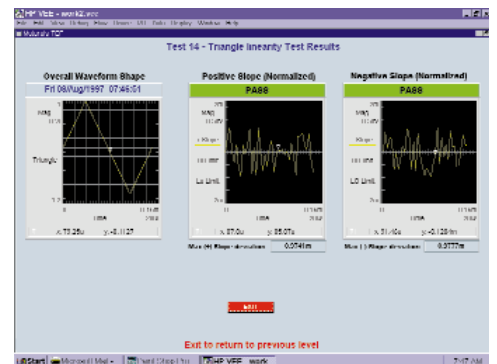
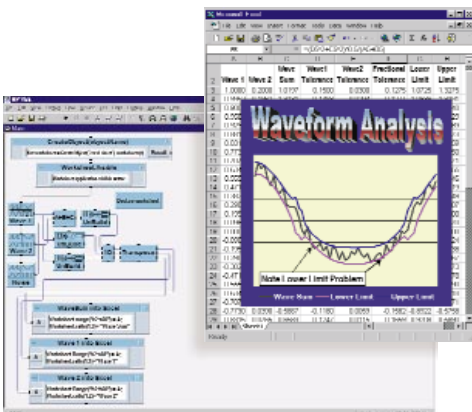
Use the HP VEE web page <http://www.hp.com/go/hpvee> as your source for drivers. You can download existing drivers, and obtain information about other companies that may be available to develop drivers as well as complete HP VEE applications.

In this test from Motorola's Space and Systems Technology Group, HP VEE's display objects exhibit results stored in datasets.

Robust Data Collection and Analysis

HP VEE provides over 200 math and analysis functions ranging from elementary math to calculus, digital signal processing, and regression analysis. When a solution must be constructed from a long mathematical equation, use HP VEE's formula box to simply type it in. HP VEE also provides 14 flexible data types to reduce development time. It automatically converts between data types, builds and unbuilds text and binary numbers, and swaps bytes—tasks that must be explicitly coded with textual programming languages.

ActiveX Automation allows you to send HP VEE test data automatically to Microsoft Excel, for example, for further analysis.



ActiveX technology is changing the software development process.

Use the Right Tools with ActiveX Automation

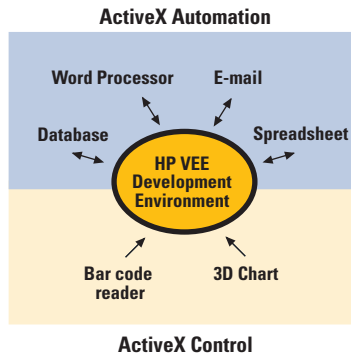
HP VEE 5.0 takes a giant step forward in power and functionality by incorporating ActiveX Automation. Now you can augment your HP VEE programs with other applications such as:

- Spreadsheets
- Databases
- Word processors
- E-mail
- Web browsers

Refer to the HP VEE web page <http://www.hp.com/go/hpvee> for application notes covering these new HP VEE 5.0 features.

Flexible Data Displays

Because engineering and scientific data are better understood visually, HP VEE provides a wide range of visual displays, which can be easily customized with markers, colors, line and point types, and scales. With HP VEE you can also display data in text format with alphanumeric and scrolling display objects.



Detailed Visual Communication

HP VEE brings data and test results to life with indicators, meters, thermometers, tanks and simple XY plots and stripcharts. You can display complex data including waveforms and spectra on polar plots, Smith charts and magnitude and phase plots. With HP VEE, you can also send your data to other applications in a range of data formats. And you can develop reports within HP VEE and print directly, or export data through ActiveX Automation to word processors and presentation packages.

“There’s no need to track file pointers, dimension arrays, or convert data types because HP VEE provides this built-in functionality for you. I also like the inherent block diagram that is created when you program in HP VEE. It’s so much easier and faster to visualize the program execution and flow with this approach.”

(HP VEE)

Dave Hamilton, Motorola Space and Systems Technology Group, Test Equipment Facility, Software Developer



Is HP VEE easy to use ?

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The difference between HP VEE and other programming languages is easy to see. Rather than providing icons for every programming function, HP VEE's powerful objects are packed with functionality. This means you program at a higher level, using a wealth of built-in scientific and engineering routines that get you started quickly. With HP VEE you need to learn only a few simple operating principles. Its pull-down menus make selecting the ideal function quick and easy, and its many navigation tools help you easily move through your visual programs.

(Q & A)

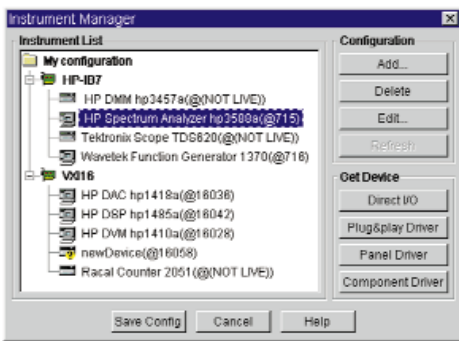


Streamlined Instrument Control

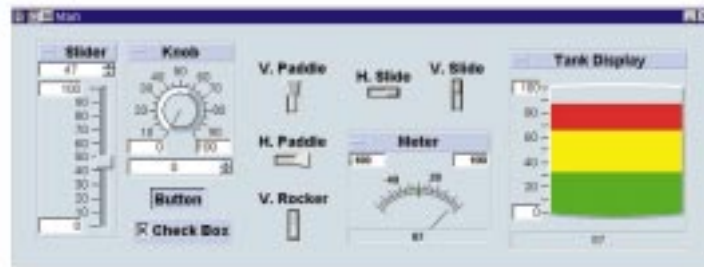
Designed specifically for test, measurement and data acquisition, HP VEE simplifies communication with instruments and other devices. The HP VEE Instrument Manager scans the bus for devices and automatically handles the interfacing details, so you no longer need to build address strings, load drivers, or manage I/O session handles. HP VEE also provides easy point-and-click instrument control through HP VEE drivers and VXI*plug&play* drivers. And when you don't have or want to use a driver, Direct I/O allows you to communicate directly with instruments via instrument command strings.

Fast Creation of Operator Interfaces

With HP VEE, you can quickly create operator interfaces, including soft front panels for instruments. HP VEE provides a variety of objects for input: toggles, sliders, drop-down lists, and buttons for control, dialogue and pop-up boxes. You can assign specific tasks to soft keys and control keys for mouse-less operation—a useful feature on production lines or other environments where space is limited. And you can secure runtime versions of test programs by locking user interfaces.



HP VEE's Instrument Manager scans the bus and automatically configures instrument addressing.



With its wide variety of user interface objects, HP VEE makes it easy to create operator interfaces and soft front panels.

Easy Use of ActiveX Controls

HP VEE can load and run any ActiveX Control, so you can quickly customize your programs for specific applications. Barcode readers, file encryption, compression utilities, databases, scientific functions, project management utilities, application/program version controls, high-speed graphics, calendars, buttons, knobs and literally thousands of other ActiveX Controls can be added to your HP VEE programs.

Visit these web sites to browse some of the more than 10,000 ActiveX Controls currently available.

- www.componentsource.com
- www.vbextras.com
- www.cnet.com/Resources/Swcentral

Easy Test Sequencing

Linking tests in a logical sequence has never been easier, faster or more productive. With HP VEE you can build complex testplans quickly with the HP VEE Sequencer, which provides extensive branching, pass/fail criteria, and test results.

The HP VEE Sequencer provides an easy-to-use framework for creating test plans.

Remote Web Monitoring

With its built-in web server, HP VEE allows you to remotely control and access measurement systems over your company intranet using the standard HTTP protocol. Any HP VEE control panel can be accessed over the intranet or World Wide Web, so you can troubleshoot systems, retrieve information from HP VEE programs, and monitor test systems remotely.

You can also access the web from within any HP VEE program with a browser ActiveX Control.

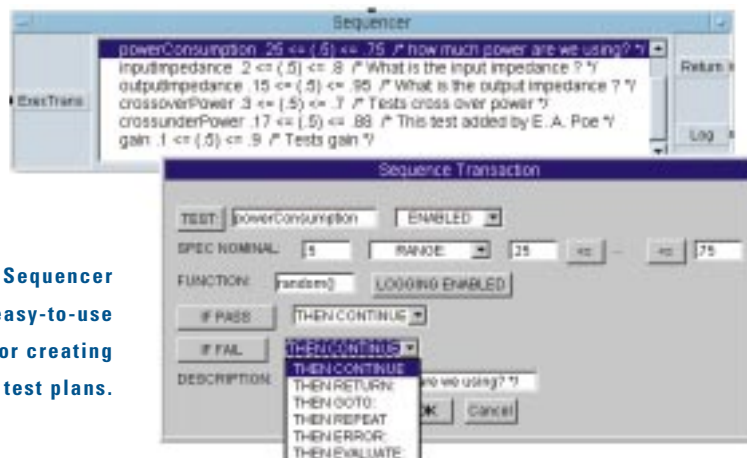
Unlimited Runtime at No Extra Charge

HP VEE allows you to freely distribute your completed programs. You can save secured runtime versions of programs and distribute them in any volume—with no hidden costs, and no limits on the number of runtime versions you ship.

“Another time- and irritation-saving feature of HP VEE is the amazing tool-morphing capability. Once a programmer has experienced this impressive device it is frustrating to go back to swapping tools manually.”

Steve Mackin, Symtx, “A Test Engineer’s Evaluation of Graphical Programming”

(HP VEE)



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HP VEE provides a full-featured, professional development environment designed to handle large, complex measurement systems. It includes the tools you need to keep the most sophisticated software under control. With HP VEE, you get the power to be productive immediately, and the depth to handle mission-critical tasks. With its integration of ActiveX technology, HP VEE provides the core development environment plus ready access to the ActiveX Controls and applications you need for maximum efficiency.

(Q & A)

Professional Development Environment

HP VEE's Professional Development Environment is instantly familiar, providing a look-and-feel that resembles today's popular operating systems and development environments. Its Program Explorer makes it easy to understand and navigate complex programs, and document windows make it easy to edit HP VEE functions: you can search for objects by name, text, type, description, color, location and other property values.



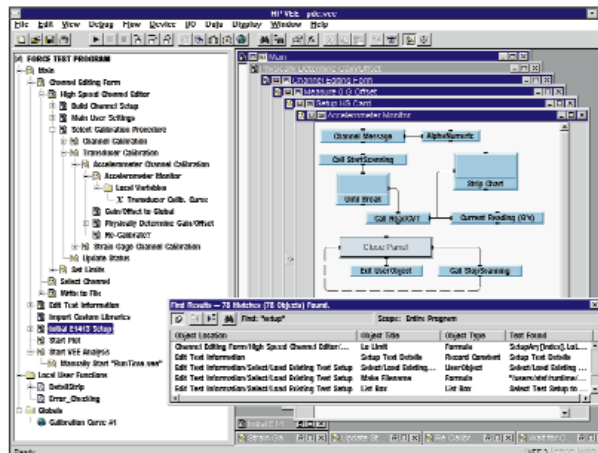
The HP VEE Program Explorer simplifies navigation through complex programs, both during debug and after the test program is up and running.

Interacts with Other Languages

HP VEE programs can call or be called by any C/C++ program. You can also run HP VEE in combination with Visual Basic, HP BASIC, FORTRAN, LabVIEW, and Pascal programs.

Flexible Source Documentation

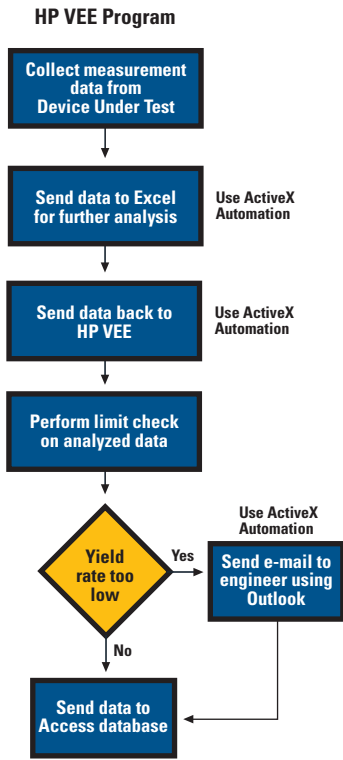
HP VEE allows you to print out and archive the design and structure of your programs, and you can save program revisions using industry-standard revision control packages. Program documentation can be saved with a click of a button.



Productivity in an ActiveX World

With its ActiveX Automation links, HP VEE allows you to create applications that integrate HP VEE's instrument control, test and measurement capabilities with popular ActiveX-compliant applications.

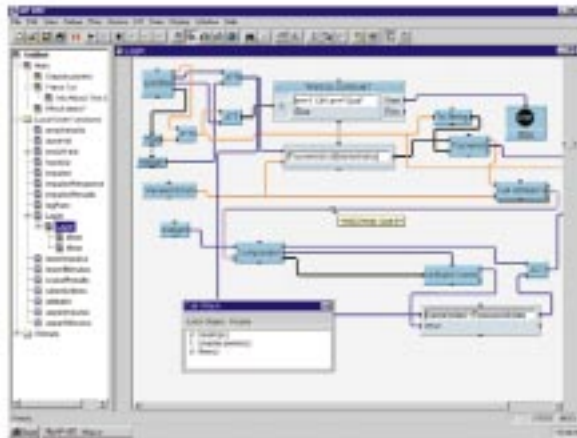
Here's a look at how HP VEE and ActiveX team up to bring step-function improvements in productivity and communication.



“HP VEE is the best way to control IEEE-488 gear on a PC. I love Direct I/O, and the way VEE handles graphics, GUIs and TO/FROM file transactions. Data sets are awesome!”

Jeff Davis, Test Facility/Software Development Lab, Motorola

HP VEE's built-in debugging features include call stacks, line probe, breakpoints, and dataflow.



(HP VEE)



Is HP VEE fast?



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HP VEE ensures the fastest possible execution of complete test programs. Your instruments will never wait while your HP VEE programs perform measurement processing, limit testing, test plan parsing or computations. Plus, HP VEE provides tools to help you optimize the time you spend tuning your program for best performance.

(Q & A)

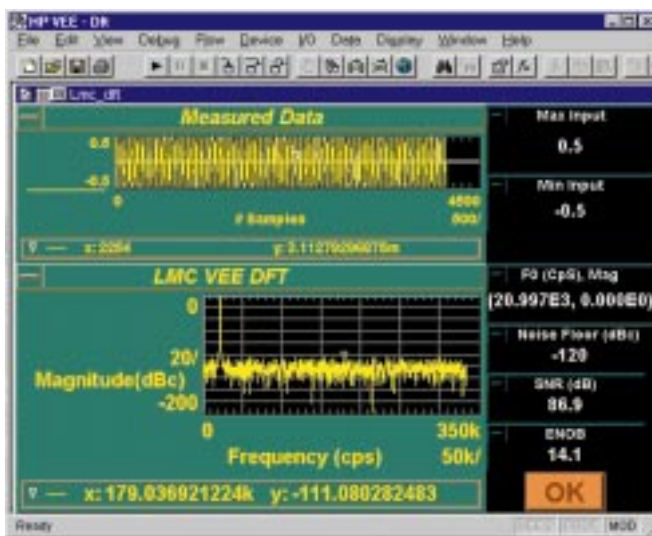
Compile Programs for Fastest Execution



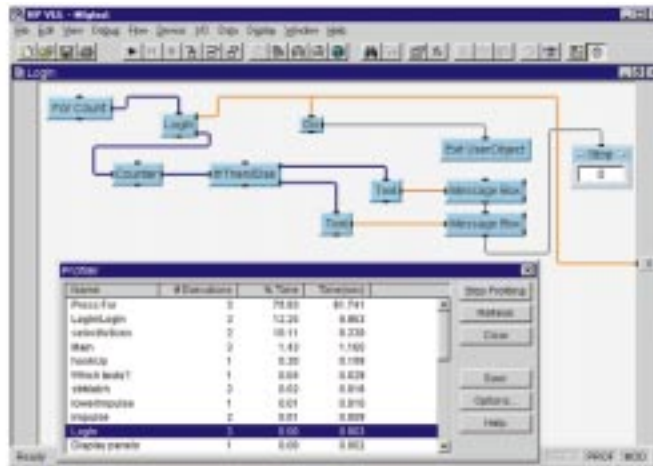
HP VEE'S compiled mode provides fastest program execution speed.

HP VEE provides fast execution using incremental compiler technology. The compiler dramatically improves performance while maintaining all the advantages of an interpreter. During test program development, HP VEE does an initial compilation and then recompiles edited functions only.

After the HP VEE program is developed, compilation occurs only once upon first execution. As a result, HP VEE programs execute 150 to 400 percent faster than typical programs that lack a compiler, where speed is constrained by I/O performance and instrumentation characteristics. Throughput is further enhanced with HP VEE's ability to execute multiple threads and perform time-slicing among individual objects.



The Profiler shows how much time is spent executing each routine so you can focus on key areas.



Full Compatibility with Earlier Versions

New releases of HP VEE are always backward compatible, so programs written in earlier versions of HP VEE can be loaded and run in the latest version. You can move to state-of-the-art visual programming with peace of mind, without losing your investment in existing programs.

Create Better Visual Programs

How fast your program runs depends not only on HP VEE's execution speed, but also on how well the program is written. HP VEE's Profiler provides easy-to-understand information to help you optimize code quickly. You can also log Profiler results to a file for later analysis.

“HP VEE was a good choice for our experimental remote laboratory course, ‘Advanced ECE Laboratory Techniques: the Virtual Laboratory.’ When used with remote control software, it allowed the full functionality of laboratory instruments to be controlled over the network. I found it to be powerful, yet easy to learn and use.”

(HP VEE)

Daniel D. Stancil, Professor of Electrical and Computer Engineering, Carnegie Mellon University



What's HP VEE's track record?



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HP VEE 5.0 is the fifth major revision of HP VEE. Engineers around the world use HP VEE in a wide range of applications. At Hewlett-Packard, we use HP VEE in the design and manufacture of printers, medical equipment, high-speed chipsets, desktop scanners and PCs. Check the HP VEE website <http://www.hp.com/go/hpvee> for application case studies.

(Q & A)

Test at the Speed of the Revolution

Around the world and in virtually every category of product test, HP VEE is changing the way engineers work. From simulating and measuring satellite test signals to monitoring a nuclear power plant, from testing jet engine components to life-testing consumer appliances, HP VEE is the preferred software productivity tool for companies that need to develop better tests faster.



Almost overnight, the technical revolution is changing the nature of everyday life.

Worldwide Service and Support

With HP VEE, you have access to the worldwide resources of Hewlett-Packard for start-up assistance, telephone support, service subscriptions, training classes, seminars, and internet-based information. HP support keeps your test programs up-and-running around the world and around the clock.



Case Studies

1

Testing Network Servers

Engineers at HP's General Systems Lab utilize HP VEE to simplify testing of their entry-level and mid-range network servers. Testing is always a critical and usually time-consuming activity. By incorporating HP VEE into the test plan, designers have been able easily assess their product's level of performance, contributing to increased product yield, quality, and reliability.

Initially, HP VEE was used as a fast and simple means to interface to the instrumentation. It allowed the designers to automate the existing functional test procedures, which had been performed by controlling the equipment manually along with the assistance of a few UNIX scripts.

The original software evolved into an extensive HP VEE application, appropriately called a "Margin Test Toolbox," which became an integral part of the qualification process. The test station resides in a single rack consisting of a UNIX workstation, power supplies, pulse generators, a data acquisition unit with a DMM, thermocouple relay, and switch. The operator can select from a menu of options for controlling the settings for each piece of equipment in the test rack, and access usage instructions. Once the user specifies the control parameters, the automatic testing takes over and runs through the battery of tests necessary to evaluate the performance of the servers.

2

Air Quality Research

As part of a long-term global research program, the University of Illinois at Urbana-Champaign is studying ambient aerosols that can potentially counteract global warming caused by greenhouse gases. The research team is using a "humidograph" for studying the optical properties of atmospheric ambient aerosol particles at select regional locations. "Studying ambient aerosols is an important step to a better understanding of the chemistry and physics of the atmosphere and how the atmosphere changes," says Dr. Rood, who has studied air quality issues for the last 15 years.

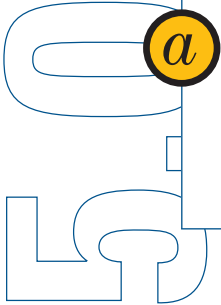
The humidograph samples ambient air and uses temperature and relative humidity control for studying light scattered by atmospheric particles. The humidograph is automated by HP VEE. "Automating the humidograph improves our confidence, reliability, and ability for continuous sampling for weeks to months at a time for characterization of aerosol properties at each site," says Dr. Rood.

"HP VEE's visual presentation of the program provides a quick map to the important pieces of the functionality of the program."

Ken Duisenberg, Hewlett-Packard, General Systems Lab

(HP VEE)





There's only one way to fully appreciate the power and elegance of HP VEE. You need to get your hands on it. Here's how.

(Q & A)

World Wide Web

The HP VEE web page <http://www.hp.com/go/hpvee> is packed with details on HP VEE. Log-on today to download instrument drivers, application notes, white papers, sample programs, technical tips and other helpful resources. You can even download a complete evaluation copy of the latest version of HP VEE.



Evaluation Kit

The HP VEE Evaluation Kit includes a full working copy of HP VEE 5.0 and instrument I/O libraries. This free kit on CD-ROM includes documentation and practical examples to get you up-and-running quickly.



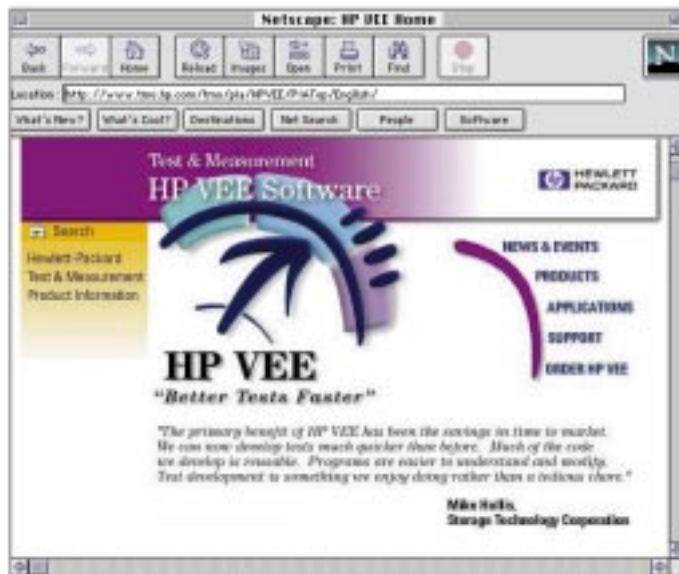
Electronic Users Group

HP VEE users worldwide exchange their ideas and experiences regarding visual programming and HP VEE via electronic mail. To join the HP VEE Users Group, send your name and address to vee-ug-reg@lvld.hp.com. Information about the Users Group is available under Support on the HP VEE web page <http://www.hp.com/go/hpvee>.

Requirements for HP VEE 5.0 for Windows 95/NT

- 486/66 with coprocessor, 200 MHz Pentium II or higher recommended
- Serial port or any card that supports Microsoft Windows 95/NT (see table opposite page)
- Memory for Windows 95: 16 MB required, 32 MB recommended
- Memory for Windows NT: 32 MB required, 64 MB recommended
- 25 MB minimum hard disk space for HP VEE 5.0
- 800x600, 256-color display minimum, 1024x768, 256-color display or better recommended
- Microsoft Windows 95/NT (4.0 or higher)
- CD-ROM drive or 3.5-inch high-density floppy drive

Note: HP VEE 3.1 is still available for use with Windows 3.1(HP E2120C).



Ordering Information

| HP VEE 5.0 | HP Model Number |
|---|-----------------|
| HP VEE 5.0 for Windows 95/NT (<i>Opt. AA8 includes 3.5-inch floppy disks</i>) | HP E2120F |
| HP VEE 5.0 for HP-UX Series 700 | HP E2111F |
| NEW! HP VEE 5.0 mini-site license (10 users)* | HP E2119F |
| HP VEE 5.0 site license (50 users)* | HP E2117F |
| HP VEE 5.0 plus HP 82341C HP-IB Card | HP 82345F |

* Order Option CDT when converting to a site license to receive credit for previously purchased copies of HP VEE. You will also receive additional discounts when you purchase multiple copies of site-license products. Site licenses include one year of complementary phone support and software upgrades.

Training Classes

| HP VEE 5.0 Training Classes | HP Model Number |
|-----------------------------|-----------------------|
| Introduction to HP VEE | HP E2120F, Option 24D |
| Advanced Topics | HP E2120F, Option 24Q |

Both classes may be given at your site and can be specifically tailored to your needs—ask your HP field representative for a quote. To register and for pricing, go to <http://www.hp.com/go/hpvee> and see Support, Training Classes.

Upgrade Information

| HP VEE 5.0 Upgrade Products | HP Model Number |
|---|---|
| HP VEE 5.0 for Windows 95/NT <i>Upgrade option from 4.0 to 5.0</i> <i>Upgrade option from 3.x to 5.0</i> | HP E2120F <i>Option UP1</i> <i>Option UP2</i> |
| HP VEE 5.0 for HP-UX Series 700 <i>Upgrade option from 4.0 to 5.0</i> <i>Upgrade option from 3.x to 5.0</i> | HP E2111F <i>Option UP1</i> <i>Option UP2</i> |
| HP VEE 5.0 mini-site license (10 users) <i>Upgrade to 5.0 for current mini-site licensees</i> | HP E2119F <i>Option AGE</i> |
| HP VEE 5.0 site license (50 users) <i>Upgrade to 5.0 for current site licensees</i> | HP E2117F <i>Option AGE</i> |

Important Note: HP VEE upgrade products will only install on computers with HP VEE currently installed. Upgrade options cannot be ordered with credit option CDT.

HP VEE in Education

| HP VEE 5.0 Education Products | HP Model Number |
|--|--|
| HP VEE 5.0 for Windows 95/NT <i>40 development licenses</i> | HP H2327F Opt. WNT <i>AE13V or AE16V discount</i> |
| HP VEE 5.0 for Windows 95/NT <i>40 development licenses plus HP-IB card</i> | HP H2327F Opt. PCN <i>AE13V or AE16V discount</i> |
| HP Educators Lab Starter Kit <i>HP VEE 5.0 for Windows 95/NT, 40 Licenses, EE fundamentals videos, computer-based training software, and textbooks.</i> | HP H2326A <i>AE13V or AE16V discount</i> |

The HP VEE products above are available to accredited universities, colleges, or vocational/technical schools that qualify for HP's AE13V or AE16V educational purchase agreement for 50% discount.

GPIB Cards Supported

| Company | Product | Win95 | WinNT |
|-----------------|--------------------------------|-------|-------|
| Hewlett-Packard | 82350A—GPIB | Yes | Yes |
| Hewlett-Packard | 82335B—GPIB | Yes | No |
| Hewlett-Packard | 82341C—GPIB | Yes | Yes |
| Hewlett-Packard | 82341D—GPIB | Yes | No |
| Hewlett-Packard | E2074B—GP10 | Yes | Yes |
| Hewlett-Packard | E2075A—GP10 | Yes | Yes |
| Hewlett-Packard | E1383A—VXLink | Yes | No |
| Hewlett-Packard | E1483A—VXLink | Yes | No |
| Hewlett-Packard | E6232A—VXI Pentium Controller | Yes | No |
| Hewlett-Packard | E6233A—VXI Pentium Controller | Yes | Yes |
| Hewlett-Packard | E6234A—VXI Pentium Controller | Yes | Yes |
| Hewlett-Packard | Radepc7B—VXI C-size Controller | Yes | No |
| Hewlett-Packard | Radepc8B—VXI B-size Controller | Yes | No |
| Hewlett-Packard | E1497A—V743/64 VXI Controller | n/a | n/a |
| Hewlett-Packard | E1498A—V743/100 VXI Controller | n/a | n/a |
| Hewlett-Packard | E8491A—IEEE-1394 PC Link | Yes | Yes |
| Hewlett-Packard | E2050A—Lan/HPIB Gateway | Yes | Yes |

| Company | GPIB | | | Data Acq. (PC plug-in) | | |
|----------------------|------|-----|--------|------------------------|-----|--------|
| | ISA | PCI | PCMCIA | ISA | PCI | PCMCIA |
| Amplicon | • | • | • | • | • | • |
| ComputerBoards | • | • | • | • | • | • |
| CyberResearch | • | • | • | • | • | • |
| Data Translation | - | - | - | • | • | • |
| Meilhaus | • | • | • | • | • | • |
| National Instruments | • | - | • | • | • | • |
| Spyr | - | - | - | - | • | • |

Additional cards are available through these manufacturers. The company providing the card is responsible for support, interoperability and sales information.

HP DIRECT & Call Centers

In certain regions of the world HP DIRECT or Call Centers offer online technical information and sales assistance. You can ask for literature or, in some cases, request products for evaluation. The HP DIRECT or Call Center team can help you with your application needs—they're only a phone call away.

If you are in a country without HP DIRECT or a Call Center, or if you want to speak with a local HP representative, please contact the sales office in your local region.

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Fax: 02/778 3414

Brazil
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Additional phone number(s): (011) 726-8155
Fax: (011) 726-8171

Canada
Phone Number: (800) 387-3154
Fax: (905) 206-4700

Czech Republic
Phone Number: 42/2/2435 5808
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Fax: 30/1/726 40 20

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Fax: 972/3/53 76 505

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Spain
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Fax: (91) 631.14.69

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Fax: (46/8) 444 2525
E-Mail Address: test-measurement@sweden.hp.com

Switzerland
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Fax: (01) 735 72 90
E-Mail Address: Messtechnik_vertrieb@hp.com

United Kingdom
Phone Number: 01344-366666
Fax: 01344-362852

United States
Phone Number: (800) 452-4844
Fax: (303) 662-3726

Worldwide Partnerships

Through contracts with leading instrument suppliers, HP provides total solutions for test, measurement and data acquisition. Companies worldwide offer hardware/software solutions based on HP VEE.



Amplicon Liveline offers a complete range of PC plug-

in cards for data acquisition, serial and HP-IB communications, industrial rack mounted PCs and single board computers. PC hardware solutions are available from 16 different suppliers to ensure that Amplicon can meet the varied demands from industry, higher education and research and development. All products offer support for HP VEE and are presented in a 320 page color catalog with full pricing and technical details.

Brighton, United Kingdom
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ComputerBoards, Inc. offers a complete line of 12-bit and 16-bit PC data acquisition products. The 16-bit products include replacements for all standard 12-bit boards, including PCI and PCMCIA boards, high-channel-count analog input boards, and 1 MHz 16-bit ISA and PCI boards. ComputerBoards Universal Library provides drivers for HP VEE.

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Printed in the USA 4/98
5966-3879EN