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# HP VEE Overview

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## Why HP VEE?

In a word, productivity. HP VEE 4.0 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 4.0, which is why it's the fastest growing visual programming language in the world today.

HP VEE produces 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 and HP 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.

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## Can HP VEE 4.0 handle everyday test tasks?

Controlling instruments. Taking measurements. Acquiring and processing data. Displaying results. Generating reports. That's the fundamental power of HP VEE 4.0, and no programming language

— visual or textual — does it better. HP VEE 4.0 gives you a broad feature-set to handle the test tasks you face every day. You'll work not just faster but smarter, with distinct bottom-line results including shorter development cycles, lower engineering costs and, ultimately, faster delivery of quality products.

**Complete Measurement Capabilities**

With HP VEE 4.0, you can control any instrument from any vendor. Regardless of the measurement you need to make, HP VEE 4.0 enables you to interface with the instrument in the way that works for you.

Use any of over 450 HP VEE drivers included with HP VEE 4.0, or any industry-standard VXIplug&play; driver, or control instruments directly — even those you build yourself — with fast, efficient Direct I/O.

**Robust Data Collection and Analysis**

HP VEE 4.0 provides over 200 math and analysis functions that range 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 4.0's formula box to simply type it in.

With 13 flexible and powerful data types, HP VEE 4.0 reduces development time. It automatically handles converting between data types, building and unbuilding text and binary numbers, and swapping bytes — all tasks that textual-language programmers must explicitly code into their programs.
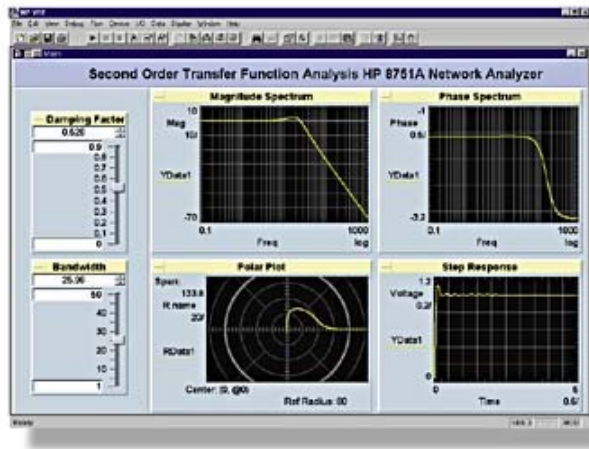
HP VEE 4.0 easily shares data with commercial and custom applications via a rich set of interprocess communication tools, including file sharing, DDE and named pipes, DLLs and shared libraries, TCP/IP, and OCX and ActiveX.

**Flexible Information Reporting**

Because engineering and scientific data are better understood graphically, HP VEE 4.0 provides a wide range of graphical displays. You can easily customize these with markers, colors, line and point types, and scales. And you can display data in text format with alphanumeric and scrolling display objects.

HP VEE 4.0 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.

You can send your data to other applications in a range of data formats. And you can develop reports within HP VEE 4.0 and print directly, or export data to a destination file for printing.

A variety of graphical displays allows you to capture and analyze test results.

## Is HP VEE easy to use?

The difference between HP VEE and other programming languages is easy to see. HP VEE 4.0 provides a set of powerful objects that you connect to create a program, as opposed to having icons for every single programming function.

In addition, HP VEE 4.0 is a leading-edge software application. It leverages the rapidly developing software technology that characterizes today's world, resulting in a tool that automates inherently complex tasks — such as controlling instruments, creating operator interfaces, sequencing tasks, and distributing programs — and simplifies and streamlines the entire programming effort.

### Streamlined Instrument Control

Designed for test, measurement, and data acquisition, HP VEE 4.0 simplifies communication with instruments and other devices.



HP VEE 4.0's Instrument Manager scans the bus for devices and automatically handles the interfacing details, so you no longer need to build address strings, load drivers, and manage I/O session handles.

The Instrument Manager automatically configures instrument addressing.

HP VEE 4.0 provides easy point-and-click driver control for both HP VEE drivers and VXIplug&play; drivers. And when you don't have or want to use a driver, HP VEE 4.0's Direct I/O enables you to communicate directly with

instruments via instrument command strings.

**Fast Creation of Operator Interfaces**

With HP VEE 4.0, you can create operator interfaces, including soft front panels for instruments, in a fraction of the time it takes using a textual programming language.

Choose from a wide variety of user interface objects. Use toggles, sliders, drop-down lists, and buttons for control, dialog boxes, pop-up boxes for user input, and indicators to visually represent data.

You can assign specific tasks to softkeys and control keys for mouseless operation — useful on manufacturing production lines or where space is limited. And you can secure runtime versions of test programs by locking user interfaces.

**Easy Test Sequencing**

Linking tests in a logical sequence has never been easier, faster or more productive. You can build complex testplans quickly using HP VEE 4.0's Sequencer, which provides extensive branching and iteration capabilities.

Call test procedures written in HP VEE 4.0, C/C++, or other languages. Set flexible pass/fail criteria based on ranges, limits, tolerance, and percent tolerance. Test results are automatically logged as data records using an easily configurable interface that allows customized reports.

**Unlimited Runtime**

HP VEE 4.0 allows you to freely distribute your completed programs. You can save secured runtime versions of programs for distribution inside or outside of your company. And you can distribute programs in any volume. There are no hidden costs, and no limits on the number of runtime versions you ship.
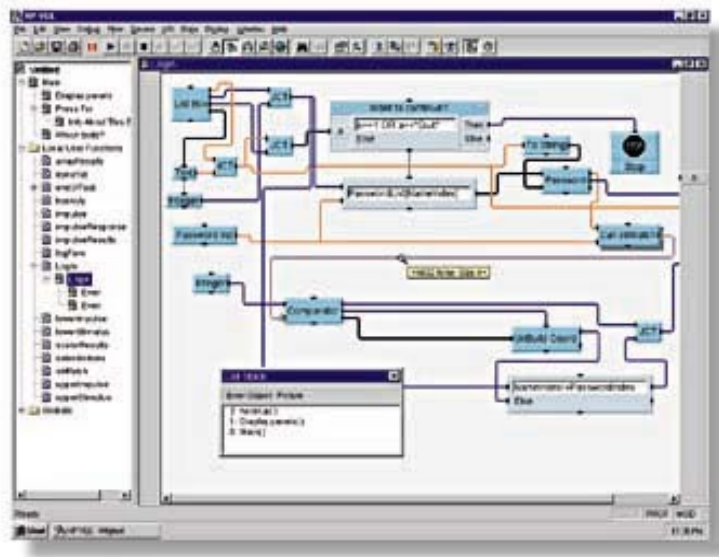
# Can I use HP VEE 4.0 to develop complex applications?

HP VEE 4.0 provides a full-featured, professional development environment designed to handle large, complex test systems. HP VEE 4.0 includes the tools you need to keep the most sophisticated software under control. With HP VEE 4.0, you get the power to be productive immediately, and the depth to handle mission-critical tasks.

**Professional Development Environment**

HP VEE 4.0's Professional Development Environment provides a look-and-feel common in today's popular operating systems and development environments, making it instantly familiar.

The Program Explorer helps you navigate through complex programs, both during debug and after the test program is up and running.

Use the Program Explorer to quickly understand and navigate through complex programs. Use document windows to easily edit HP VEE 4.0 functions. Search for objects by name, text, type, description, color, location and other property values.

**Flexible Integration with Other Languages**

HP VEE 4.0 can be easily integrated into complex systems comprised of multiple applications. Using HP VEE 4.0's ActiveX tools, you can merge HP VEE functionality into other commercial applications, or into test system programs written in standard text-based languages.

An ActiveX control encapsulates HP VEE 4.0 user functions for integration into OLE-compliant applications such as Microsoft Excel and Visual Basic. The ActiveX feature makes integrating remote instrument control, test, and measurement capabilities of HP VEE into applications as easy as "drag and drop."

For programmers using C, HP VEE 4.0 provides a simple library that offers the same capability as the ActiveX control. With this library, you can integrate HP VEE functionality into C programs without needing to learn OLE.

**Powerful Debugging Capabilities**

HP VEE 4.0 provides tools to help you optimize programs in a minimum amount of time. You can find design flaws quickly with built-in error handling.

HP VEE 4.0 allows you to view execution and data flow. You can troubleshoot errors with call stacks that show the sequence of executed functions, and you can set breakpoints and step-through your program at any point.

**Source Documentation**

You can print out and archive the design and structure of your HP VEE 4.0 programs, and you can save program revisions using industry-standard revision control packages. Save program documentation at the click of a button.

**World-Class Graphics**

HP VEE 4.0 data files can be displayed with PV-WAVE, a powerful graphics analysis package from Visual Numerics, Inc. By using PV-WAVE to display the data files generated by HP VEE 4.0, you can turn complex test results into easily understandable graphics for clear visual analysis. And you can view HP VEE 4.0 data as 2D, 3D or 4D images, including plots, charts, graphs, surfaces, and projections.

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# Is HP VEE fast?

HP VEE 4.0 ensures the fastest possible execution of complete test programs. Your instruments will never wait while your HP VEE 4.0 programs perform measurement processing, limit testing, testplan parsing, or computations.

**Powerful Compiler**

HP VEE 4.0 provides fast execution using incremental compiler technology. Programs developed using earlier versions of HP VEE can be compiled and run in HP VEE 4.0.

HP VEE 4.0's compiler substantially improves performance while maintaining all the advantages of an interpreter. During test program development, HP VEE 4.0 does an initial compilation and then only recompiles edited functions. After an HP VEE 4.0 program is developed, compilation occurs only once upon first execution.

Typical test programs, where speed is constrained by I/O performance and instrumentation characteristics, execute 150% to 400% faster in HP VEE 4.0 than applications lacking a compiler. Within an HP VEE 4.0 program, you can also have multiple threads executing and time-slicing among individual HP VEE objects to support concurrent testing for higher throughput.

**Convenient Profiler**

HP VEE 4.0 also provides a Profiler that can quickly generate easy-to-understand profiles of program execution to help you optimize code efficiently. You can also log Profiler results to a file for later analysis.

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# Does HP VEE 4.0 have a proven track record?

With HP VEE 4.0, you'll get a tool that not only continues to grow but leads the industry with ground-breaking functionality. At Hewlett-Packard, we use HP VEE to manufacture laserjet printers, medical equipment, high-speed chipsets, desktop scanners and PCs. HP manufacturing sites are an extensive testbed for our test software applications. You'll see the results in HP VEE 4.0

**Changing the Look of Test Worldwide**

In every corner of the globe 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 becoming the preferred software productivity tool when companies need to develop better tests faster.

**Worldwide Service and Support**

With HP VEE 4.0, you have access to the worldwide resources of Hewlett-Packard including start-up support, telephone support, service subscriptions, training classes, seminars, and constantly updated information on the World Wide Web. With HP's hallmark service and support after the sale, you can keep your test programs up-and-running around the world and around the clock.

**Worldwide Partnerships**

Through contracts with leading instrument suppliers, HP provides total solutions for test, measurement and data acquisition. Many companies offer hardware/software solutions based on HP VEE 4.0.

**Satellite Test**

Symmetrix, Inc., an HP Channel Partner, developed control and alarm monitoring software that provides stimulus and measurement of satellite signals. Symmetrix chose to develop the software using HP VEE. The control software provides direct control of all functions and instruments in the station via ergonomically-designed operator screens. These were designed for operators who need to control all key instrument functions without knowledge of how the instruments operate. The alarm monitoring software provides continuous control of the station amplifiers to assure these operate in the desired mode. It also provides automatic protection from conditions such as over current, over temperature, and illegal operator settings. This was implemented with a custom VXI driver that simultaneously controls multiple VXI modules, causing these to act as an overall "virtual" instrument with predictable response to any error conditions.

**Data Acquisition**

One HP VEE program controls a data acquisition system that measures

vibration, displacement, and temperature to ensure that a railway provides optimum ride quality for the transportation of a wide variety of produts. Another HP VEE program for this system analyzes the gigabytes of data collected, and helps railway personnel quickly pinpoint problems and generate reports for customers.

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## What's next?

There's only one way to fully appreciate the power and elegance of HP VEE 4.0. You need to get your hands on it. Here's how.

**Evaluation Kit**

The HP VEE 4.0 Evaluation Kit includes a full working copy of HP VEE 4.0. This free kit, available on CD-ROM or downloadable from this website, includes documentation and practical examples to get you up and running quickly.

**Ordering Information**

|  | **HP Model Number** |
|---|---|
| HP VEE 4.0 for Windows95/NT<br>Opt. AA8 includes 3.5 inch high-density floppy disks | HP E2120E |
| HP VEE 4.0 for HP-UX Series 700 | HP E2111E |
| HP VEE site license (50 users) | HP E2117E |
| PV-Wave Visual Analysis for HP VEE 4.0<br>Opt. PC for Win 95/NT<br>Opt. UX for HP Series 700 | HP E2126E |
| PC Win95/NT automation kit (HP VEE 4.0 + HP 82340 HP-IB card) | HP 82345E |

**Requirements for HP VEE 4.0 for Windows 95/NT**

HP VEE 4.0 for Windows supports many GPIB cards, including the following:

| Card | Windows95 | WindowsNT |
|---|---|---|
| HP 82335 | Yes | No |
| HP 8234X | Yes | Yes |
| NI AT-GPIB | Yes | No* |
| NI AT-GPIB/TNT | Yes | Yes* |
| NI AT-GPIB/TNT+ | Yes | No* |
| NI PCI-GPIB | Yes | No* |

| | | |
|---|---|---|
| NI PCMCIA-GPIB | Yes | No* |
| NI PCMCIA-GPIB+ | Yes | No* |
| CB-GPIB/F | Yes | No |
| CB-GPIB/LC | Yes | No |
| PCI-GPIB | Yes | No |
| PCM-GPIB | Yes | No |

\* While National Instruments only specifies that the AT-GPIB/TNT is supported on NT at the current time, they may enhance their supported list in the future. If National Instruments supports their GPIB32.DLL driver on WinNT for a particular card listed above, HP VEE will support that card on WinNT.

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