Getting Started with HP VEE RunOnly for Windows

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Printing History

Edition 1 - September 1993

Edition 2 - February 1995

Conventions Used in this Manual

This manual uses the following typographical conventions:

Example	Represents
HP VEE Reference	Italicized words are used for book titles and for emphasis.
`File`	Computer font represents text you will see on the screen, including menu names, features, buttons, or text you have to enter.
`dir` *filename*	In this context, the word in computer font represents text you type exactly as shown, and the italicized word represents an argument that you must replace with an actual value.
`File` ⟹ `Open`	The "⟹" is used in a shorthand notation to show the location of HP VEE features in the menu. For example, "`File` ⟹ `Open`" means to select the `File` menu and then select `Open`.
`Zoom Out | In 2x | In 5x`	Choices in computer font, separated with a bar (|), indicate that you should choose one of the options.
Return	The keycap font graphically represents a key on the PC keyboard.
Press Ctrl + O	Represents a combination of keys on the PC keyboard that you should press at the same time.
Dialog Box	Bold font indicates the first instance of a word defined in the glossary.

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What is HP VEE RunOnly for Windows?

What is HP VEE RunOnly for Windows?

HP VEE RunOnly for Windows is a run-only version of HP VEE, a visual engineering environment available for the MS Windows, HP-UX, and SunOS operating systems.

HP VEE RunOnly for Windows is *not* a development environment. You must create your programs using one of the following HP VEE products: HP VEE for Windows, HP VEE for HP-UX, or HP VEE for SunOS.

Once you have developed an HP VEE program, you can run the program under HP VEE RunOnly. The program can communicate with instruments, C, and other languages. However, you cannot modify or save the program from HP VEE RunOnly, and only the "panel" view can be seen.

The purpose of HP VEE RunOnly is to provide a secure, run-only environment in which end users can run programs developed with HP VEE. For example, a manufacturing engineer might develop a process-control program using HP VEE. That program can then be run on the factory floor using HP VEE RunOnly. The end-user (for example, a technician) can make use of the program for its intended purpose, but cannot save the program or modify it.

2

Installing HP VEE RunOnly for Windows

Installing HP VEE RunOnly for Windows

This chapter tells how to install HP VEE RunOnly for Windows. The installation is primarily automatic, and requires only a few minutes if your PC is already set up and running.

NOTE

If you have purchased a RADI-EPC7 or RADI-EPC8 VXI Controller from Hewlett-Packard as a bundled system with the option to include HP VEE RunOnly for Windows, HP VEE is already installed. You can ignore the installation procedure that follows. Otherwise, install the HP VEE RunOnly for Windows software as described in this chapter.

System Requirements

Before you install HP VEE RunOnly for Windows, you'll need to install Microsoft® Windows (version 3.1 or 3.11) and MS-DOS® (version 5.0 or a later version) on a personal computer meeting the hardware requirements listed below.*

PC Hardware Requirements:

- *Microprocessor:*
  - Minimum: 80386, 33 MHz or faster, *with* 80387 coprocessor.
  - Recommended: 80486, 33 MHz or faster.
- *RAM (Random Access Memory):*
  - Minimum: 12 MB (megabytes).
  - Recommended: 16 MB.
- *Mass storage:*

  A 3.5-inch (1.44 MB) floppy disk drive, and a hard disk drive with at least 15 MB of free disk space.
- *Display system:*
  - Minimum: VGA (640-by-480).
  - Recommended: Super VGA (800-by-600) or Ultra VGA (1024-by-768).

NOTE

It is recommended that your display card have enough display memory to support 256 colors at the resolution that you plan to use. However, you can use HP VEE with only 16 colors.

* MS-DOS version 6.2, or a later version, is required for an EPC-7 or EPC-8 Embedded VXI Controller, or a VXLink Interface, to support EPConnect version 4.10a.

Supported I/O Interfaces:

Before you install the software, install any hardware I/O interfaces that you intend to use. The following I/O interfaces are supported:

- *PC serial ports (COM1, COM2, COM3, and COM4).*
- *HP 82335, HP 82340, and HP 82341 HP-IB Cards.* Install each HP-IB (IEEE-488) card following the instructions provided with the card. You need only install the hardware interface card, *not* the HP-IB Command Library or SICL software that may be provided with the card. HP VEE provides the appropriate SICL drivers, which are installed as part of the HP VEE installation. You can install multiple HP-IB cards, and you can mix HP 82335, HP 82340, and HP 82341 cards in your system. However, if you are installing multiple HP-IB cards, refer to Appendix A for information about select codes and I/O addressing.

NOTE

If you are installing HP 82335 HP-IB Cards, you must exclude address space for each card before you install HP VEE. Also, you must assign a unique select code for each card. Refer to "Excluding Address Space (HP 82335 HP-IB Card Only)" in Appendix A for further information. (You don't need to do this for the HP 82340 or HP 82341 HP-IB Card, nor for any of the National Instruments GPIB cards listed below.)

- *National Instruments AT-GPIB, AT-GPIB/TNT, MC-GPIB, GPIB-PCII/IIA, and PCMCIA-GPIB cards.* You can configure up to four of these GPIB (IEEE-488) cards, provided your PC has room for them. Before you install HP VEE, install the GPIB card(s), and install the GPIB driver software (for Windows) provided with the card.
- *E1383A or E1483A VXLink interfaces.* These ISA-to-VXI interfaces connect your PC to a VXI card cage, providing direct VXI backplane access through select code `16`. Install the E1383A (B-size) or E1483A (C-size) interface following the instructions provided with the interface. Then install the EPConnect software, included with the interface, before you install HP VEE.

NOTE

HP VEE RunOnly for Windows does not currently support GPIO or MXI interfaces or devices.

HP VEE RunOnly for Windows supports direct access to the VXI backplane only for the EPC-7 and EPC-8 VXI Controllers, and for the E1383A and E1483A VXLink interfaces. You can also access VXI devices from HP VEE RunOnly for Windows by using an HP E1406 Command Module connected to one of the supported HP-IB or GPIB cards.

Once you have completed the installation, you can run the `Instrument Finder` utility (refer to "Finding Instruments" at the end of this chapter) to determine the select codes and addresses of your serial, HP-IB, GPIB, and VXI devices. For further information about I/O addressing, refer to Appendix A.

EPC-7 and EPC-8 VXI Controllers:

HP VEE RunOnly for Windows also can be installed on the EPC-7 and EPC-8 VXI Controllers, which are products of RadiSys Corporation. The EPC-7 and EPC-8 are embedded VXI controllers—PC/486 controllers that fit in a VXI card cage. The EPC-7 fits a C-size cage, and the EPC-8, a B-size cage. Hewlett-Packard re-sells these products as the RADI-EPC7 and RADI-EPC8 VXI Controllers. If you purchase a RADI-EPC7 or RADI-EPC8 with the option to include HP VEE for Windows or HP VEE RunOnly for Windows, HP VEE is already installed.

Both the EPC-7 and EPC-8 conform to the "PC Hardware Requirements" listed previously. You'll also need an appropriate display monitor. For information about the specifications of your EPC-7 or EPC-8, refer to the manual provided with it.

HP VEE RunOnly for Windows provides direct access to the VXI backplane through select code `16` for the EPC-7 and EPC-8 VXI Controllers. However, the EPConnect software, provided with the controller, must be installed before you install HP VEE.

Supported Printers:

HP VEE RunOnly for Windows supports most printers supported by Microsoft Windows, including:

- HP LaserJet Printers.
- HP DeskJet Printers.
- HP PaintJet Printers.

Installation

Once you have set up your computer, and Microsoft Windows is installed, you can install HP VEE RunOnly for Windows.* The installation program uses standard Microsoft Windows keyboard and mouse techniques.

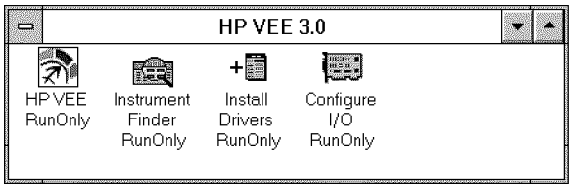
NOTE

If you are installing HP VEE on an EPC-7 or EPC-8 VXI Controller, or you are using an HP E1383A or HP E1483A VXLink interface, please install the EPConnect software (which includes the I-SCPI software) before you install HP VEE. HP VEE 3.0 requires version 4.10a (or a later version) of the "EPConnect/VXI for DOS and Windows" software in order to access the VXI backplane. (MS-DOS version 6.2, or a later version, is required to support EPConnect version 4.10a.)

1. Start Microsoft Windows (if it isn't already running).
2. Insert "HP VEE RunOnly for Windows Disk 1" in your floppy disk drive.
3. Pull down the **File** menu from the **Program Manager** window and select **Run**.
4. Type the name of the floppy disk drive, followed by **SETUP**, and then press Enter. For example, type: **A:SETUP** Enter. (It takes a few seconds for the installation program to load and start.)
5. Answer the questions that the installation program asks. To do this, click on the appropriate **button** on the screen (for example: **OK** or **Yes**), or type in the requested information. (To click on a button on the screen, move the mouse pointer over the button and press the left mouse button.)
6. The installation program asks you to insert disks 2 and 3 at the appropriate times. Click on **OK** after you've inserted each disk.

* Some anti-virus programs may interfere with the installation. If you receive an error message indicating such a conflict, disable the anti-virus program and repeat the installation.

7. When the installation is completed, the HP VEE group window appears:



To start HP VEE RunOnly for Windows, double-click on the **HP VEE RunOnly** icon. In addition, the group window contains icons for three utility programs: **Instrument Finder**, **Install Drivers**, and **Configure I/O**. You can start a utility program by double-clicking on its icon. Refer to the "HP VEE Utilities" appendix in *HP VEE Advanced Programming Techniques* for further information.

NOTE

If your HP VEE program includes instrument panel or component driver objects to communicate with instruments, you'll need to load the appropriate instrument driver (**.CID**) files in order for the program to run. HP VEE RunOnly for Windows does not include any instrument driver files. Load the drivers from the instrument driver disks supplied with the HP VEE for Windows product.

The installation program automatically configures any serial ports and HP-IB cards found. However, if you change your I/O hardware (for example, if you add or remove an HP-IB card), you'll need to reconfigure. Just double-click on the **Configure I/O** icon to run the utility before starting your next HP VEE session.

Your HP VEE RunOnly for Windows installation is now complete. Before you start HP VEE, you can run the **Instrument Finder** utility to determine your current I/O configuration. Refer to "Finding Instruments" at the end of this chapter for details.

NOTE

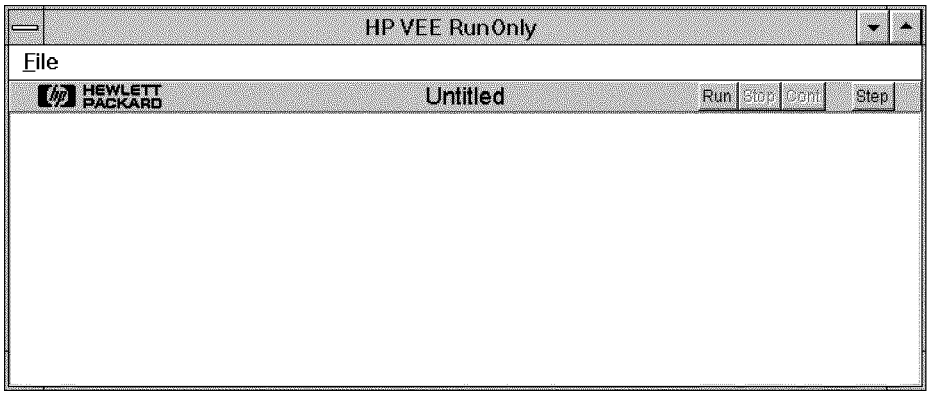
If an HP 82340 or HP 82341 HP-IB card is installed in your PC, it is assigned to PC interrupt level IRQ 15 by default during the HP VEE installation. Also, the built-in HP-IB on the EPC-7 VXI Controller is assigned to IRQ 15 during the HP VEE installation. This may cause an interrupt conflict if some other device is assigned to IRQ 15. If a conflict occurs, open the `SICL.INI` file in the `C:\SICL` directory using any ASCII text editor. Look for the line:

```
IRQ=15
```

and change the IRQ level to one that is not in use. Then exit your Windows session and restart to allow the change to take effect.

To Run HP VEE RunOnly for Windows

To start HP VEE RunOnly for Windows double-click on the `HP VEE RunOnly` icon. The HP VEE RunOnly window appears:

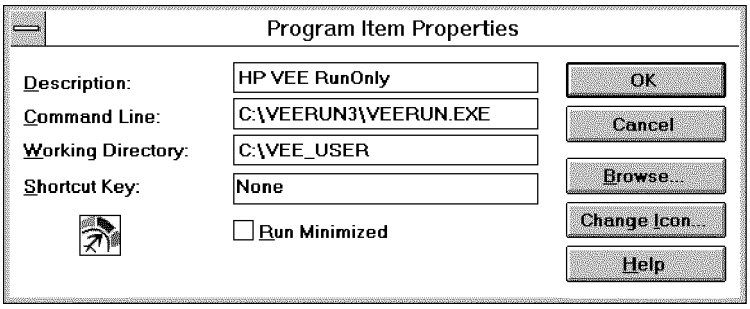


Note that HP VEE RunOnly provides only the `File` menu. To open a program, select `File` ⟹ `Open`. To exit HP VEE, use `File` ⟹ `Exit`.

To Create a New Program Icon

To create a new HP VEE RunOnly for Windows program icon that will automatically run your program, do the following:

1. While holding down the Ctrl key, click and drag on the HP VEE RunOnly for Windows icon. Drag the resulting icon to a new location within the HP VEE group window. Then release the mouse button.
2. Click on the new icon to highlight it, and then select `File` ⟹ `Properties` from the MS Windows `Program Manager` menu. The `Program Item Properties` dialog box appears:



a. Edit the `Description:` entry. (Enter an appropriate description for your program.)

b. Edit the `Command Line:` entry as follows:

   `C:\VEERUN3\VEERUN.EXE -r` *myprog.vee*

   where *myprog.vee* is the file name of the desired HP VEE program, and the `-r` option causes HP VEE to start with that program running.

c. Edit the `Working Directory:` entry if your program is not located in the `C:\VEE_USER` directory.

3. Click on the `OK` button in the dialog box when you are done.

Now you have a new icon to run your program. Double-click on the icon and HP VEE starts with the program running.

NOTE

The `-r` option for HP VEE RunOnly runs the panel view of your program and then quits. If the program doesn't continue to run, HP VEE quits and its window disappears. (You can quit at any time while a program is running by pressing Ctrl+C.)

For further information about the options for starting HP VEE, refer to the manual *How to Use HP VEE*.

To Un-Install

If you want to "un-install" HP VEE for Windows, follow these steps:

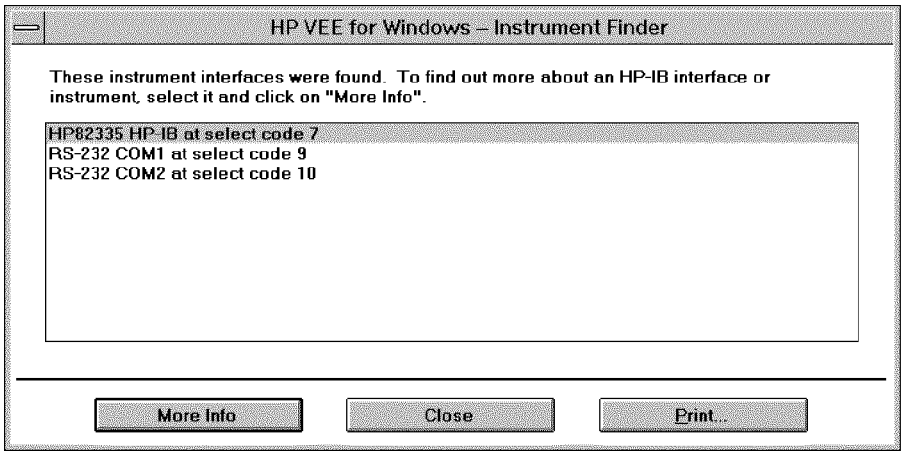
1. Delete all the files (including subdirectories) in your installation directory (default = `C:\VEERUN3`) and your program directory (default = `C:\VEE_USER`), and then remove the directories.

> **NOTE**
>
> Be sure to back up or make copies of any programs in `C:\VEE_USER` that you want to keep. Also, you may want to make copies of the `V.INI`, `VEE.RC`, and `VEE.IO` files in `C:\VEERUN3`.

2. Delete the files (including subdirectories) in `C:\SICL`, and then remove the directory.
3. Delete the files in `C:\HPIDS` and `C:\HPIDS\HELP`, and then remove the directories.
4. Delete the `HPIB.DLL`, `SICL16.DLL`, and `SICLUT16.DLL` files from your windows directory (default = `C:\WINDOWS`). Then, remove the `[VEERUN30]`, `[SICL]`, and `[HPIDS]` sections from the `WIN.INI` file, also in your windows directory.
5. Iconify the `HP VEE 3.0` group window, click on the icon to highlight it, and then delete it by selecting `File` ⟹ `Delete` from the Program Manager.

Finding Instruments

The **Instrument Finder** utility reports the select codes of your serial ports, HP-IB and GPIB cards, and VXI interfaces (EPC-7, EPC-8, or VXLink). The utility also reports the addresses of HP-IB, GPIB, and VXI instruments. To run the utility, double-click on the **Instrument Finder** icon in the HP VEE group window. The **Instrument Finder** screen appears:



In this example, one HP 82335 HP-IB Card is reported at select code 7, along with RS-232 serial ports COM1 and COM2 at select codes 9 and 10, respectively. To find individual HP-IB devices, click on **More Info** with the HP-IB selection highlighted, as shown. To print your configuration, click on **Print**. When you are ready to exit the utility, click on **Close**.

NOTE

If you have installed an HP 82335 HP-IB Card and it is not found, you probably haven't excluded address space for it. Do this, following the instructions in Appendix A, run **Configure I/O**, and then run **Instrument Finder** again to test the new configuration.

3

Developing Programs for HP VEE RunOnly for Windows

Developing Programs for HP VEE RunOnly for Windows

This chapter gives some tips for using HP VEE for Windows (or HP VEE for HP-UX or HP VEE for SunOS) to develop programs to run in the HP VEE RunOnly for Windows environment.

- *Make all modifications to your program and debug it in the HP VEE environment.* Once you have transferred the program to the run-only environment, you won't be able to change it.
- *Develop the program with a panel view designed for the appropriate window size.* You may be running HP VEE for Windows on a PC with an Ultra-VGA monitor. You can use the full capabilities of that monitor in developing the detail view. However, the panel view must be developed to fit on the display that your run-only systems will use. For example, if your run-only systems use 640-by-480 pixel VGA monitors, the panel view must fit within that space.
- *Provide a means of stopping the program from the panel view.* If you start a program in the run-only environment with the `-r` option, there will be no tool bar, hence, no `Stop` button. The operator can stop the program by pressing Ctrl+C, but it is a good practice to provide a button in the panel view to stop the program.
- *Transport your* `VEE.IO` *file to the HP VEE RunOnly environment.* When you transport your program to the run-only environment, include your `VEE.IO` file (called `.veeio` in HP VEE for HP-UX and HP VEE for SunOS). Put the file in the `C:\VEERUN3` directory of each run-only system that will run your program. If there is not a `VEE.IO` file in that directory, a default `VEE.IO` file will be created and your program may not run correctly.
- *Also, transport your* `VEE.RC` *file (if it exists).* This file includes color and font changes made with `Edit Default Preferences`, along with other preference information. If you want to include this information in the run-only environment, put this file in `C:\VEERUN3` directory of each system that will run your program.
- *Load any instrument drivers used by your program.* Use the `Install Drivers` utility provided with HP VEE RunOnly for Windows and the instrument driver disks provided with HP VEE for Windows.

- *In some cases, you may want to secure your program.* You don't have to secure your program since HP VEE RunOnly shows only the panel view and does not let the user save the program or modify its functionality. However, it is possible for the user to alter what is seen on the screen. For example, the user can move objects, change their size, or remove them from the panel view when the program is not running. This has no effect on how the program functions, and the changes cannot be saved. But you can prevent this entirely if you secure your program before transferring it to the run-only environment. (However, don't secure your only copy — you cannot "unsecure" a program once it is secured and saved.)
- *Document your program.* Tips for documenting your program are given in the manual *How to Use HP VEE*. Also, HP VEE provides the `veedoc` utility to extract information from a program.

  The best source of HP VEE training for the end user is the manual *Getting Started with HP VEE*. In addition, you may want to write a short manual for the end user of your HP VEE program.

NOTE

Here are some other things to consider when developing your program:

- If your program has no panel view, it will still run under HP VEE RunOnly, but with a blank screen. (However, `Show Panel on Execute` pop-up `UserObjects` will still appear.)
- You cannot `Step` your program in HP VEE RunOnly.
- Breakpoints saved with your program will be ignored when running under HP VEE RunOnly.

References:

For further information about developing programs with HP VEE, refer to the following manuals:

- *Getting Started with HP VEE*
- *How to Use HP VEE*
- *Building an Operator Interface with HP VEE*
- *HP VEE Reference*
- *HP VEE Advanced Programming Techniques*

These manuals are included with HP VEE for Windows, but not with HP VEE RunOnly for Windows.

A

I/O Addressing

I/O Addressing

To access an I/O device, you'll need to determine the correct address and enter it in the **Address** field in the **Device Configuration** dialog box, as described in the "Controlling Instruments" chapter in your *How to Use HP VEE* manual. The sections that follow give select code and addressing information for HP VEE RunOnly for Windows.

NOTE

HP VEE RunOnly for Windows supports the RS-232 serial, HP-IB, and GPIB interfaces. (HP-IB is Hewlett-Packard's implementation of the IEEE-488 interface bus standard. Other implementations are commonly called GPIB.) Also, you can access VXI devices by using an HP E1406 Command Module connected to one of the supported HP-IB or GPIB interfaces.

HP VEE RunOnly for Windows supports direct VXI backplane access for the EPC-7 and EPC-8 VXI Controllers, and for the E1383A and E1483A VXLink interfaces for PCs.

For further information about the specific interfaces supported, refer to Chapter 2.

Interface Select Codes and Addresses

The addressing schemes for various types of devices are described in the following sections.

To Address Serial Ports

The four PC serial ports are supported by using select codes 9 – 12:

Select Code	Interface
9 (default)	COM1 serial port
10	COM2 serial port
11	COM3 serial port
12	COM4 serial port

For example, to access a device connected to the COM1 serial port, use select code 9 as the address.

To Address HP-IB and GPIB Interfaces and Devices

HP-IB and GPIB devices are addressed using the following scheme:

SPA[*SA*]

Where:

S	is the select code of the HP-IB or GPIB interface.
PA	is the primary address of an HP-IB or GPIB device (the valid range is 00 through 31).
SA	is the optional secondary address (the valid range is 00 through 31).

Let's look at a couple of examples to see how this works:

- For an HP-IB device at select code 7, primary address 01, enter `701` in the `Address` field of the `Device Configuration` dialog box.
- For a GPIB device at select code 14, primary address 09, secondary address 02, enter `140902` in the `Address` field of the `Device Configuration` dialog box.

HP-IB Select Codes

The select codes for HP-IB interfaces are as follows:

Select Code	Interface
1*	HP 82340 or HP 82341 HP-IB Card
2*	HP 82340 or HP 82341 HP-IB Card
3	HP 82335, HP 82340, or HP 82341 HP-IB Card
4	HP 82335, HP 82340, or HP 82341 HP-IB Card
5	HP 82335, HP 82340, or HP 82341 HP-IB Card
6	HP 82335, HP 82340, or HP 82341 HP-IB Card
7 (default)	HP 82335, HP 82340, or HP 82341 HP-IB Card
8*	HP 82340 or HP 82341 HP-IB Card

* Select codes 1, 2, and 8 are not recommended for the HP 82335 HP-IB Card.

Theoretically, you can have up to eight HP-IB cards in your system, which can be a mix of HP 82335, HP 82340, and HP 82341 cards:

- For an HP 82335 HP-IB Card, the select code is determined by switch settings on the card (the default is 7). If you install more than one HP 82335 card, each card must be set for a unique select code in the range 3 through 7. (Refer to your HP-IB card installation manual for instructions.) Also, you must exclude address space for each card. Refer to "Excluding Address Space (HP 82335 HP-IB Card Only)" later in this chapter.
- For an HP 82340 or HP 82341 HP-IB Card, the select code is assigned by the software. The select codes are assigned in the order: 7, 8, 1, 2, 3, 4, 5, and 6. However, each card must be set to a unique base address.

NOTE

The built-in HP-IB on the EPC-7 or EPC-8 VXI Controller is equivalent to an HP 82341A HP-IB Card, and has select code 7 by default.

GPIB Select Codes

The National Instruments GPIB driver configures up to four GPIB cards with the designations GPIB0, GPIB1, GPIB2, and GPIB3. HP VEE assigns select codes to these cards as follows:

Select Code	Interface
14	GPIB0
15	GPIB1
17	GPIB2
18	GPIB3

To Address VXI Devices on the HP-IB or GPIB

To access VXI devices through the HP-IB (or GPIB) with an HP-IB command module, you can use secondary addresses. If you are using an HP E1406 Command Module in a VXI card cage, the primary address is set by a switch on the command module (default = 09) and the secondary address is the individual VXI device's logical address divided by eight.

For example, assume you have an HP E1406A Command Module (address = 09) in an HP E1401A C-Size High-Power Mainframe connected to the HP-IB at select code 7. If you have an HP E1326B Multimeter in a VXI slot, with its logical address set to 24, you would enter the value `70903` for the address.

Two instrument drivers are provided to help you find the correct addresses for VXI devices connected by means of an HP-IB command module:

- Use the `hpe140x.cid` driver to locate VXI devices connected by means of an HP E1405 or HP E1406 HP-IB Command Module in a C-size VXI card cage.
- Use the `hpe1300a.cid` driver to locate VXI devices connected by means of an HP E1306 HP-IB Command Module in a B-size VXI card cage. (This driver also supports the HP E1300 and HP E1301 B-Size VXI Mainframes, which include built-in command modules.)

To use either of these drivers, add an instrument panel for the driver as described in the "Controlling Instruments" chapter of *How to Use HP VEE*.

NOTE

Do not enter a sub address value for VXI devices, except for modules in a VXI switch box. Refer to the next section for details.

To Set Address/Sub Address Values

Most HP-IB, GPIB, and VXI devices do not use sub addresses. Do not enter a value in the `Sub Address` field of the `Instrument Driver Configuration` dialog box unless you are accessing a VXI switch box, or one of the card cage devices that uses sub addresses (for example, the HP 3235A Switch/Test Unit or the HP 3488A Switch/Control Unit).

NOTE

Sub address values are used only if you are using an HP Instrument Driver for a device that supports sub addresses. Do not use sub address values if you are using Direct I/O.

Let's look at a couple of examples:

- If you are accessing a module in an HP 3235A Switch/Test Unit, enter the HP-IB or GPIB address of the 3235A itself in the `Address` field of the `Device Configuration` dialog box (for example, `701`). Enter the sub address of the individual module in the `Sub Address` field of the `Instrument Driver Configuration` dialog box. For information on what to put in the `Sub Address` field, refer to the online help for the HP 3235A instrument driver (`Help` ⟹ `Instruments`).
- If you are accessing a module in a VXI switch box, enter the HP-IB or GPIB address of the switch box (for example, `70902`) in the `Address` field, and the sub address of the individual module in the `Sub Address` field. For information on what to put in the `Sub Address` field, refer to the online help for the VXI switch box instrument driver.

To Address the VXI Backplane Directly (EPC-7, EPC-8, or VXLink Only)

HP VEE RunOnly for Windows can address the VXI backplane directly for the following systems:

- An EPC-7 or EPC-8 VXI Controller, provided the EPConnect software is installed.
- A PC connected to a VXI card cage using an E1383A or E1483A VXLink (ISA-to-VXI) interface, provided the EPConnect software is installed.

In either case, HP VEE RunOnly for Windows assigns select code 16 to the VXI backplane. The address for a VXI device is simply the select code (16) with the logical address of the VXI device appended. Let's look at an example:

Suppose you have installed an EPC-7 VXI Controller and an HP 1411B Digital Multimeter in your VXI card cage. If the logical address of the HP 1411B is set to 24 (as described in the HP 1411B manual), the VXI address is `16024`. Note that you do not divide the logical address by 8 as you would if you were accessing the VXI device through the HP-IB, as described earlier in this chapter.

Excluding Address Space (HP 82335 HP-IB Card Only)

If you are using an HP 82335 HP-IB Card, which uses memory-mapped I/O addressing, you must exclude the address space required by the HP-IB so that memory manager programs won't try to use that space. *The HP 82340 and HP 82341 HP-IB Cards, and the National Instruments GPIB cards do not use memory-mapped I/O addressing, so this section does not apply to those cards.*

Install the HP 82335 HP-IB Card, following the instructions that came with it. The HP 82335 is pre-set at the factory for select code 7, but the instructions tell you how to change this setting. Normally you should use select code 7. However, if you are using more than one HP 82335 HP-IB card, each card must be set for a different select code in the range 3 through 7.

Once you have installed the HP 82335 HP-IB Card, do the following:

1. Add the appropriate line for your select code to the `[386Enh]` section of your SYSTEM.INI file (in the C:\WINDOWS directory):

For Select Code:	Add to SYSTEM.INI:
3	`EMMEXCLUDE=0CC00-0CFFF`
4	`EMMEXCLUDE=0D000-0D3FF`
5	`EMMEXCLUDE=0D400-0D7FF`
6	`EMMEXCLUDE=0D800-0DBFF`
7 (default)	`EMMEXCLUDE=0DC00-0DFFF`

2. If there is a memory manager DEVICE line (for example, `DEVICE=EMM386.EXE`) in the CONFIG.SYS file (in the root directory), you need to modify it. Add a parameter to exclude the address space (for example, `X=DC00-DFFF` for select code 7), as shown in the following table:

For Select Code:	Modify in CONFIG.SYS:
3	`DEVICE=EMM386.EXE X=CC00-CFFF`
4	`DEVICE=EMM386.EXE X=D000-D3FF`
5	`DEVICE=EMM386.EXE X=D400-D7FF`
6	`DEVICE=EMM386.EXE X=D800-DBFF`
7 (default)	`DEVICE=EMM386.EXE X=DC00-DFFF`

3. Reboot your computer (press Ctrl+Alt+Delete) and restart Windows.

If you have installed multiple HP 82335 HP-IB Cards, you must exclude address space for each of them. For example, if you have installed two cards, set to select codes 3 and 7, you'll need to add both of the following lines to the `[386Enh]` section of SYSTEM.INI:

```
EMMEXCLUDE=0CC00-0CFFF
EMMEXCLUDE=0DC00-0DFFF
```

Also, if your CONFIG.SYS file contains the DEVICE line for EMM386.EXE, you must add parameters to it as shown below:

```
DEVICE=EMM386.EXE X=CC00-CFFF X=DC00-DFFF
```

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