

WinDriver™ USB Quick Start Guide

A 5-Minute introduction to writing USB device drivers

Who should use WinDriver?

1. Hardware developers – Use Driver Wizard to quickly test your new hardware.
2. Software developers – Use Driver Wizard to generate the device driver code to drive your hardware. Use the WinDriver tools to test and debug your driver.

Which operating systems does WinDriver for USB support?

1. Windows 98/Me/2000/XP/Server2003/CE.NET and Linux.
There is also a separate version of WinDriver for Windows NT 4.0.
Check the Jungo web site for updates on new operating systems support.
2. WinDriver based drivers are portable between all supported operating systems without any code modifications.

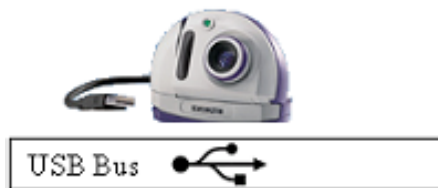
Where can I get more in-depth information?

1. You can download a free, full-featured, 30 days evaluation of WinDriver, including documentation, from our web site: <http://www.jungo.com/download.html>
2. For white papers, user manuals, and other documentation, visit Jungo's on-line documentation page: <http://www.jungo.com/support/manuals.html>

8 steps to building your driver:

1. Set Up

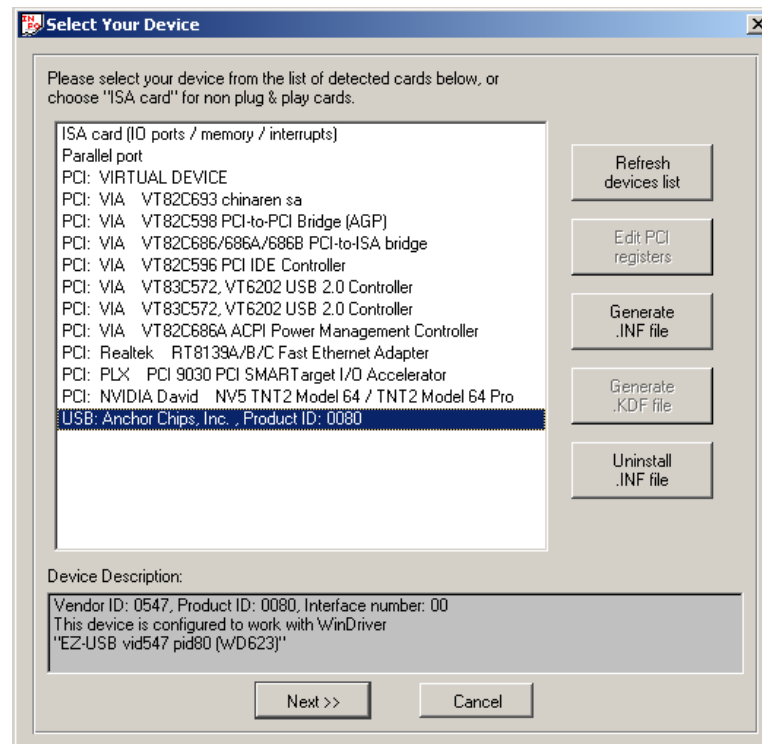
- (1) Plug your device to the USB bus



- (2) Install WinDriver

2. Select your device

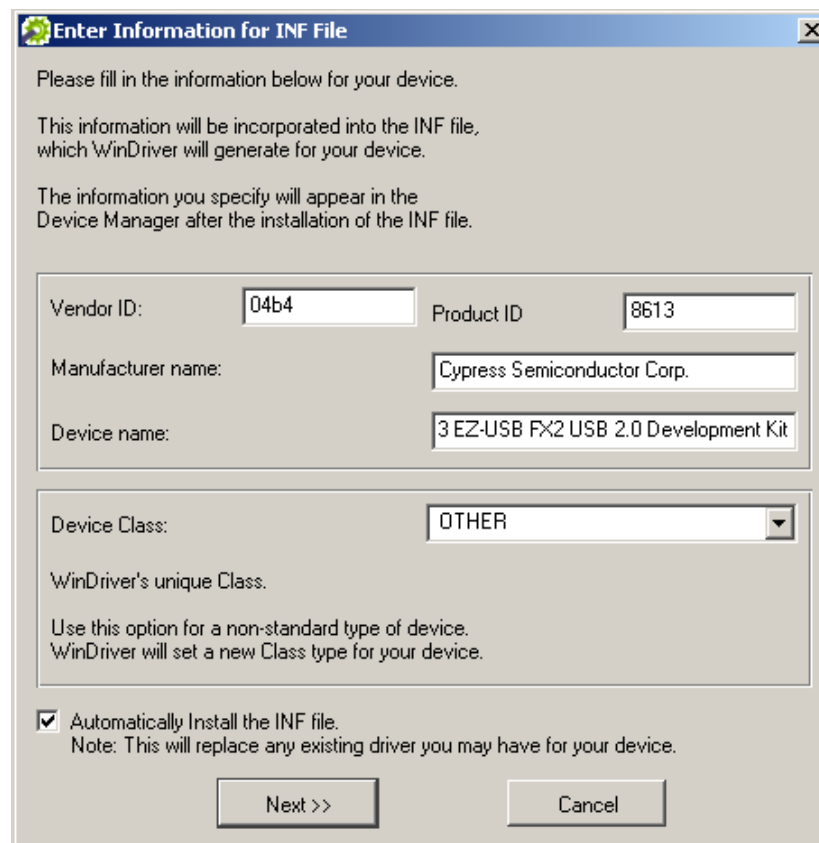
- (1) Start DriverWizard by choosing **WinDriver | DriverWizard** from Windows **Start** Menu.
- (2) In the dialogue box that appears, choose **New device driver project**.
- (3) DriverWizard will show all Plug-and-Play cards plugged in your machine.



- (4) Select your USB device from the list.

3. Generate an INF File for your Device

- (1) You must generate an INF file to for your developed driver and in some cases you will need to generate an INF file to enable DriverWizard to diagnose your device (for example, when no driver is installed for your USB device). DriverWizard automates this process for you and will notify you of the need to generate an INF file. If you click **Next** and such a notice doesn't appear, skip this step and proceed to the next one.
- (2) Click the **Generate .INF file** button or click **Next**.
- (3) DriverWizard will display information detected for your device – Vendor ID, Product ID, Device Class, manufacturer name and device name – and allow you to modify this information.



Enter Information for INF File

Please fill in the information below for your device.

This information will be incorporated into the INF file, which WinDriver will generate for your device.

The information you specify will appear in the Device Manager after the installation of the INF file.

Vendor ID: Product ID:

Manufacturer name:

Device name:

Device Class:

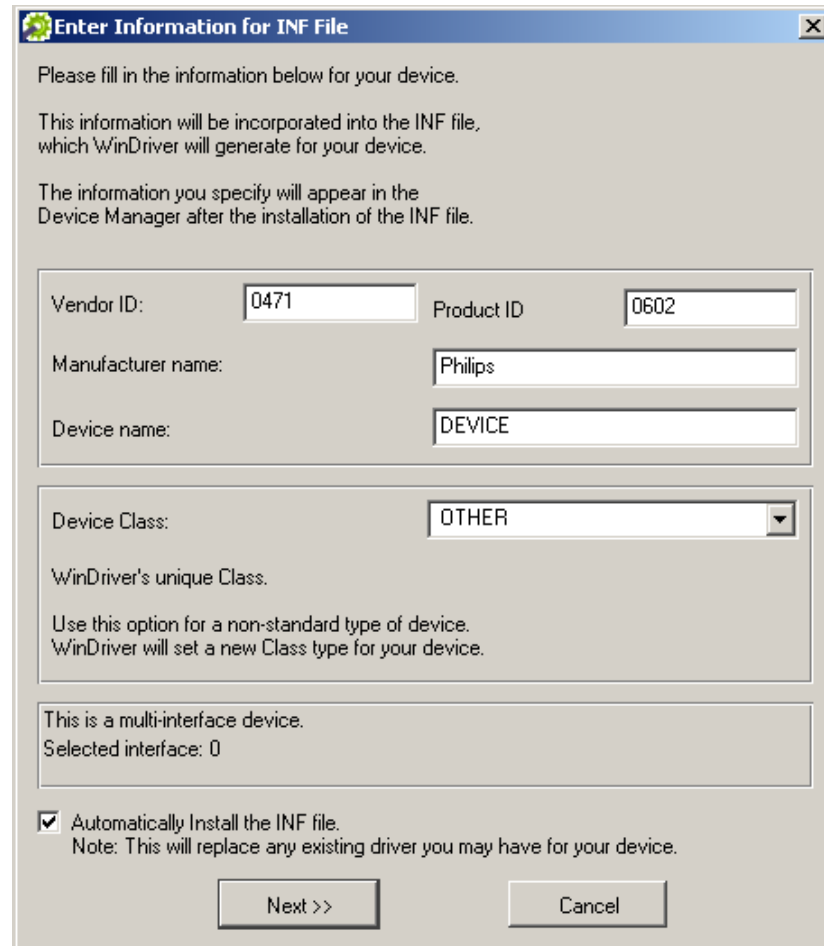
WinDriver's unique Class.

Use this option for a non-standard type of device. WinDriver will set a new Class type for your device.

☒ Automatically Install the INF file.
Note: This will replace any existing driver you may have for your device.

For **multiple-interface** USB devices, you can select to generate an INF file either for the composite device or for a specific interface.

- When selecting to generate an INF file for a specific interface of a multi-interface USB device the INF information dialogue will indicate for which interface the INF file is generated.



Enter Information for INF File

Please fill in the information below for your device.

This information will be incorporated into the INF file, which WinDriver will generate for your device.

The information you specify will appear in the Device Manager after the installation of the INF file.

Vendor ID: Product ID:

Manufacturer name:

Device name:

Device Class:

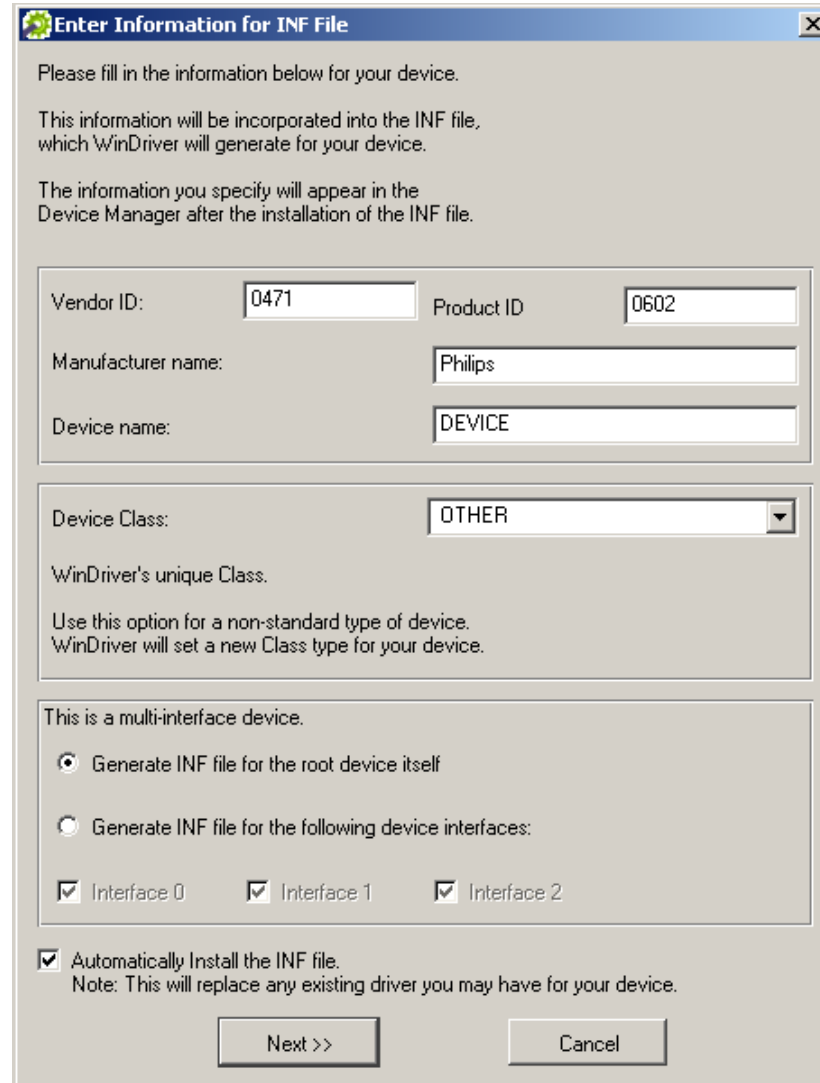
WinDriver's unique Class.

Use this option for a non-standard type of device. WinDriver will set a new Class type for your device.

This is a multi-interface device.
Selected interface: 0

☒ Automatically Install the INF file.
Note: This will replace any existing driver you may have for your device.

- When selecting to generate an INF file for a composite device of a multi-interface USB device, the INF information dialogue provides you with the option to either generate an INF file for the root device itself, or generate an INF file for specific interfaces, which you can select from the dialogue.



Enter Information for INF File

Please fill in the information below for your device.

This information will be incorporated into the INF file, which WinDriver will generate for your device.

The information you specify will appear in the Device Manager after the installation of the INF file.

Vendor ID: Product ID:

Manufacturer name:

Device name:

Device Class:

WinDriver's unique Class.

Use this option for a non-standard type of device. WinDriver will set a new Class type for your device.

This is a multi-interface device.

☒ Generate INF file for the root device itself

☐ Generate INF file for the following device interfaces:

☒ Interface 0 ☒ Interface 1 ☒ Interface 2

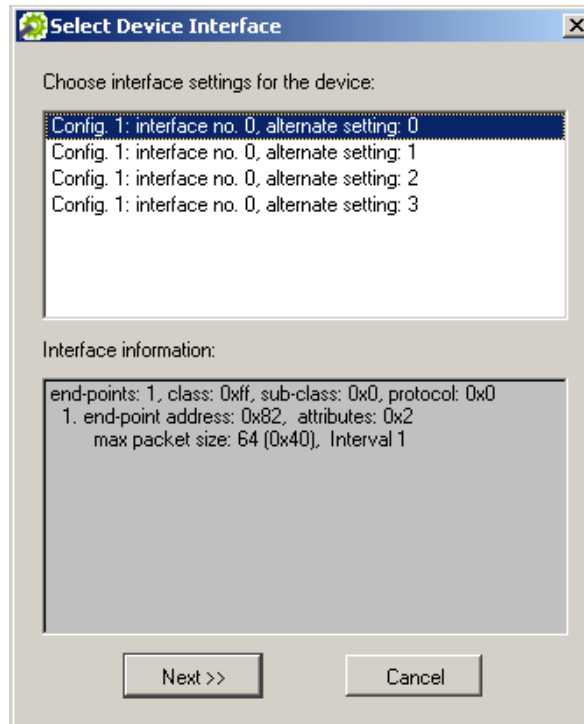
☒ Automatically Install the INF file.
Note: This will replace any existing driver you may have for your device.

- (4) On **Windows 2000/XP/Server 2003** you can choose to automatically install the INF file from the DriverWizard by checking the **Automatically Install the INF file** option in the DriverWizard's INF generation dialogue. On **Windows 98/Me** you must install the INF file manually, using Windows **Add New Hardware Wizard** or **Upgrade Device Driver Wizard**, as explained in the WinDriver documentation. If the automatic INF file installation on Windows 2000/XP/Server 2003 fails, DriverWizard will notify you and provide manual installation instructions for this operating system as well.
- (5) Click **Next** in the INF generation dialogue in order to generate the INF file and install it (if selected).

- (6) When the INF file installation completes, select and open your device from the list described in step 2 above.

4. Open your hardware device

- (1) Choose the desired **alternate setting** from the list.

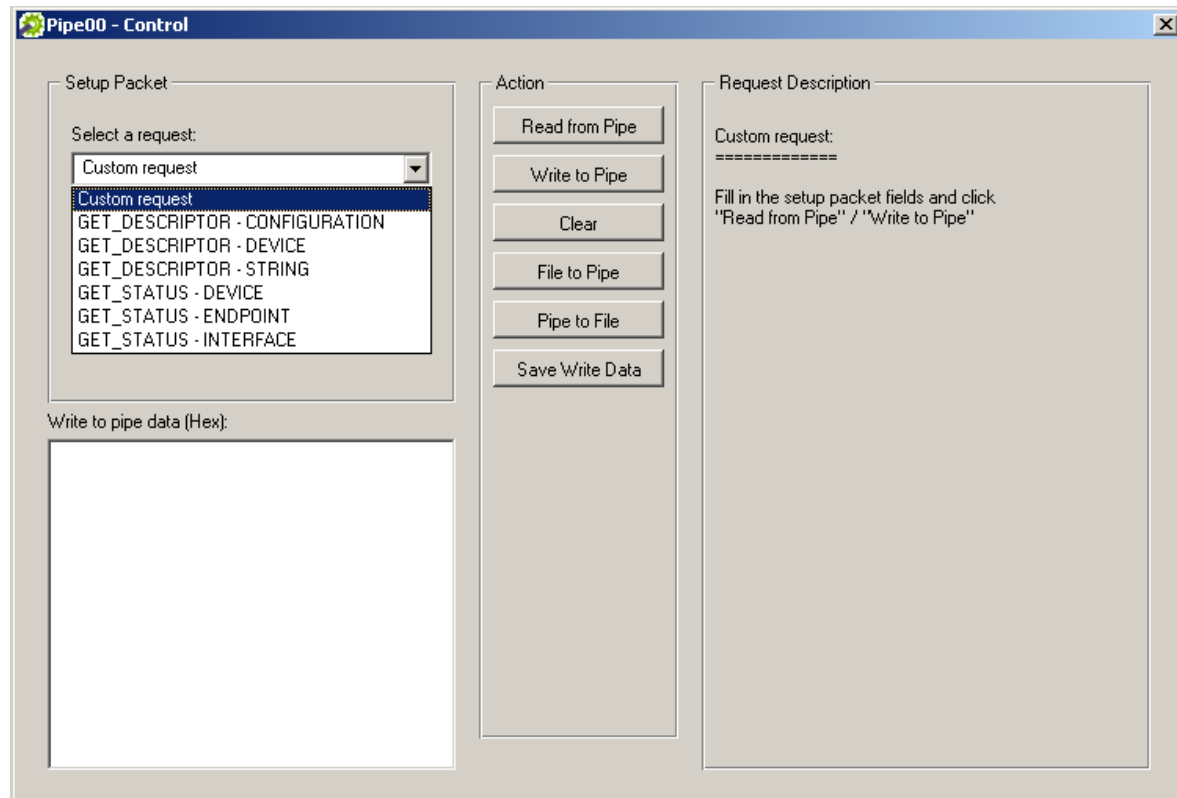


- (2) For USB devices with only one alternate setting, DriverWizard automatically selects the detected configuration and the **Interface Selection** screen will not be displayed.

5. Test your hardware

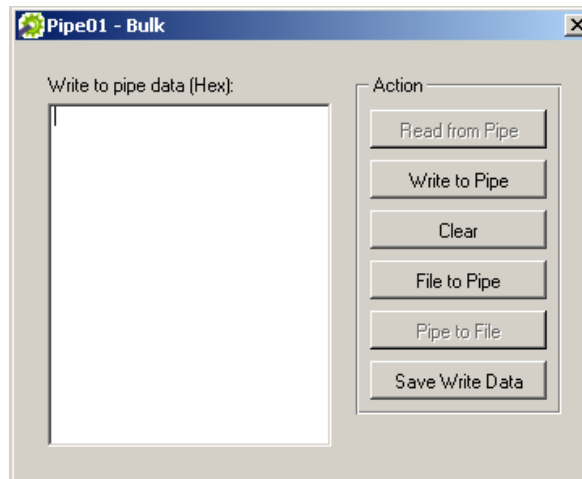
Before generating your device driver code, it is important to make sure your hardware is working as expected. Use DriverWizard to diagnose your hardware:

- Select the desired pipe.
- For a control pipe (a bidirectional pipe), click **Read/Write to Pipe**. A new dialogue box will appear, allowing you to select a standard USB request or enter a custom request. Once you select a standard USB request, the setup packet array is automatically filled, and the request description is displayed in the dialogue box. For a custom request, you are required to enter a setup packet and write operation data.



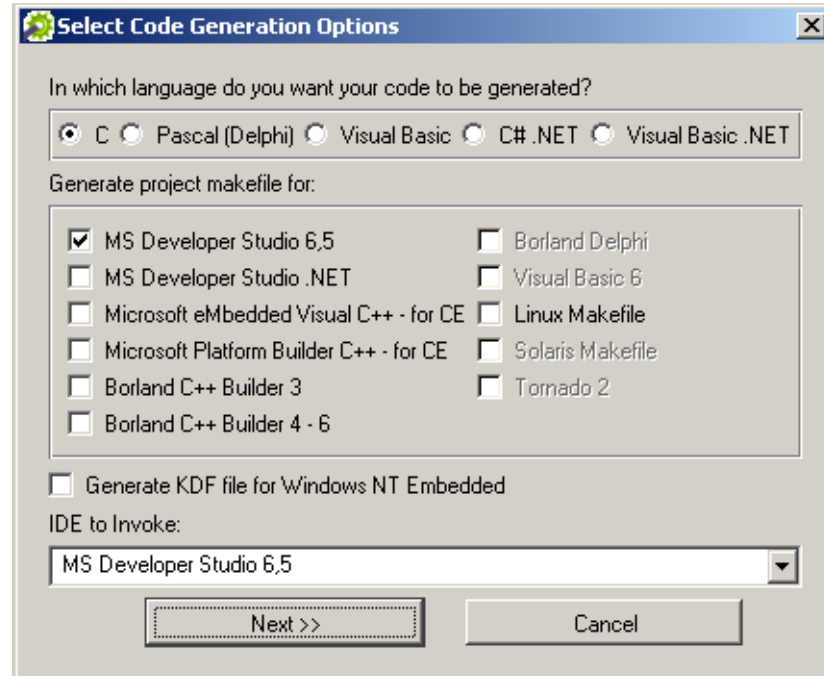
- For an input pipe (moves data from device to host), click **Listen to Pipe**. To successfully accomplish this operation, first you need to verify that the device sends data to the host. If no data is sent after listening for a short period of time, DriverWizard will notify you that the **Transfer Failed**.
- To stop reading, click **Stop Listen to Pipe**.

- For an output pipe (moves data from host to device), click **Write to Pipe**. A new dialogue box will appear, asking you to enter the data to write. The DriverWizard log will contain the result of the operation.



6. Generate the Driver Code

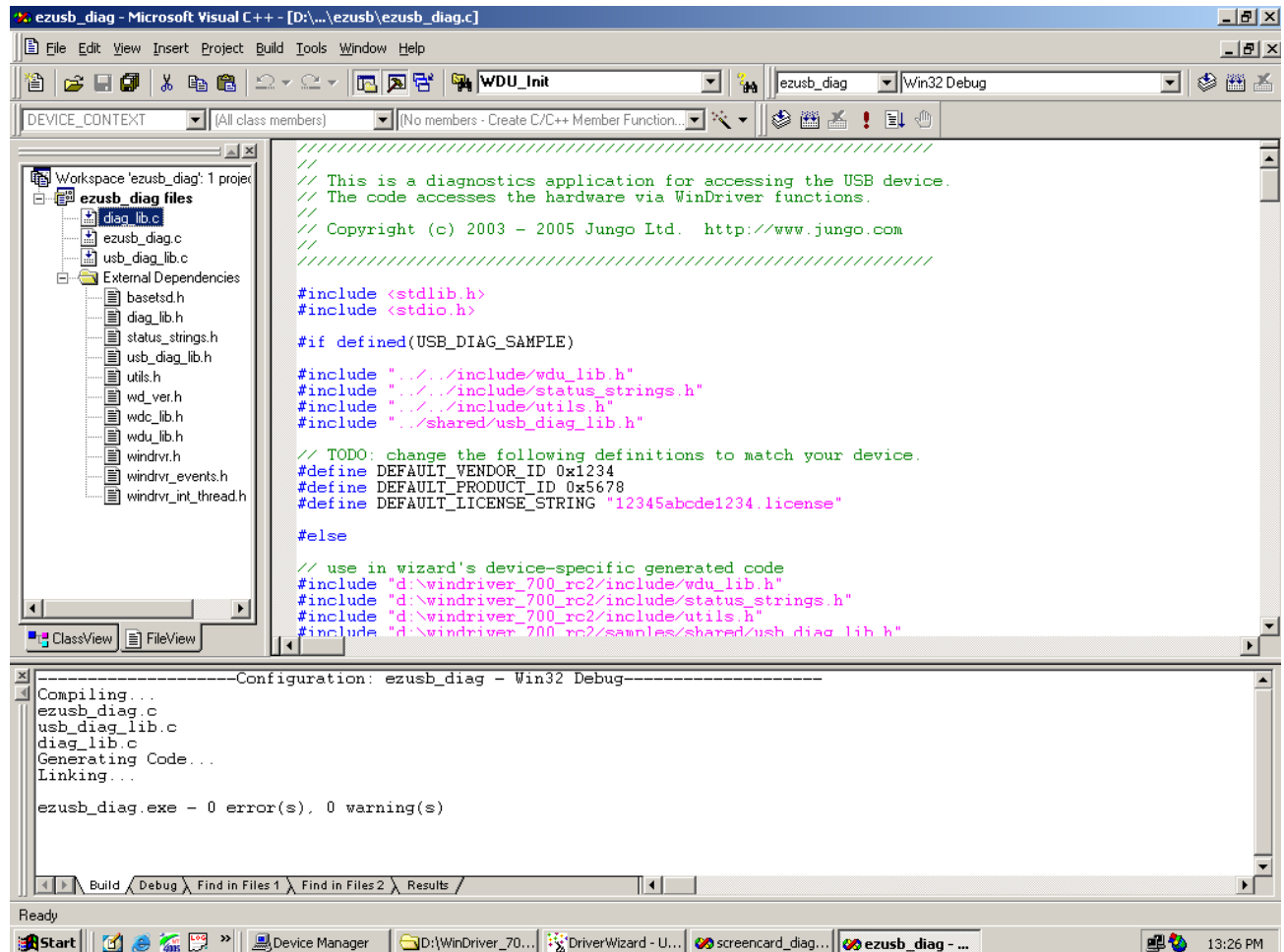
- (1) Select **Generate Code** from the **Build** menu, or click **Next** in the **Define and Test Resources for Your Device** dialogue box.
- (2) Select **WinDriver** in the **Choose Type of Driver** dialogue box.
- (3) Choose the code language and indicate which development environments you would like to have project files for:



- (4) Save your project (if required) and click **OK** to open your development environment with the generated driver.
- (5) Close DriverWizard.

7. Compile and run

- The following code is generated:
 - API for accessing your hardware from the application level (and from the kernel).
 - A sample application that uses the above API to access your hardware.
 - Project make files for all of the supported operating systems and environments.
 - An INF file for your device.



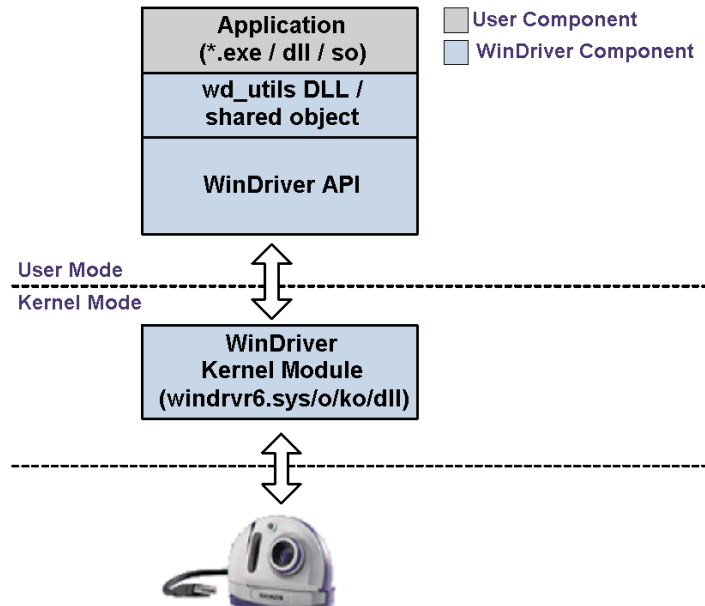
- Use the make file that DriverWizard generated with your favorite compiler.
- Compile the sample diagnostics application, and run it! This sample is a robust skeletal code for your final driver.
- Modify the sample application to suit your application needs, or start from one of the many samples provided with WinDriver.

Questions & Answers:

Q: How does WinDriver work?

A: With WinDriver, your device driver is developed in user mode (as part of your application or as a separate DLL). This dramatically shortens development time by enabling you to use your standard 32 bit tools (MSDEV, Borland, Delphi, Visual Basic etc.) to develop and debug your driver.

The device driver developed with WinDriver (YourApp.EXE) accesses your hardware through the WinDriver kernel module (windrvr6.sys) using the standard WinDriver functions.



Q: What is an INF file?

A: Device information (.INF) files are text files, that provide information used by the Plug-and-Play mechanism on Windows 98/Me/2000/XP/Server 2003 to install software that supports a given hardware device. INF files are required for Plug-and-Play hardware, such as USB devices. The INF file includes all necessary information about the device(s) and the files to be installed. When hardware manufactures introduce new products, they must create INF files to explicitly define the resources and files required for each class of device. In some cases INF files supplied with the operating system will suit your device. In other cases, you will need to create an INF file for your device. DriverWizard can generate a specific INF file for your device, which registers it to work with your driver (i.e. with WinDriver).

Q: Why should I create an .INF file?**A:** For the following reasons:

- To enable the DriverWizard to access your USB devices.
- To stop the Windows **Found New Hardware Wizard** from popping up after each boot.
- To ensure that the operating system can assign physical addresses to a USB device.
- To load the new driver created for the device.
An INF file must be created whenever developing a new driver for Plug and Play hardware that will be installed on a Plug-and-Play system.
- To replace the existing driver with a new one.