Videovision installation instructions for Windows

IMPORTANT NOTICE:

The Videovision system requires that your PC has two independent USB 2.0 host controllers. Check with the uEye Camera Manager after installing the uEye drivers (see below).

WARNING

Do not turn the micro lenses beyond the focus! You could damage the internal IR filter.

INSTALLATION:

1. Install the main uEye drivers for USB from the driver package `uEye_35000.exe` before connecting the cameras to the computer:
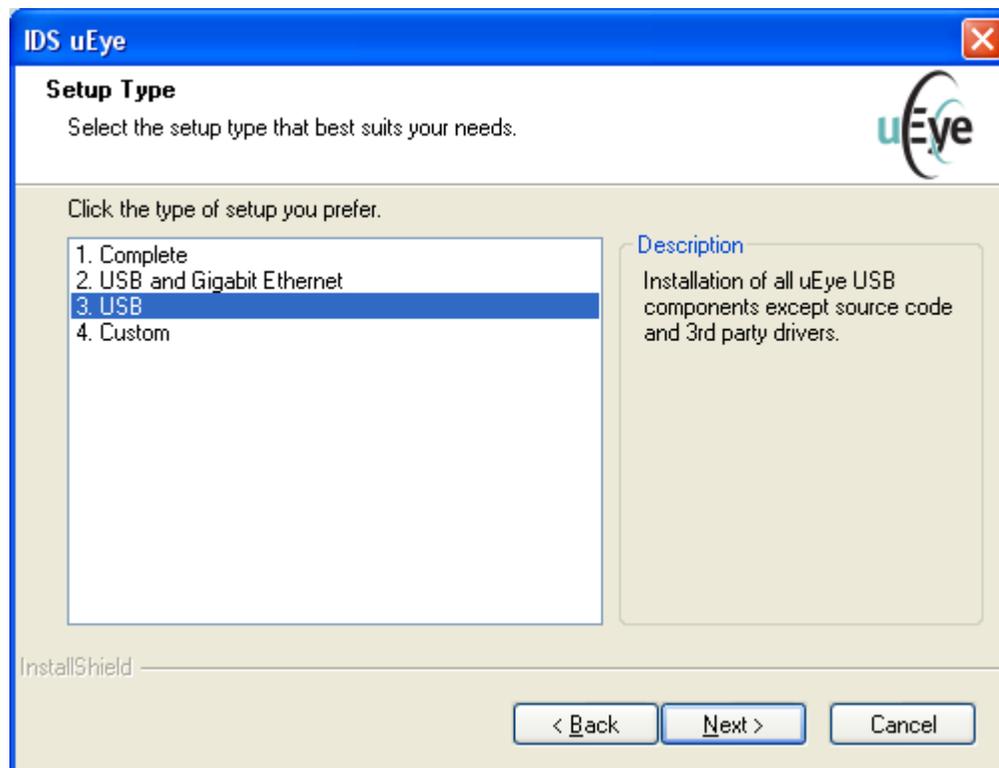
Follow the instructions on the screen.

2. Connect the cameras to the computer and install camera drivers from uEye CD. "found new hardware"(drivers have to be installed twice per camera and USB connection, follow screen instructions):

Hardware Installation

⚠ The software you are installing for this hardware:

uEye boot

has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)

Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.

[Continue Anyway] [STOP Installation]

Found New Hardware Wizard

Completing the Found New Hardware Wizard

The wizard has finished installing the software for:

uEye boot

Click Finish to close the wizard.

[< Back] [Finish] [Cancel]

3. Make sure that both cameras are connected to two different USB 2.0 controllers for bandwidth optimization. Use `UVCView.x86.exe or CheckUSB.exe` (both are included) to verify:
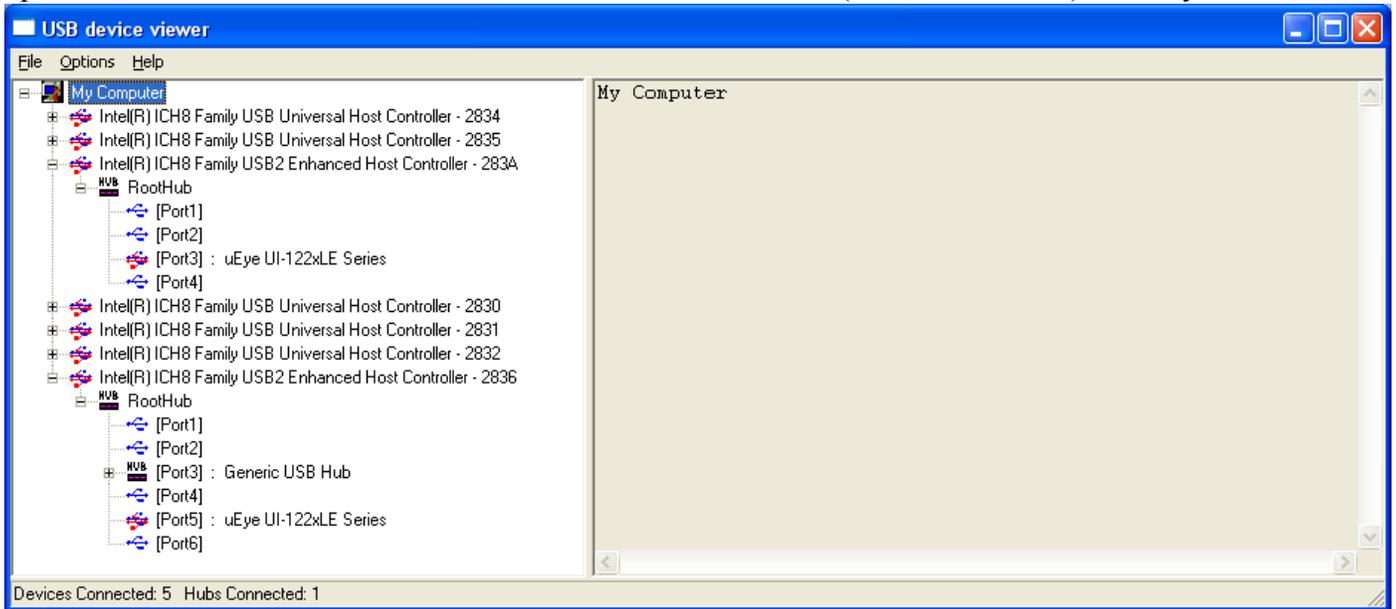
3. Run "Camera Information" inside the uEye Camera Manager to set the camera IDs to 1 and 2 respectively if they have not been preset already. If the left and right eye view in the HMD are switched, you will need to exchange the camera IDs.
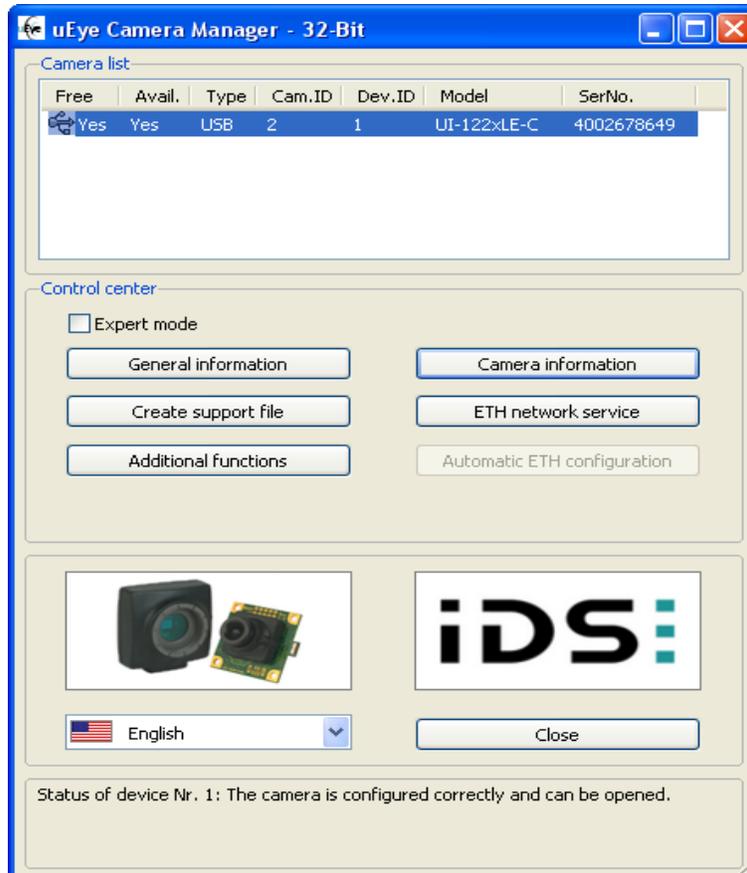
4. Install Vizard if it is not installed already on the rendering machine. Next install the Videovision plugin for Vizard by running `VideoVision_2.00.0000.exe`.

TESTING:

The following basic Vizard scripts are included to verify the operation of the system. Each directory also includes the `vvwraper.py` script which is an abstraction layer for ARToolkit. You can edit it to toggle between stereo and mono mode, invert images, adjust thresholds amnually etc.

`VideoVision-Orca.py:`

A Vizard script to run with an NVisor SX HMD. A whale will swim through your field of view. The split screen on the monitor shows left and right view of the HMD. In Vizard, press F2 to toggle between full screen mode and window view.

`Videovision-MiniCooper.py:`

A Vizard script for use with an NVisor SX in connection with an Intersense IC2 inertial orientation sensor. Look through the windows of a MiniCooper and see avatars waving at you. Move your viewpoint with the mouse or Intersense.

`VideoVision-SteerablePolys.py:`

A Vizard script that shows both camera views as video texture, set cam id correctly to 1 and 2.

`VideoVision-StereoHMD.py:`

Standard HMD application for HMDs operated with horizontal span, brings full screen video feed to the HMD.

`ARToolkit-VideoVision-DesertMedic.py:`

Demo which shows the functionality of Videovision in connection with AR Toolkit (the unlicensed version will run for a few minutes and is watermarked). Print the fiducials `32.pdf`, `33.pdf`, `34.pdf` and the multipattern `pattmulti.pdf` on paper. Once you have attached the Videovision device to the HMD and look at the fiducials, these will be replaced with GC content (moving avatar, helicopter, tank and a desert city). Light conditions and focus are important for a reliable identification of the markers (fiducials). Please see the Vizard help file for creating and printing a set of fiducials.

PARAMETERS:

Vizard searches automatically for the camera parameter file `viz_ueye.ini` in the current project folder and loads it. If it cannot find it it will use default values for the camera settings, which might lead to non optimal image settings.

It is helpful to use the "uEye Demo" program to find the best parameters possible for a given lighting situation (mostly highest frame rate). Open up the camera properties dialog and tweak the settings such as gain, exposure time, etc:
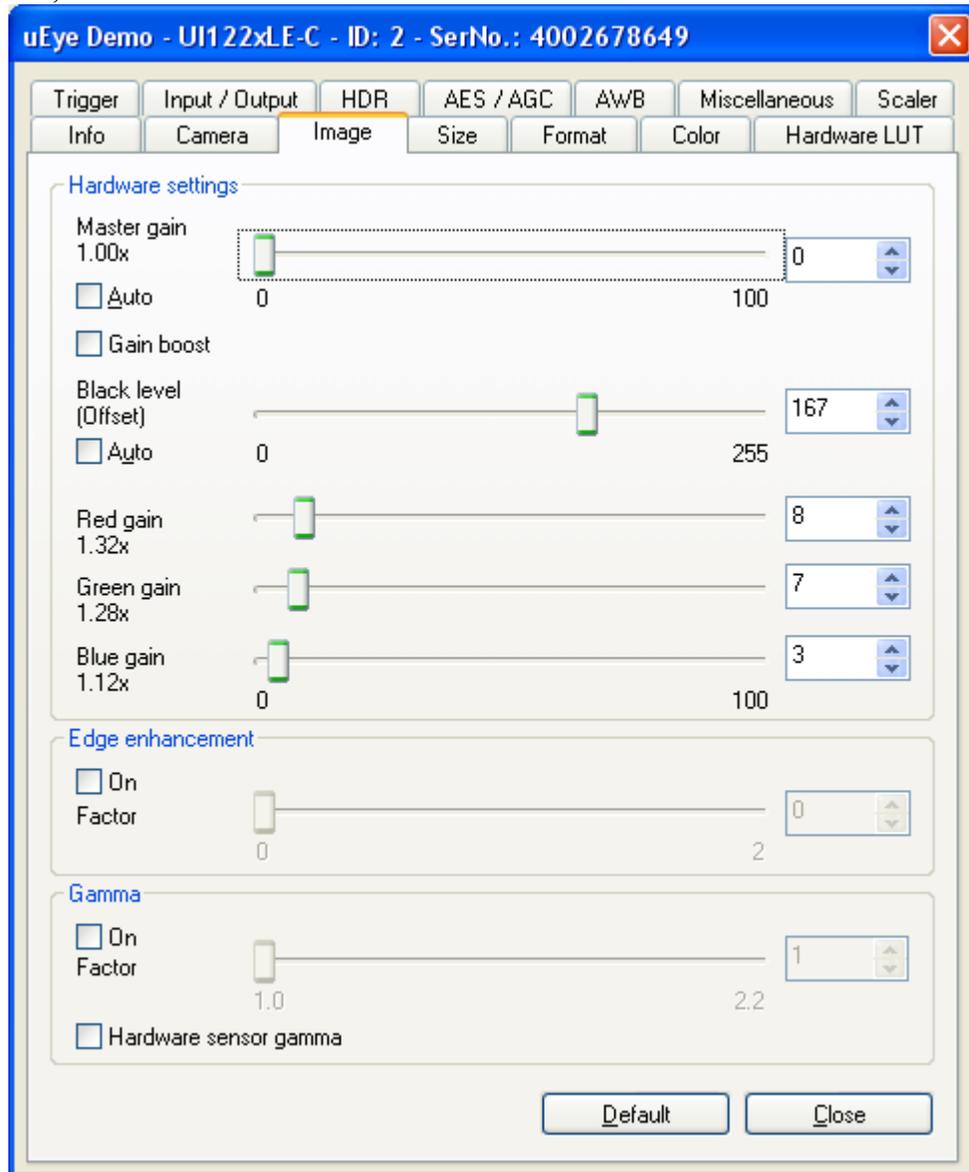
Important settings include:
- Area of interest (should be set to 640 x 480)
- Timing settings (pixel clock, exposure time, frame rate)
- Color, contrast , brightness, gain, etc.

Use the File > Save parameters > To File dialog to save your individual parameters into a file. Open that file and copy paste the settings into the `viz_ueye.ini` file. Good lighting conditions are crucial for the AR Toolkit functionality.

SYNCHRONIZED OPERATION (only available for the synchronized version of Videovision):

Connect the Vsync breakout dongle (VGA male/female pass through) to the graphics card of your PC and attached the monitor VGA cable to the other end. The cameras will be synchronized through the Vsync pulse via the Y-splitter of the sync cables. Synchronizing is is enabled in Vizard via the setTriggerMode command:

Disable triggering:
```
cam1.setTriggerMode (0)
cam2.setTriggerMode (0)
```

Enable triggering:
```
cam1.setTriggerMode (1)
cam2.setTriggerMode (1)
```

See the `VideoVision-MiniCooper.py` file for an example.
Using the synchronization function will have an impact on the frame rate, as the camera is not ready to receive a new trigger when processing an image.