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# **VR Manager 4**

**User Guide**

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**Read the Safety and Warranty information before proceeding.**

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# VR Manager 4 Introduction

This User Guide provides instructions, and reference information relevant to VR Manager software, version 4 and later.

## Overview

VR Manager is a software application that provides head tracker and stereoscopic 3D video support for Vuzix video eyewear products connected to a Windows based personal computer.

When launched, VR Manager 4 inspects your system for attached Vuzix hardware. The features, options and capabilities available will vary dependent upon the model of eyewear connected to your computer. Some aspects of the software demonstrated in this manual may not be available to your eyewear model.

## VR Manager Sections

VR Manager is divided into four sections; Calibrator, Monitor, Creator and Misc. Tools. Depending upon your needs, you may not have reason to use all of these.

### *Calibrator*

This tool enables accurate calibration of the Vuzix head tracker incorporated into or plugged into your Vuzix video eyewear. It recognizes the various models of Vuzix trackers, provides a calibration process and saves the calibration values.

### *Monitor*

VR capabilities such as 3D video and head tracking support can be incorporated directly into an applications code or, in some cases, enabled through an external Extension, such as those provided with VR Manager. A broad assortment of these Extensions are provided along with the means to identify supported applications and load the required resources.

### *Creator*

Creator is an innovative resource that allows you to create your own Extensions to enable 3D video and/or head tracking in games and simulators not already supported. No programming is required, just the selection of the right combination of available settings and parameters.

### *Misc. Tools*

This resource provides technical information and enables you to trouble shoot VR Manager and related problems, should they occur.

### **System requirements**

- Desktop or laptop computer with Microsoft Windows 8, Windows 7, Vista or XP operating system (32-bit or 64-bit)
- Windows compatible Vuzix eyewear

### **Downloads & Updates**

Vuzix provides online access to complete sets of software and documentation for individual Vuzix eyewear models as well as each of these as individual components.

- To download a complete, product specific, set of software and documentation, go to: [www.vuzix.com/DD](http://www.vuzix.com/DD)
- To download individual files and/or updates, go to: [www.vuzix.com/downloads](http://www.vuzix.com/downloads)

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# Installation

This section of the User Guide leads you through the installation of VR Manager onto a Windows based personal computer. In some cases, the VR Manager installation process may be combined with a larger suite of software. The following instructions demonstrate the install process when running an independent VR Manager installer.

## VR Manager Install

*If VR Manager is currently installed on your computer, we suggest uninstalling it prior to running the new installation process.*

The specific name and location of your VR Manager install program may vary. This information will be contained in the “Read Me.txt” file accompanying the installation program. For demonstration purposes, we’ll refer to the VR Manager installation program as “installer.exe”.

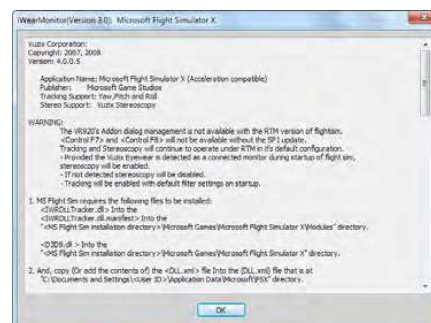
- Run the “installer.exe” program and follow the onscreen instructions.

The installation process varies from one version of the Windows operating system to another. The installation program identifies the system on your computer and adjusts to its requirements.

You may be requested to perform certain actions or grant permissions during the installation. The requested actions must be completed to accomplish a successful installation.

When the installation is complete, connect your Vuzix video eyewear and run the “Vuzix VR Manager.exe” application.

The first time VR Manager is run it will display an information screen.



Press the “OK” button to dismiss the information screen and access the programs resources.

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# Calibrator

*Gyroscopes were not used in “iWear” models and hence this capability won’t be available to those eyewear products.*

*Concentrations of ferrous metal or devices that emits a magnetic field will effect your tracker’s calibration. Minimize the proximity of your tracker to theses elements to improve its accuracy.*

Head trackers utilize multiple sensors to track movement and direction. A number of these, such as gyroscopic and magnetics sensors, require calibration to ensure they provide accurate data. Some, like the gyroscopic sensors, only require calibration when connected to a new or different computer. Others, such as magnetometers, are affected by the constantly changing magnetic fields around us and require more frequent calibration. They require a full recalibration whenever the magnetic elements around you change and can benefit from re-calibration or a zero reset even more often for the greatest accuracy possible.

## Gyro Reset

The first time you run VR Manager with a tracker connected, it will ascertain if a gyro reset is required automatically initiate the process.

When the Reset Gyros screen appears:

- Place the Wrap eyewear flat on your desk facing your computer.
- Do not move the eyewear while the gyro reset is being performed.
- Follow the on-screen instructions.

You’ll be informed when the reset is complete.

A Gyro Reset can be manually initiated from the Misc. Tools section.

## Calibration

Magnetic sensors in tracker require calibration prior to its initial use and whenever there is a significant change in its operating environment.

To achieve an accurate calibration, minimize earphone movement (they have magnets in them) and position your eyewear as close as possible to the position in which it will be used.

To calibrate the tracker’s magnetic sensors:

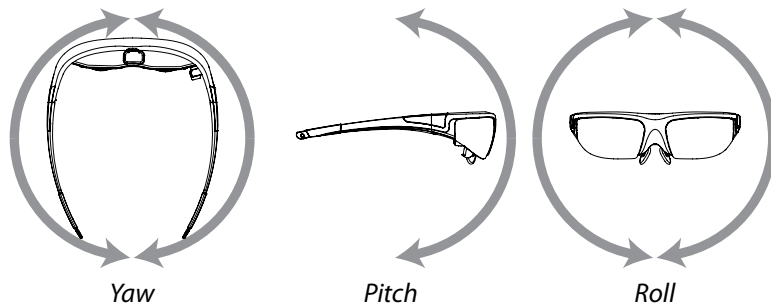
- Connect tracker-enabled eyewear to your computer and run the VR Manager software.

VR Manager will open to its Calibrator screen.

- Press the “Begin Calibration” button.



- Position your eyewear as near as possible to where they will be when worn.
- Rotate the eyewear, as illustrated below, going beyond a full 360° rotation to ensure the full range of motion is captured.



Continue to rotate the eyewear through all axes until all movement of the indicated progress bars cease. The indicator bars will not fill completely – this is normal.

- When the indicator bars stop moving, press the “Lock Calibration” button.





The last step in the calibration process is to set a “zero” or home position, your natural orientation when looking level and straight ahead while using the eyewear.

- Put on your eyewear and sit in the position and face the direction of their normal use.

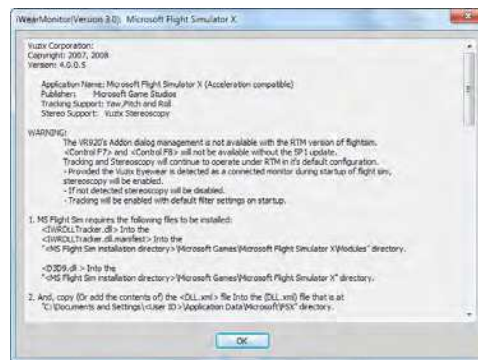


- Press the “Set Zero” button to lock the home position.

The calibration process is complete. The circle indicators to the right of the Set Zero button will move relative to your head movement.



*The contents of Extension Note vary but often describe the capabilities, configuration, and manual installation information.*



Not all Vuzix Extension includes both stereoscopic 3D video and tracking support. Some Extensions support only one and some include support for additional features and capabilities, such as Hot Keys for zooming in your view. This and other important information is contained in the Extension Notes.

You can also right-click an Extension and choose “View Extension Notes.”

## Enabling Extensions

*Tracking and/or stereoscopic 3D video support will not be available for use if the Extension has not been enabled.*

Vuzix Extensions are installed with VR Manager but are not automatically enabled. For an Extension to be used, the VR Manager must detect the appropriate directory and files for a title and load its Extension files.

To assist in Extension management, select the “Show Installed Titles Only” option. This option restricts the Extension List to displayed only titles detected as “installed”.

Likewise, you can restrict the displayed Titles to only Vuzix Extensions, omitting any Extensions authored through VR Manager’s Creator tool.

To enable a single Extension:

- Right-click each detected Extension (yellow) and choose “Enable Title Support” from the menu options.

To enable all Extensions:

- Press the “Enable All Detected” button to enable all the detected (yellow) Extension in a single action.

Enabled Extensions will display a green status indicator.

## Manual Application Detection

When installed, VR Manager searches for applications with matching Vuzix Extensions. It identifies the appropriate Extension with a yellow indicator, available

but not enabled. If an application is installed after VR Manager, you must manually initiate a title search for its Extension to be associated with the new program.

To manually initiate a Installed Software Detection:

- Press the “Refresh Installed Titles”.

In some cases, such as when a program is installed in a directory other than its default location, VR Manager may be unable to find it.

To manually locate an application’s file directory:

- Right-click on the Extension and choose “Browse for Directory” from the pop-up menu.
- Locate and select the application’s directory.

### **Importing Extensions**

Extension built in VR Manager’s Creator can be imported into your Titles list using the Creator’s “Import” button or by double-clicking the Creator extension’s (.vzx file) icon.

- To import an extension, press the Import button in the Creator.

Extensions imported while VR Manager is open may not automatically be displayed in the Titles list.

- Press the “Refresh Installed Titles” button to update the list.

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# Creator

Creator is a powerful VR Manager resource puts you in control of VR compatibility. This powerful tool empowers you to create your own Extensions, adding 3D video and head tracking support to games and simulation programs.

Creator uses an assortment functions inside Direct X and Open GL to operate and enable VR capabilities. If an application uses those functions it can be enabled for 3D video and/or head tracking support. If it does not use them, there is no means for Creator to “hook” into the application to enable VR features.

## Extension Types

Vuzix VR Manager supports two types of Extensions; Vuzix Extensions pre-installed in VR Manager and Creator Extensions built by you or other Vuzix eyewear users. Though these two Extension types are similar, Vuzix Extensions are locked and cannot be edited in VR Manager’s Creator.

## Using Creator

There is no standard method and set group of resources common to all programs so Creator provided a broad array of options to support the broadest range of applications. The downside of such broad support and the lack of technical documentation for each program mean Extension creation is mostly accomplished through trial and error.

Creator is divided into five sections:

<i>Application Data:</i>	Identifies the name and location of pertinent files and directories.
<i>Stereoscopy:</i>	Provides the control and options required to enable stereoscopy support.
<i>Tracker Settings:</i>	Provides the control and options required to enable head tracking support.
<i>Creator Buttons:</i>	Buttons that enable the saving, loading and testing of Creator extensions.
<i>Status:</i>	Provides feedback on save, load, test, and browse operations.



## Application Data

The Application Data section performs file identification functions as well as enables the import and export of Creator Extensions “.vzx” files.



A Creator Extension is comprised of a group of files saved in a directory (folder) titled by the name specified in the Extension Directory field. These files are located in C:/Program Files/Vuzix Corporation/VR Manager/[extension directory name]. The Extension’s configuration data is contained in a “.ini” file in that directory.

*Extension Directory:* Specifies the name of the Extension – the name used for an exported extension.

*Application Title:* Specifies the name of the effected game or application, but can be virtually anything you choose. This is the name under which the extension will be displayed in the Monitor’s Title list. If the name is not the same as the target application it should be recognizable to others.

*App. Exec. Directory:* The Application Executable Directory identifies the location of the target application's executable (.exe) file.

*File Browser Button:* Opens a file browser window for the manual selection of target files and folders.

*DLLs in diff. locations:* Select this identify .dll files located in a location separate from the executable.

*Location of App. DLLs:* Identifies the location of the .dll file (dynamic link library) if the application does not read the configuration from executable file's directory. (Often used by Steam applications.)

*Import / Export:* Enables Creator Extensions to be Imported and Exported.

## Stereoscopy

This section of Creator contains the controls and options to enable stereoscopic video support for an application.



The selection of the correct *Graphics API* and *Rendering Method* can be complex due to the number of possible combinations. Finding the correct combination is largely a process of trial and error, testing the results along the way.

Selecting a pair of Graphics API and Rendering Method options provides a list of Vuzix Extensions using that combination. This often provides guidance, as application developers often use the same or similar resources when developing other applications.

*Graphics API:* A drop list of the supported APIs - OpenGL, DirectX 8, and DirectX 9. "None" is also available for instances where none of the other API options work or if you choose not to enable stereoscopy.

*Rendering Method:* A drop list that varies based upon the current API selection. While the OpenGL and DirectX 8 API options provide only two Rendering Method each, DirectX 9 option provides 18 rendering methods. Combined they enable 22 possible methods of providing stereoscopy.

*IPD Value:* IPD (InterPupillary Distance) is the distance between a person's eyes, or virtual eyeballs in VR applications. If the IPD Value is increased the perception of depth increases.

There are no standards for stereoscopic depth in applications. Two applications may require very different IPD Values to deliver the same degree of depth perception. You'll have to determine the value that looks right to you.

*Side x Side Supported:* All Creator Extension support "frame sequential" stereoscopic video. When the Side x Side Supported option is selected (default), "side-by-side" 3D format used by Wrap and STAR video eyewear models, is also supported.

We recommend that all Extension support Side x Side.

*Import / Export:* Enables Creator Extensions to be Imported and Exported.

*Import / Export:* Enables Creator Extensions to be Imported and Exported.

## Tracker Settings

Setting up tracker support is similar to the stereoscopy setting but with only five methods to choose from.



*Style:* A drop list providing five tracker support method, plus "None" for when tracking is not enabled or when none of the available methods provide satisfactory results.

*Pitch & Yaw Mult.:* Pitch & Yaw Multiplier controls allow you to adjust the sensitivity of pitch (up/down tilt) and yaw (head rotation) movements.



## Creator Buttons

The following five buttons provide access to additional tools, options and resources.



*Save Extension:* Saves the Extension currently open in the Creator. Extensions cannot be saved without a file name.

*Load Extension:* Opens a file browse window displaying the contents of the VR Manager directory. Browse the Extension folders and select the “.ini” file for the Extension you wish to open in Creator.

*Create Notes:* Notes provide important information that may be vital to others using the Extension. By default, a Notes file is created for each Extension, though it is up to you to enter the data. We strongly encourage all Extension authors to enter the following information.

```
Authors Name: <name or pseudonym>
Extension Created: <date>
Application Name: <as published>
Publisher Name: <name of application publisher>
iWear Support:
-----
Stereoscopic video: <yes/no>
Tracking: <yes/no>
Wrap Support:
-----
Stereoscopic video: <yes/no>
Tracking: <yes/no>
Install and Configuration Information:
-----
<as required>
```

Providing this information will assist others in identifying and enjoying the extensions you have created.

*Test Configuration:* Enables Extensions to be tested while being developed.

The “Test Configuration” button is not available until a new Extension is saved or if an existing Extension loaded.

The target application needs to be run first before testing an Extension or using an Extension for that application with your Vuzix eyewear.

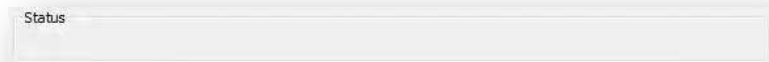
If you select an incompatible 3D mode or tracking mode the test function is where you find out. It is not unusual that choosing the wrong method can cause a blue screen and/or other program error conditions. If this happens, restart the VR manager and select a different method of support.

*Help:*

Opens a reference document describing the function of the Creator controls and provides tips and information helpful in the extension creation process.

## **Status**

The Status field may be blank or it may display status information relative to your current Creator task.



*Success:*

Indicates the operation performed successfully with no errors.

*Failure:*

Indicates critical information is missing and the operation was aborted.

*Warning/Error:*

Indicates an error has occurred but the operation was able to continue. The error may or may not affect the execution of the application or operation of the Extension.

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# Misc. Tools

Misc. Tools provides technical information and assistance in identifying and correcting problems with your Vuzix video eyewear and Extensions.

- Click on the VR Manager's "Misc. Tool" tab to access this portion of VR Manager.



### *Test Stereoscopy:*

Displays a stereoscopic image, enabling verification of the eyewear's ability to display 3D video. Some models of eyewear may have to be set to the SxS, 3D display mode.

Press the "esc" key to exit the stereoscopy test.

### *View Logfile:*

Displays a log file of recent VR Manager activity. Customer Service may request you open this file and provide them with its contents.

### *Technical Information:*

Provides technical information that may assist you in troubleshooting problems encountered with your eyewear and extension supported titles.

### *About VR Manager:*

Provides information on the current versions of supporting software and hardware firmware.

### *Enable on Startup:*

Causes VR Manager to load into the System Tray, providing an option to quickly launch the application.

### *Status:*

Displays video eyewear status information including driver and firmware version numbers.

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# Developer Tools and Support

Vuzix works with a large number of software developers, academic institutions, and researchers developing innovative applications. A number of SDKs (Software Development Kits) are available to assist their efforts.

## Vuzix AR/VR SDK for Windows

The “AR/VR SDK for Windows”, relevant to those using VR Manager, is available as a free download from the Vuzix website and can be used without royalty with non-competing private and commercial products.

This SDK is a set of development resources and examples that demonstrate the application of native support for special features and capabilities provided by a variety of Windows compatible models of Vuzix video eyewear.

### *SDK – Windows Version*

Vuzix AR/VR SDK examples are provided in: C++, C# and XNA

The Vuzix AR/VR SDK demonstrates support for:

OpenGL:	Full screen and windowed mode
DirectX:	Full screen and windowed mode
XNA:	Full screen and windowed mode

MFC windowed mode application, demonstrating head tracking only support.

### *Product ID*

The SDK demonstrates using "Product ID" to identify what products features and capabilities are operational. Different Vuzix eyewear models may feature different stereoscopy, head tracking and other technologies.

### *Head Tracking*

The Wrap Tracker supports 3-degree (yaw, pitch and roll) of freedom head tracking. RAW and Cooked output is available from the Wrap Tracker and is demonstrated in the SDK.

### *AR Extension*

Support for the AR camera and ALVAR fiduciary markers provided by the Vuzix AR/VR SDK in its AR Extension, packed in a separate installer. It demonstrates the use of OpenCV for camera support.

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# Support Services

Customer Service and Technical and Warranty Support are provided only through the region office and distribution center from which the product originated. Due to importation, duty and other considerations these services cannot be provided for product purchased in another region.

Technical support and product warranty cannot be provided for product not purchased or originating from that region. As an example, product purchased from a US online retailer cannot receive support or warranty service through our United Kingdom Customer Support services. Support service for U.S. product is provided exclusively by our U.S. Customer Service facilities.

If you are unsure of the correct region to contact for these services, please refer to the following list of distribution regions or ask the vendor providing the product:

Japan: Japan only  
United Kingdom: United Kingdom, Europe, Russia, Middle East, and Africa  
United States: United States, Canada, Central & South America, Asia (other than Japan), Australia, and New Zealand

***Product originating from the United Kingdom, please contact:***

Corporate Website: [www.vuzix.com/uksite](http://www.vuzix.com/uksite)  
Email Customer Support: [vuzix@tmti.com](mailto:vuzix@tmti.com)  
Customer Helpline: 0044 844 477 2977  
Customer Service Hours: 9 AM to 6 PM GMT Monday to Saturday

***Product originating from the United States, please contact:***

Corporate Website: [www.vuzix.com](http://www.vuzix.com)  
Email Customer Support: [technical\\_support@vuzix.com](mailto:technical_support@vuzix.com)  
Customer Helpline: (800) 436-7838  
Customer Service Hours: 9 AM to 6 PM EST, weekdays

When requesting technical support please provide the following information:

- Serial number, complete model name, and model number of your video eyewear.
- Make and model number of the audio video device being used.
- The name of any video content related to your support needs.
- Detailed explanation of the symptoms you are experiencing your questions.



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