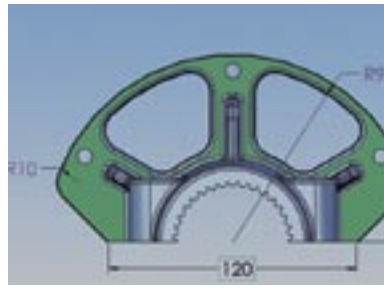


User's Manual for Microsoft® Windows®



 3Dconnexion



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Introduction to Motion Controllers

Congratulations on your purchase of a 3Dconnexion motion controller. This document describes 3Dconnexion's series of innovative motion controllers, designed for moving objects or navigating viewpoint in the virtual space.

Two Hands Are Better Than One

Welcome to the world of motion controllers. 3Dconnexion's motion controllers provide the "two hands are better than one" approach to navigating and editing 2D and 3D objects. The ability to navigate intuitively with one hand while editing with the other provides natural comfort, control and efficiency when generating and manipulating objects or viewpoints in a 2D or 3D application.



True 2D and 3D Input for Intuitive Control

A motion controller is a true three-dimensional input device that translates the slightest fingertip pressure into X, Y, and Z translations and rotations, moving 2D and 3D images instantaneously and simultaneously. This provides intuitive, interactive six degrees-of-freedom control of graphical models.

World Class Technologies

3Dconnexion produces several product lines, based on different technologies:


- *SpacePilot*
- *SpaceBall*
- *SpaceMouse*
- *CadMan*
- *SpaceTraveler*

The different models within each product line represent our offering of motion controllers.

How the Motion Controllers Control Six Degrees of Freedom

Moving the onscreen object is as easy as moving the motion controller. As you open a supported 2D or 3D application, you will begin to feel the movement/reaction of your motion controller, and how the object or viewpoints shift and rotate. The device acts as an extension of your hand, with range of motion and onscreen reactions as simultaneous as moving a real object. Push the motion controller up and down, pull forward or away from you, or shift right and left to rotate, zoom, pan or perform any of the features supported by your 3Dconnexion device.





The values inputted by the motion controllers are not interpreted as absolute position commands but as “velocity” commands. When the device is manipulated by a constant amount or measurement, the object is assigned a continuous speed in the same direction (a velocity measurement). The magnitude or degree of the device’s movement determines the magnitude of the onscreen object’s velocity.

For more information and illustrations on working with your motion controller, please consult the “Get Started Guide” or 3Dconnexion Help.

Installation

To install the motion controller device and 3DxWare driver software on systems running Microsoft® Windows® 2000 or XP, see the information below.

Hardware Installation

3Dconnexion, Inc.'s motion controllers are equipped with either a 9-pin female serial connector or a USB connector. Installation of each connection type is described below.

Serial Connection

Turn off the machine before connecting the motion controller. Plug the cable directly into the appropriate port (usually COM1 or COM2) at the back of the machine. Once the connection has been made, you can restore power to the machine.



USB Connection

Plug the cable directly into the appropriate port at the back of the machine.

Software Installation

CD Auto-Install

Insert the CD into the CD-ROM drive. The installation will automatically start.

Install

Run Setup.exe from your CD-ROM drive.

From Website

Visit <http://www.3dconnexion.com/software> to download updated drivers.

Install Folder

The installation creates a folder under the directory specified at the time of installation. The default directory is:

**\Program
Files\3Dconnexion\3Dconnexion
3DxWare**


Visit www.3dconnexion.com/software/drivers for the most current information.

Driver Installation Procedure

- 1 Insert the CD-ROM into your CD-ROM drive.
- 2 The installation program *Setup.exe* automatically begins (if auto-start is activated on your CD-ROM drive). Continue with this installation program only if *Run Setup.exe* is listed for your application. (If *Run Setup.exe* is not listed for your application, you should cancel the installation and follow the instructions given for your application.)
- 3 The installation automatically searches your system for supported applications that require additional components.
- 4 Follow the instructions on screen. You may select Custom from the appropriate dialog box to view advanced installation options, including changing the driver installation path and deselecting components.
- 5 After installation is complete, the 3DxWare driver starts automatically and the motion controller should respond within your supported application. The driver icon appears at the lower right corner of the Windows Taskbar in the system tray.

Startup Tips

In order to use a motion controller, the driver must be started on your system. The installation and setup will give you the option of setting the driver to automatically start every time Windows starts. Alternatively, you can put the driver in the *Startup* folder, so that it starts automatically every time you log on.

The 3DxWare driver icon  will appear in the Taskbar system tray if the driver has been initialized successfully.

Driver Uninstall Procedure

To uninstall the 3DxWare Driver, go to *Start > Control Panel > Add or Remove Programs*. The 3DxWare driver will be listed there, as well as any of the application plug-ins that have been installed.

Choose *Change/Remove* and follow the onscreen instructions for removing the driver or plug-in.

You do not need to perform an uninstall before installing a driver upgrade. The installer will automatically detect that you have a previous 3DxWare driver version already installed overwrite the previous version. Indicating yes will uninstall the current version and proceed to install the newer version.

You may check for driver upgrades at www.3dconnexion.com/software.

3DxWare Driver

The 3DxWare driver establishes communication between the motion controller and application, searches and recognizes attached devices, and changes configuration files dependent on which application is in the active window.

Starting the Driver

The driver can be started in three ways:

- Automatic Start-up
- Windows Start Menu
- Console Command Line

Automatic Start-up

The driver will start automatically when a user logs in. This option must have been selected during installation. This will place a Shortcut to the driver in the All Users Startup folder.

Windows Start Menu

If you did not choose the automatic startup option, you can start the driver by launching *Start > Programs > 3Dconnexion > 3Dconnexion 3DxWare > Start Driver*.

Console Command Line

The driver can also be invoked at a command prompt from the directory installed (default is: C:/Program Files/3Dconnexion/3Dconnexion 3DxWare) by typing the following:

3DxSrv	Starts the driver
3DxSrv -quiet	Starts the driver without warnings or error messages
3DxSrv -shutdown	Closes all running drivers

System Tray Menu



To open the 3DxWare System Tray menu, right click on the icon in the system tray.

Help...	brings up online documentation
Open Window	opens or closes the 3Dconnexion control panel
Exit	shuts down the driver

3Dconnexion Control Panel

The 3Dconnexion control panel gives you the option to change settings on your motion controller. Control Panel settings can be modified by each user to create custom sensitivities and button mappings that satisfy your personal preferences.

Application Specific Configurations

Every supported application has a separate configuration file. The driver automatically switches to the configuration file for the application running or being edited in the active window. The "Any Application" file will load for applications that do not have a specific configuration file. Additionally, each file has unique button mappings for each device model. The driver automatically loads the settings for the attached motion controller.

Customize Your User Profile

You can create your own user profile for the device. If you made changes on the control panel and saved them to a custom configuration file by clicking on the Save As button, the custom configuration file will be available to you in future application sessions, and the saved configuration name will be listed in the "[Configuration For](#)" box of the control panel.

Saved Configuration Files

The device configuration is saved in a file that is part of the driver software (*.scg). This file is a Windows platform specific file in ASCII text format. The configuration file is read by the driver software before opening the user interface, initializing it accordingly.

3Dconnexion Control Panel

By accessing the 3Dconnexion control panel, you can customize the device button functions, adjust sensitivity, and change device properties to most suit your needs.

Note: Some applications have a 3Dconnexion panel available for button mapping within the application itself. Currently, these applications are: CATIA, SolidWorks, Solid Edge, 3Ds Max, Softimage, Maya and COSMOSDesignStar.

The driver's control panel has a self-adjusting layout and will always visually reflect the motion controller device type. An image of the detected device accompanies the correct button layout for the hardware.



To open the panel, double click on the 3Dconnexion icon in the system tray.

Or, right click on the icon and select "Open" from the menu. You can also access this Help file and exit 3DxWare from this menu.

3Dconnexion Control Panel Features

The opening or front panel for the 3Dconnexion interface contains:

"Configuration For" box: This box at the top lists the application configuration currently in focus. User created configurations for the application in focus are available by selecting the drop-down arrow.

Device image: A picture of your installed 3Dconnexion device appears on the front

panel. Moving the cursor over the buttons on the image will highlight the button and its corresponding drop-down box.

Button Mapping: An interface for mapping buttons and creating new user macros or commands.

Motion Settings Button: Let's you select the button to access the Motion Settings Panel (Simple and Advanced). The Motion Settings panel lets you configure sensitivities, precision, and toggle on/off translations and rotations, and other settings for the cap or ball on your motion controller.

The Motion Settings panel also gives you access to Orientation Settings, a tool which allows you to configure the way your motion controller operates in 2D and 3D applications. Reconfigure the controller to your preferred motion for zooming, panning or scrolling.

Button Mapping

Button mapping is available from the opening page of the 3Dconnexion Control Panel.

This interface allows you to assign pre-defined or user created commands to device buttons so that you can execute a function with one push of a button.

Button Mapping Boxes

Each drop-down box contains the following:

- **Device Settings:** Pre-defined motion controller settings or global functions which can be assigned to a button.
- **Application Settings:** Pre-defined or user created macros for your application.

Default settings are conveniently pre-assigned for most supported applications, but can be changed by selecting the down arrow on the drop-down box and choosing another pre-defined command or a new command that you create.

New Command

Any macro or command that you can execute using your keyboard can be recorded, saved and made available to any of your 3Dconnexion buttons.

Create a New Command or Macro

- Right click on any of the drop-down boxes in the opening 3Dconnexion panel.
- Choose New Command from the menu
- The Macro Editor will open.
- Enter a name for the new command or Macro Name.
- Type the keyboard command into the user macro box.
- Select Save. The new command will now be available from each button's drop down menu.

Other Macro Editor Functions:

- Insert Pause: adds a 1/2 second delay between key presses.
- Delete Last: Removes last key typed in.
- Clear all: Clears the User Macro window.
- Cancel: Closes the Macro Editor without saving the command.

Delete a Command

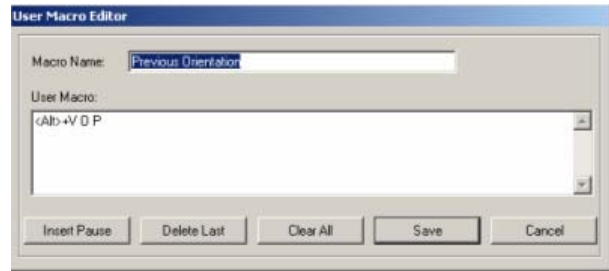
You may delete a command that is currently assigned to a button in the drop-down box.

- Right click on the drop-down box that has the command assigned.
- Select Delete Command.
- Select Y/N.

The command will be removed from all button drop-down boxes.

Edit a Command

You may edit a command that you have already created.



- Right click on the drop-down box that has the command assigned.
- Select Edit Command.
- The macro editor will appear with the name of the command and the keystroke you previously typed in.
- After making changes, select Save. The edited command will now be available for all button drop-down boxes.

Unassign a Button

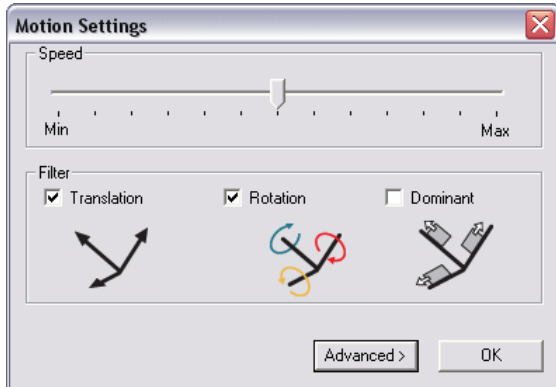
You may unassign a button so that there is no command associated with it.

- Right click on the drop-down box of the button that you wish to unassign.
- Select Unassign.
- A dash (--) will appear in that box denoting that there is no associated command.

Motion Settings

Select the Motion Settings button from the main 3Dconnexion control panel to open the motion settings panel. The motion settings panel allows you to adjust sensitivities, speed and adjust individual axes for the ball, puck or cap (controller) on your device.

Selecting motions settings will open the following panel.



Speed

This setting affects the overall sensitivity of the controller, changing the amount of force or torque that needs to be applied to the controller to move an object, scene, image or document.

The slider defaults to the middle position, and has six positions to the left and right of its default position. Each position to the right doubles the sensitivity. Each position to the left halves the sensitivity. This gives the user a multiplier of 1/64 to 64 of the original starting data.

Filter

Translation: Turn translations on or off for all axes by selecting/deselecting checkbox. This checkbox is enabled by default.

Rotation: Turn rotations on or off for all axes by selecting/deselecting checkbox. This checkbox is enabled by default.

Dominant: Select Dominant mode to restrict translations or rotations around a single axis. This checkbox is disabled by default.

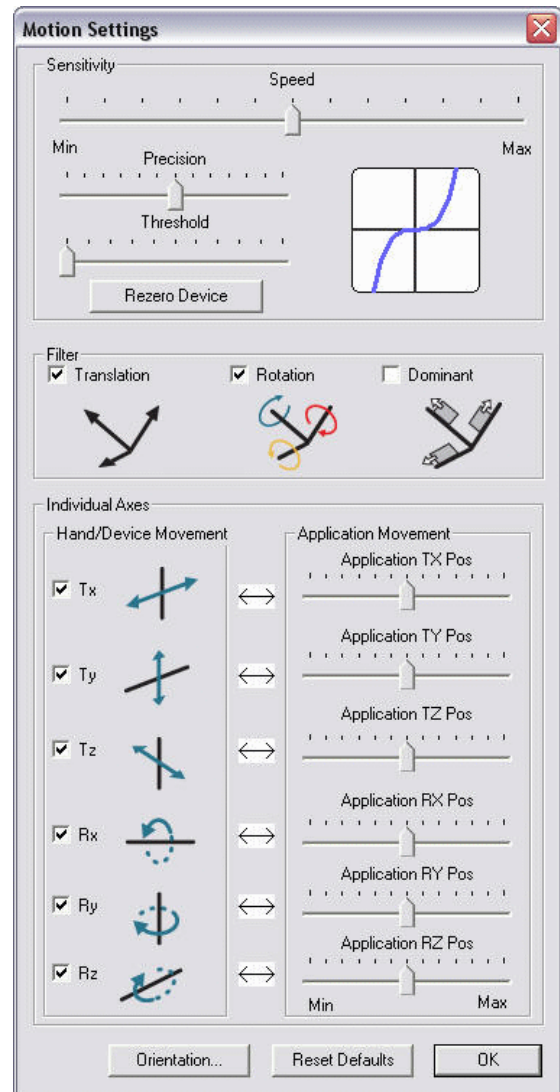
If you are new to motion controllers, enabling Dominant is an excellent way to work with the device for the first day of usage.

Advanced

Select the Advanced Button for additional and advanced motion settings.

Motion Settings (Advanced)

Selecting the Advanced button in Motion Settings will expand the panel to include additional and advanced user settings.



Additional settings include:

Precision

Adjust from fine precise control with slow model movement to immediate action with faster model acceleration.

Threshold

This slider is used to adjust the minimum values that the device will sense. Increasing this value might be useful in environments with excessive vibration that would cause the controller to send values as the desktop bounces, even though the user is not touching it.

Reset Device

Reset Device recalibrates the device in case of accidental drift.

Individual Axes

Allows you to turn individual translation and rotation axes on and off, as well as adjust sensitivities for individual axes within your application.

Orientation

Select to go to the Orientation Panel.

Reset Defaults

Resets the defaults for the Motion Settings Panel.

Orientation Settings

Orientation settings allow you to change the way your controller operates in both 3D and 2D applications. Using this tool, you can select or swap the following to change the motion response of your model, scene, image or document to the movement of the cap or ball on your motion controller:

Zoom Orientation (2D and 3D applications)

Select...



...to zoom by pushing the controller cap away from you or towards you. This is the default setting.

Select...



...to zoom by pulling up or pushing down on the controller cap or ball. Vertical panning or vertical scrolling reverts to pulling the controller cap or ball away from or towards you.

Scroll Orientation (2D applications only)

Select....



...to pan or scroll the document or image with the application scrollbars. This is the default setting.

Select....

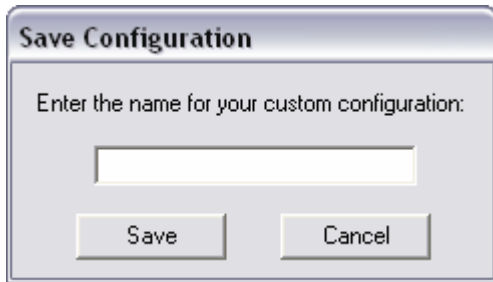


...to pan or scroll moving the document or image itself.

Saving Changes to a New Configuration (Save As)

When any change is made in the Control Panel, a new configuration is created and needs to be saved under a new name if you wish to save your changes.

You can save the configuration by selecting Configuration --> Save As from the Control Panel menu. The Save As dialog box will appear.



Type in a name for the new configuration. This configuration will now appear in the "Configuration For" box on the panel.

The new configuration is linked to the application that was in focus when you saved the new configuration. Therefore, it will only appear again when that same application is in focus.

Leaving Application or 3DxWare before Saving Changes

Switching the application or shutting down 3DxWare without saving to a new configuration will also execute this dialog box. You will either need to save changes to a new configuration name or Cancel to discard changes.

Saving changes to a Created New Configuration

If changes are made to the control panel while a configuration you created is in focus, you have the choice of saving those changes to the same configuration, or creating another configuration under another new name.

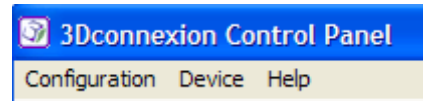
The Save Configuration box will display the name of the current configuration in focus. Select Save to save changes to the current configuration, or type in a new name and then hit save. Both

configurations will now be available to you when the associated application is in focus.

You may never save changes to a default application configuration.

Control Panel Menu

The 3Dconnexion Control Panel has a top menu bar with some useful functions and links to helpful information.



Configuration Menu

Save As

Allows you to save changes to the control panel under a new configuration name for the application in focus.

Automatically Save Configurations

When enabled, this feature allows you to autosave changes to an application specific configuration without having to perform a Save As. Changes will be automatically saved to a configuration that has the application title and your user name. You may still create as many other configurations as you would like using Save As.

Delete Saved Configuration

Allows you to select and remove configurations that you have created.

Restore All Defaults

Returns all control panel settings to the originally installed settings for the current application.

New Command

Select New Command to open the Macro Editor.

Exit Control Panel

Closes the 3Dconnexion Control Panel. You can re-access the control panel by selecting the 3Dconnexion icon in the system tray.

Device Menu

Enable LEDs

Enables/Disables LED lights for applicable 3Dconnexion products. This is enabled by default.

Enable Beeps

Enables/Disable the motion controller tones for applicable 3Dconnexion products. This is enabled by default.

LCD Short Strings (SpacePilot only)

Displays larger font on the SpacePilot LCD display.

LCD Long Strings (SpacePilot only)

Displays smaller font on the SpacePilot LCD display.

LCD Black on White (SpacePilot only)

Changes the display from White on Black (default) to Black on White.

Help

3Dconnexion Help

Opens 3Dconnexion Help.

Tips and Tricks

For additional data on using your 3dconnexion motion controller, applications and other useful information, this menu item will take you directly to the 3Dconnexion Tips and Tricks website.

Write Log File

Creates a log file for technical support if a problem is encountered. Enabling this selection may cause your application to run slowly; therefore, Write Log File should only be enabled for the purpose of troubleshooting.

3Dx Website

Connects you to the 3Dconnexion website's home page.

Technical Support

Gives you easy access to 3Dconnexion technical support information.

About 3DxWare

Lists the 3DxWare version you have installed, Device Type, and Firmware Version for your device. This information is important to capture if you need to make a technical support request.

Technical Support

3Dconnexion Technical Support

US/Asia/Americas

Tel: +1-800-344-1609
Fax: +1-248-743-1001

Europe/EMEA

Tel: +49 (0) 8152 9919 44
Fax: +49 (0) 8152 9919 50

To Email a Technical Support Request for any region:

Visit the [3Dconnexion Contact Support](#) page. After selecting the appropriate link for your region, you will be prompted to fill out an online Technical Support Request Form for submission.

3Dconnexion endeavors to answer all technical support requests promptly. Filling out the Technical Support Request completely and accurately will help us to answer your request expeditiously.

Frequently Asked Questions

For a list of the most common frequently asked questions and an additional list of FAQs for both Windows and Unix platforms, please visit the main [3Dconnexion Support Page](#).

Downloading Software

The latest released software for your motion controller is available on the [Download](#) page of the 3Dconnexion website. Review the [Latest Changes in Software](#) page to check if you have the latest software installed or to review updates to software before downloading and installing.

Software Developer's Kit

3Dconnexion has Software Developer's Kits for Windows, Unix or Macintosh Platforms available. Please visit our [Software Developer's](#) page to download.

Additional Support Information

From the 3Dconnexion website, you can also view a list of [Supported Applications](#), check [Upgrade](#) offers, review [Documentation](#), including an online [Get Started Guide](#), and review some [Tips and Tricks](#) for your motion controller. Should you have suggestions on how to improve the technical support, software download or other 3Dconnexion website pages, please contact 3Dconnexionweb@3Dconnexion.com.

Contacting Support by Phone

When you call technical support, please be at your computer so that we can assist you.

Please have the following information available when you call:

- Your name, company name, and telephone number Product name and version number
- Your computer configuration: CPU type, speed, memory, pointing device, video card (its memory and resolution)
- The platform and operating system you are running
- Your application name and version
- The version of 3d motion controller driver you are using

3Dconnexion Services

Please visit our website <http://www.3Dconnexion.com> for any of the following services.

New Integration

To find out details about integrating motion controllers into your application you can contact one of the offices listed on the website.

Software Development Kit (SDK)

A documented C-based library is available online for add-in development. Please visit our website for the latest information on our SDK at: <http://www.3Dconnexion.com/software/sdk>

Implementation Support

To get help in your implementation efforts you can find support information on the website.

Application Support

A list of supported applications can be found on our website. If a particular application is not on the list, please contact the software company producing that application to find out more about motion controller support.

Appendices

Connecting to the Serial Port

The motion controller for serial port connection is equipped with a 9-pin D-Sub female connector. The wiring of this connector matches any IBM-compatible PC with a 9-pin serial connector. To use the motion controller with other computers, check the pin functions against the list shown below and verify whether the motion controller connector wiring matches your system.

<i>Pin</i>	<i>Meaning</i>	<i>Connection to Computer</i>
Case	Shield	Case
2	TxD	RxD
3	RxD	TxD
4	Supply	DTR
5	GND	GND
7	CTS	RTS
8	RTS	CTS

If not, you must use an appropriate adapter cable to connect the motion controller wiring to that of your computer. The use of the handshake signals (CTS, DTR and RTS) is absolutely necessary for the safe operation of the motion controller. Without these handshake signals, loss of data will occur. Additionally, the signal lines (DTR and RTS) are used to supply power to the 3Dconnexion device. Therefore, no external power supply is required. The minimum output voltage has to be 5 V, providing an output current of 10 mA on both signal lines.

Communication via the serial port using the XON/XOFF protocol is supported by the motion controller, but the handshake signals (CTS, DTR and RTS) are needed for safe operation. Therefore, the status of the handshake signals has to be carefully checked and treated by the computer. To activate the motion controller, these signals should have a positive (active) level.

Product Specifications

Please visit our website to see information on our complete line of motion controllers at: <http://www.3dconnexion.com/products>.

FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference.
- 2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: The user is cautioned that changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

European Economic Community Declaration of Conformance (CE)

The Magellan/SPACE MOUSE is attested to meet the essential protection requirements against electromagnetic emission, which are established in the regulations of the council for assimilating the rules and regulations of the member states about electromagnetic compatibility 89/336/EEC and changed by regulation 92/31 EEC. This declaration is valid for all samples produced according to the enclosed production drawings, which are part of this declaration. The following standards

were used for judging the product concerning electromagnetic capability:

- For trouble emission: EN55022 edition: 05/95
- For trouble security: EN50082-1 edition: 03/93

VCCI Class B Declaration

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをして下さい。

Korea Class B Declaration

이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

Warranty Information

3Dconnexion's Limited Lifetime Product Warranty

Limited Warranty

3Dconnexion warrants that any hardware product accompanying this documentation shall be free from significant defects in material and workmanship for a period of three (3) years from the date of purchase. 3Dconnexion's limited warranty is nontransferable and is limited to the original purchaser. This warranty gives you specific legal rights, and you may also have other rights which vary under local laws.

Remedies

3Dconnexion's entire liability and your exclusive remedy for any breach of warranty shall be, at 3Dconnexion's option, to: (a) repair or replace the hardware, provided that the hardware is returned to the point of purchase or such other place as 3Dconnexion may direct, with a copy of the sales receipt, or (b) refund the price paid. Any replacement hardware will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer. These remedies are void if failure of the hardware has resulted from accident, abuse, or misapplication.

DISCLAIMER OF WARRANTY

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