# User's Manual
# for the
# 2015XLS
# Virtual Window™

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# FCC RF
# INTERFERENCE STATEMENT

**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 technical for help.
- Only shielded interface cable should be used.

Finally, any changes or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the users authority to operate such equipment.

# 1. Introduction

The 2015XLS Virtual Window™ sets a new benchmark in autostereoscopic viewing. The Virtual Window™ produces clear, bright, full-color stereoscopic images that can be seen without the aid of restrictive viewing devices. With its wide-view autostereoscopic imagery, the Virtual Window™ will allow for many hours of convenient and comfortable 3D viewing. Stereoscopic 3D imagery, as well as viewing software, is provided with the display.

The Virtual Window™ contains precisely aligned optical components. It is important to exercise care when handling or moving the display. Be sure to read the Care and Handling section of this manual, and follow the recommendations provided.

Note that two features described in this manual are optional. Side-by-side stereo support, when using a computer signal, is one such feature. The other is support for one-channel and two-channel video.

The remainder of this manual describes the installation, operation, and maintenance of the Virtual Window™ display. Please read the pertinent sections of this manual before installing and operating the unit. If you encounter any problems with your Virtual Window™, or have any questions about operating the unit to deliver the best possible performance, please feel free to contact DTI Technical Support. Contact information should be provided with your purchase agreement.

In the event that this unit is defective or damaged, purchaser agrees not to open the unit; rather, it agrees to return the unit to DTI for repair or replacement at purchaser's expense. If purchaser does not agree to these terms of sale, it will return the unit to DTI prior to its use of the unit.

# 2. Installation

NOTE: Please see the "2015XLS Quick-Start Guide" for an illustrated one-page computer installation guide.

## 2.1. Items Included With Your DTI Virtual Window™

Your Virtual Window™ is shipped with the following:

- One "DTI Virtual Window™ Quick Start Guide"
- One User Manual (which you are now reading)
- One standard power brick and power cord
- One display interface cable (VGA male to VGA male)
- One serial (RS-232) cable
- A CD-ROM containing PC software for your Virtual Window™

If any of these items appear to be missing, please contact DTI. Contact information can be found in the "2015XLS Quick-Start Guide."

## 2.2. Connection Overview

NOTE: When attaching cables to your Virtual Window, or detaching existing cables, the display should always be turned off first.

**** Video signal inputs are optional. Some models are not applicable for this feature.***

The following picture shows the connections on your 2015XLS's rear panel, along with labels for each:

The following provides a overview of each connection:

- The 'VESA Stereo Sync.' connector is used for Frame Sequential stereo. The stereo sy77nc. signal, utilized by workstations and high-end PC graphics accelerators, allows your Virtual Window to recognize which incoming frames are left-eye frames, and which are right-eye frames.

- The 'S-Video' connectors are used for video input. For single-channel video (for example, from a VCR), the left-hand connector is used for video input.

  For dual-channel video, the left-hand connector is used to connect the left-eye camera, while the right-hand connector is used to connect the right-eye camera.

- The 'BNC' connectors are also used for video input; you can use these as an alternative to the S-Video connectors, if you have a composite video source.

NOTE: You cannot use the S-Video and BNC video inputs simultaneously.

- The ‘Power’ connector is used to connect the power supply to your Virtual Window.
- The ‘VGA’ connector is used to connect your computer system to your Virtual Window. Your display requires a VESA-compliant, 60 Hz, 1024x768 signal to operate properly.
- The ‘Serial RS-232’ connector is used with the included PC software. The connection allows the software to automatically switch your display between 2D and 3D modes. It is not needed for 3rd party software, or other types of computer systems.

## 2.3. Computer Connections

Before connecting your 2015XLS to your computer system, please configure your system to display a resolution of 1024x768, using a 60 Hz refresh rate. If you are not sure how to accomplish this task, please ask your System Administrator for assistance.

To interface your computer system to your 2015XLS, please follow these steps:

- Make sure your 2015XLS is powered off.
- Connect the display cable to your 2015XLS’s VGA connector, as well as your computer system.
- If you will be using Frame Sequential stereo, connect the stereo sync. cable to your 2015XLS, along with your computer system.
- Turn the display on.

Note that the 2015XLS defaults to 2D computer input mode. To switch to 3D viewing, press the ‘Select 3D’ button on the front panel to enable the desired stereo mode.

When using Frame Sequential stereo, your computer system must be configured for 60 Hz display. Other frame rates will not work correctly.

## 2.4. Video Connections ( *This feature depends on the model*.)

***Note: Video inputs are optional. Some models might not have this feature***.

If you purchased the video option with your 2015XLS, you can display one-channel and two-channel stereo video. This section describes how the video support operates.

To use one-channel video:

- Make sure your 2015XLS is powered off.
- *For S-Video:* Connect the S-Video cable between your video source (a VCR for example), and the left-hand S-Video connector.

- *For BNC:* Connect the BNC cable between your video source and the left-hand BNC connector.
- Power the display on.
- Press the ‘Select 3D’ button until you have switched the display to the proper stereo mode. Note that the ‘video’ light should be on, *in addition to* one of the stereo mode lights. If the ‘video’ light is on only, you are in two-channel video mode; continue pressing the ‘Select 3D’ button until you have selected the desired mode.
- To view the video source in 2D, press the ‘2D’ button.
- To switch back to computer input mode, press the ‘Select 3D’ button until one of the computer stereo modes are active.
- Finally, press the ‘2D’ button to switch back to 2D mode.

Two-channel video works in a similar manner to one-channel video. However, please note that the two video sources should be synchronized (gen-locked). If they are not, one video source may “roll” horizontally and/or vertically, while the other remains stable.

To use two-channel video, please follow these steps:

- Make sure your 2015XLS is powered off.
- *For S-Video:* Connect the left-eye video source’s S-Video cable to the left-hand S-Video connector; connect the right-eye video source’s S-Video cable to the right-hand S-Video connector.
- *For BNC:* Connect the left-eye video source’s BNC cable to the left-hand BNC connector; connect the right-eye video source’s BNC cable to the right-hand BNC connector.
- Power the display on.
- Press the ‘Select 3D’ button until you have switched the display to two-channel video mode. Note that the ‘video’ light should be on, with all stereo mode lights off. If a stereo mode light is on in addition to the ‘video’ light, you are in one-channel video mode; continue pressing the ‘Select 3D’ button until you have enabled two-channel video mode.
- To switch back to computer input mode, press the ‘Select 3D’ button until one of the computer stereo modes are active.
- Finally, press the ‘2D’ button to switch back to 2D mode.

# 3. General Operation

## 3.1. Introduction

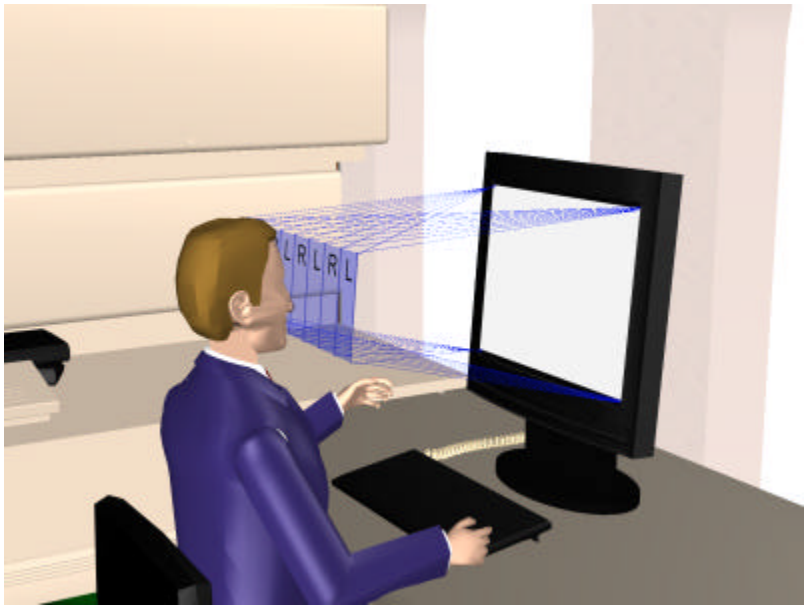
One of the main advantages of the Virtual Window™ is the ability to comfortably view autostereoscopic 3D images for extended periods.

Here are some guidelines to facilitate comfortable and efficient viewing:

- The optimal viewing position is centered with respect to the screen, approximately 31" away from the eye.
- Tilt the display back approximately six degrees.
- When possible, avoid placing the Virtual Window™ where there will be a bright light source behind the viewer. This could result in glare and unwanted reflections.

The Virtual Window™ creates a series of autostereo zones in front of the screen. There are three to four autostereo zones to either side of the T-on position, at about 31” from the display. The good viewing zones are interleaved with pseudo stereo zones where the image is reversed. When your eyes are correctly positioned in an autostereo zone, the Virtual Window™ casts a left image into the left eye and a right image into the right eye. This results in the perception of a stereoscopic image.

The zones are illustrated in the following diagram:



## 3.2. 3D Controls

The Virtual Window 3D controls are located on the bottom-right of the display fascia. There are three buttons, along with a number of indicator lights.

- "Select 3D" toggles between the available stereo modes. The lights to the right of this button depict which stereo mode is currently active.
- "Reverse 3D" will provide stereo reversal of the image, when operating in 3D mode. When this function is active, the indicator light above this button will be lit.
- Finally, the "2D" button will toggle between 2D and 3D mode. 2D mode, when enabled, is denoted by the light above the button.

The available stereo modes include:

*For video input:*

- Dual-channel video ('Video' light on, with no stereo mode lights on)
- Single-channel video:
  - Field Sequential ('Video' light on, along with 'F/S' light)
  - Side-by-Side ('Video' light on, along with 'S/S' light)
  - Top-and-Bottom ('Video' light on, along with 'T/B' light)

*For computer input:*

- Frame Sequential ('Fr/S' light on)
- Field Sequential ('F/S' light on)
- Side-by-Side ('S/S' light on)
- Top-and-Bottom ('T/B' light on)

Note that there are two sets of single-channel video modes: full-screen (scaled), and windowed (unscaled). The full-screen mode provides a larger image, while the windowed mode provides a sharper image, with no scaling.

## 3.3. Image Adjustment Controls

Your Virtual Window provides a full set of image adjustment controls, accessed via the button grouping on the bottom-left area of the display fascia. The controls are augmented by a full on-screen display, to aid you in changing the different settings. Note that the display must be powered-on and operational in order to use these controls.

If you make changes to any of the following settings, they are saved in non-volatile memory in your Virtual Window. As such, the display "remembers" your settings when powered off and back on again.

## 3.3.1 Button Reference

**‘Menu’ Button**
- With pressing the button once, the OSD Screen comes on Menu Button is used when exits
upper Menu after adjusting each Menu. The parameter value adjusted is automatically saved.

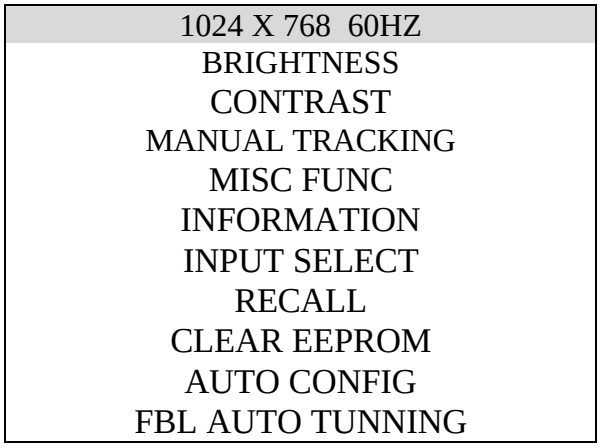
**‘UP/DOWN’ Button**
- UP/DOWN : Used for adjusting Menu position

**‘PLUS(+)/MINUS(-)’ Button**
- Used for increasing or decreasing parameter value.
- Used for selecting Menu being adjusted.

**‘Power’ ON/OFF Button**
- ON/OFF : LCD SCREEN

## 3.3.2 Main Menu

The following screen is shown with pressing Menu Button.



## 3.4 Function

-  BRIGHTNESS : Adjusts the black level of the backlight.
-  CONTRAST : Adjusts the contrastratio of the image.
-  MANUAL TRACKING :

| MANUAL TRACKING |
|---|
| H SIZE POSITION |
| H POSITION ADJUST |
| V POSITION ADJUST |
| PHASE ADJUST |

- H SIZE ADJUST : Adjusts the value of clock per Line.
- H POSITION ADJUST : Adjust Horizontal position.
- V POSITION ADJUST : Adjusts Vertical position.
- PHASE ADJUST : Adjsuts RGB GAIN.

-  MISC FUNC : Adjusts RGB GAIN

| MISC FUNC |
|---|
| EDGE FILTER |
| ADC R GAIN |
| ADC G GAIN |
| ADC B GAIN |
| ADC R OFFSET |
| ADC G OFFSET |
| ADC B OFFSET |

- EDGE FILTER : Reserved
- ADC R GAIN : Reserved
- ADC G GAIN : Reserved
- ADC B OFFSET : Reserved
- ADC R OFFSET : Reserved
- ADC G OFFSET : Reserved
- ADC B OFFSET : Reserved

-  INFORMATION : Indicates the information of the present Mode.

-  INPUT SELECT : Selects input source

| INPUT SELECT |
|---|
| VGA |
| VIDEO IN |
| RETURN |

  - VGA : Uses for displaying VGA signal.
  - VIDEO IN : Reserved
  - RETURN : Returns to upper Menu.
  - CLEAR EEPROM : Clears EEPROM datum.
  - RETURN : Returns to upper Menu.
  - RECALL : Sets all the values to be DEFAULT Value.

-  AUTO CONFIG :

| AUTO CONFIG |
|---|
| AUTO ADJUST |
| AUTO TRACKING |
| AUTO POSITION |
| AUTO GAIN |
| RETURN |

  - AUTO ADJUST : Automatically adjusts the screen position, the screen focus and RGB GAIN for sharpening the image.
  - AUTO TRACKING : Automatically sharpens the screen focus.
  - AUTO POSITION : Automatically sets the screen position to be the best.
  - AUTO GAIN : Automatically sets RGB gain to be the best.

- FBL AUTO TUNNING : Adjusts the screen image from FRAME BUFFER LESS.

| FBL AUTO TUNNING |
|---|
| FBL AUTO ADJUST |
| FBL FINE |

  - FBL AUTO ADJUST : Automatically sets the screen image to be the best from FRAME BUFFER LESS.
  - FBL LINE : Adjusts the screen image in specific manually.

## 3.4 Operating procedure (6-Button)

- With pressing Menu Button, Main Menu displayed.
- Select Menu by pressing UP/DOWN Button, then press PLUS or MINUS Botton.

- With pressing PLUS or MINUS Button, adjust the value as you want.
- With pressing Menu Button, it returns to the upper Menu.
- With pressing Menu Button from Main Menu, the screen exits after saving the adjusted values.

## 3.5 Screen Image Adjustment

- With pressing Menu Button, Main Menu displayed.
- Select FBL AUTO TUNNING by pressing UP/DOWN Button, then press PLUS or
  MINUS Button.
- Select FBL AUTO ADJUST
    1. The screen is OFF, then it appears within few seconds.
    2. In case the screen gets pressed out of shape, try again.
    3. If not satisfied with automatic adjustment, adjust the image manually by pressing FBL LINE.
- Select AUTO CONFIG from Main Menu by pressing Menu Button for a moment.
- Select AUTO ADJUST, then press PLUS/MINUS Button.
    1. Automatically adjusts the screen position, the screen focus and RGB gain.
    2. In case that the lines appear horizontally, select MANUAL TRACKING first from Main Menu and select PHASE ADJUST next, and then adjust Parameter values by using PLUS or MINUS Button.
    3. In case that the screen overlaid horizontally, select MANUAL TRACKING first from Main Menu and select H SIZE ADJUST next, and then adjust parameter values by using PLUS OR MINUS BUTTON
    4. With pressing MENU Button for a moment, Main Menu displayed.
    5. With pressing MENU Button from Main Menu, the screen exits after saving the adjusted values.

# 4. Care and Handling

## 4.1. Handling

The DTI Virtual Window™ contains carefully aligned optical components. A severe shock can damage or misalign the unit, resulting in degraded performance or unit failure. If you exercise care when handling the unit, your Virtual Window™ should remain trouble-free.

## 4.2. Environment

The Virtual Window™ works best at room temperature. Temperatures other than room temperature may affect system performance. Do not operate the unit at ambient temperatures lower than 10º C (50º F) or higher than 30º C (86º F).

Some other general guidelines:

- Avoid humid environments.
- As with all electronics, exercise caution with liquids. The display is not waterproof.
- Never bypass the grounding prong on the power cable.

# 5. Maintenance

The DTI Virtual Window™ does not require regularly scheduled maintenance. Instead, maintenance should be performed on an as-needed basis.

For cleaning the Virtual Window™ screen, best results can be achieved with a soft tissue and distilled water. Dampen the tissue and gently wipe the screen in straight, even strokes. Be careful not to leak water into the Virtual Window™. Clean the sides and back of the Virtual Window™ with a damp cloth and mild soap.

# 6. Specifications

## 6.1. Environmental

Ambient Temperature:
Storage/Shipping +4º to +50º C (+39º to +122º F)
Operating +10º to +30º C (+50º to +86º F)

Ambient Relative Humidity:
Storage/Shipping 5% to 95% RH
Operating 8% to 80% RH

## 6.2. Interfaces

### 6.2.1. VGA

Analog RGB, 15-pin, accepting VESA-compliant signals.

### 6.2.2. Video

S-Video and BNC connectors, accepting NTSC or PAL signals.

### 6.2.3. Serial

Standard RS-232, 9-pin connector.

### 6.2.4. Stereo Sync.

VESA Stereo Sync. connector, accepting a VESA-compliant stereo sync. signal.

## 6.3. Electrical

Voltage: 95 to 240V 50/60Hz
Average Power Consumption: 35W

## 6.4. Screen

LCD Type: Active Matrix/TFT
Contrast Ratio: 230:1
Brightness: 180 cd/$m^2$ in 3D, 58 cd/$m^2$ in 2D
Screen Size: 15.1" Diagonal
Resolution, 2D Mode: 1024 x 768
Resolution, 3D Mode: 512 x 768
Viewing Distance: 31” ± 5”