FHD651-P and FHD651-T LCD Panels

User Manual

020-000693-01

CHRISTIE

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The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.
CAN ICES-3 (A) / NMB-3 (A)
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d. Problems or damage caused by combination of a Product with non-Christie equipment, such as distribution systems, cameras, DVD players, etc., or use of a Product with any non-Christie interface device.
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j. For LCD projectors, the warranty period applies only where the LCD projector is in "normal use." "Normal use" means the LCD projector is not used more than 8 hours a day, 5 days a week.
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l. Image retention on LCD flat panels.
m. Defects caused by normal wear and tear or otherwise due to normal aging of a Product.
n. Products where the serial number has been removed or obliterated.
o. Products sold by a Reseller to an End User outside of the country where the Reseller is located unless (i) Christie has an office in the country where the End User is located or (ii) the required international warranty fee has been paid.
p. Products when there is failure to perform maintenance as required and in accordance with the maintenance schedule.
q. This warranty does not obligate Christie to provide any on site warranty service at the Product site location.

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Preventative maintenance is an important part of the continued and proper operation of your product. Please see the Maintenance section for specific maintenance items as they relate to your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

Addendum

Translated copies of this document are provided on the CD in the back of this document. The CD may also contain additional product documentation. Read all instructions before using or servicing this product.

本文档的翻译副本在本文档背面的 CD 上提供。该 CD 中还可能包含其他产品文档。使用或维修本产品之前请务必阅读所有说明。

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Le CD au dos de ce document contient des traductions de celui-ci dans différentes langues. Ce CD peut également contenir de la documentation supplémentaire sur le produit. Lisez toutes les instructions avant d'utiliser ou d'entretenir ce produit.

Übersetzte Versionen dieses Dokuments werden auf der CD auf dem Vorsatzblatt dieses Dokuments bereitgestellt. Die CD kann auch zusätzliche Produktdokumentation enthalten. Bitte lesen Sie diese Anweisungen vor der Verwendung dieses Produkts oder vor der Ausführung von Wartungsarbeiten am Produkt.

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Table of Contents

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Introduction

About This Manual

This Owner's Manual describes how to install, set up and operate the FHD651-P and FHD651-T LCD Panels.

Throughout this manual, the FHD651-P and FHD651-T LCD Panels are referred to collectively as the "display."

Target Audience

The manufacturer has prepared this manual to help end users get the most out of the display.

The manufacturer has made every effort to ensure that this manual is accurate as of the date it was printed. However, because of ongoing product improvements and customer feedback, it may require updating from time to time.

Textual and Graphic Conventions

Text Conventions

The following conventions are used in this manual, in order to clarify the information and instructions provided:

- Remote and built-in keypad button identifiers are set in upper-case bold type; for example, "Press **EXIT** to return to the previous menu."
- Computer input (commands you type) and output (responses that appear on-screen) is shown in monospace (fixed-width) type; for example: "To change the aspect ratio to Letterbox, type `07 00 02 41 53 50 03 08` **<Enter>**."
- All keys with functional names are initial-capped, set in bold type and enclosed in angle brackets. These keys are the following: **<Enter>**, **<Spacebar>**, **<Control>**, **<Esc>** and **<Tab>**.
- **<Enter>** indicates that you may press either the RETURN or ENTER key on your keyboard if it has both keys.

In addition to these conventions, underlining, boldface and/or italics are occasionally used to highlight important information.

A carriage return **must** be used after each command or string.

Description, Features and Benefits

The FHD651-P and FHD651-T LCD Panels represent the cutting edge of direct-view LCD technology. They combine ultra-high resolution and unparalleled image quality with configurable I/O in a large-format display for a wide range of digital signage and control-room applications.

Key Features and Benefits

The display offers these key features and benefits:

- Full-HD Native Resolution: 1920 x 1080 (16:9 Native Aspect Ratio)
- High Brightness: Up to 360 nits
- Ultra-wide 178-degree Viewing Angle
- DisplayPort 1.1a, HDMI and DVI Inputs with High-bandwidth Digital Content Protection (HDCP)
- Direct LED Backlight with active ambient light sensor to adjust backlight automatically
- **Touch Capability (FHD651-T only):**
  - Precise, highly responsive touch technology
  - High touch sensitivity – no pressure required
  - Any touch: finger, gloved hand or pointer
  - One-time, nine-point calibration with no drift
  - Windows 7/8 compliant
  - USB: one cable for power and communications
- Supports landscape and portrait orientations

Parts List

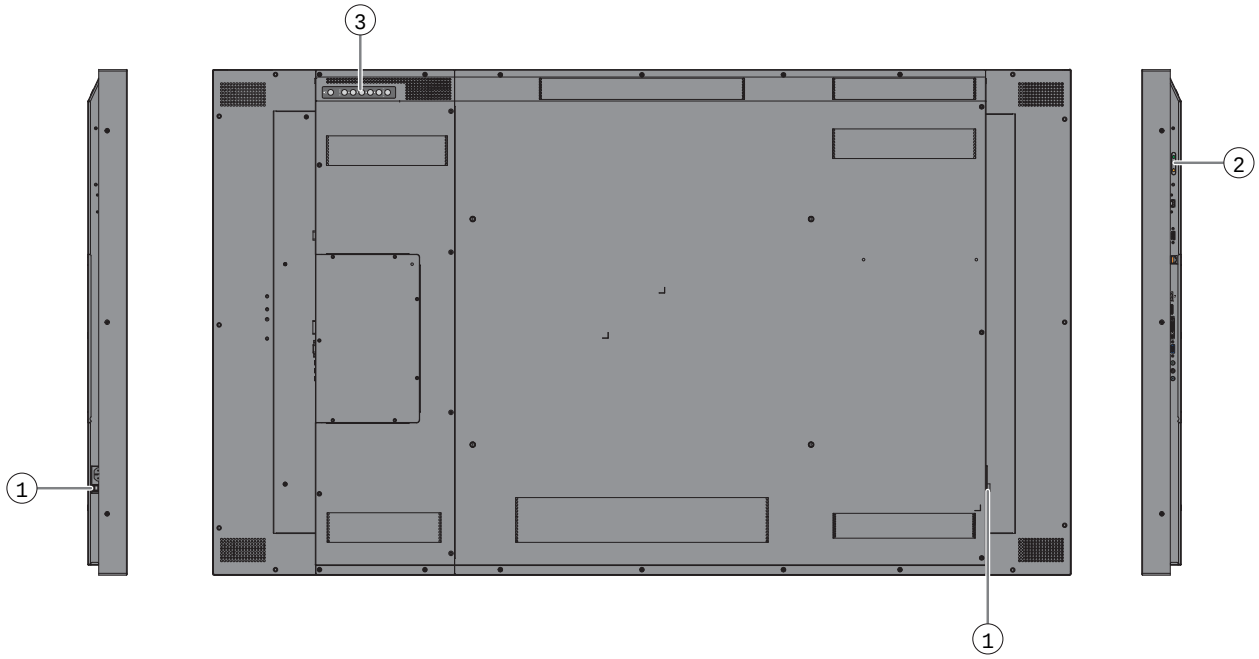
Your display is shipped with the following items. If any items are missing or damaged, please contact your dealer or Customer Service.

- FHD651-P or FHD651-T LCD Panel
- Remote Control Unit and batteries
- VGA Cable
- DVI Cable
- RS232 Cable
- IR Extender
- USB Cable (FHD651-T only)

Controls and Functions

Display at a Glance

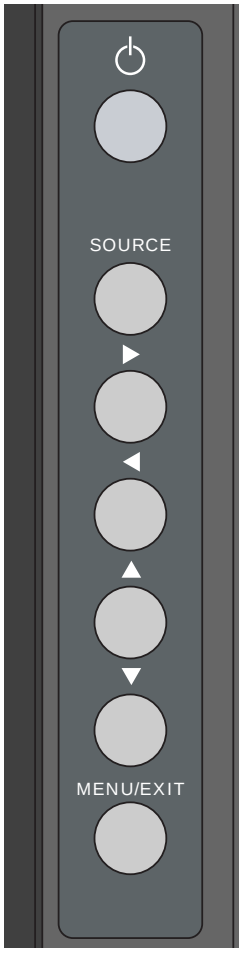
The illustration below shows the key display components, and the paragraphs that follow describe them.



1. **MAIN POWER SWITCH**
   Connects or disconnects the display panel from the AC power source.
2. **STATUS LED**
   Lights orange to indicate that the display is in standby mode; blinks orange if no input signal is present; off if the main power switch is set to off.

3. **KEYPAD**

You can use the keypad instead of the remote control unit to operate the on-screen display (OSD) controls. The keypad operates as follows:



On / Standby ( )

Press once to toggle from standby mode to on mode. Press it again to return to standby mode.

SOURCE

To select a source, press the **SOURCE** button repeatedly (with no menus visible on-screen).

▶

When a menu is visible on-screen, this button operates identically to the right-arrow (or **ENTER**) button on the display remote control unit.

◀

When a menu is visible on-screen, this button operates identically to the left-arrow button on the display remote control unit.

▲ / ▼

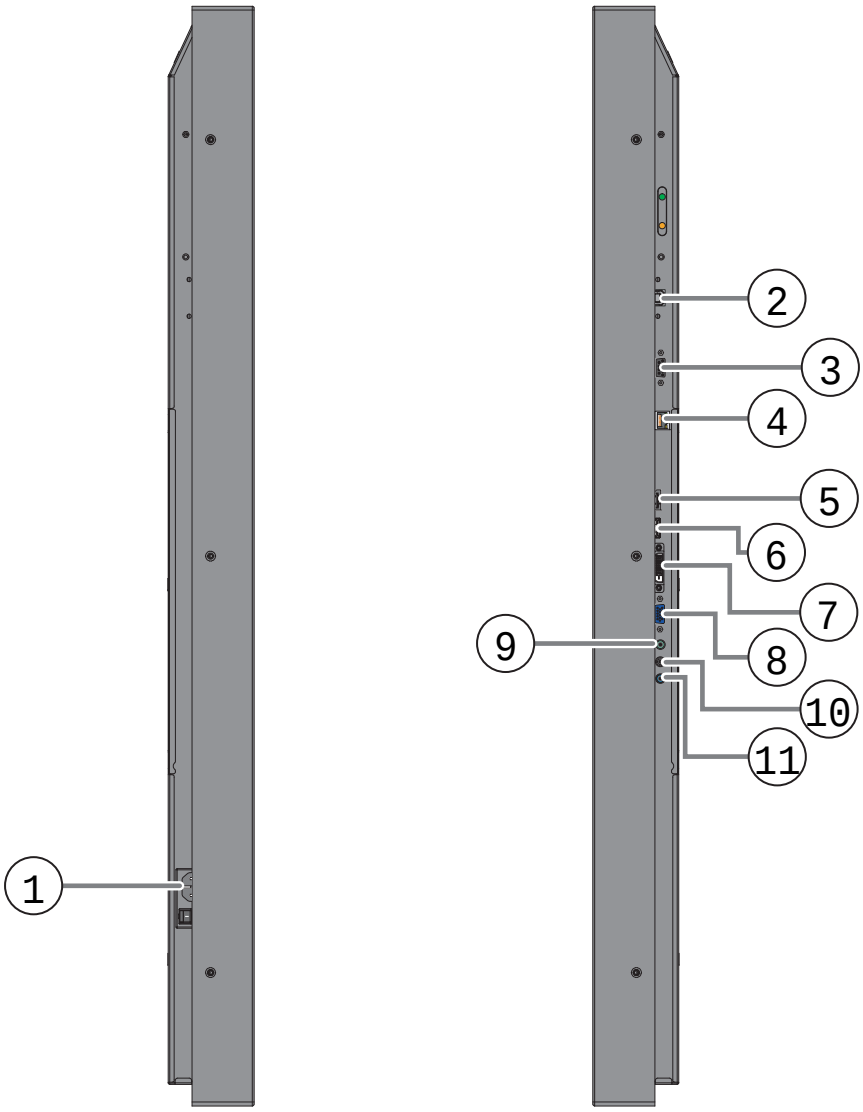
When a menu is visible on-screen, these buttons operate identically to the up- and down-arrow buttons on the display remote control unit.

MENU / EXIT

Press this button to access the on-screen display (OSD) controls, or to exit the current menu and return to the previous one.

Input Panel

The illustration below shows the display input panel.



1. **Power Input (100 to 240 VAC)**
   Connect the display to power here.
2. **USB (Touch Model only)**
   A standard, Type B USB port for connecting the Multi-Touch Controller host computer to the display.
3. **RS232C In**
   A female, 9-pin D-sub connector for interfacing with a PC or control system.
4. **Ethernet**
   A female, RJ45 connector for interfacing with a PC or control system over a local area network.

5. **DisplayPort**
   DisplayPort 1.1a and DisplayPort-HDCP 1.1 compliant, SD/HD input for connecting SDTV, EDTV or HDTV component video sources.
6. **HDMI**
   HDCP-compliant digital video input for connecting HDMI or DVI sources.
7. **DVI-D In (HDCP-compliant)**
   VESA-standard digital video input from a personal computer, or digital video from a DVD player or HD set-top box.
8. **VGA In (15-pin D-Sub)**
   For connecting components that have RGB or component output jacks such as a personal computer or external DTV decoder (a break-out cable is needed for BNC-type connection).
9. **PC Audio In**
   Connect the audio output from a personal computer here.
10. **IR Extender**
    Connect the IR Extender cable provided with the display to this input.
11. **Audio Out**
    For connecting external, powered speakers or an external audio receiver/amplifier.

Remote Control Unit

The illustration below shows the display remote control, and the table that follows describes its functionality.

Label		Description
1	⏻	Turns the monitor on and off
2	INFO	Provides source and resolution information
3	VGA	Selects the PC RGB source
	DVI	Selects the PC DVI source
	HDMI1	Selects the HDMI source
	COMP	(no function)
	AV	
	HDMI2	
4	P-POSITION	
	DISPLAYPORT	Select the DisplayPort source
	PIP	(no function)
	S-V	
5	P-SOURCE	
6	SWAP	
7	MENU	Opens the monitor's on-screen menu system. When the menu system is already open, pressing this button will select the previous submenu
	▶, ◀, ▲, ▼	Navigates through submenus and settings
8	ENTER	Selects highlighted menu choices
9	EXIT	Closes the menu system
10	SCALING	Selects each aspect ratio, in sequence: Full Screen, Pillar Box and Auto
	FREEZE	(no function)
	MUTE	Turns off the sound
	BRIGHT	Adjusts the brightness
	CONTRAST	Adjusts the contrast
	AUTO	Auto adjustment of VGA source
	SOURCE	Selects each source, in sequence
	VOLUME-	Decreases the sound volume
	VOLUME+	Increases the sound volume

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Installation

NOTICE Installation **must** be performed by a qualified custom video installation specialist.

Remote Control

To install batteries in the remote control:

1. Press down the tab on the cover and pull the cover up.
2. Insert the included batteries. Ensure that the polarities correctly match the ⊕ and ⊖ markings inside the battery compartment.
3. Insert the lower tab of the cover into the opening, and press down the cover until it clicks in place.

Notes on Batteries

- Make sure that the battery polarities are correct when installing the batteries.
- Do not mix an old battery with a new one or different types of batteries.
- If you will not use the remote control for a long time, remove the batteries to avoid damage from battery leakage.
- Do not expose batteries to excessive heat such as from sunshine, fire or the like.

Notes on Remote Control Operation

- Make sure that there is nothing obstructing the infrared beam between the remote control and the IR receiver on the display.
- If the effective range of the remote control decreases, or it stops working, replace the batteries with new ones.
- The remote control may fail to operate if the infrared remote sensor is exposed to bright sunlight or fluorescent lighting.
- Ambient conditions may possibly impede the operation of the remote control. If this happens, point the remote control at the display, and repeat the operation.

Locking and Unlocking the Remote Control

You can lock the remote control buttons to prevent unauthorized persons from changing settings on the display. To do this, press **ENTER**, **ENTER**, **EXIT**, **EXIT**, **ENTER** and **EXIT**, in sequence. To unlock a locked remote control unit, use the same sequence of button presses.

Quick Setup

Here is a quick overview of the display installation process. The sections following this one provide detailed instructions.

Step	Procedure	For Details, Refer to page...
1	Mount the display(s) on a wall (optional)	11
2	Connect other external equipment to the display (optional): • Automation/control system (RS232 or Ethernet) • IR extender	 12 14
3	Connect signal sources to the display	14
4	Apply power to the display	17
5	Change the OSD language (optional)	17
6	Perform touch screen-specific installation and configuration tasks (touch model only): • Connect touch screen controller host computer to the display • Install TouchWin software (optional) • Use TouchWin to configure touch screen engine and calibrate display	 18 18 20
7	Display calibration: adjust the following ***for each input***: • Aspect ratio • Brightness • Contrast • Color temperature and white balance • Color level • Tint • Input position	23

Installation Considerations

Proper installation of your display will ensure a satisfying viewing experience. Whether you are installing a display temporarily or permanently, you should take the following into account to ensure your display performs optimally.

Ambient Light

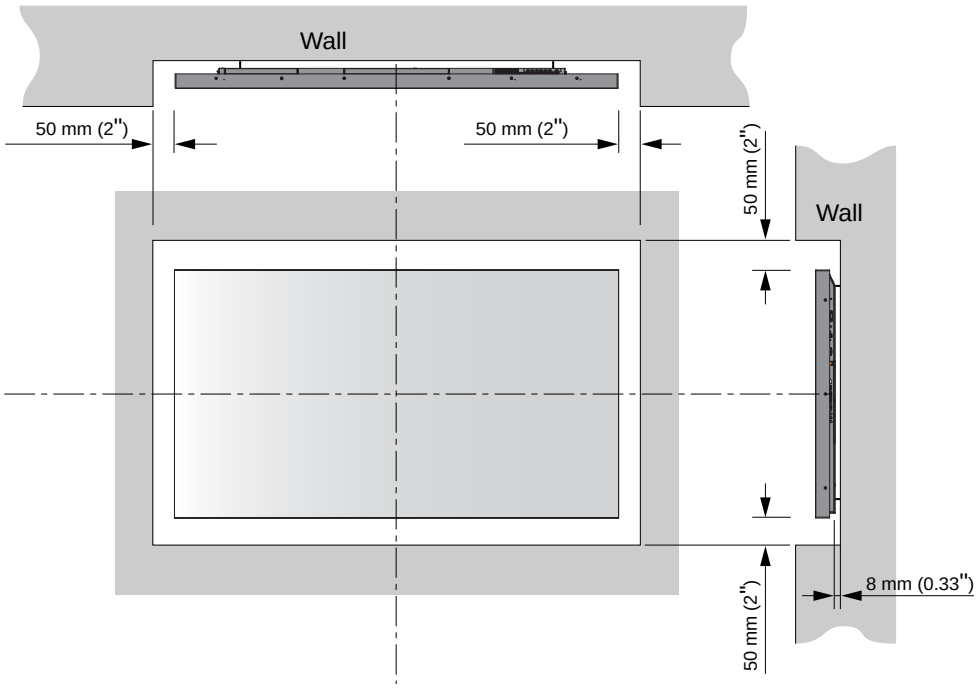
In general, minimize or eliminate light sources directed at the screen. Contrast ratio in your images will be noticeably reduced if light directly strikes the screen, such as when a shaft of light from a window or floodlight falls on the image. Images may then appear washed out and less vibrant.

Ambient Heat

Keep the ambient temperature constant and below 35°C (95°F). Keep the display away from heating and/or air conditioning vents.

Ventilation Considerations

If you are mounting the display in an enclosure, leave sufficient space on all sides between it and surrounding objects, as shown below. This allows heat to disperse, maintaining the proper operating temperature.



Mounting the Display

You can mount the display on a wall. See *FHD651-T Dimensions* on page 53 for mounting hole locations.

If you do decide to wall-mount the display, ensure that the wall-mount bracket is installed according to the instructions included with it. The wall must be capable of supporting a redundant weight factor three (3) times the weight of the display, or be reinforced.

We recommend that this be done by a custom installation specialist.

NOTICE Use only the approved wall-mount kit designed for your display.

Connections to the Display

Proceed as follows to connect the display to your video sources, external controller(s) – if present – and AC power.

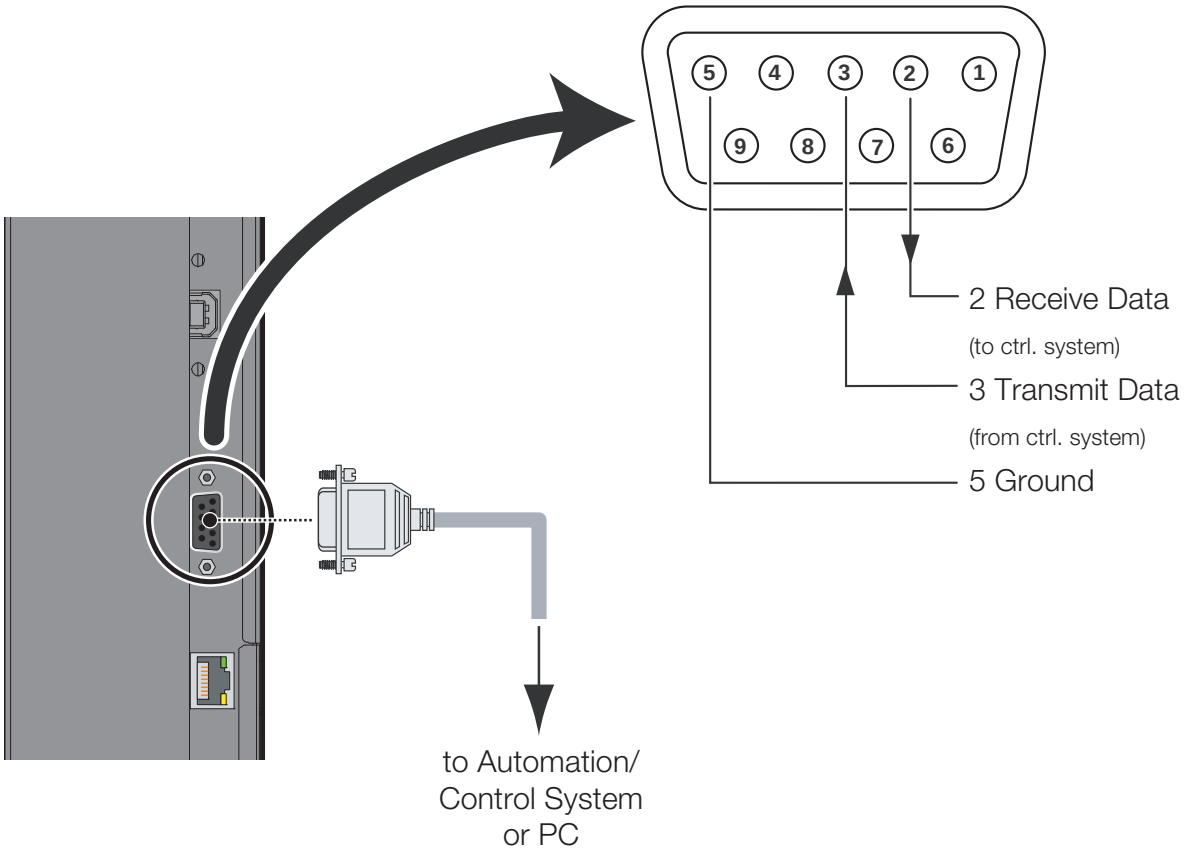
When connecting your equipment:

- Turn off all equipment before making any connections.
- Use the correct signal cables for each source.
- For best performance and to minimize cable clutter, use high-quality cables that are only as long as necessary to connect two devices. (Don't use a 20-foot cable when a 6-foot cable will suffice.)
- Ensure that the cables are securely connected. Tighten the thumbscrews on connectors that have them.

Connecting a Control System or PC

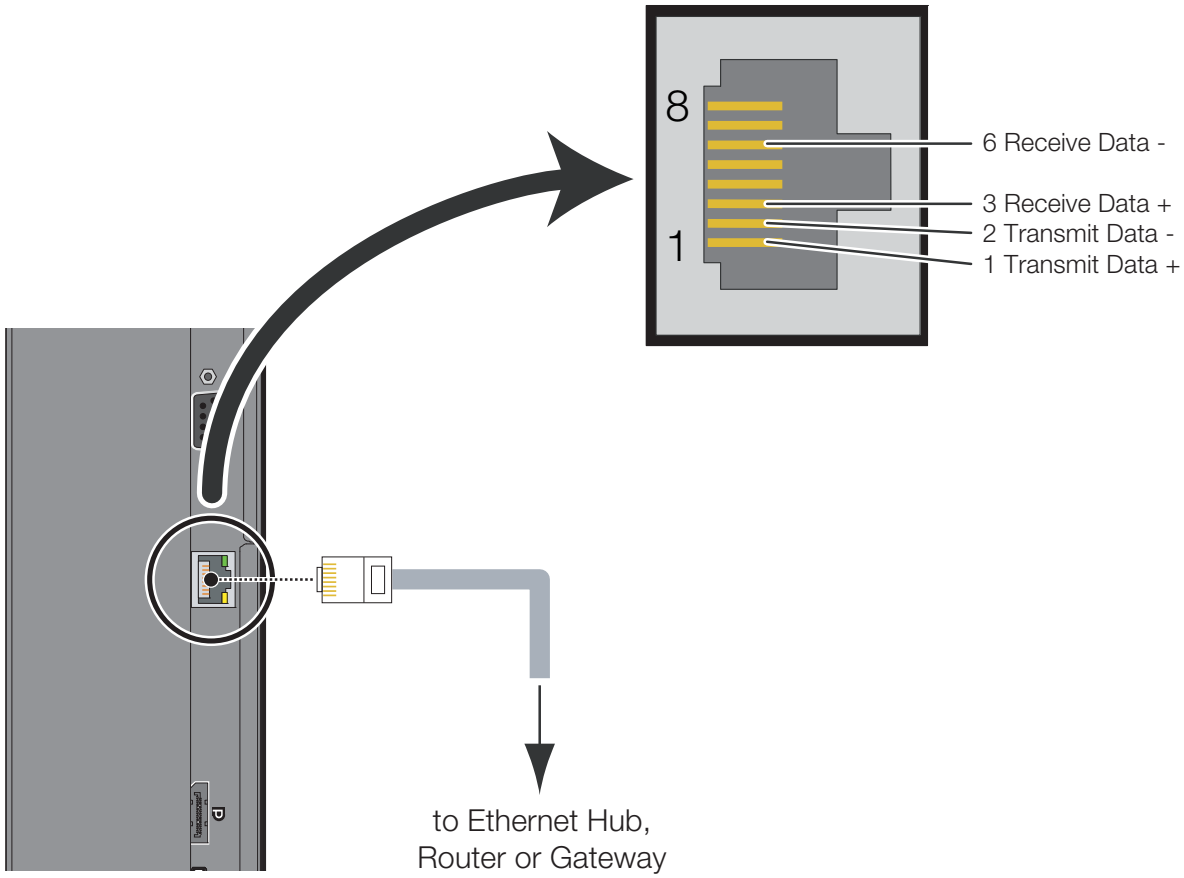
RS232 Connection

Use a straight-through RS232 cable with a 9-pin male connector to connect a PC or control/ automation system (if present) to the RS232 port on the display. For more information about using this connection, refer to *External Control* on page 39.



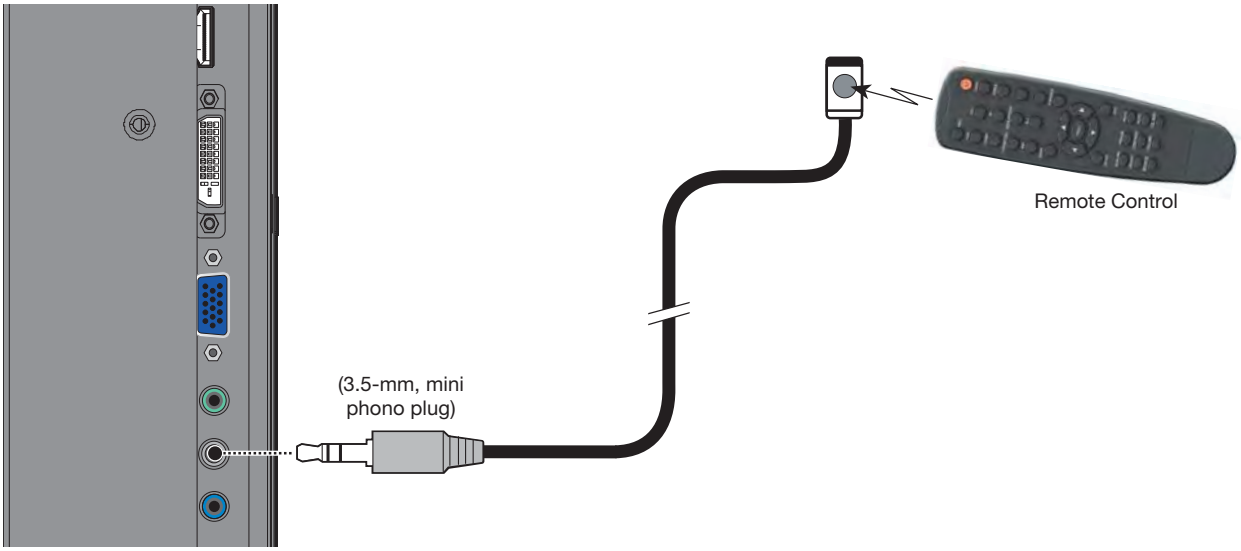
Ethernet Connection

Use a standard Ethernet cable with an RJ45 male connector to connect a PC or control/automation system (if present) to the Ethernet port on the display. For more information about using this connection, refer to *External Control* on page 39.



IR Extender Connection

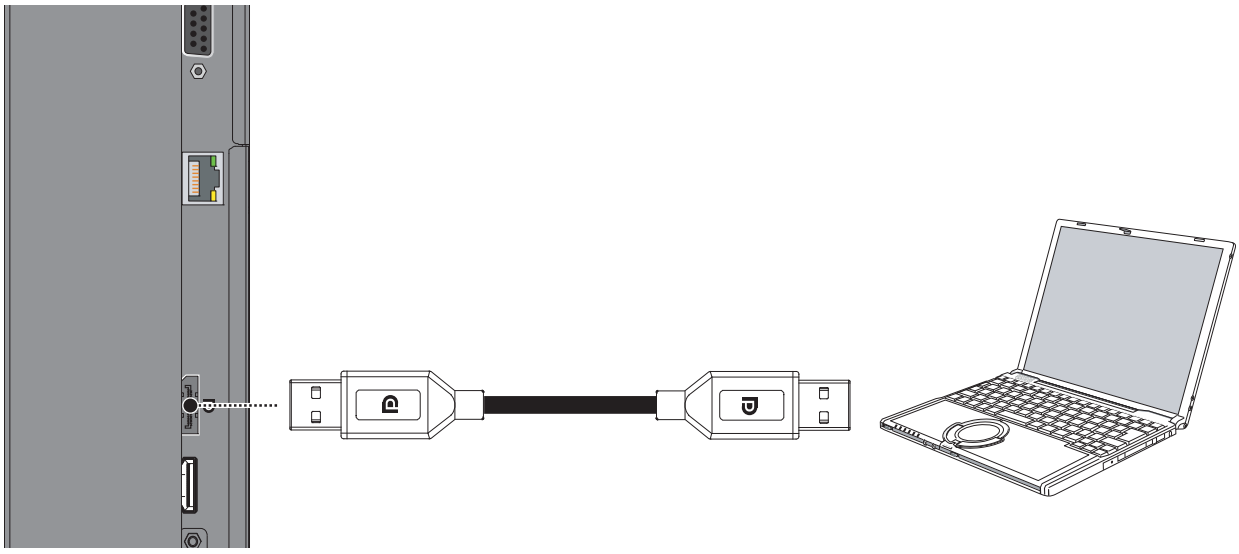
Connect the provided IR extender cable to the IR Extender input as shown below.



Connecting Source Components to the Display

Connect your video sources to the display as shown and described in the sections that follow.

DisplayPort Source Connection



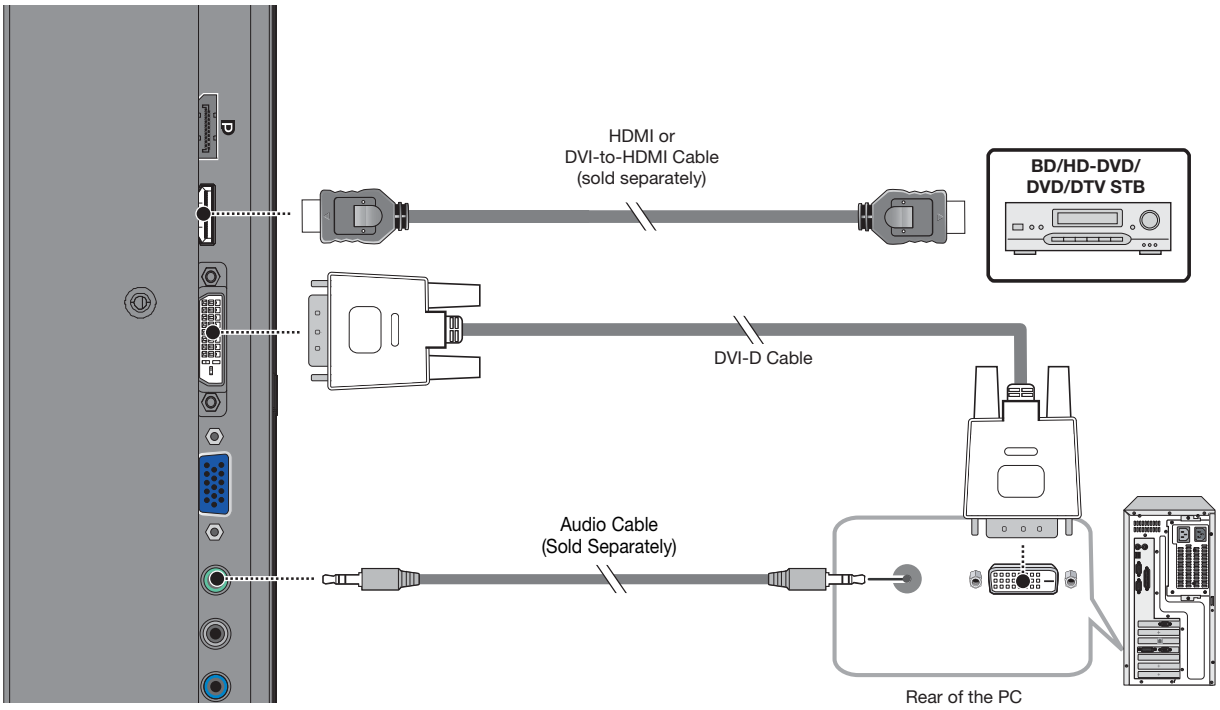
HDMI and DVI-D Source Connections

Use the HDMI inputs whenever possible. This ensures the highest video quality because the signal is carried in the digital domain throughout the entire signal path, from source component output into the display.

You can also connect computers with DVI output to these inputs. Refer to *Supported Timings* on page 51 for a list of compatible input signals.

This display supports the VESA Display Data Channel (DDC) standard. This standard provides “Plug and Play” capability; the display and a VESA DDC-compatible computer communicate their setting requirements, allowing for quick and easy setup.

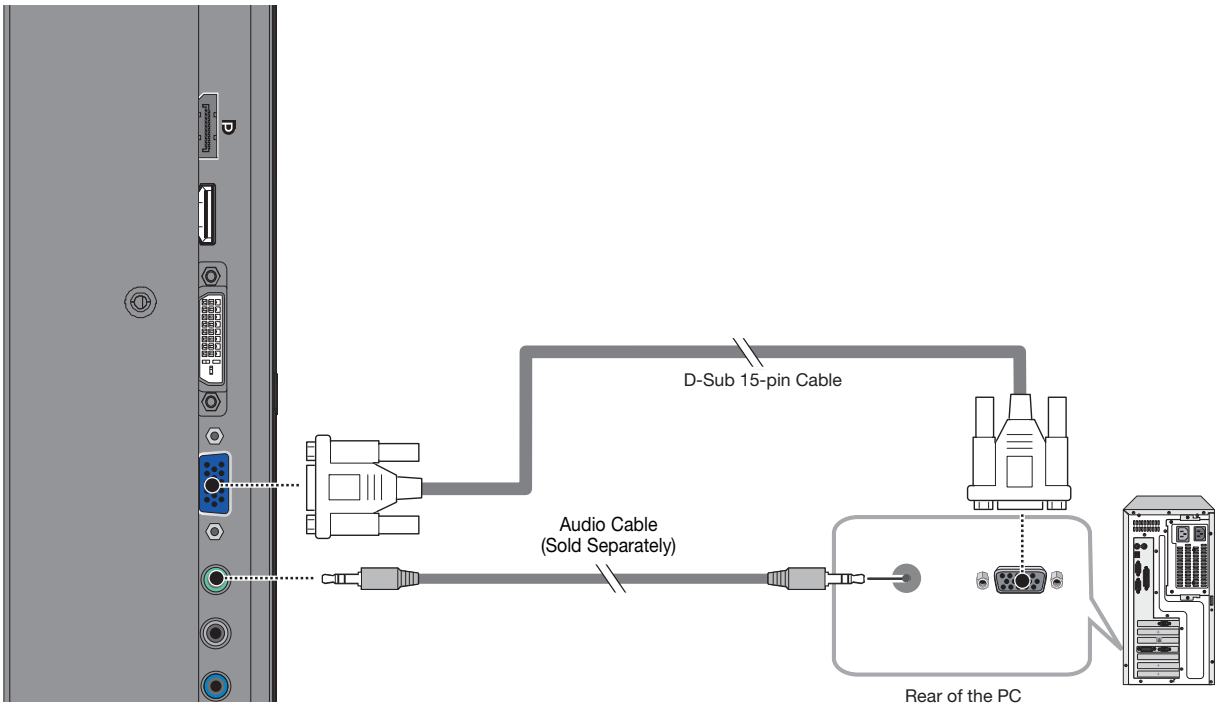
For Plug and Play to work correctly, you must turn on the display before you turn on the connected computer.



RGBHV (VGA) Source Connection

Connect a personal computer or other RGB source to the VGA input as shown below.

Refer to *Supported Timings* on page 51 for a list of compatible input signals.



Turning on the Power

1. Turn on your source components.
2. Plug the female end of the supplied power cord into the AC receptacle on the side of the display (AC 100V ~ 240V).
3. Connect the other end to your AC power source.
4. Turn on the main power switch at the side of the display. The power indicator lights orange to indicate that the display is in “standby” mode.
5. Press the power button ( ) on the remote control to turn on the display (or press the power button ( ) on the keypad). After a brief warm-up period, the display will display an image.

Changing the OSD Language

The display OSD language is initially set to English, but can also display the menus in Simplified Chinese, French, German, Italian, Portuguese, Russian, Spanish, Korean or Japanese. To change the OSD language:

1. Press **MENU**.
2. Select Basic Settings from the Main Menu.
3. Select **OSD Language** from the Basic Settings Menu.
4. Press ◀ or ▶ to select the desired language and press **ENTER**. The change takes effect immediately.

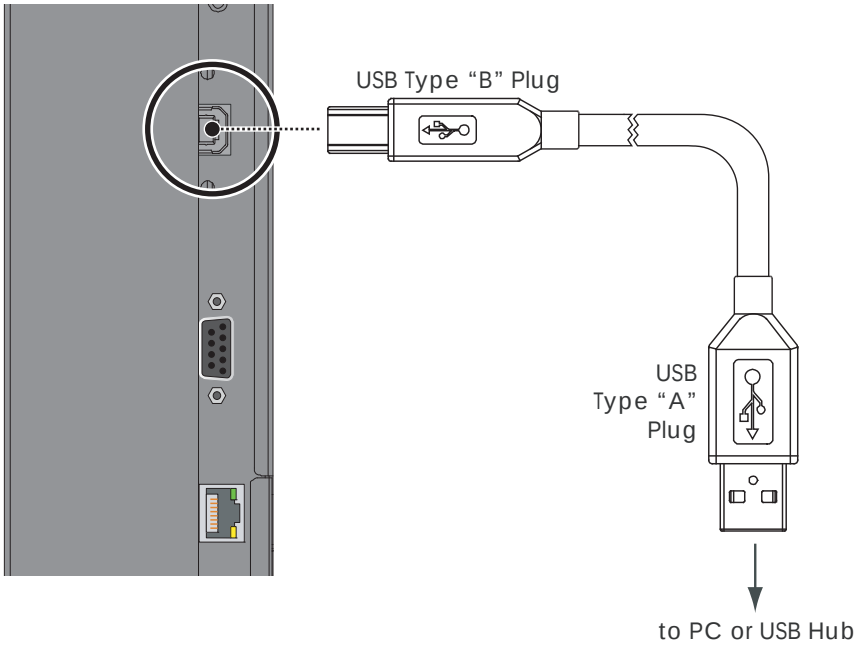
Enabling the Touch Screen (FHD651-T Only)

Before setting up your FHD651-T display to support touch screen capability, ensure that:

- The touch screen controller host computer is turned **off**.
- The display is turned on.
- The video output from the computer is connected to a video input on the display.

Connecting the Touch Screen Controller Host Computer to the Display

Use the provided USB cable to connect the touch screen controller host computer to the USB input as shown below.



After (and ***only*** after) making this connection, turn on your host computer.

Installing TouchWin Software (Optional)

This section provides instructions for installing the TouchWin software, which runs on a host computer to provide expanded touch screen functionality. Before you install TouchWin, ensure that your touch screen controller host computer meets the following minimum hardware and software requirements.

Hardware Requirements

TouchWin requires the following hardware to work correctly.

- **Computer Configuration (Minimum):**
  - 2.2 GHz dual-core processor
  - 1 GB RAM
  - 10 GB available hard disk space
  - 128 MB Nvidia Geforce 6600T graphics card
- **Computer Configuration (Recommended):**
  - 2.5 GHz quad-core processor

- 3 GB RAM
- 10 GB available hard disk space
- 1 GB Nvidia GTX330 graphics card

Software Requirements (Multi-Touch Operation)

These operating systems natively support multi-touch operation.

- Microsoft® Windows 7 Home Premium or Windows 7 Ultimate
- Microsoft Windows 8

Software Requirements (Single-Touch Operation)

These operating systems natively support single-touch operation only.

- Microsoft Windows 7 Home Basic
- Microsoft Windows Vista Enterprise or Vista Business Edition
- Windows XP or Windows Server 2003 with .NET Framework version 2.0 or later
- Apple® OS X

The above operating systems that do not natively support multi-touch can achieve multi-touch via the Tangible User Interface Object (TUIO) protocol. For more information, refer to *Advanced Setting* on page 22.

Installation Prerequisites

Before installing TouchWin, ensure that:

- The USB and graphics card drivers have been installed properly;
- The panel is connected to a computer with a USB cable;
- No virus or malware protection programs are running on the host computer;
- If the driver was installed previously, uninstall it completely and manually remove the old installation files; and
- You are using only a qualified USB extension cable (or none at all).

If the video signal cable is disconnected and re-connected to the host, the USB cable must also be disconnected and re-connected to restore the touch screen capability.

Software Installation

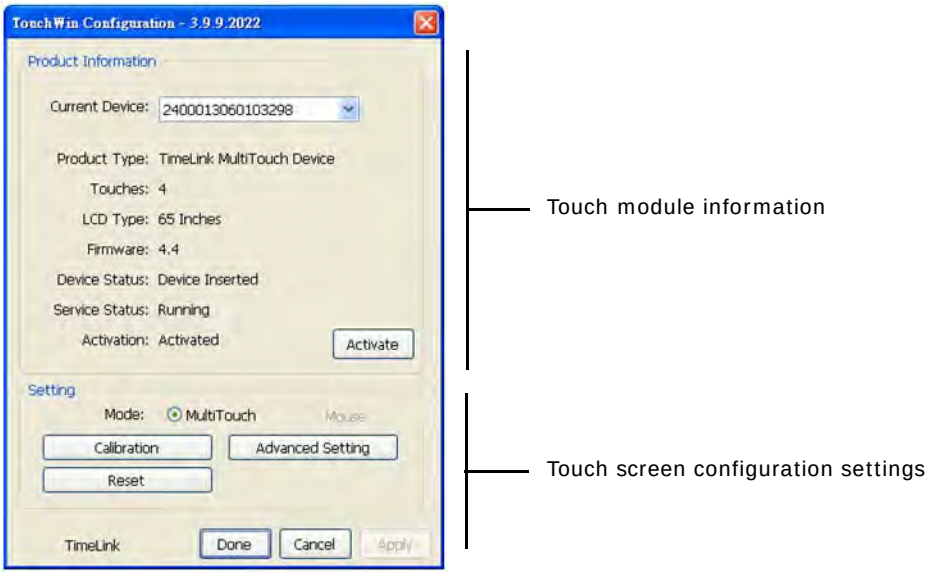
1. Double-click the installation file **TouchWin-[x.x.x.xxxx].exe**, located on the CD-ROM provided with the display. (You can also download the most recent version of the TouchWin software from http://www.timelink.cn/plus/list.php?tid=142.)

2. Choose the desired setup language (English or Simplified Chinese (简体中文)), then click **OK**.

3. The TouchWin Setup Wizard appears. Click **Next** four times, then click **Install**.
4. Select **Yes, restart the computer now** and click **Finish** to restart your computer and complete the installation.

Touch Screen Configuration Instructions

From the Windows Start menu, select **Timelink > TouchWin > TouchWin Configuration**.



Product Information

This area of the TouchWin configuration window contains a variety of information about the touch module: the product type, firmware version and operating status. Should you ever need to contact

Technical Support, this information will help them answer your questions or resolve product performance issues.

Settings

From this area of the TouchWin configuration window, you can change settings, calibrate the touch screen or reset the product to its factory-default state.

The following paragraphs describe these settings in detail. When you are finished configuring the touch screen, click **Done** to save your changes or **Cancel** to discard them.

- **Mode**: Choose one of the following, then click **Done**.
  - **MultiTouch:** This mode is available only in Windows operating systems that support multi-touch; the user can interact with the display using multiple fingers simultaneously and independently of each other. See *Software Requirements (Multi-Touch Operation)* on page 19.
  - **Mouse:** This mode simulates the mouse to process the touch points. Generally, this mode is single-touch. All of the operating systems listed in the previous section support mouse mode. See *Installing TouchWin Software (Optional)* on page 18.

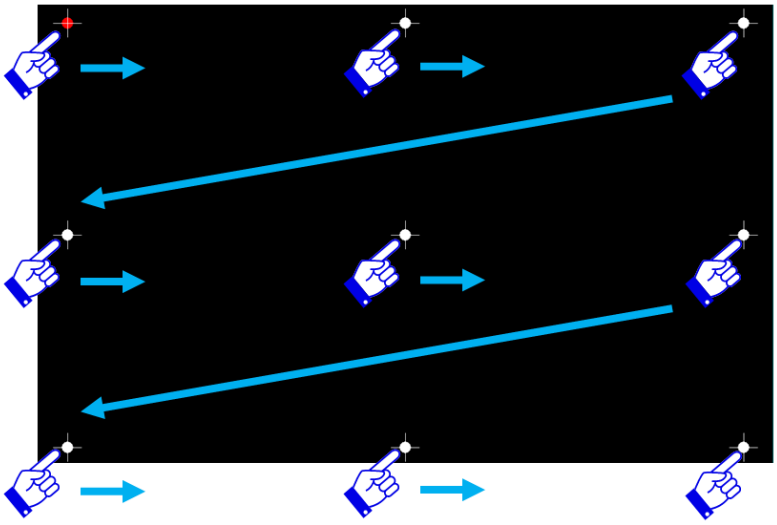
Calibration

If touching the screen does not place the cursor in the desired position, you may be able to correct this by performing a touch screen engine calibration. To do this:

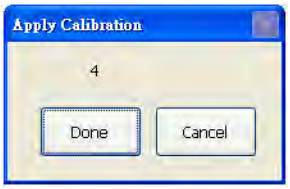
a. Click **Calibration**. A red spot and eight white spots against a black background appear on the screen.

b. Click the red spot by hand and follow the red spot moving to finish the nine-point touch calibration.

Only click the nine points with a finger on the black screen when calibrating.

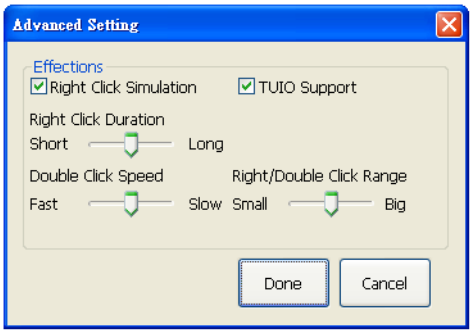


c. When you complete the nine-point calibration, a confirmation window appears. Click **Done** to accept the calibration; click **Cancel** or do nothing (in which case the calibration window automatically disappears after five seconds) to cancel the calibration.



Advanced Setting

Click **Advanced Setting** to display the Advanced Setting window. When you are finished, select **Done** to save your changes or **Cancel** to discard them.



- **Right Click Simulation:** When this option is enabled, pressing on the screen (as opposed to tapping it) performs a “right-click” mouse button action. The amount of time the finger must remain on the touch screen to perform this action is configurable; refer to *Right Click Duration*, below.
- **TUIO (Tangible User Interface Object) Support:** Certain applications require access to touch point messages via the TUIO protocol. Also, certain operating systems require TUIO to provide multi-touch capability (refer to *Software Requirements (Single-Touch Operation)* on page 19). Therefore, it is recommended that you enable this option.
- **Right Click Duration:** When Right Click Simulation is enabled, this slider controls how long a finger press action must be in order for it to be interpreted as a “right-click” action.
- **Double Click Speed:** This slider controls the maximum duration between two touches in order for them to be interpreted as a “double-click” action.
- **Right / Double Click Range:** This slider controls the maximum distance between two touches in order for them to be interpreted as a “double-click” or “right-click” action.

Reset

To restore all TouchWin configuration settings to their factory defaults and undo the effects of any previous calibrations, click **Reset**.

NOTICE ***This action is not undoable. Proceed with caution!***

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Operation

Using the On-Screen Menus

To display the on-screen menus, press **MENU** on the remote control or built-in keypad.

To select a sub-menu, use the ▲ and ▼ buttons to highlight it. Then, press ▶ to enter that sub-menu.

To select a menu item, use the ▲ and ▼ buttons to highlight it. Then, press ◀ or ▶ to adjust that setting and press **ENTER**.

The OSD menus are arranged hierarchically, as shown here and on the next page. Depending on the selected input source and signal characteristics, some menu options may not be available. The default settings appear in bold type.

Video Settings	Scheme	**User**, Vivid, Cinema, Game or Sport	
	Brightness	0, 1, 2 ... **50** ... 99, 100	
	Contrast		
	Sharpness	0, 1, 2 ... **6**, 7, 8	
	Saturation	0, 1, 2 ... **50** ... 99, 100	
	Hue		
	Backlight	0, 1, 2 ... **80** ... 99, 100	
	Color Temperature & Gamma	Gamma	Off or **2.2**
		Color Temperature	5000K, 6500K, 7500K, **9300K** or User
		Red / Green / Blue Gain	128, 129, 130 .. **256** ... 382, 383
		Red / Green / Blue Offset	-50, -49, -48 ... **0** ... 48, 49, 50
	Aspect Ratio	**Full Screen**, Pillarbox or Auto	
	Auto Scan	**On** or Off	
	Select Source	**VGA**, HDMI1, DVI, or DisplayPort	
Audio Settings	Volume	0, 1, 2 ... **50** ... 99, 100	
	Bass	-6, -5, -4 ... **0** ... 5, 6	
	Treble		
	Balance		
	HDMI Audio Input	**HDMI** or PC Audio	
	DP Audio Input	**DisplayPort** or PC Audio	
	Internal Speakers	**Off** or On	

Basic Settings	OSD Transparent	**0**, 1, 2 ... 99, 100	
	OSD Location	Up, Down, Left, Right	
	OSD Rotation	**Landscape** or Portrait	
	OSD Language	**English**, 简体中文 (Simplified Chinese), Français, Deutsch, Italiano, Português, Русский (Russian), Español, 한국어 (Korean) or 日本語 (Japanese)	
	OSD Timeout	5, 10, 15 ... **30** ... 115, 120 seconds	
	Power LED	**On** or Off	
	Real Time Clock	Current Date and Time	
		Timer Mode	User, All Days (Monday ... Sunday) or Work Days (Monday ... Friday, Saturday and Sunday)
		Power-On	**Disable** or Enable
		Power-Off	
	Start Up Logo	On or Off	
Advanced Settings	Auto Adjustment	**No** or Yes	
	Image Position (VGA mode)	Up, Down, Left, Right	
	Phase (VGA mode)	0, 1, 2 ... 63	
	Clocks (VGA mode)	0, 1, 2 ... 100	
	IRFM	**Off** or On	
	Baud Rate	**115200**, 38400, 19200 or 9600	
	Smart Light Control	**Off**, DCR or Light Sensor	
	Wake Up from Sleep	**VGA Only**, VGA/Digital/RS232 or Never Sleep	
	Ethernet Setup	Enable Network	**No** or Yes
		IP Address Settings	Dynamic IP (**Disable** or Enable)
			Static IP Address
			Subnet Mask
			Gateway
			DNS Addr.
			Save Network Settings
			Refresh
		Power Status Alert	**No** or Yes
		Source Status Alert	
		Signal Lost Alert	
		Load Default	
		Device MAC	
	Factory Reset	**No** or Yes	

System	Channel Information	Main	Active Source / Signal Resolution and Refresh Rate
	Firmware Version		

Video Settings

Use the controls in the Video Settings Menu to calibrate each display input to achieve optimum picture quality.

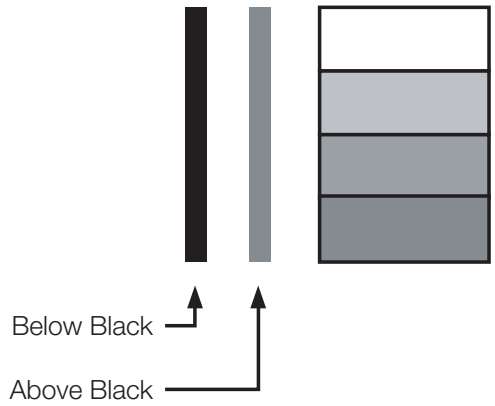
Connect your test pattern source to the input that you are calibrating and proceed as follows. **Perform the adjustments in the order listed here.**

Scheme

Select Scheme from the Video Settings menu, then press ◀ or ▶ to select one of four image quality presets (Vivid, Cinema, Game or Sport) depending on the type of program material you are viewing. These presets automatically adjust the other image settings for optimal image quality. Or, select **User** to adjust Brightness, Contrast and other settings manually.

Brightness

On your external test pattern source, select a PLUGE pattern. (PLUGE is an acronym for “Picture Line-Up Generation Equipment.”)



PLUGE patterns vary but generally consist of some combination of black, white and gray areas against a black background. The example above includes two vertical bars and four shaded boxes.

Select Brightness from the Video Settings menu and press ◀ or ▶ to adjust the brightness so that:

- The darkest black bars disappear into the background.
- The dark gray areas are barely visible.
- The lighter gray areas are clearly visible.
- The white areas are a comfortable level of true white.
- The image contains only black, gray and white (no color).

Contrast

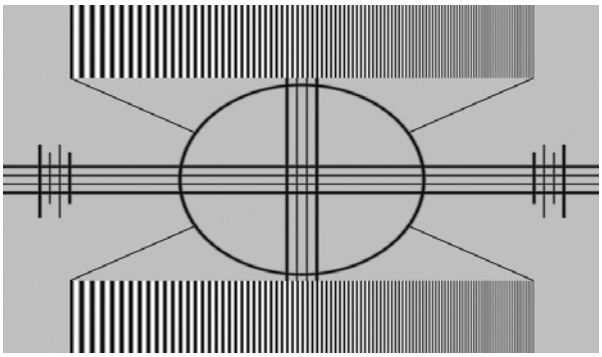
On your external test pattern source, select a stepped, gray-bar pattern like the one shown below.

Select Contrast and press ◀ or ▶ to adjust the contrast to a point just below which the white rectangle starts to increase in size.

Brightness and contrast controls are interactive. A change to one may require a subtle change to the other in order to achieve the optimum setting.

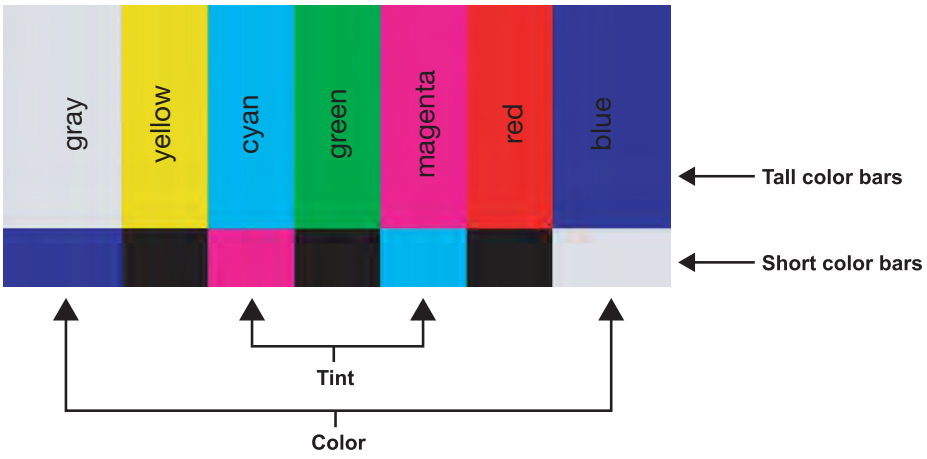
Sharpness

“Sharpness” is the amount of high-frequency detail in the image. To adjust sharpness, select Sharpness from the Video Settings menu. On your external test pattern source, select a pattern like the one shown below. Adjust as needed, looking for white edges around the transitions from black to gray and differently-sized lines in the “sweep” patterns at the top and bottom. Lower the sharpness setting to eliminate them.

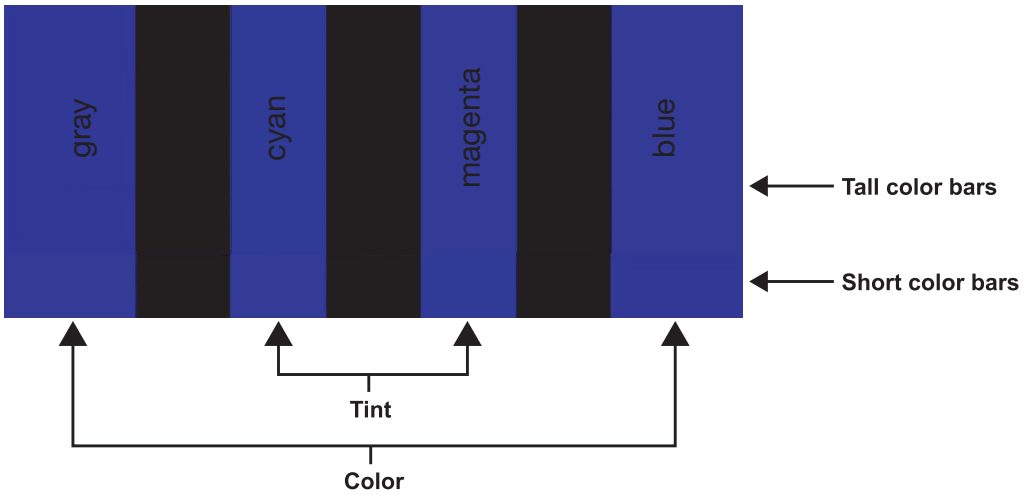


Saturation

On your external test pattern source, select a color bar pattern like the one shown here.



1. Press **MENU** on the remote control or keypad.
2. Select Saturation from the Video Settings menu.
3. While looking at the color bar pattern through a blue filter, adjust the color saturation level until the outermost (gray and blue) color bars appear to be a single shade of blue:



Hue

“Hue” (or “tint”) is essentially the ratio of red to green in the color portion of the image. When hue is decreased, the image appears redder; when it is increased the image appears greener.

To adjust the hue, use a blue filter when viewing the color bar pattern, as you would for adjusting color saturation (refer to the previous section, *Saturation* on page 27).

Select Hue from the Video Settings menu and press ◀ or ▶ to adjust it until the cyan and magenta color bars (on either side of the green bar) appear to be a single shade of blue.

Like the brightness and contrast controls, the color and tint controls are interactive. A change to one may require a subtle change to the other in order to achieve the optimum setting.

Backlight

The Backlight control changes the apparent brightness of the displayed image. Its effect is similar to that of a lamp intensity control on a projector.

Gamma

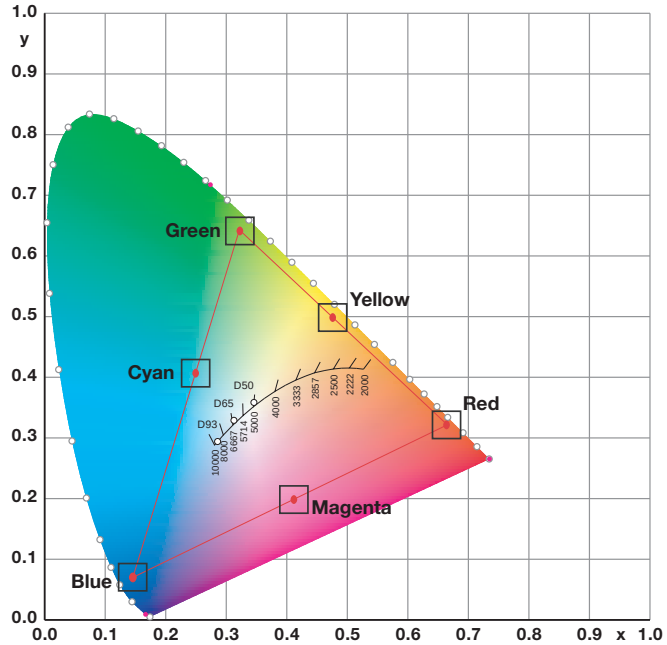
Select Gamma from the Video Settings menu and choose either **2.2** (default) or **Off**.

Color Temperature

Select Color Temperature from the Video Settings menu to adjust the color temperature. Color temperature establishes the “color of gray” by adjusting the 75% white point to various color points.

What are “color points?”

A “color point” is an x/y coordinate pair that defines a color’s location on the standard CIE chromaticity graph, shown below. (CIE stands for “Commission Internationale de l’Éclairage” (International Commission on Illumination), the organization responsible for color measurement and management standards.)



Select a value of from 3200K to 9600K. Higher settings produce a “bluer” picture; lower ones impart a reddish hue to the image. To select a custom color temperature, select User and set the Gain and Offset as described below.

Gain

Use the Gain controls to correct color imbalances in the bright areas of the image. A good way to do this is to use a test pattern consisting mostly of solid white areas, such as an 80 IRE “window” pattern. If the white areas contain traces of red, green or blue, decrease the Gain for that color.

Offset

Use the Offset controls to correct color imbalances in the dark areas of the image. A good way to do this is to use a test pattern consisting mostly of dark gray areas, such as a 30 IRE “window” pattern. If the gray areas contain traces of red, green or blue, decrease the Offset for that color.

Aspect Ratio

To change the aspect ratio (size and shape) of the displayed image, select Aspect Ratio from the Video Settings menu and press **ENTER**. Select the appropriate aspect ratio for the type of program material being viewed.

Note that some aspect ratios are unavailable and/or not useful with certain types of source material. The optimal setting depends on a number of factors, such as:

- The aspect ratio of the source material, as broadcast or encoded on the playback medium.
- The “display type” (16:9 or 4:3) and output resolution settings at the source component. Most modern DVD/BD players and set-top boxes have such controls.
- Viewer preference (original aspect ratio with “black bars,” or a full-screen presentation with some distortion or cropping).

Auto Scan

Select Auto Scan from the Video Settings menu and press ◀ or ▶ to turn this feature on or off. When set to **On**, Auto Scan causes the input select function (using the **SOURCE** button on the remote control unit or keypad) to skip over unused inputs, saving time.

Select Source

Choose Select Source from the Video Settings menu and press ◀ or ▶ to select the video source.

Audio Settings

Volume

Select Volume from the Audio Settings menu and press ◀ or ▶ to change the audio volume.

Bass

Select Bass from the Audio Settings menu and press ◀ or ▶ to cut or boost the low audio frequencies.

Treble

Select Treble from the Audio Settings menu and press ◀ or ▶ to cut or boost the high audio frequencies.

Balance

To adjust the left/right speaker balance, select Balance from the Audio Settings menu and press ◀ or ▶ to make one channel louder than the other.

HDMI Audio Input

If you are using one of the HDMI inputs with a PC or other device that does not support audio output via HDMI, set HDMI Audio Input to **PC** for that input. (Also connect the audio output from your source; refer to *HDMI and DVI-D Source Connections* on page 15.) This setting associates the **PC Audio In** input with that HDMI input.

DP Audio Input

If you are using the DisplayPort input with a PC or other device that does not support audio output via DisplayPort, set DP Audio Input to **PC** for that input. (Also connect the audio output from your source; refer to *HDMI and DVI-D Source Connections* on page 15.) This setting associates the **PC Audio In** input with the DisplayPort input.

Internal Speakers

Set Internal Speakers to **Off** to disable the internal speakers on the display. Set it to **On** to enable them.

Basic Settings

OSD Transparent

Select OSD Transparent from the Basic Settings menu and press ◀ or ▶ to adjust the degree of translucence (show-through) in the menus and message boxes. Zero (0) means that the menus are opaque.

OSD Location

Select OSD Location from the Basic Settings menu and press ◀ or ▶ to move the OSD menu to the desired location.

OSD Rotation

Select OSD Rotation from the Basic Settings menu and press ◀ or ▶ to change the orientation of the OSD menu to match that of the display.

OSD Language

Select OSD Language from the Basic Settings menu and press ◀ or ▶ to select the OSD Language (English, 簡体中文 (Simplified Chinese), Français, Deutsch, Italiano, Español, Português, Русский (Russian), 한국어 (Korean) or 日本語 (Japanese)).

OSD Timeout

Select OSD Timeout from the Basic Settings menu to specify how long the menus remain on-screen after selecting them. Select from 5 to 120 seconds, in five-second increments.

Power LED

Select Power LED from the Basic Settings menu to change the behavior of the status indicator LED during standby mode. When set to **On**, the LED lights orange to indicate that the display is in standby mode. When set to **Off**, the LED is always off, regardless of the operational state of the display.

Real Time Clock

Select Real Time Clock from the Basic Settings menu to set the display's internal real-time clock.

From this menu, you can also program the display to turn on and off at specified times of day and days of the week:

- To set power-on and power-off times for each day of the week independently, set the Timer Mode to **User**.
- To set the same power-on and power-off times for every day of the week, set the Timer Mode to **All Days**.
- To set the same power-on and power-off times for Monday through Friday, set the Timer Mode to **Work Days**.

Start Up Logo

Select Start Up Logo from the Basic Settings menu to enable or disable the Christie Digital Systems splash screen. When set to **On**, the splash screen appears when the display is powered on or exits standby mode. When set to **Off**, the splash screen does not appear.

Advanced Settings

Auto Adjustment

Select Auto Adjustment from the Advanced Settings menu to force the display to reacquire and lock to the input signal. This is useful when the signal quality is marginal.

Image Position (VGA sources)

Use the controls in the Image Position (VGA sources) Menu to fine-tune the image position.

- **Left/Right:** Select Left/Right from the Input Position menu to shift the projected image horizontally. Press ▶ to shift the image to the right; press ◀ to shift it to the left.
- **Up/Down:** Select Up/Down from the Input Position menu to shift the projected image vertically. Press ▶ to shift the image upward; press ◀ to shift it downward.

Phase (VGA sources)

This control adjusts the phase of the pixel sampling clock relative to the incoming signal. Adjust the phase when an image still shows shimmer or “noise” after the Clock setting has been optimized.

Adjust the Phase after adjusting Clock (see below).

For best results, use a good test pattern such as a smooth gray consisting of a clear pattern of black and white pixels, or a similar “half on, half off” graphic image. Adjust the slidebar until the image stabilizes and each pixel is clearly defined. You may notice that you can stabilize the image at more than one point. Use either setting in such cases.

Clock (VGA sources)

This control sets the frequency of the pixel sampling clock, indicated by the number of incoming pixels per line, so that all pixels generated by a particular source are sampled.

Steady flickering or several soft vertical stripes or bands across the entire image indicates poor pixel tracking. Proper pixel tracking helps ensure that the image quality is consistent across the screen, that aspect ratio is maintained and that pixel phase (see above) can be optimized.

IRFM

Select IRFM from the Advanced Settings menu and press ◀ or ▶ to enable or disable this feature, which creates slight frame motion to help avoid image retention.

Baud Rate

Select Baud Rate from the Advanced Settings menu and press ◀ or ▶ to set the data rate of the RS232 communication link.

Smart Light Control

Select Smart Light Control from the Advanced Settings menu and press ◀ or ▶ to configure the automatic backlight control feature of the display. Select one of the following, or select **Off** to control the backlight level manually with the Backlight control in the Video Settings menu.

- **Light Sensor:** With this setting, the backlight level is controlled by the display's internal ambient light sensor.
- **DCR:** With this setting, the display automatically adjusts the backlight level according to the amount of contrast and brightness in the source material.

Wake Up From Sleep

Select Wake Up From Sleep from the Advanced Settings menu and press ◀ or ▶ to control this feature, which operates as follows:

- **VGA Only:** The display wakes up from power-saving mode when it receives an active video signal on its VGA (analog) input.
- **VGA, Digital, RS232:** The display wakes up when it receives an active signal from its VGA, HDMI, Display Port or DVI inputs, or receives a valid RS232 command.
- **Never Sleep:** The display never enters power-saving mode.

Factory Reset

To reset ALL display settings (including image settings) back to their factory defaults, choose Factory Reset from the Advanced Settings menu.

NOTICE ***This action is not undoable. Proceed with caution!***

System

The read-only System menu provides the following status information about the display:

- The resolution and refresh rate of the active source; and
- The currently-installed firmware version.

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Maintenance and Troubleshooting

Maintenance

The FHD651-P and FHD651-T LCD Panels do not require any routine maintenance. There are no user-serviceable or -replaceable parts. Unless you are a qualified, factory-trained technician, ***do not attempt to repair or replace any system component yourself.*** You will void the product warranty if you do so.

Troubleshooting

The table below provides some general guidelines for troubleshooting problems you may encounter with your display. If the suggested solutions fail to resolve the problem or if you encounter an issue not described here, please contact your dealer.

Symptom	Possible Cause(s)	Solution
The display does not turn on.	• The display is not plugged in or the AC outlet is not active. • The main power switch is off. • The remote control batteries have run out.	• Ensure that the display is plugged in and that the AC outlet is active. • Set the main power switch (see *Display at a Glance* on page 3) to the on position. • Replace the batteries.
The display is on and menus appear, but there is no picture.	• Incorrect source selection. • Source component is not turned on. • Source component is connected incorrectly or not at all.	• Select the correct source. • Turn on the source component. • Check connections from the source component to the display.
The remote control does not work.	• The remote control batteries have run out. • The buttons are locked. • IR extender is not connected.	• Replace the batteries. • Unlock the buttons by pressing **ENTER**, **ENTER**, **EXIT**, **EXIT**, **ENTER** and **EXIT**, in sequence. • Verify that the IR extender cable is correctly connected (see *IR Extender Connection* on page 14).
Image geometry is incorrect.	• Incorrect aspect ratio selection.	• Select a different aspect ratio.
The display is jittery or unstable.	• Poor-quality or improperly connected source. • The horizontal or vertical scan frequency of the input signal may be out of range for the display.	• Ensure that the source is properly connected and of adequate quality for detection. • Correct at the source.

Symptom	Possible Cause(s)	Solution
Image is too bright and/or lacks definition in the bright areas of the image.	• Contrast is set too high.	• Decrease the contrast setting.
Image appears “washed out” and/or dark areas appear too bright.	• Brightness is set too high.	• Decrease the brightness setting.
Image is too dark.	• Brightness and/or Backlight are set too low.	• Increase the brightness and/or backlight settings.
Images from an HDMI source do not display.	• The resolution and frequency of the video card in the computer are not compatible with the display. • HDMI cable from source to display is either defective or too long.	• Select a compatible resolution and vertical frequency (refer to *Supported Timings* on page 51). • Try a known-good and/or shorter HDMI cable.
Computer images do not display correctly.	• The resolution and frequency of the video card in the computer are not compatible with the display. • Clock and Phase settings need adjustment.	• Select a compatible resolution and vertical frequency (refer to *Supported Timings* on page 51). • Adjust Clock and Phase settings (refer to *Clock (VGA sources)* on page 33 and *Phase (VGA sources)* on page 33).
Touch screen doesn’t work (FHD651-T only).	• Multi-touch controller host computer is not connected correctly. • Host computer hardware or OS incompatibility.	• Refer to *Connecting the Touch Screen Controller Host Computer to the Display* on page 18. • Refer to *Installing TouchWin Software (Optional)* on page 18.

External Control

In addition to using the display keypad or remote control unit, you can control the display using a serial (RS232) link or Ethernet connection to send commands and receive responses to those commands. You also use discrete infrared (IR) control codes to program a third-party remote control unit. For more information, refer to *Using Discrete IR Codes* on page 46.

Serial Communications

The display uses a simple text-based control protocol to take requests from control devices and to provide responses to such devices. This section describes how to send control messages over a serial link between the display and an automation/control system or a PC running a terminal emulation program.

RS232 Connection and Port Configuration

Connect your control system or PC to the RS232 input of the display; refer to *Connecting a Control System or PC* on page 12.

Configure the RS232 controller or PC serial port as follows: no parity, 8 data bits, 1 stop bit and no flow control. Set the baud rate to 115200, to match that of the display RS232 port.

Command and Response Format

Commands sent from an automation/control system or PC to the display must have the following format:

`[STX] [IDT] [TYPE] [CMD] ([VALUE] or [REPLY]) [ETX] [CR]`

Where:

- `[STX]` indicates the start of the command data (always 07).
- `[IDT]` is the display ID (always 01).
- `[TYPE]` is the command type:
- `00` = return to host (response from the LCD panel)
- `01` = read/action
- `02` = write
- `[VALUE]` is the parameter setting for the command.
- `[REPLY]` is the parameter setting for the command, acknowledged by the display in its response to a command.
- `[ETX]` indicates the end of the command data (always 08).
- `[CR]` is the ASCII carriage return key (0x0D).

Command and Response Examples

Here are some examples of serial commands and their responses:

Description	Command Sent to LCD Panel	Response Received from LCD Panel
Turn LCD panel power off.	07 01 02 50 4F 57 00 08	07 01 00 50 4F 57 00 08
Turn LCD panel power on.	07 01 02 50 4F 57 01 08	07 01 00 50 4F 57 01 08
Request LCD panel power status.	07 01 01 50 4F 57 08	07 01 00 50 4F 57 XX 08 (XX = 0 when off or 1 when on)
Set the LCD panel contrast to 30 (1E hex).	07 01 02 43 4F 4E 1E 08	07 01 00 43 4F 4E 1E 08
Reset the LCD panel display settings.	07 01 02 41 4C 4C 00 08	07 01 00 41 4C 4C 00 08
Request LCD panel serial number.	07 01 01 53 45 52 08	07 01 00 53 45 52 S(0)…S(12) 08 S(0) …S(12) = the serial number in ASCII
Request LCD panel firmware version.	07 01 01 47 56 45 08	07 01 00 47 56 45 S(0)…S(5) 08 S(0) …S(5) = the firmware version in ASCII

Serial Command List

Main Item	Control Item	CMD	Type	Value (DEC)	Reply (DEC)	Content	CMD (HEX)
Power Control and Input Source	Power Control	POW	W/R	00	00	Off (soft power) (For advanced A/D boards – optional)	50 4F 57
				01	01	On (soft power)	
	Input Source	MIN	W/R	00	00	VGA	4D 49 4E
				01	01	Digital DVI	
				09	09	HDMI	
				13	13	DisplayPort	

Main Item	Control Item	CMD	Type	Value (DEC)	Reply (DEC)	Content	CMD (HEX)
Display Adjustment	Display Adjustment	BRI	W/R	0~100	Current value	Back Light Brightness	42 52 49
		BRL	W/R	0~100	Current value	Digital Brightness Level	42 52 4C
		BLC	W/R	00	00	Off (Back Light)	42 4C 43
				01	01	On (Back Light)	
		CON	W/R	0~100	Current value	Contrast	43 4F 4E
		HUE	W/R	0~100	Current value	Hue	48 55 45
		SAT	W/R	0~100	Current value	Saturation	53 41 54
		COT	W/R	00	00	User	43 4F 54
				01	01	6500K	
				02	02	9300K	
				06	06	5000K	
				07	07	7500K	
		GAC	W/R	00	00	Off (Gamma)	47 41 43
				01	01	2.2 (Gamma)	
		USR	W/R	0~255	Current value	Red Gain (128~383)	55 53 52
		USG	W/R	0~255	Current value	Green Gain (128~383)	55 53 47
		USB	W/R	0~255	Current value	Blue Gain (128~383)	55 53 42
		UOR	W/R	0~100	Current value	Red Offset (-50~50)	55 4F 52
		UOG	W/R	0~100	Current value	Green Offset (-50~50)	55 4F 47
		UOB	W/R	0~100	Current value	Blue Offset (-50~50)	55 4F 42
		PHA	W/R	0~63	Current value	Phase	50 48 41
		CLO	W/R	0~100	Current value	Clock	43 4C 4F
		HOR	R		Current value	Horizontal Position	48 4F 52
		VER	R		Current value	Vertical Position	56 45 52
		ADJ	W	00	00	Auto Adjust	41 44 4A

Main Item	Control Item	CMD	Type	Value (DEC)	Reply (DEC)	Content	CMD (HEX)
Display Adjustment (cont.)	Video Mode	SHA	W/R	0~24	Current value	Sharpness	53 48 41
RTC	Current Time Adjustment	RTY	W/R	0~99	0~99	Year	52 54 59
		RTM		1~12	1~12	Month	52 54 4D
		RTD		1~31	1~31	Day	52 54 44
		RTH		0~23	0~23	Hour	52 54 48
		RTN		0~59	0~59	Minute	52 54 4E
	Timer Mode	TMS	W/R	0	0	All	54 4D 53
				1	1	Work Days	
				2	2	User	
	Alarm Enable	AEN	W/R	1	1	Sunday	41 45 4E
				2	2	Monday	
				4	4	Tuesday	
				8	8	Wednesday	
				16	16	Thursday	
				32	32	Friday	
				64	64	Saturday	
	Alarm Disable	AEF	W/R	1	1	Sunday	41 45 46
				2	2	Monday	
				4	4	Tuesday	
				8	8	Wednesday	
				16	16	Thursday	
				32	32	Friday	
				64	64	Saturday	
	Sunday	SNH	W/R	0~23	0~23	Sunday On Hour	53 4E 48
		SNM		0~59	0~59	Sunday On Minute	53 4E 4D
		SFH		0~23	0~23	Sunday Off Hour	53 46 48
		SFM		0~59	0~59	Sunday Off Minute	53 46 4D

Main Item	Control Item	CMD	Type	Value (DEC)	Reply (DEC)	Content	CMD (HEX)
RTC (cont.)	Monday	NNH	W/R	0~23	0~23	Monday On Hour	4E 4E 48
		NNM		0~59	0~59	Monday On Minute	4E 4E 4D
		NFH		0~23	0~23	Monday Off Hour	4E 46 48
		NFM		0~59	0~59	Monday Off Minute	4E 46 4D
	Tuesday	ENH	W/R	0~23	0~23	Tuesday On Hour	45 4E 48
		ENM		0~59	0~59	Tuesday On Minute	45 4E 4D
		EFH		0~23	0~23	Tuesday Off Hour	45 46 48
		EFM		0~59	0~59	Tuesday Off Minute	45 46 4D
	Wednesday	DNH	W/R	0~23	0~23	Wednesday On Hour	44 4E 48
		DNM		0~59	0~59	Wednesday On Minute	44 4E 4D
		DFH		0~23	0~23	Wednesday Off Hour	44 46 48
		DFM		0~59	0~59	Wednesday Off Minute	44 46 4D
	Thursday	UNH	W/R	0~23	0~23	Thursday On Hour	55 4E 48
		UNM		0~59	0~59	Thursday On Minute	55 4E 4D
		UFH		0~23	0~23	Thursday Off Hour	55 46 48
		UFM		0~59	0~59	Thursday Off Minute	55 46 4D
	Friday	INH	W/R	0~23	0~23	Friday On Hour	49 4E 48
		INM		0~59	0~59	Friday On Minute	49 4E 4D
		IFH		0~23	0~23	Friday Off Hour	49 46 48
		IFM		0~59	0~59	Friday Off Minute	49 46 4D
	Saturday	TNH	W/R	0~23	0~23	Saturday On Hour	54 4E 48
		TNM		0~59	0~59	Saturday On Minute	54 4E 4D
		TFH		0~23	0~23	Saturday Off Hour	54 46 48
		TFM		0~59	0~59	Saturday Off Minute	54 46 4D

Main Item	Control Item	CMD	Type	Value (DEC)	Reply (DEC)	Content	CMD (HEX)
Other Control	Scaling	ASP	W/R	01	01	Full Screen	41 53 50
				02	02	Pillar Box	
				04	04	Auto	
	Baud Rate Adjustment	BRA	W/R	00	00	115200	42 52 41
				01	01	38400	
				02	02	19200	
				03	03	9600	
	Other Control	RCU	W	00	00	MENU Key	52 43 55
				01	01	INFO Key	
				02	02	UP Key	
				03	03	DOWN Key	
				04	04	LEFT Key	
				05	05	RIGHT Key	
				06	06	ENTER Key	
				07	07	EXIT Key	
	Other Control	ALL	W	00	00	Reset All	41 4C 4C
		KLC	W/R	00	00	Un-lock Keys	4B 4C 43
				01	01	Lock Keys	
		SER	R		13 bytes	Read Serial Number	53 45 52
		MNA	R		13 bytes	Read Model Name	4D 4E 41
		GVE	R		6 bytes	Read Firmware Version	47 56 45
		RTV	R		Current value	Read RS232C Table Version	52 54 56
		WFS	W/R	00	00	Wake Up From Sleep = VGA Only	57 46 53
				01	01	Wake Up From Sleep = VGA, Digital, RS232	
				02	02	Wake Up From Sleep = Never Sleep	

Main Item	Control Item	CMD	Type	Value (DEC)	Reply (DEC)	Content	CMD (HEX)
Other Control (cont.)	Audio	VOL	W/R	0~100	Current value	Volume	56 4F 4C
		MUT	W/R	00	00	Mute Off	4D 55 54
				01	01	Mute On	
	Scheme Selection	SCM	W/R	00	00	User	53 43 4D
				01	01	Sport	
				02	02	Game	
				03	03	Cinema	
				04	04	Vivid	

Using Discrete IR Codes

The display accepts commands in the form of infrared (IR) signals that conform to the NEC protocol. Each display remote control button has an IR control code associated with it.

You can use these codes to program a third-party, “universal” remote control unit to work with the display. These third-party products usually come with a computer software application for this purpose. For more information, consult the documentation provided with the remote control unit.

IR Command Protocol

The IR control codes have the following characteristics:

- Each code consists of the following:
  - A leader pulse (a modulated pulse of 9 ms followed by a non-modulated pulse of 4.5 ms);
  - 16 address bits (also called a “custom code”): eight (8) bits for the address followed by the logical inverse of the address. The custom code for the display is 16559 decimal (0x40AF, binary 01000000 10101111).
  - 16 data bits: eight (8) bits for the command followed by the logical inverse of the command; and
  - An end pulse (a modulated pulse of 0.56 ms, similar to the modulated pulse in the ‘0’ and ‘1’ bits). The end of the modulated pulse constitutes the end of the data transmission.
- The carrier frequency is 38 kHz, with the modulated pulses having a 33% duty cycle.
- Commands are sent at a maximum rate of 9 Hz.

For example, here is the NEC control code for the **POWER** button on the display remote control unit:

Hex	40	AF	1C	E3
Binary	01000000	10101111	00011100	11100011

Hex	40	AF	1C	E3
Function	Cust. Code Byte 1	Cust. Code Byte 2	Command	Command (Logical Inverse)

IR Control Code List

Customer Code	Data Code	Function
40AF	04FB	INFO
40AF	1CE3	POWER
40AF	07F8	VGA
40AF	08F7	DVI
40AF	09F6	HDMI1
40AF	15EA	DISPLAY PORT
40AF	0EF1	MENU
40AF	12ED	ENTER
40AF	05FA	EXIT
40AF	14EB	SCALING
40AF	43BC	FREEZE
40AF	00FF	MUTE
40AF	17E8	BRIGHTNESS
40AF	18E7 s	CONTRAST
40AF	1EE1	AUTO
40AF	0FF0	SOURCE
40AF	1BE4	VOLUME -
40AF	1DE2	VOLUME +

Ethernet Communications

Please consult the Christie website at www.christiedigital.com for instructions on how to control the display using the display's Ethernet port.

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Specifications

Display Specifications

LCD PANEL	
Brightness	360 cd/m^2
Contrast Ratio	4000:1
Viewing Angle	H:178° / V:178°
Response Time	8 ms (GTG)
Supported Colors	1.07 billion colors
Display Resolution	1920 x 1080 (16:9)
Display Frame Rate	60 Hz
SIGNAL COMPATIBILITY / CONNECTIVITY	
Horizontal / Vertical Frequency	**Analog:** 23 ~ 92 KHz / 47 ~ 63 Hz **Digital:** 15 ~ 94 KHz / 47 ~ 63 Hz
Input Resolution	1920 x 1080 @ 60 Hz (Analog); 1920 x 1080 @ 60 Hz (Digital)
Connectors	DisplayPort / HDMI / DVI / VGA / PC Audio In / IR Extender / Audio Out
Communication Ports	RS232C In
MECHANICAL	
Dimensions	See *FHD651-T Dimensions* on page 53.
Weight	**FHD651-P:** Net: 55 kg / 121 lbs; Gross: 70 kg / 154 lbs **FHD651-T:** Net: 68 kg / 150 lbs; Gross: 83 kg / 183 lbs
Wall Mount	400mm x 600mm VESA
OSD FUNCTIONS	
Control	RS232C, Built-in Keypad, IR Remote Controller
Language	English, 簡体中文 (Simplified Chinese), Français, Deutsch, Italiano, Português, Русский (Russian), Español, 한국어 (Korean) or 日本語 (Japanese)
Source Auto Detect	Yes
Key Lock	Yes
ELECTRICAL	
Power Supply	AC 100V ~ 240V (50/60 Hz), 3.0 Amps, maximum
Power Consumption	223 W, maximum
Power Consumption (standby mode)	0.5 W
Internal Speaker	Input: 1Vp-p; Output: 4Ω / 10W x 2

ENVIRONMENTAL	
Operating Temperature	5°C ~ 40°C, 85% RH
Storage Temperature	-20°C ~ 60°C, 85% RH
TOUCH PANEL	
Interface	USB
Touch	4-point Touch
Specifications are subject to change without notice.	

Supported Timings

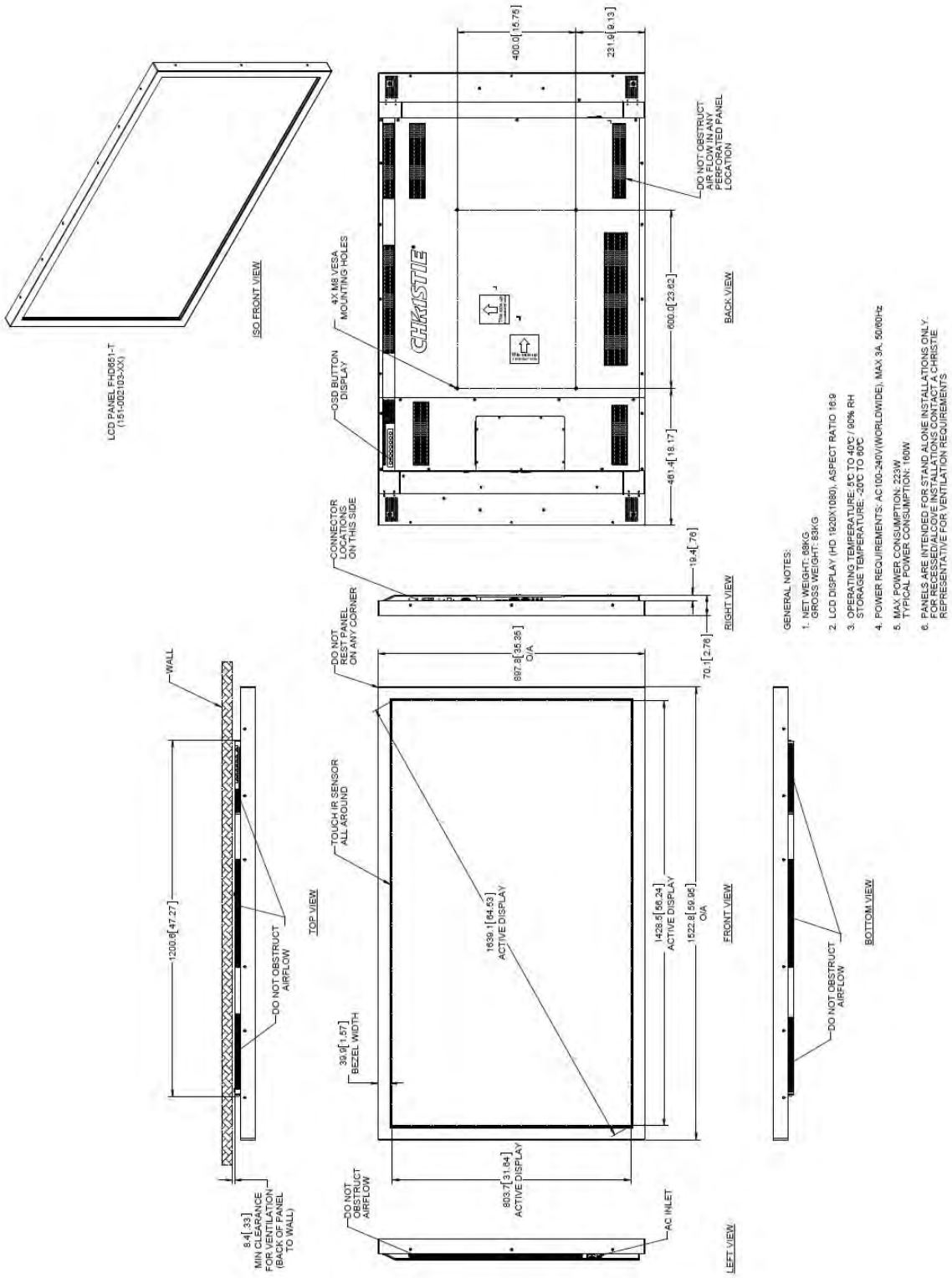
	Timing		fH (kHz)	fV (Hz)	Dot clock (MHz)	HDMI	VGA	DVI	DisplayPort
VESA	VGA 640x480		31.469	59.94	25.175	O	O	O	O
			37.861	72.809	31.5	O	O	O	O
			37.5	75	31.5	O	O	O	O
			43.269	85.008	36	O	O	O	O
	SVGA 800x600		35.156	56.25	36	O	O	O	O
			37.879	60.317	40	O	O	O	O
			48.077	72.188	50	O	O	O	O
			46.875	75	49.5	O	O	O	O
			53.674	85.06	56.25	O	O	O	O
	XGA 1024x768		48.363	60.004	65	O	O	O	O
			56.476	70.069	75	O	O	O	O
			60.023	75.029	78.75	O	O	O	O
			68.677	84.997	94.5	O	O	O	O
	WXGA1360x768		47.712	60.015	85.5	O	O	O	O
	1280 x 720		44.444	59.98	64	O	O	O	O
			44.772	59.86	74.5	O	O	O	O
			56.456	74.78	95.75	O	O	O	O
	1280 x 768		47.776	59.87	79.5	O	O	O	O
			47.396	59.995	68.25	O	O	O	O
			68.633	84.837	117.5	O	O	O	O
	1280 x 800		49.306	59.91	71	O	O	O	O
			49.702	59.81	83	O	O	O	O
	SXGA	1152x864	67.5	75	108	O	O	O	O
		1280x1024	63.981	60.02	108	O	O	O	O
			79.976	75.025	135	O	O	O	O
			91.146	85.024	157.5	O	O	O	O

O = Compliant timing. - = Non-compliant timing.
480i means supported 480i@60Hz (YPbPr). 576i means supported 576i@50Hz (YPbPr).

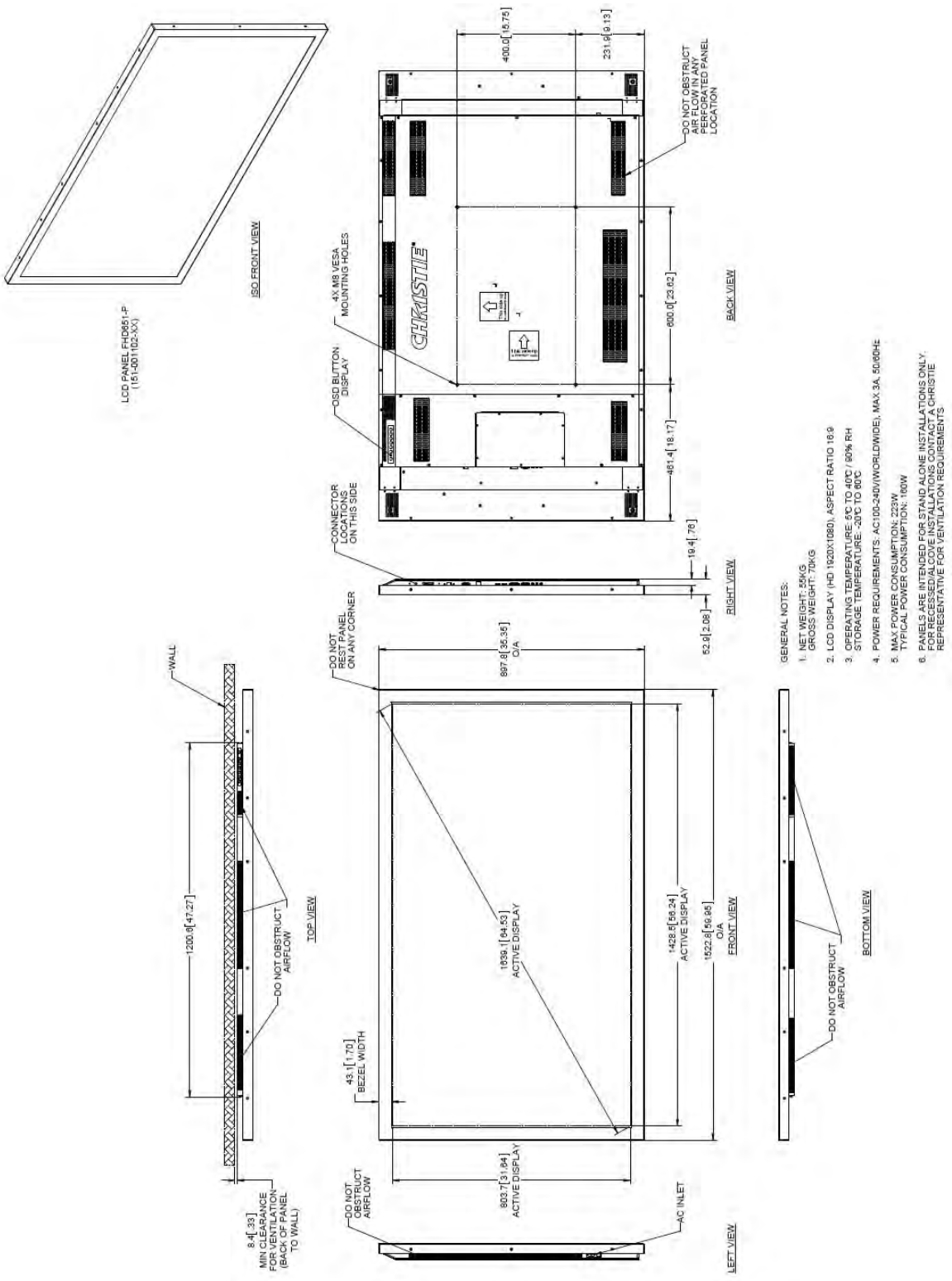
	Timing		fH (kHz)	fV (Hz)	Dot clock (MHz)	HDMI	VGA	DVI	DisplayPort
VESA (cont.)	SXGA+	1400 x 1050	64.744	59.95	101	O	O	O	O
			65.317	59.98	121.75	O	O	O	O
	1440 x 900		55.469	59.901	88.75	O	O	O	O
			55.935	59.88	106.5	O	O	O	O
	WSXGA+ 1680 x1050		64.674	59.883	119	O	O	O	O
			65.29	59.954	146.25	O	O	O	O
	UXGA 1600 x 1200		75	60	162	O	O	O	O
	1920 x 1080		66.587	59.93	138.5	O	O	O	O
SDTV	NTSC		15.734	29.97	13.5	-	-	-	-
	PAL		15.625	25	13.5	-	-	-	-
EDTV	480p		31.5	60	27.03	O	-	O	O
	576p		31.25	50	27	O	-	O	O
HDTV	720p 1280x720		37.5	50	74.25	O	-	O	O
			44.995	59.94	74.176	O	-	O	O
			45	60	74.25	O	-	O	O
	1080i 1920x1080		28.13	50	74.25	O	-	O	O
			33.716	59.94	74.176	O	-	O	O
			33.75	60	74.25	O	-	O	O
	1080p 1920x1080		27	24	74.25	O	-	-	O
			28.125	25	74.25	-	-	-	-
			33.716	29	74.18	-	-	-	-
			33.75	30	74.25	-	-	-	-
			56.25	50	148.5	O	-	O	O
			67.433	59.94	148.352	O	-	O	O
			67.5	60	148.5	O	-	O	O

O = Compliant timing. - = Non-compliant timing.
480i means supported 480i@60Hz (YPbPr). 576i means supported 576i@50Hz (YPbPr).

FHD651-T Dimensions



FHD651-P Dimensions



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