TVC-1700

User Manual

CHRISTIE®

TVC-1700

User Manual

020-100919-03

NOTICES

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REGULATORY

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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The product is designed and manufactured with high-quality materials and components that

can be recycled and reused. This symbol ⊠ means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

Canadian manufacturing facility is ISO 9001 and 14001 certified.

GENERAL WARRANTY STATEMENTS

For complete information about Christie's limited warranty, please contact your Christie dealer. In addition to the other limitations that may be specified in Christie's limited warranty, the warranty does not cover:

   a. Problems or damage occurring during shipment, in either direction.

   b. Projector lamps (See Christie's separate lamp program policy).

   c. Problems or damage caused by use of a projector lamp beyond the recommended lamp life, or use of a lamp supplied by a supplier other than Christie.

   d. Problems or damage caused by combination of a Product with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of a Product with any non-Christie interface device.

   e. Problems or damage caused by the use of any lamp, replacement part or component purchased or obtained from an unauthorized distributor of Christie lamps, replacement

parts or components including, without limitation, any distributor offering Christie lamps, replacement parts or components through the internet (confirmation of authorized distributors may be obtained from Christie).

f. Problems or damage caused by misuse, improper power source, accident, fire, flood, lightening, earthquake or other natural disaster.

g. Problems or damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized repair service provider.

h. Problems or damage caused by use of a Product on a motion platform or other movable device where such Product has not been designed, modified or approved by Christie for such use.

i. Problems or damage caused by use of a projector in the presence of an oil-based fog machine.

j. For LCD projectors, the warranty period specified 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. For any LCD projector where "normal use" is exceeded, warranty coverage under this warranty terminates after 6000 hours of operation.

k. Image retention on LCD flat panels.

l. Failure due to normal wear and tear.

PREVENTATIVE MAINTENANCE

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.

Table of Contents

![Christie logo]

Introduction

This manual provides comprehensive instructions for installing and configuring the TVC-1700 controller. The TVC-1700 controller includes pre-installed wall management software that is used to control and display several applications simultaneously on a large, high resolution desktop. Every TVC-1700 controller is pre-configured to meet the specific requirements of individual customers.

For information about MASTERSuite 5 wall management software, see the MASTERSuite 5 User Manual (P/N: 020-100933-XX), in the root of the MASTERSuite 5 disc included with the TVC-1700.

Parts and Accessories

Item	Description
TVC-1700 Controller	• 2U height • Sliding rail rack mounting kit • Accessories box: • Christie MASTERSuite 5 software box with CD • TVC-1700 User Manual (P/N: 020-100919-xx) • Christie TVC-1700 recovery CD • Drivers disk • Keyboard • Mouse • 1 AC power cord per power supply (2 per controller; separate box)

Item	Description
Expansion Chassis	• 4U height • Sliding rail rack mounting kit • Accessories box • Expansion Linking cable (Qty 1) • DisplayPort to DVI-D adapters (4 per Display4 module) • Optional cables and adapters: • BNC breakout cables (1 per C08V module) • VGA to DVI-I adapters (2 per C02I-SL module) • Component to DVI-I adapters (2 per C02I-SL module) • HDMI to DVI-I adapters (2 per C02I-SL module) • 1 AC power cord per power supply (2 per chassis; separate box)

Contact Support

If you require assistance with the TVC-1700 controller contact Christie technical support. In North America, call toll free 1-800-221-8025. Updated contact information can be found at www.christiedigital.com.

Enter the information in the table below and keep it with your records for future reference. The serial number can be found on the license label or on the front or rear of the controller.

Purchase Record	
TVC Serial Number	
Expansion Chassis Serial Number(s)	
Purchase Date	

Install the Controller

This section provides information and procedures for installing the TVC-1700 controller. It is recommended that you install the TVC-1700 controller in a rack. For optimum performance follow these recommendations:

Item	Requirement
Airflow	To prevent overheating, make sure there is adequate airflow around the controller.
Circuit Overloading	To avoid circuit overloading make sure the equipment is properly connected to the supply circuit and follow equipment ratings.
Mechanical Loading	To minimize personal injury or damage to equipment, avoid uneven mechanical loading when installing the TVC-1700 controller in a rack.
Operating Temperature	Do not operate the TVC-1700 controller in an environment with an ambient temperature greater than 35°C (95°F).
Reliable Grounding	The rack and all rack-mounted equipment should be grounded. Particular attention should be given to supply connections rather than direct connections to the branch circuit. Avoid using power strips.

General Safety Precautions

⚠CAUTION
- When performing maintenance, do not wear loose clothing such as neckties, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body that can act as metal conductors and create short circuits and damage printed circuit boards.
- Two people are required to lift and move the TVC-1700 controller. When lifting keep your back straight, lift with your legs, and spread your feet to distribute the weight.

NOTICE
- When removing the chassis top cover or any system components, place them in a location where they cannot be accidentally stepped on.

Electrical Safety Precautions

⚠CAUTION

- Be aware of the locations of the power switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, memory modules and optical drives. When disconnecting power, turn the operating system off first and then unplug all of the AC power cords.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- To avoid making a complete circuit and electrical shock, use only one hand when working with equipment that is still turned on. Do not allow metal tools to contact electrical components.

- For protection from electrical shock use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- This controller may be equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

Electrostatic Discharge Precautions

NOTICE	• Use a grounded wrist strap designed to prevent static discharge. • Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use. • Touch a grounded metal object before removing the board from the antistatic bag. • Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap. • Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts. • When handling chips or modules, avoid touching their pins. • Put the controller motherboard and peripherals back into their antistatic bags when not in use. • For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Rack Precautions

NOTICE	• Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them. • In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together. • Always make sure the rack is stable before extending a component from the rack. • Extending two or more rack components simultaneously may cause the rack to become unstable. • Install the rack in a clean, well ventilated, and dust-free location. Avoid locations where heat, electrical noise and electromagnetic fields are generated. • Install the rack near a grounded power outlet.

Controller Precautions

- Determine the placement of each component in the rack before you install the rails.
- Install the heaviest components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the controller from power surges and voltage spikes and to keep your system operating in case of a power failure.
- Allow any hot plug drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the controller closed when not servicing to maintain proper cooling.

Separate the Rail Assemblies

The controller package includes two rail assemblies in the rack mounting kit. Each assembly consists of an inner fixed chassis rail that secures to the controller and an outer fixed rack rail that secures to the rack.

1. Open the TVC-1700 controller and expansion chassis packages. If the controller or expansion chassis are physically damaged, file a damage claim with your delivery company.

2. Locate the rail assembly (A) in the expansion chassis packaging and remove it.
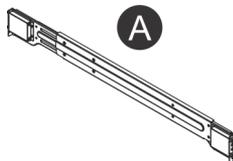
3. Extend the rail assembly by pulling it outward.
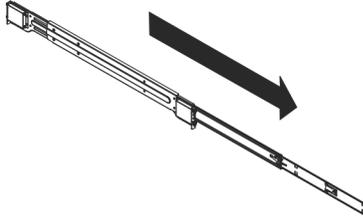
4. Press the quick-release tab (A) down and then separate the inner rail extension from the outer rail assembly.
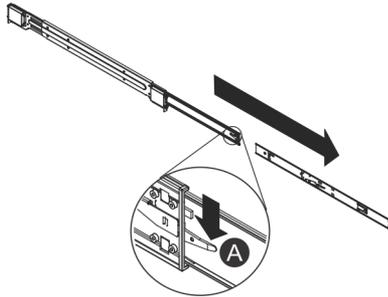
5. Repeat steps 3 to 5 for the second rail assembly.

Install the Inner Rail Extensions on the Controller

The controller includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rail extension is attached to the inner rail to mount the chassis in the rack.

1. Separate the rail assemblies. See *Separate the Rail Assemblies* on page 6.

2. Place the inner rail extension on the side of the chassis. Align the hooks of the chassis with the rail extension holes. Make sure the extension faces the same direction as the pre-attached inner rail.

3. Slide the extension toward the front of the chassis.

4. Secure the inner rail extension to the chassis with 2 screws.

5. Repeat steps for 1 to 3 to install the second inner rail extension on the opposite side of the controller.

Install the Inner Rail Extensions on the Expansion Chassis

1. Remove the 2 screws securing the side panel to the side of the expansion chassis.

2. Remove the side panel and set it aside.

3. Repeat steps 1 and 2 to remove the side panel on the opposite side of the expansion chassis.

4. Align the inner rail mounting holes with the mounting holes on the side of the expansion chassis. The inner rail should fit flush against the side of the expansion chassis.

5. Secure the inner rail to the expansion chassis with 2 screws.

6. Repeat steps 4 and 5 to install the second inner rail on the opposite side of the expansion chassis.

Install the Outer Rack Rails

Outer rails attach to the rack and hold the chassis in place.

1. Separate the rail assemblies. See *Separate the Rail Assemblies* on page 6.

2. Align the rear mounting holes of the outer rail with the mounting holes on the rear rack post.

3. While holding the outer rail in position, secure it to the rack with the screws provided in the rack kit.

4. Press the button where the two outer rails are joined and retract the smaller outer rail.
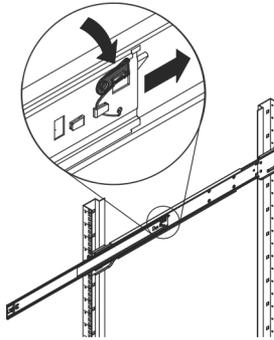
5. Insert the rail hooks into the holes on the front rack post.

6. Secure the front of the outer rail to the rack with the 2 screws provided in the rack kit.
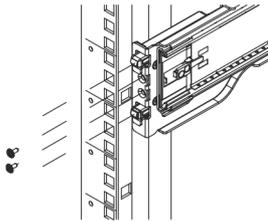
7. Repeat steps 1 to 5 to install the second outer rail on the opposite side of the rack.

Install the Controller into a Rack

1. Extend the outer rails.

2. Align the inner rails of the controller with the outer rails on the rack.

3. While keeping even pressure on both sides of the controller, slide the inner rails into the outer rails.
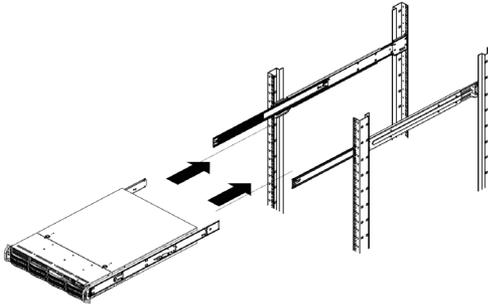
When you hear an audible click, the chassis is pushed completely into the rack and locked into position.

4. Optionally, secure the front of the chassis to the rack with screws.

Controller Front Panel Components
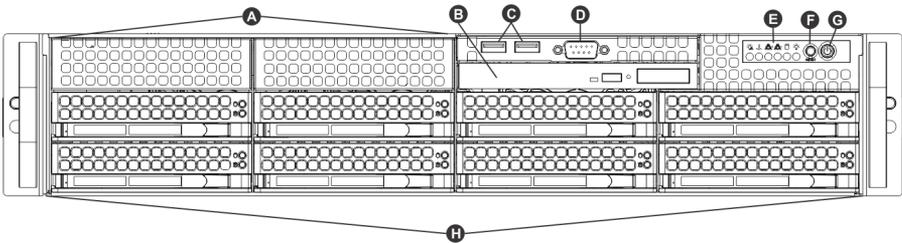
A	3.5" Drive Bays (2)	**E**	Control Panel
B	Slim DVD-ROM Drive	**F**	Reset Button
C	USB Ports (2)	**G**	Power Button
D	COM Port	**H**	SAS/SATA Drives (8)

Controller Rear Panel Components
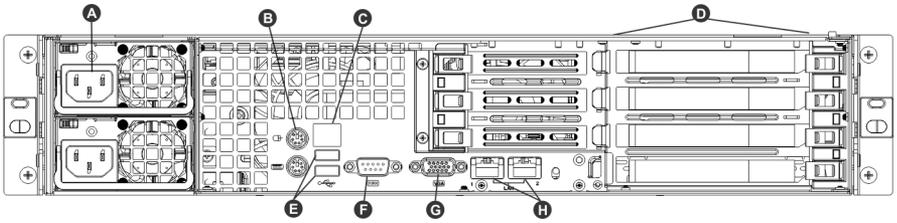
A	AC Power Inputs	**E**	USB Ports
B	Keyboard/Mouse Ports	**F**	COM1 Port
C	IPMI Lan	**G**	VGA Port
D	Standard PCIe Slots (4)	**H**	Ethernet Ports

Controller Buttons

Button	Description
RESET	Restarts the controller.
	Turns the controller on or off. Turning off system power with this button keeps standby power supplied to the system.

Controller LEDs

LED	Description
	Indicates a power supply module failure. The secondary power supply keeps the controller operating. Replace the defective power supply.

LED	Description
	Indicates a fan failure when flashing or an overheat condition when illuminated constantly. This LED remains active until the condition is corrected. • Check the routing of the cables and make sure all fans are operating normally. • Make sure the chassis covers are installed. • Verify that the heatsinks are installed properly.
	NIC1. Indicates network activity on the LAN1 port when flashing.
	NIC2. Indicates network activity on the LAN2 port when flashing.
	Indicates hard drive and/or DVD-ROM drive activity when flashing.
	Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

Drive Carrier LEDs

LED	Description
Green	Flashes on and off when a specific drive is accessed.
Red	Indicates a drive is rebuilding when flashing. When solid it indicates a SATA drive failure. If a drive fails, you are notified by your system management software.

Connect Devices to the Controller

This section provides instructions for connecting devices to the controller and expansion chassis. It also provides an overview of the capabilities of the controller modules.

The controller is pre-configured to your specifications. You should be able unpack the controller and expansion chassis, connect input devices, and display content.

Read the Service Manual(s) provided with the module(s) before you connect new or replacement component(s) to an existing controller. The information provided in this chapter does not provide enough detail for to correctly install and configure TVC-1700 controller modules.

Connect the Controller to the Expansion Chassis

Connect the controller to the expansion chassis with the cable provided.

TVC-1700 Controller
(Host Expansion Card)

9-Slot Expansion Chassis
(Slave Expansion Card)
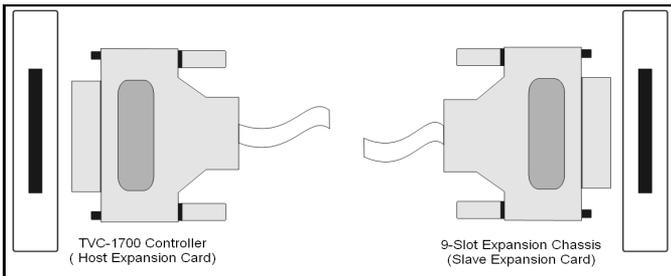
A maximum of three expansion chassis can be connected to a controller.

A daisy chain wiring scheme connects a controller to multiple expansion chassis. Control, Gen-Lock signals and video data are passed between all the connected chassis over the Infiniband cables.
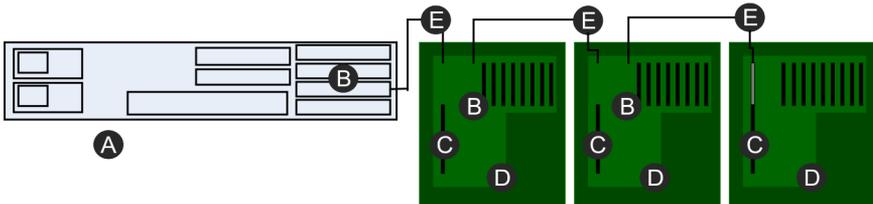
A	Main Chassis	**D**	Expansion Chassis
B	H-Link Cards	**E**	Infiniband Link Cables
C	S-Link Cards		

Input Signals

The controller accepts input signals in these formats:

- Standard video through a 16 input BNC to DB26 cable connection
- Computer video through a DVI connection (RGB, HDMI or Component connections available using DVI to VGA, HDMI or Component adapters)
- Computer video over Ethernet through a RJ-45 connection

Frame rates for Standard Video, DVI and RemoteDesktop capture frame rates are dependent on the number of simultaneous captures and the resolution.

2-Port Single Link DVI-I Input Module

Each DVI-I input module has two DVI-I connectors. A source connected to the top connector is considered input
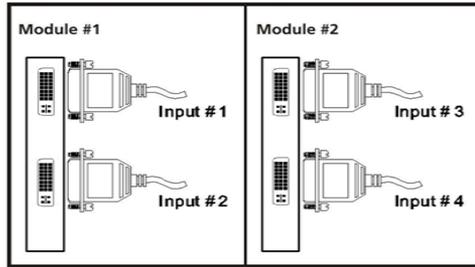
The DVI-I Input Module can accept these standard input signals with support for de-interlacing: DVI-D, DVI-A, DVI-I, RGB/VGA (via HD15 to DVI-I adapter), RGB 3/4/5 wire (via proper adapter), HDMI (via HDMI to DVI-I adapter), and Component (via Component to DVI-I adapter).

Signal Description	Standard Input VGA Connectors				
	RED	**GREEN**	**BLUE**	**Hor/ Comp**	**Vert**
RGB with H & V Sync (5 wire)[a]	Red	Green	Blue	H-Sync	V-Sync
RGB with composite sync (4 wire)[a,b]	Red	Green	Blue	Comp Sync	No signal
RGB with sync-on-green (3 wire)[b]	Red	Green with sync	Blue	No signal	No signal

a. Sync signals cannot be switched between the Horizontal or Composite and Vertical connectors. Sync signal(s) can be negative or positive polarity. Sync present on any of the RGB signals will be ignored when separate or composite sync is input.
b. Sync can be bi-level.'No signal' indicates no signal should be applied to the input.

1-Port Dual Link DVI-D Input Module

Each DVI-D input module has one DVI-D connector.
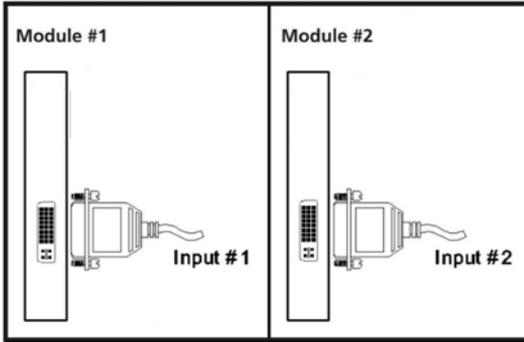
The DVI-D input module can accept DVI-D and HDMI input signals. A maximum canvas of 4K-by-4K allows any DVI source to be captured, except for analog sources. The dual link input module has integrated DVI equalizers on its input, to support longer input cable lengths (up to 20m).

8-Port Standard Video Input Module

Each Standard Video input module has 8 built-in decoders. A single Standard Video Module can connect up to 8 composite or S-video sources. Each module can capture and display 8 composite or S-video sources simultaneously on one or more displays in a display wall. Each module has 2 DB26 connectors. Video sources are connected to the module with a DB26 to 16 way BNC splitter cable connected to the top port on the module. The bottom port is not used.
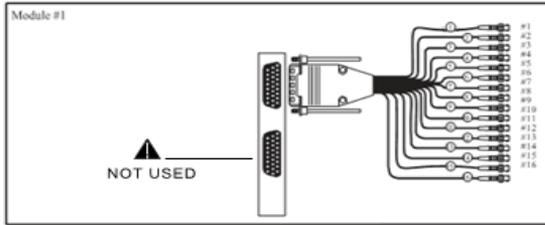
	BNC Connector	
Input Number	**Composite/S-Video Luma**	**S-Video Chroma**
1	1	9
2	2	10
3	3	11
4	4	12
5	5	13
6	6	14
7	7	15
8	8	16

Connect Input Devices

To associate an input connection with a specific MASTERSuite channel, connect each input connection to the correct port. In this example, there are 25 Digital Visual Interface (DVI) ports:
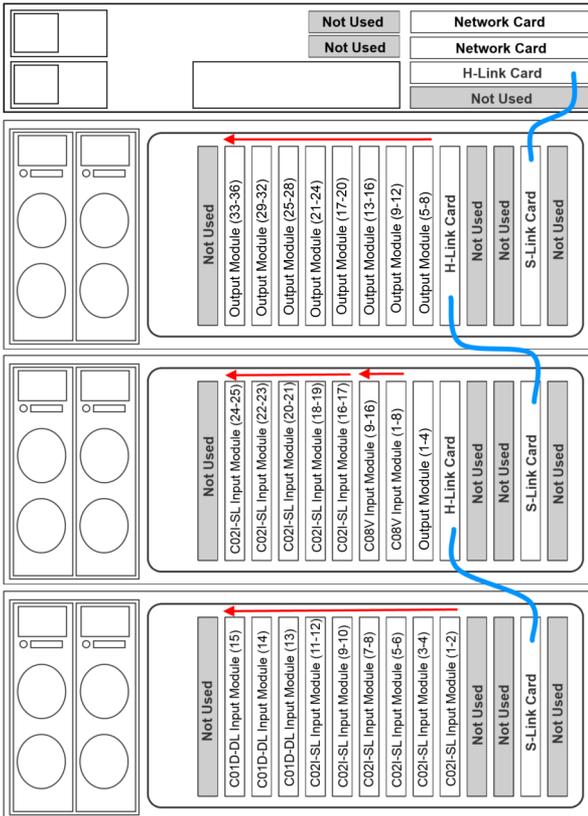
Each numbered input port corresponds directly to a MASTERSuite channel.

1. To associate an input connection with channel 1, connect a DVI cable to the top port of the C02I-SL Input Module (1-2) on the lowest expansion chassis.

2. To associate an input connection with channel 2, connect a DVI cable to the bottom port of the C02I-SL Input Module (1-2) on the lowest expansion chassis.

Top Port
Channel 1

Bottom Port
Channel 2
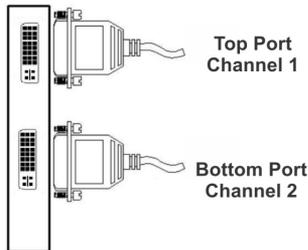
3. Continue connecting input connections from right to left until all of the DVI ports on the lowest expansion chassis are filled.

    When all of the DVI ports on the lowest expansion chassis are filled, start new input connections in the top, lowest numbered port of the middle expansion chassis. Complete the installation by connecting to the DVI ports in the top expansion chassis.

4. Use a daisy chain cabling scheme to connect the expansion chassis to the TVC-1700 controller.

    In this example, connect one end of the (blue) Ex-Link cable to the controller H-Link card and the other end to the S-Link card in the first expansion chassis. Connect a second Ex-Link cable to the H-Link card of the first expansion chassis and then connect the other end to the second S-Link card.

Output Signals

The TVC-1700 controller outputs signals through a DVI or DisplayPort connection. Each output drives up to WUXGA (digital) resolution at 60 Hz. Refresh rates of 60-75 Hz are available for SXGA+ resolution. DVI adapters are provided.

4-Port Output Module

Each output module has 4 DisplayPort ports that connect to the display device directly or with a DisplayPort to DVI adapter (provided). Each output module can connect to 4 display devices or Electronic Control Units (ECUs).

Connect Display Devices and Screens

Additional expansion chassis can be connected to a controller to allow a maximum of 16 Display4 modules.
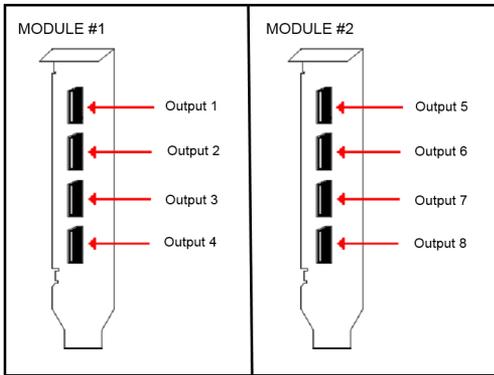
Looking at the front of the display wall, the numbering of the displays begins from the top-left, continues across each row, and then down.
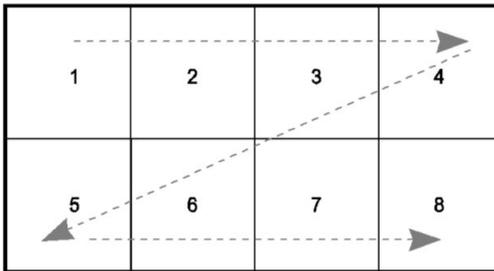
Connect the Display4 display module that is closest to the H-Link card in the expansion chassis farthest away from the controller to displays 1-4.

For example, if all of the display modules are in a single expansion chassis, displays 1-4 are connected to the display module next to the H-Link card in the expansion chassis that is connected directly to the controller:
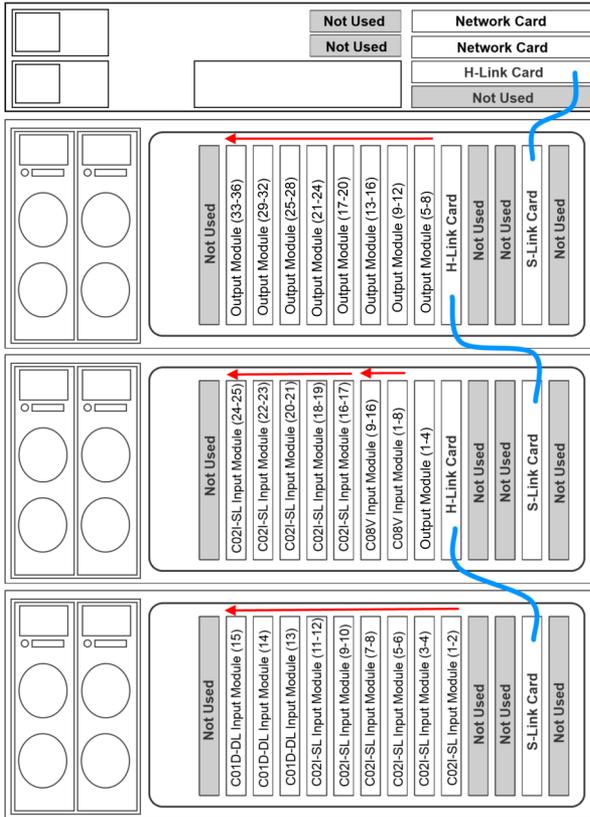
Displays 5-8 are connected to the display module to the left of the first display module. If more then 8 display modules are installed and an extra expansion chassis is used, displays 1-4 are connected to the display module next to the H-Link card in the second expansion chassis.

Connect DVI-D Cables

When connecting DVI-D cables, the controller and display devices must be turned off. A DVI-D connection requires Extended Display Identification Data (EDID), which is detected at startup.

1. Connect one end of the 4 DisplayPort to DVI-D adapter to the connector on the rear panel of the display module.

2. Connect the other end of the 4 DisplayPort to DVI-D adapter to a display device.

3. Repeat steps 1 and 2 to connect the remaining DVI-D cable.

4. Turn on the display devices.

5. Turn on the controller. See *Turn the Controller On* on page 23.

Connect Peripheral Devices

1. Connect the keyboard and mouse to the USB ports on the back of the TVC-1700 controller.

2. If you are connecting to a network, connect the CAT5 Ethernet cable(s) to the network ports on the back of the TVC-1700 controller.

   The ILO port is not supported.

3. Connect peripheral devices, such as USB or serial components to the appropriate connectors on the rear or front panel.

Connect the Controller Power Cords

Two hot plug, redundant power supplies are provided with the standard TVC-1700 controller.

The power cords provided with the controller are region-specific. Do not operate the controller if the AC supply and power cord are not within the specified voltages and power range.

1. Connect one end of the power cord supplied with the controller to the AC inlet of the power supply on the rear panel.

2. Connect the other end of the power cord to a grounded AC outlet.

   The input voltage must be capable of 100-240 VAC, 15A.

3. Repeat steps 1 and 2 for the remaining power cords.

Connect the Expansion Chassis Power Cords

Two hot plug, redundant power supplies are provided with the standard expansion chassis.

The power cords provided with the expansion chassis are region-specific.

 ⚠CAUTION   Do not operate the expansion chassis if the AC supply and power cord are not within the specified voltages and power range. The expansion chassis must be grounded to a reliable earth ground. The reliable earth ground must be installed in accordance with local electrical safety standards.

1. Connect one end of the power cord supplied with the expansion chassis to the AC inlet of the power supply on the rear panel.

2. Connect the other end of the power cord to a grounded AC outlet.

   The input voltage must be capable of 100-240 VAC, 15A.

3. Repeat steps 1 and 2 for the remaining power cords.

Turn the Controller On

When you turn the controller on, the expansion chassis automatically turns on.

1. Press the **Power** button on the front panel of the controller.
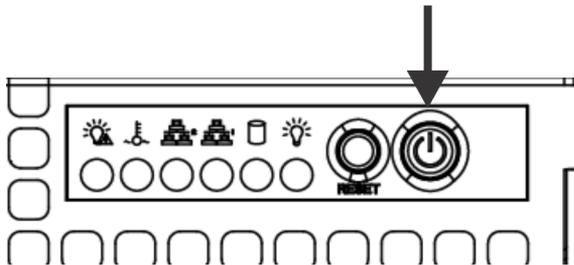
2. Wait for the operating system to complete its initialization process. This may take several minutes depending on the number of display cards installed.

   Depending on your display device capabilities the start up process may not be visible. The default resolution at start up is 640 x 480.

3. If required, enter a valid user name and password.

   If a power supply is not plugged in or has failed, an alarm will sound. If the alarm sounds, press the **Alarm Reset** button on the expansion chassis to turn it off. Determine which power supply modules are missing, disconnected, or have failed. Turn the controller off and add, connect, or replace the power supply modules.

Turn the Controller Off

⚠WARNING The power button on the front panel does not completely turn system power off. Portions of the power supply and some internal circuitry remain active until AC power is removed. If you are performing maintenance, you must also remove the power cord from each power supply. Failure to remove the power cords may increase the risk of personal injury, electric shock, or damage to the equipment.

ⓘ If you are installing or replacing a hot plug device, you do not need to turn the controller off.

1. Close all applications.

2. Click **Start** > **Shutdown**.

   The controller enters standby mode. The system power LED changes to amber. The expansion chassis automatically shuts down.

Recognizing Hard Drive Failures

A `POST` message lists failed drives whenever the system is restarted, as long as the controller detects at least one functional drive.

Occasionally, a drive that has previously failed may seem to be operational after the controller is turned off and then on or after the drive has been removed and reinserted. Continued use of failed drives could result in data loss. Replace all failed drives as soon as possible.

Specifications

This section provides the specifications for the TVC-1700 controller.

Main Chassis

CPU	Intel® Xeon™ Quad Core 2.4GHz/1066MHz 12MB L3 cache
Hard drive	Base: 1 x 1 TB SATA 3Gb/s 7200RPM Premium: 3 x 1 TB SATA 3Gb/s 7200RPM RAID1 with Hot Spare
Memory	Type: DDR3 Fully Buffered RDIMM (Registered) Capacity: • Base 8 GB (2 x 4 GB) • Premium 32 GB (4 x 8 GB)
Optical drive	8x DVD ROM
Operating system	Windows 7 Ultimate 64-bit Version 6.1.7600
Cooling	2 x power supply fans 3 x cooling fans for PCI, Memory, CPU
Application software	Christie MASTERSuite 5

I/O Interfaces

Optical USB mouse	1
Standard USB keyboard	1
USB 2.0 ports	4 (2 front, 2 rear)
Serial	2 (1 front, 1 rear)

Embedded PCI Express Gigabit NIC Server Adapter

Network interface	10/100/1000-T
Compatibility	IEEE 802.3 10Base-T
	IEEE 802.3u 100Base-TX
	IEEE 802.3ab 1000Base-T
Data transfer method	PCI Express, four lanes (x4)
Connector	RJ-45
Network Transfer Rate:	
10Base-T (Half-Duplex)	10Mb/s
10Base-T (Full-Duplex)	20Mb/s
100Base-TX (Half-Duplex)	100Mb/s
100Base-TX (Full-Duplex)	200Mb/s
1000BaseTX (Half and Full-Duplex)	2000Mb/s
Cable support	
10Base-T	Cat. 3, 4, 5 UTP; up to 100m (328ft)
10/100/1000Base-TX	Cat. 5 UTP; up to 100m (328ft)

Power Requirements

Standard	720 Watt
Range line voltage	90 to 269 VAC
Rated input voltage	100 to 240 VAC
Rated input frequency	50/60 Hz
Rated input current	9.0 A (100-127 VAC) to 4.0 A (200-240 VAC)

Peripheral Devices

Keyboard	Type	Standard English
	Interface	USB
Mouse	Type	2-button optical with scroll wheel
	Interface	USB

Graphics Output

Card format	PCI Express x16
Card size	110 mm (4.3 in.) x 177 mm (7 in.)
Graphics memory	512 MB
Number of GPUs	1
Number of output channels	4
Bandwidth	720 MB/s
Maximum power consumption	15 watts
Maximum current at +12V	1.2A
Maximum current at +3.3V	250mA (1.8A when powering four DispayPort extenders)
Maximum cards per system	16 (64 display channels)
Resolution	4x2560x1600 @ 60Hz Supports both standard and custom resolutions
Supported display modes	All available in 16bpp and 32bpp
Frame rate	60 Hz @ WUXGA; 60/75 Hz @ SXGA+
Graphics support	2D and 3D (not 3D Stereoscopic)
Standard output connector type	DisplayPort; DVI-D (with adapter)

Standard Video Capture

Card format	PCI Express x4
Card size	110mm (4.3") x 170mm (6.7")
Connectors	2 DB26 connectors
Maximum data rate	480 MB/s
Frame buffer memory	32 MB
Maximum power consumption	8 watts
Maximum current at +3.3V	250mA
Maximum current at +12V	600mA
Number of capture channels	8
Maximum cards per system	16 (128 capture channels)
Frame rate	25/30 fps (PAL/NTSC)
Maximum capture resolution per channel	720x576x16
Signal formats	Composite video (CVBS), S-Video (Y/C)
Supported video standards	NTSC M, J, N, 4.43 50/60; PAL I, B, D, G, H, M, N, NC, 4.43 60; SECAM B, D, G, K, L, LD
Video bus	PCI Express
Wall placement	Anywhere on the display wall

Dual Link DVI-D Video Capture

Card format	PCI Express x4
Card size	110mm (4.3") x 170mm (6.7")
Connectors	1 DVI-D connector
Maximum sample rate	330MHz
Video sampling (Analog)	24/32 bits per pixel / 8-8-8 format
Video capture memory	128 MB triple buffered

Maximum power consumption	12 watts
Maximum current at +3.3V	200mA
Maximum current at +12V	900mA
Input connector type	Single Link DVI, Dual Link DVI
Maximum cards per system	24 (24 capture channels)
Frame rate	Capable of Quad HD at 24/25/30fps
Resolution - digital	640x480 (VGA), 800x600, 1024x768, 1280x1024, 1600x1200, 1920x1080, 1920x1200, 2048x1536, 2560x1600, 3840x2400 (WQUXGA)
Input mode detection	Automatic detection of input modes in hardware which enables the tracking of mode changes in the source signal
Maximum data rate	650 MB/s
Video bus	PCI Express
Wall placement	Anywhere on the display wall
HDCP	Not supported

Single Link DVI-I Video Capture

Card format	PCI Express x4
Card size	110mm (4.3") x 170mm (6.7")
Connectors	2 DVI-I connectors
Maximum sample rate	170 MP/s - Analog; 165 MHz - Digital
Video sampling (Analog)	24 bits per pixel / 8-8-8 format
Video capture memory	64 MB triple buffered
Maximum power consumption	15 watts
Maximum current at +3.3V	250mA
Maximum current at +12V	1.2A

Input connector type	Analog RGB plus Hsync&VSync (5 wire); Analog RGB with Composite Sync (4 wire); Analog RGB with Sync on Green (3 Wire); Single Link DVI; HD15 VGA; HDMI; or Component (with adapter)
Maximum cards per system	24 (48 capture channels)
Frame rate	Dependent upon Resolution (see below)
Resolution - digital	640x480 (VGA), 800x600, 1024x768, 1280x1024, 1600x1200, 1920x1080, 1920x1200 (WUXGA)
Resolution - analog	640x480 (VGA), 800x600, 1024x768, 1280x1024, 1600x1200, 1920x1080, 2048x1536, (QXGA)
Input mode detection	Automatic detection of input modes in hardware enabling the tracking of mode changes in the source signal
Maximum data rate	650 MB/s
Video bus	PCI Express
Wall placement	Anywhere on the display wall
HDCP	Not supported
Analog input range	Min. 0.5Vpp, Max 1.0Vpp
Input offset	+/-2V
Hsync	15kHz - 110kHz
Vsync	No hardware limits, but typically 25Hz - 200Hz for real signals
Separate sync polarity	Positive or Negative (Separate H & Vsync, Composite Sync)
Sync on green polarity	Negative
Inputs	75 Ω terminated

Frame count for DVI captures varies depending on the number of inputs being captured and the resolution of the input signals.This table lists sample frame rates based on a variety of resolutions and input counts. In general, frame rates scale with resolution, so other capture resolutions can be interpolated based on the values in the table.

Resolution	Number of Inputs	Frames Per Second
1920x1200	1	45
1920x1200	2	20
1280x1024	1	60
1280x1024	2	50
1280x1024	4	40

Safety

- CAN/CSA C22.2 No. 60950-1-03 1st Edition
- UL 60950-1 1st Edition
- IEC 60950-1:2001

Electro-Magnetic Compatibility

Emissions	FCC CFR47, Part 15, Subpart B, Class A/B – Unintentional Radiators
	CISPR 22:2005 (Modified) / EN55022:2006, Class A/B - Information Technology Equipment
	CISPR 22:2005 (Modified) / EN55022:2006, Class A - Information Technology Equipment
Immunity	CISPR 24:1997 (Modified) +A1:2001 +A2:2002 / EN55024:1998 +A1:2001 +A2:2003 EMC Requirements - Information Technology Equipment
Marking	The product shall bear the CE markings and conform to all relevant European directives, standards, safety, health, and environmental concerns.
	Future product markings to include International Certifications: cULus, GoST-R, KC, CCC, c-tick.

Reliability and Serviceability

Reliability	MTBF of major components	50 000 hours
Serviceability	MTTR	15 minutes max.

Quality

- ISO 9001:2000 Manufactured in Christie's Canadian facility, certified for ISO 9001:2000 and ISO 14001:2004

- ISO 14001:2004

Environment

Operating	Temperature	+5°C to +35°C (+40°F to +95°F) Derate by 1 degree C (1.8 degrees F) for every 305m (1000ft) altitude over 1525m (5000ft)	
	Relative Humidity	8% to 85% non-condensing	
	Altitude	0 to 2000m (6561ft) max.	
	Shock (Single event only	Half-sine: 40g, 2-3ms	
	Vibration (random, non-continuous)	0.5g (rms), 5-300Hz	
Non Operating	Storage	Temperature	-40°C to +60°C (-40°F to +140°F) Derate by 1 degree C (1.8 degrees F) for every 305m (1000ft) altitude over 1525m (5000ft)
		Relative Humidity	8% to 90% non-condensing
	Shipping	Shock (Single event only)	Half-sine: 160cm/s, 2-3ms (~100g) Square: 422cm/s, 20g
		Altitude	0 to 9,144m (30 000 ft) max.
		Vibration (random, non-continuous)	2.0g (rms), 10 to 500Hz

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