Christie ACT

USER MANUAL

CHRISTIE®

Christie ACT

NOTICES

COPYRIGHT AND TRADEMARKS

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.

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

이 기기는 업무용 (A 급) 으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며 , 가정 외의 지역에서 사용하는 것을 목적으로 합니다 .

GENERAL

Every effort has been made to ensure accuracy, however in some cases changes in the products or availability could occur which may not be reflected in this document. Christie reserves the right to make changes to specifications at any time without notice. Performance specifications are typical, but may vary depending on conditions beyond Christie's control such as maintenance of the product in proper working conditions. Performance specifications are based on information available at the time of printing. Christie makes no warranty of any kind with regard to this material, including, but not limited to, implied warranties of fitness for a particular purpose. Christie will not be liable for errors contained herein or for incidental or consequential damages in connection with the performance or use of this material.

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.

WARRANTY

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. Damage occurring during shipment, in either direction.
b. Projector lamps (See Christie's separate lamp program policy).
c. 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 caused by combination of the product with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of the product with any non-Christie interface device.
e. Damage caused by misuse, improper power source, accident, fire, flood, lightening, earthquake or other natural disaster.
f. Damage caused by improper installation/alignment, or by product modification, if by other than a Christie authorized repair service provider.
g. 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.
h. 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.

1 Introduction

2 Installation and Setup

3 Operation

4 Maintenance

5 Troubleshooting

6 Specifications

1   Introduction

Christie *ACT* (Automation Controller) is an independent box that can be used to sequence Christie actions of multiple devices inside or outside of theatre environments. Christie *ACT* provides a simple user interface for operators, yet provides a rich interface for advanced users that need to configure the unit.

- *1.1 Using this Manual*
- *1.2 Purchase Record and Service Contacts*
- *1.3 Christie ACT Overview*

1.1 Using this Manual

USERS/OPERATORS: This manual is intended for trained users authorized to operate electronic components within Christie *ACT*, located in restricted area such as projection rooms in theatres.

SERVICE: There are no serviceable parts within Christie *ACT*.

This manual contains the following sections:

- *1 Introduction*
- *2 Installation and Setup*
- *3 Operation*
- *4 Maintenance*
- *5 Troubleshooting*
- *6 Specifications*

Disclaimer:

Every effort has been made to ensure the information in this document is accurate and reliable. However, due to constant research, the information in this document is subject to change without notice. Christie Digital Systems assumes no responsibility for omissions or inaccuracies. Updates to this document are published regularly, as required. Please contact Christie Digital Systems for availability.

1.1.1 Typographical Notations

The following notations are used throughout this manual:

References to specific areas of the document appear italicized and underlined. When viewed online the text appears in blue indicating a direct link to that section. For example, *Section 6 Specifications*.

- References to other documents appear italicized and bold, such as ***Christie User Manual.***
- References to software menus, tabs, and available options appear bold, such as **Operator Menu, Editor**: **Script Menu,** and **Config.**
- User input or messages that appear on screen, in status display units or other control modules appear in Courier font. For example. **"No Signal Present", Login: christiedigital.**
- Error codes, LED status appear in bold, e.g. **LP, A1** etc.
- Operational states of modules appear capitalized, such as "power ON, power OFF".
- Signal words, such as **Warning**, **Caution** and **Notes** are used in this manual to point the reader to specific information or instructions that warn of safety related hazards which may be present and how to avoid them.

1.2 Purchase Record and Service Contacts

Whether this product is still under warranty or the warranty has expired, Christie's highly trained and extensive factory and dealer service network is always available to quickly diagnose and correct malfunctions.

Should you encounter a problem with this product, please contact your dealer listed on the back cover of this manual. If you have purchased the product, fill out the form below and keep with your records.

Table 1.1 Purchase Record

Dealer/Christie Sales Contact:	
Dealer/Christie Sales Contact Phone Number:	
Christie *ACT* Serial Number*:	
Purchase Date:	
Installation Date:	

* *The serial number can be found on the license label located on the side panel of the product.*

1.2.1 RS232 IN Settings

Table 1.2 Serial Port Default Settings

	RS-232 IN	RS-232 OUT	RS-422	RS-232 OUT (Audio)
Baud Rate (Bits Per Second)	115,200	115,200	19,200	9,600
Data Bits	8	8	8	8
Parity	None	None	None	None
Stop Bits	1	1	1	1
Protocol	Script Protocol	Script Protocol	Script Protocol	Script Protocol
Mode	8N1	8N1	8N1	8N1
Flow Control	None	None	None	None

Determine the IP Address Using the Serial Port

You can determine Christie *ACT*'s current IP address by connecting to Christie *ACT* using the RS232 IN port and rebooting Christie *ACT* (reboot by unplugging the power cord and plugging it back in). As Christie *ACT* boots up it will display the current Ethernet settings over the serial connection.

The Ethernet settings can also be queried by using these serial commands:

(net+eth0?) - query the current IP Address

(net+sub0?) - query the current Subnet Mask

(net+gate?) - query the current Gateway

Configure the IP Address Using the Serial Port

To configure the IP address over RS232 IN:

1. Connect a serial cable to the RS232 on Christie *ACT*.

2. Use a terminal program (for example HyperTerminal) to connect to Christie *ACT*. **NOTE***: If you cannot connect to this device and you do not know the IP address, see <ins>Section 5.1.4 Manually Resetting RS-232 IN Port.</ins>*

3. Log into Christie *ACT* using the command: **(UID "service" "service")**

4. Set the IP Address using: **(net+eth0 "192.168.1.90")**
    where '192.168.1.90' is replaced with the IP Address to be set.

5. Set the Subnet Mask using: **(net+sub0 "255.255.255.0")**
    where '255.255.255.0' is replaced with the Subnet Mask to be set.

6. Set the Gateway using: **(net+gate "192.168.0.1")**
    where '192.168.0.1' is replaced with the Gateway to be set.

1.2.2 Ethernet Settings

At manufacture, the following Ethernet settings were defined for Christie *ACT*:

Table 1.3 Ethernet Settings

Default Gateway:	192.168.10.1
DNS Server:	n/a
Default IP Address:	192.168.1.89
Subnet Mask:	255.255.0.0

NOTE: *Christie ACT listens for incoming TCP/IP ethernet cues on port 6001.*

1.3 Christie *ACT* Overview

Christie *ACT* incorporates two basic user interface systems a control interface and a web user interface.

• Control Interface - 8 programmable buttons on the front panel of the unit that trigger a single isolated event or initiate the start of a programmed sequence.

The *web user interface* - a web based interface served internally by Christie *ACT* and displayed in a web browser over a local area Ethernet network. The *web user interface* is a full function setup and diagnostic tool that can be used for setup, configuration of "scripts," defining button functions, and creating event sequences.
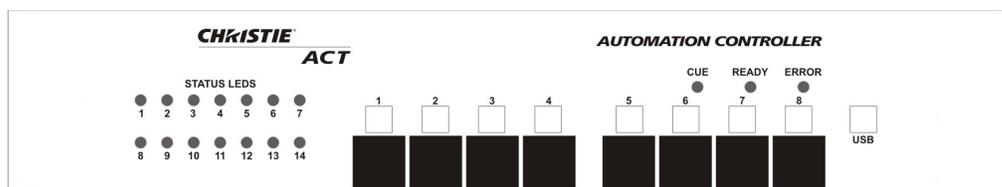
Figure 1-1 Christie *ACT* Front Panel
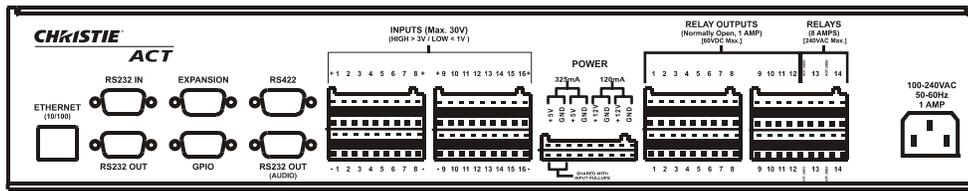
Figure 1-2 Chrisite *ACT* Back Panel

1.3.1 Key Features

- Inputs - 16 opto-isolated inputs
- Outputs - 14 relays Single Pole Single Throw (SPST)
- GPIO - 7 non-isolated with 12V rail
- Control Interface - 8 front panel buttons
- Power - Dual voltage (120/240 VAC) input
- Accessory Power - 12V and 5V terminals
- Dimensions - 2 Rack Unit Height
- Web User Interface
- Serial Control RS232 and RS422
- Ethernet
- RS232 (loop-through)
- 14 programmable LEDs
- Status LEDs
- Available Buzzer (user configured)

1.3.2 Inputs

There are 16 inputs (32 terminals) located on the back panel of Christie *ACT*. (**Figure 1-2**). There is an option to internally pull up any of the inputs to an isolated 5V via software control. The input pull-up feature is disconnected by default.

The internal pull-up to 5V is useful when interfacing with other equipment's contact closures (such as relays). The internal input pull-ups provide a voltage to active the inputs.

If available, an emergency situation input can be connected and the automation is able to control the appropriate auditorium functions (lights up, projector off, etc.) in case of an emergency. Refer to
Section 3 Operation.

1.3.3 Outputs

There are 14 relay outputs (28 terminals) all of which are normally open (N/O) single pole single throw (SPST) located on the back panel of Christie *ACT*. The first 12 are rated for 1A, and the last two are rated for 8A. The external power terminals can be connected to allow the relay outputs to carry some voltage.

Relays can be grouped together (connect common for multiple signals) by using jumper leads at the connectors.

1.3.4 List of Components

Ensure you received the following components with your *ACT*:

- *ACT* with pre-installed ears for rack mounting (2-RU)
- 6 ft. power cord
- Magnetic "C" Channel Label Holder
- Adhesive Rubber Feet
- User Manual

2　Installation and Setup

This section explains how to install, connect, and get Christie *ACT* up and running. For operation details, refer to *Section 3 Operation*.

- *Section 2.1 General Information*
- *Section 2.2 Front Panel*
- *Section 2.3 Back Panel*
- *Section 2.4 I/O Connections and Communications*
- *Section 2.5 Installation*
- *Section 2.6 Communications Setup*

2.1 General Information

The Christie *ACT* unit is designed for installation in a *CP2000* projector pedestal or, more typically, in a Mounting Rack like the CP2000ZX or M rack stand.

NOTE: *The Christie ACT unit is intended for installation in a RESTRICTED ACCESS LOCATION only.*

⚠ **WARNING** **1) Installation to be performed by a Qualified Service Technician only. 2) Disconnect all power before servicing!**

Before you begin installation, it is important to fully understand all site requirements and characteristics.

⚠ **WARNING** **Christie *ACT* DOES NOT have an internal battery. If AC Power is interrupted Christie *ACT* will abort the ongoing program and will reset to an OnDeviceStartup condition which means the system will re-initialize.**

2.2 Front Panel

2.2.1 Mounting Points

Mounting points enable Christie *ACT* to be installed in the rear of the CP2000 pedestal, or be rack-mounted in a separate standard 19-inch rack. Refer to *Section 2.5.1 Rack Mount Installation*.
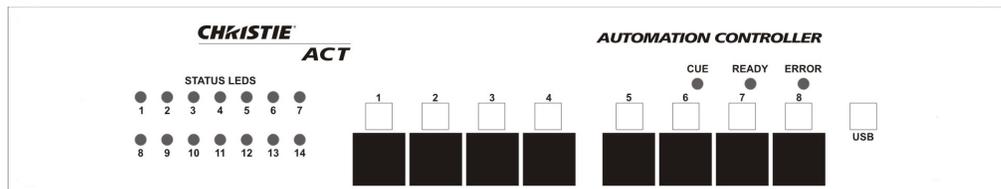
Figure 2-1 Christie *ACT* Front Panel

2.2.2 Front Display Panel

STATUS LEDS	Used to display the status of I/O scripts. They are programmable under script control.
Buttons (1-8)	These are programmable buttons that provide event control via the front panel of Christie *Act*. They are programmable under the **Script** tab by adding a Button Action. For example, a button can be configured to provide a cue to open a relay or send an output signal via RS232 or any other output sequence of events.
White label boxes/magnetic 'C' channel label	Used to identify the button function.
CUE led	Indicates that a cue is active.
READY led	Indicates that power is ON, the system has booted up and is ready.
ERROR led	Indicates an error condition. Use the web interface to determine the error.
USB port	Deferred feature located on the front panel of Christie *ACT*.

2.3 Back Panel
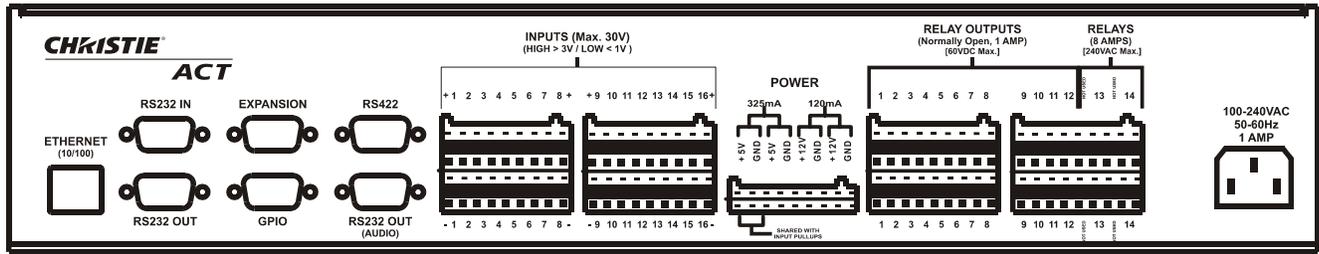
Figure 2-2 Christie *ACT* Back Panel

2.3.1 Back Display Panel

Communications

- **Ethernet Management** - Connect with an Ethernet switch for transmission of control and status communications.
- **RS232** - Connect with a server, PC or other device for serial communication.
- **RS422** - Connect an RS422-compatible controller for unusually long-distance serial communication.
- **GPIO** -This is a digital GPIO. Connect the desired GPIO-compatible device here for integration of Christie *ACT* with an established control system. Devices connected via GPIO can operate in tandem with Christie *ACT*, or vice versa and is often used for automation of regularly scheduled events. Refer to *Section 6.7 GPIO* for input and output voltages.

AC Connector and Power Cord

⚠ **WARNING** **1) The North American rated line cord is provided with each unit. Ensure that you are using a line cord, socket and power plug that meets the appropriate local rating standards. 2) Use only an AC power cord recommended by Christie. Do not attempt operation if the AC supply and cord are not within the specified voltage and power range.**

Use only the attachments and/or accessories recommended by Christie. Use of others may result in the risk of fire, shock or personal injury.

Use the Christie *ACT* power cord for any installation. Plug into an appropriate wall outlet or use the convenience outlet in the CP2000 pedestal. Christie ACT is rated for 100-240VAC. Refer to *Section 6 Specifications* for more information.

2.4 I/O Connections and Communications

⚠ **WARNING** **Do not interrupt the Christie *ACT* while it is saving. This will interrupt any active script!**

2.4.1 Input/Output Connector Types

⚠ **WARNING** **Primary voltages MUST be connected by Qualified Electricians only!**

2.4.2 Power Out

The power outputs are isolated and separate from the main electronics. They are located to the left of the relay outputs, facing the back panel (**Figure 2-3**). The *Christie ACT* accepts universal voltages, but includes a North American plug. There are 4 output voltage rails, two 5V, 2W rails and two 12V, 2W rails. These can be connected to the inputs/outputs as desired. A resettable (poly PTC type) fuse limits the total draw on these rails. The pull-ups to 5V is shared with one of the isolated rails. Refer to *Section 6 Specifications* for more information.

Power Features

- 2x 5V outputs, 2x 12V outputs
- One 5V rail; shared with input pull-ups
- Current limited
- Internally fused
- Voltages can be connected in series for higher output voltages
- Removable connector terminals for easy wire connection
- Isolated, electronically, from the internal electronics
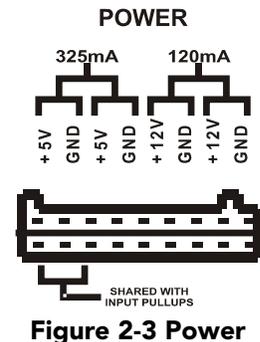
Figure 2-3 Power

2.4.3 Power Input

For specifications pertaining to power input refer to *Section 6.2 Power*.

2.4.4 Inputs

The Inputs are located on the back panel of the *Christie ACT*. There are two groups of 16 bi-directional inputs (32 terminals). Both groups have the optional 5V pull-ups via software control. The pull-ups are disconnected by default. Since a double-stacked connector is used, the matching pairs of terminals are arranged vertically. **NOTE**: *For connection, the top inputs are positive and the bottom are negative.* Refer to *Section 6 Specifications* for more information.
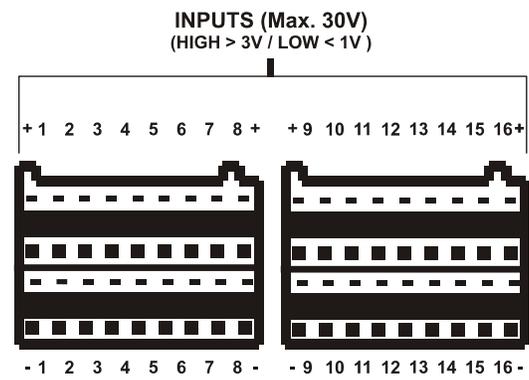
Figure 2-4 Inputs

Input Features

- Removable connector terminals for easy wire connection
- Configurable internal pull-ups are useful when power is unavailable from the user device (dry contacts, such as un-powered relays, on the user device)
- 16 inputs, positive and negative input terminals
- +/- 30V Max. input voltage tolerance
- Optically-isolated from internal electronics

User   Christie ACT

\+

No Connection   R= 600 ohms

Software reads OFF

\-

Fairchild MOC256M
Optically Coupled Isolator
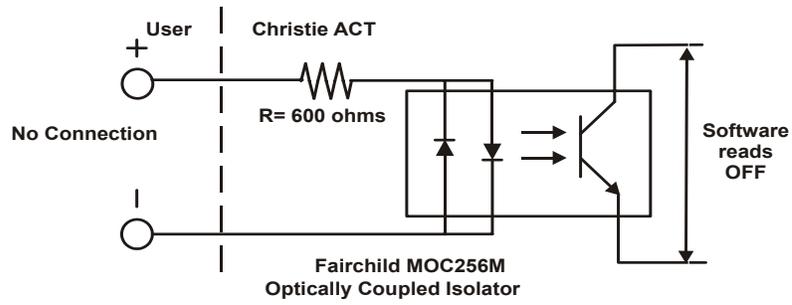
Figure 2-5 Inputs OFF State

5V

NOTE: *Not to be connected in this mode*

\+

Pull-up + ground

R= 300 ohms

\-

Optically Coupled Isolator

Software reads ON

User   Christie ACT

\+

External voltage   R= 600 ohms

\-

Optically Coupled Isolator

Software reads ON

GND on 5V Power Output Terminal
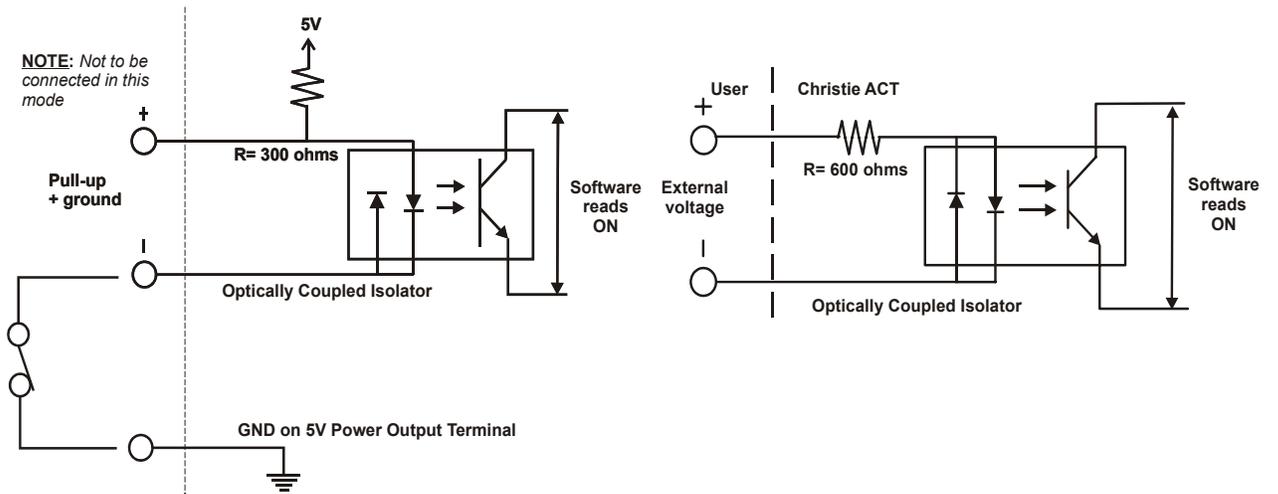
Figure 2-6 Inputs ON State

POWER

325mA   120mA

5V GND +5V GND +12V GND +12V GND

The Ground (GND) is shared with Input Pullups

SHARED WITH INPUT PULLUPS
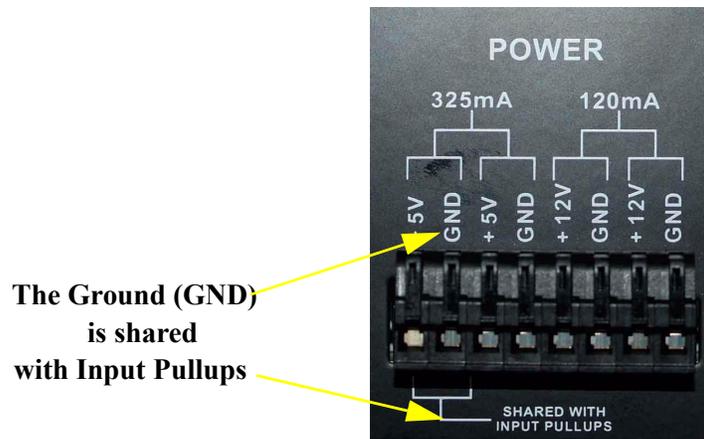
Figure 2-7 Inputs With Internal Pull-ups (Active)
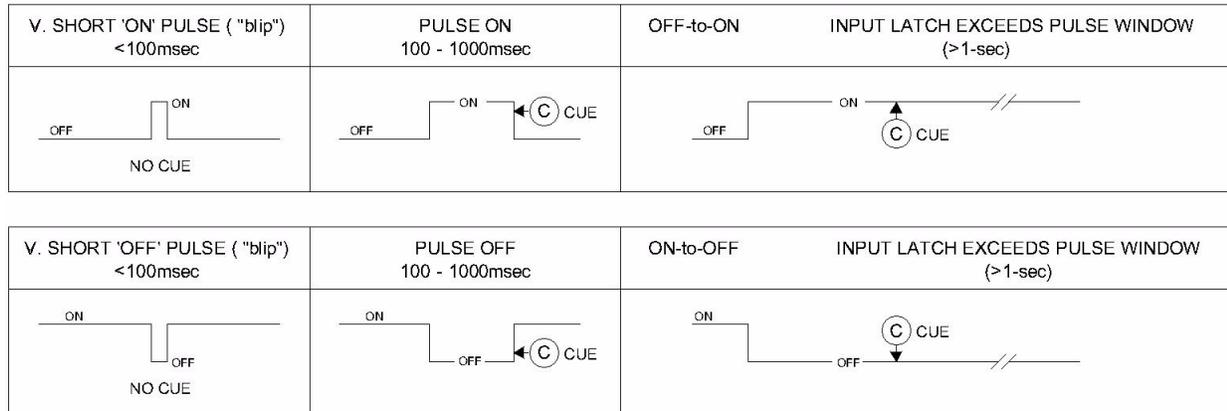
Figure 2-8 Rules for Opto-Inputs

2.4.5 GPIO

The 9-pin GPIO male connector is located on the back panel of the *Christie ACT.* Refer to . It provides a flexible method of interfacing a wide range of external input and output devices to Christie *ACT*, often so that an event on one device automatically triggers an event on the other. The GPIO pins 2 to 4 and pins 6 to 9 are for general purpose which are configured for input or output. Refer to the *Config: Communication Tab, on page 3-17*. Each GPIO pin can be set to input or output but is <u>not</u> isolated. Power provided is 12V, which is rated for 200 mA. Refer to *Section 6 Specifications* for more information.

GPIO Features

• Configurable inputs/outputs for signalling between devices.

• Easy integration within an established control system.

• Ability to trigger user configurable script/actions on input events.
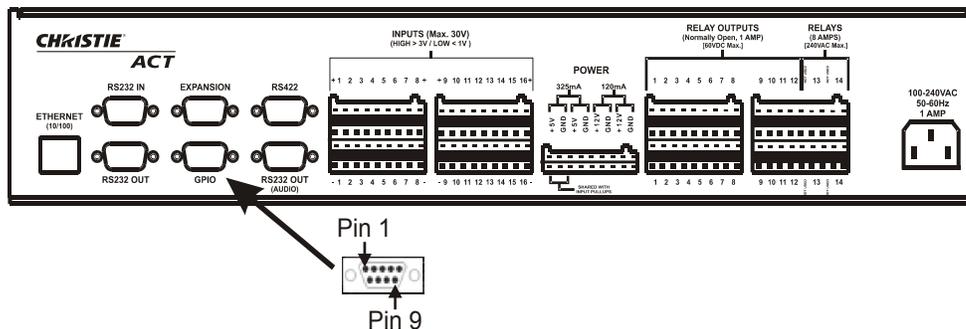
Figure 2-9 GPIO

Pin	Signal Name	Direction
1	12V	O
2	GPIO 2	I/O
3	GPIO 4	I/O
4	GPIO 6	I/O
5	Ground	-
6	GPIO 1	I/O
7	GPIO 3	I/O
8	GPIO 5	I/O
9	GPIO 7	I/O

| Figure 2-10 GPIO IN | Figure 2-11 GPIO OUT |
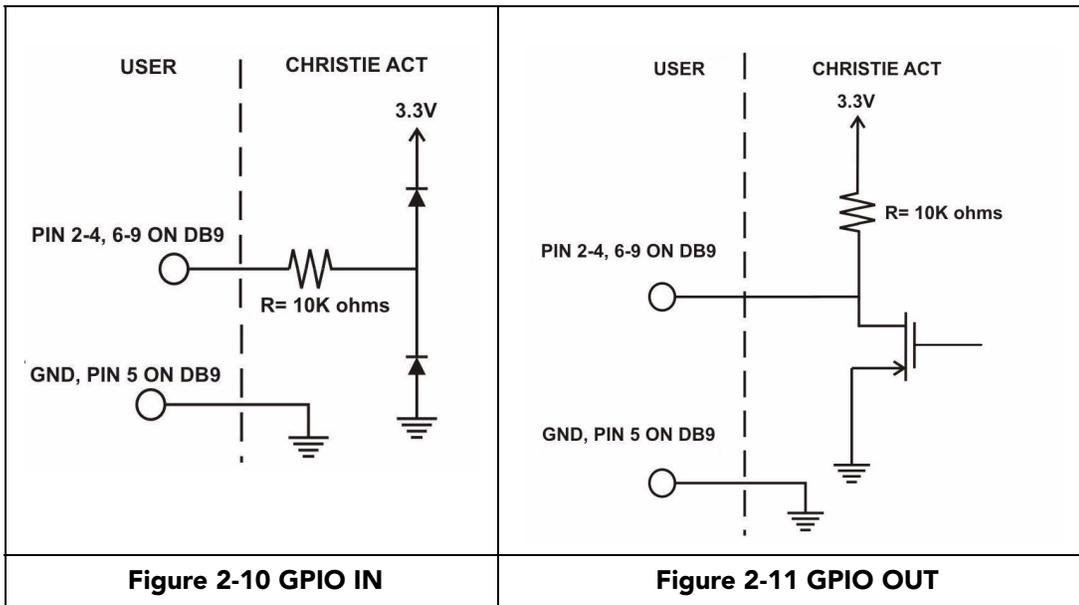
2.4.6 Relay Outputs

The relay outputs are located on the back panel of the Christie *ACT* (**Figure 2-2**). There are 14 relay outputs (28 terminals) all of which are normally open single pole single throw. The first 12 are rated for 1A, and the last 2 are rated for 8A. Only the 8A high current connections are rated for line voltage connections. The external power output terminals (refer to *Section 2.4.2 Power Out*) can be connected to allow the relay outputs to carry some voltage. Relays can be grouped together (connect common for multiple signals) by using jumper leads at the connectors.
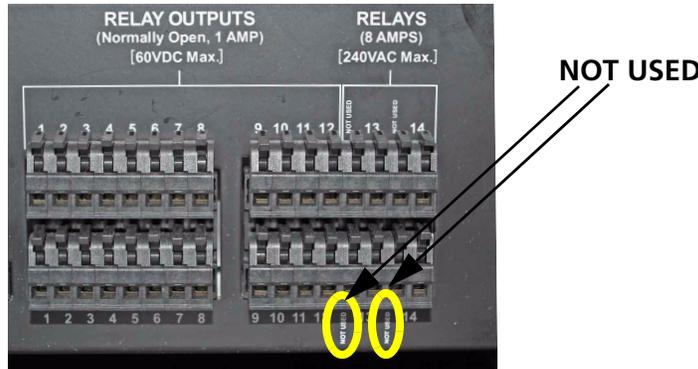
Figure 2-12 Relay Outputs

NOTE: *Two connector pins are "NOT USED" as identified in **Figure 2-12***.

Refer to *Section 6 Specifications* for more information.

Relay Output Features

- All contacts are normally open (N/O)
- Aligned vertically
- Contact closures
- Capacity: twelve 1 Amp and two 8 Amp
- Removable connector terminals for easy wire connection

NOTE: *The two 8 Amp relays can be used to control primary voltage*s.
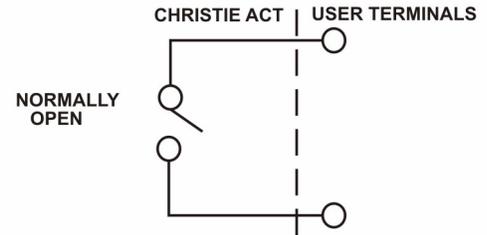
Figure 2-13 Relay Output

2.4.7 USB

The USB is located on the front panel of the Christie *ACT* and is a deferred feature (**Figure 2-1**).

2.4.8 Ethernet

The Ethernet connector is located on the back panel of the *Christie ACT* (**Figure 2-2**). The Ethernet connection is capable of 10/100 Base-T with 2 status LEDs. **NOTE:** *Ethernet crossover cable is not required if connecting directly to a PC.*

Pin	Signal	Description
1	+	Transmits data out
2	-	Transmits data out
3	+	Receives data in
4		Not connected
5		Not connected
6	-	Receives data in
7		Not connected
8		Not connected

2.4.9 Serial Port In/Out

There are 4 serial ports: **RS232 IN** (female port), **RS232 OUT** (male port), **RS232 OUT** (AUDIO) (male port) and **RS422** (female port). **NOTE:** *Male and female port locations identified in* **Figure 2-14**.

FEMALE PORTS
- RS232 IN
- EXPANSION
- RS422

Pin 1

Pin 9

RS232 IN   EXPANSION   RS422

RS232 OUT   GPIO   RS232 OUT (AUDIO)

Pin 1

Pin 9

MALE PORTS
- RS232 OUT
- GPIO
- RS232 OUT (AUDIO)
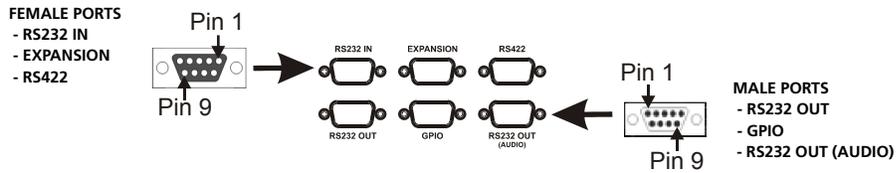
Figure 2-14 - Male and Female Port Locations

RS232

The RS232 port is used to receive serial cues or send serial commands for cues. The RS232 has options for which protocol to use. Refer to . RS232 IN is typically used for incoming signals and RS232 OUT is used by Device Libraries which primarily require outgoing signals, however all of the Christie *ACT* serial ports are bi-directional. **NOTE:** *Hardware handshaking is not available. For pin identification refer to* **Figure 2-14.**

Pin	Signal Name	Direction	Description
1			Not connected
2	TXD	out	Transmits serial data to external device.
3	RXD	in	Receives serial data from external device.
4			Not connected
5	GND	-	Ground return
6			Not connected
7			Not connected
8			Not connected
9			Not connected

RS422 With Non-Isolated Power

The RS422 12V has a maximum power out of 200mA. Pins 2 and 4 receive serial data from an external device, and Pins 3 and 5 transmit serial data to an external device. RS422 is used for both input and output and has longer cable distance than RS232.

Pin	Signal Name	Direction	Description
1	NC		Not connected
2	RXD-	in	Receives serial data from external device.
3	TXD-	out	Transmits serial data to external device
4	RXD+	in	Receives serial data from external device
5	TXD+	out	Transmits serial data to external device
6	NC		Not connected
7	GND		Ground
8	NC		Not connected
9	+12V	out	PWR

Expansion

For future use only.

RS232 Audio

This serial port controls audio devices through RS232. No audio signals are passed through this connection. The pin descriptions for the RS232 Audio port are the same as the other RS232 ports.

2.5 Installation

This section covers both the Rack Mount and CP2000 Pedestal (optional) installation.

2.5.1 Rack Mount Installation

Before installing Christie *ACT* in a rack mount, the following should be considered:

Elevated Operation Ambient	If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient, therefore consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (ThermoMechanical Analysis) specified by the manufacturer.
Reduce Air Flow	Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
Mechanical Loading	Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
Circuit Overloading	Consideration should be given to the supply circuit equipment and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate equipment nameplate ratings should be used when addressing this concern.
Reliable Earthing	Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Installing Christie *ACT* in a Rack Mount

1. Insert the rear of Christie *ACT* into the open area of the rack.

2. Secure Christie *ACT* mounting ears to the rack frame using 4 screws.

2.5.2 CP 2000 Installation

Preparation for CP2000 Installation

1. Unlock and open the *CP2000* pedestal doors (**Figure 2-15**).

2. Remove the 2 rack protector posts from the rear of the *CP2000* pedestal. The screws are accessed from inside the pedestal.

3. Remove 2 security plates to create a 2RU opening for Christie *ACT.*
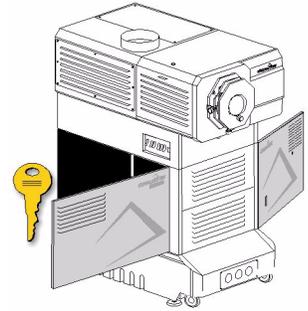
Figure 2-15 Unlock and Open Pedestal Doors

Pedestal Installation

1. Remove rack protectors (2) and security plates (2).

2. Insert the rear of Christie *ACT* into the open area of the pedestal so that the front of Christie *ACT* is visible.

3. Secure Christie *ACT* mounting points to the frame using 4 screws.

4. Re-install the 2 rack protector posts.

5. Close and lock the pedestal doors.
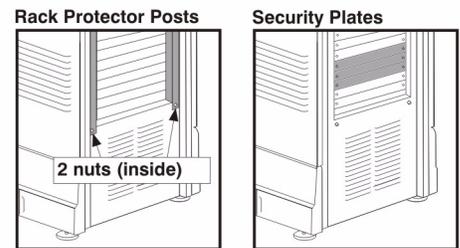
Figure 2-16 Remove Rack Protectors (2) and Remove Security Plates (2)

2.6 Communications Setup

There are several communication methods available to access Christie *ACT.* An ethernet connection via the web interface is the recommended method of configuration. Refer to *Section 3 Operation*. **NOTE**: A c*onfigured IP address is required. The default address 192.168.1.89.*

2.6.1 Ethernet Communications

To add Christie *ACT* to an Ethernet network with other equipment such as controllers and other projectors, connect a standard CAT5 Ethernet cable between your Ethernet controller (or switches) and the Ethernet port on the Christie *ACT* back panel. Refer to **Figure 2-2** for the location of the ethernet port. **NOTES: 1)** *Ethernet crossover cable is not required if connecting directly to a PC.* **2)** *Downloading new software to Christie ACT via Ethernet is supported*.

To use a specific static IP address for Christie *ACT,* you can set this address, refer to *Config: Network Tab, on page 3-15* or via an ASCII serial command.

For more information on determining and configuring the IP Address refer to,

• *Section Determine the IP Address Using the Serial Port, on page 1-3*.

• *Section Configure the IP Address Using the Serial Port, on page 1-4*.

2.6.2 RS232 Serial Communications

From most computers, connect a standard RS232 serial communication cable between the computer and Christie *ACT* serial port labeled **RS232 IN**. Then ensure that Christie *ACT* baud rate matches that of your computer. To change the baud rate, refer to *Config: Communication Tab, on page 3-17*

For additional information concerning the serial ports, refer to *Section 2.4.9 Serial Port In/Out*. **NOTE:** *There are three RS232 ports: RS232 In, RS232 Out, RS232 Out (audio).*

2.6.3 RS422 Serial Communications

⚠ **CAUTION** **Do not use an RS422 port unless you are using equipment with RS422 capability. The voltage levels of this signal can damage incompatible equipment.**

Some computers can provide RS422 serial communications (often through a plug-in adapter or external converter) rather than the more common RS232 standard. RS422 communication has differential "transmits-and receives" and is generally better suited for longer distances than RS232 communication. **NOTE:** *RS422 is NOT compatible with RS232. Connecting an RS232, compatible PC to RS422 can damage the equipment at either end.*
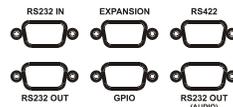
Figure 2-17 Serial Communications

The 9-pin RS422 connector is located on the back panel of Christie *ACT*, refer to **Figure 2-17**. When using the port, ensure that the baud rate matches that of your RS422 controlling device. Refer to *Config: Communication Tab, on page 3-17*.

3   **Operation**

This section describes the basic and advanced operation features of Christie *ACT* using the *web user interface* (Web UI). It includes:

The Christie *ACT* Web UI is accessed over a local area Ethernet network. The Web UI is a full function setup and diagnostic tool that can be used for setting up Christie *ACT*, configuring "scripts," defining button functions, and creating event sequences.

3.1 Logging into Christie *ACT*

To login to Christie *ACT*:

1. Open a web browser and type the IP address assigned to your Christie *ACT* unit (default http:// 192.168.1.89). The Christie *ACT* Login window appears. **NOTE:** *Internet Explorer V6.0 has known performance issues and is not recommended to be used as the primary web browser for the Christie ACT Web UI. It is recommended to use Internet Explorer V7.0 or greater, or Firefox V2.0 or greater.*

Figure 3-1 Christie *ACT* Login Window

2. Enter your User Name and Password (both are case sensitive) in the appropriate locations. The default User Name is **service** and default Password is **service**.

3. Click **Login**.

For information on permission levels and access privileges, refer to *Section 3.5 User Access and Rights*.

Auto Login is accessed through the Christie *ACT* Login window (**Figure 3-1**). When enabled by the administrator, it will automatically enter the password when the username is entered. For more information refer to *Section Config: Users Tab, on page 3-16*.

3.2 Navigating the Web User Interface

When navigating Christie *ACT* in the web browser, DO NOT use the browser's navigational buttons, i.e. Back and Forward. Using these buttons will cause you to lose your web connection to Christie *ACT*.

3.2.1 Using the Toolbar

Each window in the Christie *ACT* Web UI has the same main tool bar from which you can:

• Select a specific Christie *ACT* from within a network and view the assigned IP address.

• View the current time on the device.

• Close the window and logout (exit) from the Web UI.

• See the device name of the selected Christie *ACT*.

• Navigate through the Christie *ACT* interface using the tabs.

Figure 3-2 Common Toolbar

Viewing a Specific Christie *ACT*

To browse for available Christie *ACT* devices,

1. Click the **Device** button to open the **Christie Devices** window (**Figure 3-3**).

2. Select an address from the displayed list of IP addresses.
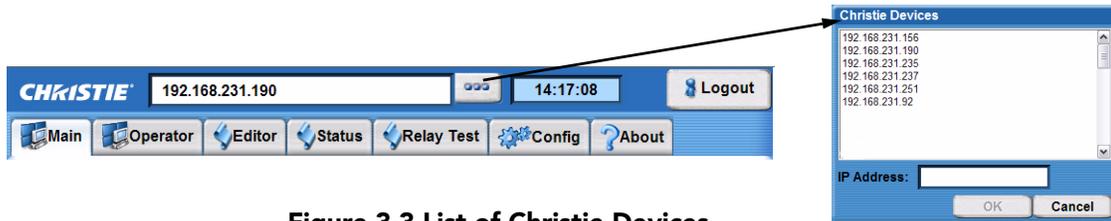
Figure 3-3 List of Christie Devices

Viewing the Current Status

When a tab is clicked, the information for that selection is displayed in the center of the window. When the **Editor**, **Status** and **Config** tabs are selected, additional sub tabs are presented at the bottom of the window. Each sub tab opens a new window that is relative to the original tab selection.

3.3 Setting Christie *ACT*'s Configuration

Christie *ACT* must be configured before it can be used. Use the Setup and Configuration Manual to configure Christie *ACT*. For now, refer to *Section 3.7 Configuring Christie ACT* to configure Christie *ACT*.

3.4 Basic Operation

This section discusses the four basic tabs that an operator can view: **Main** tab, **Operator** tab, **Status** tab, and **About** tab. Other tabs are discussed in *Section 3.6 Advanced Operation and Configuration*.

3.4.1 Main Tab

The **Main** tab provides a series of programmable buttons that mimic the front of Christie *ACT*. There are a series of 14 **LED** lights that turn ON and OFF depending on the state of the selected button. They are for display only and cannot be turned ON or OFF from this tab.
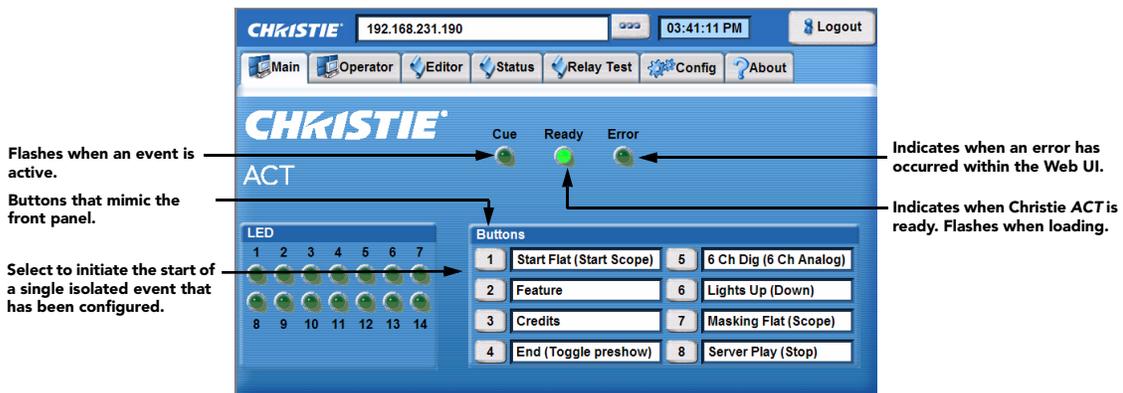
Figure 3-4 Main Tab

3.4.2 Operator Tab

The **Operator** tab provides a view of the user-defined operator buttons where each button performs a specific action initiating the start of a programmed sequence. Operator buttons extend the system beyond the 8 buttons available on Christie *ACT*. Buttons are created in the **Editor: Operator Buttons** tab. You must have the proper permission to create or modify buttons. For more information on adding or editing buttons, refer to *Section 3.9.6 Adding an Operator Button*.
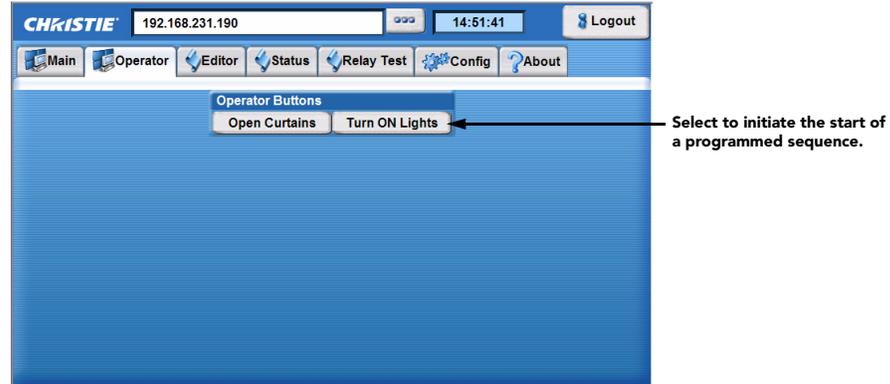
Figure 3-5 Operator Tab

3.4.3 Status Tab

The **Status** tab provides an overall view of Christie *ACT*'s status.

Status: Summary Tab

This tab provides status information about Christie *ACT*'s log files (**Figure 3-6**).
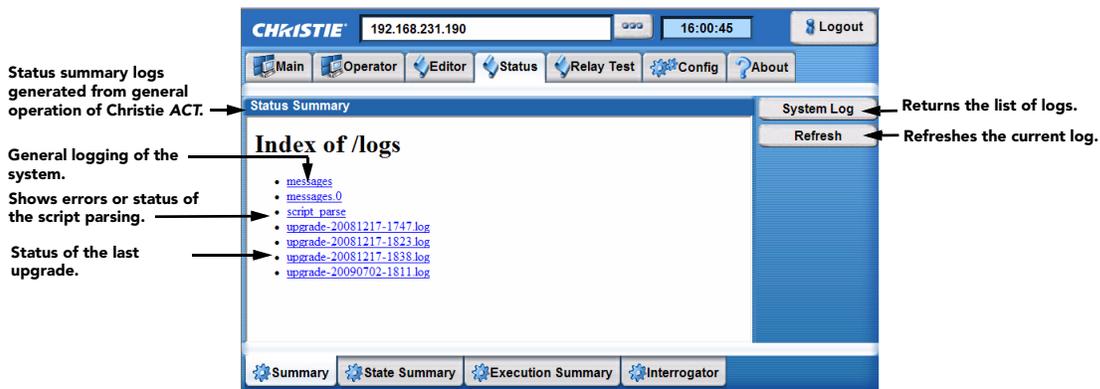
Figure 3-6 Status: Summary Tab

Status: State Summary Tab

The **Status: State Summary** tab provides a list of system and device properties created by the script.
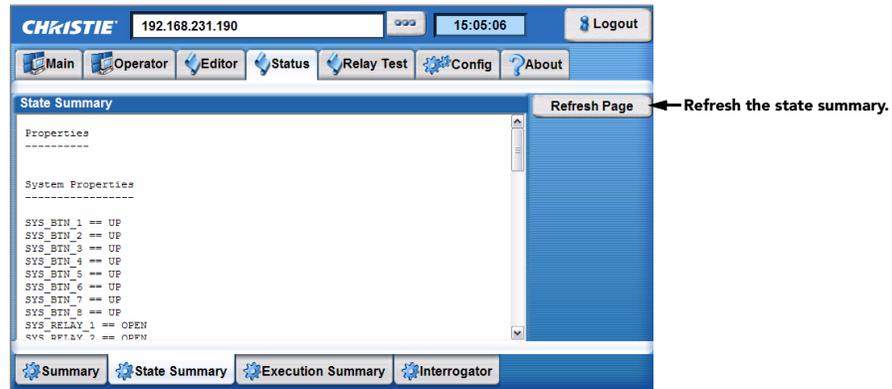
Figure 3-7 Status: State Summary Tab

Status: Execution Summary Tab

The **Status: Execution Summary** tab is a summary of the Cue actions that were executed from the system reset.
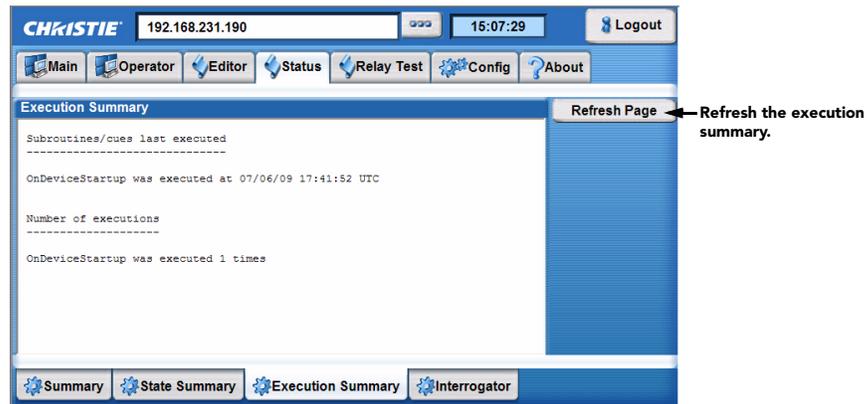
Figure 3-8 Status: Execution Summary Tab

Status: Interrogator Tab

The **Status: Interrogator** tab enables the collection of advanced-level status information that can assist in the diagnostics of Christie *ACT*'s components. A .tar file is created and saved to the location you specify.
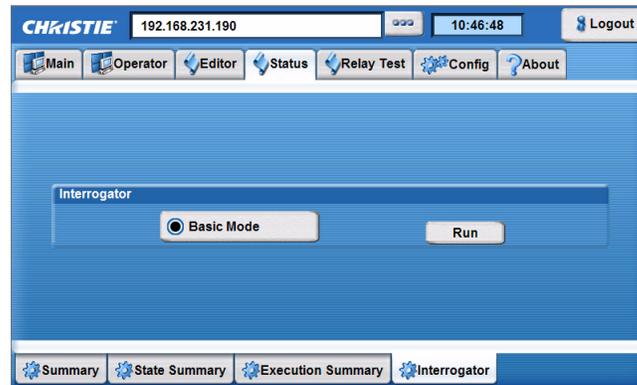
Figure 3-9 Status: Interrogator Tab

3.4.4 About Tab

The **About** tab is a read-only window that lists important information about Christie *ACT* such as the current level of software, critical hardware components, and the manufacture date.
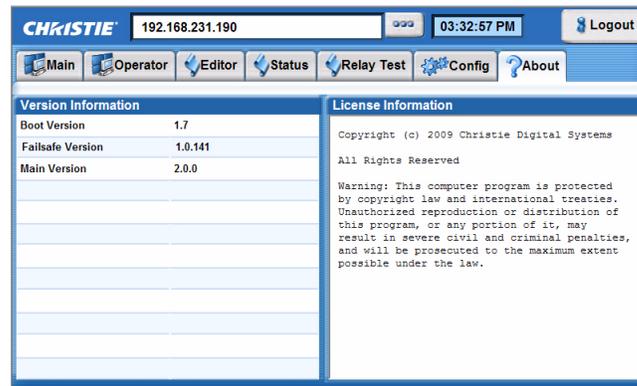
Figure 3-10 About Tab

Christie *ACT* comes with one of two flash boards, 9.1.1 or 9.1.3. The new flash board version number is 9.1.3. To determine the version number, telnet into the machine and run the command **cat/proc/hardware**.

3.5   User Access and Rights

Accessing different Web UI tabs and functions depends on your login permission level. There are five distinct password-protected levels of users as identified in **Table 3.1**. Each progressive level of security has increased rights and the rights of previous levels.

Table 3.1 Permission Levels

User Security Levels	Access to Tabs...	
Status	**Main** **Status** **About**	Any user can view basic Christie *ACT* status and diagnostic information.
Operator	**Main** **Operator** **Status** **About**	Operators can view additional operator control buttons.
Advanced	**Main** **Operator** **Editor** **Status** **Relay Test** **Config (All except Users)** **About**	Advanced Operators cannot access the **Config: Users** tab.
Administrator	**Main** **Operator** **Editor** **Status** **Relay Test** **Config (All)** **About**	This can include defining new Ethernet settings (IP network address). **NOTE**: *Administrators can add users and set user access rights from its level and below only.*
Service	**Main** **Operator** **Editor** **Relay Test** **Config (All)** **About** **Administrator Password**	Installers and other service personnel can access additional tabs. This allows them to define remote access rights and the ability to add administrators.

3.6 Advanced Operation and Configuration

To perform the more advanced operations that are documented in this section, you must have administrative privileges to Christie *ACT*. Refer to *Section 3.8 Upgrading Christie ACT Software* for details.

3.6.1 The Christie *ACT* Design Concept

Christie *ACT* is designed to give the application developer (or system integrator) freedom to configure the automation as required for the installation. Christie *ACT* can be configured to run independently or require user intervention to initiate actions. This is up to the design choices of the application developer.

The system integrator is given the ability to build and manage applications whether simple or complex via the **Editor** tab.

The **Editor: My Devices** tab is where the integrator chooses which devices are to be used for a given application. Devices are created in the **Editor: Library** tab.

The **Editor: Library** tab (**Figure 3-13**) encapsulates device interfaces or other concepts into objects with simple named interfaces. The interface is designed to allow combinations of basic primitive actions and cues into objects to build device interfaces. Device interfaces help to manage the complexity of applications.

The library definitions are open, allowing the system developer the ability to create their own objects or to modify existing objects. These library objects can be instantiated and combined to build up solutions to complex requirements, while allowing the developer the ability to manage and understand how the pieces fit together. The library can define a practically unlimited number of devices. Not all devices are required for any given application. Libraries can be exported and appended.

The **Editor: Script** tab (**Figure 3-12**) is where the mapping of input events to output actions takes place. By choosing device library interface names and device instantiation names carefully, it is possible to design high level scripts that are very generic yet can be applied to many applications by choosing which devices are instantiated. The default scripts provide an example of a framework that allows this flexibility.

The **Editor: Operator Buttons** tab is where you create virtual buttons, which are just like another button cue. Users can associate cue handlers (call subroutines) with these buttons. This makes Christie *ACT* extensible by essentially allowing it to support more cues than it can physically.

Actions

An action is a command that is executed by Christie *ACT*. For example, turning LED 1 ON. Actions are output events that Christie *ACT* sends to external devices.

Actions	Action Options
LED	On/Off/Pulse/Flash
Relay	Open/Close/Pulse Open/Pulse Close
GPO	Low/High/Pulse Low
Serial	Port/Signal/Termination Character
Ethernet	IP/Port/Signal/Termination Character
Buzzer	Time in msec.
Wait	Time in msec.
SET	Name/Value
IF	Condition/True Actions/False Actions
WHILE	Condition/Loop Actions
CALL	Subroutine

The serial ports addressed in the scripts are as follows:

Serial Ports	
1	RS232 IN
2	RS232 OUT
3	RS422
4	RS232 Audio

Cues

Actions sent from external devices to the Christie *ACT* which Christie *ACT* will then activate an action on.

Cue	Cue Options
Button	Click/Hold
Input	OFFtoON/ONtoOFF/PulseON/PulseOFF
GPI	LowToHigh/HighToLow/PulseHigh/PulseLow
Time	Time of day with Start Date/End Date/Days of Week Selection
Ethernet	Signal to match
Serial	Port/Signal to match

3.6.2 The Editor Tab

The **Editor** tab provides four sub tabs (**My Devices**, **Script**, **Library**, and **Operator Buttons**) for developing the functionality to automate the device(s) that are connected to Christie *ACT*. The **Editor: My Devices** sub tab enables you to create unique devices to be used in scripts. The **Editor: Script** tab enables you to manage and configure scripts. The **Editor: Library** tab allows you to define your own library item. The **Editor: Operator Buttons** tab is where you manage and configure the operator button(s).

Editor: My Devices Tab

The **Editor**: **My Devices** tab provides the ability to manage devices that interact with Christie *ACT*. You can select predefined devices, projectors, audio, lighting systems, etc. that are in your auditorium environment. To add a device, refer to *Section 3.9.8 Editing a Device*. **NOTE:** *GPO will not appear in the drop-down list unless it is configured using the* **Config: Communication** *tab. Refer to Section Config: Communication Tab, on page 3-17*. Device types are built in the **Editor: Library** tab.
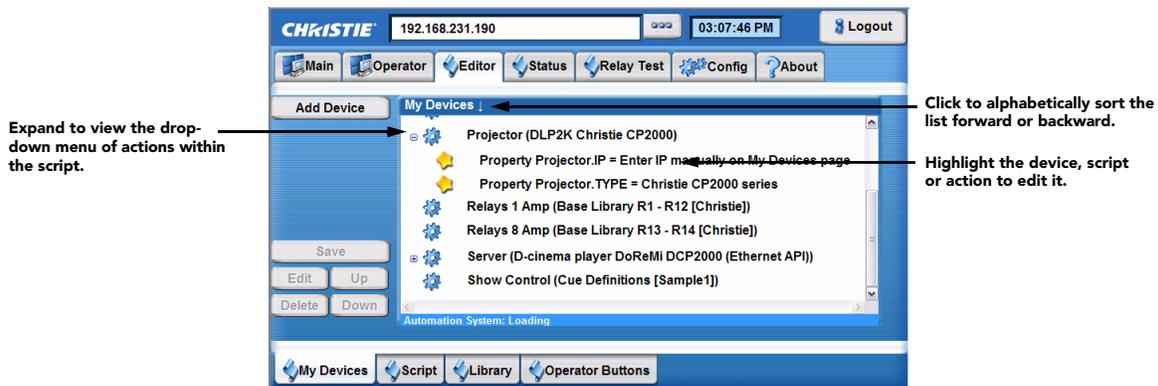
Figure 3-11 Editor: My Devices Tab

Table 3.2 Summary of the Editor: My Devices Tab

EDITOR: MY DEVICES TAB OPTIONS	
Add Device	Click to add an additional device.
Save	Saves additions and changes made to the devices. **NOTE**: *You must save prior to logout to save any changes. Leaving the* **Editor: My Devices** *tab without saving will open a dialogue prompting you to save or revert changes.*
Edit	Edits the contents of a cue or action. Highlight a cue or action from the cue list and click **Edit**.
Delete	Deletes a device. Select a device from the **My Devices** window and click **Delete**.
Up	Moves the action up in the scenario. Select action in the list and click **Up**.
Down	Moves the action down in the scenario. Select action in the list and click **Down**.

NOTE: The **Save**, **Edit**, **Delete**, **Up**, and **Down** buttons are available in the **My Devices**, **Script**, and **Operator Buttons** tabs.

Editor: Script Tab

The **Editor**: **Script** tab provides the core functionality to the system. It is where you manage and configure the scripts that control Christie *ACT*. A set of pre-configured device cues are available. For more information on adding scripts, refer to *Section 3.9 Using Christie ACT*.

Highlight the script in the Scripts region to enable the Edit, Delete, Up, and Down buttons.
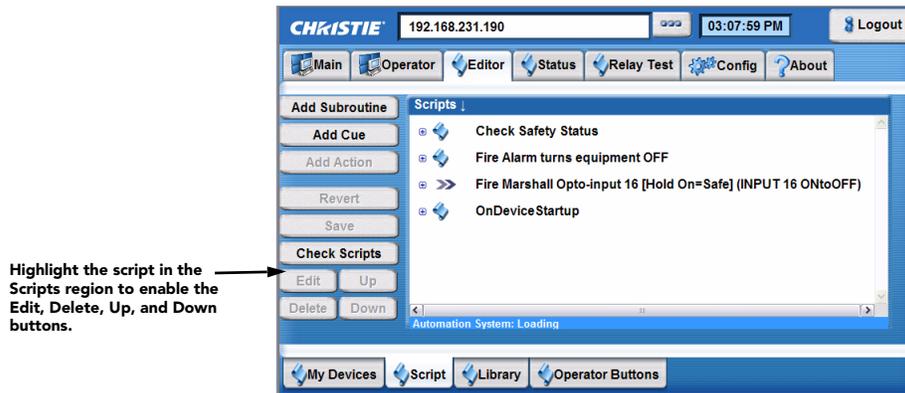
Figure 3-12 Editor: Script Tab

Table 3.3 Summary Editor: Script Tab Options

EDITOR: SCRIPT TAB OPTIONS	
Add Subroutine	Adds a new subroutine.
Add Cue	Adds a cue to the current script. Cues include assigning actions to the non-virtual buttons on Christie ACT, setting the start and end time of a cue, etc. Refer to *Section Cues, on page 3-9*.
Add Action	Adds a new action. Refer to *Section Actions, on page 3-9* for a list of actions.
Revert	Reverts a previous event.
Check Scripts	Checks the scripts to determine if the references are valid.

Subroutines

A subroutine is a collection of actions. For more information, refer to *Section 3.9.2 Adding a Subroutine to a Script or Library*

Cues

A cue is an input event which allows Christie *ACT* to perform associated actions. For example, pressing button 1 will result in an event taking place. By adding a cue, you are configuring Christie *ACT* to respond to an input event. For more information, refer to *Section 3.9.5 Adding a Cue to a Script or Library.*

Actions

An action is an output event executed as a response to a cue. For example, sending a GPO pulse or ethernet command to another device. For more information, refer to *Section 3.9.3 Adding an Action to a Script or Library.*

Editor: Library Tab

The **Editor**: **Library** tab provides access to library definitions that are pre-configured. If a device requires specific configuration that is not provided as a part of the default set, you can define your own and add it to the library. When a library item is selected, a drop-down menu is displayed with the library item properties, cue(s) and subroutine(s). For more information on creating a library, refer to *Section 3.9 Using Christie ACT*.
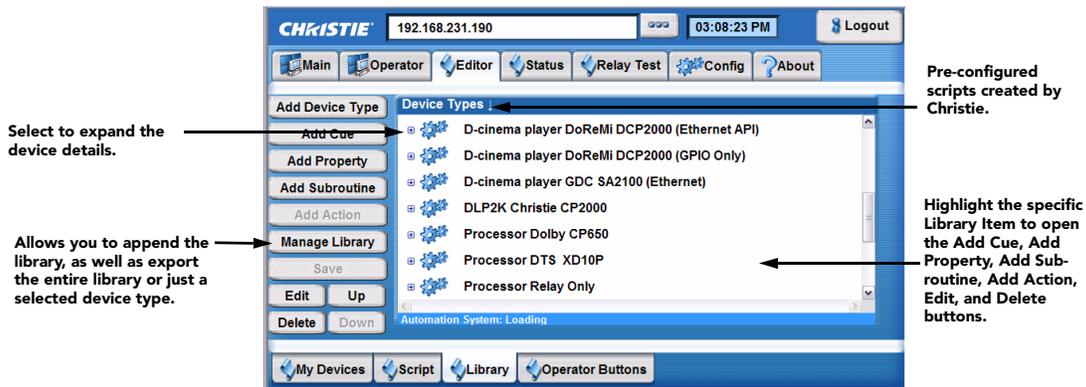
Figure 3-13 Editor: Library Tab

Table 3.4 Summary Editor: Script Tab Options

EDITOR: LIBRARY TAB OPTIONS	
Add Device Type	Adds a library device.
Add Cue	Adds a cue to the current library. Click to open a drop-down list prompting you to define a cue.
Add Property	Adds a new property. A device property is an attribute of a device type. For example, the "cp2000" device type will contain a **[device].IP** property.
Add Subroutine	Adds a new subroutine.
Add Action	Adds a new action to a subroutine.
Manage Library	This offers features to manage your library. The **Manage Library** window appears. • **Append Library** - allows you to append a device library to the entire library of devices. • **Export Entire Library** - allows you to export the entire library. • **Export Selected Device Type** - allows you to export a single device type. Highlight the library device you want to export.

Editor: Operator Buttons Tab

The **Editor**: **Operator Buttons** tab allows you to create virtual buttons. Each button is associated with a subroutine, which essentially allows Christie *ACT* to support more cues then it can physically. Once a button is created, it is displayed to the **Operator** tab. Refer to *Section 3.4.2 Operator Tab*.

Figure 3-14 Editor: Operator Buttons Virtual Buttons

1. Click **Add Button**. The **Operator Button** window opens.

2. Type the name of the new button.

3. Click the subroutine button and select a **Subroutine** from the list.

3.6.3 Relay Test Tab

The **Relay Test** tab () allows you to toggle the relay states.
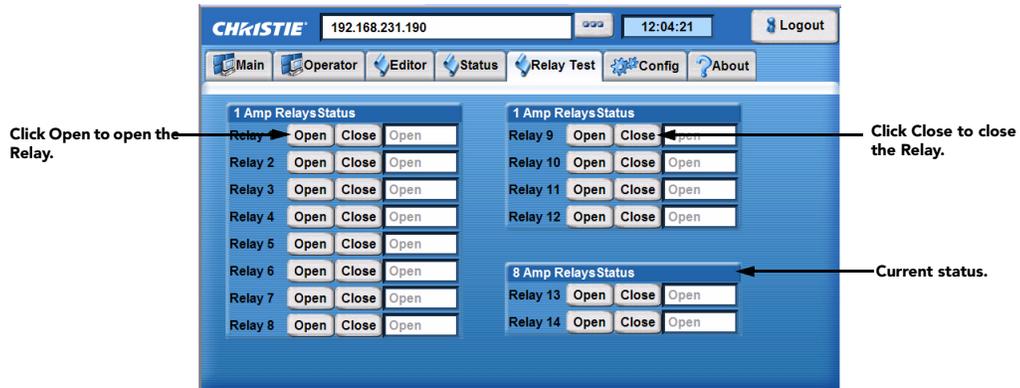
Figure 3-15 Relay Test Tab

3.7   Configuring Christie *ACT*

The **Config** tab consists of five sub tabs (**General**, **Network**, **Users**, **Communication**, **File Management**) that enable advanced operators, administrators, and users to define system operating parameters, change Ethernet settings, and configure communication settings.

Config: General Tab

The **Config: General** tab provides access to various system parameters that must be defined according to your requirements.
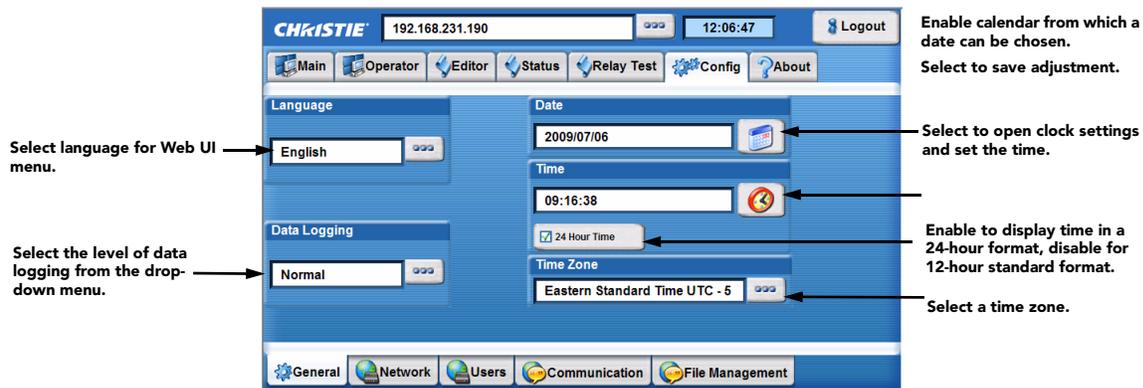
Figure 3-16 Config: General Tab

Table 3.5 Summary of Config: General Tab

CONFIG: GENERAL TAB OPTIONS	
Language	From the displayed list, select the desired language. Default is **English**.
Data Logging	Select the level of data logging from the displayed tab. Options are **Minimal**, **Normal**, **Debug**. Default is **Normal**.
Date	Select the date from the displayed calendar.
Time	Enter the hours, minutes and seconds. **NOTE:** *If the* **24 Hour Time** *option is check marked, the* **Select a Time** *window will not display the AM/PM selection option.* In **24 Hour Time**, click to add a checkmark to display time in a 24 hour format or AM/PM format (default). This can be toggled without requiring re-configuration.
Time Zone	Select your time zone from the list of world time zones.

Config: Network Tab

The **Config: Network** tab is used to define or change the Ethernet settings for Christie *ACT*.
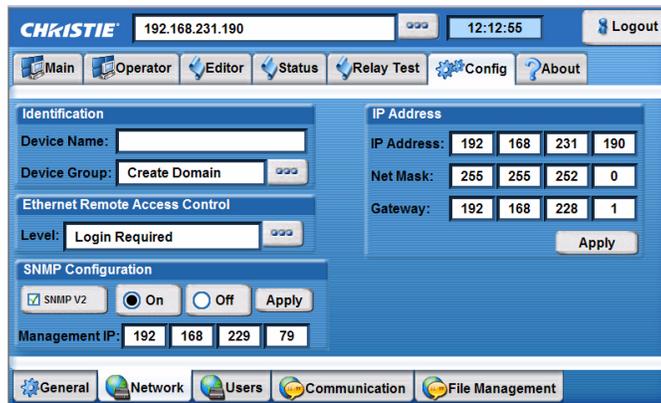
Figure 3-17 Config: Network Tab

Table 3.6 Summary of Config: Network Tab

CONFIG: NETWORK TAB OPTIONS		
Identification	**Device Name**	Name for the device.
	Device Group	Assign the device to a device group by selecting a group from the displayed list.
Ethernet Remote Access Control	**Level**	Restrict Ethernet access to Christie *ACT*. Options include **No Access**, **Login Required**, and **Free Access**. Default is **Login Required**.
SNMP Configuration	**On/Off**	Gives network managers access to manage the network. Select **On** or **Off** to enable or disable the SNMP network management system. Click **Apply** to apply any changes.
	SNMP V2	Simple Network Management Protocol version 2.
	Management IP	The IP address of the SNMP Manager.
IP Address	**IP Address**	Christie *ACT*'s current IP address. To change it, type a unique IP address and click the Apply button. For default factory settings, refer to *Section 1.2.2 Ethernet Settings.*
	Net Mask / Gateway	For default factory settings, refer to *Section 1.2.2 Ethernet Settings.*
	Apply Button	Click to apply any IP address changes.

Config: Users Tab

The **Config: Users** tab provides options for the management of users, passwords and user access rights. Depending on your login level, you can manage users having the same or fewer access rights than yourself.
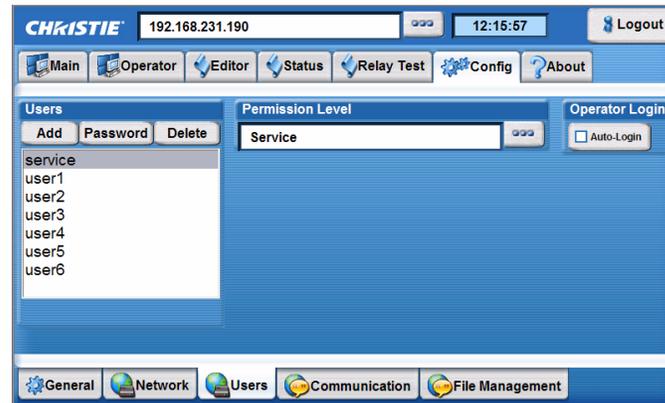
Figure 3-18 Config: Users Tab

To configure settings for users that will have access to Christie *ACT*, refer to **Table 3.7** for options and instructions. **NOTES: 1)** *Do not use capitalization for usernames or passwords. If Capitalization is used for the username or password, Christie ACT will automatically convert it to lower case.* **2)** *Usernames can be a minimum of 4 and maximum of 32 characters. Passwords can be a minimum of 4 and maximum of 128 Characters.*

Table 3.7 Configuring Users

Task	Procedure
Add a user and password	1. Click the **Add** button to open the **Add User** window. 2. Type the user name and password. 3. Click **OK**.
Edit a password	1. Select a user from the **Users** list. 2. Click the **Password** button to open the **Edit Password** window. 3. Type the new password. 4. Click **OK**
Editing a user's permission level	1. Select a user from the **Users** list. 2. Click the Permission Level button to the right of the text region to open the **Permission Level** window. 3. Select the permission level from the list. 4. Click **OK**.
Enabling and Disabling the Auto-Login	1. Click **Auto-Login** to add a checkmark (enabled). 2. The **Operator Login Verification** window appears. 3. Type the Username and Password of the operator.

Config: Communication Tab

The **Config: Communication** tab provides the ability to configure the communication settings on Christie *ACT*. Configure the direction of each GPIO by toggling each GPIO button between input (I) and output (O). These changes instantly change the pin configuration of the device. You can also enable or disable the internal input pull-up on the opto-isolated inputs by checking the appropriate boxes next to the inputs.
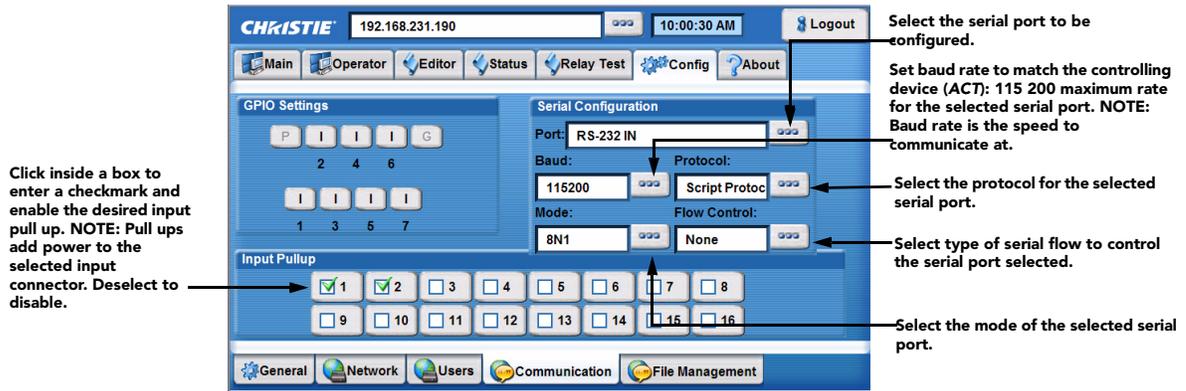
Figure 3-19 Config: Communication Tab

Table 3.8 Summary of Config: Communication Tab Options

CONFIG: COMMUNICATION TAB OPTIONS		
GPIO Settings		Click the buttons to toggle the direction of the specified pin.
Input Pull-up		Input pull-ups allow internal pull-up connection to signal incoming source if required.
Serial Configuration	**Port**	Select the serial port to be configured from the list.
	Baud	Select the baud rate from the list to match the controlling device (*ACT*) baud rate.
	Protocol	Select the protocol from the list. Options include: • **Christie Protocol** talks to the port in Christie formats, for example the commands used making a terminal connection. (NET+ETH0?) Refer to *Section Configure the IP Address Using the Serial Port, on page 1-4*. • **Raw Protocol** does nothing and is designed to free the port for external uses. • **Script Protocol** is used if you want to use input from that port in a script.
	Mode	Select the mode of the serial port.
	Flow Control	Select the type of serial flow to control the serial port selected.

Config: File Management Tab

The **Config: File Management** tab allows you to backup and restore files, as well as reboot into fail-safe mode.

Create a backup file for specific settings, such as user, configuration, and preferences.

Places *ACT* **in Fail-safe mode. This is required during software**

Reboot will reload and re-initialize the system.

Retrieve backup files that were saved on a local network (PC) or restore previously saved settings using the restore button.
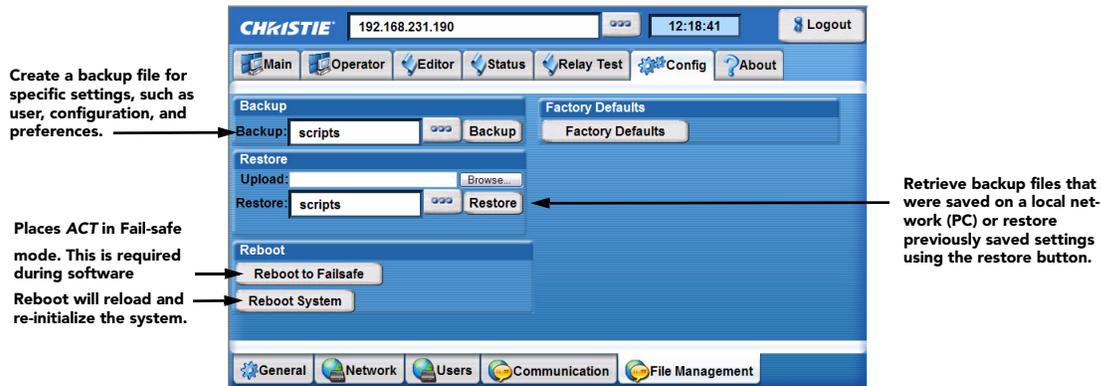
Figure 3-20 Config: File Management Tab

Table 3.9 Summary of Config: File Management Tab

CONFIG: FILE MANAGEMENT OPTIONS	
Backup	Backing up your configuration files. 1. Click the button to open the **Backup** window. 2. Select an item to backup from the list. 3. Click **Backup** to create and save a backup .tar file for the selection. The file is automatically assigned a name based on the selection.
Upload and Restore	To restore you must have done a Backup to create the necessary files. 1. Click the **Browse** button to open the Windows **Choose File** window. 2. Navigate and select the files that were backed up on your network and click **Open**. 3. Click the **Restore** button to open the **Restore** window. 4. Select from the list what you are restoring (scripts, users, preferences, or config). 5. Click **OK**. 6. Click the **Restore** button.
Rebooting to Failsafe	This reboots Christie *ACT* into a Failsafe mode which is the first step required when conducting a software upgrade. The **Upgrade/Versioning** window appears. The **Upgrade** tab offers 3 buttons which are used during the upgrade process. • **Refresh** - once in Failsafe mode, the Refresh button reloads the Upgrade Packages list. After you ftp a file to Christie *ACT*, click **Refresh** to view the file in the list. • **Upgrade** -Upgrades the selected file. • **Reboot** - Reboot Christie *ACT*. To complete the upgrade process, refer to *Section 3.8 Upgrading Christie ACT Software*. The **Versioning** tab displays the software currently installed on Christie *ACT*.
Reboot System	This will re-load / re-initialize the system as if it had just been powered on and booted up. This will also execute the OnDeviceStartup event when boot-up is complete.
Factory Defaults	Click to restore factory defaults for Christie *ACT*'s scripts and users. Click the appropriate radio button to revert to Default Scripts or Default Users. NOTE: *You can make only one reset option at a time.*

3.8 Upgrading Christie *ACT* Software

The software installed on Christie *ACT* can be upgraded by using the **Config: File Management** tab. You must have the required access level to upgrade Christie *ACT*. The upgrading process may take between 7 -10 minutes depending on your computer and network. To upgrade Christie *ACT*:

1. Login into Christie *ACT* using the Service login and password.

2. Go to the **Config: File Management** tab (**Figure 3-20**).

3. Click **Reboot to Failsafe** and then click **Yes** when you see the confirmation dialog with the following text, "Are you sure you want to reboot ito Failsafe?" The **Upgrade/Versioning** window displays as shown in **Figure 3-21**.

NOTE: *If you try to download to an older package assuming you're using the new board, an error should return.* (**Figure 3-22**).

4. Download the new `.shar` file onto your C drive from the Christie Website.

5. Open a Windows Explorer window.

6. In the Explorer window, type **FTP://**ʏᴏᴜʀ ᴀᴄᴛ **IP** ᴀᴅᴅʀᴇss and press Eɴᴛᴇʀ.
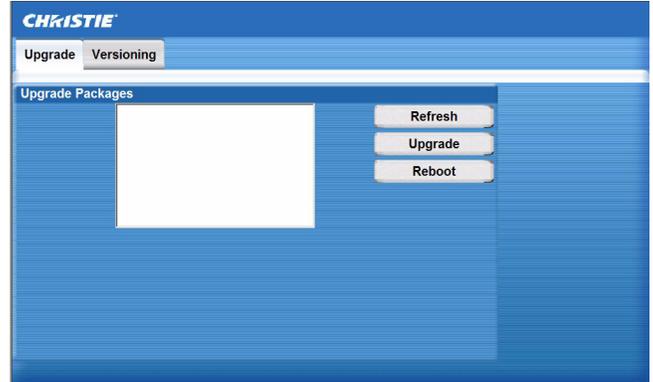
Figure 3-21 Upgrade/Versioning Window
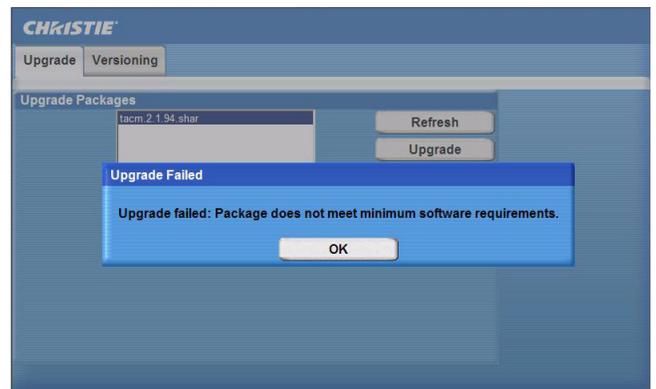
Figure 3-22 Downgrade Error
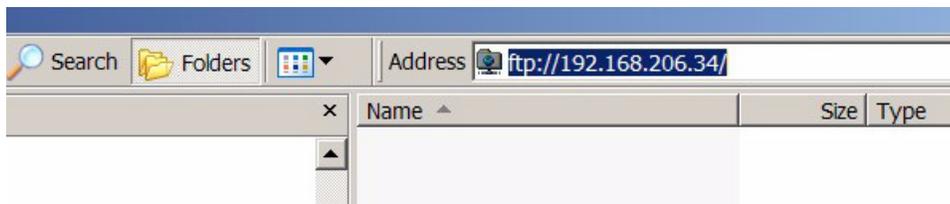
Figure 3-23 Enter Your Christie ACT IP Address in Windows Explorer

7. Drag and drop the upgrade file into the Explorer window.

8. In the Christie *ACT* **Upgrade/Versioning** window, click **Refresh**. The file that was selected appears.

9. Click the file to highlight it and click **Upgrade**.

During the upgrade process, a status message will show the progress of the operation.

10. When the upgrade is complete, click **Reboot** to restart Christie *ACT*.

3.9   Using Christie *ACT*

This section contains instructions on how to use the Christie *ACT* web browser interface to enter and manipulate data within Christie *ACT*. You must have the proper permission level to perform these Christie *ACT* operations. **Warning! 1)** *DO NOT save a script during a show. Saving a script resets Christie ACT's script management engine. If Christie ACT is in the middle of running a script and another script is saved, the current active script will be interrupted.* **2)** *DO NOT change or save scripts during a show.*

- *3.9.1 Creating a Library*
- *3.9.2 Adding a Subroutine to a Script or Library*
- *3.9.3 Adding an Action to a Script or Library*
- *3.9.4 Adding a Device to MyDevices*
- *3.9.5 Adding a Cue to a Script or Library*
- *3.9.6 Adding an Operator Button*
- *3.9.7 Adding a Property to a Library*
- *3.9.8 Editing a Device*
- *3.9.9 Editing a Script*
- *3.9.10 Aborting a Script in Progress*
- *3.9.11 Deleting a Property*

3.9.1   Creating a Library

1. Select the **Editor**: **Library** tab.

2. Click **Add Device Type**.

3. Type the name of the library in the **Your Device Name** window.

4. Click **OK** to add the name to the Library Items list.

3.9.2   Adding a Subroutine to a Script or Library

A subroutine can be added to a script or to a library.

1. Select the **Editor**: **Script** tab or the **Editor**: **Library** tab.

2. Highlight a script from the **Scripts** tab or a device type in the **Library** tab.

3. Click **Add Subroutine**.

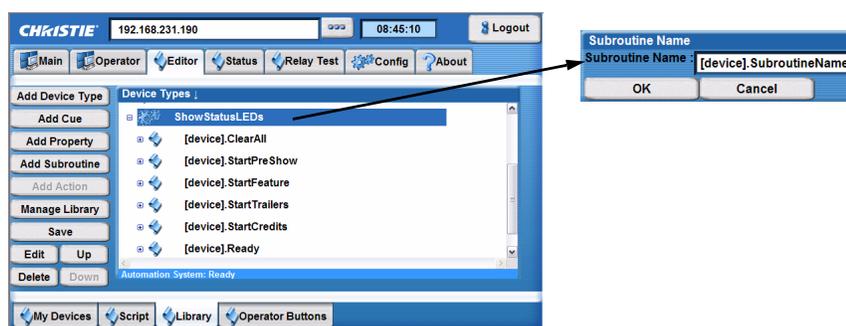4. Type the subroutine name in the **Subroutine Name** window (**Figure 3-24**).

Figure 3-24 Adding a Subroutine to a Library

When adding a subroutine to a library, the **Subroutine Name** window opens with the prefix of **[device].** already populated in the text region. This is needed to connect the Subroutine to a selected device type. If you remove this entry, the subroutine will not work as intended.

5. Click **OK** and then **Save** to save this new subroutine.

6. Select the **Editor**: **Script** tab.

7. Highlight a script from the **Scripts** list.

8. Click **Add Action** and then select **CALL**. The **Call** window opens.

9. Click the Subroutine button to open a list of options. The new subroutine will display (**Figure 3-25**).
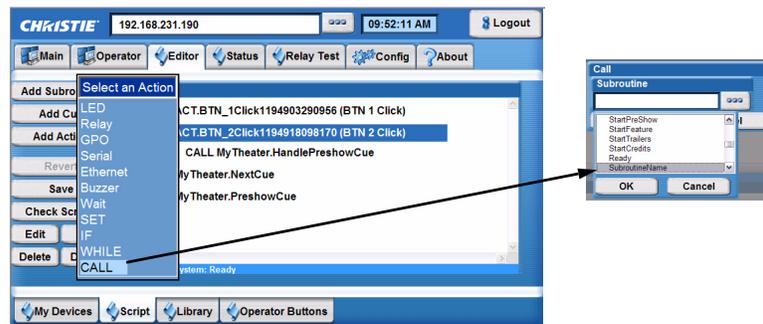
Figure 3-25 Displaying the New Subroutine

3.9.3 Adding an Action to a Script or Library

The following instructions will guide you in adding various actions depending on the specific action selected. To create an action, you must first create a Subroutine so that it appears in the Script area. *Section 3.9.2 Adding a Subroutine to a Script or Library*.

1. Select the **Editor**: **Script** tab or the **Editor**: **Library** tab.

2. Highlight a subroutine or cue. Adding an action is only available when you have a subroutine or cue selected.

3. Click **Add Action** to open the **Select an Action** drop-down menu.

4. Select a specific action from the list to either open a window to configure that action (as in the GPIO shown in **Figure 3-26**) or to select a predefined action (as in SubroutineName shown in **Figure 3-25**).

Figure 3-26 Adding a Call Action

All of the selections displayed in the **Select an Action** drop-down list require you to make selections or to type entries. Each option is outlined in **Table 3.10**.

Table 3.10 Options and Commands for Adding Actions

Adding Actions

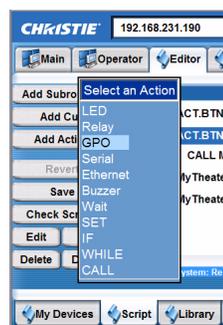| **LED**	
1. Select **LED** to open the **LED Configuration** window. 2. Click the LED button to open the **LED** window. 3. Highlight the LED number from the drop-down list (1-14) and click **OK**. 4. Click the State button to open the **State** window. 5. Highlight the State from the drop-down list (**Off, On Flash, Pulse**) and click **OK**. 6. In the **LED Configuration** window, click **OK** to add the action.	
Relay	
1. Select Christie *ACT* **Relay** option to open the **Relay Configuration** window. 2. Click the Relay button to open the **Relay** window. 3. Highlight the Relay number from the drop-down list (1-14) and click **OK**. 4. Click the State button to open the **State** window. 5. Highlight the State from the drop-down list **(Open, Close, PulseOpen, PulseClose**) and click **OK**. If you select **PulseOpen** or **PulseClose,** the **Relay Configuration** window appears with an area for you to type the duration (in ms) of the pulse. The pulse duration can be 100 - 1000 ms. 6. In the **Relay Configuration** window, click **OK** to add the action.	
GPO	
1. Select **GPO** to open the **GPO Configuration** window. 2. Click the GPO button to open the **GPO** window. 3. Highlight the GPO number from the drop-down list and click **OK**. 4. Click the State button to open the **State** window. 5. Highlight the State from the drop-down list (**Low, High, PulseLow**) and click **OK**. If you select **PulseLow**, the **GPO Configuration** window appears with an area for you to type the duration (in ms) of the pulse. The pulse duration can be 100 - 1000 ms. 6. In the **GPO Configuration** window, click **OK** to add action to Christie *ACT.*	

Adding Actions

Serial

1. Select **Serial** to open the **Serial Msg** window.

2. Click the Ports button to open the **Ports** window.

3. Highlight the Port number (**RS232 IN, RS232 OUT, RS422, RS422 Out (Audio)**) from the drop-down list and click **OK**.

4. In the **Serial Msg** Configuration window, type the signal.

5. Click the Termination character button to open the **Termination character** window.

6. Highlight the Termination character (**[none]**, **<CR>**, **<LF>**, **<CR><LF>**) from the drop-down list and click **OK**.

7. In the **Serial Msg** window, click **OK** to add action to Christie *ACT*.
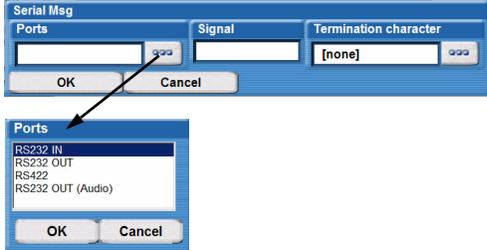
Ethernet

1. Select **Ethernet** to open the **Ethernet Msg** window.

2. From the **Ethernet Msg** window, type the **IP**, **Port**, **Signal**, and **Termination character** information.

3. Click **OK** to add action to Christie *ACT*.

Buzzer

1. Select **Buzzer** to open the **Buzzer Time** window.

2. Type the buzzer time duration in ms.

3. Click **OK** to add action to Christie *ACT*.

Wait

1. Select **Wait** to open the **Wait Time** window.

2. Type the wait time duration in ms.

3. Click **OK** to add action to Christie *ACT*.

SET

1. Select **Set** to open the **Set Property** window.

2. Type the Name and Value of action. These can be any variable.

3. Click **OK** to add action to Christie *ACT*.
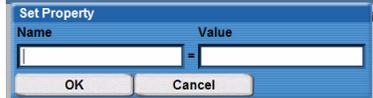
IF

1. Select the **IF** option to open the **IF Condition** window. This can be any variable.

2. Type the first action for the IF condition.

3. Select the appropriate symbol (**==** or **!=**)

4. Type the second action. This can be any variable.

5. Click **OK** to add action to Christie *ACT*.

Adding Actions

WHILE	
1. Select the **WHILE** option to open the **WHILE Condition** window. This can be any variable.	WHILE Condition
2. Type the first action for the WHILE condition.	OK Cancel
3. Select the appropriate symbol (**==** or **!=**)	
4. Type the second action. This can be any variable.	
5. Click **OK** to add action to Christie *ACT*.	
6. To add loop actions, from the **Device Types** window, highlight the **true** option and click **Add Action**. These actions will execute repeatedly as long as the While condition is true.	
CALL	
1. Select **CALL** to open the **Call** window.	Call
2. Click the **Subroutine** button to display a list of subroutines.	Subroutine
3. Select an action or cue from the drop-down list that appears.	*MyPlayer* Start *MyProjector* OpenDouser CloseDouser PowerOn
4. Click **OK** to select the routine.	
5. Click **OK** a second time to add the selection to Christie *ACT*.	OK Cancel
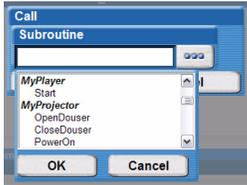
Table 3.11 Editor: My Device Selections (Factory Defaults)

ACT Buttons (Button definitions [Sample1])

ACT Buzzer (Base Library Status Buzzer [Christie])

ACT Front Panel (Base Library Status LEDs [Christie])

Audio (Processor Dolby CP650)

Cues (Cue Library Serial [Christie])

Projector (DLP2K Christie CP2000)

Relays 1 Amp (Base Library R1 - R12 [Christie])

Relays 8 Amp (Base Library R13 - R14 [Christie])

Server (D-cinema player DoReMi DCP2000 (Ethernet API))

Show Control (Cue Definitions [Sample1])

Table 3.12 Device Libraries

My Devices Name	Library Name	Subroutine Options
Projector	DLP2K Christie CP2000	OpenDouser CloseDouser PowerWake PowerStandby LampOn LampOff Channel 01 Channel 02 Channel 11 Channel 15 Channel 16 Get Status CHANNEL Get Status LAMP Get Status DOUSER
Server	[selected Server Device Library]	Play Pause Stop Fire_Alarm
Audio	[selected Audio Device Library]	6 Ch Analog 1 6 Ch Digital 1 Non Sync 1 Microphone Mute Audio Unmute Audio Set Audio Level to 7 Set Audio Level to Feature Set Audio Level to User Get Status Input Get Status Volume

Table 3.13 Base Libraries

My Devices Name	Library Name	Subroutine Options
ACT Buzzer	Base Library Status Buzzer [Christie]	Short Medium Long 1 2 3 No Go Warning Fire Alarm Loop Buzzer
Relays 1 Amp	Base Library R1 - R12 [Christie]	Masking Flat 1.85 Masking Flat 2.39 Masking Other Lights Up Lights Mid Lights Down Lights All Clear Relay #7 Spare Relay #8 Spare 6 Ch Digital 1 6 Ch Analog 1 Non Sync 1 Mute Audio

My Devices Name	Library Name	Subroutine Options
Relays 8 Amp	Base Library R13 - R14 [Christie]	Latch Relay Hold Latch Relay Clear Slide Relay Hold Slide Relay Clear Slide Relay Toggle
ACT Front Panel	Base Library Status LEDs [Christie]	LED Clear All Pulse All Play Circle Small Loop Play Circle Medium Loop Play Circle Big Loop Play Circle 671314 LED Bar Dance Block 1 Flash Block 2 Flash Block 3 Flash Block 4 Flash Block 5 Flash Block 6 Flash

Table 3.14 Cue Libraries

My Devices Name	Library Name	Subroutine Options
ACT Buttons	Button Definitions [Sample1]	Button Click • 1 = START_FLAT • 2 = FEATURE • 3 = CREDITS • 4 = END • 5 = 6 Channel Digital • 6 = Lights Up • 7 = Masking Flat • 8 = Server Play Button Hold • 1 = START_SCOPE • 2 = • 3 = • 4 = Preshow Toggle • 5 = 6 Channel Analog • 6 = Lights Down • 7 = Masking Scope • 8 = Server Pause
Cue	Cue Library Ethernet [Christie]	Cues call Show Control subroutines below:

My Devices Name	Library Name	Subroutine Options
Show Control	Cue Definitions [Sample1]	START START_FLAT START_SCOPE START_3D FLAT START_3D SCOPE FEATURE CREDITS END CUE_1 CUE_2 PROJECTOR_WAKE PROJECTOR_SLEEP

Table 3.15 ACT Library Structure (Factory Defaults)

SCRIPTS	***OnDeviceStartup*** ***[Fire Marshall] Check Safety Status***	
CUE LIBRARIES	***ACT Buttons*** * Button Definitions [Sample1] ***Cues*** * Cue Library Ethernet [Christie] * Cue Library Serial [Christie]	
CUE DEFINITIONS	***Show Control*** * Cue Definitions [Sample1]	
DEVICE LIBRARIES	***Projector*** * DLP2K Christie CP2000 ***Server*** * D-cinema player Dolby DSS100 (serial) * D-cinema player DoReMi DCP2000 (Ethernet API) * D-cinema player DoReMi DCP2000 (GPIO Only) * D-cinema player GDC SA2100 (Ethernet) ***Audio*** * Processor Dolby Cp650 * Processor DTS XD10P * Processor Relay Only Processor * UltraStereo JSD-80 ***Video*** * Scaler Christie Cine-IPM 2K (Ethernet) * Scaler Christie Cine-IPM 2K (RS232 Serial) * Scaler Christie Cine-IPM 2K (RS422 Serial) * Scaler Gefen AV Cinema Pro 1	
BASE LIBRARIES	* Base Library Status Buzzer [Christie] * Base Library R1 - R12 [Christie] * Base Library R13 - R14 [Christie] * Base Library Status LEDs [Christie]	

3.9.4 Adding a Device to MyDevices

1. Select the **Editor**: **My Devices** tab.

2. Click **Add Device**.

3. In the **Add Device** dialog, type the **Device Name** then click the **Device Type** button. From the drop-down list, select a device type and click **OK**.

4. In the **Add Device** dialog, click OK. The new device name appears in the **My Devices** list.

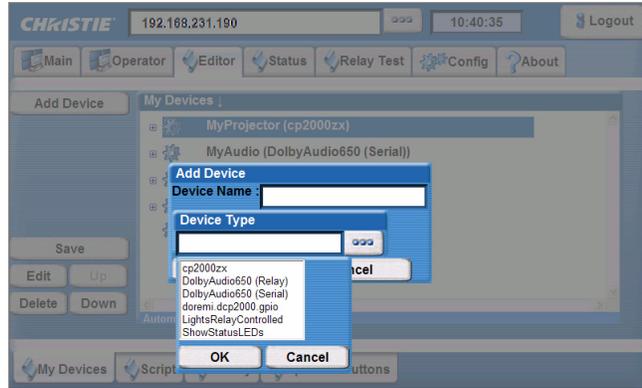5. Click **Save**. The subroutine appears in the **Editor: My Devices** tab.

Figure 3-27 Adding a Device in the Editor: My Devices Tab

3.9.5 Adding a Cue to a Script or Library

1. Select the **Editor**: **Script** tab or the **Editor**: **Script** tab.

2. Click the **Add Cue** button to open the **Select a new Cue** drop-down list.

3. Select a new cue. All of the selections displayed in the **Select a new Cue** drop-down list require you to make selections or type entries. Each option is outlined in **Table 3.16**. **Warning!** DO NOT *save a script during a show. Saving a script resets Christie ACT's script management engine. If Christie ACT is in the middle of running a script and another script is saved, the current active script will be interrupted.*
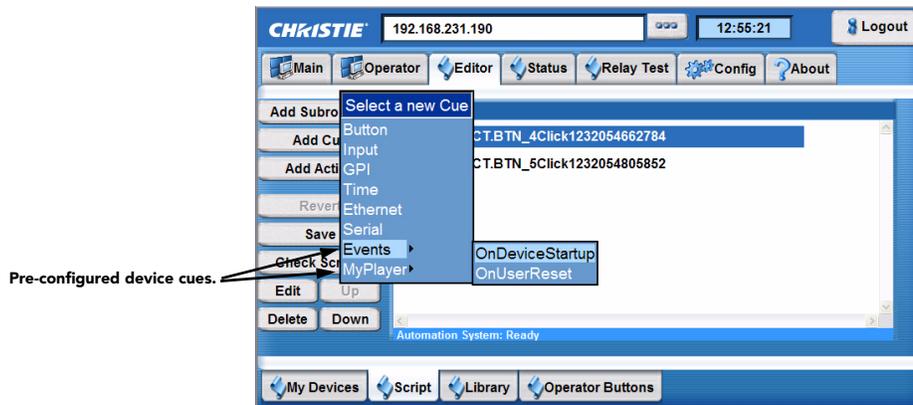
Figure 3-29 Add a Cue to a Script

Table 3.16 Adding Script Cues

Adding Script Cues - Options and Commands
Button 1. Highlight the button number from the drop-down list (numbered 1-8) and click **OK**. 2. Highlight the state from the **State** drop-down list (**Click**, **Hold**) and click **OK**.

Adding Script Cues - Options and Commands

Input

1. Select the inputs number from the drop-down list (numbered 1-16) and click **OK**.

2. Select the state from the **State** drop-down list (**OFFtoON**, **ONtoOFF**, **PulseON**, **PulseOFF**) and click **OK**.
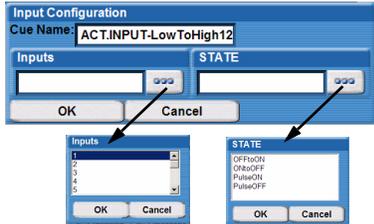
GPI

1. Select the GPI number from the drop-down list (numbered 1-7) and click **OK**.

2. Select the state from the State drop-down list (**Low ToHigh**, **HighToLow**, **PulseHigh**, **PulseLow**) and click **OK**. Only pulses greater than 15 ms will be detected. Pulses less than 15 ms in duration are considered to be noise.

Time

1. Click the **Start Date** button to open the **Select a Date** window. Select a date.
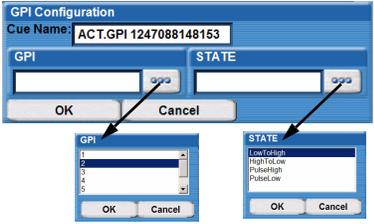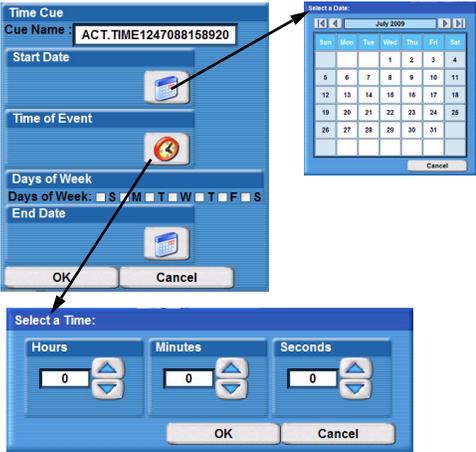
2. Click the **Time of Event** button to open the **Select a Time** window. Enter the duration using the arrow buttons to scroll through the times. Click **OK**.

3. Select the days of the week by clicking to add a checkmark (you can check more than one).

4. Click the **End Date** button to open the **Select a Date** window. Select a date.

5. Click **OK**.

Ethernet

1. Enter the signal in the Signal text region.

2. Click **OK**.
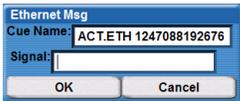
Serial

1. Select the Port number from the drop-down list (**RS232 IN**, **RS232 OUT**, **RS422**, **RS232 OUT (Audio)**).

2. Type the signal.

3. Click **OK**.
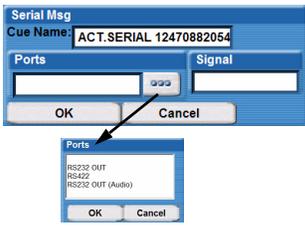
Adding Script Cues - Options and Commands

Events (applies to Script Cues only)

1. Select either the **onDeviceStartup** or **onUserReset** option.

•   The **OnDeviceStartup** event is executed each time Christie *ACT* is powered on and booted up. It also runs each time the user saves a script (used to set the box into a known state). **Warning!** DO NOT *save a script during a show.*

•   The **OnUserReset** event is executed each time the user manually resets Christie *ACT* by holding down Buttons #1 and #5 for 5 seconds. Used to recover from a reset.

Device Cues

1. Any cues inside selected Device Libraries will also be available.

2. This includes cues within the ACT Buttons library, the Cues library, and any other devices added to the My Devices page by end-users.

3. If the Library Device Cues already have actions associated (Functional Device Cues), and Library actions associated with this cue will be overridden.

Note on using Device Cues:
If Cue actions are only defined in the **Library** tab (Functional Device Cues), the Library actions will execute.
If Cue actions are only defined in the **Scripts** tab, the Script actions will execute.
If Cue actions are defined in both the **Script** and **Device** tabs, only the Script actions will execute. A pop-up dialog will display asking that you confirm overriding the library actions with the Script cue.

3.9.6 Adding an Operator Button

1. Select **Editor: Operator Button** tab.
2. Click **Add** to open the **Operator Button** window.
3. Type the Name and click the Subroutine button to open a list of **Subroutine** options.
4. Click **OK** to accept the highlighted subroutine.
5. In the **Operator Button** window, click **OK** to add your button to the Virtual Buttons list.

3.9.7 Adding a Property to a Library

To add a property you must have a library item. Refer to .

1. Select the **Editor: Library** tab.
2. Highlight a library from the **Device Types** list.
3. Click **Add Property** to open the **Add Property** window.
4. Type the **Name** and **Value** properties.
5. Click **OK** to add the property to the Library items.

3.9.8 Editing a Device

1. Select the **Editor**: **MyDevices** tab.
2. Select the device name in the **MyDevices** list.
3. Click the **Edit** button.
4. The **Your Device Name** window appears.
5. Type the new device name.
6. Click **OK**.

3.9.9 Editing a Script

1. Select the **Editor: Script** tab.

2. Select the script from the **Scripts** list.

3. Click the **Edit** button. The **Button Configuration** window appears.

4. Edit the script name in the **Cue Name** text region.

5. Select the Button Number and State from the appropriate lists.

6. Click **OK**.

3.9.10 Aborting a Script in Progress

The user can abort any in progress script by manually resetting the system. This is accomplished by either holding down Buttons #1 and #5 together for 5 seconds on the Christie *ACT* controller or pressing the **Save** button in the **Editor: Script** window. The **CUE** / **READY** / **ERROR** lights will flash ON when the reset has been triggered.

Upon completing the reset, Christie *ACT* will execute the OnUserReset event and any associated actions. Refer to .

3.9.11 Deleting a Property

Use the **Delete** button to delete properties, buttons or information by selecting the item and clicking the **Delete** button. The item will disappear from the list but is not permanently deleted until you click the **Save** button. If you attempt to move to another window without saving your changes, you will be prompted to save.

If you choose not to save your changes and you want to revert to your last saved configuration, click the **Revert** button.

3.9.12 Managing a Library

The **Editor: Library** tab contains a **Manage Library** button where you can append a library, export an entire library or export a selected device type.
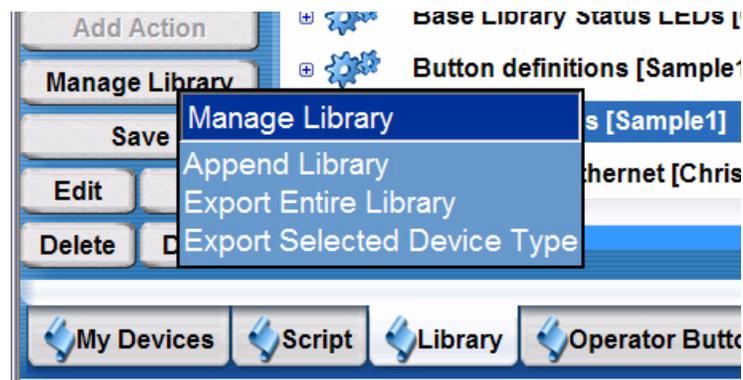
Figure 3-30 Manage Library Options

3.9.13 Checking Scripts

The **Editor: Script** tab contains a **Check Scripts** button where you can validate the scripts you have created. Simply click the **Check Scripts** button to determine if any errors exit.

4 Maintenance

Read through this section in it s entirety and understand all warnings and precautions before attempting to operate Christie *ACT*. This section contains:

- *4.1 Safety Warnings and Guidelines*
- *4.2 Maintaining Proper Cooling*

4.1 Safety Warnings and Guidelines

4.1.1 Labels and Markings

Observe and follow any warnings and instructions marked on the Christie *ACT*.

The exclamation point within the equilateral triangle indicates related operating/ maintenance instructions in the documentation accompanying Christie *ACT*.

The lightning flash and arrowhead symbol within the equilateral triangle indicates non-insulated "dangerous voltage" within Christie *ACT's* enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

4.1.2 General Precautions

Always follow the precautions and warnings provided with your projector - for example, consult *the projector User Manual* for all warnings pertaining to the use of that projector. Be aware of the following general precautions in all installations:

⚠ **WARNING** **1) Position all cables where they cannot contact hot surfaces or be pulled or tripped over. 2) Do not open the Christie *ACT*. There are no serviceable parts within the Christie *ACT*.**

Christie *ACT* must be installed in an environment that meets the operating range specifications in *Section 6 Specifications*.

4.1.3 AC Power Precautions

⚠ **WARNING** **1) Do not attempt operation if the AC supply is not within the specified voltage range. 2) Only Qualified Electricians should connect primary voltages.**

• Do not allow anything to rest on the power cords. Locate the projector where cords cannot be abused by persons walking on it or objects rolling over it. Never operate Christie *ACT* if the power cable appears damaged in any way.

• Do not overload power outlets and extension cords as this can result in fire or shock hazards.

• Only qualified service technicians are permitted to open any enclosure on the product, and only if AC has been fully disconnected from the product.

4.1.4 Power Cords and Attachments

⚠ **WARNING** **1) The North American rated line cord is provided with each unit. Ensure that you are using a line cord, socket and power plug that meets the appropriate local rating standards. 2) Use only an AC power cord recommended by Christie. Do not attempt operation if the AC supply and cord are not within the specified voltage and power range.**

Use only the attachments and/or accessories recommended by Christie. Use of others may result in the risk of fire, shock or personal injury.

4.2   Maintaining Proper Cooling

4.2.1 Ventilation

Mesh side grills provide ventilation. Never block or cover these openings. Do not install the product near a radiator or heat register, or within a small enclosure. Christie *ACT* does not contain a cooling fan or other cooling mechanism.

4.2.2 Air Filter

There is no air filter in the Christie *ACT*.

5   Troubleshooting

If Christie *ACT* does not appear to be operating properly, note the symptoms present and use the following guide to assist you. If you cannot resolve the problems yourself, contact your dealer for assistance.

- *5.1 Power*
- *5.2 Ethernet*
- *5.3 Input or Relays are Not Functioning*

5.1 Power

5.1.1 Christie *ACT* Will Not Start

1. Check the Ready light that indicates it is powered and started up.

2. Check the status of the LEDs on Christie *ACT*. If there is no activity (READY not lit) then check the wall circuit breaker to see if it's ON.

3. Is there a problem with the wall circuit breaker "tripping" OFF? Have a certified electrician investigate any electrical problem.

4. If plugged into the AC convenience outlet inside a pedestal, make sure the corresponding breaker labeled "Internal" is ON. This breaker is located on the side of the operator's side of the pedestal.

5.1.2 If Christie *ACT* Loses AC Power

Christie *ACT* DOES NOT have an internal battery to keep it running during a power interruption. If AC power is interrupted, Christie *ACT* will abort the ongoing program and will reset to an OnDeviceStartup condition. This system will re-initialize and all unsaved data will be lost.

5.1.3 Manually Resetting Christie *ACT*

This is accomplished by holding down buttons #1 and #5 together for 5 seconds. The CUE / READY / ERROR lights will flash ON when the reset has been triggered. The reset stops the Christie *ACT* engine, reloads all scripts (devices, scripts, libraries, and buttons), starts the engine, and then calls any user-defined **OnUserReset** actions defined in the **Editor: Scripts** tab.

5.1.4 Manually Resetting RS-232 IN Port

If you cannot connect to Christie *ACT* through Kore Librarian or HyperTerminal and you do now know the IP address, press and hold buttons #1 and #8 on Christie *ACT* for 5 seconds or until the **Cue** and **Error** LEDs blink. This sets serial communication to its default as indicated below. **NOTE**: *If the buttons are released too early, the cues that are associated with holding down these buttons will be triggered.*

Port:	RS232 IN
Baud:	115200
Protocol:	Christie Protocol
Mode:	8N1
Flow Control:	None

If you have the Web UI open and you press and hold button #1 and #8 for 5 seconds, the Web UI will not refresh the values displayed on the screen. You need to refresh the browser to see the update.

5.2 Ethernet

1. Check the **Config** tab to see if the IP address matches that of Christie *ACT*. Refer to *Section 3.7 Configuring Christie ACT.*

2. Make sure the Ethernet settings are valid for your site. All network devices should have the *same* subnet mask and *unique* IP addresses.

3. Ensure Christie *ACT* is connected to the network when changing its IP address. Refer to *Section 2 Installation and Setup.*

4. If you still have trouble establishing communications with Christie *ACT*, contact your network administrator.

5.3 Input or Relays are Not Functioning

This problem can occur if the terminal blocks have been removed and then replaced. Check the terminal block connections to ensure that they are properly installed. The terminal blocks are factory installed. If you replaced a terminal block, ensure the Input and Relay connectors are fully inserted into the mating header located on the back panel of Christie *ACT*.

5.3.1 Terminal Block Installation

1. Ensure the terminal block is parallel to the mating header (**Figure 5-1**).

2. Maintain orientation while inserting the terminal block into the header (**Figure 5-2**). **NOTE**: *Do not insert the terminal block at an extreme angle. This will damage the header causing the pins to be pushed back into the header.*

3. Continue to push the terminal block until it is fully seated in the header (**Figure 5-3**). **NOTE**: *Do not rock the terminal block from side to side while inserting it into the header.*

Figure 5-1 Terminal Block Parallel to Header	**Figure 5-2 Maintain Orientation**	**Figure 5-3 Terminal Block Fully Seated into the Header**
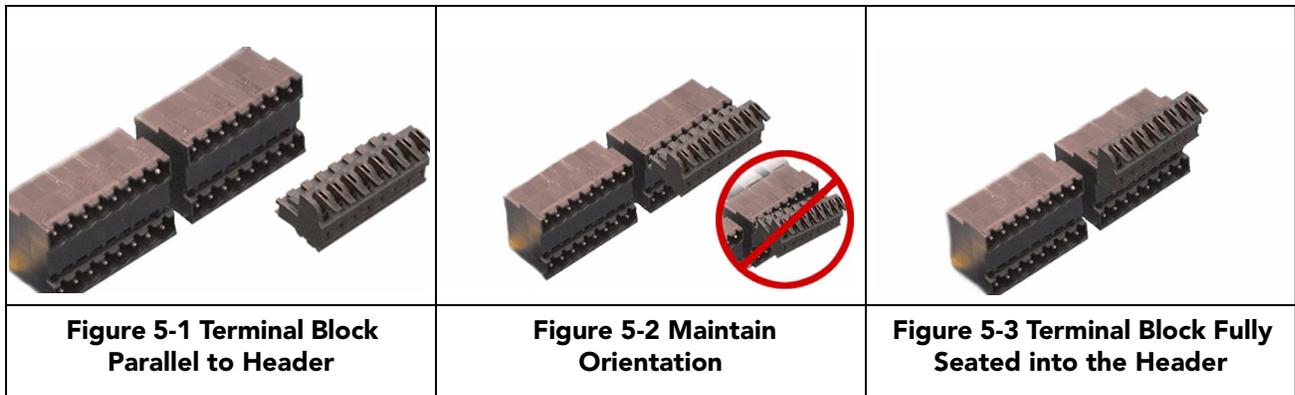
6   Specifications

This section provides detailed Christie *ACT* specifications including:

- *6.1 Performance*
- *6.2 Power*
- *6.3 Electrical Interface*
- *6.4 Physical I/O Connectors*
- *6.5 Buzzer*
- *6.6 USB*
- *6.7 GPIO*
- *6.8 Regulatory*

6.1 Performance

6.1.1 Operating Environment

Parameter	Min.	Nom.	Max.	Unit
Temperature	10	-	35	°C
Humidity (Standard non-condensing)	20		80	%
Altitude	0		3000	Meters

6.1.2 Input / Output Response Parameters

Parameter	Symbol	Min.	Nom.	Max.	Unit
Maximum input rate	f_{MAX}	-	-	1	Hz
Minimum hold time	T_{Hmin}	10	-	-	msec
Maximum latency for input trigger to output response	T_{LAT}	-	-	50	msec
Adjustable pulsed output	T_{on}	20	-	1000	msec
Tolerance on pulsed output	T_{tol}	-	2	-	msec

6.2 Power
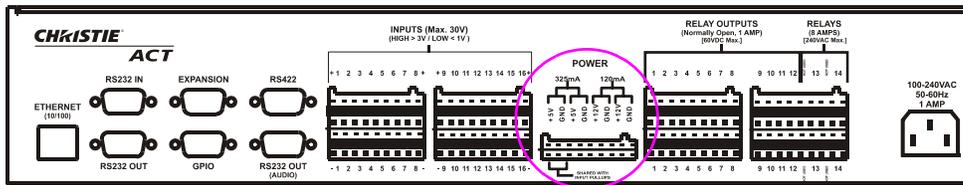
Figure 6-1 Power Outputs

Parameter	Symbol	Min.	Nom.	Max.	Unit
Input AC voltage	V_{ac}	85		264	V
Input frequency	f_{ac}	47		63	Hz
Hold-up time	$T_{hold-up}$		20		msec
Input current	I_{in}			1	A
Output voltage 12V (2 W)	V_{U1}	11	12	13	V
Reset-able fuse rating (continuous)	I_{OVL1}	-	-	0.2	A
Parameter	Symbol	Min.	Nom.	Max.	Unit
Output voltage 12V (2 W)	V_{U2}	11	12	13	V
Reset-able fuse rating (continuous)	I_{OVL2}			0.2	A
Output voltage 5V (2 W)	V_{U3}	4.5	5	5.5	V
Reset-able fuse rating (continuous)	I_{OVL3}	-	-	0.5	A
Output voltage 5V (2 W)	V_{U4}	4.5	5	5.5	V
Reset-able fuse rating (continuous)	I_{OVL4}			0.5	A
Power isolation voltage	V_{iso}		1000		V
Wire size accept - Clip terminals	Gauge	28	-	16	AWG

6.3 Electrical Interface

6.3.1 Inputs
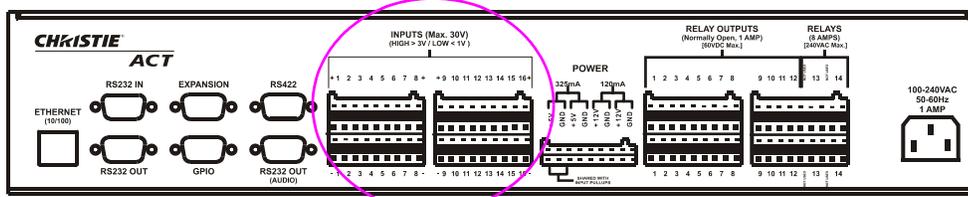
Figure 6-2 Opto-Isolated Inputs

Parameter	Symbol	Min.	Norm.	Max.	Unit
Input voltage range	V_{max}	0		30	V
Isolation voltage	V_{iso}	1000			V
ON voltage level	V_H	3		30	V
OFF voltage level	V_L			1	V
Min. ON time	t_{min}	1			ms
Pull-up current	I_{PU}		10		mA

6.3.2 Outputs

Relay Outputs

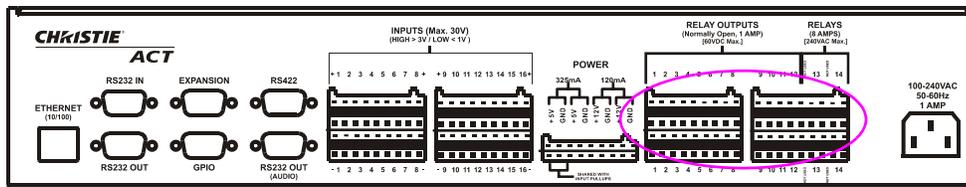⚠ WARNING Only Qualified Electricians should connect primary voltages.

Figure 6-3 Relay Outputs

Parameter	Pin	Symbol	Min.	Nom.	Max.	Unit
Small relay contact ratings (continuous A)		I_{CMax}	-	-	1	A
Small relay contact ratings	1 to 12	V_{CMax}	-	-	220	V_{DC}
Large relay contact ratings (continuous A)		I_{CMax}	0.1		8	A
Large relay contact ratings (resistive)	13 & 14	V_{CMax}			240	V_{AC}
Wire size accepted - Clip terminals		Gauge	28	-	16	AWG

6.4 Physical I/O Connectors

NOTE: *Screw type connectors are available.*

Parameter	Value
Type	Pluggable lever terminal
Current rating	Varies depending on connection
Voltage rating	300V
Wire size	16-28 AGW

6.5 Buzzer

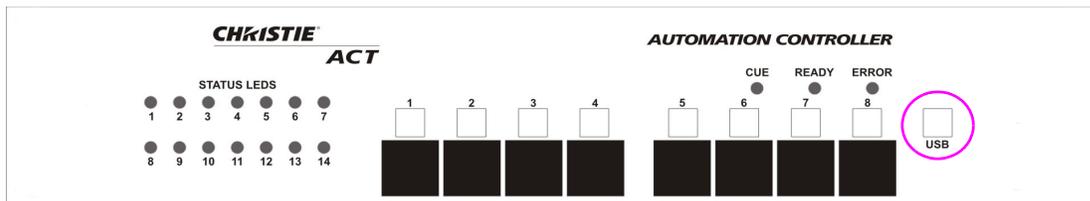| Parameter	Value
Type	Piezo
Sound pressure level @ 30cm/12VDC	Min. 85 dB

6.6 USB

Figure 6-4 USB

USB Full-Speed (12 MBPS)

The USB is located on the front panel of Christie *ACT* and is a deferred feature.

Pin	Direction	Description	Signal Name
1	In	Power	Vbus
2	I/O	Data -	D-
3	I/O	Data +	D+
4	-	Ground	GND

6.7 GPIO
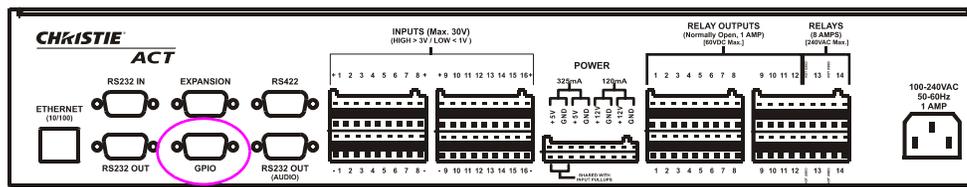
Figure 6-5 GPIO

Parameter	Value	Min.	Max.	Units
Connector	DB9	-	-	-
Output supply voltage @ 200 mA	12	10	13	V
Output current	-	-	200	mA
Number of I/O	7	-	-	-
Output sink current (logic low) @ 0V	90	-	-	mA
Output source current (logic high) @ 3.3V	15	-	-	mA
Input logic low	-	0.6	0.9	V
Input logic high		2.2	12	V

6.8 Regulatory

This product conforms to the following regulations related to product safety, environmental requirements and electromagnetic compatibility (EMC):

6.8.1 Safety

CAN/CSA C22.2 No. 60950-1

UL 60950-1

IEC 60950-1

6.8.2 Electro-Magnetic Compatibility

Emissions

FCC CFR47, Part 15, Subpart B, Class A - Unintentional Radiators

CISPR 22/EN 55022, Class A - Information Technology Equipment

Immunity

CISPR 24 / EN55024 EMC Requirements - Information Technology Equipment

Environmental

EU Directive (2002/95/EC) on the retraction of the uses of certain hazardous substances (RoHS) in electrical and electronic equipment and the applicable official amendment(S)

EU Directive (2002/96/EC) on waste and electrical and electronic equipment (WEEE) and the applicable official amendment(s)

Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and its amendments.

China Ministry of Information Industry Order No.39 (02/2006) on the control of pollution caused by electronic information products, hazardous substances concentration limits (SJ/T11363-2006), and the applicable product marking requirements (SJ/T11364-2006)

Corporate offices

USA – Cypress
ph: 714-236-8610

Canada – Kitchener
ph: 519-744-8005

Worldwide offices

United Kingdom
ph: +44 118 977 8000

Germany
ph: +49 2161 664540

France
ph: +33 (0) 1 41 21 44 04

Hungary/Eastern Europe
ph: +36 (0) 1 47 48 100

Singapore
ph: +65 6877 8737

Shanghai
ph: +86 21 6278 7708

Beijing
ph: +86 10 6561 0240

Korea
ph: +82 2 702 1601

Japan
ph: +81 3 3599 7481

ISO 9001
QMI
REGISTERED

ISO 14001
QMI
REGISTERED

For the most current technical documentation, please visit www.christiedigital.com

CHRISTIE®