



Installation Guide for Sony Paint Control

For DashBoard software version 8.7.1 (or higher)

Thank You for Choosing Ross

You've made a great choice. We expect you will be very happy with your purchase of Ross Technology. Our mission is to:

1. Provide a Superior Customer Experience
 - offer the best product quality and support
2. Make Cool Practical Technology
 - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at solutions@rossvideo.com.



David Ross
CEO, Ross Video
dross@rossvideo.com

Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

Installation Guide for Sony Paint Control

- Ross Part Number: **8351DR-012-8.7**.
- Publication Date: August 22, 2019. Printed in Canada.
- For DashBoard Software Version: 8.7.1 (or higher)

Copyright

©2019 Ross Video Limited, Ross®, and any related marks are trademarks or registered trademarks of Ross Video Limited. All other trademarks are the property of their respective companies. PATENTS ISSUED and PENDING. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, photocopying, recording or otherwise, without the prior written permission of Ross Video. While every precaution has been taken in the preparation of this document, Ross Video assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

Patents

Ross Video products are protected by patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B. Other patents pending.

Company Address



Ross Video Limited

8 John Street
Iroquois, Ontario
Canada, K0E 1K0

Ross Video Incorporated

P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office: (+1) 613 • 652 • 4886

Fax: (+1) 613 • 652 • 4425

Toll Free Technical Support: 1-844-652-0645 (North America)
+800 1005 0100 (International)

Technical Support: (+1) 613 • 652 • 4886

After Hours Emergency: (+1) 613 • 349 • 0006

E-mail (Technical Support): techsupport@rossvideo.com

E-mail (General Information): solutions@rossvideo.com

Website: <http://www.rossvideo.com>

Contents

Welcome	7
Documentation Conventions	7
Contacting Technical Support	8
 Network Architecture and Planning	 9
Network Architecture	9
System Components	11
Planning the Workstation Components	12
Planning the Studio and Network Components	13
Hardware and Software Checklist	14
 Install and Configure the System	 17
Establish an Ethernet Network	17
Install Camera Control Computers	17
Install Camera Paint Boxes	18
Install the Proxy Server	18
Install and Configure Sony Cameras	19
Install and Configure Sony CNS Master Device (for MSU Mode)	19
Install and Configure CNA-1 Network Adapters (for MSU Mode)	19
Install and Configure CNA-1 Network Adapters (for RCP Mode)	20
Install DashBoard Software on All Computers	21
Configure the First Computer	21
Configure Additional Camera Control Computers	27
Configure the Camera Paint Box Connection	28
Install the Camera Video Monitor(s) and Routing/Switching Equipment	30

Welcome

Ross Video's Sony Paint Control system enables you to adjust lens iris, camera paint (shading), and other settings on supported Sony cameras. You can also save and load Sony scene files.

The Sony Paint Control panel can be set up as a standalone paint control workstation, or be integrated with a Ross Robotics robotic camera system.

This Installation Guide describes how to install and configure the Sony Paint Control panel as a standalone paint control workstation.

Tip: If you later purchase Ross Robotics, you can reconfigure your standalone Sony Paint Control system to integrate it with your Robotics system. For more information, contact Ross Video.

For information about how to use Sony Paint Control, see the *Sony Paint Control User Guide (8351DR-013-xx)*.

Documentation Conventions

Text Format Conventions

Special text formats are used in this Installation Guide to identify parts of the user interface, text that a user must enter, or a sequence of menus and submenus that must be followed to reach a particular command.

Text Format	Meaning
Bold text	Bold text is used to identify a user interface element such as a dialog box, menu item, or button. For example: In the Display Name box, type a name for the node.
Courier text	Courier text is used to identify text that a user must type. For example: In the address bar, type <code>localhost</code> and press Enter .
<i>Italic text</i>	Italic text is used to identify the titles of referenced guides, manuals, or documents. For example: For more information, see the <i>Sony Paint Control User Guide (8351DR-013-xx)</i> .
>	Menu arrows are used in procedures to identify a sequence of menu items that you must follow. For example, if a step reads " File > New ," you would tap the File menu and then tap New .

User Interface Conventions

You can interact with the Sony Paint Control panel using a touch screen and/or a keyboard and mouse. The instructions in this Installation Guide describe how to interact with the Sony Paint Control panel using a touch screen. The following table provides equivalent actions for using a keyboard and mouse.

Instruction	Touch Screen	Keyboard and Mouse
tap	Tap the object briefly.	Click the object. Click refers to pressing the left mouse button briefly. Right-click refers to pressing the right mouse button briefly.
touch and hold	Touch the object and hold your finger on it until a circle appears, and then release it.	Right-click and hold your finger on the mouse button until the expected action occurs.
drag	Touch the object, hold your finger on it, and drag your finger on the screen to move the object.	Click and drag the object.

Contacting Technical Support

At Ross Video, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24-hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross Video personnel. During business hours (Eastern time), technical support personnel are available by telephone any time. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support person who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. This team of highly trained staff is available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

- **Technical Support:** (+1) 613-652-4886
- **After Hours Emergency:** (+1) 613-349-0006
- **E-mail:** techsupport@rossvideo.com
- **Website:** <http://www.rossvideo.com>

Network Architecture and Planning

The Sony Paint Control panel enables you to adjust lens iris, camera paint (shading), and other settings on supported Sony cameras. You can also save and load Sony scene files.

Sony Paint Control can be set up as a standalone paint control workstation, or can be integrated with a Ross Robotics robotic camera system and/or other Ross Video or third-party production solutions.

This Installation Guide describes how to install and configure the Sony Paint Control system as a standalone paint control workstation.

Tip: If you later purchase Ross Robotics, you can reconfigure your standalone Sony Paint Control system to integrate it with your Robotics system. For more information, contact Ross Video.

This section provides information about the Sony Paint Control system, to help you plan your installation. It includes the following topics:

- “**Network Architecture**” on page 2–9
- “**System Components**” on page 2–11
- “**Planning the Workstation Components**” on page 2–12
- “**Planning the Studio and Network Components**” on page 2–13
- “**Hardware and Software Checklist**” on page 2–14

Network Architecture

The Sony Paint Control system includes one or more paint control workstations, each with a camera control computer running DashBoard, which is a versatile control and monitoring interface for many Ross Video and openGear Partner devices. Through DashBoard you can access the Sony Paint Control panel, which is the camera control interface featuring camera iris and paint (shading) controls. Multiple cameras can be adjusted from a single workstation.

In systems with multiple workstations, an additional DashBoard computer acts as a proxy server. Camera control computers interact with the proxy server, which in turn interacts with cameras through Sony Camera Control Network Adapters (CNA-1). You can decide whether a given workstation controls some or all cameras. Any given camera can be controlled from one or more workstations.

This section of the Installation Guide describes network architecture options for a standalone paint control workstation. It includes the following topics:

- “**RCP Mode and MSU Mode**” on page 2–9
- “**Network Architecture using CNA-1 Adapters in RCP Mode**” on page 2–10
- “**Network Architecture using CNA-1 Adapters in MSU Mode**” on page 2–10

RCP Mode and MSU Mode

In Ross Video’s Sony Paint Control system, the Sony Paint Control panel sends commands to one or more CNA-1 adapters, which communicate with Sony cameras and control them. The CNA-1 adapters are configured to run either in Remote Control Panel (RCP) mode, or Master Setup Unit (MSU) mode:

- **RCP Mode** — Each camera is associated with a dedicated CNA-1 Adapter. The camera control computers address each camera directly through the camera’s CNA-1 Adapter. **RCP** mode is sometimes referred to as **Gateway** mode.
- **MSU Mode** — The system includes one or more CNA-1 adapters, upgraded to run in MSU mode (Sony upgrade **HZC-MSCN1**). Each CNA-1 adapter controls a group of cameras. For systems with a large number of cameras, deploying multiple CNA-1 adapters may improve response time, as the system queues control requests and polls the cameras for status updates. Additionally, a Sony MSU or a CNA-1 adapter is required to act as the master device on the Sony network.

MSU mode is also sometimes referred to as **Multi-Camera** mode.

Note: If you are using existing CNA-1 adapters for camera control, confirm that they can be upgraded to operate in MSU mode.

IMPORTANT: For several of the procedures in this manual, you need to know whether your system uses CNA-1 adapters in **RCP mode** or in **MSU mode**.

Note: Mixed configurations are also supported, in which some CNA-1 Adapters operate in RCP mode, and others in MSU mode.

Network Architecture using CNA-1 Adapters in RCP Mode

Figure 2.1 shows the architecture of a Sony Paint Control system that includes three Sony cameras, any of which can be controlled from either of the two paint control workstations. In this example, the system uses CNA-1 units in RCP mode, with one CNA-1 unit per camera.

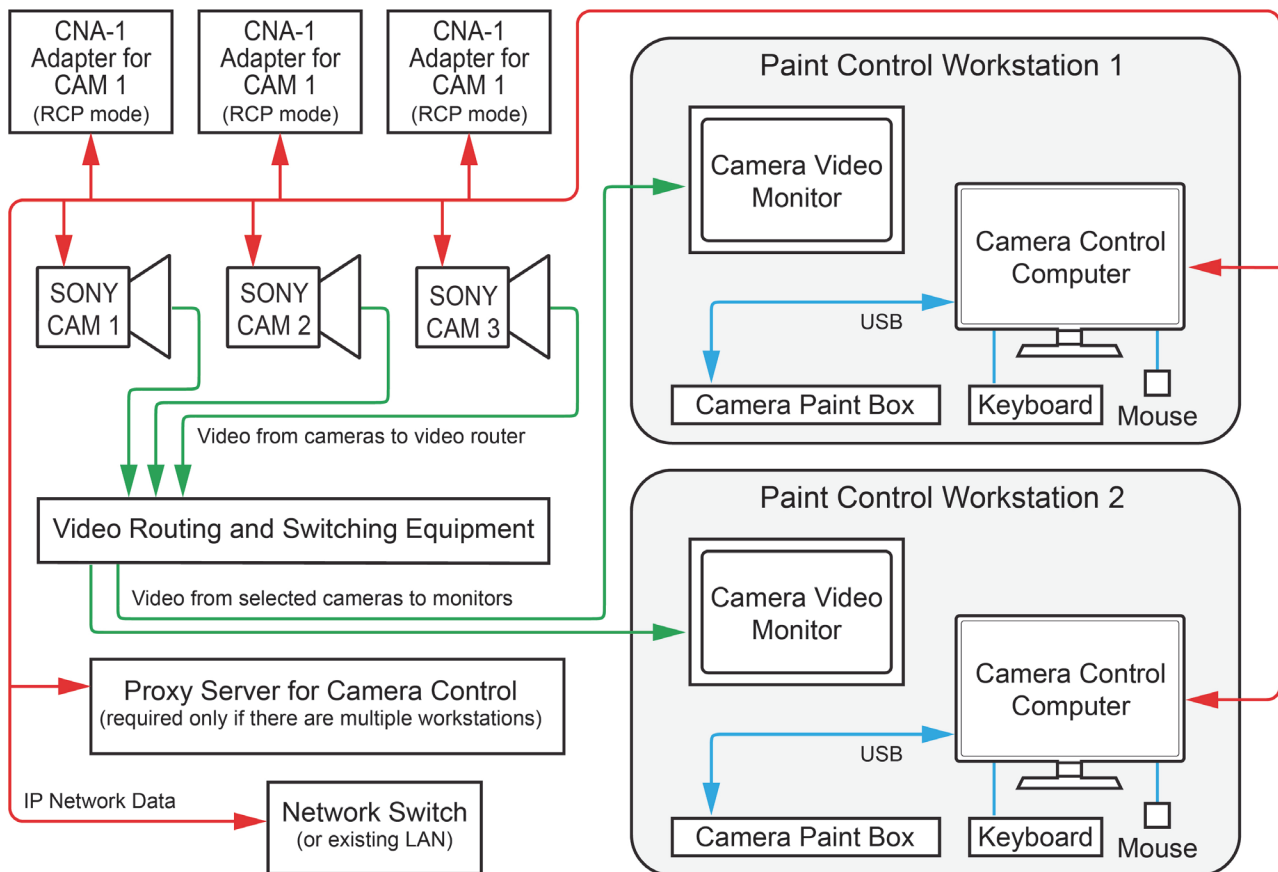


Figure 2.1 - Sony Paint Control System using CNA-1 Adapters in RCP Mode

All Sony cameras and CNA-1 adapters are assigned individual IP addresses on the network. Each CNA-1 adapter is configured with the IP address of the Sony camera it controls.

On the DashBoard computer acting as the proxy server, each camera is added as a device, using the IP address of the CNA-1 adapter that controls the camera.

Network Architecture using CNA-1 Adapters in MSU Mode

Figure 2.2 shows the architecture of a Sony Paint Control system that includes three Sony cameras, any of which can be controlled by either of the two paint control workstations.

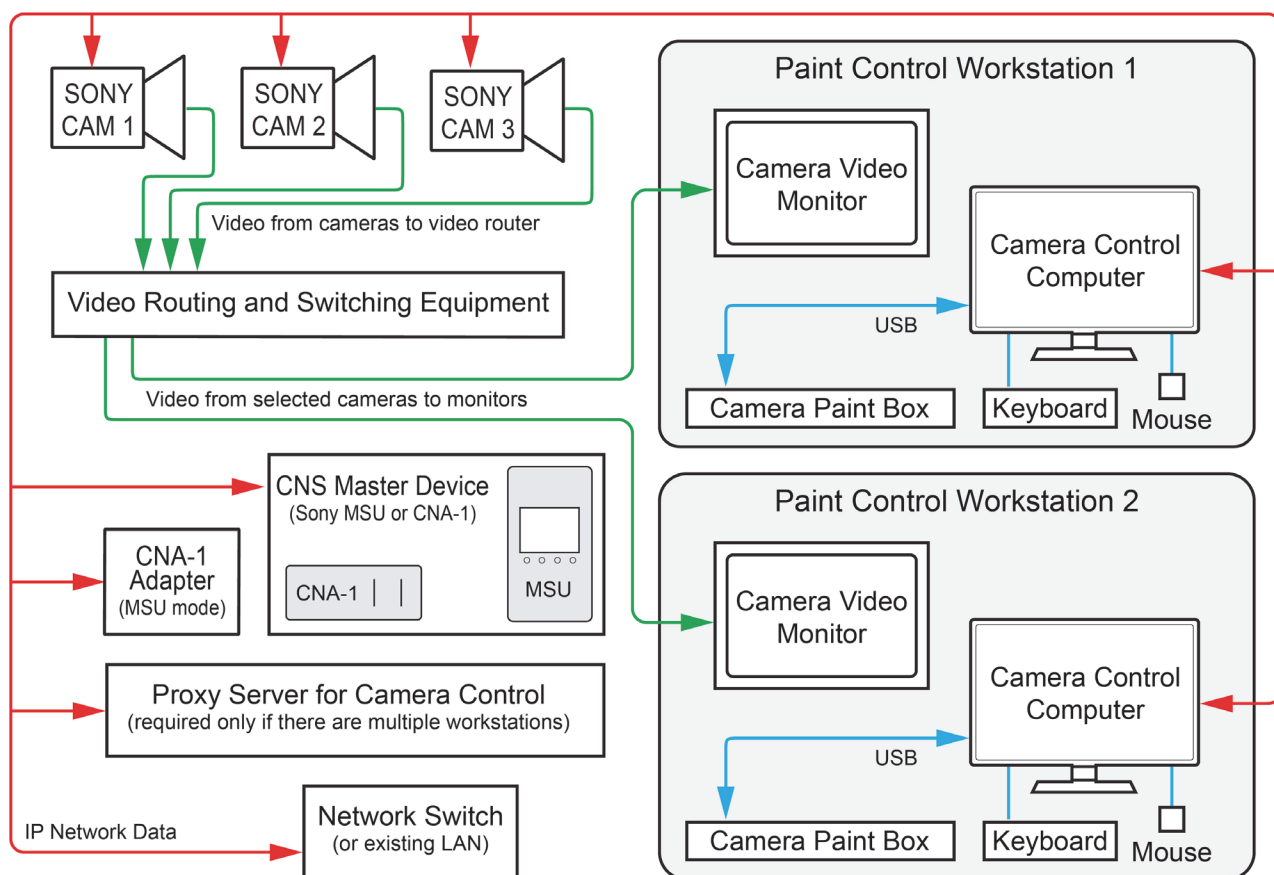


Figure 2.2 - Sony Paint Control System, using CNA-1 Adapters in MSU Mode

All Sony cameras and CNA-1 adapters are assigned individual IP addresses on the network. They are also assigned unique device numbers in the range 1 to 96.

On the DashBoard computer acting as the proxy server, each camera is added as a device, using the IP address of the CNA-1 adapter that controls the camera, and the camera's device number.

An additional CNA-1 Adapter in MSU mode (or a Sony MSU), is required to establish a Sony Camera Network System (CNS) and co-ordinate control commands. A Sony CNS can accommodate up to 96 devices including cameras, CNA-1 adapters, and MSUs.

System Components

This section lists the components of a standalone Sony Paint Control system.

Workstation Components

The Sony Paint Control system includes one or more paint control workstations. Each workstation can control any or all cameras. Each workstation consists of the following:

- Camera Control Computer — includes computer, monitor, keyboard, and mouse.
- Camera Video Monitor — displays video from the camera being controlled, so you can monitor the effect of adjustments as you make them. The camera video monitor is not included.
- Camera Paint Box (optional). The Camera Paint Box features physical knobs for adjusting iris and paint controls (gains and pedestals). These settings can also be controlled through the Sony Paint Control panel.

For more detailed information about the workstation components, see “**Planning the Workstation Components**” on page 2–12.

Studio and Network Components

Studio and network components include the following:

- **Network Switch** — The system can use a dedicated network switch, or use an existing LAN.
- **Sony cameras** — The system can control iris and paint functions on select Sony cameras.
- **Sony CNA-1 Camera Control Network Adapter(s)** — CNA-1 adapters translate control commands to a protocol that Sony cameras can process. Depending on your system layout, there is either one CNA-1 adapter per camera, or one or more CNA-1 adapters that each control a group of cameras.
- **Sony Master Setup Unit (MSU)** — In systems where a CNA-1 adapter controls multiple cameras, an additional CNA-1 adapter (or MSU) acts as the master device on the Sony network
- **Proxy server computer** — In systems with multiple paint control workstations, the proxy server communicates with the cameras. All camera control requests from camera control computers are handled by the proxy server.

For more detailed information about the studio and network components, see “**Planning the Studio and Network Components**” on page 2–13.

Planning the Workstation Components

This section describes the components of a paint control workstation, to help you plan your installation.

The main topics in this section are as follows:

- “**Camera Control Computer and Accessories**” on page 2–12
- “**Camera Video Monitor**” on page 2–12
- “**Camera Paint Box (optional)**” on page 2–13

Camera Control Computer and Accessories

Each Camera Control Computer runs DashBoard, which is a versatile control and monitoring interface for many Ross Video and openGear Partner devices. Through DashBoard you can access the Sony Paint Control panel, which is the camera control interface featuring camera iris and paint (shading) controls.

You need one Camera Control Computer running DashBoard at each paint control workstation. DashBoard is free, but the Sony Paint Control panel is a licensed application. You require one license for each workstation.

You can purchase your Camera Control Computer(s) from Ross Video. Alternatively, you can use any computer that meets the Windows system requirements for installing DashBoard. To view the DashBoard system requirements, download the DashBoard User Guide at <http://www.rossvideo.com/control-systems/dashboard/index.html>.

All computers are connected to a single Ethernet IP network.

If your system includes multiple paint control workstations, the camera control computers are set up in a primary-secondary topology. On each camera control computer, DashBoard is configured to be a secondary instance. On an additional proxy server computer, DashBoard is configured to be the primary instance.

Camera Video Monitor

The camera video monitor displays video from the camera being controlled so you can monitor the effect of adjustments as you make them. The camera video monitor is usually a carefully calibrated reference monitor. Sometimes two identical monitors are used to compare video output of two cameras side-by-side. Video routing equipment is required to direct the desired video feed(s) to the monitor(s).

Note: Camera video monitors and routing equipment operate independently of the Camera Control System. The Sony Paint Control panel and Camera Paint Box do not select video to be displayed on camera video monitors.

Camera video monitors and video routing equipment are not included as part of the Sony Paint Control system.

Camera Paint Box (optional)

The Camera Paint Box is an optional accessory that features physical knobs for adjusting iris and paint controls (gains and pedestals). These settings can also be controlled through the Sony Paint Control panel.

Each paint control workstation may or may not include a Camera Paint Box.

The Camera Paint Box is connected to the camera control computer by a USB cable. The Camera Paint Box is designed to occupy 1RU in a standard 19" component rack.

Planning the Studio and Network Components

This section describes the studio and network components of a Sony Paint Control system, to help you plan your installation.

The main topics in this section are as follows:

- “Cameras” on page 2–13
- “Sony CNA-1 Camera Control Network Adapters” on page 2–13
- “Proxy Server Computer” on page 2–13
- “Network Configuration” on page 2–14

Cameras

The Sony Paint Control system works with Sony broadcast video cameras that communicate via Sony 700PTP protocol. This includes Sony System 700 series cameras, and may include others. For information about which Sony cameras are supported, contact Ross Video.

Sony CNA-1 Camera Control Network Adapters

The Sony CNA-1 Camera Control Network Adapter translates Sony 700PTP control protocol to a protocol that the camera control system can process.

If your system uses CNA-1 adapters in RCP mode, each Sony camera requires a dedicated CNA-1 adapter.

If your system uses CNA-1 adapters in MSU mode, one or more CNA-1 adapters that have been upgraded to run in MSU mode (Sony upgrade **HZC-MSCN1**) are required. Each CNA-1 adapter controls a group of cameras. For systems with a large number of cameras, deploying multiple CNA-1 adapters may improve response time, as the system queues control requests and polls the cameras for status updates. An additional CNA-1 adapter (or MSU) acts as the master device on the Sony network.

The CNA-1 adapter(s) and MSU (if present) are connected to the same Ethernet IP network as the cameras and the camera control computer.

Note: CNA-1 adapters are powered by Power over Ethernet (PoE). Your network must be PoE-capable. For information about power consumption, see the Operation Manual for the CNA-1 adapter.

Proxy Server Computer

If your system includes multiple paint control workstations, the camera control computers are set up in a client/server topology. On the proxy server, DashBoard is configured to be the 'proxy server' instance. On each camera control computer, DashBoard is configured to be a client of the proxy server instance.

The proxy server communicates with the cameras. All camera control requests from camera control computers are handled by the proxy server.

Because the proxy server must remain on at all times, we recommend you use a server-grade computer installed in a rack room. Alternatively, you can designate one of the camera control computers to act as the proxy server.

You can purchase a server from Ross Video. Alternatively, you can use any computer that meets the Windows system requirements for installing DashBoard. To view the DashBoard system requirements, download the DashBoard User Guide at <http://www.rossvideo.com/control-systems/dashboard/index.html>.

Network Configuration

Components of the Sony Paint Control system communicate over an Ethernet IP network. You can use a dedicated network switch or an existing network.

The following components require network connections:

- Each Camera Control Computer
- Each Sony camera
- Each Sony CNA-1 Camera Control Network Adapter and the Sony MSU (if present)
- The proxy server (only required for systems that have multiple paint control workstations)

Note: Network cables between components are not included.

Hardware and Software Checklist

The tables in this section list components required for your system. You can use the tables as checklists when determining what you purchase.

Table 2.1 - Paint Control Workstation Equipment and Software

Quantity	Item	Source	Notes / Requirements
	Camera Control Computer Must include monitor, keyboard, and mouse.	Ross Video or Other	One computer per paint control workstation. Ross Video sells an all-in-one computer for this purpose. Computers must meet Windows system requirements for DashBoard installation. Computers require power supply outlets.
	Sony camera control license	Ross Video	One license per paint control workstation.
	Camera Paint Box	Ross Video	Maximum one per paint control workstation. Optional accessory. The Camera Paint Box requires a power supply outlet.
	Camera video monitor	Other	Minimum one per paint control workstation. Can have multiple monitors for side-by-side comparison of camera outputs. Monitors power supply outlets.
	Routing and switching equipment for camera video monitor(s) Must include video cabling between cameras and router, and between router and monitor(s).	Ross Video and/or Other	Independent of Sony Paint Control. Typically, an existing video router is used. Ross Video can provide video routing solutions. Routing equipment requires power supply outlets.

Table 2.2 - Studio and Network Equipment

Source			
Quantity	Item	(Ross or Other)	Notes
	Sony camera	Other	One or more. Contact Ross Video for information about which Sony cameras are supported. Each camera requires a power supply outlet.
	Sony CNA-1 Control Network Adapter	Other	If in RCP mode, one per Sony camera. If in MSU mode, one or more for camera control, plus one to act as the master device on the Sony network. Alternatively, a Sony MSU can act as the master device. Note: CNA-1 adapters are powered by Power over Ethernet (PoE).
	Sony software upgrade HZC-MSCN1 for Sony CNA-1 adapters, to enable them to run in MSU mode	Other	This applies only if your system uses Sony CNA-1 adapters in MSU mode. By default, CNA-1 adapters are not capable of operating in MSU mode. A software upgrade from Sony is required for each CNA-1 adapter.
	Proxy server for camera control	Ross Video or Other	Required if your system has multiple paint control workstations. Ross Video sells servers for this purpose Server must meet Windows system requirements for DashBoard installation. Server requires a power supply outlet.
	Camera control license for proxy server computer	Ross Video	License fees are based on the number of paint control workstations in your system. If your system has a proxy server running on a separate computer (as opposed to running on a camera control computer), the license for the proxy server computer is provided free of charge.
	Network Switch	Other	One required. Can use dedicated network switch, or an existing LAN. Must be PoE-capable to power Sony CNA-1 adapter(s)
	Ethernet network cables	Other	The following require network connections: • Each Camera Control Computer • Each Sony camera • Each Sony CNA-1 adapter, and MSU (if present) • Proxy server (if equipped)

Install and Configure the System

This section describes how to install and configure a standalone Sony Paint Control system.

Components in the system communicate over an Ethernet network. All components in the system must use the same subnet mask and gateway. Determine the subnet mask and gateway in advance so you can configure the IP addresses of the components as you install them. If you plan to use an existing network, ask your network administrator to provide an available subnet mask and gateway.

Before you install the system, you need to plan the installation. For more information, see “**Network Architecture and Planning**” on page 2–9.

IMPORTANT: In Ross Video’s Sony Paint Control system, the Sony Paint Control panel sends commands to one or more CNA-1 adapters, which communicate with Sony cameras and control them. The CNA-1 adapters are configured to run either in Remote Control Panel (RCP) mode or Master Setup Unit (MSU) mode. Before you install and configure the system, you need to know which CNA-1 mode your system will use. For more information, see “**RCP Mode and MSU Mode**” on page 2–9.

Perform the installation procedures in the following order:

1. “**Establish an Ethernet Network**” on page 3–17
2. “**Install Camera Control Computers**” on page 3–17
3. “**Install Camera Paint Boxes**” on page 3–18
4. “**Install the Proxy Server**” on page 3–18
5. “**Install and Configure Sony Cameras**” on page 3–19
6. “**Install and Configure Sony CNS Master Device (for MSU Mode)**” on page 3–19
7. “**Install and Configure CNA-1 Network Adapters (for MSU Mode)**” on page 3–19
8. “**Install and Configure CNA-1 Network Adapters (for RCP Mode)**” on page 3–20
9. “**Install DashBoard Software on All Computers**” on page 3–21
10. “**Configure the First Computer**” on page 3–21
11. “**Configure Additional Camera Control Computers**” on page 3–27
12. “**Configure the Camera Paint Box Connection**” on page 3–28
13. “**Install the Camera Video Monitor(s) and Routing/Switching Equipment**” on page 3–30

Establish an Ethernet Network

Ross Video’s Sony Paint Control system can use a dedicated network switch, or use an existing LAN.

To set up a dedicated network switch:

1. Install the network switch in an appropriate location.
2. Connect the power supply for the switch.
3. Turn on the switch.

Install Camera Control Computers

Each paint control workstation includes one camera control computer. This section describes how to install a camera control computer provided by Ross Video. If your computer is not provided by Ross Video, the steps may vary somewhat.

To install a Camera Control Computer and Peripherals:

1. Position the camera control computer in the paint control workstation location.
Ensure that the touch-screen monitor is within easy reach of the operator. Ensure that the optical drive, accessory ports, and buttons on the right and left edges of the computer are accessible.
2. Position the keyboard and mouse within easy reach of the operator, and then plug them into the connection panel on the back of the computer.
3. Plug one end of an Ethernet cable into the connection panel on the back of the computer. Connect the other end to the IP network.
4. Connect the power cable to the computer, and to a suitable power outlet.
5. Configure the networking parameters (IP address, subnet mask, and gateway).

Install Camera Paint Boxes

The Camera Paint Box is an optional accessory. Each paint control workstation may or may not include a Camera Paint Box.

To install a Camera Paint Box:

1. Position the Camera Paint Box in the paint control workstation location.
Ensure that the Camera Paint Box is within easy reach of the operator.
The Camera Paint Box can sit on a flat surface, or occupy 1RU in a standard 19" component rack.
2. Plug one end of the provided USB cable into the Camera Paint Box. Plug the other end into a USB connector on the back of the camera control computer.
3. Plug the power cable into the Camera Paint Box, and into a suitable power outlet.
On the front of the Camera Paint Box, a green LED indicates that the unit is powered.

Install the Proxy Server

This section applies only if your system has multiple paint control workstations.

The proxy server communicates with the cameras on behalf of the camera control computers. It must always be running, and must be on the same network as the other components of the system.

This section describe how to set up a proxy server computer provided by Ross Video. If your computer is not provided by Ross Video, the steps may vary somewhat.

The operator does not need physical access to the proxy server. The server can be installed in a rack room. It does not need a dedicated keyboard and mouse. You can use a KVM or use Windows Remote Desktop to interact with the server.

To install the Proxy Server:

1. Position and install the server in a standard 19" component rack.
2. Connect the power cable to the computer, and to a suitable power outlet.
3. Plug one end of an Ethernet cable into the server. Connect the other end to the IP network.
4. Turn on the server.
5. Configure the networking parameters (IP address, subnet mask, and gateway).

Install and Configure Sony Cameras

This section describes how to install Sony cameras, and how to set their communication protocol to RS-422.

To install and configure a camera:

1. Position and mount the camera.
2. Connect the camera to the Ethernet network.
3. On the camera, find the **IRIS** switch and set it to the **automatic (A)** position.
4. Plug the camera power supply unit into the camera and to a suitable power outlet.
5. Connect a video cable from the camera's video output to a video monitor, and then turn on the video monitor so you see the camera output.
6. Using the camera's on-screen configuration menu, do the following:
 - Set the **IP address** of the camera. Each camera must have a unique IP address.
Note the IP address you set. You will need to know the IP address of each camera for later procedures.
 - Set the **CNS mode**, as follows:
 - › If your system uses CNA-1 adapters in **MSU mode**, set the **CNS Mode** to **MCS**.
 - › If your system uses CNA-1 adapters in **RCP mode**, set the **CNS Mode** to **Bridge**.
 - If your system uses CNA-1 adapters in **MSU mode**, set a unique device number (**1 - 96**) and record it. You will need to know the device number of each camera for a later procedure.
Tip: Each device on the Sony Camera Network System (CNS), such as a camera, CNA-1 adapter, or MSU requires a unique device number.

Tip: For more information about configuring your Sony camera, see the manual(s) that came with the camera.
7. Disconnect the video output cable from the video monitor, and then connect the video output to its intended destination.

Install and Configure Sony CNS Master Device (for MSU Mode)

When CNA-1 adapters are used in **MSU mode**, the Sony Camera Network System (CNS) requires an additional master device on the network. The master device can be either a Sony Master Setup Unit (MSU), or a CNA-1 adapter in **Master** mode.

Install and configure the master device to operate on the CNS network. For more information, consult Sony manuals that came with your device.

Install and Configure CNA-1 Network Adapters (for MSU Mode)

This procedure applies only if your system uses CNA-1 adapters in **MSU mode**. If your system uses CNA-1 adapters in **RCP mode**, skip this procedure.

The system includes one or more CNA-1 adapters. Each CNA-1 adapter controls a group of cameras. For systems with a large number of cameras, deploying multiple CNA-1 adapters may improve response time, as the system queues control requests and polls the cameras for status updates.

The Sony Camera Control Network Adapter (CNA-1) translates between Sony Proprietary Protocol (SPP or 700PTP), which is used by Sony cameras, and Sony Simple Camera Protocol (SSCP), which is designed to enable non-Sony controllers and cameras to connect to a Sony Camera Network System (CNS).

IMPORTANT: By default, CNA-1 adapters are not capable of operating in MSU mode. A special software upgrade (**HZC-MSCN1**) from Sony is required for each CNA-1 adapter. Upgrade each CNA-1 adapter before performing the steps in this section.

Configure each CNA-1 adapter as follows:

1. In a web browser, type the IP address of the CNA-1 adapter in the address bar and then press **Enter**.

The CNA-1 configuration menu appears.

Tip: The factory default IP address is **192.168.1.1**. A user name and password may be required to access portions of the configuration menu.

2. On the **System** tab, specify **IP Configuration** settings to assign a unique **IP address** for the CNA-1 adapter.

The **IP Address** and **Subnet Mask** must be accessible by all computers in the system.

Note the IP address you assigned. You will need it when you later register cameras.

3. On the **CNS tab**, specify **CNS Configuration** settings as follows:

- Set **CNS Mode** to **MCS**.
- Disable **Master Mode**.
- Set the **Master IP Address** to the IP address of the CNA-1 adapter or MSU that is the master device on the SONY CNS network.
- Set a unique device number (**Device No.**) for the CNA-1 adapter (**1 - 96**).

Tip: Each device on the Sony Camera Network System (CNS), such as a camera, CNA-1 adapter, or MSU requires a unique device number.

4. On the **CNS tab**, specify **Gateway Configuration** settings as follows:

- Set **Gateway Mode** to **Enable**.
- Set **Emulation Mode** to **MSU**.

5. Tap **Apply**.

Install and Configure CNA-1 Network Adapters (for RCP Mode)

This procedure applies only if your system uses CNA-1 adapters in **RCP mode**. If your system uses CNA-1 adapters in **MSU mode**, skip this procedure.

The Sony Camera Control Network Adapter (CNA-1) translates between Sony Proprietary Protocol (SPP or 700PTP), which is used by Sony cameras, and Sony Simple Camera Protocol (SSCP), which is designed to enable non-Sony controllers and cameras to connect to a Sony Camera Network System (CNS).

Because your system uses CNA-1 adapters in RCP mode, each Sony camera must be associated with its own CNA-1 adapter. Cameras and CNA-1 adapters do not have to be co-located. They must all reside on the same IP network.

Configure each CNA-1 adapter as follows:

1. In a web browser, type the IP address of the CNA-1 adapter in the address bar and then press **Enter**.

The CNA-1 configuration menu appears.

Tip: The factory default IP address is **192.168.1.1**. A user name and password may be required to access portions of the configuration menu.

2. On the **System** tab, specify **IP Configuration** settings to assign a unique **IP address** for the CNA-1 adapter.

The **IP Address** and **Subnet Mask** must be accessible by all computers in the system.

Note the IP address you assigned. You will need it when you later register cameras.

3. On the **CNS tab**, specify **CNS Configuration** settings as follows:

- Set **CNS Mode** to **Bridge**.
- Set **Target IP Address** to the actual IP address of the associated camera.

4. On the **CNS tab**, specify **Gateway Configuration** settings as follows:
 - Set **Gateway Mode** to **Enable**.
 - Set **Emulation Mode** to **RCP**.
5. Tap **Apply**.

Install DashBoard Software on All Computers

Install the latest version of DashBoard on each Camera Control Computer and on the proxy server (if present).

DashBoard and the DashBoard User Guide are available as free downloads from Ross Video. The DashBoard User Guide contains instructions for installing DashBoard. Both are available at the following location:

<http://www.rossvideo.com/control-systems/dashboard/index.html>.

Configure the First Computer

The steps for configuring the first computer in the Sony Paint Control are different than the steps for subsequent computers:

- If your system includes only one paint control workstation, the camera control computer is the first (and only) computer.
- If your system includes multiple paint control workstations, the proxy server is the first computer.

To configure the first computer, you perform the following tasks:

- “**Configure Network Settings**” on page 3–21
- “**Add Cameras**” on page 3–22
- “**Manage Cameras (CNA-1 Configuration)**” on page 3–23

Note: To perform the steps in this section, you need to have good working knowledge of basic computer networking procedures.

Note: DashBoard is free, but use of the Sony Paint Control panel requires one license per computer. During the configuration process, DashBoard provides a Request Code and requires a License Key in response. The License Key can be obtained only by relaying the Request Code to Ross Video Technical Support. The License Key cannot be obtained in advance because it is a response to the unique Request Code generated by DashBoard.

Configure Network Settings

To configure network settings:

1. Configure the network settings on the computer so it can communicate with the CNA-1 adapter(s).

If this computer is the proxy server, note its IP address. You will need to know the proxy server’s IP address for later procedures.

Add Cameras

Add cameras to the first computer only. If there are multiple paint control workstations, the first computer is the proxy server, and the other workstations access the cameras through the proxy server.

IMPORTANT: Add the cameras in the order in which you want them to appear when listed in the Sony Paint Control panel.

To add a camera:

1. On the first computer, open DashBoard.
2. From the **File** menu, tap **New**, and then tap **Other**.
The **New** dialog box appears.
3. Expand the **Camera Control** node, tap **Sony Camera**, and then tap **Next**.
The **New Ross Video Sony Camera Connection** dialog appears.

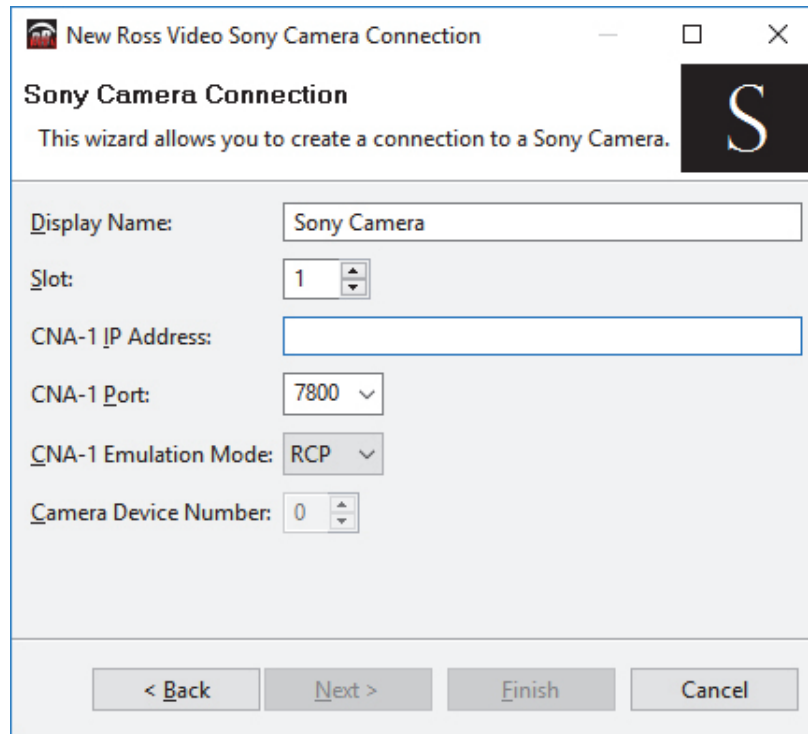


Figure 3.1 - Adding a Camera

4. In the **Display Name** box, type a name for the camera. This name will appear in the DashBoard component tree.
5. In the **CNA-1 IP Address** box, type the IP address of the CNA-1 adapter that controls the camera you want to add.
6. In the **CNA-1 Port** box, type the port number for the CNA-1 adapter that controls the camera you want to add.
Tip: The default port number is **7800**. Do not change this value unless you configured a different port number on the CNA-1 adapter.
7. In the **CNA-1 Emulation Mode** list, do one of the following:
 - If your system uses CNA-1 adapters in **RCP mode**, select **RCP**.
 - If your system uses CNA-1 adapters in **MSU mode**, select **MSU**.
8. If your system uses CNA-1 adapters in **MSU mode**, in the **Camera Device Number** list, specify the device number you assigned to the camera when you configured it.

9. Tap **Finish**.
10. In the **DashBoard Component Tree**, expand the **Sony Cameras** node.
11. Tap and hold, and then release the **Slot** node for the camera you just added, and then tap **Share Device**.
12. Expand the **Slot** node for the camera you just added.
13. Tap **Remote Control**.
14. If the **Sony Paint Control** panel appears, go to **Step 20 on page 3-23**.
15. In the **Enter License Key** interface, tap **Copy to Clipboard**.

The request code is copied to the clipboard.

16. Paste the request code into an e-mail to Ross Video (techsupport@rossvideo.com), requesting a corresponding license key. Be sure to include the original Ross Video sales order number.

IMPORTANT: Do not do anything with the computer until you receive a license key from Ross Video. If you leave the **Enter License Key** page, the license key you receive will not work. It is valid only for the session during which it was generated.

17. When you receive the license key, copy it and paste it into the **License Key** box, and then tap **Install**.

The **License Installed** message appears. Tap **OK**.

18. In DashBoard, close the **Sony Cameras - Slot x** tab.

19. In the **Component Tree**, tap **Remote Control**.

The **Camera Control Panel** appears.

20. In the camera selection area at the top of the panel, tap the camera name.

If the camera initializes and connects, it has been successfully added and can be controlled.

Manage Cameras (CNA-1 Configuration)

The Sony Paint Control panel features a restricted-access interface for viewing the status of camera and CNA-1 connections, and for managing advanced configuration settings.

The configuration interface is always available from the first computer (proxy server). You can also make it available to other paint control workstations.

To share the advanced configuration interface to all workstations:

- In the DashBoard component tree, expand the node for the cameras, expand the **Sony Camera Server** node (**Slot 0**), press and hold the **Master Control** node, and then tap **Share Device** (Figure 3.2).

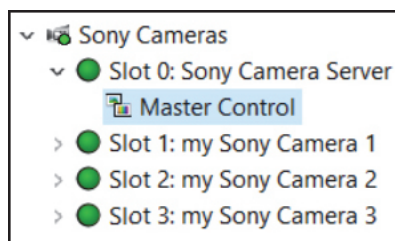


Figure 3.2 - The Master Control Node in the DashBoard Tree

To access the advanced configuration interface:

- Do one of the following:
 - If you are configuring the first (proxy server) computer, tap the **Manage Cameras** button.
The advanced configuration interface appears (**Sony CNA-1 Configuration**). See **Figure 3.3**.
 - If you are configuring a computer other than the first computer (proxy server), in the DashBoard tree, expand the node for the cameras, expand the **Sony Camera Server** node (**Slot 0**), and then tap the **Master Control** node (**Figure 3.3**).

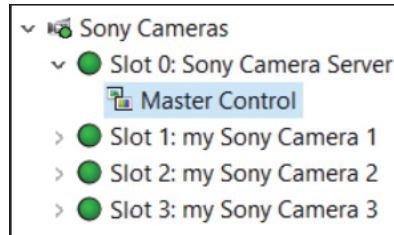


Figure 3.3 - The Master Control Node in the DashBoard Tree

The advanced configuration interface appears (**Sony CNA-1 Configuration**). See **Figure 3.4**.

Tip: If the **DashBoard Tree** does not have a **Master Control** node, the configuration settings are not available to you. Contact your administrator.

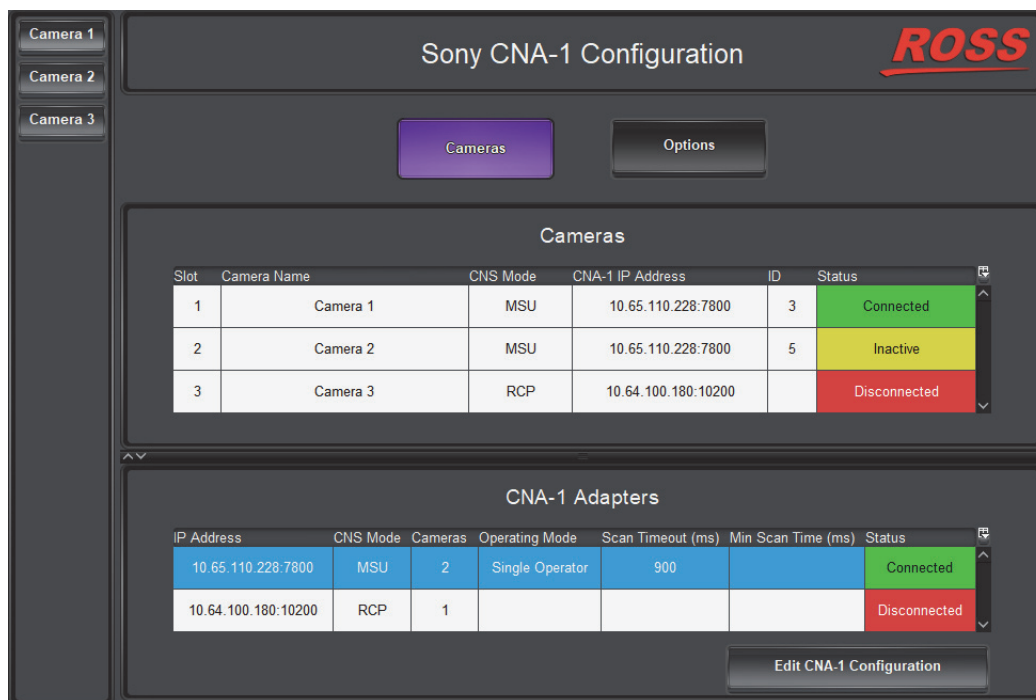


Figure 3.4 - The Advanced Configuration Interface (Sony CNA-1 Configuration)

Tip: To exit the advanced configuration interface and return to camera operation, tap a camera button.

To view the status of camera and CNA-1 connections:

- In the **Sony Paint Control** panel, tap the **Cameras** button.
The **Cameras** list and the **CNA-1 Adapters** list appear.

To edit CNA-1 configuration (applies only to CNA-1 adapters running in MSU mode)

1. In the **Sony Paint Control** panel, tap the **Cameras** button,
2. In the **CNA Adapters** list, tap the adapter you want to edit.
3. Tap the **Edit CNA-1 Configuration** button.

The **CNA-1 Configuration** dialog box appears (**Figure 3.5**).

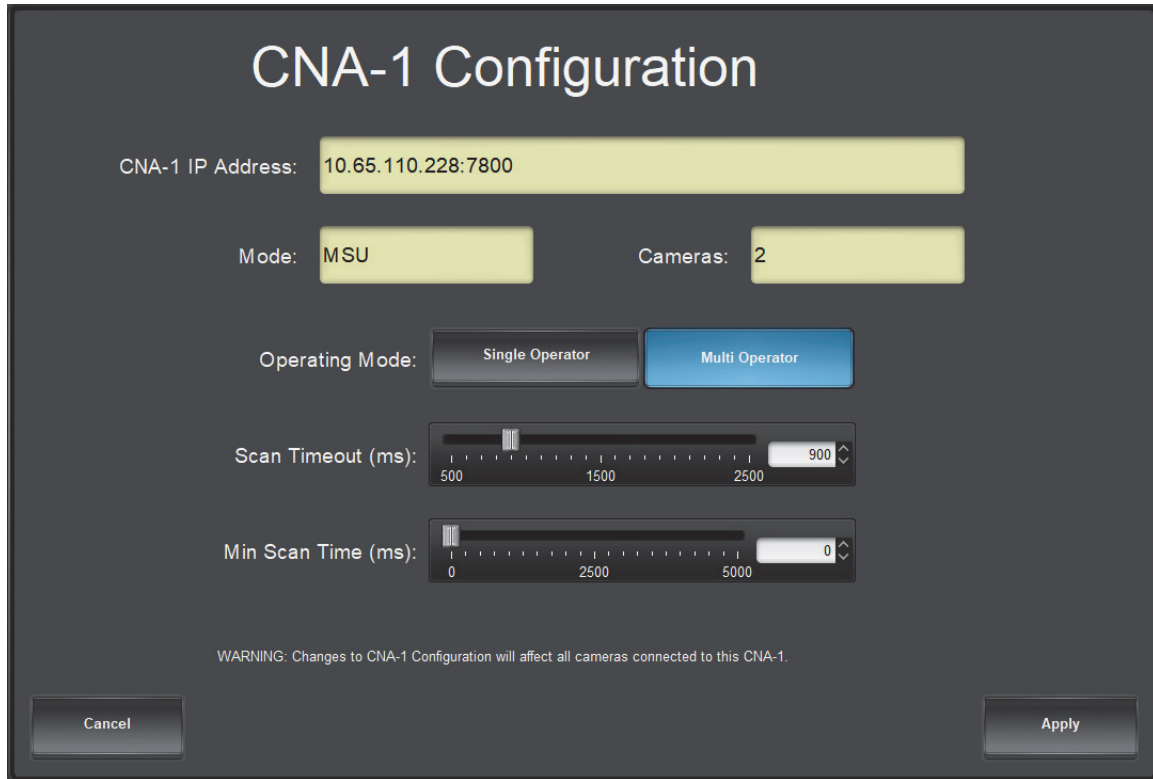
The image shows a 'CNA-1 Configuration' dialog box with a dark grey background. At the top, the title 'CNA-1 Configuration' is in white. Below it, there are several configuration fields: 'CNA-1 IP Address:' with a yellow input field containing '10.65.110.228:7800'; 'Mode:' with a yellow dropdown menu showing 'MSU'; 'Cameras:' with a yellow input field showing '2'; 'Operating Mode:' with two buttons, 'Single Operator' (grey) and 'Multi Operator' (blue); 'Scan Timeout (ms):' with a slider and a numeric input field showing '900'; and 'Min Scan Time (ms):' with a slider and a numeric input field showing '0'. At the bottom, there is a warning message: 'WARNING: Changes to CNA-1 Configuration will affect all cameras connected to this CNA-1.' and two buttons, 'Cancel' and 'Apply'.

Figure 3.5 - CNA-1 Configuration Dialog Box

4. Observe the **CNA-1 IP address**, **CNS Emulation Mode**, and the number of **Cameras** connected to the CNA-1.

These properties are not editable in DashBoard. They are configured on the CNA-1 adapter.

5. Specify the **Operating Mode**:

- **Single Operator** — Select this option if your system has only one paint control workstation.
- **Multi Operator** — Select this option if your system has multiple paint control workstations.

Tip: The selected option has a blue background.

6. Set the **Scan Timeout**, in milliseconds (ms).

When the system switches to point to a new camera, it sends queries to retrieve updated parameter data. The **Scan Timeout** setting specifies how long the system waits to receive that data before declaring a Scan Timeout error and possibly moving on to query the next camera.

If the **Scan Timeout** value is too low, some relevant data may not be collected in time.

If the **Scan Timeout** value is too high, the updating of parameters as shown in the Sony Paint Control panel may lag, especially if there are many cameras.

Note: The default value for **Scan Timeout** (900 ms) is suitable for most systems. We recommend you do not change it unless instructed to do so by Ross Video Technical Support.

7. Set the minimum scan time (**Min Scan Time**), in milliseconds (ms).

This setting is available only if the **Operation Mode** is set to **Multi Operator**.

The system queries each camera one by one to retrieve updated parameter data. The **Min Scan Time** setting specifies the minimum amount of time the system lingers after querying a given camera before it proceeds to the next camera.

If the **Min Scan Time** value is too low, the cameras are queried more often than necessary and more network traffic is generated. This is especially true in systems with few cameras.

If the **Min Scan Time** value is too high, the updating of parameters as shown in the Sony Paint Control panel may lag, especially if there are many cameras. This is especially true in systems with many cameras.

Note: The default value for **Min Scan Time** (0 ms) is suitable for most systems. We recommend you do not change it unless instructed to do so by Ross Video Technical Support.

To configure Sony Paint Control panel options:

1. In the **Sony Paint Control panel**, tap the **Options** button.

Camera **Options** settings appear (**Figure 3.6**).

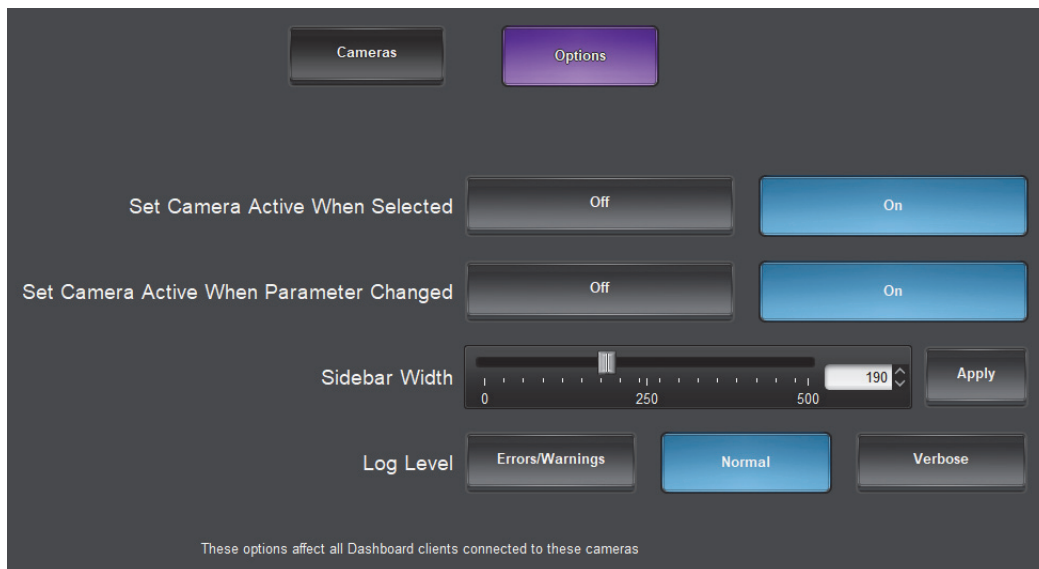


Figure 3.6 - Camera Options

2. The options described in this step apply to systems that have **Operator Mode** set to **Single Operator** (see **Step 5 on page 3-25**).

A CNA-1 adapter establishes a direct control path to only one camera at a time (the active camera).

Commands are sent to cameras immediately, but updates can only be received from the active camera. This means that any changes applied outside of the DashBoard system, for example by automatic Iris or by an operator using a Sony RCP, will not be updated in the DashBoard UI until the camera becomes active.

You can control whether certain actions causes the CNA-1 adapter to switch its camera control path to the selected camera.

Configure the following options:

- **Set Camera Active When Selected** — When **On**, selecting a camera causes the CNA-1 adapter to establish a direct control path to the selected camera. This applies to all selections made, whether through the Sony Paint Control panel or by other means.

IMPORTANT: This setting applies to systems that use the **DashBoard Selector Service**, which controls how cameras are selected by various devices or systems. It works only if the cameras have been added to the

Selection Mapping list in DashBoard. The **Selection Mapping** list is available through the DashBoard tree (**DashBoard Services > Selector UI Mappings**).

- **Set Camera Active When Parameter Changed** — When **On**, changing any parameter on a camera causes the CNA-1 adapter to establish a direct control path to that camera. This applies when parameters are changed through the Sony Paint Control panel.
3. Configure the following options:
 - **Sidebar Width** — Sets the width of the camera list. Move the slider or specify a value, and then tap **Apply**.
 - **Log Level** — Controls the level of detail presented in system activity logs. More intensive logging consumes CPU capacity and results in more logging data. The default setting is **Normal**. There is no need to adjust the logging level unless requested to do so by Ross Video.

Configure Additional Camera Control Computers

This section applies only if your system has multiple paint control workstations.

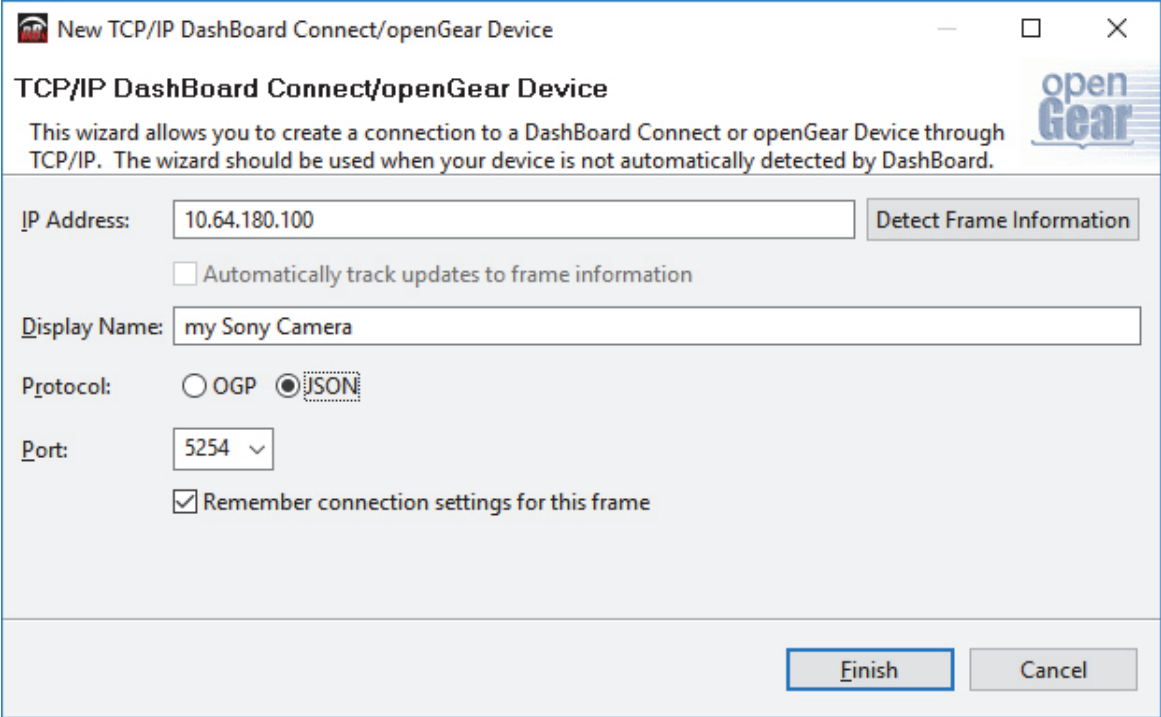
DashBoard is free, but use of the Sony Paint Control panel requires one license per computer. During the configuration process, DashBoard provides a Request Code and requires a License Key in response. The license key can be obtained only by relaying the Request Code to Ross Video Technical Support. The License Key cannot be obtained in advance because it is a response to the unique Request Code generated by DashBoard.

Note: To perform the steps in this section, you need to have good working knowledge of basic computer networking procedures.

To configure an additional camera control computer:

1. Configure the network settings on the computer so it can communicate with the CNA-1 adapter(s) through the first (proxy server) computer.
2. Open DashBoard.
3. From the **File** menu, tap **New**, and then tap **New TCP/IP DashBoard Connect or openGear Device**.

The **TCP/IP DashBoard Connect/openGear Device** dialog box appears.



New TCP/IP DashBoard Connect/openGear Device

TCP/IP DashBoard Connect/openGear Device

This wizard allows you to create a connection to a DashBoard Connect or openGear Device through TCP/IP. The wizard should be used when your device is not automatically detected by DashBoard.

IP Address: 10.64.180.100 **Detect Frame Information**

☐ Automatically track updates to frame information

Display Name: my Sony Camera

Protocol: ☐ OGP ☒ JSON

Port: 5254

☒ Remember connection settings for this frame

Finish **Cancel**

Figure 3.7 - Connecting to the Proxy Server

4. In the **IP Address** box, type the IP address of the proxy server.
5. In the **Display Name** box, type a name for the camera node, as you want it to appear in the DashBoard component tree.
6. Select the **JSON** protocol.
7. In the **Port** box, type **5254**.
8. Tap **Finish**.
9. In the **DashBoard Component Tree**, expand the **Sony Cameras** node.
10. Expand the **Slot** node for the camera you just added.
11. Tap **Remote Control**.
12. If the **Sony Paint Control** panel appears, go to **Step 18 on page 3-28**.
13. In the **Enter License Key** interface, tap **Copy to Clipboard**.

The request code is copied to the clipboard.

14. Paste the request code into an e-mail to Ross Video (techsupport@rossvideo.com), requesting a corresponding license key. Be sure to include the original Ross Video sales order number.

IMPORTANT: Do not do anything with the computer until you receive a license key from Ross Video. If you leave the **Enter License Key** page, the license key you receive will not work. It is valid only for the session during which it was generated.

15. When you receive the license key, copy it and paste it into the **License Key** box, and then tap **Install**.

The **License Installed** message appears. Tap **OK**.

16. In DashBoard, close the **Sony Cameras - Slot x** tab.

17. In the **Component Tree**, tap **Remote Control**.

The **Camera Control Panel** appears.

18. In the camera selection area at the top of the panel, tap the camera name.

If the camera initializes and connects, it has been successfully added and can be controlled.

19. Configure the **DashBoard Selector Service**, which controls how cameras are selected by various devices or systems. The selector service enables devices outside of DashBoard, such as a joystick panel or Sony RCP to select cameras. It works only if the cameras have been added to the **Selection Mapping** list in DashBoard. The **Selection Mapping** list is available through the DashBoard tree (**DashBoard Services > Selector UI Mappings**).

Configure the Camera Paint Box Connection

Each camera paint box is connected to a camera control computer via a USB cable. You must configure the computer to interact with the Camera Paint Box.

DashBoard communicates with the Camera Paint Box through a service called the bridge server. To establish communication with the Camera Paint Box, you must:

1. Install the bridge server software.
2. Add and configure a DashBoard gateway for the Camera Paint Box.

To install the bridge server software:

1. Obtain the **Bridge Server** software zip file from Ross Video, and save it on the camera control computer.
2. Unzip the file to **C:\Ross**.
3. Open a command prompt window as **Administrator**, and change directory to the location where you unzipped the file, for example:

```
cd "C:\Ross\Bridge Server 4.5.0.4093"
```

4. Type the command to install the **ManagedServicesHost.exe** file and then press **Enter**. An example of the command is as follows:

```
C:\> "Ross\Bridge Server 4.5.0.4093\ManagedServicesHost.exe" -install
```

5. Press **Enter**.

The Bridge Server software is installed. A message in the command prompt window appears when the installation is complete.

6. Close the command prompt window.
7. In a web browser, navigate to the Bridge Server configuration page at **localhost:3000**.
8. If the **PaintBox Bridge** service is not running, tap **Start**.

Tip: From the configuration page, you can start or stop the server. Alternatively, you can start or stop the **Bridge Service Host** from the **Services** tab in **Windows Task Manager**.

To add and configure a DashBoard gateway for the Camera Paint Box

1. In DashBoard, from the **File** menu, tap **New**, and then tap **TCP/IP DashBoard Connect or openGear Device**.
The **New TCP openGear Frame Connection** dialog box appears.
2. In the **IP Address** box, type the IP address of the computer, or type `localhost`.
3. In the **Display Name** box, type a name for the node as you want it to appear in the DashBoard component tree, for example, **Robotics DashBoard Gateway**.
4. Select the **JSON** protocol.
5. In the **Port** box, type **5257**.
6. Select the **Remember connection settings for this frame** check box.
7. Tap **Finish**.

A new gateway node with the name you specified appears in the DashBoard component tree.

Tip: After you complete this procedure, you can expand the gateway node and tap **Station 1** to open an interface that displays real-time data received from the Camera Paint Box.

8. In the DashBoard component tree, expand the **DashBoard Services** node.
9. Tap **Device Class Mappings**.
10. For each **Class**, in the **Selected Device** list, select the only available option in the list.
11. In the DashBoard component tree, tap **Selector UI Mappings**.
12. Set the **Autowire Follows UI** setting to **ON**.

Install the Camera Video Monitor(s) and Routing/Switching Equipment

Each paint control workstation requires at least one video monitor to view camera output. The monitor enables you to monitor the effect of iris and paint adjustments as you make them. Sometimes two monitors are used, to compare video output of two cameras side-by-side.

Video routing/switching equipment is required to select the video. Ideally, the camera control operator should be able to switch the video from the paint control workstation.

Note: The camera video monitor and routing equipment operate independent of the Camera Control System. The Sony Paint Control panel and Camera Paint Box do not select video to be displayed on the camera video monitor.

The camera video monitor and video routing equipment are not included as part of the Sony Paint Control system.

To install the Camera Video Monitor(s) and Video Routing/Switching Equipment

1. Install the Video Routing / Switching Equipment.
2. Install the video monitor(s) in the paint control workstation(s).
3. Connect video cables between the camera video monitors and outputs on the routing/switching equipment.
4. Connect video cables from each camera to an input on the routing/switching equipment.
5. Configure the video routing/switching equipment so it is possible to route video from each camera to each camera video monitor.