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NUCLEUS™

Network Control Panels
Installation and Operation Manual

Edition D
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NUCLEUS™

Network Control Panel

Installation and Operation Manual

Edition D
October 2007

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Contents

Preface

Manual Information vii
- Purpose vii
- Audience vii
- Revision History vii
- Writing Conventions viii
- Obtaining Documents viii

Unpacking the Product ix
Safety Standards and Compliances x
- Safety Terms and Symbols x

Important Safety Instructions xi
Servicing xi

Chapter 1: Introduction and Installation

Overview 1
- Front Views 3
- Back Views 4

Installation 5
- Mounting NUCLEUS-DM into a Desk or Tabletop 6

Chapter 2: Operation

Overview 9
NUCLEUS Operational Overview 10
Using Panel Controls 12
- NUCLEUS Display Area 12
- Static Controls 14
- Dynamic Controls 16

Using the Option Menu 18

Activating NUCLEUS Control Options with a License Key 20
Alarms 21
Viewing Active Alarms 21
Configuring Alarms 22
Setting Up the Clock 25
Enabling/Disabling the Control Panel 26
Updating Software on the Control Panel 26
Transferring Configurations with a USB Memory Key 27
Using a USB Key with NUCLEUS 29
Transferring Information with the File Manager 29
Troubleshooting 31
Persistent “Offline Devices” Message 31
CCS Software or Control Panel Lock Up 32

Chapter 3: Specifications

Overview 33
Dimensions 34
Connections 34
Power Consumption 35
Replacing Fuses 35

Appendix A: Control Panel Setup Parameters

Overview 37
Navigating the Setup Parameters 38
Setup Parameter Descriptions 40
Scroll Mode 40
Screen Intensity 40
LED Intensity 40
LCD Intensity 40
LCD Contrast 40
Screen Saver Timeout 40
Screen Saver Select 41
Shaft Direction 41
Leitch Name Mode 41
TRAX 41
TRAX Confirm 41
Panel Name 41
Network 42
Subnet Mask 42

Gateway Address 42
Control Panel Tracking 42
Auto Boot to Configuration 42
Reboot 43

Appendix B: Displaying NTP Time

Overview 45
System Requirements 45
Configuring NUCLEUS to Display NTP Time 46

Appendix C: GNU Public License Information

Overview 47
Modifications to the GPL Source Code 47

Index

Keywords 49

Preface

Manual Information

Purpose

This manual details the features, installation procedures, operational procedures, and specifications for NUCLEUS and NUCLEUS-DM Network Control Panels.

Audience

This manual is written for engineers, technicians, and operators responsible for the installation, setup, and/or operation of NUCLEUS and NUCLEUS-DM.

Revision History

Table 1-1. Revision History

Edition	Date	Comments
Edition A	January 2006	Initial production release
Edition B	April 2006	Addition of NUCLEUS-DM and router operation features
Edition C	June 2006	Minor corrections to content
Edition D	October 2007	Content restructuring

Writing Conventions

This manual adheres to the following writing conventions.

Table 1-2. Writing Conventions

Term or Convention	Description
Bold	Indicates dialog box, property sheet, field, button, check box, list box, combo box, menu, submenu, window, list, and selection names
Italics	Indicates email addresses, names of books and publications, and first instances of new terms and specialized words that need emphasis
CAPS	Indicates a specific key on the keyboard, such as ENTER, TAB, CTRL, ALT, DELETE
`Code`	Indicates variables or command-line entries, such as a DOS entry or something you type into a field.
>	Indicates the direction of navigation through a hierarchy of menus and windows.
hyperlink	Indicates a jump to another location within the electronic document or elsewhere
Internet address	Indicates a jump to a Web site or URL
 Note	Indicates important information that helps to avoid and troubleshoot problems

Obtaining Documents

Product support documents can be viewed or downloaded from our website. Alternatively, contact your Customer Service representative to request a document.

Unpacking the Product

This product was carefully inspected, tested, and calibrated before shipment to ensure years of stable and trouble-free service:

1. Check the equipment for any visible damage that may have occurred during transit.
2. Confirm that you have received all items listed on the packing list.
3. Remove the anti-static shipping pouch, if present, and all other packaging material.
4. Retain the original packaging materials for possible reuse.
5. Contact your product sales representative if parts are missing or damaged.

Keep at least one set of original packaging in the event that a product needs to be returned for service. If the original package is not available, you can purchase replacement packaging from the product supplier. Otherwise, you can supply your own packaging as long as it meets the following criteria:

- The packaging must be able to withstand the product's weight.
- The product must be held rigid within the packaging.
- There must be at least two inches (five centimeters) of space between the product and the container.
- The corners of the product must be protected.

If the product is still within the warranty period, we will return it to you by prepaid shipment after servicing.

Safety Standards and Compliances

See the *NUCLEUS Product Safety Instructions and Regulatory Compliance Manual* to find the safety standards and compliances for this product. Information about the Restriction on Hazardous Substances (RoHS) Compliance and Waste from Electrical and Electrical Equipment (WEEE) Compliance is also outlined in the manual. A safety manual is shipped with every *NUCLEUS Control Panel Installation and Operation Manual* and can be downloaded from the our website. Alternatively, contact your Customer Service representative for a copy of this safety manual.

Safety Terms and Symbols

This manual uses the following safety terms and symbols. See your *NUCLEUS Product Safety Instructions and Regulatory Compliance Manual* for more information.

Table 1-3. Safety Terms and Symbols Used in Manual

	**WARNING**: Statements identifying conditions or practices that can result in personal injury or loss of life: High voltage is present. Uninsulated dangerous voltage within the product's enclosure may be sufficient to constitute a risk of electric shock to persons.
	**CAUTION**: Statements identifying conditions or practices that can result in damage to the equipment or other property: Important operating and maintenance (servicing) instructions in the literature accompanying the product.

Important Safety Instructions

See the *NUCLEUS Product Safety Instructions and Regulatory Compliance Manual* for important safety instructions about this product. Read these instructions. Keep these instructions. Heed all warnings. Follow all instructions.

Servicing

Only qualified personnel should perform service procedures. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Chapter 1

Introduction and Installation

Overview

Using industry-standard IP networks, NUCLEUS™ and NUCLEUS™-DM provide control and monitoring of CCS network devices including the following:

- X75™ multi-path converter/synchronizer
- NEO™ and 6800**+** modular platforms
- Platinum™, Integrator®, Integrator® Gold, and Panacea™ routers
- Videotek® (certain) test and measurement products
- IconLogo devices

NUCLEUS (see Figure 1-1 on page 3) is a rack-mount control panel and NUCLEUS-DM (see Figure 1-2 on page 3) is a desk-mount control panel.

The type of devices that you can control with NUCLEUS and NUCLEUS-DM depends on the software license control options that are activated on the panel. Your NUCLEUS control panel is shipped with at least one software license activated. Table 1-1 on page 2 lists each software license control option that can be purchased for NUCLEUS.

Table 1-1. NUCLEUS Control Panel Software License Control Options

NUCLEUS Part Number	Purchased Option Description	Additional Software License Key Options
NUCLEUS-PROC	Rack-mount control panel with software license key activated for processing device control	• Router Control (NUC-OPT-RTR) • NUCLEUS-TRAX (NUC-OPT-TRAX) • IconLogo Control (LOGO)
NUCLEUS-DM-PROC	Desk-mount control panel with software license key activated for processing device control	
NUCLEUS-RTR	Rack-mount control panel with software license key activated for router control	• Processing Device Control (NUC-OPT-PROC) • NUCLEUS-TRAX (NUC-OPT-TRAX) • IconLogo Control (NUC-OPT-LOGO)
NUCLEUS-DM-RTR	Desk-mount control panel with software license key activated for router control	
NUCLEUS-LOGO	Rack-mount control panel with software license key activated for IconLogo control	• Processing Device Control (NUC-OPT-PROC) • Router Control (NUC-OPT-RTR) • NUCLEUS-TRAX (NUC-OPT-TRAX)
NUCLEUS-DM-LOGO	Rack-mount control panel with software license key activated for IconLogo control	

For information about activating software license control options, see “Activating NUCLEUS Control Options with a License Key” on page 20.

Information pertaining to CCS Navigator can be found in the online help and user guided associated with those product.

Front Views

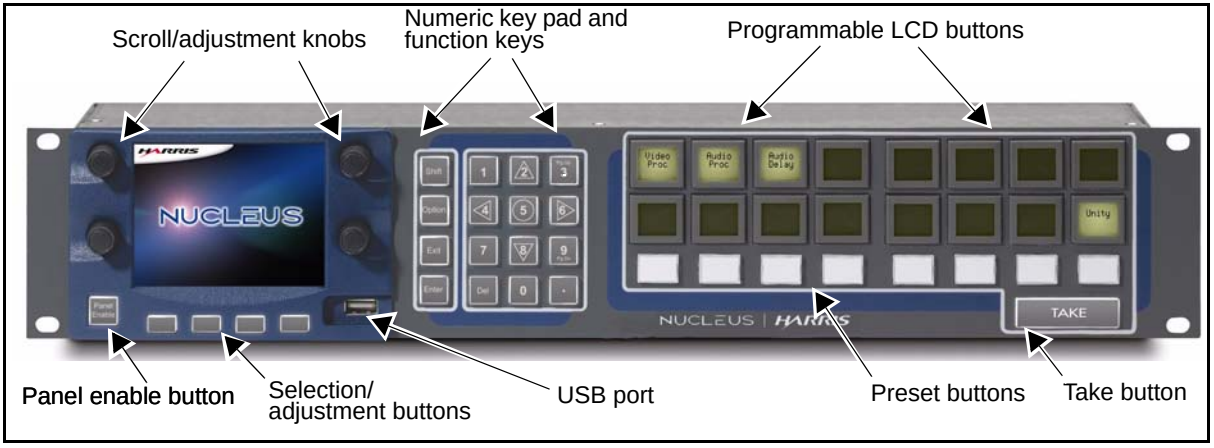

Figure 1-1. Front View of NUCLEUS Rack-Mount Control Panel

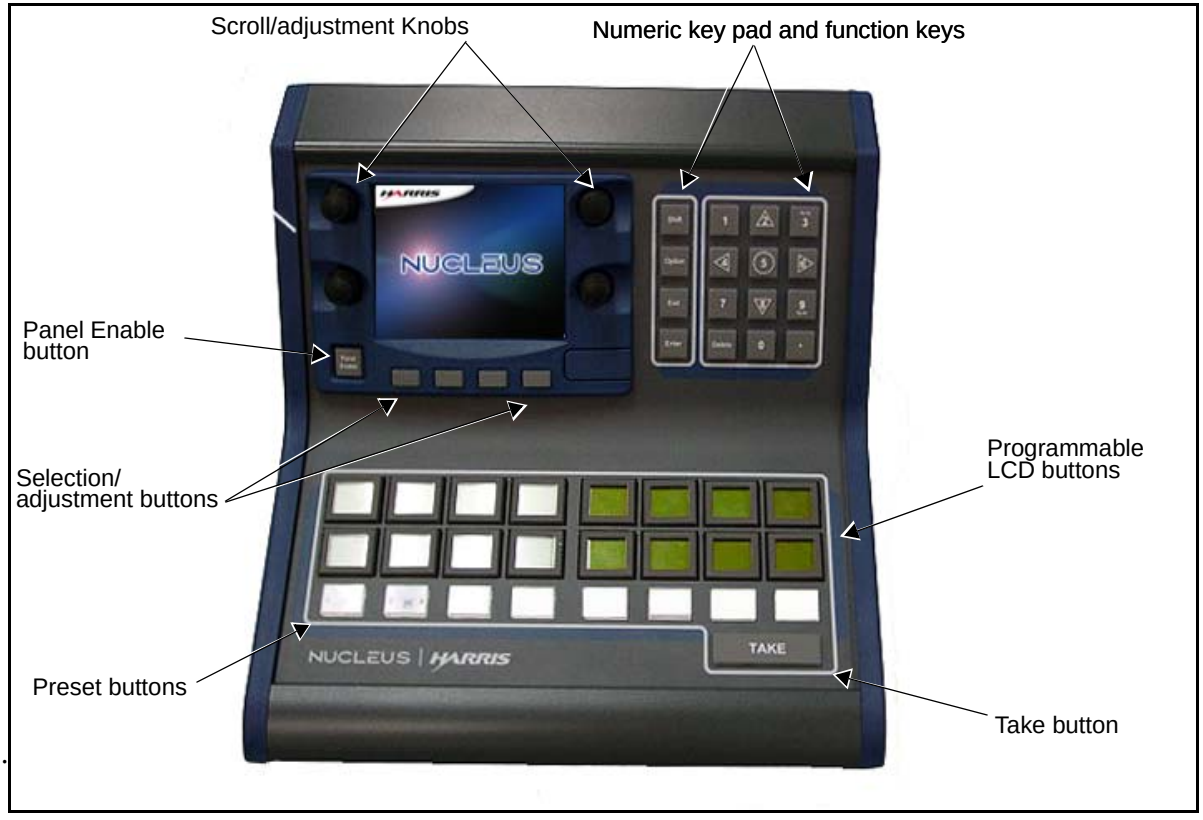

Figure 1-2. Front View of NUCLEUS-DM Desk-Mount Control Panel

Back Views

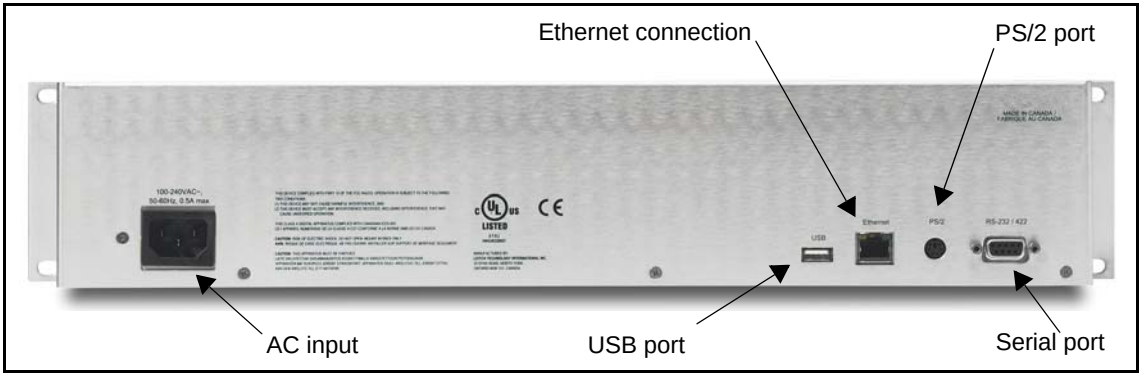

Figure 1-3. Back View of NUCLEUS Rack-Mount Control Panel

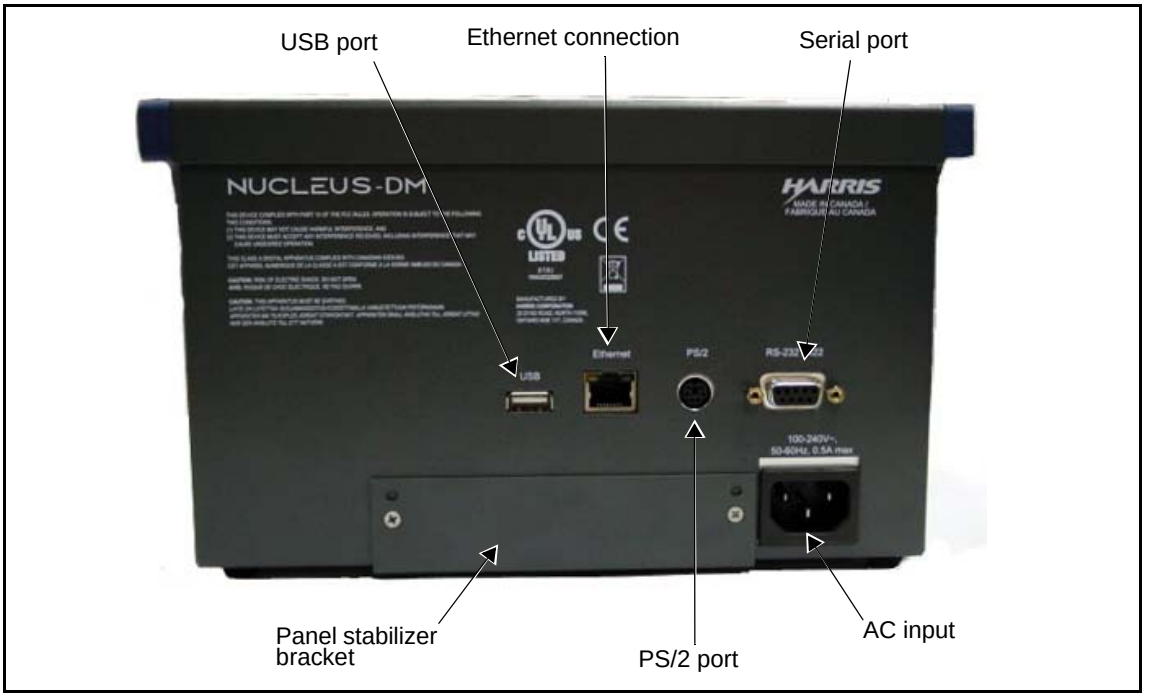

Figure 1-4. Back View of NUCLEUS-DM Desk-Mount Control Panel

Installation

NUCLEUS rack-mount control panel can be mounted in a standard width 19-in. (48.3 cm) equipment rack. See the *NUCLEUS Product Safety Instructions and Regulatory Compliance* manual for important information about installing rack-mountable equipment.

NUCLEUS-DM desk-mount control panel can be mounted into a desk or tabletop. For more information, see “Mounting NUCLEUS-DM into a Desk or Tabletop” on page 6.

Mounting NUCLEUS-DM into a Desk or Tabletop

Follow these steps to mount NUCLEUS-DM into a desk or tabletop:

1. Using the dimensions shown in Figure 1-5 on page 6 and Figure 1-9 on page 8, make a cutout in the desk or tabletop.

   If the surface of the desk or table you want to set NUCLEUS-DM into is more than 0.5 in. (1.3 cm) thick, you must notch the desk's or table's under surface to provide space for the AC power cord. As an alternative to notching the under surface, you can cut out a space for the power cord. The dimensions for notching the desk or table under surface are included in Figure 1-9 on page 8.

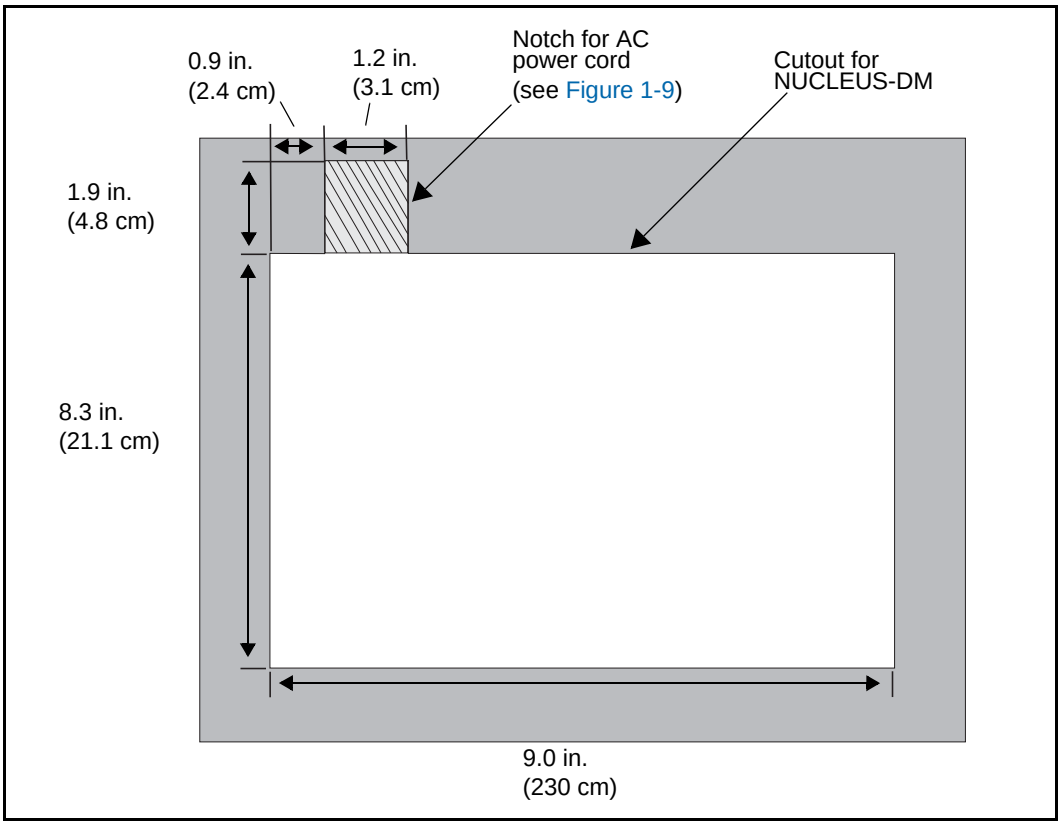

Figure 1-5. Dimensions for NUCLEUS-DM Cutout

2. Remove the stabilizing bracket screws from the back of NUCLEUS-DM.

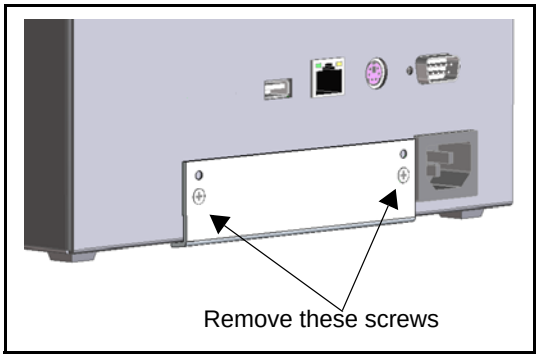

Figure 1-6. Removing the Stabilizer Bracket

3. Rotate the bracket 180 degrees from bottom to top as shown in the figure below.

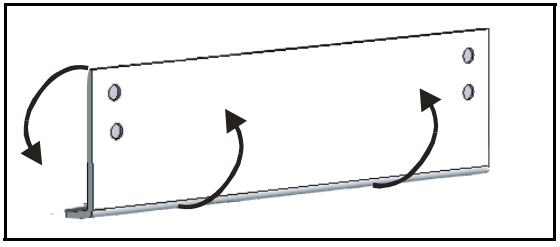

Figure 1-7. Rotating the Stabilizer Bracket

4. Align the holes on the stabilizer bracket (use the holes that have the countersink) with the screw holes on the back of NUCLEUS-DM.

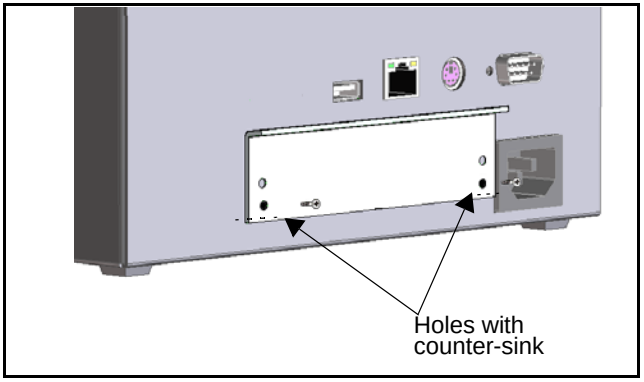

Figure 1-8. Attaching the Stabilizer Bracket to NUCLEUS-DM

5. Secure the bracket by inserting and tightening the two screws.
6. Carefully place NUCLEUS-DM into the cutout.

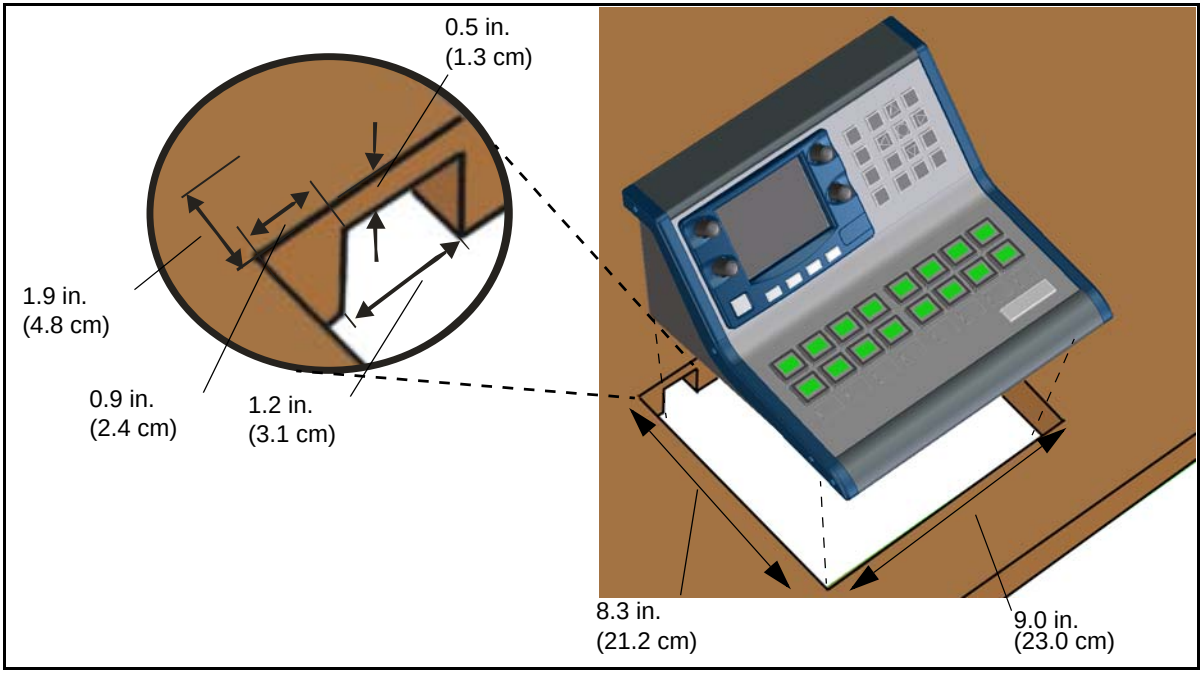

Figure 1-9. Mounting NUCLEUS-DM into the Cutout

Chapter 2

Operation

Overview

This chapter includes information about NUCLEUS' generic features. It does not include information that is specific to the control options activated on your NUCLEUS control panel. See your appropriate NUCLEUS control option configuration and operation manual for detailed information about using control options on NUCLEUS.

Note

Except where noted, the term NUCLEUS is used in the manual to refer to both NUCLEUS and NUCLEUS-DM.

The following topics are found in this chapter:

- "NUCLEUS Operational Overview" on page 10
- "Using Panel Controls" on page 12
- "Using the Option Menu" on page 18
- "Alarms" on page 21
- "Setting Up the Clock" on page 25
- "Enabling/Disabling the Control Panel" on page 26
- "Updating Software on the Control Panel" on page 26
- "Troubleshooting" on page 31

NUCLEUS Operational Overview

NUCLEUS control panels provide user-customized operational control over CCS networked processing and routing devices. Each NUCLEUS control option follows a similar configuration and operational workflow. This workflow consists of creating a NUCLEUS configuration, transferring the configuration to the panel, and then recalling the configuration to control CCS networked devices. Figure 2-1 illustrates an overview of configuring and operating NUCLEUS.

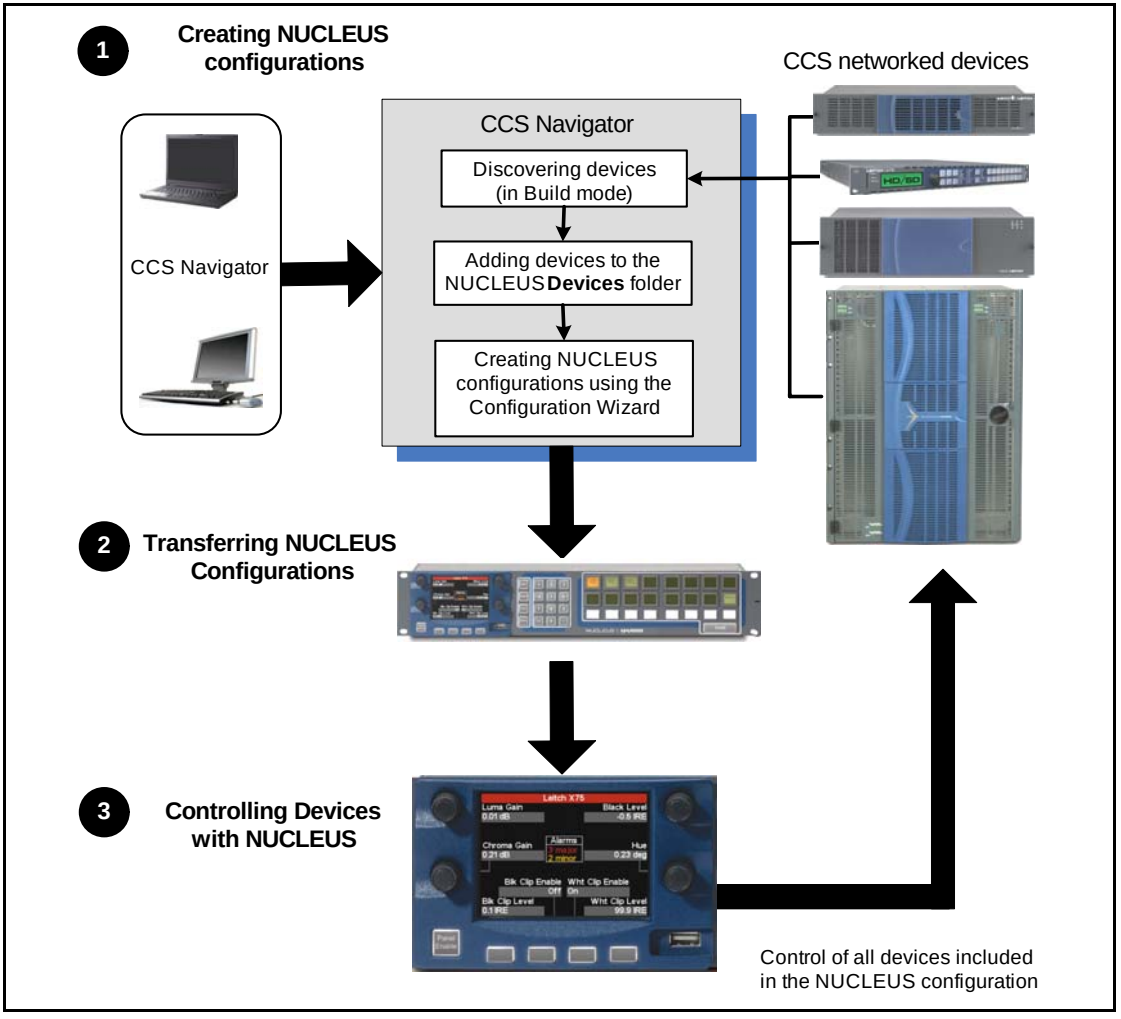

Figure 2-1. NUCLEUS Operational Overview

1. **Creating NUCLEUS Configurations—**Before creating a NUCLEUS configuration, you must use your CCS software application (CoPilot, Pilot in Build mode, Navigator in Build mode) to discover the devices you want the panel to control. In the Network view of your CCS software application, the discovered devices can be added to the NUCLEUS **Devices** and/or **Routers** folder. Any device that is in the NUCLEUS **Devices** folder can be added to the NUCLEUS configuration. NUCLEUS configurations are created using the your configuration wizards. The number of steps required to create a NUCLEUS configuration depends on the control option you are using. For more information about creating NUCLEUS configurations, see the appropriate NUCLEUS control option configuration and operation manual.

2. **Transferring NUCLEUS Configurations—**After a configuration is created and saved to your PC's local or network drive, the configuration file can be transferred to the control panel. Configurations are transferred to NUCLEUS using the Configuration Wizard or by using a USB storage device. Up to five configurations can be transferred to NUCLEUS at one time. For more information about transferring configurations using the Configuration Wizard, see your NUCLEUS control option configuration and operation manual. For information about transferring configurations using a USB storage device, see "Transferring Configurations with a USB Memory Key" on page 27.

3. **Controlling Devices with NUCLEUS—**After your configurations are loaded into NUCLEUS, you will be prompted to select a configuration from the list displayed across the LCD buttons and in the panel display. You do not need to create a NUCLEUS configuration to control IconLogo devices. After you have selected the NUCLEUS configuration that you want to use, the control panel displays the list of devices that can be accessed within the configuration. You can then use the panel controls to control these devices as appropriate (See "Using Panel Controls" on page 12 for more information). The IconLogo control option, does not permit the user to customize the device control interfaces.

Using Panel Controls

All devices controlled by NUCLEUS are operated and monitored using the front panel controls. The panel controls are divided in to three main areas: the display area, the static controls, and the dynamic controls. Before using the panel controls, you must either access a NUCLEUS configuration, or connect (using an IP address) with device you want to control.

Additional control panel settings, such as alarm configuration settings and panel setup options, are accessed through the Options menu. For more information about the Options menu items, see “Using the Option Menu” on page 18.

The panel control areas are described in the sections below.

NUCLEUS Display Area

The NUCLEUS display area consists of the QVGA display, scroll/adjustment knobs, selection/adjustment buttons, and the panel enable button. The layout and function of the NUCLEUS display area are specific to the control option that you are using on the panel. This section only provides general information about the panel’s display area. See the appropriate NUCLEUS control option configuration and operation manual for detailed information about using these controls.

Figure 2-2 shows the NUCLEUS display area.

Figure 2-2. NUCLEUS Display Area

QVGA Display

The QVGA display shows information about the devices controlled by NUCLEUS. The layout of the display is specific to the software license control option that you are using on the panel. For example, Figure 2-2 shows the NUCLEUS display for the Processing Device Control option. The panel display also shows the NUCLEUS Options menu items (see "Using the Option Menu" on page 18 for more information).

Scroll/Adjustment Knobs

You can use the scroll/adjustment knobs to navigate menus and items on the display, scroll through and select options, and adjust various device settings. In most cases, pressing the adjustment knob replicates the action of pressing the **Enter** button.

Selection/Adjustment Buttons

You can use the selection/adjustment buttons to select items such as operational modes and adjust various device settings. In must cases, the items that you can select or adjust are labelled in the QVGA display directly above the buttons.

Panel Enable Button

When the **Panel Enable** button is pressed, the control panel is locked to prevent inadvertent use. To unlock the control panel, press the **Panel Enable** button a second time. To log out, press the **Shift** button, and then press the **Panel Enable** button. For more information about the **Panel Enable** button, see “Enabling/Disabling the Control Panel” on page 26.

Static Controls

NUCLEUS static controls are not programmable, meaning that they have the same function for all software license control options. Figure 2-3 shows the static controls.

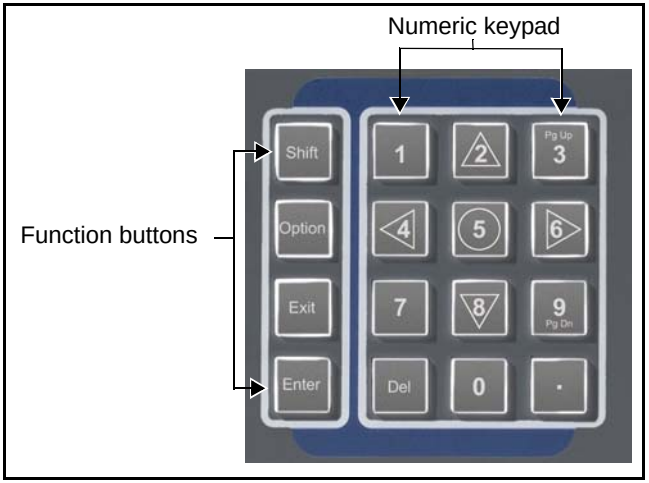

Figure 2-3. NUCLEUS Static Controls

Function Buttons

Many of the buttons on the control panel have multiple functions assigned to them. Different tasks can be selected using the multi-function buttons.

- **Shift** button—Provides multi-function access to numeric keypad buttons. The Shift button flashes when the shift function is active. (see "Using Multi-Function Buttons")
- **Option** button—Provides access to the Options menu (see "Using the Option Menu" on page 18)
- **Enter** button— Inputs an entered value or selection into the control panel such as a parameter value, an index value, or a menu option
- **Exit** button— Navigates backwards in the menu or assignment level hierarchy

Numeric Keypad

The numeric keypad values are used to input numeric values or assign numeric values to parameters. You can navigate through LCD button pages, parameter lists, and menus using the navigation, **PG UP**, and **PG DN** keys on the keypad. Use the **Exit** button to navigate back through the list. These buttons are non-programmable.

Using Multi-Function Buttons

Many of the buttons on the control panel's numeric keypad have multiple functions assigned to them. To select different tasks from a multi-function button, press **Shift** and then the desired multi-function button. The **Shift** button flashes when the shift function is active. The assigned function is written in white on the button face near the top of the button.

Dynamic Controls

The layout and function of the dynamic controls are specific to the control option that you are using on the panel. This section only provides general information about the panel's dynamic controls. See the appropriate NUCLEUS control option configuration and operation manual for detailed information about using these controls. Figure 2-4 shows the dynamic controls.

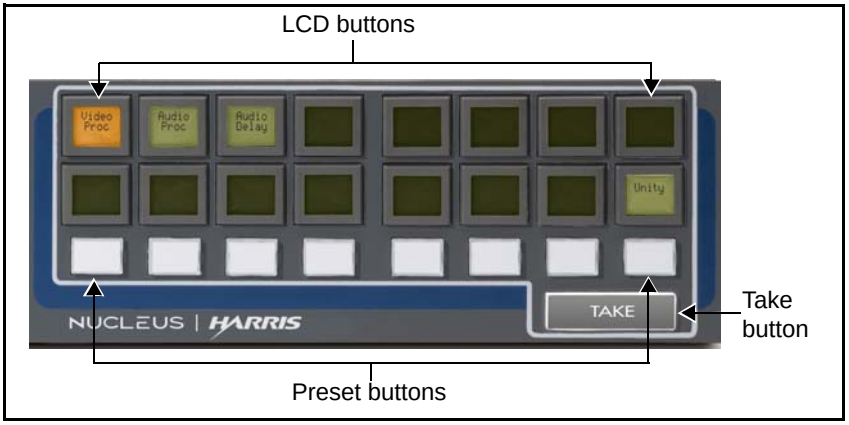

Figure 2-4. Dynamic Controls

LCD Buttons

You can use the LCD buttons to perform operation and control functions such as providing access categories, indexes, devices, device parameter sub-menus, destinations, or sources. Depending on the control option that you are using, the LCD buttons are either user-programmable or have preset functions. The appearance and color of the LCD buttons is also dependent on the control option you are using. Multiple pages of 16 LCD buttons can be assigned and used.

You can use the page up button 

and the page down button 

on the numeric keypad to navigate through multiple LCD button pages.

Preset Buttons

The user-assignable preset buttons can be either used to set user-defined device preset values or to enable specific functionality predetermined by the control option you are using. The preset buttons are not configurable using CCS software applications.

Take Button

The function of the **Take** button depends on the control option that you are using on the panel. For example, when the Router Control option is used, the **Take** button can be used to navigate the routing sources and destinations of a crosspoint take.

Using the Option Menu

You can access the Options menu by pressing the **Option** button. Each menu item opens up into submenus that you can navigate through and select as required.

Note

Some items listed in the Options menu are not supported by all NUCLEUS software license key options.

Table 2-1 briefly describes each menu item.

Table 2-1. Options Menu Items

Menu Name	Menu Description
Active Alarms	Displays information about the currently active alarms for the selected device (see "Viewing Active Alarms" on page 21)
Configure Alarms	Configures the available alarms for the selected device (see "Configuring Alarms" on page 22)
IconLogo Devices	Allows you to add or remove IconLogo devices to and from NUCLEUS. To use this option, you must have the NUCLEUS IconLogo Control option activated on your panel. For information, see your *NUCLEUS IconLogo Control Option Configuration and Operation Manual*.
Thumbnail	Enables NUCLEUS' thumbnail display feature. This feature is only available on control panels with an activated processing device control option (NUCLEUS-PROC) licence. See your *NUCLEUS Processing Device Control Option Configuration and Operation Manual* for information.
Setup	Configures the control panel setup parameters (see "Appendix A: Control Panel Setup Parameters" on page 37)
Clock Management	Configures the control panel's internal clock and NTP support (see "Setting Up the Clock" on page 25)
Presets/Unity	Configures user-specific preset buttons, the **Device Unity** button, and the **Menu Unity** button. For more information, see your *NUCLEUS Processing Device Control Option Configuration Operation Manual*.

Table 2-1. Options Menu Items *(Continued)*

Menu Name	Menu Description
Physical Devices	Displays a list of devices (stand-alone devices and virtual devices) that are controlled by the panel. You can select each stand-alone device or virtual device from the list to obtain information about the device, such as the IP address, frame slots number and operational state. This option is not used for router system devices.
Version Info	Displays the following information: panel name, the hardware version number, the software version, memory size, flash memory size, serial number, and a list of enabled NUCLEUS options for which a software license key been entered.
License Key	Activates NUCLEUS features (see “Activating NUCLEUS Control Options with a License Key” on page 20)
File Manager	Displays options for copying and deleting NUCLEUS configurations (see “Transferring Information with the File Manager”)
Logout	Logs the user out of the current configuration.
Copy All Configs to USB	Copies all configurations from NUCLEUS to the USB drive. If the *Nucleus/panel name* structure does not exist on the USB drive, NUCLEUS creates it when the files are transferred to the drive.

Activating NUCLEUS Control Options with a License Key

To activate software license control options, you must enter a softkey code into the **License Key** menu. The code, consisting of 16 characters, will be provided when you purchase a software license control option. NUCLEUS panels are always shipped with one license key activated. The valid key character sets are numbers 2—9 and letters A~Z.

The software license key is derived from the NUCLEUS panel's serial number. To view the serial number of your NUCELEUS panel, from the Options menu, select **Version Info**.

Note

You can activate software license control options with NUCLEUS by entering the software license key in the **Device** tab of your CCS software application. For more information, see your CCS software application user guide.

To enter the key using the control panel, follow these steps:

1. Press the **Option** button.

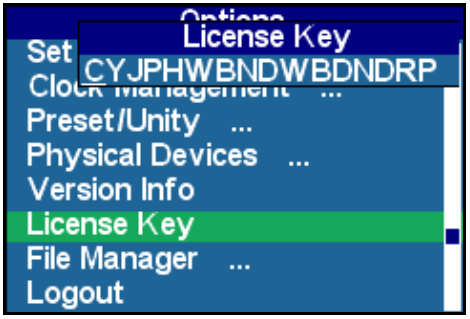

Figure 2-5. Entering the License Key

2. Select **License Key** from the list.
3. Use the adjustment knob or the left and right keypad arrows (and delete key) to select license key characters.
4. Press the **Enter** button to enter the characters.
5. Press the **Exit** button when completed.

Alarms

Each product in your network has a list of default minor and major alarms. Using the NUCLEUS control panel's **Active Alarms** and **Configure Alarms** menus, you can view information about active alarms; you can enable, disable, and configure any alarms that are received at the control panel. These menus are accessed from the Options menu.

Note

Device alarm notifications are not visible while you are using NUCLEUS to operate a routing panel.

Viewing Active Alarms

When device alarms are active, an alarm notification appears in the control panel display. The device name bar turns yellow for minor alarms and red for major alarms. Using the **Active Alarms** menu, you can view information about these alarms.

To view detailed alarm information follow these steps:

1. Press the **Option** button.

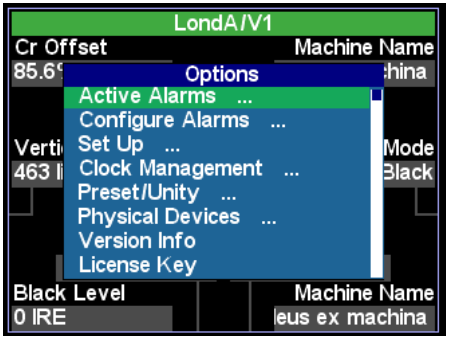

Figure 2-6. Active Alarms

2. Select **Active Alarms** from list, and then press **Enter**.

   A list of the currently active alarms for the selected device appears.

3. To view information about an alarm, select it from the list of active alarms, and then press **Enter**.

Figure 2-7. Active Alarm Information

4. Press **Enter** to acknowledge the alarm. Acknowledging an alarm removes the alarm from the Active Alarms list after you exit from the Options menu. Press **Exit** if you choose not to acknowledge the alarm. The alarm will then remain on the Active Alarms list.
5. Press the **Exit** button to go back the alarms list or to navigate back to the Options menu.

Configuring Alarms

Using the **Configure Alarms** menu, you can enable, disable, and configure alarm settings. To access the **Configure Alarms** menu, press the **Option** button, and then select **Configure Alarms** from the list.

Note

6800+ devices must be Q-SEE™ compliant to support control panel functions for configuring alarms.

Table 2-2 describes each menu item. Alarm configuration settings are stored on the module.

Table 2-2. Configure Alarms Menu

Menu Name	Menu Description
Enable	Enables and disables the selected alarm on the selected device.
Mute	Mutes all alarm notifications for the selected device alarm. For example, when Mute is enabled, active alarm notifications for the selected alarm do not appear in the control panel display. Any alarm monitoring mechanism within the network is also muted.
Active Time	Sets the amount of time in seconds (in 0.1 second increments) that an alarm condition exists before it is considered an “active alarm.” This setting is specific to the control panel only. It does not affect module card-edge alarms.
Clear Time	Sets the amount of time in seconds (in 0.1 second increments) that an alarm condition is resolved before it is considered inactive (no longer an active alarm). This setting is specific to the control panel only. It does not affect module card-edge alarms.
Priority	Assigns an alarm priority value to the selected device alarm. Priority values range from 1 (for the lowest priority alarms) to 10 (for the highest priority alarms).

Follow these steps to configure alarms for a selected device:

1. In the NUCLEUS display, navigate to the device for which you want to configure alarms.
2. Select the device, and then press the **Option** button.

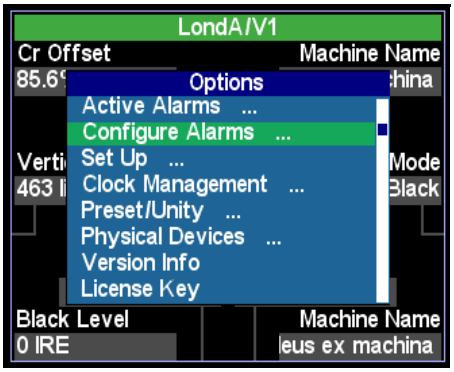

Figure 2-8. Configure Alarms

3. Select **Configure Alarms** from the **Options** menu, and then press **Enter**.
4. Press **Enter** again to confirm the IP address of the device.

   A list of the possible alarms on the selected device appears.
5. From the list of alarms, select the alarm that you want to configure, and then press **Enter**.

   The alarm settings information appears.

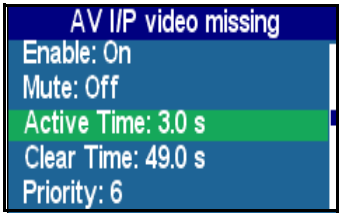

Figure 2-9. Alarm Settings Information

6. To change an alarm setting, select it from the list, press **Enter**, and then use an adjustment knob to make the appropriate changes.
7. Press the **Exit** button to go back the alarm settings list or to navigate back to the Options menu.

Setting Up the Clock

NUCLEUS has an internal clock that displays the current time and date.

Note

NUCLEUS does not have a backup battery to keep your local time and date settings when the control panel is powered down. To keep the local time and date when NUCLEUS is powered down, you must configure the panel to receive time from an NTP server.

The internal clock can be configured using the **Clock Management** menu. To configure the internal clock, press the **Option** button, and then from the Options menu, select **Clock Management**. Table 2-3 briefly describes each menu item.

Table 2-3. Clock Management Menu

Menu Name	Menu Description
Show Time	Displays the current time and date in the control panel screen.
NTP	Enables/disables the clock to receive time from an NTP server (see “Appendix B: Displaying NTP Time” on page 45)
NTP Server	Provides information about the available NTP servers (see “Appendix B: Displaying NTP Time” on page 45)
Time Zone	Configures the clock’s time zone offset
DST	Enables/disables the auto-DST (daylight savings time) feature. When this feature is enabled, the clock automatically adjusts to DST at the appropriate time.
Time Present	Selects whether time is displayed in 12-hour or 24-hour format
Set Local Time	Sets the local time
Set Local Date	Sets the current local date

Enabling/Disabling the Control Panel

NUCLEUS has an **Enable Panel** button that prevents you from accidentally modifying any parameters. No control panel knob or button is functional until the **Enable Panel** button is pressed. You can disable the panel by pressing the button while the panel is enabled. The current user can log out by simultaneously pressing the **Shift** button and the **Enable Panel** button. The **Enable Panel** button is located on the front of the control panel.

Updating Software on the Control Panel

Periodically, you may need to transfer updated software versions into NUCLEUS. This procedure is accomplished using CCS software applications. For instructions on this procedure, read the CCS software application manual or online help topic “Updating the Software on a CCS Device.”

You can also use the **Copy Panel Image to Panel** option from the **File Manager** menu to copy updated software from one panel to another via a USB memory key.

For information about using the File Manager, see “Transferring Information with the File Manager” on page 29.

Caution

When updating software on the control panel, ensure that you do not interrupt the process once it has started. If the updating process is interrupted by power failure, loss of Ethernet connectivity, or some other cause, the software may be corrupted. If this occurs, call your Customer Service representative for product support.

Transferring Configurations with a USB Memory Key

Using the **File Manager** menu, you can copy configurations, software, and panel settings between NUCLEUS and a Universal Serial Bus (USB) memory key. You can also use the **File Manager** menu to delete configurations from a USB memory key and from NUCLEUS itself. To access the **File Manager** menu, press the **Option** button, and then select **File Manager** from the list.

Note

To copy or delete NUCLEUS configurations, users must have been granted access to do so. For information about copy and delete access, see “Setting Control Panel Options” in your NUCLEUS control option manual.

Table 2-4 describes each menu item.

Table 2-4. File Manager Menu

Menu Name	Menu Description
Copy All Configs to USB	Copies all configurations from NUCLEUS to the USB drive. If the *Nucleus/panel name* structure does not exist on the USB drive, NUCLEUS creates it when the files are transferred to the drive.
Copy One Config to USB	Copies a selected configuration from a list on the NUCLEUS panel to the USB drive
Copy Settings to USB	Copies the panel’s set up parameters to the USB drive
Copy Firmware to USB	Copies the firmware currently installed on the panel to the USB drive
Copy Everything to USB	Copies all the NUCLEUS configurations, the firmware currently installed on the panel, and the panel’s set up parameters from NUCLEUS to the USB drive
Delete Config from USB	Deletes a selected configuration file from the USB drive. In the list, configurations are identified by control panel name/configuration name (for example *panel3/news2)*.

Table 2-4. File Manager Menu *(Continued)*

Menu Name	Menu Description
Delete Firmware from USB	Deletes a selected firmware file from the USB drive. When you select this option, you first chose a panel name followed by the firmware file.
Copy All Configs to Panel	Copies a maximum of five configurations from the USB key to NUCLEUS. If there are configurations on the panel, you may need to delete one or more of them before completing the copy operation.
Copy One Config to Panel	Copies a selected configuration from the available configurations on the USB key to NUCLEUS. In the list, configurations are identified by control panel name/configuration name (for example *panel3/news2)*.
Copy Settings to Panel	Copies NUCLEUS set up parameters to the control panel. In the list, setup files are identified by control panel name. For information about NUCLEUS set up parameters, see “Appendix A: Control Panel Setup Parameters” on page 37.
Copy Firmware to panel	Copies a selected firmware file from the USB key to NUCLEUS. In the list, firmware files are identified by control panel name.
Undo Copy Firmware to Panel	Reverts back to the firmware version that was on the panel before the **Copy to Firmware to Panel** command was executed
Delete configuration from Panel	Deletes a selected configuration from NUCLEUS. This is a useful operation if you need to space for other configurations.

Using a USB Key with NUCLEUS

You can use a USB memory key to transfer configurations to and from NUCLEUS. A key with at least 128MB of available storage is recommended. The USB key must be formatted for the FAT or FAT16 file system before you can use it with NUCLEUS. USB keys formatted as FAT32 are not supported on NUCLEUS.

Note

Not all USB drives are the same. Some USB drives may not be recognized by NUCLEUS due to hardware incompatibility.

You can use either of NUCLEUS's USB ports to transfer configurations. See "Front Views" on page 3 and "Back Views" on page 4 for the location of NUCLEUS's USB ports. (There is a USB port on the back of NUCLEUS-DM).

Transferring Information with the File Manager

Using the **File Manager** menu, you can select options for transferring configurations and panel images. Before transferring information with a USB drive, ensure that the USB key you use is properly formatted as FAT16.

When you select **File Manager** from the Options menu, the list of file transfer options appears.

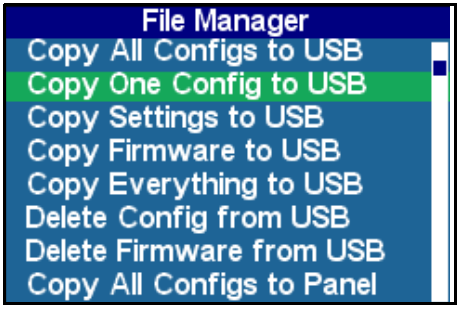

Figure 2-10. File Manager Options

When you transfer files from NUCLEUS to the USB drive, the files you select are identified in the following ways:

- Configuration files are identified by panel name/configuration name (for example, *panel3/news2*).

- Settings files are identified by panel name.
- Firmware files are identified by panel name.

If the *Nucleus/panel name* structure does not exist on the USB drive, NUCLEUS creates it when the files are transferred to the drive.

When you transfer files from the USB key to NUCLEUS, the files you select are identified in the following ways:

- Configuration files are identified by panel name/configuration name (for example, *panel3/news2*).
- Settings files are identified by panel name
- Firmware files are identified by panel name.

Rebooting NUCLEUS

If any of the configurations you transfer to NUCLEUS include routing panels, you must reboot the control panel before using the configuration. To reboot NUCLEUS, follow these steps:

1. On the control panel, press the **Option** button.
2. From the **Options** menu, select **Setup**.
3. From the **Setup** menu, select **Reboot**.

Troubleshooting

In unusual situations, one of the following two problems may occur.

Persistent “Offline Devices” Message

Occasionally, the message **Offline Devices** may appear on a control panel. A temporary flood of traffic may delay device communications. Also, if you have just rebooted a frame or reinstalled a module, the re-synchronization of the module’s status could cause a short delay. In most instances, this message disappears without intervention once there is a reduction in excessive network traffic. However, if the problem persists, you may need to discover and eliminate the reason for the message.

Follow one or more of these procedures to eliminate the message:

- Navigate through the control panel menu to the frame level, and then return to the module’s parameter list.
- Log out by pressing and holding the **Shift** button while pressing the **Panel Enable** button. Log back on to the panel.
- If the affected module and its resource module are NEO products, reinstall both modules.
- Locate the source of any frequently reported alarms (if you are using the CCS software applications), and then either resolve the problem or disable the alarms.

  Excessive alarm traffic could cause communication interference between control panels and devices.
- If you are not using CCS software applications, attempt to resolve any system alarms by checking card-edge indicators, frame indicators, and the control panel alarm log if you are *not* using CCS software applications.
- Reboot the control panel to clear a possible internal error. To do this, simultaneously press the **Shift**, **Enter**, and **Del** (delete) buttons and hold them for three seconds.
- Ensure that the subnet mask address for the device(s) or for the panel is correct. For more information, see “Subnet Mask” on page 42.

CCS Software or Control Panel Lock Up

During installation of NEO modules in a frame, if your CCS software application or the control panel locks up, wait one full minute between module installations to allow communications to fully establish. If this fails to resolve the problem, reboot the control panel.

Chapter 3

Specifications

Overview

The following specifications are listed for the NUCLEUS and NUCLEUS-DM network control panel:

- “Dimensions” on page 34
- “Connections” on page 34
- “Power Consumption” on page 35

This specifications may change without notice.

Note

Except where noted, the term NUCLEUS is used in the manual to refer to both NUCLEUS and NULEUS-DM.

Dimensions

Table 3-1. NUCLEUS Dimension Specifications

Item	Dimension
Height	3.47 in. (8.8 cm)
Mounting width	17.5 in. (44.4 cm)
Width (including front panel)	19 in. (48.3 cm)
Mounting depth (including connectors)	Approximately 3.56 in. (9.0 cm)
Depth (front-to-back, including front panel and back connections)	Approximately 3.63 in. (9.2 cm)

Table 3-2. NUCLEUS-DM Dimension Specifications

Item	Dimension
Height	5.87 in. (14.9 cm)
Width	9.84 in. (25.0 cm)
Mounting depth (including connectors)	Approximately 9.37 in. (23.8 cm)
Depth (front-to-back, including front panel and back connections)	Approximately 9.45 in. (24.0 cm)

Connections

Table 3-3. Connection Specifications

Item	Specification
Ethernet	RJ-45

Table 3-3. Connection Specifications *(Continued)*

Item	Specification
Serial	RS-232/422 serial port
USB	USB type A receptacle
PS/2	Mini Din 6-pin female

Power Consumption

Table 3-4. Power Consumption Specifications

Item	Specification
Power consumption	Input power: 10.0 W max. at 100 to 240 VAC, 50/60 Hz
Input fuse	• 1.6A - 250 VAC • Fuse type and marking: T1.6 AH 250 V

Replacing Fuses

To access the power supply fuse, follow these steps:

1. Remove the AC power cord from the back of the control panel.
2. Locate the fuse access cover above the AC power cord inlet, and then squeeze both ends of the cover to remove it.
3. Remove the fuse, and then replace it with another 1.6 A 250 V 20 mm cartridge fuse.

Warning

For continued protection against risk of fire, replace only with the same type 1.6 A 250 V 20 mm fuse.

Warning

To avoid the risk of fire, you must always replace the fuse with the same type of fuse and specified rating. Failure to comply may result in result in personal injury and/or equipment damage.

4. Re-install the fuse cover.
5. Re-connect the AC power supply.

Appendix A

Control Panel Setup Parameters

Overview

Using **Setup** parameters, you can customize the control panel's operation to function in a manner that is tailored for your facility.

The **Setup** parameters are accessed via the **Option** button.

Note

Except where noted, the term NUCLEUS is used in the manual to refer to both NUCLEUS and NULEUS-DM.

This appendix contains the following topics:

- "Navigating the Setup Parameters" on page 38
- "Setup Parameter Descriptions" on page 40

Navigating the Setup Parameters

The following list is a tree view of the setup parameters for the NUCLEUS and NUCLEUS-DM control panels. To access the setup parameters, press the **Option** button, and then from the Options menu, select **Set Up**.

Descriptions of these parameters begin on page 40.

Scroll Mode
- **Wrap Around**
- **Don't Wrap Around**

Screen Intensity
- **Numeric parameter (1 to 10)**

LED Intensity
- **Numeric parameter (1 to 10)**

LCD Intensity
- **Numeric parameter (1 to 10)**

LCD Contrast
- **Numeric parameter (1 to 10)**

Screen Saver Timeout
- **Off**
- **5 mins**
- **10 mins**
- **20 mins**
- **30 mins**

Screen Saver Select
- **Default**
- **Blank**

Shaft Direction
- **Clockwise = List Up**
- **Clockwise = List Down**

Leitch Name Mode
- **Off**
- **On**

Trax
- **Off**
- **On**

Trax Confirm
- **Off**
- **On**

Panel Name

Network
- **IP**
- **Subnet Mask**
- **Gateway**

Control Panel Tracking
- **On**
- **Off**

Auto Boot to Configuration
- **Save**
- **Delete**

Reboot

Setup Parameter Descriptions

Scroll Mode

In *Wrap* mode, when you scroll through a parameter list, the control panel considers the list as a circular set of data. When the last parameter in the list is reached, the first parameter in the list immediately follows it. In *Don't Wrap* mode, the control panel stops when the last parameter in the list is displayed. To return to the first parameter, you must scroll through the entire list in the opposite direction.

Screen Intensity

To accommodate different equipment room lighting conditions, you can set the panel display intensity. Use the numeric parameter sliding bar to make the intensity adjustments.

LED Intensity

Using a numeric parameter sliding bar, you can adjust the intensity of the LEDs on the preset buttons.

LCD Intensity

Using a numeric parameter sliding bar, you can adjust the intensity of the user-programmable LCD buttons.

LCD Contrast

Using a numeric parameter sliding bar, you can adjust the contrast of the user-programmable LCD buttons.

Screen Saver Timeout

To extend the life of the display device, the screen saver automatically shuts off the display after a preset period of inactivity. Using the screen saver timeout parameter, you can set the duration of inactivity after which the control panel display turns off. The available options are **Off, 5**, **10**, **20**, or **30** minutes. If the **Off** feature has been enabled, the screen saver will not operate.

To exit the screen saver mode, press any button. No parameters will be changed when you exit the screen saver mode.

Screen Saver Select

Using this parameter, you can select either a blank screen or a default screen to display when the control panel's screen saver is activated.

Shaft Direction

Using this parameter, you can determine whether the clockwise rotation of the adjustment knobs moves up or down through a parameter list, and increases or decreases numeric values when adjusting numeric values.

Leitch Name Mode

With this parameter enabled, device parameter names are displayed in the control panel screen as Leitch default names. Otherwise, alias parameter names are displayed. For information about parameter aliases, see your CCS software application user guide.

TRAX

With this parameter enabled, you can use the NUCLEUS-TRAX on the control panel. For more information about NUCLEUS-TRAX, see your *NUCLEUS for Processing Device Control User Manual*.

TRAX Confirm

With this parameter enabled, you receive a message after you press **TAKE**, asking whether or not you want Trax to jump to the device menu associated to the selected source. For more information about the TRAX Confirm feature, see your *NUCLEUS for Processing Device Control User Manual*.

Panel Name

This parameter establishes a user-specific name for the control panel. This name identifies the control panel throughout the network. For example, when the control panel tracking parameter is enabled (see "Control Panel Tracking" on page 42) the control panel is tracked by other panels using this name.

Network

This parameter sets the control panel's network IP address. The system administrator can set a new IP address to the control panel. Because this panel operates in an Ethernet environment, a unique IP address must be set. The default IP address is **192.168.100.251**. To prevent IP address conflicts, this default IP address must be changed. You can assign an IP address to the panel using the control panel or a CCS software application.

Subnet Mask

A subnet is a part of a network. It may include, for example, the devices in one geographic location, studio, or local area network. Using this parameter, the system administrator can assign a new subnet mask to the control panel. The default subnet mask is **255.255.255.0**.

Gateway Address

This parameter sets the value for the gateway IP address. The default gateway IP address is **192.168.100.251**.

Control Panel Tracking

With the control panel tracking parameter enabled, you can track other NUCLEUS control panels on the same network. A notification is generated when two control panels are connected to the same device. This alerts the user to the fact that two control panels are attempting to simultaneously control the same device.

Auto Boot to Configuration

Using this parameter, you can set the panel's auto boot configuration. The panel's auto boot configuration is automatically loaded when NUCLEUS is powered up or rebooted. Selecting **Save**, automatically overwrites the previous auto boot configuration assignment with the configuration that is currently active on the panel. Selecting **Delete** removes the previous auto boot configuration assignment and leaves the panel with no assigned auto boot configuration.

Reboot

When you select this parameter, you will reboot the control panel. No other devices on the network are effected by this reboot, and no settings are lost.

Appendix B

Displaying NTP Time

Overview

The display on NUCLEUS and NUCLEUS-DM control panels can be used as a digital clock to display the current time. The clock can display time internally generated by the control panel, or it can display time from a Network Time Protocol (NTP) signal from within the Ethernet network. This appendix includes information about configuring NUCLEUS to display time from an NTP signal.

Note

Except where noted, the term NUCLEUS is used in the manual to refer to both NUCLEUS and NULEUS-DM.

System Requirements

NUCLEUS can display NTP time from a networked NEO frame containing a clock system driver (CSD) if all of the following system requirements are met:

- A CSD module is installed within the network.
- The CSD module is configured as an NTP server.

  (See Chapter 5 “Network Time Protocol Support” in the *NEO CSD-3901* or *CSD-3902 Clock System Driver Installation and Operation Manual* for instructions for configuring the CSD module as an NTP server.)
- The NEO frame contains a 3901RES-E resource module.
- The control panel uses version 1.29 or newer firmware.

Configuring NUCLEUS to Display NTP Time

In order for NUCLEUS to display time from an NTP source (CSD), this feature must be enabled using the **Clock Management** menu. For the control panel to communicate with the CSD module, you must provide the IP address of that frame's resource module.

Follow these steps to provide the IP address of the NEO frame's resource module:

1. Press the **Option** button on the control panel.
2. From the **Options** menu, select **Clock Management**, and then press **Enter**.
3. Select **NTP**, and then press **Enter** to enable the NTP Server option.
4. Press **Exit** to return to the **Clock Management** menu, and then select **NTP Servers** from the list.

   A list of IP addresses appear on the control panel display.

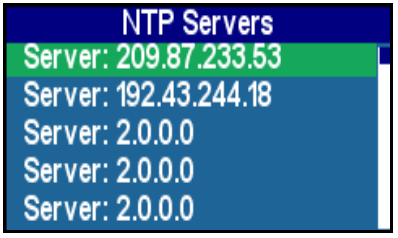

Figure B-1. NTP Servers

5. Select an IP address from the list, and then press **Enter**.
6. To display the time, use the **Exit** button to navigate back the **Clock Management** menu, and then select **Show Time**.

   The control panel display shows the current time.

Appendix C

GNU Public License Information

Overview

The appendix provides information about modifications to the GNU open source code.

Modifications to the GPL Source Code

The following table provides information about modifications to GPL source code that have been used in the creation of this product.

Table C-1. GPL Software Modification Log

Software Modified	Details
Apex Boot Loader 1.3.2	**Date Modified:** October 27, 2005
	Files Modified: serial.c, initialize.c, init.c
Linux Kernel 2.6.12.5 with lh-patch	**Date Modified:** March 20, 2006
	Files Modified: main.c

Upon receipt of a written request from the Customer, Harris will provide one (1) copy of the source code for the Linux Kernel 2.6.12.5 and/or Apex Boot Loader 1.3.2 applications. The Customer will address such request to NUCLEUS Customer Service at BCDService@harris.com.

HARRIS IS PROVIDING THE LINUX KERNEL AND APEX BOOTLOADER PROGRAM SOURCE CODE TO CUSTOMER “AS IS” AND HARRIS SHALL NOT BE LIABLE IN ANY WAY FOR THE PERFORMANCE OF THE LINUX KERNEL AND APEX BOOTLOADER PROGRAM SOURCE CODE. CUSTOMER ACKNOWLEDGES THAT HARRIS IS NOT PROVIDING, AND CUSTOMER IS NOT RELYING ON, ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN REGARD TO THE LINUX KERNEL AND APEX BOOTLOADER PROGRAM SOURCE CODE.

To view the GPL license agreement see www.gnu.org/licenses/gpl.txt.

Index

A

Activating license keys 20
Active Alarms menu 18, 21
Adjustment buttons 14
Adjustment knobs 13
Alarms
    configuring 22
    viewing active 21
Auto Boot to Configuration parameter 42

B

Back views
    NUCLEUS 4
    NUCLEUS-DM 4
Buttons
    adjustment 14
    Enter 15
    Exit 15
    LCD 16
    navigation 15
    Option 15, 37
    Panel Enable 14, 26
    preset 16
    Shift 15
    user-programmable LCD 16
Buying additional manuals viii

C

CCS software 10, 32
Clock 25
Clock Management menu 18, 25, 46
Compliance and certification information x
Configurations
    copying 27
    deleting 27
    transferring with USB drive 27
Configure Alarms menu 18, 21, 23
Configuring
    alarms 22
    for NTP support 46
Connections 34
Control panel
    display area 12
    enabling/disabling 26
    front panel description 12
    updating software 26
    using panel controls 12
Control Panel Tracking parameter 42
Copying
    configurations 27
    firmware 27

D

Deleting

configurations 27
firmware 27
Dimensions 34
Disabling the control panel 26

E

Enable Panel button 26
Enabling the control panel 26
Enter button 15
Exit button 15

F

File Manager
menu 19
transferring information with 29
Front views
NUCLEUS 3
NUCLEUS-DM 3
Fuse replacement 35

G

Gateway Address parameter 42
GNU Public License Information 47

I

IP address
NEO resource module 46
NUCLEUS 42

K

Knobs, adjustment 13

L

LCD buttons 16
LCD Contrast parameter 40
LCD Intensity parameter 40
LED Intensity parameter 40
Leitch Name Mode parameter 41
License key activation 20
License Key menu 19

M

Manual revision history vii
Manuals, purchasing additional viii
Menus
Active Alarms 18, 21
Clock Management 18, 25, 46
Configure Alarms 18, 21, 22
File Manager 19
License Key 19
Options 18–30
Physical Devices 19
Preset/Unity 18
Setup 18
Version Info 19
Mounting NUCLEUS-DM into a desk or tabletop 6–8
Multi-function buttons 15

N

Navigating setup parameters 38
Navigation keys 15
Network IP address parameter 42
NTP support 25
NUCLEUS
activating features with a license key 20
back view 4
clock 25
connections 34
dimensions 34
front view 3
IP address 42
power consumption 35
specifications 33
NUCLEUS-DM
back view 4
front view 3
mounting into a desk or tabletop 6–8
Numeric keypad 15

O

Option button 15, 37
Options menu 18–30

P

Panel controls 12
Panel Enable button 14
Panel Name parameter 41
Parameter
    setup
        Shaft Direction 41
Parameters
    setup 37–43
        Auto Boot to Configuration 42
        Control Panel Tracking 42
        Gateway Address 42
        LCD Contrast 40
        LCD Intensity 40
        LED Intensity 40
        Leitch Name Mode 41
        Network 42
        Panel Name 41
        Reboot 43
        Screen Intensity 40
        Screen Saver Select 41
        Screen Saver Timeout 40
        Scroll Mode 40
        Subnet Mask 42
        TRAX 41
        TRAX Confirm 41
Physical Devices menu 19
Power consumption 35
Preset buttons 16
Preset/Unity menu 18

R

Reboot parameter 43
Revision history vii

S

Safety
    instructions xi
    safety standards and compliances x
    terms and symbols x
Screen Intensity parameter 40
Screen Saver Select parameter 41
Screen Saver Timeout parameter 40
Scroll Mode parameter 40
Servicing xi
Setup menu 18
Setup parameters 37–43
    Auto Boot to Configuration 42
    Control Panel Tracking 42
    Gateway Address 42
    LCD Contrast 40
    LCD Intensity 40
    LED Intensity 40
    Leitch Name Mode 41
    navigation 38
    Network 42
    Panel Name 41
    Reboot 43
    Screen Intensity 40
    Screen Saver Select 41
    Screen Saver Timeout 40
    Scroll Mode 40
    Shaft Direction 41
    Subnet Mask 42
    TRAX 41
    TRAX Confirm 41
Shaft Direction parameter 41
Shift button 15
Specifications 33
Subnet Mask parameter 42

T

Transferring
    configurations with a USB drive 27
    information using the File Manager 29

TRAX Confirm parameter 41
TRAX parameter 41
Troubleshooting 31

U

Updating software on the control panel 26
USB drive 27
User-programmable LCD buttons 16

V

Version Info menu 19
Viewing active alarms 21

W

Warranty information ii

NUCLEUS Preset Button Template

PRESET 1	PRESET 2	PRESET 3	PRESET 4	PRESET 5	PRESET 6	PRESET 7	PRESET 8
DEST 1	DEST 2	DEST 3	DEST 4	DEST 5	DEST 6	DEST 7	DEST 8
SRC 1	SRC 2	SRC 3	SRC 4	SRC 5	SRC 6	SRC 7	SRC 8
SALVO 1	SALVO 2	SALVO 3	SALVO 4	SALVO 5	SALVO 6	SALVO 7	SALVO 8
RE-CUE <<	PLAY >	FADE	CUT	LAYER 1	LAYER 2	LAYER 3	LAYER 4

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